



Forestry and
Land Scotland
Coilltearachd agus
Fearann Alba

East Region

Gartly

Land Management Plan



Plan Reference No: LMP 39

Plan Approval Date: 11/05/2023

Plan Expiry Date: 11/05/2033

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

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



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1.0 Summary of Proposals

This plan is a review of Forestry and Land Scotland’s (FLS) management of Gartly, situated approximately 5 miles to the south-east of Huntly in Aberdeenshire. The plan area extends to 1221.5ha.

The purpose of the plan is to outline felling and thinning proposals over 20 years, with the first 10 years in detail, along with restocking proposals for the whole plan area.



Gartly Land Management Plan 2023

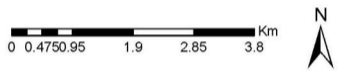
Map 1: Location

Scale @ A2: 1:50,000

Date: November 2022

Legend

Gartly LMP Area



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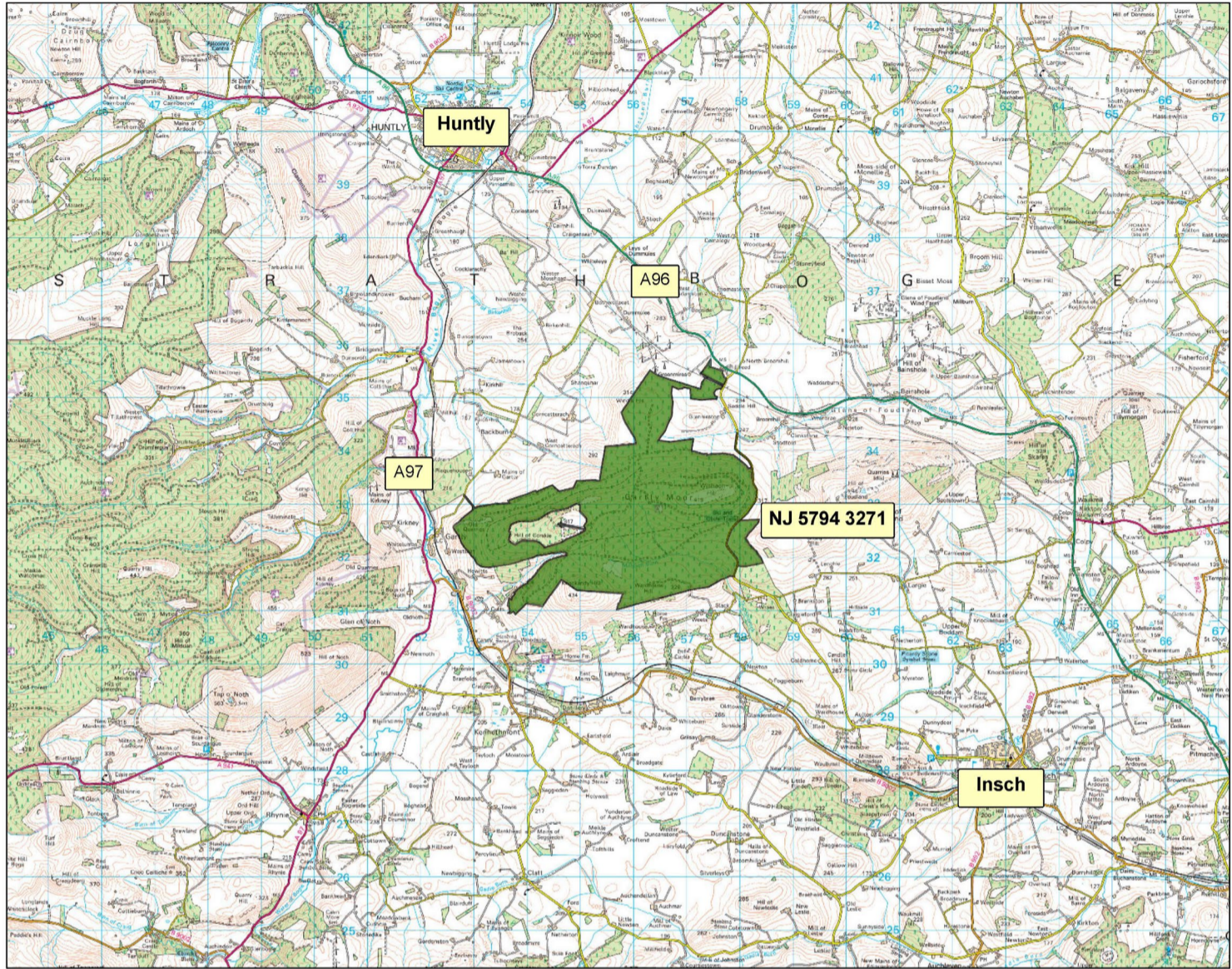


Figure 1: Map showing Gartly location

Planned Operations	2023-2033 plan period
Clearfell	226.3ha
Thinning	768.2ha
Restock	239.5ha
Road construction	0m
Road upgrade	0m
Peat restoration	68.9ha

Table 1: Operations within this plan period

Gartly Land Management Plan 2023

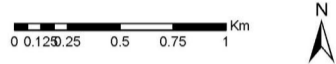
Phase 1 & 2 Felling Coupes

Scale @ A2: 1:15,000

Date: November 2022

Legend

- Phase 1 felling (2023 - 2027)
- Phase 2 felling (2028 - 2033)
- Majority Windblown Areas
- Forest Roads
- Watercourses



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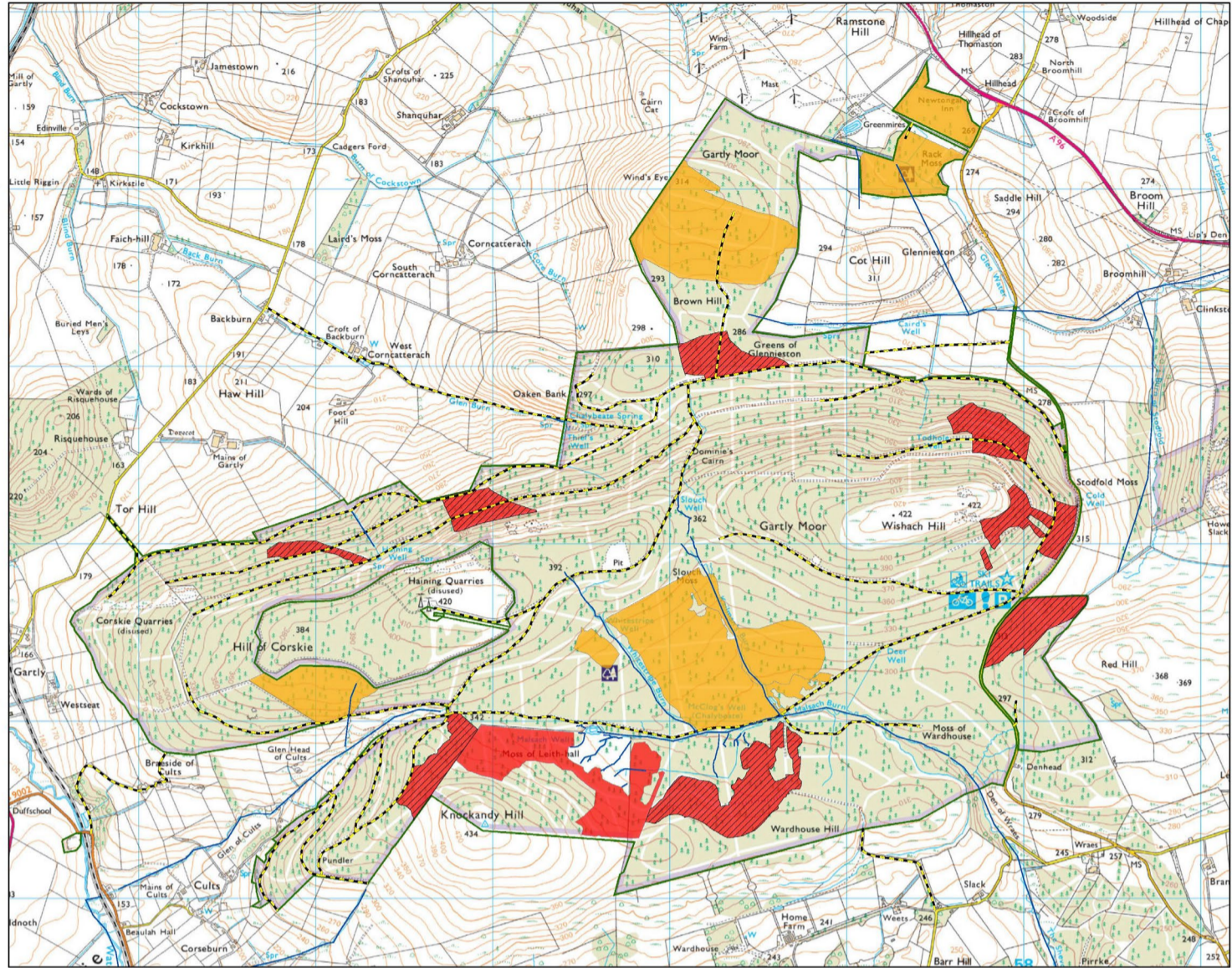


Figure 2: Map of planned felling coupes and phase of felling

Gartly Land Management Plan 2023

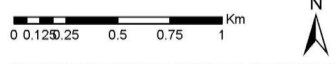
Restocking in Plan Period

Scale @ A2: 1:15,000

Date: November 2022

Legend

- Forest Roads
- Watercourses
- Peat Restoration
- Other/Mixed Broadleaves
- Scots Pine
- Sitka Spruce
- Birch with any Other Broadleaves
- Birch with Scots Pine
- Norway Spruce with Sitka Spruce
- Other Broadleaves with Birch
- Other Broadleaves with Scots Pine
- Scots Pine with Birch
- Scots Pine with any Other Broadleaves
- Sitka Spruce with Lodgepole Pine



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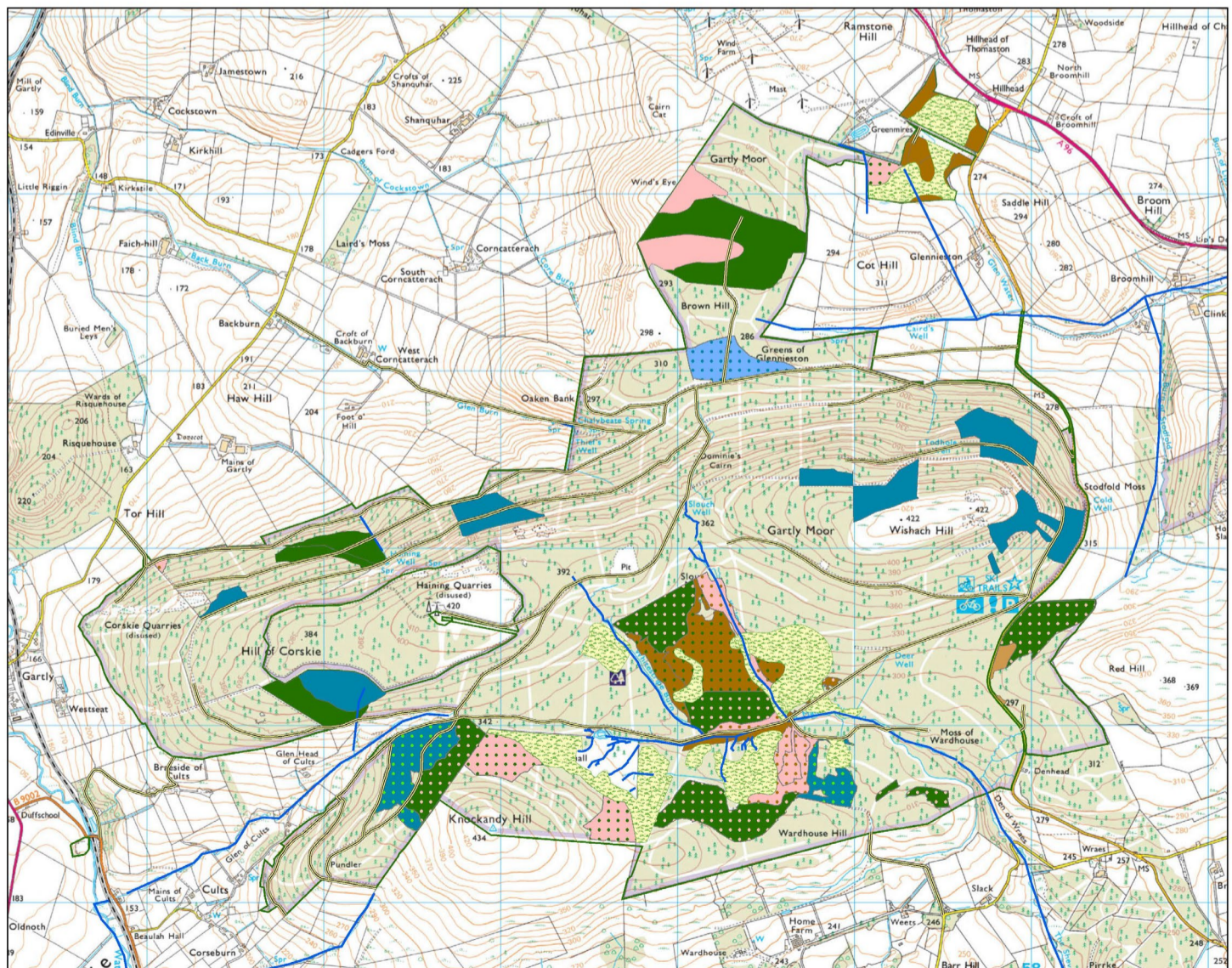


Figure 3: Map showing areas to be restocked within plan period and species to be planted

The plan will be reviewed after five years to ensure the objectives set out in the LMP are still appropriate for the management of the forest in the current conditions. All operations, both planned and completed, will also be reviewed to ensure they are still necessary to achieve the stated objectives.

In addition to this overarching strategic level plan, all operations will be preceded with a more detailed operational planning process. This will be guided by the work plan document that provides an opportunity for all sections of FLS (visitor services, environment, civil engineers, etc.) to provide detailed information that pertains to the planned operation. The forest works manager is then able to plan the operation with the fullest and latest information available, which enables them to make any changes or undertake any mitigation measures necessary to minimise any potential negative impacts identified.

2.0 Scottish Forestry Regulatory Requirements

This section provides a summary of the elements of the LMP which are regulated by Scottish Forestry, focusing on relevant operations and activities being carried out in the first ten years of the plan.

2.1 Summary of planned operations

Planned Operations	2023-2033 plan period
Clearfell	226.3ha
Thinning	768.2ha
Restock	239.5ha
Road construction	0m
Road upgrade	0m
Peat Restoration	68.9ha

Table 2: Planned operations in 10 year plan period

2.2 Proposed felling in years 2023-2033

Proposed felling year	Fell area (ha gross)	% forest area
2023-2027	110.3	9.0%
2028-2033	116.0	9.5%

Table 3: Proposed Phase 1 and Phase 2 felling over this plan period (gross coupe size)

Coupe	SS	SP	LP	NS	Larch	Total
39005	27.42		0.23		0.41	28.06
39042	13.91		1.62	3.47	3.00	22.00
39330	8.87				0.42	9.29
39543	8.37		0.6		0.03	9.00
39562	6.95					6.95
39609	2.56				0.68	3.24
39877	11.37					11.37
39935	8.07				0.42	8.49
39992	8.59		1.2		2.1	11.89
39079	7.89		3.85		1.95	13.69
39337	24.15		0.31		10.41	34.87
39757	19.93					19.93
39758	29.19	0.14	0.67		4.47	34.47
39919	8.17		4.91			13.08
Total	185.44	0.14	13.39	3.47	23.89	226.3

Table 4: Clearfell details by coupe (ha)

Age of trees	Growth stage	Percentage of class at given year	
		2023	2033
0 – 10	Establishment	23.4	22.0
11 - 20	Thicket	17.4	18.9
21 – 40	Pole stage	19.0	24.1
41 – 60	Maturing high forest	5.2	5.6
61+	Old high forest	19.9	14.3
Open/felled	n/a	15.1	15.1

Table 5: Change in age class over plan period (%)

2.3 Proposed thinning in years 2023-2033

Coupe	Thinning Year	Area (ha)	Volume (m ³)
39001	23/24	64.2	3654
	30/31	106.4	5367
39002	23/24	90.5	5502
	30/31	91.8	5510

39003	23/24	33.6	1643
	30/31	93.3	4166
39004	25/26	80.2	4313
	32/33	96.5	5317
39005	26/27	47.7	902
39012	24/25	30	1484
	31/32	34	1659

Table 6: Proposed thinning in Phases 1 and 2

2.4 Proposed restocking in years 2023-2033



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Gartly Land Management Plan 2023

Species at End of Plan Period

Scale @ A2: 1:15,000

Date: November 2022

Legend

- Forest Roads
- Watercourses
- All Restock and restoration areas July 2022
- Peat Restoration
- Other/Mixed Broadleaves
- Scots Pine
- Sitka Spruce
- Birch with any Other Broadleaves
- Birch with Scots Pine
- Norway Spruce with Sitka Spruce
- Other Broadleaves with Birch
- Other Broadleaves with Scots Pine
- Scots Pine with Birch
- Scots Pine with any Other Broadleaves
- Sitka Spruce with Lodgepole Pine
- Beech
- Birch
- Other/Mixed Conifers
- Douglas Fir
- Larch
- Lodgepole Pine
- Norway Spruce

0 0.125 0.25 0.5 0.75 1 Km



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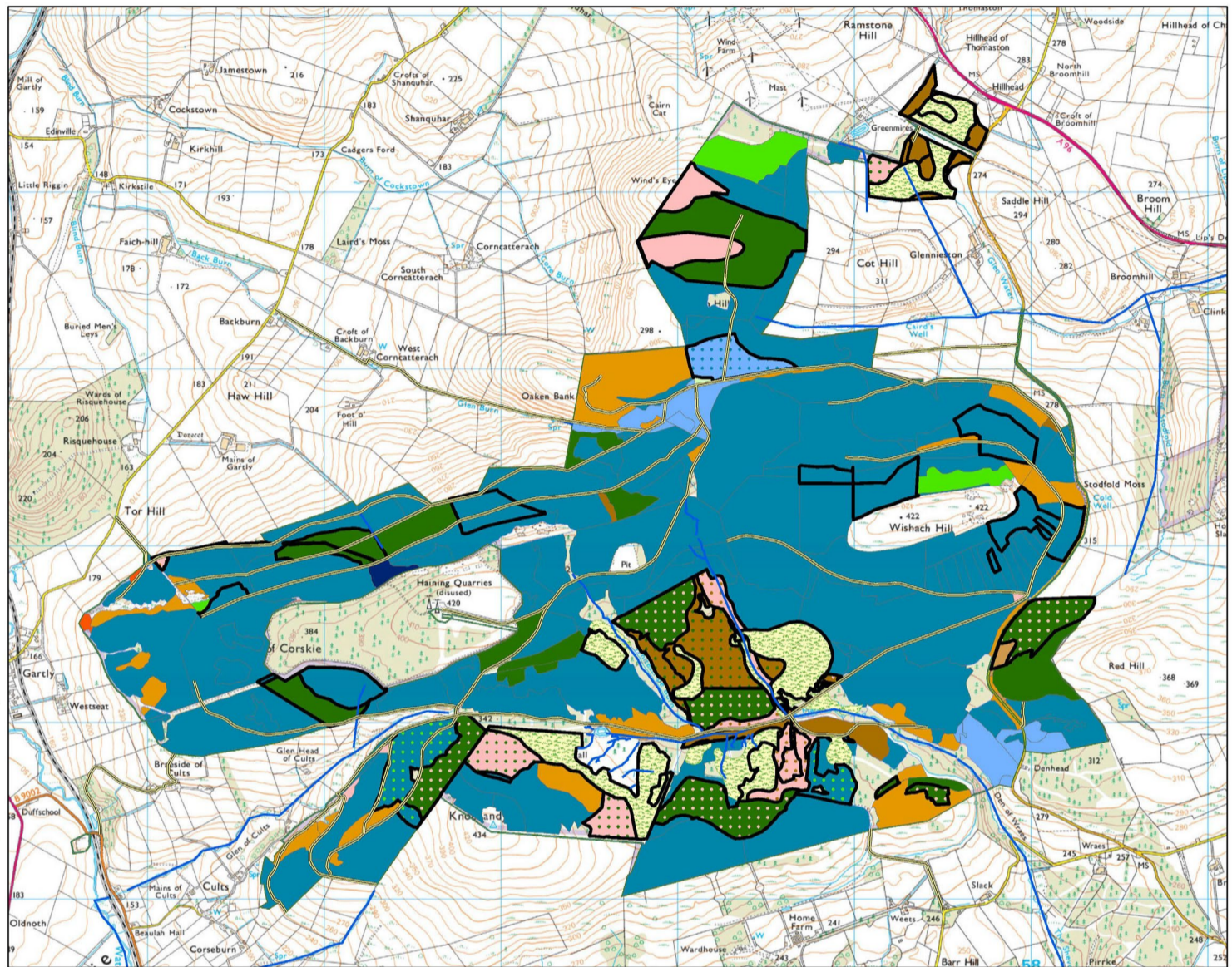


Figure 4: Species coverage at end of plan period

Coupe	SS	SP	LP	NS	Alder	Birch	Mix BL	Open space	Peat Rest.	Total
39005		2.42				9.58			16.06	28.06
39042/39027		9.42			3.87	7.90			4.26	25.45
39330	9.29									9.29
39543	4.5			4.5						9.00
39562	6.95									6.95
39609/39370		8.10								8.10
39877	11.37									11.37
39935		5.11				3.38				8.49
39992		8.02				2.28	1.59			11.89
39079	7.43	6.26								13.69
39337		25.74				13.06				38.80
39757		0.27			0.90	3.16	0.86	0.68	14.74	20.61
39758		17.89				4.31	5.81	9.68	4.73	42.42
39919		0.82				1.23	4.56	3.04	14.00	23.65
39345	9.12									9.12
39288	1.94									1.94
39029/39339	6.43		6.43							12.86
39009	2.66	1.25	2.66			0.83				7.40

Coupe	SS	SP	LP	NS	Alder	Birch	Mix BL	Open space	Peat Rest.	Total
39008/39519							2.86			2.86
39744						0.65	0.65			1.30
Total	59.69	85.30	9.09	4.50	4.77	46.38	16.33	13.40	53.79	293.25

Table 7: Restock details by coupe (ha)

Species	Area (ha) 2023	% Cover 2023	Area (ha) 2033	% Cover 2033
Sitka spruce	762.4	62.4	636.7	52.1
Larch	122.9	10.1	99.0	8.1
Lodgepole pine	69.1	5.7	64.8	5.3
Norway spruce	27.1	2.2	28.1	2.3
Scots pine	33.1	2.7	118.3	9.7
Birch	7.9	0.6	54.3	4.5
Alder	6.5	0.5	11.3	0.9
Mixed conifers	2.1	0.2	2.1	0.2
Mixed broadleaves	5.9	0.5	22.2	1.8
Open/Other	141.5	11.6	184.7	15.1
Felled/Failed	43.0	3.5	0	0
Total	1221.5	100	1221.5	100

Table 8: Species change over plan period

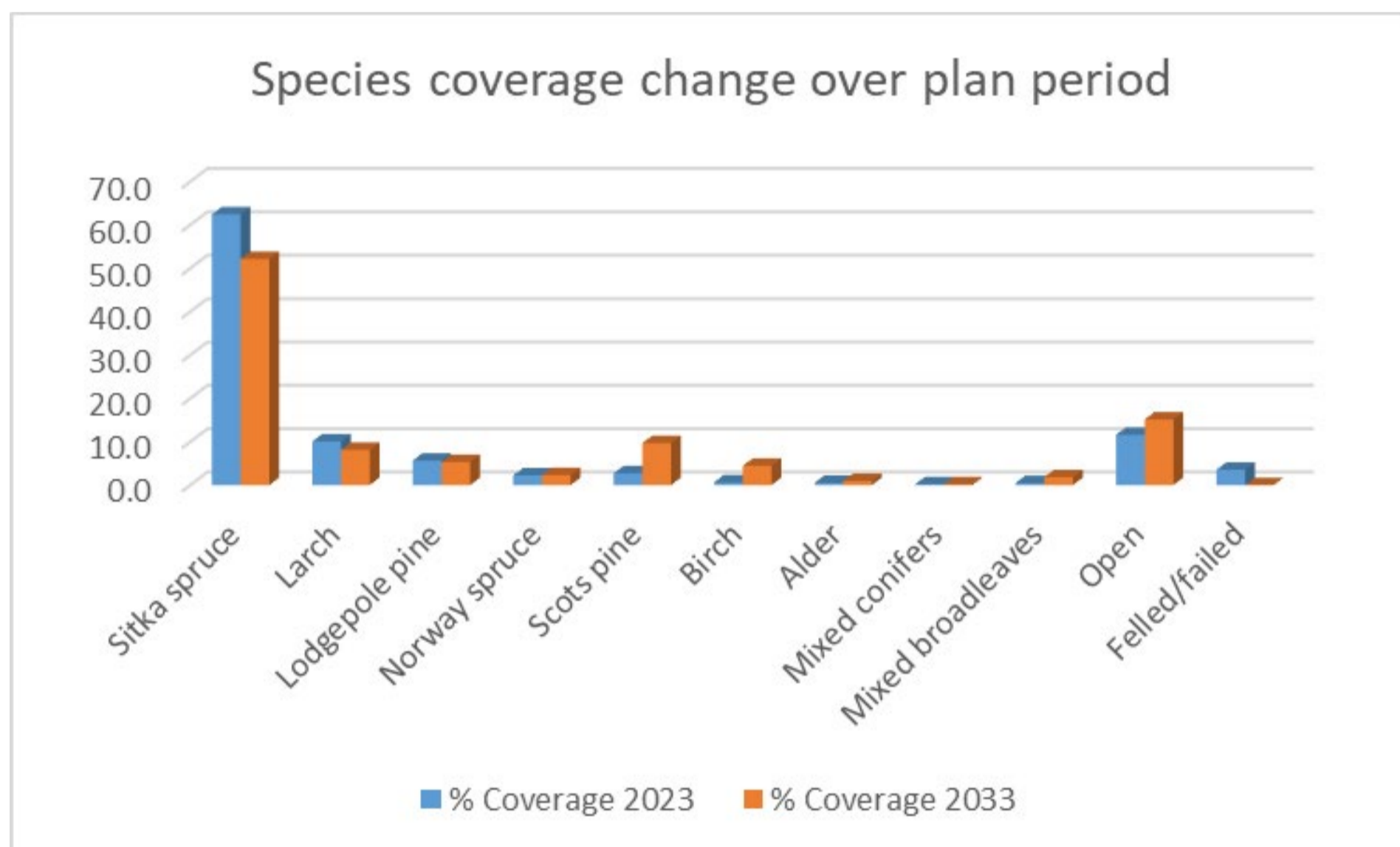


Figure 5: Graph showing species change over plan period

A concerted effort has been made to increase the broadleaf coverage in this plan as, at 1.7%, the coverage is currently significantly under the UKFS target of a minimum of 5%.

At the end of this plan period, the broadleaf coverage will stand at 7.2% and Sitka spruce coverage will have dropped by over 10%, with the majority of this area replanted with Scots pine and native mixed broadleaves.

This, combined with large areas of habitat restoration, including peat restoration, ensure that the block will be fully UKFS compliant and also contributing towards biodiversity, resilience and carbon capture targets by the end of the plan period.

2.5 Access and roading 2022-2032

There are no proposals for new roads in the plan period. There are also no proposed road upgrades. The only work on the existing road network will be ongoing maintenance to ensure all parts of the LMP area are accessible for planned operations.

2.6 Recreation facilities

Current car-parks and waymarked paths will be maintained but no new facilities will be added.

2.7 Departure from UKFS guidelines

The LMP seeks to follow the UKFS in all requirements.

2.8 Standards and guidance on which this LMP is based

This land management plan has been produced in accordance with a range of government and industry standards and guidance as well as recent research outputs. A list of these standards and guidance can be found here: <https://forestryandland.gov.scot/what-we-do/planning/links>

In addition Forest Guidance Notes regarding forest operations and specific species, will be adhered to. These can be found here: <https://forestry.gov.scot/publications/forests-and-theenvironment/biodiversity/wildlife-forest-operations>

FLS and East region have a full set of national and local policies and plans plus working groups to deal with all major contingencies that may affect the forest during the period of the plan.

2.9 Tolerance table

Please see Appendix C

3.0 EIA screening determination for forestry projects

3.1 Proposed deforestation

This plan requests permission to carry out deforestation of 65.16ha for the purposes of deep peat restoration across the LMP area.

Although there is 68.89ha of total peat restoration to be carried out during the plan period, 3.73ha of this is already within approved open ground from previous plan period.

There are patches of deep peat across the plan area but they are primarily focused in the Malsach Burn valley (51.16ha of deforestation) and Rack Moss in the Northernmost part of the block (14ha of deforestation). Areas on to be deforested are primarily on deep peat soils and will be restored to a functioning peatland system that includes Blanket Bog (Priority Habitat). This will involve the removal of any remaining live conifers and undertaking ground works to restore the original ground surface as best as possible. An EIA screening determination is being sought as part of this plan submission to allow the deforestation to be undertaken. Further details of the sites and the restoration process are in Appendix G - Peatland Restoration Plan.

3.2 Proposed forest road works

There are no roadworks in the period requiring an EIA determination.

3.3 Proposed forest quarries

There are no new quarries or quarry extensions in the plan period requiring an EIA determination.

3.4 Proposed afforestation

There is no proposed afforestation within the plan period. All planting will take place on ground with previous forest cover.

4.0 Introduction

4.1 The existing land holding

Gartly consists of one large forest block, which lies just off the A96 between the towns of Huntly and Inch in Aberdeenshire, main entrance grid reference: NJ 578 327. The block covers a total area of 1221ha.

The majority of Gartly was converted to forestry from moorland when the land was acquired after World War II, with the first major periods of tree planting occurring between 1947-52 and 1957-65. There was a further period of planting on newly acquired ground between 1988 and 1990.

Much of Gartly is still in its first rotation of forestry, in particular, the areas planted in the late 80's. There has, however, been widespread clearfelling in the past 10 years, mostly due to the presence of DNB at damaging levels and, more recently, the occurrence of *Phytophthora ramorum* in some larch.

Restocking operations have been carried out from 1999 to present, resulting in a wide age range of timber present currently.

More details on the existing physical characteristics and background to the site can be found in Appendix B.

This plan is a revised submission of an earlier plan, approved in 2012.

4.2 Setting and context

Gartly is predominantly set around three hills which are all notable in the landscape from the surrounding area. The hilltops range between 380m and 430m and the lowest point within the block sits at 250m.

The Eastern end of the block is clearly visible to traffic passing along the A96 and the Western end is prominent from the A97, landscape impacts of forest operations will be a consideration in these areas.

The large Clashindarroch forest block begins around a mile from the western boundary of Gartly and there is a recently planted private scheme situated immediately to the East on existing moorland.

There is relatively little forest cover in the rest of the surrounding area, with the majority of the adjacent land utilised for farming. This means that Gartly is an important recreational resource for the local community, with long established recreation routes for walking, biking and equestrian activities well used at present.

4.3 LMP Presentation

The land holding as a whole will be considered in this LMP.

5.0 Plan Objectives

5.1 Issues

The main issues to consider in this LMP are:

- The percentage coverage of broadleaf species is currently below the UKFS minimum limit.
- Sitka spruce regeneration is known to be extremely prevalent in some areas of the block.
- Large areas within the block were clearfelled during the previous plan period due to the presence of DNB and phytophthora ramorum infection.
- A number of UK Biodiversity Action Plan priority species are recorded in the block including red squirrel, pine marten, otter, water vole and Scottish wildcat.
- There are significant areas of deep peat and bog habitat present. Some which have possibly been planted with unsuitable species in the past.
- Some riparian zones have unsuitable species present, whether planted or regenerated.
- Watercourses within Gartly feed into rivers known to be susceptible to flooding.
- Large areas of the forest were severely affected by Storm Arwen in winter 2021, leading to a large amounts of fresh windblow.

5.2 Key Challenges

- How to produce quality timber from blocks high in recreation and environmental value
- How to conduct necessary forest operations without having a detrimental effect on visitor experience
- How to protect priority habitats within LMP area
- How to restore damaged areas of deep peat effectively
- How to manage potential impacts on river catchments known to have a flood risk
- How to ensure LISS prescriptions are applied to suitable areas
- How to increase resilience and species diversity within the LMP area
- How to protect UK BAP species habitats during forest operations
- How to conduct felling operations without a detrimental effect on the landscape
- How to clear large areas of windblown timber in a short period of time to maximise timber recovery

5.3 National Spatial Overview

The Forestry and Land Scotland National Spatial Overview includes Gartly within Zone 7: Moray and Aberdeenshire Uplands.

The aims and objectives identified that Zone 7 can best contribute to include:

- **Ecosystem services and additional public benefits:** support for small sawmills; establish and support started farms; secure carbon sequestration through CCF; maintenance of high water quality of salmon rivers; provide shelter for stock on neighbouring land; high recreation use of NFE contributes to increased health and well-being; sustainable timber production
- **Other national commitments:** investment in silvicultural practices; management of tree disease; habitat management for Scottish wildcat
- **Contribution to financial sustainability:** high quality timber crops; high potential for saw logs; diversity of softwood species; specialist timber markets; windfarms

Focusses of effort and investment challenges for this area include:

- **Continue to develop a thinning and CCF programme.** More CCF would extend the resilient forest structure and reinforce 'coniferous forest as mature habitat' in this zone, while potentially increasing saw log production. Challenges are likely to be deer management,

contractor and staff skills, provenance of recruited species, potential impacts of climate change and of tree disease, while benefits may include reduced restocking costs and long term carbon sequestration

- **Respond to predicted impacts of climate change.** Including current and up-coming disease threats related to third rotation forests and changing climate, potential drought and predicted longer growing season. The challenge is to reduce the risk to future forest structure and high quality timber products
- **Accommodate the increasing number of overhead lines proposed to cross the NFE,** alongside continued wind farm development. Challenges include planning roads and efficient felling patterns within a more fragmented forest area, ensuring on going ‘resilience’ of infrastructure and timescales involved with construction
- **Increase broadleaf to at least 5% in each LMP area and develop an associated management and marketing strategy,** as the zone overall does not meet UKFS requirements. There are opportunities to use broadleaves to provide shelter for farmland, maintain and improve water quality for salmon rivers; and expand woodland habitats; build on LISS and CCF management expertise and contractor base to expand broadleaf silviculture, higher value productive BL outputs and marketing

5.4 Management Objectives

5.4.1 Primary objectives

Objective 1: Ensure that the forest continues to contribute to Region’s timber production targets. There are opportunities to produce a significant amount of timber through a combination of clearfell and thinning activities. A future resource can also be guaranteed by restocking with primarily productive species.

Objective 2: Increase resilience and biodiversity value by adding more diverse range of species. The presence of diseases affecting several tree species and the poor soils present in Gartly may mean that suitable restock species will be limited in large areas of the block. There will be a focus on identifying suitable areas for additional species diversity, which will build resilience to probable pest and disease impact in the future and help mitigate the impact of other issues associated with a changing climate.

5.4.3 Secondary Objectives for entire LMP area

- **Identify and implement management operations to help achieve carbon capture and biodiversity targets.** This will include investigating known areas of deep peat within the block and carrying out restoration work where it is likely to increase the carbon capture potential of the area.
- **Protect and improve the water environment.** Gartly forms part of the watershed for several locally important watercourses, with some tributaries originating from within the block. Feasible steps will be taken to ensure water quality is maintained or improved and that operations do not have a negative impact on flood risk downstream.
- **Maintain and improve habitat for all priority species found within the block.** As well as the known presence of red squirrel and pine martin, Gartly also forms part of the Strathbogie Wildcat Priority Area so in-depth consultation with conservation experts will be sought to ensure the block is managed in a sensitive manner.
- **Maintain current levels of recreational use.** The local population already use the woodlands for recreation, this should be sustained by conducting forest operations sensitively and maintaining current facilities.
- **Protect or improve priority habitats.** There are several priority open habitats within Gartly which should be protected or improved where possible, including: upland heath, acid grassland and open water.

6.0 Opportunities and Constraints

6.1 Opportunities and Constraints Analysis

The following table details the objectives, opportunities and constraints that have determined the design concept for the Gartly LMP.

Objective	Opportunities	Constraints	Concept
Ensure the forest continues to contribute to the region’s timber production targets	Several stands are suitable for clear-fell and restock management regimes	Felling operations are likely to have an impact on recreational use of the forest	Continue clear-fell operations but ensure close communications with local community and other stakeholders
		Some parts LMP area are prominent in landscape	Ensure felling coupes are planned to be complimentary to the landscape by applying landscape design principles and checking using visualisation software
		Potential problems with adjacency of felling coupes	Delay felling of suitable coupes to reduce impact of adjacent clearfells on newly restocked areas
		Regeneration usually occurs at extremely high densities	LISS coupes added where regeneration is known to occur but

Objective	Opportunities	Constraints	Concept
	Abundant regeneration observed in Eastern end of block	Single species dominates regeneration, having negative impact on diversity	need for respacing program is recorded Focus core sika spruce crop in specific zone and attempt to diversify in more suitable areas
Add species diversity where possible	Some areas suitable for clearfell could be restocked with alternative conifer species and broadleaves	Site conditions may only be suitable for a narrow range of species	Restock sites in suitable areas with alternative conifer species, ensuring they will grow at a productive rate by fully investigating site conditions Add broadleaves where site conditions are suitable to raise percentage cover to 5% minimum
Identify suitable areas and implement relevant management operations to help achieve carbon capture and biodiversity targets	Several areas of deep peat recorded which may be suitable for restoration	Spruce regeneration observed on some areas of peatland which is currently designated as open space Peat restoration activities usually involve deforestation	Plan non-native conifer removal and other peatland restoration activities on current areas of open deep peat Any potential sites to be fully investigated to ensure that restoration works would result in increased carbon capture when compared to restocking
Protect and improve the water environment	Opportunity to improve riparian habitats around watercourses across LMP area Several tributaries within Gartly are upstream of known floodpoints; opportunity to increase flood mitigation potential	Several small watercourses have spruce regeneration encroaching on bank Some watercourses have conifer crop planted within recommended buffer zones	Continue to manage riparian zones by planting suitable, native species adjacent to water courses and removing conifer regeneration when adjacent coupes are being felled or thinned If resources allow, non-native conifer removal operations to be carried out in existing riparian zones All forest operations will be carried out in line with the UK Forestry Standard Water Guidelines as a minimum Target crop immediately adjacent to watercourses during thinning operations if not within a planned clearfell Ensure areas felled within water catchments do not exceed recommended limit for each phase. Seek opportunities to establish riparian woodland to contribute to flood mitigation/prevention
Maintain and improve habitat for all priority species found within the block	Opportunity to protect and increase existing Red squirrel habitat	Some Red squirrel habitat has reached felling age	Maintain areas of suitable species with LISS prescriptions, ensure continuity of suitable maturing/mature high forest through felling program, restock

Objective	Opportunities	Constraints	Concept
	Opportunity to protect or increase suitable habitat for Scottish Wildcat	Lack of brash or windblow for suitable den sites in some areas of block	with suitable red squirrel friendly species where suitable Retain some existing areas of windblow as deadwood habitat and potential den sites
Maintain current levels of recreational use	Locally high number of daily visitors to the woodland, primarily walking dogs and exercising	Increase in recreational facilities provided is unlikely due to lack of resources	Continue to maintain current car parking and information boards, encouraging visitors to continue using woodland
Protect and improve priority habitats	Opportunity to protect existing upland heath priority habitat	Some spruce regeneration occurring on planned open ground at top of Wishach hill	Monitor area and remove spruce regeneration if it is deemed a threat to the open priority habitats

Table 9: Opportunities, constraints and concept analysis

6.2 Outcomes/Concept

Analysis of the above has led to the block being split into zones with one of three general priorities as per **Map 4: Opportunities, Constraints & Concept**.

These priority areas can be grouped as:

- **Zone 1: Core spruce production area.** This area is generally on higher ground where there is an existing spruce crop and large amounts of regeneration has been observed. Much of the Eastern side of this zone lends its self to LISS management which would also help with potential landscaping issues which would arise from clearfelling. Opportunities to add some diversity in the form of productive mixtures and riparian zones can also be taken where possible.
- **Zone 2: Species diversification, water quality and peatland management.** This zone mostly encompasses low lying, flat or gently sloping areas within the valley for Malsach Burn as well as Knockandy Hill where there are plans to create a clean-water area. This zone also includes the vast majority of deep-peat with the potential for restoration within the plan area. There is also a significant area of windblow which could be retained as deadwood reserve and potential habitat for Scottish Wildcat den sites.
- **Zone 3: Diversification with production focus.** This zone covers the lower slopes and valleys present in the remainder of the block where soil and climate data indicates a wider range of species than is currently present could be supported while still producing a valuable timber resource. Future restocking in this area will focus on transitioning to Scots pine and native broadleaf habitats and increasing the coverage of “alternative” conifers such as Norway spruce and Noble fir. Increasing the coverage of these species will also increase suitable habitat for red squirrel.

7.0 Long Term Land Management Plan Proposals

7.1 Felling

7.1.1 Clearfelling

Please see **Map 5: Management** for details of which areas are due to be clearfelled within the plan period.

Areas within the LMP which have objectives more focused on commercial benefits will be managed under a clearfell management type, using conventional harvester and forwarder working. 14 coupes are scheduled for clearfell within the plan period (see section 2.2) which constitute around 18.5% of the plan area. Of these coupes, 8 of them (82ha, 6.7% of plan area) are being felled primarily because of recent windblow and 4 (95.5ha, 7.8% of plan area) are part of the landscape scale habitat restoration in the Malsach Burn valley or for peat restoration.

These clearfell coupes were selected by analyzing a range of different variables. Clearfell coupes are generally programmed to be felled around the time that they reach their maximum annual increment for timber production but the impact on landscape value, recreational use, crop stability and the environment are also considered before felling coupes are designed.

Urea will be applied to stumps as standard in felling coupes which are known to have heterobasidion annosum present to help reduce infection levels.

Clearfelling provides more flexibility for restructuring and adding diversity; the coupes which are due to be felled during the plan period will be restocked using alternative conifer and broadleaf species where possible. However, for some of the felled areas, restocking with more common conifer species ie. Sitka spruce, is more likely to successfully achieve the aims of the plan due to the underlying site conditions.

Other Tree Felling in Exceptional Circumstances (November 2021)

FLS will normally seek to map and identify all planned tree felling in advance through the LMP process.

However, there are some circumstances requiring small scale tree felling where this may not be possible and where it may be impractical to apply for a separate felling permission due to the risks or impacts of delaying the felling.

Felling permission is therefore sought for the LMP approval period to cover the following circumstances:

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

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

The maximum volume of felling in exceptional circumstances covered by this approval is 75 cubic metres per Land Management Plan per calendar year.

A record of the volume felled in this way will be maintained and will be considered during the five year Land Management Plan review.

7.1.2 Thinning

Please see Map 6: Thinning Approval for details of which areas will be thinned within the plan period and see table 5 (section 2.3) for the expected volumes.

Wherever possible the region will continue to maximise the area managed through thinning. FLS policy assumes that all productive conifer crops will be thinned. The only exceptions are where:

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

There are several areas of young conifer plantation within the plan area which would benefit from thinning as soon as possible, so carrying out thinning activities throughout the area in phase 1 is a priority.

The growth rates within the blocks are good, so they have been placed on a seven year rotation, allowing two thinnings on suitable coupes within the plan period.

All thinning decisions will be guided by Operational Guidance Booklet No 9: "Managing Thinning".

Thinning will normally be carried out at, or below, the level of marginal thinning intensity (i.e. removing no more than 70% of the maximum MAI, or YC, per year). Higher intensities (no more than 140 % of maximum MAI, or YC, per year) may be applied where thinning has been delayed, larger tree sizes are being sought or as part of a LISS prescription. Where trees need to be removed to accommodate facilities to support approved thinning and CCF, including stacking areas, ramps and access racks within adjacent management coupes, this should ideally be identified in thinning maps and thinning plans as part of the LMP submission. Where this is not the case, additional felling necessary for reasonable infrastructure can be agreed by exchange of email. In all cases work plans will define the detailed thinning prescription before work is carried out and operations will be monitored by checking pre and post thinning basal areas for the key crop components.

7.1.3 Continuous cover forestry (CCF)/LISS

LISS is defined as a silvicultural system whereby the forest canopy is maintained at one or more levels without clearfelling. Clearfelling is defined as the cutting-down of all trees on an area of more than 2.0ha.

The attraction of LISS lies in the fact that this approach is suited to an era of multi-purpose forestry where environmental, recreational, aesthetic and other objectives are as important as timber production. In particular LISS is seen as a means of reducing the impact of clearfelling and the associated changes that this produces in forest landscapes and habitats. It can also help to create a diverse forest structure which will increase its biodiversity potential. LISS also helps reduce the potential issue of soil erosion and subsequent watercourse siltation.

Within the plan area, the coupes selected for LISS management are in areas where LISS management has been shown to work already or where LISS most suits the objectives for the coupe. For example, areas which have been managed under LISS systems in the previous plan period, stable stands showing strong regeneration potential and stands in high visitor use areas.

Please see **Appendix D: LISS Prescriptions** for detailed prescriptions of the future management for the coupes shown on the below map.

Gartly Land Management Plan 2023

LISS Coupes

Scale @ A2: 1:15,000

Date: November 2022

Legend

- LISS Coupes
- Forest Roads
- Watercourses

0 0.125 0.25 0.5 0.75 1 Km

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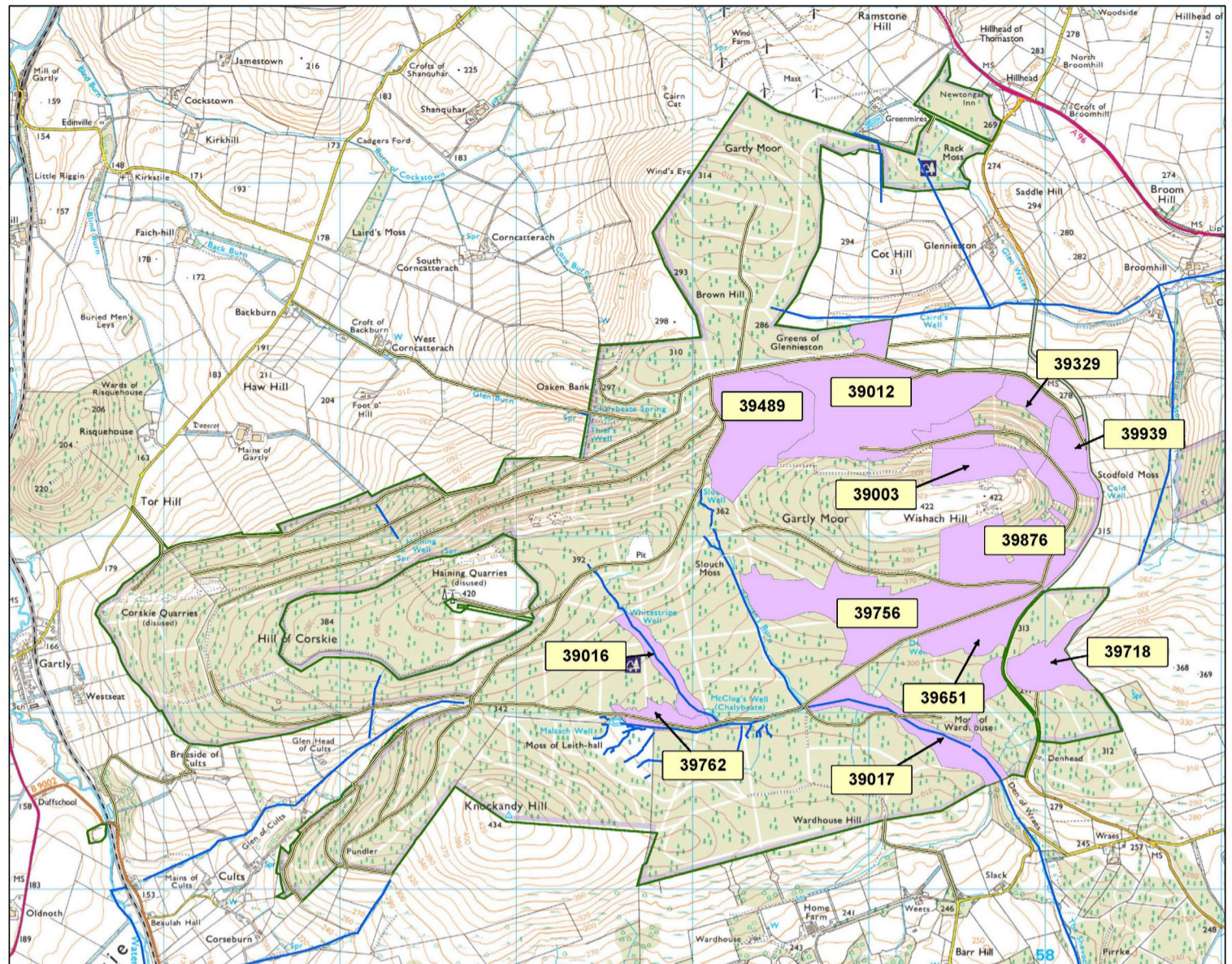


Figure 6: Map showing areas to be managed under LISS systems

All areas identified for restocking by natural regeneration will be recorded and programmed for inspection on a five yearly basis. At each inspection an assessment will be made to establish whether the natural regeneration has already achieved the objectives for the site, or if it is likely to in the near future. If it is decided that the objectives are not being met, then replanting with an appropriate species will be undertaken. If natural regeneration is occurring but not yet at the required density then the option to review the site in a further five years may be taken. If after two such inspections, that is ten years following felling, it is felt appropriate to wait a further period for natural regeneration then a discussion and agreement will be reached with the Scottish Forestry woodland officer.

Enrichment planting will be used to ensure the target stocking densities of minimum 2500 stems per hectare for conifers and 1600 stems per hectare for broadleaves are achieved if, on inspection, it is thought there is insufficient natural regeneration present to achieve restocking without intervention.

7.1.4 Natural reserves

There are currently no Natural Reserves designated within the LMP area.

7.2 Restocking proposals, future habitats and species

Please see section 2.4 for tables detailing the restock plans for the plan period and Map 9: Restocking phases 1 & 2, showing the planned restock areas.

The restocking of felled areas is guided by the primary objectives for the plan area, which are to produce a sustainable crop of quality timber and to provide environmental benefits. In order to achieve this, conifers will be planted at a minimum of 2500 trees per hectare and broadleaves at a minimum of 1600 trees per hectare.

The choice of ground preparation for each site will be decided at the operation planning stage by the relevant establishment forester. Ground preparation techniques can vary greatly even across individual sites, so the most up to date advice will be applied at the time of the operation to ensure that soil structure and water quality is preserved whilst also providing an optimal environment for establishment depending on the species and site conditions. Forest and Water Guidelines, UK Forest Standard and UKWAS can all be used to help with the decision making process if required.

Forest Research Information Note ODW 10.01 **Forest Ground Preparation** will be referenced where necessary to help aid in the specific choice applied across any restock sites. The below table is a good indication of what ground preparation techniques will be applied, with the “Best

Practice” option the target if possible. The majority of restock operations within the plan period take place on intergrade soils, with Ironpans, Podzols and Surface-water Gleys all present so a mixture of scarifying and shallow hinge or inverted mounding will be the most likely ground preparation techniques applied.

Soil Type	Objective	Best Practice	Acceptable Alternative
Brown earths	To create a weed free planting site, to avoid activating the soil seed bank, to provide frost protection especially on flat inland sites with grassy sward and to impose a discipline on the site	Shallow scarification Shallow mounding	Shallow agricultural ploughing for improved grassland Weed control only on freely draining sites
Podzols	To achieve a light surface mixing of soil and humus, to break up the compacted horizon or hardpan and provide weed suppression.	Spaced tine ploughing	Deep scarification Shallow agricultural ploughing for lowland podzols Scarification for restock sites
Ironpan soils	To aerate and mix the organic horizon and also to extensively disrupt the compacted horizon and ironpan	Mounding and ripping Spaced tine ploughing Deep scarification (if ironpan is weak or discontinuous)	Mounding or scarification (restock sites that have previously been subsoiled only)
Gley soils (inc surface water gleys and peaty gleys)	To provide a raised planting position and lower water table if possible, creating conditions for symmetrical rooting. Weed suppression and frost protection are also important	Mounding/moling for relatively stone free soils with a loamy texture Mounding/subsoiling for other soils.	Mounding alone is acceptable if slope < 3° or if a restock site Note: An open drainage system is usually required on these soils.
Deep peats	To provide a raised planting position and lower the water table if possible	Shallow spaced ploughing Mounding (restock sites only)	Drain mounding Note: An open drainage system is usually required on these soils.

Table 10: Recommended ground preparation techniques based on soil type.

For any restock operations with Drinking Water Protected Areas, ground preparation techniques will be discussed and agreed with Scottish Water before any work is carried out.

The species choice for restocking has been guided by the ESC results for this climatic area and soil types (see section II 2.1.1). This has shown that the climate and site conditions make a range of species suitable for restocking. This range will be utilised where possible, provided they will meet the objectives of the plan.

One of the aims of the restocking will be to increase the species diversity within the plan area while also retaining timber productivity. To achieve this, alternative conifer species such as Noble fir and Norway spruce will be added and there will be an increase in the use of productive mixtures such as Scots pine/Birch and Sitka spruce/Norway spruce. This will provide environmental benefits, increase resilience to pests and diseases, and ensure there is a sustainable crop of timber in the future.

FLS is following a chemical reduction strategy. This involves the limiting of chemical application only to occasions when they are essential. To allow this strategy to be followed the Hylobius management support system will be applied and the minimum recommended fallow period used prior to restocking. This reduced fallow period will also reduce the potential need for herbicide applications to restocked areas.

Restocking and/or planting in PAWS will use native broadleaves of local origin (201/2/3) unless these cannot be sourced within the required time-frame, in which case alternative sources will be discussed with Scottish Forestry. Out with these areas, native broadleaves of local origin such as birch, aspen, oak and willow will be preferred if available. If not available then trees from an alternative origin will be used provided this origin makes them suitable to grow and thrive in the prevailing site conditions. Where Sitka spruce is to be used for restocking, we will endeavour to use improved SS transplants, provided the nursery is able to supply them in sufficient quantities. If appropriate sites present themselves, i.e. good soils, low risk of Hylobius attack and the potential of yield class 14 or higher crops, then VPSS will be used if available. Over and above this, only certified material will be used for species covered by the Forest Reproductive Material Regulations.

7.3 Open land

The intention is that any land identified as “Open” in the plan area will be managed to keep tree cover to <10%. Where the land is described as “Open/Successional”, regeneration of native species at low densities will be accepted.

At the end of the plan period, the managed open space will total 15.1% of the plan area.

The largest single area of open land within the LMP area is the Upland Heath area on Wishach Hill in the East of the block. Much of the surrounding crop has been felled in the past 10 years and is regenerating with Sitka spruce at productive densities, there does not appear to be a significant issue with regeneration appearing on the upland heath however.

The other significant large area of open space within the plan area is at the foot of Knockandy hill and is an area which was never established with trees and has recently had non-native regen removed and peat restoration activities carried. This area will be expanded and restored further during this LMP period as per Appendix F.

The other areas of open ground in the plan area currently are based around watercourses or archaeological features. The areas around Whitestripe Burn and Malsach Burn will be cleared of non-native species to maintain an open habitat with native broadleaf groups established to improve the diversity of the areas.

Other areas of open land or riparian habitat with non-native conifer regeneration present at low densities will be cleared as part of the standard 7-year thinning cycle and therefore have been added to thinning permission map.

Please see **Appendix F: Malsach Valley Peatland Water Sanctuary** and **Appendix G: Peat Restoration Plan** for full details of the management of areas with open space components and prescriptions for any areas of peat restoration to be carried out within the plan period.

7.4 Visitor zones, public access and core path

The main visitor zone within Gartly is the large, well-used car park at the Eastern end of the block. There is no plan to change the way this is managed within the plan period; all necessary maintenance will continue as normal.

Public access will be encouraged throughout the LMP area as per the Land Reform (Scotland) Act 2003.

7.5 Operational access

The existing internal road network allows access to all Phase 1 and 2 coupes and should not require upgrading. However, we will continue to undertake a program of maintenance and post operation repairs.

FLS is an active member of the Timber Transport Group. We will liaise with this group and the local highway authorities to ensure that during felling and timber transport operations other road users are not put at risk. This will include the use of the appropriate traffic control measures during felling operations adjacent to public roads and the erection of any necessary warning signage.

Map 10: Operational Access & Predicted Volume shows the main access points and the volume of timber that will be leaving the forest in each felling phase for the duration of the plan.

7.6 Deer management

Wild deer of the National Forest Estate are managed in accordance with the Scottish Government's strategy "Scotland's Wild Deer: A National Approach" and under the auspices of the Code of Practice on Deer Management.

The strategy and Code of Practice makes recognition of the fact that wild deer are an asset, an integral part of Scotland's biodiversity and provide healthy food and recreational opportunities. The challenge of managing wild deer originates in a need to balance the environmental, economic and deer welfare objectives of the Scottish nation with the objectives of private landowners for forestry, agriculture, sporting and other forms of land use.

The principal legislation governing the management of deer in Scotland and hence on the NFE is the Deer (Scotland) Act 1996.

It is therefore FLS deer policy to:

- Prevent adverse deer impacts on commercial tree crops and the wider habitat. In doing so to carry out deer culling in an exemplary and humane way
- Work closely with relevant organisations and neighbours to make sure that there are integrated deer management plans which seek to recognise the interests of all parties.
- Take opportunities to optimise income from venison from sporting activities where this does not conflict with our primary objective of maintaining deer impacts at an acceptable level, in line with the Quality Meat Scotland accreditation in the form of The Scottish Quality Wild Venison (SQWV) Assurance Scheme.
- Take all practicable steps to slow down the expansion of deer species into areas where they are not currently present.

All deer management will be carried out in accordance with OGB 5 – Deer Management. The aim is to manage deer density safely and humanely at a level which is consistent with acceptable impacts on forests and other habitats. This is likely to be at a density level of 5 deer per 100 hectares.

Deer cull plans are prepared for each Deer Management Unit and are the responsibility of the Wildlife Ranger Management. Deer damage assessments are carried out to evaluate the current density of the deer population and the level of cull required.

Deer fencing has been used within the LMP area in the past to help allow the successful establishment of broadleaves, the decision on future fencing requirements will be taken by the FM forester and WRM in conjunction. Fencing should not be required to establish any conifer components.

7.7 Management of invasive species

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

7.8 Riparian management

Any existing riparian zones within the LMP area will be retained or improved by the introduction of native broadleaf species or management to encourage native broadleaf regeneration, including the removal of non-native conifers in riparian areas.

Riparian restoration will primarily take place as part of the standard felling, thinning and restock program in any coupes containing the relevant habitat. In this plan the coupes with the most potential for riparian restoration works are 39012, containing much of Whitestripe Burn and coupe 39017, which Malsach Burn flows through.

Non-native conifer removal will be identified and removed periodically in a separate operation or as part of thinning operations where regeneration has reached a mature size. To ensure the relevant felling permission is in place, riparian areas which are expected to need non-native conifer removal have been added to the thinning areas map.

7.9 Deadwood management

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

Key principles applied:

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

The following map shows the ecological deadwood potential of Gartly, based on the following criteria:

Deadwood Ecological Potential (DEP) class	FES woodland management categories included in this DEP class
High	Natural reserves, ancient semi-natural woodlands, native pinewoods, riparian buffers along watercourses, PAWS with high ecological potential, wood pasture
Medium	Minimum intervention areas of broadleaved woodlands, PAWS, LEPOs, long-term retentions, LISS coupes
Low	All other stands (i.e stands where timber production is the priority)

Table 11: Description of Deadwood Ecological Potential classes

Gartly Land Management Plan 2023

Deadwood Ecological Potential

Scale @ A2: 1:15,000

Date: November 2022

Legend

- Deadwood Ecological Potential**
- HIGH
 - MEDIUM
 - LOW
 - Forest Roads
 - Watercourses

0 0.125 0.25 0.5 0.75 1 Km



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

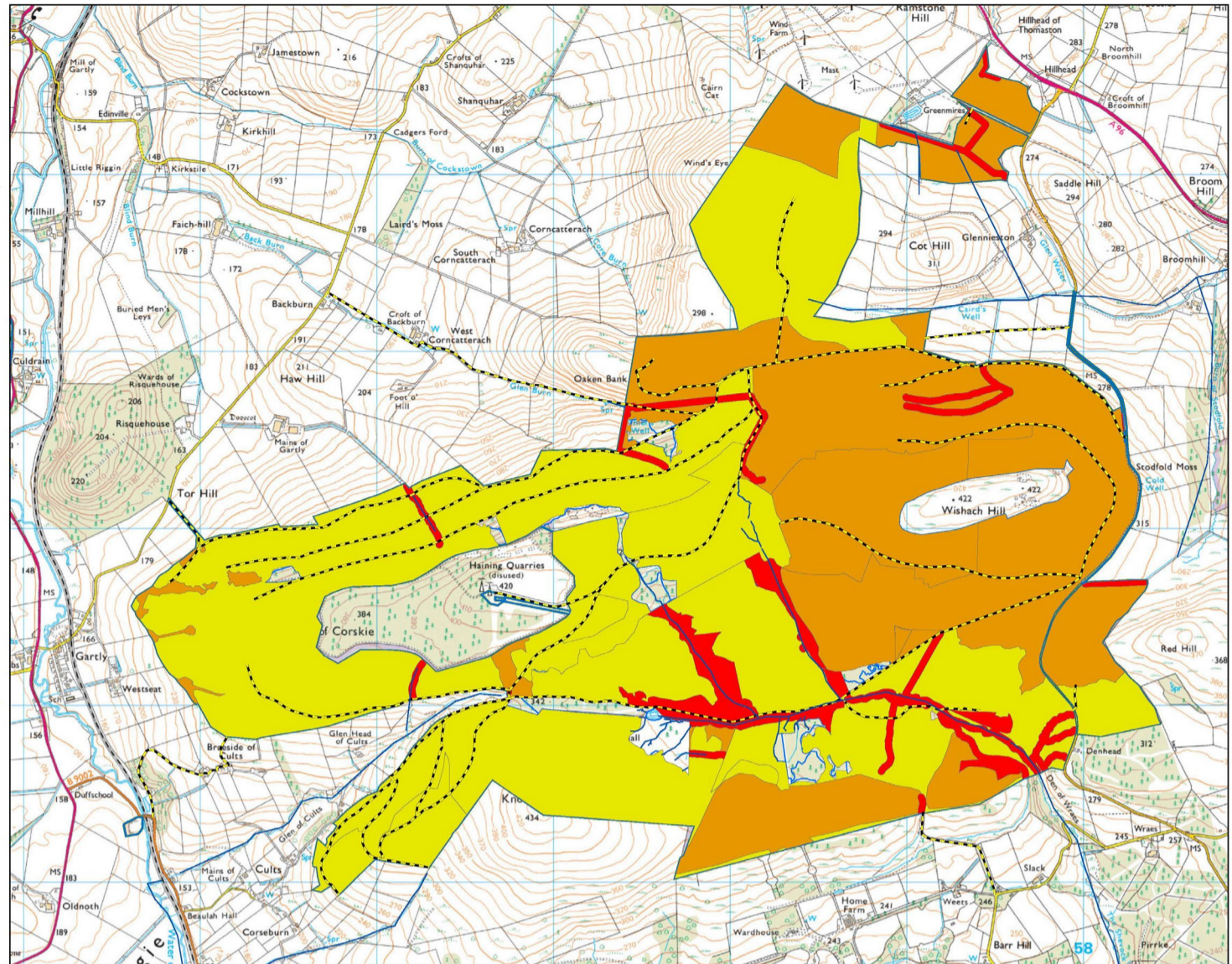


Figure 7: Map showing deadwood ecological potential of Gartly

(DEP) class	Deadwood Management Prescription
High	<ol style="list-style-type: none"> 1. Retain all existing veteran trees and deadwood apart from that which is a health and safety risk or where it would be highly obtrusive in the landscape 2. Retain all wind blow apart from that which is a health and safety risk 3. Deadwood distributed throughout the coupe 4. Seek opportunities to create particularly valuable deadwood e.g. import some large-diameter logs from nearby coupes when they are thinned or clear felled.
Medium	<ol style="list-style-type: none"> 1. Retain all existing veteran trees and deadwood apart from that which is a health and safety risk 2. Only harvest windblow of significant value or which poses a health and safety risk 3. Seek opportunities to create particularly valuable new deadwood e.g when felling big trees, retain some large diameter logs at the edge of the coupe 4. Where windblow is harvested, retain some blown trees in a group as 'future deadwood' where not obtrusive in the landscape
Low	<p><i>During thinning</i></p> <ol style="list-style-type: none"> 1. Retain all existing deadwood apart from that which is a health and safety risk 2. Take obvious opportunities to create particularly valuable new deadwood e.g. when felling big trees, retain one or two large diameter logs at the edge of the coupe 3. Where wind blow is harvested, take opportunities to retain a few blown trees in a group as 'future deadwood' in a location that will not restrict future operations and that is not obtrusive in the landscape e.g. in the corner of a coupe <p><i>During clearfelling</i></p> <ol style="list-style-type: none"> 1. Retain all deadwood and living trees in areas that are uneconomic or too difficult to harvest (e.g. wet, steep or rocky areas) where it is not obtrusive in the landscape 2. Where an obvious opportunity arises, create new deadwood in a location that will not restrict future operations e.g. a pile of logs and brush in the corner or along the edge of a coupe. <p><i>Additional notes for Low DEP class areas</i></p> <ol style="list-style-type: none"> 1. Deadwood should only be retained in areas that will not restrict future operations 2. Standing deadwood (snags) should not be retained on clearfells, except in areas that will not restrict future operations and that do not pose a health and safety risk e.g. in the corner of a coupe 3. Large diameter (>20cm) deadwood logs and snags are particularly scarce in the NFE. Take opportunities to retain this kind of deadwood. When harvesting large diameter trees, seek opportunities to retain some

(DEP) class	Deadwood Management Prescription
	<p>standing deadwood, if it is safe to do so, and consider retaining a few large diameter logs on site in a location that will not restrict future operations.</p> <p>4. Large diameter deadwood from native broadleaves is particularly scarce. When harvesting large diameter native broadleaves, retain standing deadwood, if it is safe to do so, and retain some large diameter logs on site in a location that will not restrict future operations.</p> <p>5. Deadwood should only be retained in areas which are not deemed to be in obtrusive locations i.e. open hillsides in landscape sensitive areas</p>

Table 12: Description of management prescriptions for each DEP class

7.10 Phytophthora ramorum management

There have been two SPHNs served relating to Gartly since 2019 which has led to the clearfelling of large areas of larch as well as the removal of larch within some areas of mixed crop. The area will continue to be monitored via the annual aerial survey as well as ground staff being vigilant for early signs of infection and reporting them as soon as possible.

As part of the planning process, areas containing larch have been identified and checked to ensure that there would be no significant issues with access or adjacency, should a Statutory Plant Health Notice be served within the plan period. In particular, the need for new forest roads which may require a long lead time was investigated.

It was found that, should the need for emergency felling of larch be required, the felling and extraction of timber is feasible at short notice and should be able to be completed with an acceptable impact on landscape and adjacency.

7.11 Long Term Retentions

Please see **Map 5: Management**.

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

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

7.12 Peatland restoration

See Appendix G - Peat Restoration Plan for full peat restoration details.

8.0 Critical Success Factors

- Thinning and clearfelling operations to be carried out on schedule to ensure timber production targets are met and to avoid adjacency issues.
- Protect and improve water environment during all forestry works.
- Effective deer control over restock sites is imperative to ensure successful establishment.
- Forestry works carried out with protecting recreational use as a priority.
- Second EIA required for Greenmires deforestation and peat restoration scheme prior to operations commencing.

Appendix A: Land Management Plan Consultation Record

Statutory Consultee	Date contacted	Date response received	Issue raised	Forest District Response
Scottish Forestry	28/11/22	3/3/23	Various small changes to clarify figures and justifications for peatland restoration highlighted	All suggestions and improved noted and incorporated in the LMP text and EIA screening request form.
Aberdeenshire Council	14/05/21	n/a	n/a	n/a
Local Authority Archaeologist	28/09/21	06/10/21	Advised to include mitigations for features within Historic Environment Process (HER)	HER consulted as part of the planning process and again at site planning stage for any forest operations.
SEPA	14/05/21	27/05/21	Highlighted need for diverse range of BL and conifer for restock. Highlighted need to refer to good forestry practices and UKFS for all forestry activities. Highlighted need for ground prep techniques to be suitable for ground conditions and to be as unintrusive as possible. Highlighted that protecting water quality for Ardmore distillery intake will be key and any operations in sensitive areas should strive to go beyond best practice.	All points addressed in text or reflected in species choice for restock. Procedure for choosing best practice ground preparation explained. Plans for clean water area to protect Ardmore distillery water supply were created with detailed input from distillery owner.
NatureScot	14/05/21	14/05/21	No specific comments but provided links to Wildcat guidance	Links added to text in Appendix V: Wildcat risk Matrix
RSPB	14/05/21	n/a	n/a	n/a
SSEN	14/05/21	n/a	n/a	n/a
HES	14/05/21	08/06/21	Noted scheduled monument within 1km of forest boundary but no specific comments	No response needed
Scottish Water	14/05/21	n/a	n/a	n/a

Table A. 1: Statutory consultee responses

Non-Statutory Consultee	Date contacted	Date response received	Issue raised	Forest District Response
Bennachie Community Council	14/05/21	n/a	n/a	n/a
Huntly Community Council	14/05/21	n/a	n/a	n/a
Forest Research	14/05/21	19/05/21	Noted one biosoils plot within plan area, will have no impact on general forest management.	No response needed
CONFOR	14/05/21	n/a	n/a	n/a
Saving Wildcats	14/05/21	n/a	n/a	n/a
Wildcat Haven	14/05/21	n/a	n/a	n/a
Carriage Drivers	14/05/21	n/a	n/a	n/a
Scottish Wildcat Projects	14/05/21	n/a	n/a	n/a
63 Car Club	14/05/21	08/06/21	No specific comments but expressed interest in continuing to use forest for a rally stage.	No response needed
James Hutton Institute	14/05/21	n/a	n/a	n/a
Huntly and District Development Trust	14/05/21	14/05/21	No specific points at this time	No response needed

Table A. 2: Non-Statutory consultee responses

Appendix B: Supporting Information

B/1.0 Analysis of previous plan

1.1.1 Aims of previous plan and achievements

Objectives from the previous plan were as follows:

Objectives	Assessment of objectives met during plan period
Production of a sustainable timber crop	Timber has been produced within the plan period via thinnings and clearfells. Areas have been restocked or are programmed to be restocked.
Management of DNB infected crop	Large areas of DNB infected crop were felled during the last plan period, nearly all of these areas have now been restocked either by planting or by natural regeneration.
Increase area of CCF forestry	The areas now designated as LISS are now greater than they were in the previous plan. The majority of these areas are now showing good indications of an understory developing but some require further thinning to encourage regeneration. Respacing activities have been carried out in some areas.
Continue work with local communities involved in the plan, seek opportunities to increase access to the forest	There is now an access and new path in the North of the block which connects Gartly to the Greenmires farm new planting and recreational area owned by the Huntly and District Development Trust.

Table B. 1: Objectives from previous plan

1.2.2 How previous plan relates to today's objectives

The objectives of the previous plan were broadly similar to those in the current LMP. The new set of objectives seek to build on and refine the objectives identified in the previous plan.

Managing DNB crops will be much less of a priority in the next plan period due to the extensive felling which took place previously.

There will also be much more focus on diversifying the species composition in the block in the new LMP.

B/2.0 Background information

B/2.1 Physical site factors

2.1.1 Geology, Soils and landform

According to the British Geological Survey Geological Map of the UK, Gartly is predominantly underlain with bedrock from the Hill of Foundland Pelite Member and Macduff Formation groups. Both of which are formed from sedimentary deposits which have undergone various stages of metamorphism. The bedrock is evident on the surface at higher elevations within the block, which led to extensive quarry activities in the past.

The two main soil types present within Gartly are Ironpan (typically ericaceous and moderately indurated) and Peaty Surface-Water Gley (loamy). There are also significant areas of Upland Sphagnum Bog, Calluna, Eriophorum vaginatum Blanket Bog and Juncus effusus Bog present in lower lying areas which are flat or gently sloping.

Minor soil components include a small area of Brown Earth in the western end of the block and some Typical Podzol in the north, adjacent to Greenmires Farm, and South, on Knockandy Hill.

Gartly is predominantly set around three hills which are all notable in the landscape from the surrounding area. The hilltops range between 380m and 430m and the lowest point within the block sits at 250m within the Malsach Burn valley.

There are some steep slopes along the North side of the block but generally the gradients present are shallow and do not cause many operational issues.

2.1.2 Water

The main watercourses to consider within Gartly are the Malsach Burn and its tributaries: Whitestripe Burn and Kailman's Burn. Malsach Burn eventually enters River Urie via the Shevock, exiting the block to the South-West. The River Urie in turn, joins the Dee as a major tributary further South in Inverurie.

Gartly also forms part of the watershed for the River Bogie to the West which joins the River Deveron to the North at Huntly.

The watercourses which water shed from Gartly feeds are all important resources which help support several industries, including Salmon fishing and whisky distilling, so maintaining water quality will be a key objective within the LMP.

A secondary objective included in this LMP is "Protect and improve the water environment." This will be achieved firstly by following UKFS Forest and Water Guidelines and the UK woodland assurance standard.

2.1.3 Climate

The climate data for this area has been obtained from the Ecological Site Classification System and is displayed below.

Accumulated Temperature	Exposure (DAMS)	Moisture Deficit
977-794 (Cool)	12 (Sheltered) – 19 (Highly Exposed)	85 – 44 (Wet)

Table B. 2: Climate data for Gartly

Accumulated Temperature is the accumulated total of the day degrees above the growth threshold temperature of 5°C, which provides a convenient measure of summer warmth.

DAMS is the Detailed Aspect Method of Scoring. This represents the amount of physically damaging wind that forest stands experience in the year.

Moisture Deficit reflects the balance between potential evaporation and rainfall and therefore emphasises the dryness of the growing season.

B/2.2 The existing forest

2.2.1 Age structure, species and yield class

The species breakdown for the LMP area can be found below.

Species	Area (ha)	Percentage
Sitka spruce	762.4	62.4
Larch	122.9	10.1
Lodgepole pine	69.1	5.7
Norway spruce	27.1	2.2
Scots pine	33.1	2.7
Birch	7.9	0.6
Alder	6.5	0.5
Mixed conifers	2.1	0.2
Mixed broadleaves	5.9	0.5
Open/Other	141.5	11.6
Felled/Failed	43.0	3.5
Total	1221.5	100

Table B. 3: Current species coverage

The age structure ranges from a few coupes planted at the turn of the century and 1920's which predate forestry commission planting, to first rotation conifer plantation planted in the 1950's and 60s. There has also been a significant amount of restocking and planting recently, with 40.8% of the forest cover being planted in the last 20 years. Please see table 4, section 2.2 for further details on the current age class composition.

The current yield class composition is shown below:

Yield Class	Percentage
24	1.9
22	0.8
20	4.2
18	5.7
16	19.9
14	14.1
12	25.9
10	14.8
8	5.7
6	5.0
4	1.7
2	0.2

Table B. 4: Current Yield class composition

2.2.2 Access

The existing road network should be sufficient for all timber extraction required during the plan period, there may however be some work required in terms of clearing and re-instating existing roads. This not expected to require any road construction.

2.2.3 LISS potential

LISS is defined as "Use of silvicultural system whereby the forest canopy is maintained at one or more levels without clearfell of areas over 2.0 ha".

All blocks have areas suitable for LISS systems with the exception of the highest points, which have DAMS scores of up to 19, marking them as moderately exposed. Within Gartly, LISS coupes are generally focused where there is strong evidence of natural regeneration occurring at high densities currently, around Wishach Hill in particular.

2.2.4 Thinning potential

All areas within the LMP have the potential to be thinned. The exact prescription will vary between species and the objectives for each coupe.

B/2.3 Land use

2.3.1 Neighbouring land use

The majority of the neighbouring land use is agriculture, with a combination of cattle, sheep, and crops all present on adjacent land.

To the East of the block, there is an area of newly established woodland on moorland, forming part of the boundary. Clashindarroch forest is also within a mile of the western boundary of the block.

To the North of the block there is a small area of land owned by a local development trust which contains wind turbines, grazing, a pond, some forestry and paths for recreational use which link up to the forest road network in Gartly.

Other notable neighbours include Leith Hall and Ardmore distillery which will require landscape and water quality considerations respectively in the LMP.

The A96 also passes close to the North-East of the block and the Aberdeen-Inverness rail route passes within 500 meters of the western boundary.

B/2.4 Biodiversity and environmental designations

2.4.1 Designations

PAWS & LEPO: There is a small amount of LEPO designated woodland on the Southern boundary of Gartly, the majority of which has been felled and restocked with conifer during the previous plan period.

There are no other significant designations affecting Gartly.

2.4.2 Habitats and species

There are a few areas of Upland Heath priority habitat, the largest of which is at the summit of Wishach Hill and a significant area around the Haining Quarries heritage site.

There are large areas of deep peat and blanket bog within the plan area which will also require careful management. See Map 2: Key Features for specific locations of these habitat types.

There are a number of Scottish Biodiversity Action Plan and FLS 6 key species recorded in Gartly, including red squirrel, pine marten, otter, water vole and numerous badger setts are recorded. A number of forest raptors are also recorded within the block.

Scottish Wildcat are also present within Gartly and the area is within the Strathbogie wildcat priority area. See Appendix V: Wildcat Risk Matrix for details of mitigation measures which will be applied to aid protection of wildcats and their den sites.

2.4.3 Riparian habitat

Gartly is upstream of a number of floodpoints (Huntly, Insch, Inverurie and Aberdeen) and there is a flood protection scheme at Insch with identified natural flood management.

The Shivock Burn is in good ecological condition and the maintenance and further enhancement of the associated riparian habitat will be a priority for the new LMP. There is currently only a limited amount of valuable riparian habitat within the LMP area, the LMP includes plans to add and improve riparian habitat going forward.

2.4.4 Invasive species

No invasive species present

2.4.5 Pests and diseases

Although heavily affected by DNB and the associated felling in the previous plan period, DNB is not as pertinent an issue going forward although planting pure stands of susceptible species such as Corsican and Lodgepole pines will be avoided as a precaution.

There is an ongoing DNB tree health survey which covers all areas containing a large pine component. These coupes are surveyed every 3 years and the data collected is used to inform the felling program if there is a significant decline in tree health detected.

Phytophthora ramorum has become an issue within Gartly in the last five years with Statutory Plant Health Notices being served on two occasions, resulting in approximately 50Ha of larch clearfelling recently.

There is *Peridermium pini* present in without the woods although not at problematic levels. Any pine which show symptoms of this disease will be identified at the initial felling survey and felled during standard thinning operations

B/2.5 Landscape

2.5.1 Landscape character

Under the SNH Landscape Character Assessment, Gartly falls into the **Outlying Hills and Ridges** landscape character type.

This character type lies at the transition between the high mountains of the Cairngorms and the low farmland of the north-east coastlands in Aberdeenshire. It comprises a series of moorland spurs that extend from the central massif of the Cairngorms into the farmed landscape of Garioch and Formartine, forming prominent areas of high ground. The Key characteristics of this area are described below:

- Long and often narrow undulating ridges, punctuated with occasional pronounced hills, which stand proud of surrounding low-lying farmland.
- Distinctive and recognisable profiles of occasional dramatic outcrops of rock, creating local landmarks which are visible and ever-present across wide expanses of Aberdeenshire.
- Extensive tracts of coniferous woodland covered slopes, these interspersed to varying degrees with heather moorland.
- Green fields of pasture cover often gently folded lower slopes and this merges gradually with more intensively managed lowland farmland.
- Communication masts and windfarms are dominant features on parts of these outlying ridges.
- Important prehistoric and cultural heritage.
- Spectacular views across the surrounding lowlands of Aberdeenshire from these promontories of higher ground.
- Strong visual relationship with wider Cairngorm massif.
- Relatively remote and wild landscape character.

2.5.2 Landscape designations

The Gartly LMP area is not located within any nationally designated landscape areas.

2.5.3 Visibility

Wishach Hill in the East of the block is very visible to traffic travelling South on the A96 so the potential for impact on the landscape from operations will be a key concern here.

The western end of the forest is also very visible to traffic travelling along the A97 between Huntly and Rhynie.

These viewpoints are marked on Map 2: Key Features.

B/2.6 Social factors

2.6.1 Recreation

Gartly is widely used by the local population with various equestrian and running clubs using the forests regularly. There is also a rally stage held in the block regularly and several members of the public have permissions for carriage driving on the forest roads.

To the North of the block, there is also a new path which connects the forest road network to the adjacent community scheme at Greenmires farm.

To service visitors, there is a large car park to the east of the block which gives access to several forest roads and walking routes.

Please see Map 2: Key features for details on existing recreation routes.

2.6.2 Community

The main communities making use of Gartly are the residents of Huntly and Inch, the surrounding villages, including Gartly and Kennethmont, and scattered areas of housing and farms.

There is also evidence that people travel from slightly further afield in Moray and Aberdeenshire to make use of the walking and equestrian routes present

2.6.3 Heritage

There are no scheduled monuments within Gartly. There are, however, a number of unscheduled monuments, including disused quarries, a network of hollow ways, several healing wells and old cart-ways.

All of these features appear on the FLS database, which is updated regularly at a national level, and will be protected during any forest operations.

Any new findings will be reported to the regional archaeologist as standard.

B/2.7 Statutory requirements and key external policies

The legal status of the land is purchased.

The forest plan is in accordance with the guidance supplied in:

- UK Forestry Standard
- UK Woodland Assurance Scheme
- Scotland's Forest Strategy 2019-2029
- FLS Corporate Strategy

Appendix C: Tolerance Table

	Adjustment to Felling period	Adjustment to felling coupe boundaries	Timing of restocking	Change to species	Changes to roadlines	Designed open space	Windblow Clearance
FC Approval not normally required	Fell date can be moved within 5 year period and between phase 1 and phase 2 felling periods where separation or other constraints are met	Up to 10 % of coupe area	Normally up to 2 planting seasons after felling. Where hylobius levels are high up to four planting seasons after felling subject to the wider forest and habitat structure not being significantly compromised.	Change within species group e.g. conifers, broadleaves.		Increase by up to 5% of coupe area	
Approval by exchange of letters and map		Up to 15 % of coupe area	Between 2 and 5 planting seasons after felling subject to the wider forest and habitat structure not being significantly compromised.		Additional felling of trees not agreed in plan Departures of more than 60m in either direction from centre line of road.	Increase by up to 10%. Any reduction in open ground within coupe area.	Up to 5 ha
Approval by formal plan amendment may be required	Advanced felling (phase 3 or beyond) into current or 2 nd 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.	More than 10% of coupe area. Colonisation of open areas agreed as critical.	More than 5 ha

Appendix D: LISS Prescriptions

Coupe ref.	Management Type and area	Management objective/Reason for selection	Long-term structure and desirable species	Regeneration and ground flora	Observations (e.g. likely barriers to achieving objective)	Next treatment required
39003	Uniform Shelterwood 9.4ha	Productive spruce crop. Abundant regeneration present and landscape sensitive area	Uniform shelterwood with well thinned mature crop above next rotation of same species	Sitka spruce with some Lodgepole pine. Very little ground flora	Regeneration will likely require respacing	Uniform thinning
39012	Uniform Shelterwood 54.3ha	Productive spruce crop. Young crop at 15-25 years, thinned with racks present, abundant regeneration, landscape sensitive area.	Uniform shelterwood with well thinned mature crop above next rotation of same species	Sitka spruce with minor component larch. Very little ground flora.	Regeneration will likely require respacing	Uniform thinning
39016	Uniform Shelterwood 6.8ha	Riparian zone, mixture of native BL and Sitka spruce regeneration present. Objective is native BL and OG to protect water quality.	Shelterwood of mature BL with mixed BL understory developing. Proportion of open ground.	Sitka spruce, mixed broadleaves. Rushes, grasses, heather.	Spruce regeneration is likely to suppress desirable species	Selective thin to remove Sitka regeneration. Top-up planting of BL if required
39329	Uniform Shelterwood 10.7ha	First rotation SS and Larch crops with SS regen throughout. Previously thinned, landscape sensitive.	Uniform shelterwood with well thinned mature crop above next rotation of same species	Sitka spruce with minor component larch. Very little ground flora.	Regeneration will likely require respacing	Uniform thinning
39489	Uniform Shelterwood 29.8ha	Young SS and NS crop, landscape sensitive area, surrounding crops indicate regeneration will be prolific	Uniform shelterwood with well thinned mature crop above next rotation of same species	Sitka spruce regen, minimal ground flora due as presently dense young crop.	Relying on regeneration at similar levels to surrounding crop	Uniform thinning
39651	Uniform Shelterwood 11.5ha	First rotation, well thinned. SS and JL. High recreational use area, regeneration occurring since last thinning.	Uniform shelterwood with well thinned mature crop above next rotation of same species	Sitka spruce regen, grasses, mosses	Another thinning probably required before large amount of regen will establish	Uniform thinning
39718	Uniform Shelterwood 10.5ha	Young SP crop, good access for management. Part of conversion of Red Hill mini-block to SP/NBL woodland	Mixed age productive W18 woodland. Primarily SP with timber harvested from thinnings, native broadleaf component encouraged	Some Sitka regen amongst SP, heather and grasses dominate ground flora in open areas	Sitka spruce regeneration present which will suppress Scots pine crop if not targeted early	Uniform thinning but with Sitka spruce regen targeted where present
39756	Uniform Shelterwood 40.9ha	Large area of dense young spruce crop, high levels of regeneration in adjacent felled areas.	Uniform shelterwood with well thinned mature crop above next rotation of same species	Sitka regen, grasses and heathers.	Regeneration may need respacing.	Uniform thinning
39762	Uniform Shelterwood 5.2ha	Conversion to spruce crop. Currently mature JL stand with well-	Uniform shelterwood with well thinned mature crop above next rotation of same species	Sitka regen dominates	Spruce regen may require respacing, larch may require	Uniform thinning

Coupe ref.	Management Type and area	Management objective/Reason for selection	Long-term structure and desirable species	Regeneration and ground flora	Observations (e.g. likely barriers to achieving objective)	Next treatment required
		established spruce understory, easy access for thinning.			early felling if phytophthora infection spreads through block	
39876	Uniform Shelterwood 29ha	Predominantly first rotation spruce with first small area of larch. Abundant spruce regen throughout, ideal for productive spruce crop. Part of coupe strip felled in past	Uniform shelterwood with well thinned mature crop above next rotation of same species	Sitka and larch regen dominate.	Spruce regen within crop may need respacing in future. If phytophthora spreads within block, larch may need to be removed.	Continue respacing of strip felled areas, uniform thin rest of coupe
39017	Uniform Shelterwood 18.3ha	Riparian zone, mixture of native BL and Sitka spruce regeneration present. Objective is native BL and OG to protect water quality.	Shelterwood of mature BL with mixed BL understory developing. Proportion of open ground.	Sitka spruce, mixed broadleaves. Rushes, grasses, heather.	Spruce regeneration is likely to suppress desirable species	Selective thin to remove Sitka regeneration. Top-up planting of BL if required
39939	Uniform shelterwood 5.3ha	Young Sitka spruce crop, good access, large amounts of regeneration present in adjacent coupes	Uniform shelterwood with well thinned mature crop above next rotation of same species	Sitka spruce, grasses, mosses	Sitka spruce regeneration may require respacing	Uniform thinning

Appendix E: Wildcat Risk Matrix

Draft by Emma Rawling and Roo Campbell 4th Feb 2019

Below we set out the potential risk levels to wildcats depending on the forestry activity, knowledge of wildcat presence, and time of year. This matrix is intended as a working draft and should be reviewed periodically as we learn more about wildcats and forestry and we learn from applying this matrix. Note that we suggest the inclusion of hybrid records because locations used by hybrids may be suitable for wildcats.

Type of Work		
Lower risk	Medium risk	High risk
		Clear felling
	First thinning (young coupes)	Second/third thinning of more mature trees where brash piles have accumulated
		Mounding and moving or driving over windrows, brash raking
Tree planting		
Road works - repairs		
Knowledge of Wildcat presence		
Lower risk	Medium risk	High risk
No wildcat or hybrid records historically and no recent information		
	Historical records of wildcats and/or recent records of hybrids.	
	Data Deficient areas where there have not been any surveys	Any recent wildcat records, sightings or signs; presence of any wildcat den site or known resting places
Time of Year		
Lower risk	Medium risk	High risk
October to February – juvenile dispersal and adult, courtship behaviour; relatively resilient to disturbance	July to September – semi dependant young with some vulnerability to disturbance	March to end June – peak breeding season with highly dependent young most vulnerable to disturbance. There is some variation in timing of breeding therefore the higher risk period could extend to July

Table E. 1: Details of risk level of certain forest operations

Assuming evidence of wildcat presence, the risk matrix below sets out levels of risk for different operations across the year. See below for management advice in relation to each risk level.

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Clearfelling												
First thinning												
Second/third thinning												
Mounding/brash raking												
Planting												
Roadworks/quarrying												
Flailing (roadside)												

Table E. 2: Risk of operations according to time of year

Risk Level				Recommended precautions
Red	Orange	White	White	Do not proceed without further investigation; consider licensing issues carefully; consider requesting specialist help with checks.
Red	White	White	White	Plan ahead for extra time to do necessary prior work checks – at least two months in advance
Red	Orange	White	White	If possible, survey site proactively for general cat activity of cats in previous winter (collaborate with Saving Wildcats (SW))
Red	Orange	Yellow	White	Thorough walk over site checks for cat dens needed: check brash piles, windthrow areas, cairns and stone features for den site signs. Or use trained dog or a specialist consultant to check the whole site.
White	White	White	Yellow	Statutory checks and normal precautions such as walk through to check brash piles, windthrow areas, cairns and stone features for den site signs. Camera trap these if any field signs seen.
Red	Orange	Yellow	White	Consult with experts (SW, WildCRU) for very latest information on wildcat use of the area and also consult SW survey records.
Red	White	White	White	Camera trap any possible cat dens if any field signs seen at least two months in advance of work starting. This establishes if den is used by a cat (or Pine marten etc) and if so, what type of cat.
White	Orange	Yellow	White	Camera trap any possible cat dens if any field signs seen at least one month in advance of work starting. This establishes if den is used by a cat (or Pine marten etc) and if so, what type of cat.
Red	Orange	Yellow	Yellow	If any wildcat dens (in current use or not) are identified, you will need to impose exclusion zone around it or apply for an SNH license before proceeding.
Red	Orange	Yellow	Yellow	Train all staff and contractors in wildcat awareness – hand-out available.
Red	Orange	Yellow	Yellow	Prepare to adapt if there are new sightings whilst work in progress.

Table E. 3: Recommended precautions based on risk level

If a den site is found, follow advice set out in FCS guidance note 35d. Options include:

- Setting an exclusion zone of 200m
- Rescheduling the work. Note however that a license is needed to disturb a den at any time of year.

If a suspected den is found, options include:

- Leave out destructive work (e.g. leave the brash or rocky pile undisturbed)
- Minimise disturbance in the immediate vicinity

Plan to leave some brash piles permanently as habitat features and keep records of den site locations and mitigation.

Appendix F – Malsach Valley Peatland Water Sanctuary

F/1.1 Scope of project

The Peatland Water Sanctuary (PWS) aims to create an ecologically robust landscape that benefits peatland, water, biodiversity, and trees. The primary aim of the PWS is to restore peatlands in the Malsach Valley and expand those wetlands to create larger areas of peatland, support the hydrological cycle and provide greater resilience to climate change.

How will this be done? For the last 60 years the land in the Malsach Glen was drained and planted for commercial forestry. Although efforts have been made through not restocking to create open habitats within the structure of a commercial forest, the disturbed hydrology remains and impacts the overall productivity of the land. Restoration of the hydrology and integrating this with the commercial forestry is key to a positive outcome for the Malsach Valley PWS. Resilience of the habitats and the forest will become more critical as the predicted Climate Change effects of increased droughtiness, stormy weather and wetter winters will affect growth rates, stability, and establishment of future tree crops. To counter these effects the vision must go far beyond the current situation, to optimise future potential with much stronger resilience. To achieve this water must be brought back into the landscape, held, utilised, and then slowly released. Through optimisation of ecological function, resilience, and productivity, the PWS restoration will provide this functionality for the benefit of the afforested areas and provide robust habitat networks that will benefit many apex species.

Approach

The PWS Plan optimises the benefits for water, peatland, biodiversity, forestry carbon storage and sequestration to create a more balanced landscape.

The approach considers 'open areas' not as unproductive and non-commercial areas, but supporting commercial forestry, climate change and biodiversity targets, whilst optimising the productive capacity of the landscape. An example of this is the nutrient cycling and water retention. Long term retention, Low Impact Silvicultural Systems and Continuous Cover Forestry are considered as being useful management regimes to maintain nutrient and water cycling. Wetlands and peatlands have a role in the process by cycling and retaining water and nutrients in the Glen rather than those being quickly lost through drainage ditches.

The approach for this plan is to utilise the water and nutrients in the landscape to rejuvenate the biodiversity, provide climate change resilience and enhance a productive forest. The PWS is a proactive opportunity to show how peatland and forestry management, integrated planning can enable and enhance water yield, quality, biodiversity and rebuild natural capital. The future for maintaining some commercial forestry sites in the changing climate with increased droughts and flooding, is through the management of water in the landscape.

The PWS plan attempts to push the boundaries, whilst maintaining a realistic approach to the fact this is a commercial forestry plantation.

Expected outcomes and improvements.

- Expansion of peatlands and wetlands in the Malsach Valley
- Improvement in wetland health and re-establish conditions for peat forming vegetation.
- Greater water retention (buffering) in the area, through ditch blocking and vegetation establishment.
- Reduced peak flows and increased base flows.
- Reduced sediment and nutrient loss.
- Improved biodiversity, through improvement of all trophic levels.
- A resilient section of productive forest with a wide range of tree species.

The below map shows the intended species coverage and areas of restored peatland which will should be achieved by the end of the current LMP plan period for the Malsach Valley. Some of the surrounding areas outwith the black outline and some small areas with young crops will be converted to this species prescription over a longer period in the future as per Map 5 - Management.

Gartly Land Management Plan 2023

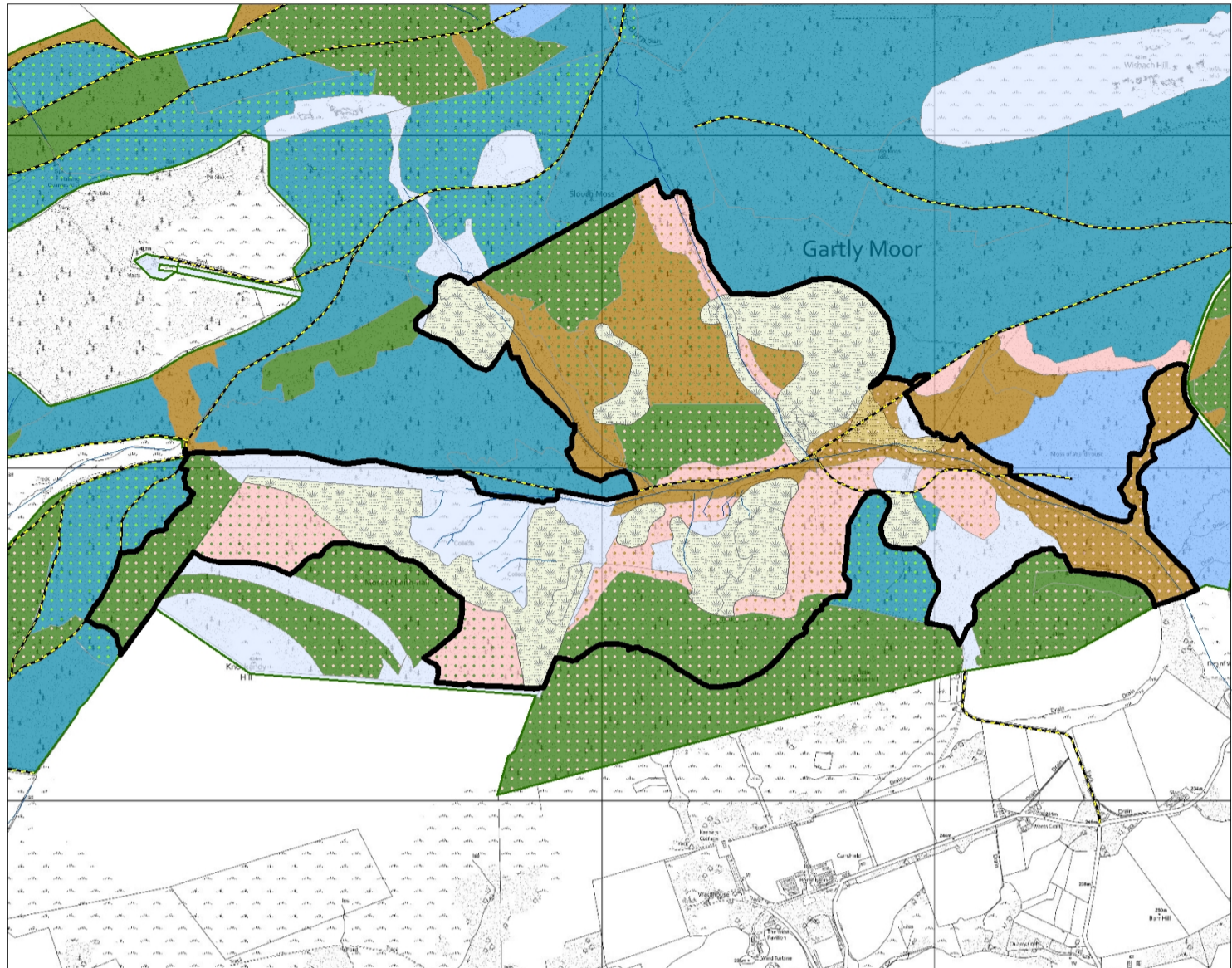
Malsach Glen

Scale @ A2: 1:8,000

Date: March 2023

Legend

- Malsach Glen habitat restoration Outline
- Peat Restoration
- Birch
- Norway Spruce
- Other/Mixed Broadleaves
- Scots Pine
- Sitka Spruce
- Birch with any Other Broadleaves
- Birch with Scots Pine
- Other Broadleaves with Birch
- Other Broadleaves with Scots Pine
- Scots Pine with Birch
- Sitka Spruce with Lodgepole Pine
- Open
- Forest Roads
- Watercourses



0 0.075 0.15 0.3 0.45 0.6 Km

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Map F. 1: Map showing restock prescriptions for PWS area

F/1.2 Detailed plans for each area

Detailed prescriptions have been decided for each area within the Malsach Valley PWS based on extensive field work and recommendations from an external Wetland Ecologist – **Andrew McBride**, listed below. The below map shows the numbers assigned to each compartment and is followed by a detailed analysis of each compartment along with the planned operations for this LMP period.

The management coupes for the Malsach Valley area have all been built to ensure that the necessary felling permissions and restock prescriptions are in place to complete this project within the LMP period. Please see Appendix G for more information on all areas of peatland restoration.

Gartly Land Management Plan 2023

Malsach Glen

Scale @ A2: 1:8,000

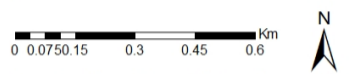
Date: March 2023

Legend

Malsach Glen habitat restoration Outline

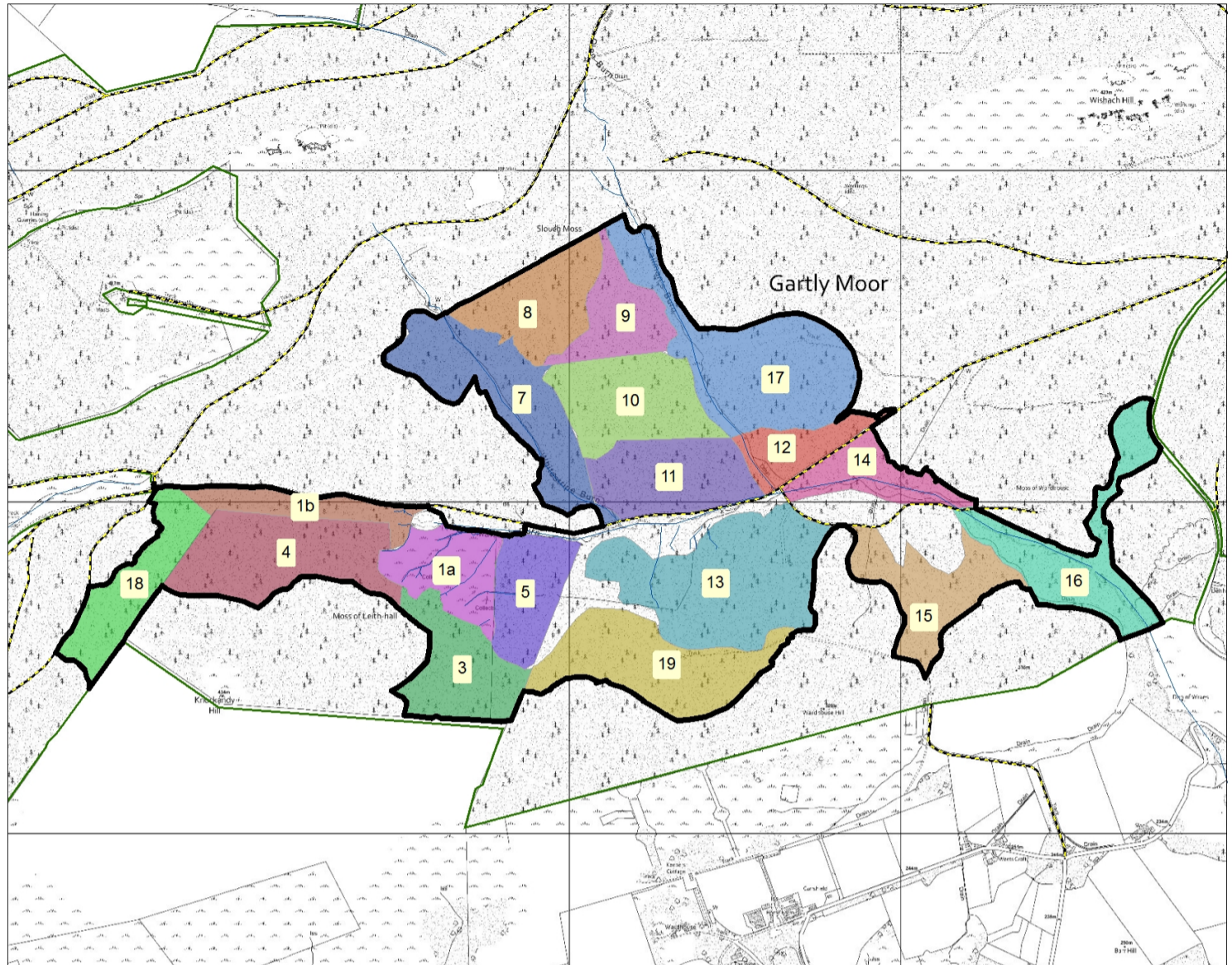
Compartment Number

- 1a
 - 1b
 - 3
 - 4
 - 5
 - 7
 - 8
 - 9
 - 10
 - 11
 - 12
 - 13
 - 14
 - 15
 - 16
 - 17
 - 18
 - 19
- Forest Roads
Watercourses



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Map F. 2: Map showing compartment numbers for habitat restoration areas

Compartments 1a & 1b – Moss of Leith Hall Blanket Bog and Upland Heath

These areas are historically open space and have never been afforested. Non-native regeneration has recently been cleared from these areas and some unwanted vegetation flailed. Ditches have also been blocked in some areas to help raise the water table and further protect these priority habitats.

These coupes will continue to be managed as designated open space with non-native regeneration removed when required.

Compartment 3 – Knockandy Hill South East

Current Situation



Image 1: Ride in Compartment 3 showing rank heather dominated vegetation

This compartment stretches from the break of slope above Moss of Leith Hall, southwards to the ridge of Knockandy Hill and consists of Sitka spruce planted on wet and dry heath; the remnants of which are seen in the rides. Sitka growth within the compartment is highly variable with better trees on the edges and stunted trees within blocks. Overall, the compartment has suffered from check caused by heather/nitrogen deficiency and is just starting to recover in some places whilst remaining checked in others. This change could be due to increase atmospheric nitrogen initiating growth. A section of the Knockandy ridge has an area of hill peat that was prepared but not planted and has regenerated with diffuse Sitka spruce. In the open areas the vegetation comprises of dry heath with rank heather dominating, grading into wetter heath with a sphagnum dominated understory.

Note on compartment outline: The boundary of Compartment 3 has been extended northwest along the ride at the foot of the larch. This extension will provide an early buffer to Moss of Leith Hall and allow the spreading of springs on the edge of the forest

to have a wider influence and create diverse wetland habitats. A wind firm edge would still be provided by the current ride.

Suggested Management

Aim: Create a habitat link from the shallower peats on the hillside to the deeper peats of the valley floor, thus creating a natural graduation of habitats from dry heath through wet heath to fen and bog. Compartment 3 provides an opportunity for measuring water inputs into the landscape from top to bottom of the hill.

What to retain: Semi open areas of dry heath close to the ridge. By creating new extraction routes, retain all ride vegetation as a diaspora for seeds and species.

Want to change: Remove plantation and regenerated Sitka spruce. The plantation to the east of Compartment 3 contains newly planted Larch. Felling Compartment 3 earlier would establish a wind firm edge in larch.

Recommendations

- Fell and remove Sitka spruce crop and brash.
- Manipulate the spring heads and forestry ditches to create broader flushes across the previously afforested slope.
- Where possible flip remaining stumps and surface smooth.
- Establish native birch and Scots pine woodland on the upper slopes where ground conditions are suitable.

Compartment 4 – Knockandy Hill West

Current Situation



Image 2: Stunted Sitka spruce in Compartment 4



Image 3: Compartment 4 Ride where trees to the left could be included as part of Compartment 6, to right clear felled and returned to bog

Compartment 4 is a block of highly variable area of Sitka spruce, with tree sizes ranging from 2 to 20 metres. The edges of the block have possibly benefited from more intense drainage and greater soil inversion that has restricted heather growth in the early years of establishment. The area is not particularly wet, and the peat depths range from 20 to 50 cm. However the compartment links well to the western end of Moss of Leith Hall.

Suggested Management

Aim: Create a habitat and a link from the shallower peats on the hillside to the deeper peats of the Moss of Leith Hall. The removal of the trees and blocking ditches will allow the development of peatlands and other wetlands, creating a natural graduation of habitats from dry heath through wet heath to fen and bog. In addition, the tree removal and the additional evapotranspiration loss will improve the Moss of Leith Hall water budget and provide a wetland buffer around the moss.

What to retain: Retain all ride vegetation and where possible the vegetation in the checked areas to provide diaspores to colonise the bare areas.

Want to change: Remove conifers to windfirm edges.

Recommendations

- Fell and remove Sitka spruce crop and brash.
- Where possible flip remaining stumps and surface smooth.
- Although other upwellings were not found the presence of the Malsach Well at a lower altitude at eastern end of this compartment suggests other upwellings and potential for fen habitat creation are present. Manipulate the spring heads and forestry ditches to create broader flushes across the previously afforested slope.
- Establish native birch and Scots pine woodland on the upper slopes where ground conditions are suitable.

Compartment 5 – Moss of Leith Hall Eastern Extension

Current situation



Image 4: Windblown trees showing peat and poor drainage



Image 5: Nearby sphagnum 'poor fen' dominated flushes



Image 6: Sphagnum rich pool in plantation



Image 7: Fen area within the compartment

Compartment 5 consists of mature Sitka spruce stretching from the Malsach Burn, south to the break of slope on Knockandy. The whole compartment mainly consists of deep peat and as a result some of the trees have blown over, exposing shallow root systems. The compartment is bisected by a deep and wide ditch draining the springs on the east end of Moss of Leith Hall. This ditch through the peat was dug to transmit water to Warehouse on the other side of the hill, but now drains northwards into the Malsach Burn. Within the compartment there is little major drainage apart from the planting furrows. Part of the compartment at the northern end was ditched in preparation for planting but not planted.

A very wet 'poor fen' area with a small area of 'rich fen' in the south-eastern quarter of the compartment was also unplanted. This area is dominated by soft rush and dense cover of Sphagnum and is one of the more interesting wetland areas in the glen. The interest is enhanced by wells and upwellings with higher pH creating rich fen with brown moss flushes along the western edge of the forestry. In addition, within this area are slightly raised mounds of peat, remnants of peat cutting and topped with heather.

Suggested Management

Aim: Create a larger area of poor and rich fen and other open habitats. Create pools to encourage open water succession that will benefit dragonflies, darters, and damselflies.

What to retain: Retain the existing area of fen. This area is too wet for machinery access.

Want to change: Change the hydrology to spread and retain water from the upper part of the slope and remove conifers to create a mosaic of open wetland habitats. Utilise the existing drainage to create small pools for colonisation by Sphagnum moss.

Species of note: Common Darter, Blue Aeshna dragonfly

Recommendations

- Fell and remove Sitka spruce crop.
- Manipulate the spring heads and forestry ditches to create broader flushes across the previously afforested slope.
- Create pools through the manipulation of the forest drains.
- Where possible flip remaining stumps and surface smooth.

Compartment 7 – Whitestripe Burn and adjacent deep peat

Current Situation



Image 8: The foot of the Whitestripe where over the years the 'burn' has deposited a fan of silt and peat

The Whitestripe Burn is strongly canalised and deeply incised (2m deep in places). Probably a result of the channeling of many forestry drains above the valley into the newly created canalised burn.

Following felling the forest, the immediate burnside was left unplanted, presumably for the benefit of biodiversity.

Broadleaves were planted along the edges of the replanted forest, but the center remained unplanted. The stumps and ditches from the previous planting remain and are functional. The result has been to encourage regeneration of Sitka spruce and the development of rank tussocky grassland and rush, all of very low biodiversity value. The forestry to the West has areas of tree check due to poor drainage and to the east the taller trees are subject to windthrow, due to poor drainage and iron pans. At the foot of the valley, the water from the burn spreads out in places mainly due to the silt/peat delta formed from the ditch outwash.

The current vegetation is dominated by areas of tussocky hair grass, with welved thistle, foxglove, sorrel, soft rush and a covering of mat mosses.

Suggested Management

Aim: Return water retention into the landscape through reinstatement of form and function of the Whitestripe flushes, to slow and spread the flow across the valley, to increase species diversity.

What to retain: Dome stumps and fallen timber which would be beneficial to Wildcat, reptiles and fungi

What to change: Hydrology to spread and retain water within the valley, improve habitat structure and increase species composition.

Recommendations

- Remove Sitka spruce regeneration.
- Block the 'burn' with woody debris to create pools and raise the water table.
- Spread water at the top of the compartment to create flushes downslope.
- Block the forestry ditches and flip/push tree stumps into ditches.

- Leave piles of woody debris and stumps for mammals and reptiles.
- Complete peat restoration activities on deep peat soils in North-West of compartment (see Appendix G)

Blocking the burn as described will require a CAR License and a fisheries assessment of the Whitestripe Burn which will be sought closer to the date of operations. It is not expected that the burn contains fish as the watercourse becomes dissipated/fragmented at the lower end by the delta of silt and peat and has no distinct course.

Compartment 8 – North of Slouch Moss

Current Situation

Compartment 8 is an area of Sitka spruce and Japanese larch on comparatively dry soils to the north of the Slouch Moss area. This compartment does not show the same levels of bog vegetation or wet ground conditions as the surrounding area. The current crop is gradually being damaged by increasing windblow which was compounded by storm Arwen in winter 2021.

Suggested Management

Aim: Return this area to productive forest cover of more suitable species which will also act a buffer to surrounding non-native plantation forestry.

Recommendations

- Fell standing and clear windblown crops of Sitka spruce and Japanese larch.
- Establish productive Scots pine (80%) and birch (20%) crop

Compartment 9 – Upper Slouch Moss

Current situation



Image 9: Open area in Upper Slouch Moss



Image 10: Semi open area with stunted Sitka spruce and Scot's pine with some resemblance to bog woodland

Compartment 9 is a mix of productive Sitka spruce with multiple open areas. Some of these openings are caused by wind throw of mature trees whilst other have been created by clearing back trees from wetter boggy areas 15 to 20 years ago, to release the bog vegetation. The clearing of the trees has been a great success with Sphagnum flourishing along with sundew and cranberry.

The ditches within the compartment run across the slope, and following the felling to waste approx. 15 years ago, they have infilled quickly with Sphagnum and are not a hydrological issue. The wet conditions mean the Sitka spruce regeneration is struggling to grow on the established bog vegetation. The tree removal was restricted to a very small area less than 0.1ha but the similar topography/drainage down slope has created areas of stunted trees. The swards in these areas are either dominated by *Carex nigra* or Sphagnum/Polytrichium.

Suggested Management

Aim:

- Increase wetland area and water storage at the top of the slope
- Maintain extant biodiversity

What to retain: High quality bog vegetation in the existing open areas. Stunted Scots pine as they closely resemble a bog woodland. Sphagnum and sedge cover in the partially open areas to provide a propagule source for future bog expansion.

What to change: Hydrology to spread and retain water within the valley, improve habitat structure and increase species composition.

Recommendations

- Remove Sitka crop and brash, keeping machinery away from existing rides and open areas. Cut stumps as close to ground level as possible.
- Block all forest drains. As the drains all flow across the slope this will not require large amount of damming but in places the furrows will need enhancing to reduce cascading of water from one furrow to the next without raising the water table.
- Flatten and tidy woody debris, using surplus timber to impede flow in the ditches.
- Block any main ditches to spread water across the slope to improve the wetlands resilience to drought.
- Hand fell around existing open areas of bog and remove regenerated Sitka from open bog areas.
- Establish diverse wet woodland consisting of open space (50%), mixed native broadleaves (30%) and Scots pine on drier areas (20%)
- Peat restoration on 10b peat soils (see appendix G)

Compartment 10 – Lower Slouch Moss

Current situation



Image 11: Conifers downslope of the open areas showing impeded drainage and good tree growth



Image 12: Flushed open areas showing stunted Sitka growth

Compartment 10 is a block of productive Sitka spruce at maturity with areas of windblown timber, the largest on the western boundary. Ground flora is largely absent except in the less shaded rides where it consists of carpets of *Sphagnum* and *Carex nigra*.

Suggested Management

Aim:

- Increase wetland area and water storage on the slope
- Spread water across the slope to create a bigger area of quality bog vegetation.
- Maintain extant biodiversity

What to retain: existing *Sphagnum* lawns in the wetter areas and ride vegetation. Retain Scots pine.

What to change: Hydrology to spread and retain water within the valley, improve habitat structure and increase species composition.

Recommendations

- Fell and remove all Sitka spruce and brash. Cut stumps as low as possible ideally with shears.
- Block all forest drains. As the drains all flow across the slope this will not require large amount of damming but in places the furrows will need enhancing to reduce cascading of water from one furrow to the next without raising the water table.
- Block the main ditches to spread water across the slope to improve the wetlands resilience to drought.
- Establish diverse wet woodland consisting of open space (50%), mixed native broadleaves (30%) and Scots pine on drier areas (20%)
- Peat restoration on 10b peat soils (see appendix G)

Compartment 11 – Malsach Moss West

Current Situation



Image 13: Well vegetated ride



Image 14: Within Compartment 11 showing dry conditions and very limited ground flora

Compartment 11 consists of mature ready to harvest Sitka spruce. The center of the compartment has suffered from wind blow. The ride on the northern edge of the compartment is well vegetated with a mix of *Calluna* and *Carex nigra*, which provides an indication of the type of vegetation that could be restored. The compartment is much drier than the compartments further up slope probably due to the interception of water on the heavily ditched slope.

Suggested Management

Aim:

- Create productive native woodland
- Maintain extant biodiversity

What to retain: Existing ride vegetation.

What to change: Remove Sitka spruce

Recommendations

- Fell and remove all Sitka spruce and brash. Cut stumps as low as possible ideally with shears.
- Establish productive Scots pine (80%) and birch (20%) crop

Compartment 12 – Malsach Moss East

Current situation



Image 15: Dry heather dominated sward, showing regenerating Sitka



Image 16: Where blockages occur, vegetation becomes more diverse.

This small compartment is relatively flat and sitting above the forests track, provides some indication of the appearance of the original Malsach Moss. Due to drainage and routing of the Burn the area is currently dominated by rank heather forming dry heath. Semi mature Sitka bound the compartment to the north and regenerating Sitka are found across the whole of the compartment. The compartment was previously planted, drained, and felled with the forest drains still functional and resulting in a dry *Calluna* dominated sward. Where water is held back a mix of *Carex nigra* and *Carex echinata* proliferates. Water from the area currently collects at a trackside ditch and is then directed under the track via culverts into the Malsach Burn. The main culvert contains Kailsman's Burn.

Suggested Management

Aim:

- Increase the peatland area and enhance the bog forming vegetation.
- Maintain extant biodiversity

What to retain: Existing vegetation.

What to change: Remove Sitka spruce

Recommendations

- Fell and remove all Sitka spruce and brash. Cut stumps as low as possible ideally with shears.
- Block all drains in the compartment.
- Restore deep peat areas which continue to North into Compartment 17
- Establish native broadleaf groups on suitable ground adjacent to road. Prescription: Open (50%), Mixed native broadleaves (30%), Birch (20%)

Compartment 13 – Wardhouse Hill Moss

Current Situation



Image 17: Replanted and regenerating Sitka spruce on the northern edge of the peaty soils



Image 18: The vegetation in the unplanted area is dominated by rank rush and hair grass, with the wetter open areas covered in Sphagnum and Polytrichium Mosses.

The moss is a flat raised area above the Malsach Burn has been partially planted with Sitka spruce. An estimate of peat depth of the northern edge of the site is between 20 and 40 cm. The southern half of the area also marked as peaty soils has not been replanted.

Although the peat across the area is highly variable and thin, there is a good potential to create a diverse wetland on the area without adversely affecting the planted Sitka spruce to the north. The existing drainage ditches are significantly lowering the water table and encouraging rank grasses and rush. However, where the water table is higher a Sphagnum carpet is establishing and to the eastern end of the site, base rich flushes have developed. Both aspects show the potential to greatly improve the species richness and interest of the unplanted areas. The stumps from the previous crop are very apparent and often very large as are many of the ditches within the area.

Suggested Management

Aim:

- Increase wetland area and peat forming vegetation.
- Spread water across the slope to create a bigger area of quality bog vegetation.
- Maintain extant biodiversity

What to retain: The flushed areas

What to change: Hydrology to spread and retain water within the wetland, increase abundance of peat forming vegetation and increase species composition.

Recommendations

The presence of large stumps and deep ditches make machine access to the site difficult. However, by mulching tracks to specific locations/ditches easy access could be gained for an excavator.

Where possible flip and invert stumps. In many places the peat is too shallow (less than 50 cm) to invert stumps. Leave stumps in situ and block drains, utilising the shallow cross slope gradient to raise the water significantly. The recently planted crop is protected from flooding from the wetland by an existing deep ditch that would not be blocked.

- Strategically block all larger ditches.
- Flatten and tidy woody debris, using timber to impede flow in the ditches.
- Invert Sitka spruce regeneration.

Species of note *Sphagnum squarrosum*, *S. tenellum* *Carex rostrata* *C. echinata*
C. curta

Compartment 14 – Moss of Wardhouse North

Current Situation



Image 19: Flatter area of the floodplain with obscured drain



Image 20: Tree regeneration on the flood plain

This compartment is on the valley floor and can partially be considered as a small flood plain. Trees were removed from the area approximately 20 years ago and Sitka spruce and Lodgepole pine regeneration have returned. Drainage from Slouch and Malsach all enter the compartment via track culverts, but the remnant forestry drainage ensures the water is not held on the flatter flood plain area. The vegetation on the ridges is dominated by rank heather and areas where pooling occurs are filled with Sphagnum. Water from the Deer Well (and other upwellings) drains down the slope by means on a straight drain. Although wet in places, water generally moves quickly to the Malsach Burn through the drainage system.

The Deer well water feeds the site from the surrounding hills and multiple captured upwellings across the hill, at a similar height to wells on Knockandy, just above the 300m contour. The key well is known as the Deer Spring, but all are ditched into one ditch which flows to the flood plain and then partially disseminated through several forest ditches at the break of slope. Prior to drainage the springs would have formed flushes across the slope. The other water supply to the flood plain is from Kailsman's Burn which receives its water from the forestry above and originally from Slough Moss. Kailsman's Burn flows through what was once known as Malsach Moss before going under the track and into the Malsach Burn. Peat depth across the area ranges between 30 and 45cm.

Suggested Management

Aim:

- Recreate a small floodplain
- Increase wetland area and peat forming vegetation.
- Spread water across the valley floor to create a bigger area of quality bog/fen vegetation.

What to retain: Dry grassy knolls above the floodplain.

What to change: Hydrology to spread and retain water across the floodplain, increase abundance of peat forming vegetation and increase species composition.

Recommendations

- Strategically block all larger ditches shown on the above plan. Also block plough furrows at 10 to 15m intervals. Leave a 10 m buffer adjacent to the track to allow free flow under the culverts. At the foot of the Deer Well ditch spread the water across the slope.
- Flatten and tidy woody debris/roots, using timber to impede flow in the ditches.
- Fell all Sitka spruce and Lodgepole pine regeneration. Invert into the ground all small Sitka spruce/Lodgepole pine regeneration.
- Create a series of ponds across the floodplain to retain water and create Dragonfly habitat.
- Establish native broadleaf groups on suitable ground to maintain element of forest cover. Prescription for coupe: Open (50%), Mixed native broadleaves (30%), Birch (20%)

Compartment 15 – Moss of Wardhouse South

Current Situation



Image 21: Rank grasses, Compartment 15, looking west



Image 22: Eastern compartment boundary ditch

This compartment is shown on soil maps as being a substantial area of peat. The area had been previously planted with conifers and in the last 10 years partially replanted with Sitka spruce and alder. In general, the peats are shallow and very degraded. An area to the south and east has not been replanted and provides an opportunity to restore to an active peatland. This area is covered in rank rush and hair grass tussocks. Peat depth is highly variable ranging from 0.10m to 1.30m.

Suggested Management

Aim:

- Increase wetland area and peat forming vegetation.
- Hold water in the basin and across the slope to create a larger area of quality bog vegetation.
- Maintain extant biodiversity in the flushes and wet areas
- Maintain growth of the adjacent existing tree crop

What to retain: The flushed areas and existing wet areas.

What to change: Hydrology to spread and retain water within the wetland, increase abundance of peat forming vegetation and increase species composition.

Recommendations

- Strategically block all larger ditches to hold water back and spread across the site. Block preferential drainage routes where they are found or are created. Where possible create open water pools by redirecting water flows.
- Flatten and tidy woody debris, using timber to impede flow in the ditches/plough furrows.
- Stump flip where conditions allow.
- Invert Sitka spruce regeneration.

Compartment 16 – Shevock and South-East Malsach Burn Valley

Current Situation



Image 23: Planted broadleaves, showing poor establishment in the dominant heather sward



Image 24: Sitka spruce regeneration

The area of interest sits between a replanted area and retained forest. At this point the Malsach Burn changes its name to the Shevock. In between the two areas of forestry, large tree stumps would indicate good tree growth in the first rotation, but there are also areas of wind throw.

Peat depth averages around 50cm of peat with the maximum peat depth in the higher part of the area at 76cm, with high Sphagnum cover and the water close to the surface. Contour ploughing has led to poor tree growth in the areas of shallow slope and peaty soil. The area is wet enough to support two horsetails, *Equisetum fluvatile* and *Equisetum palustre*. Within the area broad leaved trees were planted with highly variable results with most dying but birch aspen and rowan surviving. Sitka spruce has successfully regenerated in many of the previously open areas. The wetter areas support small areas of Sphagnum lawn amongst the soft rush. A silt fan where the ditch exists the forest fans out and has the potential to support more than the existing rush and rank grass community.

Where the Shevock meets the wider Malsach Burn valley, the trend continues with previously felled areas dominated by Sitka regeneration with tubed broadleaves showing variable rates of establishment throughout.

Suggested Management

Aim:

- Retain and spread water within the wetland.
- Encourage formation of riparian woodland in suitable areas along Malsach Burn valley

What to retain: Existing very wet areas and surviving planted broadleaved trees

Want to change: Hydrology to spread and retain water within the valley, improve habitat structure and increase species composition.

Recommendations

- Remove Sitka spruce regeneration.
- Remove tree shelters and dispose at landfill.
- Leave aspen, birch and alder.
- Mulch stunted trees plus others leaving a 10 to 20 m buffer of trees to protect existing crop.
- Block all ditches.
- At the lower end of the ditch where the it exists the conifers intercept the ditch to spread the water across the whole of the grassy/rushy area.
- Top up planting in suitable areas to retain forest cover once Sitka regeneration removed. Prescription: open (50%), mixed native broadleaves (30%), birch (20%).

Compartment 17 – Malsach Moss East and Kailman’s Burn

Current Situation

The majority of Compartment 17 is comprised of a large area of deep peat which was planted with Sitka spruce in 2007 and is now showing significant check due to the ground conditions and heather dominated vegetation cover.

The remainder of this compartment covers either side of Kailman's Burn, running North to South, before passing through Compartment 12 and under the main forest road into Compartment 14. There is significant Sitka regeneration all along the burn side, the habitat could be improved by removing the non-native species and establishing native riparian species in this area.

Suggested Management

Aim

- Improve riparian zone habitat and water quality of Kailman's Burn
- Restore deep peat areas to functional peatland ecosystem. (see Appendix G)

What to retain: Any existing flushed areas and any native species which have regenerated in riparian zone.

What to change: Hydrology to spread and retain water across the hillside, improve habitat structure and increase species composition.

Recommendations

- Remove all Sitka spruce
- Block all ditches
- Flatten and tidy woody debris, using timber to impede flow in the ditches/plough furrows.
- Stump flip where conditions allow.
- Establish mixed native broadleaf habitat along Kailman's burn. Prescription: birch (70%), alder (20%), willows (10%).

Compartment 18 – Knockandy Hill Western Buffer

Current Situation

Compartment 18 is comprised of a large area of 1950s Sitka spruce which was flattened by storm Arwen in winter 2021. It is situated immediately adjacent to the main Knockandy Hill habitat restoration area.

Suggested Management:

This compartment will be felled/cleared of all Sitka spruce and restocked with a productive crop of Scots pine (60%) and birch (40%) to act as a buffer between the habitat restoration area and surrounding non-native plantation forestry.

Appendix G – Peat Restoration Plan

The purpose of this Appendix is to provide supplementary information to support the EIA screening determination (see 3.1) for deforestation as part of the Gartly LMP submission for the purpose of initiating peatland restoration across the block.

This Appendix demonstrates alignment with the following key Scottish Government and Scottish Forestry and practice:

- Forestry Commission Scotland (2009). Scottish Government’s policy on control of woodland removal: implementation guidance: Annex 3 woodland removal without the requirement for compensatory planting¹
- Forestry Commission Scotland (2015). Deciding future management operations for afforested deep peatland²
- Forest Research (2000). Forests and Peatland Habitats³
- Forestry Commission (2017). UK Forestry Standard⁴
- Scottish Government (2015). Biodiversity Strategy: Route Map to 2020⁵

G/1.1 Location and Context

The areas identified as suitable for peat restoration operations within this plan period are focused in two main areas: within the wider Malsach Valley habitat restoration area (see Appendix F) and in the Northern area of Rack Moss as shown in the map below.

The total area of peat restoration identified is 68.89ha. Of this total area, 65.16ha currently has some form of forest cover, or an existing requirement to restock, which will require transition to open space prior to restoration being completed. All areas for deforestation are covered within the phase 1 and 2 felling coupes detailed in Map 5: Management and section 2.2 of the LMP.



Coilltearachd agus Fearann Alba

Gartly Land Management Plan 2023

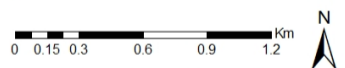
Peat Restoration Areas

Scale @ A2: 1:15,000

Date: March 2023

Legend

- Forest Roads
- Watercourses
- ▨ Deforestation Areas
- ▨ Peat Restoration Areas



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

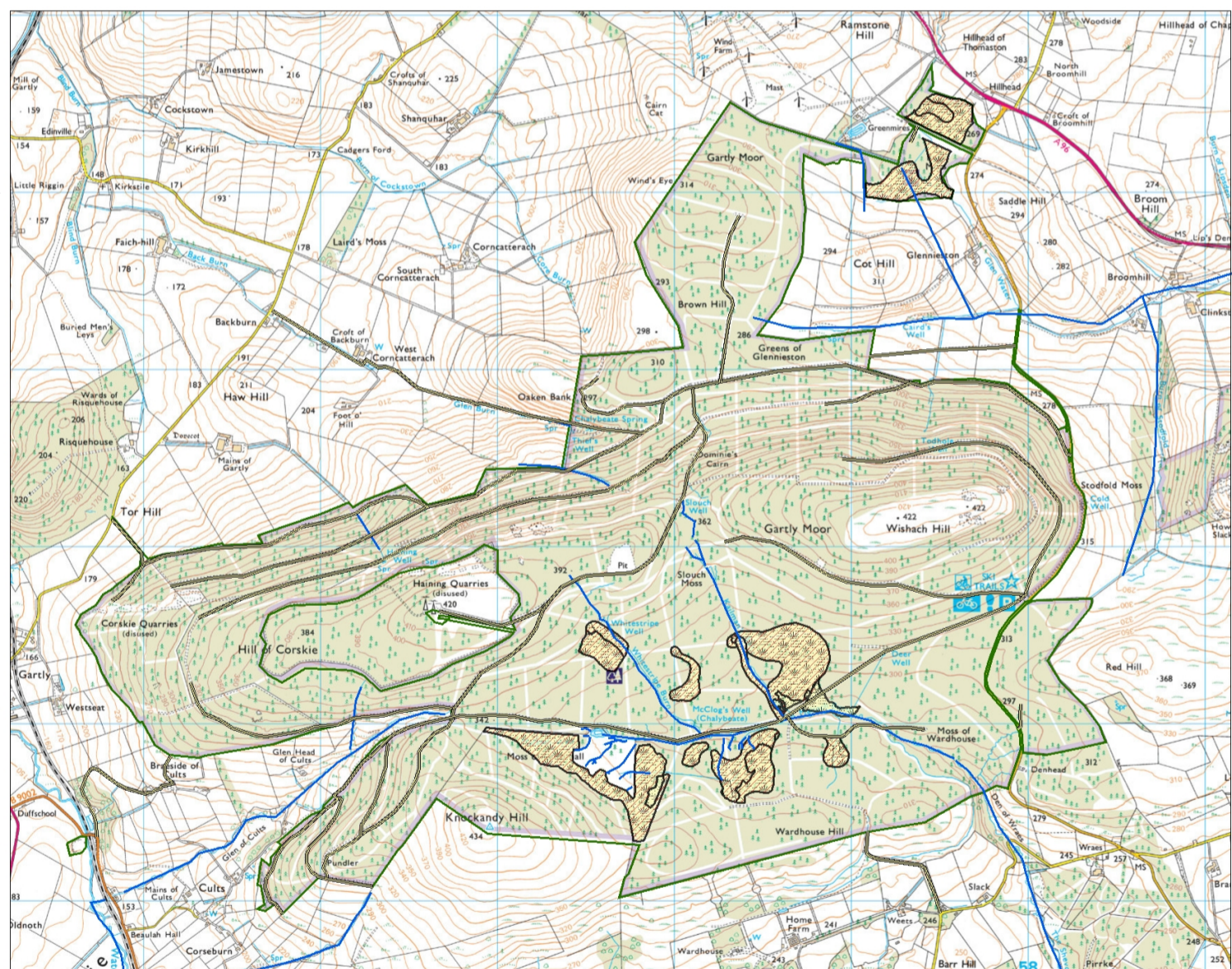


Figure G.1: Areas to be restored to peatland within plan period

G/1.2 Long term vision

The long term vision for the project is to restore the sites identified to their previous conditions as Upland Sphagnum Bog, Calluna, Eriophorum vaginatum Blanket Bog and Juncus effusus Bog through the sensitive removal of conifer plantation and a program of peatland restoration. The

¹ <https://forestry.gov.scot/publications/349-scottish-government-s-policy-on-control-of-woodland-removal-implementation-guidance/viewdocument/349>

² <https://forestry.gov.scot/publications/1-deciding-future-management-options-for-afforested-deep-peatland>

³ <https://www.forestresearch.gov.uk/documents/2549/fcgn1.pdf>

⁴ <https://www.forestresearch.gov.uk/tools-and-resources/fthr/uk-forestry-standard/>

⁵ <https://www.gov.scot/publications/scotlands-biodiversity-route-map-2020/>

aim is to allow the key peat forming species, such as Sphagnum Mosses and Cotton Grass, to become the dominant ground flora and allow the associated biodiversity to thrive in the priority habitat whilst returning these areas to their pre-forestry roles as significant carbon sinks. Riparian native woodland will complement the surrounding habitat and further increase the biodiversity value of the restored areas.

G/1.3 Management objectives

1. Systematically restore the deep peat areas to a functioning peatland system which will act as a long term carbon store and increase its value for biodiversity and water quality.
2. Recover the existing timber from the current conifer crop while balancing this with the primary objective of peatland habitat restoration.
3. Protect the existing bog habitat, future peatland areas and acid grassland areas, by the removal of regeneration of non-native conifers.

G/1.4 Critical success factors

- Utilise appropriate harvesting techniques to minimise ground impacts and so protect to the carbon storage potential of the blanket bog habitat.
- Where practical realise the biomass potential of all scrub and harvesting waste, leaving as clean a site as possible to help facilitate peatland restoration.
- Utilise low impact forwarding methods to extract products to minimise ground damage.
- Apply current best practice and expertise in peatland restoration operations and use suitably experienced contractors with the appropriate machinery.
- Maintain a level of deer browsing conducive to native broadleaf regeneration by culling and fencing where appropriate.

G/1.5 Management of afforested deep peat

G/1.5.1 Summary

- All areas identified for peat restoration are comprised of Upland Sphagnum Bog, Calluna, Eriophorum vaginatum Blanket Bog and Juncus effusus Bog soil types and are therefore a priority for restoration on ecological grounds.
- Afforestation is listed as one of the key threats to Blanket Bog having a significant impact on their conservation status at a national level ([Control of Woodland Removal Policy – Annex 3: woodland removal without a requirement for compensatory planting](#)).
- Restoration of Blanket Bog is a key action of the Scottish Biodiversity Strategy. FLS as a Scottish Government agency has a duty to further the protection and enhancement of these habitats under the Nature Conservation Scotland Act (2004).
- The Blanket Bog areas in Gartly are part of a wider landscape of upland habitats which provides connectivity with the habitat restoration works also planned for the surrounding Malsach Valley area.
- Remnant bog vegetation is abundant on the rides and open spaces within afforested areas indicating that the site has good potential for successful restoration.
- Forest to bog restoration techniques have advanced over the last few years and FLS is regarded as one of the leading organisations in developing best practice and delivering positive restoration programmes. Using current best practice we anticipate a more rapid recovery of the water table and successful establishment of bog vegetation on restoration sites than has been experienced previously.
- The Sitka spruce and Lodgepole pine crops currently on many of the afforested peat areas are showing clear signs of check with very poor rates of tree growth on surviving conifers. The habitat in its current condition will be acting as a carbon source.
- Recent advances in restoration techniques indicate that the site has very good potential for restoration thus turning this carbon source into a moderate carbon sink with long term secure carbon storage.

G/1.5.2 FLS approach to peatland management

Restoration of Blanket Bog is a key action from the Scottish Biodiversity Strategy, the habitat is recorded on the Scottish Biodiversity List. Beyond its value as a carbon store, peatlands contain a huge diversity of organisms. Planting trees on peat leads to a fundamental change in the ecosystem⁶.

FLS's approach to peatland management is different to the rest of the forest industry. FLS's objectives and legislative framework has an added dimension. Being a Scottish Government agency, FLS has an added 'Biodiversity Duty', as stated in the Nature Conservation Scotland Act (2004). Protection of conservation values is required as part of UKWAS certification and principles of sustainability are required under the UKFS. This means that for afforested peatlands restoration is considered before deciding if replanting is appropriate.

This is set out in "Making future management decisions of afforested peatlands Practice Guide". This practice guide outlines how to manage afforested peatlands that are not going to be restored for biodiversity reasons. It states that replanting must be justified by considering if the crop will achieve YC 8 or more for Sitka Spruce. The default is to not replant unless there is evidence it will achieve a good growth rate of harvestable timber. If YC 8 or above is not achievable then restocking peatlands is unsustainable. A slow growing crop will not result in a profit, it will be acting as a carbon source thus contributing to climate change and so society would be disadvantaged or threatened based on current scientific information.

The restoration potential of the identified areas in Gartly is considered to be high due to the very wet ground conditions and abundant remnant bog vegetation that persists in rides and other open areas. FLS are committed to a long-term restoration program of Blanket Bog and Upland Heath, priority habitats.

⁶ Payne et al., 2018: The future of peatland forestry in Scotland: balancing economics, carbon and biodiversity. Scottish Forestry. pp. 34-40.

Objectives for the restoration of the Gartly sites are:

- Expand the area of peatland habitat by applying restoration treatments, restoring it to a functioning peatland within 30 years.
- Protect the storage of carbon within the soil (peats).
- Maximise the sequestration of carbon by the peatland in the future.
- Improve the water quality leaving the site and help regulate its flow.
- Monitor the impacts of treatments on the water quality to establish if it been improved over the long term.

The following tables present future management of afforested peatlands for Gartly forest block.

Area statistics	Hectares (Ha)	Comments
Current management of peatlands in LMP		
Afforested deep peatland	65.16	Total area size of afforested peatlands based on analysis of aerial images and site surveys. This includes the wider hydrological unit to be restored and areas previously felled but which have a current restocking requirement from the previous plan period.
Existing open habitat on deep peat	3.73	Total area of open peatland (ha).
TOTAL - All deep peat soils	68.89	Total area size (ha) of deep peat soils to be restored within the forest block area based on the soils data, including hydrological unit of areas to be restored. Deep peat soils are defined as per the SF Practice Guide: Scenario A, B and C soils. Presence of peat soils confirmed via peat surveys.
Future management of afforested peatlands		
'Presumption to restore' peatlands. Forest-to-bog restoration of afforested peatlands including the hydrological catchment	36.18	Only includes afforested peatlands which lie next to open existing peatlands, or Scenario A peatland types, as per the SF Practice Guide. The area of their hydrological units is also included (Figure 23).
'Assessed' peatlands. Forest-to-bog restoration to secure carbon store and sequestration, and maximize ecosystem services.	32.71	Only includes Scenario B and C peatland types, as per the SF Practice Guide. Total area of afforested peatlands that will be restored following an assessment of predicted growth (YC). This is where no evidence found to support the conclusion that the next rotation stand would grow Sitka spruce YC8 or more with minimal disturbance and low level of peatland modifications. The areas of the hydrological units are also included. All of these areas form part of the hydrological units of presumption to restore peatlands or existing peat restoration/open ground sites in this instance.
Peatland to be restocked	NA	Total area of afforested peatlands that will be restocked because evidence was found to support the conclusion that the second rotation will clearly be YC8 or more with minimal disturbance and with a low level of peatland modifications.

Table G.1: Summary of afforested deep peatland, existing open habitat on deep peat, associated ground to be restored in this plan period



Forestry and Land Scotland

Coilltearachd agus Fearann Alba

Gartly Land Management Plan 2023

Malsach Glen Peat Restoration

Scale @ A2: 1:5,000

Date: March 2023

Legend

- Forest Roads
- Watercourses
- Existing Habitat Restoration
- Presumption to Restore Peat Soil Types
- Assessed Peat Soil Types
- Hydrological Unit Restoration
- Drying effect
- OS Terrain 50 Contours
- OS Terrain 50 Contours



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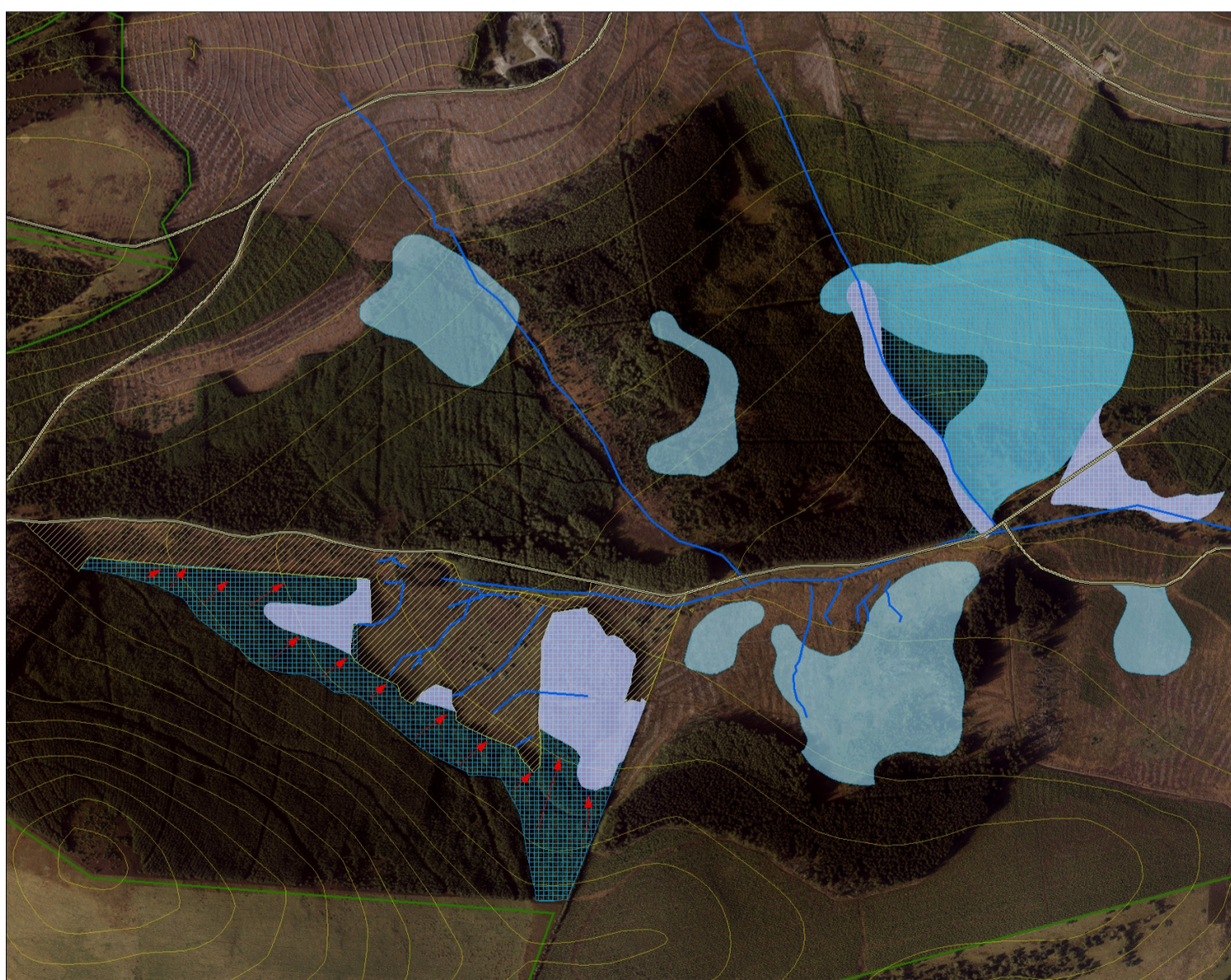


Figure G.2 Location of peatland to be restored within Malsach Valley, a combination of forest-to-bog and open habitat restoration

Gartly Land Management Plan 2023

Greenmires Peat Restoration

Scale @ A2: 1:3,000

Date: March 2023

Legend

- Forest Roads
- Watercourses
- Existing Habitat Restoration
- Presumption to Restore Peat Soil Types
- Assessed Peat Soil Types
- Hydrological Unit Restoration
- Drying effect
- OS Terrain 50 Contours
- OS Terrain 50 Contours

0 0.0275 0.055 0.11 0.165 0.22 Km

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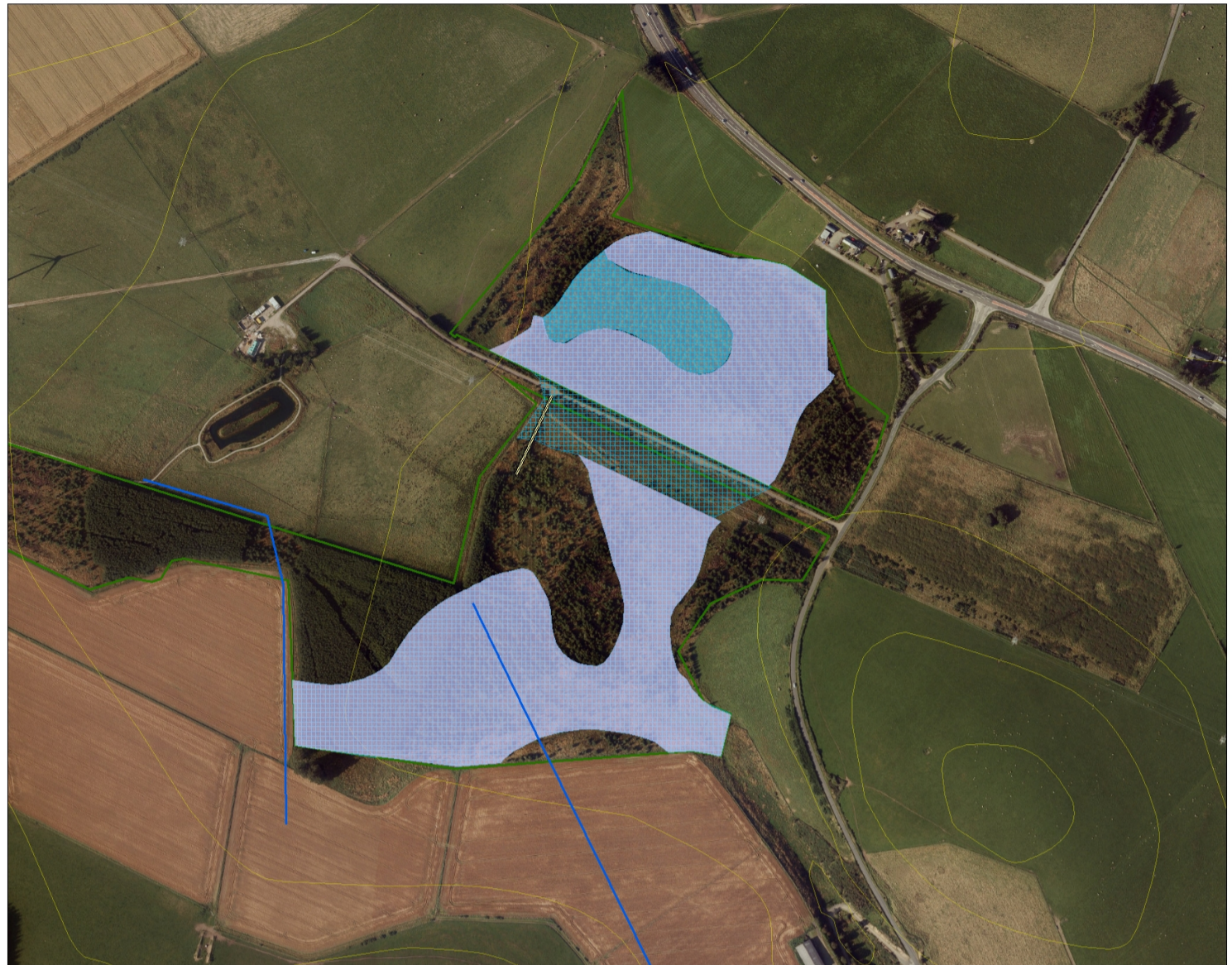


Figure G.3 Location of peatland to be restored at Greenmires, a combination of forest-to-bog and open habitat restoration

Description	Description	Location of described attribute (peat types, part of the forest)
<p>Description of any designated sites, priority peatland habitats needing to be protected and enhanced.</p>	<p>Blanket Bog priority peat habitat exist across the areas to be restored, with Blanket Bog habitat covering the rides within the afforested peatlands with associated vegetation found under trees. The canopy is thin in places, allowing light to support a field layer characteristic of Blanket Bogs in existing open spaces.</p> <p>Also large areas of Upland Heathland and Neutral Grassland present in existing managed open space.</p>	<p>Illustrated by Figures G.4 and G.5 (habitat and soils).</p> <p>Pictures of bog habitats present and their locations can also be seen in Appendix F: Malsach Valley Peatland Water Sanctuary</p>
<p>Description of the Scenario peat types present in the forest (all will be restored), and any characteristics of interest.</p>	<p>Large areas of Scenario 10b Upland Sphagnum Bog comprise the majority of the area to be restored.</p>	<p>Illustrated by Figures G.4 and G.5 (habitat and soils).</p> <p>Pictures of bog habitats present and their locations can also be seen in Appendix F: Malsach Valley Peatland Water Sanctuary</p>
<p>Description of hydrological units, extent, relation to peatlands to be restored and the topography.</p>	<p>All Upland Sphagnum Bog areas within the Malsach Valley area lie on the flat valley bottom or on gentle on the northern side of the valley. All areas are part of large hydrological units encompassing flushed areas but which are not deep-peat and will be restocked with suitable species to enhance and protect the peat restoration zones.</p>	<p>Illustrated by Figures G.2 and G.3 (peatland to restore).</p>
<p>State any points of note from survey</p>	<p>NA</p>	<p>NA</p>

Table G.2 Presumption to restore, description of key features. Only relevant for presumption to restore peatlands (Scenario A peat types) where deforestation would prevent the significant net release of greenhouse gases

Gartly Land Management Plan 2023

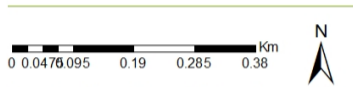
Malsach Valley Soils and Habitats

Scale @ A2: 1:5,000

Date: March 2023

Legend

- Forest Roads
- Watercourses
- 2s [Mining Spoil, Stony or Coarse Textured]
- 3 [Typical Podzol]
- 4 [Typical Ironpan Soil]
- 4z [Podzolic Ironpan Soil]
- 4b [Intergrade Ironpan Soil]
- 6 [Typical Peaty Surface-Water Gley]
- 7 [Typical Surface-Water Gley]
- 8c [Juncus effusus Bog]
- 10b [Upland Sphagnum Bog]
- 11a [Calluna Blanket Bog]
- 11b [Calluna, Eriophorum vaginatum Blanket Bog]
- 13z [Podzolic Ranker]
- VC [Valley Complex]
- ▭ Peat Restoration Areas



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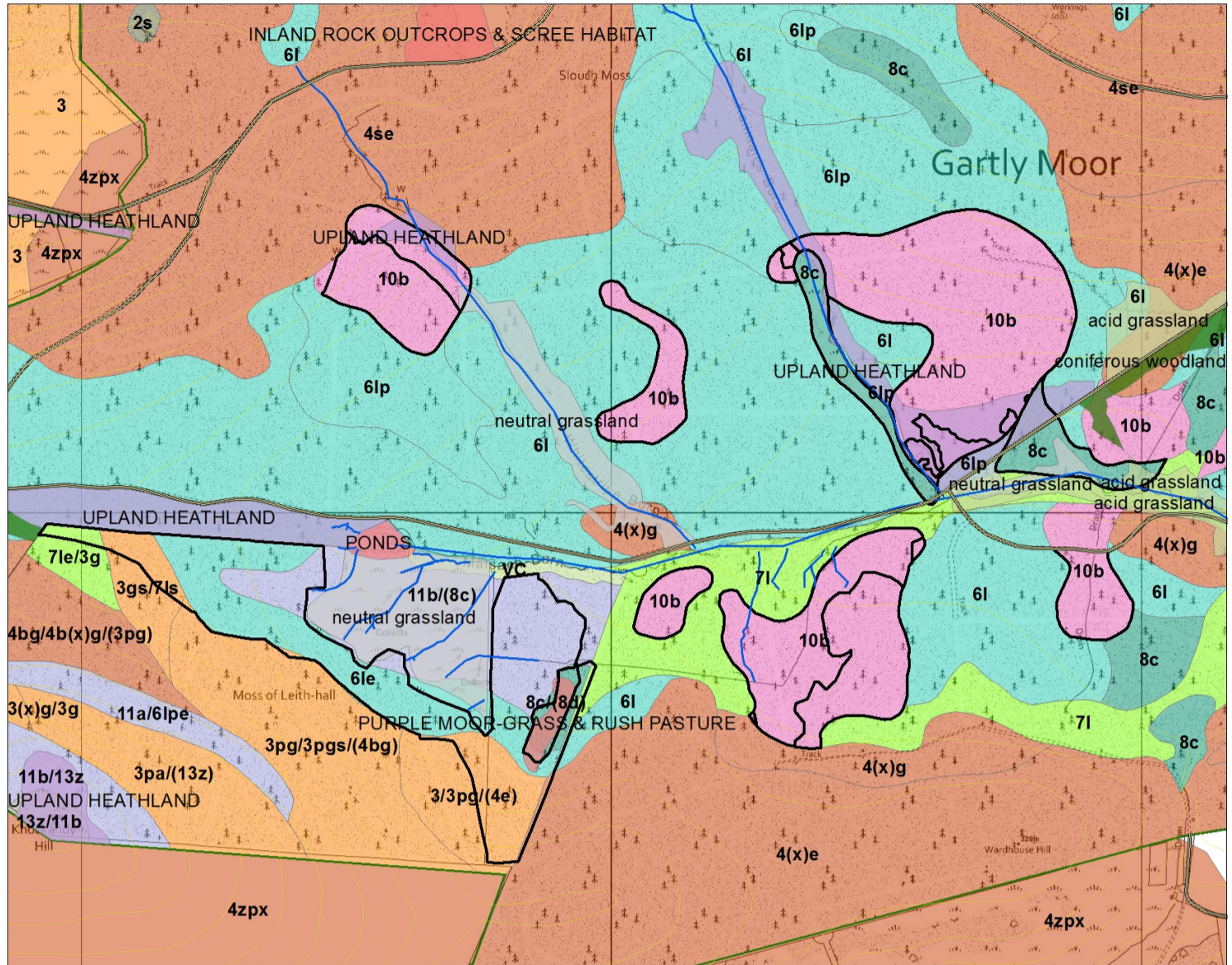


Figure G.4: Habitats and Soils in Malsach Valley

Gartly Land Management Plan 2023

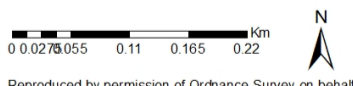
Greenmires Soils and Habitats

Scale @ A2: 1:3,000

Date: March 2023

Legend

- Forest Roads
- Watercourses
- 4 [Typical Ironpan Soil]
- 6 [Typical Peaty Surface-Water Gley]
- 7 [Typical Surface-Water Gley]
- 8c [Juncus effusus Bog]
- 10b [Upland Sphagnum Bog]
- ▭ Peat Restoration Areas



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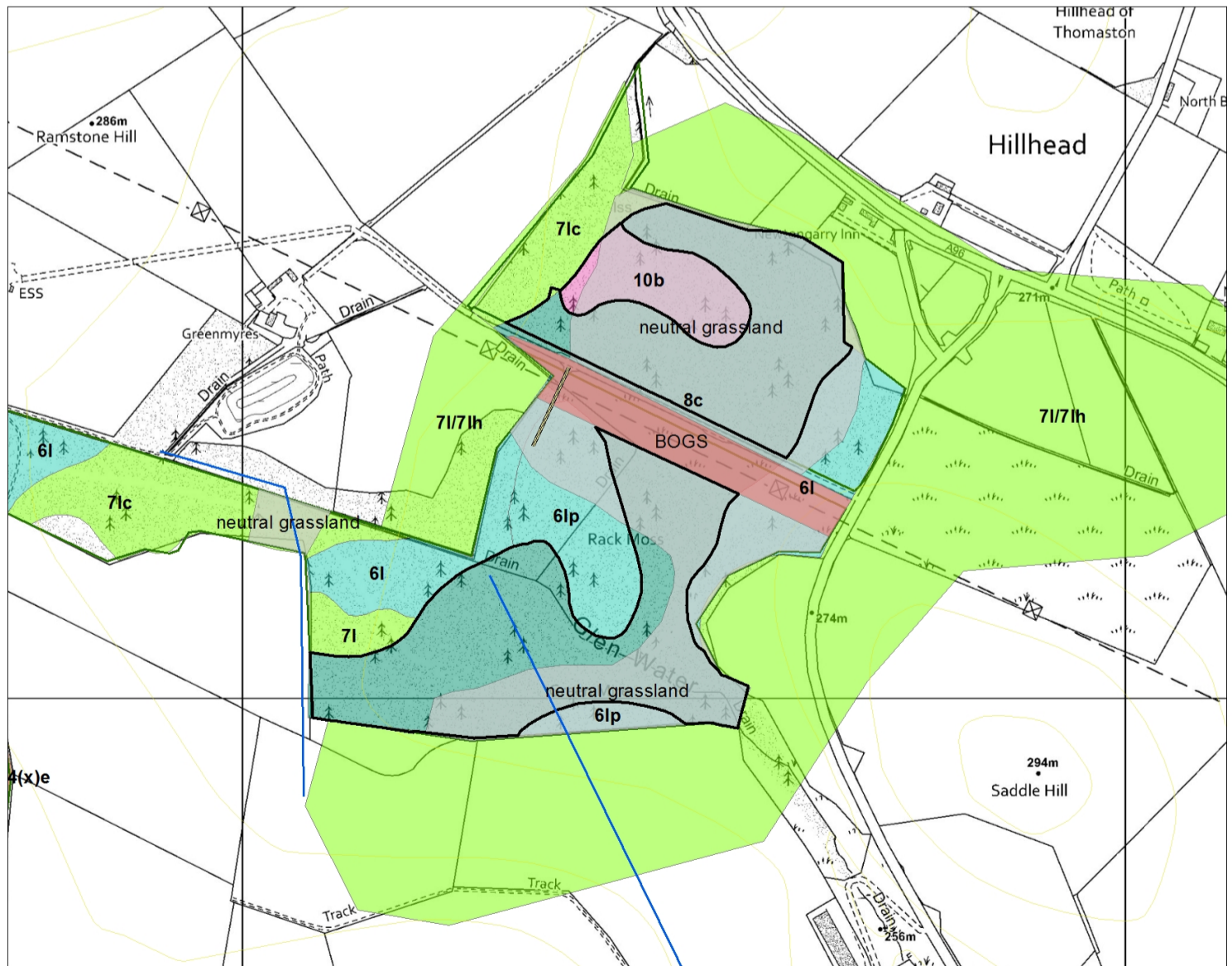


Figure G.5: Habitats and Soils at Greenmires

Attribute described	Description	Location of described attribute (peat types, part of the forest)
Treatments used to restore the hydrology	For all areas within the Malsach Valley zone, please see Appendix F: Malsach Valley Peatland Water Sanctuary for full details of restoration techniques in each area. For the Greenmires restoration area, a combination of drain blocking and ground smoothing will be applied once trees have been removed.	Whole afforested site.
Treatments used to restore the topography (remove afforestation modifications, and previously hagged sites)	For all areas within the Malsach Valley zone, please see Appendix F: Malsach Valley Peatland Water Sanctuary for full details of restoration techniques in each area. For Greenmires: Site specific specifications or alterations of the approach: A 'light' touch ground smoothing specification will be used to help retain any desirable vegetation. Any furrows will have the vegetation reserved, then ridges pushed into the furrows, and the reserved vegetation replaced on top of the site of the ridges (which will be bare). The tree stumps are of a small size, and most may not even need to be flipped, but rather slid sideways into the excavated furrow.	Whole afforested site.
Treatments used to counter-act peat cracking or other modifications caused by the afforestation of the peatland	No peat cracking noted	N/A

Table G.3: Restoration proposals. Describes the restoration techniques to be applied to the proposed restoration areas.

G/1.5.3 Environmental Impact Assessment risk assessment

Forest-to-bog peatland restoration is classified as a forestry project under the Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017. To obtain consent from Scottish Forestry, an assessment of potential environmental risks as a result of the proposed forestry project is required to allow the determination of whether it is likely to have significant effects on the environment.

Gartly Land Management Plan 2023

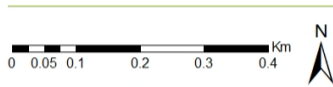
Malsach Glen Deforestation

Scale @ A2: 1:5,000

Date: March 2023

Legend

- Forest Roads
- Watercourses
- ▨ Deforestation Areas



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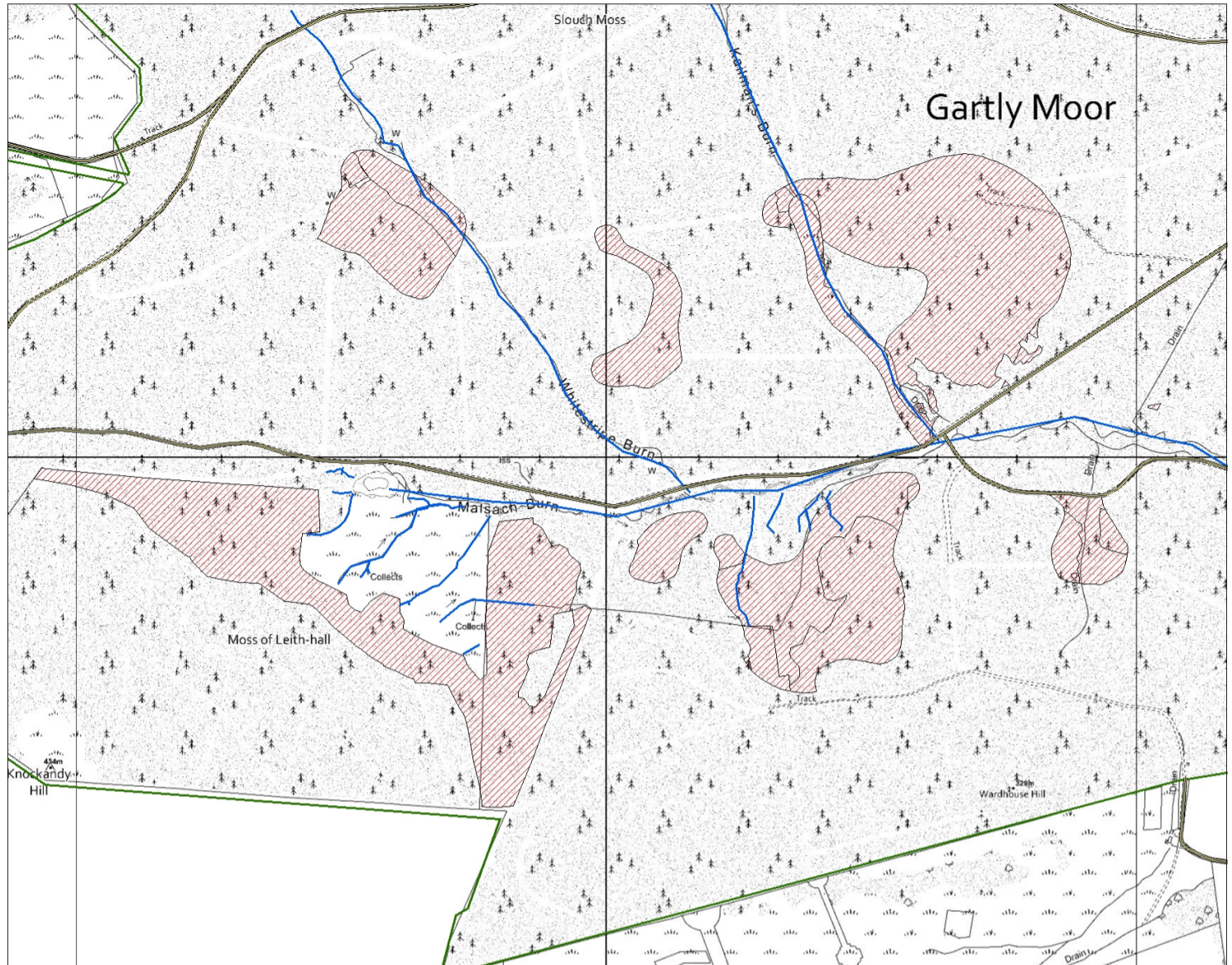


Figure G.6: Malsach Glen deforestation areas

Gartly Land Management Plan 2023

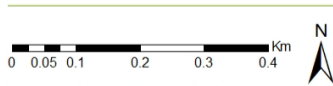
Malsach Glen Peat Restoration

Scale @ A2: 1:5,000

Date: March 2023

Legend

- Forest Roads
- Watercourses
- ▨ Peat Restoration Areas



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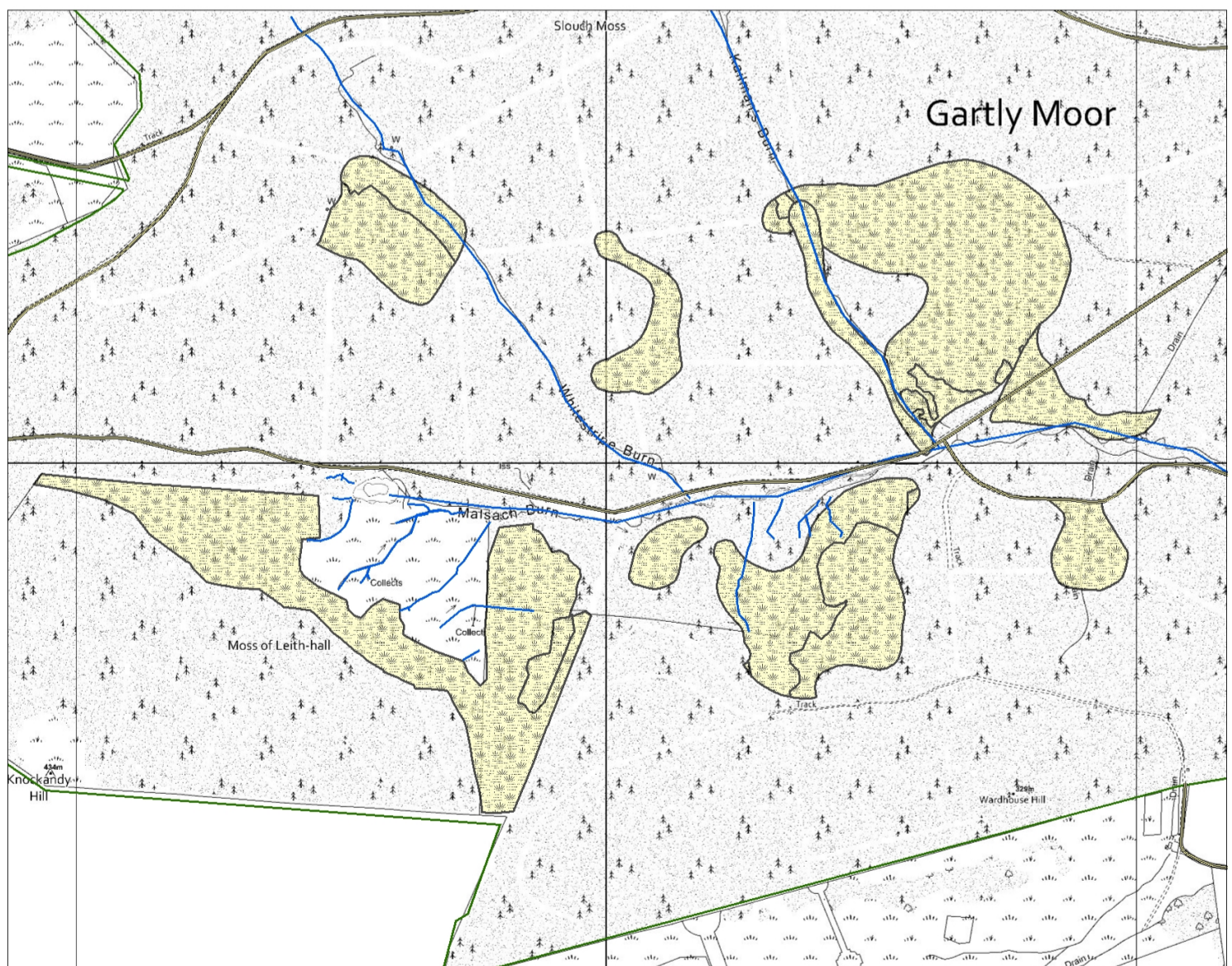


Figure G.7: Malsach Glen peat restoration areas

As the peat restoration activities during this LMP period are likely to take the full 10 years to complete, the EIA screening form below is only for operations planned for the Malsach Glen habitat restoration areas as per Figures G.6 and G.7 above. A separate EIA screening request will be made for the Greenmires restoration area closer to the operational start date, not scheduled to begin until phase 2 of the LMP period in 2028/29 .



Please complete this form to find out if you need consent from Scottish Forestry, under the **Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017**, to carry out your proposed forestry project. Please refer to Schedule 2 Selection Criteria for Screening Forestry Projects under [Applying for an opinion](#). If you are not sure about what information to include on this form please contact your [local Conservancy office](#).

Proposed Work							
Please put a cross in the box to indicate the type of work you are proposing to carry out. Give the area in hectares and where appropriate the percentage of conifers and broadleaves							
Proposed Work	select	Area in hectares	% Conifer	% Broad-leaves	Proposed work	select	Area in hectares
Afforestation	<input type="checkbox"/>				Forest roads	<input type="checkbox"/>	
Deforestation	<input checked="" type="checkbox"/>	51.16 ha	100%		Forest quarry	<input type="checkbox"/>	
Location of work		Malsach Valley within Gartly LMP area. See below map.					

Description of Forestry Project and Location
Provide details of the forestry project (size, design, use of natural resources such as soil, and the cumulative effect if relevant). Please attach map(s) showing the boundary of the proposed work and other known details.
Phase 1 of peatland restoration as part of large scale habitat restoration in Gartly, encompassing all areas to be deforested with the Malsach Valley area. See Appendixes F and G of LMP for details of the proposed deforestation, peatland restoration plan and associated maps. Figure G.6 shows a map of the areas which this screening opinion relates to.

Provide details on the existing land use and the environmental sensitivity of the area that is likely to be affected by the forestry project.
The existing land use is a combination of commercial conifer plantation of Sitka Spruce planted on deep peat soils or the associated hydrological unit and some areas where a mix of checked Sitka spruce and Lodgepole pine has self seeded on deep peat soils. The proposed works will restore the deep peat areas to a functioning peatland system which will act as a long term carbon store and increase its value for biodiversity and water quality.

Description of Likely Significant Effects
Provide details on any likely significant effects that the project will have on the environment (resulting from the project itself or the use of natural resources) and the extent of the information available to assist you with this assessment.
There will be significant positive effects on the environment as a result of this project. See Appendix G of LMP for details of the positive effects this project will have. The main positive effects will be:
<ul style="list-style-type: none"> - Returning the areas of peaty soils in the valley to functioning peatland ecosystems - Returning peat areas to carbon sinks and supporting a higher variety of plant and animal species than the current areas of plantation spruce

Environmental Impact Assessment Screening Opinion Request Form

- Creating a more open, biodiverse and visually varied habitat throughout the valley
- Reduced flood risk further downstream by slowing the rate of flow into watercourses via drain blocking and ground smoothing

Other significant effects to be noted:

- Clearing a large area of young spruce crop may have a short term effect on the valley environment by increasing rainfall run-off rates until peat restoration activities have been completed.
- Although this is a significant alteration to the valley environment, the scale of the block means that these changes are reasonable and are more akin to restoring the natural scale of the landforms in the valley before plantation forestry was added using drainage, ground cultivation and fertilisation in the past.
- The changes to the valley, although complex to deliver and covering a large area, will not be unusual in this location, which already has open valleys present, previously completed peat restoration and open acid grasslands.
- Effects across boundaries should be minimal as the Malsach valley area is enclosed within the Gartly forest block, however, as mentioned above, there may a very short term increase in water entering the Malsach burn. Mitigations listed later in this document and in Appendixes F and G.
- There will be short term impacts on people using the forest for recreational use in terms of path and road closures, these impacts will be no more that those of standard forestry operations. The long term impact on people visiting the forest will be positive by creating a very biodiverse, open and visually varied setting throughout the valley.
- Poorly managed forestry operations on peaty and gleyed soils are likely to cause soil disturbance and, in the damp conditions here, there is the potential for sediment to enter watercourses. Protecting the soil structure and avoiding diffuse pollution will be key concerns during these operations. Mitigations listed below.
- The impacts on soils and knock on effects of ground disturbance will be short term as the areas earmarked for deforestation will be subject to a variety of peatland restoration techniques immediately after felling.

Include details of any consultees or stakeholders that you have contacted in order to make this assessment. Please include any relevant correspondence you have received from them.

Statutory consultees will be consulted as part of LMP approval process.

Mitigation of Likely Significant Effects

If you believe there are likely significant effects that the project will have on the environment, provide information on the opportunities you have taken to mitigate these effects.

The long term significant effects of the project are expected to be positive so no mitigation measures are required. However Appendix G includes details of the environmental protection measures that will be undertaken during works on site to ensure there are no short-term detrimental impacts on the environment while the habitat restoration and deforestation operations occur.

Environmental Impact Assessment Screening Opinion Request Form

The key mitigations required relate to protecting soils and water habitats during operations:

- UKFS forestry and water guidelines will be adhered to at all times with enhanced measures taken where needed including the use of silt traps, enlarged buffer zones and any other mitigations required.
- Regular monitoring of all watercourses in vicinity of operations will take place to ensure water quality is not being adversely affected.
- Appropriate harvesting techniques will be applied to minimise the ground impacts and protect carbon storage potential of soils. This may include utilising low ground pressure machines for harvesting and forwarding operations and completing operations at a suitable time of year.
- We will apply current best practice and expertise in peatland restoration operations and use suitably experienced contractors with the appropriate machinery.
- We will removing as much scrub and waste materials from peat restoration sites as possible to maintain nutrient balance on peaty soils and help facilitate restoration activities.

Short term impacts on the general public during operations will be minimised by signposting operations well in advance and providing alternative recreation routes where possible.

Sensitive Areas

Please indicate if any of the proposed forestry project is within a sensitive area. Choose the sensitive area from the drop down below and give the area of the proposal within it.

Sensitive Area	Area
Deep peat soil	40.6ha
Select...	
Select...	
Select...	
Select...	

Property Details

Property Name:	Gartly Forest		
Business Reference Number:		Main Location Code:	
Grid Reference: (e.g. NH 234 567)	NJ 558 328	Nearest town or locality:	Huntly
Local Authority:	Aberdeenshire Council		

Owner's Details

Title:		Forename:	
Surname:			
Organisation:	FLS, East region.	Position:	
Primary Contact Number:		Alternative Contact Number:	
Email:			
Address:	Portsoy Road, Huntly, Aberdeenshire.		

Environmental Impact Assessment Screening Opinion Request Form

Postcode:	AB54 4SJ	Country:	
Is this the correspondence address?	Select...		

Agent's Details			
Title:	Mr	Forename:	Euan
Surname:	Stewart		
Organisation:	FLS	Position:	Forest Planner
Primary Contact Number:	0300 067 6200	Alternative Contact Number:	
Email:	enquiries.east@forestryandland.gov.scot		
Address:	Portsoy Road, Huntly, Aberdeenshire.		
Postcode:	AB54 4SJ	Country:	Scotland
Is this the correspondence address?	Yes		

Office Use Only	
GLS Ref number:	

Main risks to assess	Impact assessment
Population and Human Health	Positive impact. This area is widely used by members of the public. The increase in diversity in the landscape and species present will make this an attractive area to visit and increase recreational value. There are no public/private water supplies within the proposed area.
Biodiversity (habitats, species)	Positive. Restoration of a degraded peatland will restore a priority open habitat (Blanket Bog) and compliment adjacent upland heath, benefitting both habitat and its associated species. Pre-operational surveys will identify any protected or breeding species to ensure suitable mitigation is in place to avoid any disturbance.
Land	No impact. Where the restoration project is adjacent to agricultural land, boundary drains will not be blocked to ensure neighbouring land is not compromised by re-wetting and increased potential to flooding.
Soil – and geology, geomorphology	Positive. Re-wetting the site will benefit the peat soils as forestry modifications will be reversed to stop oxidisation and further degradation and erosion of the peat.
Water	Positive. Re-wetting techniques have shown to have no significant adverse effect on water quality. Ultimately, the water quality of the local area will be improved by reducing run-off from the exposed peat and degraded peatland. Any water courses will be suitably protected and buffered as per the UKFS Guidelines.
Air	No impact.
Climate	Positive. Afforested peatlands have the potential to emit more Green House Gas (GHG) emissions than can be absorbed by a woodland. Restoration of afforested peatlands, especially 'presumption to restore' peatlands, will prevent the significant net release of GHGs, ultimately benefitting the local climate.
Material Assets	No impact.
Cultural Heritage	No impact. Pre-operational surveys will identify any cultural heritage features to ensure suitable mitigation is in place to avoid any disturbance.
Landscape	Positive. Peatland restoration will create more open space within the forest blocks and their local area. This will add more diversity to the forest structure by creating open and associated native woodland habitats.

Table G.5: Summary of main risks associated with forest-to-bog peatland restoration

G/1.5.4 Monitoring

All peat restoration will be monitored on a regular basis to assess the change in surface vegetation (also a proxy indicator of water table level) and to check for non-native regeneration. It is envisaged that more monitoring will be undertaken by drone-based aerial photography at least bi-yearly. A full review of the peatland restoration will take place 5 years after completion and at the LMP mid-term review.

FLS continues to work closely with Forest Research on the effects of peatland restoration on water quality and will follow the best practice recommendations made in a recent publication by Shah and Nisbett based on 10 years of data collected from Flanders Moss. More details can be found at [Forest Research](#).