Forestry and Land Scotland | Coilltearachd agus Fearann Alba

East Region

Clashindarroch

Land Management Plan

Including:

Hill of Towanreef SSSI & SAC plan

Plan Reference No: LMP 37

Plan Approval Date:

Plan Expiry Date:

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

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

The mark of responsible forestry

Signed ……
Regional Manager

East region

Date ……

Signed ……
Conservator

Grampian conservancy

Date of Approval ……

Date approval ends: ……

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Appendices

Maps

1.0 Summary of proposals

This plan is a review of Forestry and Land Scotland's (FLS) management of Clashindarroch forest. The plan area includes the main Clashindarroch block along with Brown hill and the Darroch Wids sites of Coynachie, Merdrum and Black Middens. In addition Ittingstone, Culdrain and Mains of Lesmore, all of which were recent acquisitions and newly planted, are subsumed into this plan.

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

The **primary objective** is the management of the woodland for the production of a sustainable quality crop of timber.

There are additional **secondary objectives** for the future management of the woodland in certain areas of the plan area. These include:

- The improvement of biodiversity potential in riparian corridors;
- The improvement of the forest habitat for European Protected Species (EPS) and other protected species present;
- The restoration of non-forest habitats;
- New woodland creation;
- The maintenance of existing recreational facilities.

In order to work towards achieving these objectives taking into account limitations imposed by the current makeup of the forest has led to the following range of operations.

Planned Operations	**2020 – 2029 plan period**
Clearfell	602.8 ha
Thinning	3461.1 ha
Restock	929.7 ha
Afforestation	126.1 ha
Road construction	None
Road upgrade	None

In addition there are a number of operations planned to specifically target the improvement in biodiversity potential of the LMP area and the protection of existing designated sites, both heritage and biodiversity.

The plan will be reviewed after five years to ensure the objectives set out above are still appropriate for the management of the forest in light of the conditions pertaining at that time and that the planned operations still to be undertaken continue to meet the stated objectives. This will include a review of the critical success factors (see section 8.9) of this plan.

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 to enable them to making changes or undertaking mitigation measures to minimise any negative impacts and improve the forest environment .

2.0 Forestry Scotland Regulatory Requirements

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

2.1 Summary of planned operations

Proposed felling, restock and infrastructure works are shown on Map 7 Management, Map 9 Thinning and Map 10 Future habitats and species

Table 1 Planned operations over this LMP period

Planned Operations	**2020 – 2029 plan period**
Clearfell	602.8 ha
Thinning	3461.1 ha
Restock	929.7 ha
Afforestation	126.1 ha
Road construction	None
Road upgrade	None

2.2 Proposed felling in years 2020 - 2029

Proposed felling in phases 1 and 2 are shown in Map 7 Management.

Table 2 Proposed phase 1 and phase 2 felling (total coupe area)

Proposed felling year	**Fell area (ha)**	**% of forest area**
2020 - 2024	325.7	5.2
2025 - 2029	277.1	4.4

Table 3 Clearfell details by coupe (ha)

Proposed felling phase	Coupe no.	SS	Larch	NS	LP	SP	MC	MB	Open	Total
Phase 1 (2020 - 2024)	37014	5.0								5.0
	37020	2.5	1.8							4.3
	37022	7.8	2.8		0.3				0.2	11.1
	37038	35.1	0.4	0.6	2.5					38.5
	37048	19.8	2.9							22.8
	37050	3.9							0.0	3.9
	37090	3.1		1.3					0.2	4.6
	37101	3.5	0.3	0.0	0.3					4.1
	37114	0.1	5.1	2.2		5.4			0.1	12.9
	37130	9.0	11.4		0.7					21.0
	37139	8.4								8.4
	37141	2.3		4.5		0.1			0.3	7.1
	37145	3.9	2.5		2.9					9.3
	37153	7.6								7.6
	37158	0.2		1.0	0.1	0.3				1.6
	37166	0.6		1.2		0.2				2.0
	37227	1.0	6.0							7.0
	37251	6.2			0.0	5.5	0.4			12.1
	37273		18.8		2.3		0.4		0.1	21.5
	37275	1.4					4.8	0.7	0.2	7.0
	37283	20.0	7.0				2.5			29.4
	37288	4.8			6.6					11.4
	37292	5.8	15.9							21.7
	37294	1.8	4.4	2.4					0.2	8.7
	37344	9.9	4.7		0.9	1.7				17.2
	37350			5.9					0.6	6.5
	37375	13.9	4.5			0.7			0.1	19.2
Phase 2 (2025 - 2029)	37027	2.1	0.0	18.8				0.0	1.1	21.9
	37033	9.9	0.0		0.5			0.0	0.0	10.4
	37066	19.9	4.7		4.1			1.1		29.8
	37074	17.7	0.0		0.1		3.1	0.0		20.9

	37081		0.0	7.8				0.0	0.3	8.1
	37156		0.0					0.0	2.1	2.1
	37165		1.4	1.1				0.1		2.6
	37177	7.1	0.0	12.0				0.0	0.7	19.7
	37180	13.7	0.0	3.4		0.4		0.0	0.1	17.6
	37187	25.4	2.3		1.9			0.0		29.6
	37194	3.5	8.0		0.1	0.0		0.0		11.7
	37204	7.2	0.0		0.6	3.1		0.0		10.9
	37214	5.1	0.0				6.3	0.0	0.8	12.2
	37237	2.0	6.4		0.8	0.7		0.0	0.0	10.0
	37244		10.9					0.0	0.0	10.9
	37306	20.0	0.0		1.8			0.0		21.8
	37312	0.6	0.0					23.6		24.1
	37339		3.7			9.1		0.0		12.8
Total		320.1	122.3	85.7	30.2	18.1	17.4	1.8	7.4	**602.8**

Table 4 Change in age class over plan period (%)

Age of trees	Growth stage	Area (ha) 2020	% 2020	Area (ha) 2029	% 2029
0 - 10	Establishment	391.8	6.2	1050.8	16.7
11 - 20	Thicket	865.1	13.8	384.9	6.1
21 - 40	Pole stage	1330.7	21.2	1610.5	25.7
41 – 60	Mature high forest	695.4	11.1	744.7	11.9
61+	Old high forest	1003.2	16.0	933.9	14.9
	Open	1413.3	22.5	1310.5	20.9
	Felled	578.9	9.2	243.1	3.9

2.3 Proposed thinning in years 2020 - 2029

Proposed thinning coupes in Phases 1 and 2 is shown in Map 9 Thinning.

Table 5 Thinning details by coupe

Coupe no.	Next thin year	Area (ha)	Volume (m^3)
37101	2024	136	9255
37102	2024	218	13259
37103	2026	161	12830

37104	2020	309	17937
37106	2026	234	15156
37108	2024	480	24716
37109	2026	217	17387
37110	2021	360	21855
37111	2025	214	13740
37112	2026	148	7862
37113	2021	332	17775
37115	2022	650	39775
37116	2023	64	2858
Total		**3523**	**214404**

Table 6 Summary of thinning coupes in Phases 1 and 2 (percentage of forest area)

Proposed thinning year	Total coupe area (ha)	% of forest area
2020 - 2024	1808	29
2025 - 2029	1715	26

2.4 Proposed restocking in years 2020 - 2029

Proposed restocking species is shown on Map 10 Future habitats and species.

Table 7 Restock details by coupe (ha)

Coupe	SS	NS	SP	MC	MB	Open	Total
37004	21.5						21.5
37014	4.9						4.9
37020	2.2		2.2				4.3
37021	4.6						4.6
37022	5.5		5.5				11.1
37027		18.6				3.4	22.0
37028		8.6	8.6				17.2
37033	9.2					1.1	10.3
37038	37.2					1.2	38.4
37046	11.5						11.5
37048	17.4			4.3		1.1	22.8
37050					3.9		3.9
37059					8.2		8.2
37066	14.9		14.9				29.8

37074	9.3			9.3	2.3		20.9
37081		6.6				1.6	8.2
37090		2.3	2.3				4.6
37101	4.1						4.1
37105	0.8						0.8
37114			9.7			3.2	12.9
37123	1.8						1.8
37130	10.5		10.5				21.0
37134	0.2		0.2		5.4		5.8
37139	8.4						8.4
37141	2.5	2.5				1.8	6.8
37145	4.6		4.6				9.2
37153	7.6						7.6
37156	20.6	1.2					21.8
37158					1.6		1.6
37162					1.0		1.0
37165	1.3	1.3					2.6
37166		1.4				0.6	2.0
37177	8.6	8.6				2.6	19.8
37180	8.8	8.8					17.6
37182	3.9						3.9
37186	2.0						2.0
37187	27.4					2.2	29.6
37194	4.7		7.0				11.7
37204			10.9				10.9
37214	7.3			4.9			12.2
37227	6.1		0.9				7.0
37228	13.3			13.3			26.6
37234		10.6					10.6
37237	5.0		5.0				10.0
37239	15.0		15.1				30.1
37244			10.9				10.9
37246	1.2						1.2
37250	1.3						1.3
37251	8.5	3.6					12.1
37255		13.4	13.4				26.8
37260					2.1		21.0
37273		10.8	10.8				21.6
37275					7.0		7.0
37283	28.7					0.7	29.4
37288	11.4						11.4

37292	10.9		10.9				21.8
37294					8.7		8.7
37295					2.6		2.6
37305	1.7						1.7
37306	21.8						21.8
37312		24.0				0.1	24.1
37313	0.6						0.6
37334		4.3					4.3
37339	12.8						12.8
37341	23.0						23.0
37344	8.6			8.6			17.2
37345		2.1					2.1
37350		6.5					6.5
37358	11.2				57.8		69.0
37361						16.2	16.2
37375	9.6		9.6				19.2
37392	9.9		1.0				10.9
Total	**463.8**	**135.2**	**154.0**	**40.4**	**117.0**	**19.4**	**929.7**

2.5 Proposed new planting in years 2020 - 2029

Proposed new planting species is shown on Map 10 Future Habitats & Species

Table 8 New planting details by coupe (ha)

Coupe	MB	Open	Total
37256	15.7	3.7	19.4
37387		1.6	1.6
37385	43.5	21.8	65.3
37269	1.5	0.4	1.9
37389	60.7	6.7	67.4
37264	1.9	0.6	2.5
37263	1.2	0.8	2.0
Total	**126.1**	**34.0**	**160.1**

Table 8 Species change over plan period (%)

Species breakdown	Area (ha) 2020	% cover 2020	Area (ha) 2029	% cover 2029
Sitka spruce	2485.2	39.6	2629.0	41.9
Larch	512.3	8.2	390.0	6.2
Norway spruce	285.3	4.5	334.8	5.3
Mixed broadleaves	517.6	8.2	758.9	12.1
Scots pine	155.9	2.5	292.6	4.7
Lodgepole pine	178.3	2.8	148.1	2.4
Other conifers	148.4	2.4	171.4	2.7
Open	1416.8	22.6	1310.5	20.9
Felled	578.6	9.2	243.1	3.9

2.5 Access and roading 2020 – 2029

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 Departure from UKFS Guidelines

The LMP seeks to follow the UKFS guidelines in all requirements however due to the constraints on the felling coupe design such as the requirement to deal with over mature crops that are susceptible to windblow and the desire to make this a forest with a normal age structure it has not been possible to meet the adjacency guideline in all cases. However all efforts have been made to limit where this is the not the case and it is felt that the already diverse structure of the block makes this a very minor issue given the other issues affecting the forest.

2.7 Standards and guidance on which this LMP is based

This land management plan has been produced in accordance with a range of government and industry standards and guidance as well as recent research outputs. A list of these standards and guidance can be found here: https://scotland.forestry.gov.uk/managing/plans-and-strategies/land-management-plans/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-the-environment/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.

2.8 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
FS 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 2nd 5 year period	More than 15% of coupe area	More than 5 planting seasons after felling subject to the wider forest and habitat structure not being significantly compromised.	Change from specified native species. Change between species group.	As above depending on sensitivity.	More than 10% of coupe area. Colonisation of open areas agreed as critical.	More than 5 ha

3.0 EIA Screening Determination for forestry projects

3.1 Proposed deforestation

No deforestation is proposed within the LMP unless required to achieve UKFS guidelines or for the overriding benefit to the area. This would include riparian protection or the enhancement of habitats or biodiversity. The area of permanent open space increases modestly over this LMP period, predominantly around watercourse buffer zones as per requirements of the UK forest standards.

3.2 Proposed forest road works

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

3.3 Proposed forest quarries

There are proposals to increase the size of the quarry at Drumfergue (NJ 472 341) by 0.9ha and Cat Craigs (NJ 487 307) by 0.7ha. Screening opinion request form attached.

Prior to any operations the work plan process will be undertaken which includes pre-operational checks by our environment team.

Forestry Commission Scotland
Coimisean na Coillteachd Alba

Environmental Impact Assessment
Screening Opinion Request Form

Please complete this form to find out if you need consent from Forestry Commission Scotland, 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	☐				Forest roads	☐	
Deforestation	☐				Forest quarry	☒	1.6 (0.9 + 0.7)
Location of work	Drumfergue & Cat Craigs quarries, Clashindarroch						

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.

The expansion of two existing quarries to provide materials for forest road construction and maintenance.

Provide details on the existing land use and the environmental sensitivity of the area that is likely to be affected by the forestry project.

Drumfergue quarry - 0.9ha expansion - currently P52 HL crop
Cat Craigs quarry - 0.7ha expansion - currently P65 LP/SS crop
There are no environmental sensitivities to either of the areas.

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 no significant effects of the quarry extensions given their small size, the nature of the current land use and the size of the forest bock they form part of.

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Forestry Commission Scotland
Coimisean na Coillteorachd Alba

Environmental Impact Assessment
Screening Opinion Request Form

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.
Public consultation on LMP raised no issues or concerns.

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.
No significant effects expected.

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
Select...	
Select...	
Select...	
Select...	
Select...	

Property Details			
Property Name:	Clashindarroch		
Business Reference Number:	LMP 37	Main Location Code:	
Grid Reference: (e.g. NH 234 567)	NJ 472 341	Nearest town or locality:	Huntly
Local Authority:		Aberdeenshire	

Owner's Details			
Title:		Forename:	
Surname:			
Organisation:	Forest and Land Scotland	Position:	
Primary Contact Number:		Alternative Contact Number:	
Email:			

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Forestry Commission Scotland
Coimisean na Coillteachd Alba

Environmental Impact Assessment
Screening Opinion Request Form

Address:	East Region, Portsoy Rd, Huntly		
Postcode:	AB54 4SJ	Country:	Scotland
Is this the correspondence address?		Yes	

Agent's Details			
Title:	Mr	Forename:	Mark
Surname:	Reeve		
Organisation:	Forest and Land Scotland	Position:	Planning forester
Primary Contact Number:	07990 802879	Alternative Contact Number:	
Email:	mark.reeve@forestandland.gov.scot		
Address:	East Region, Portsoy Rd, Huntly		
Postcode:	AB54 4SJ	Country:	Scotland
Is this the correspondence address?		Yes	

Office Use Only	
GLS Ref number:	

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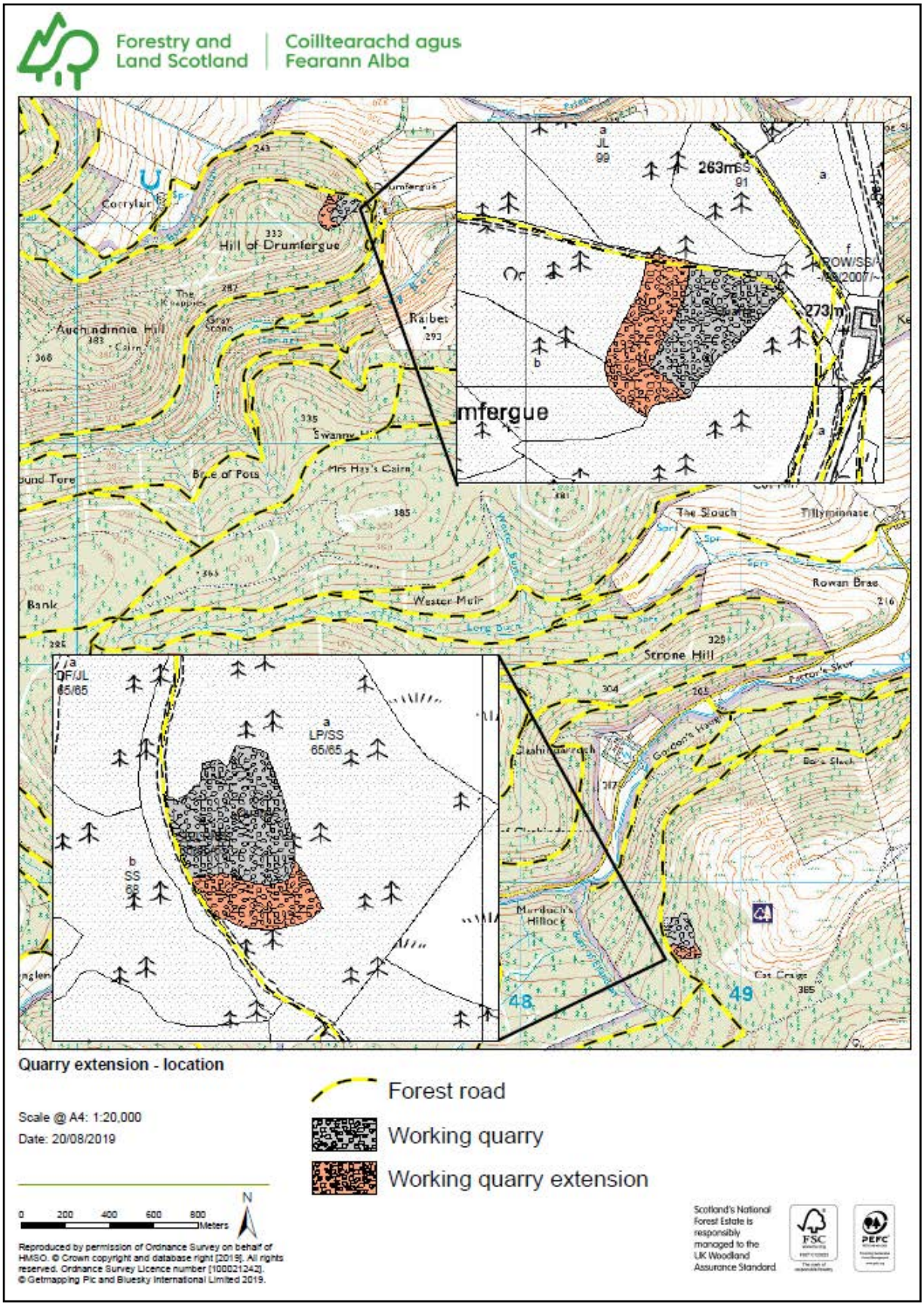
Forestry and Land Scotland
Coilltearachd agus Fearann Alba
Hill of Drumfergue
Auchindinnie Hill
Raibet
Bruce of Pots
Mrs Hay's Cairn
The Slouch
Tillyminnase
Rowan Brae
Wester Muir
Strone Hill
Murdoch's Hillock
Cat Craigs
263m
273m
DF/JL 65/65
LP/SS 65/65
SS 68
48
49
Quarry extension - location
Scale @ A4: 1:20,000
Date: 20/08/2019
Forest road
Working quarry
Working quarry extension
0 200 400 600 800 Meters
N
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Scotland's National Forest Estate is responsibly managed to the UK Woodland Assurance Standard
FSC
PEFC

3.4 Proposed afforestation

There is 126.1 ha of afforestation on previously unplanted land proposed in this LMP. This includes additional planting at Coynachie and planting of land previously under agriculture.

However these areas, Ittingstone and Mains of Lesmoire, were approved in previous plans and EIA determinations sort. This latest plan is simply bringing together several existing plans and so no additional EIA determinations are required.

3.5 Additional regulatory considerations

It should be noted that there is currently a planning application for a windfarm that includes part of the Clashindarroch forest block. At the time of writing the application is at the pre planning application stage. This LMP has been designed specifically to **not** take these proposals into account and concentrate on the most suitable management prescriptions for the block in its current form. Should the windfarm be consented all felling and infrastructure will be dealt with through the Planning Authorities process and the LMP amended as appropriate.

4.0 Introduction

Refer to Map 1: Location

4.1 Setting and context

Clashindarroch LMP area is located just south west of Huntly, Aberdeenshire. The A920, Huntly to Dufftown road, runs to the north of the plan area with the A97, Huntly to Strathdon, running along the eastern side and the A941, Rhynie to Dufftown, running to the south.

The plan area includes the main Clashindarroch block along with Brown hill and the Darroch Wids sites of Coynachie, Merdrum and Black Middens. In addition Ittingstone, Culdrain and Mains of Lesmore, all of which were recent acquisitions some of which are now newly planted, are subsumed into this plan.

Name	Area (ha)
Clashindarroch main block	5417.2
Coynachie	326.2
Merdrum	68.8
Black Middens	107.0
Ittinstone (including Tullochbeg starter farm)	218.2
Culdrain	76.7
Mains of Lesmore	65.2
Total	**6279.3**

4.2 History of the forest

The land for Clashindarroch was purchased by the Forestry Commission in the late 1920's. Afforestation progressed steadily through to the 1940's. In the late 1950's and 60's some of the higher hillsides and tops were also planted. In the 1980's this process was repeated with some forest areas being established at over 500m.

There was very little broadleaf woodland established within the block until 2003 when a substantial area of native broadleaf (400ha) started to be planted at three sites on the periphery of the forest. These sites, collectively

form Darroch Wids instigated under the auspices of the Scottish Forestry Alliance.

In 2011 a programme of new acquisitions around the main Clash block was started. This resulted in a further 272ha of agricultural land being purchase in three separate blocks. See section 1.1 for details. The primary objective for these areas is the planting of woodlands that will produce a high quality timber crop.

4.3 Land management objectives

The purpose and objectives for managing these blocks of woodland have been identified following a review of:

- The physical context and existing woodland;
- The land management objectives of other statutory bodies;
- The physical capability of the woodland;
- Interim Corporate Plan (https://forestryandland.gov.scot/what-we-do/plans-and-strategies/corporate-plan)

Analysis of the available information has led to the **primary objective** being the management of the woodland for the production of a sustainable quality crop of timber.

There are additional **secondary objectives** for the future management of the woodland in certain areas of the plan area. These include:

- The improvement of biodiversity potential in riparian corridors;
- The improvement of the forest habitat for European Protected Species (EPS) and other protected species present;
- The restoration of non-forest habitats;
- New woodland creation;
- The maintenance of existing recreational facilities.

These objectives are specific to certain areas of the plan. See Map 2 Plan objectives which shows where each secondary objective is relevant.

5.0 Analysis of previous plans

Since the last plan was approved three new areas of agricultural land have been purchased and are being amalgamated into this plan. However as the plans for these areas have only recently been approved and some are not yet planted there is no analysis of the objectives for these areas included in this table.

Since the last plans were approved policy themes have been updated, and as a consequence previous objectives can't be directly compared with the current aspirations for the National Forest Estate. The following table highlights the main priorities set out in the previous plans. It describes how and if those aims were met and what the proposed management intent is to carry these objectives forward in this plan.

Theme	Priority (in current approved plan)	Issue	Plan Objective	Progress to date **0 –** No progress in plan period **1** – Nominal progress **2** – Some progress **3** – Progress as per plan	Proposed action (in this plan)
Economic	**High**	Timber supply	Production remains a priority in this forest with further develop of LISS where appropriate.	**3** – The majority of the thinning and felling operations approved in previous plan have been completed.	This will continue to be the primary objective in the new plan.
Environmental	**Medium**	Structural diversity	Encourage diversity of tree height, age and species.	**3** – The majority of the thinning, felling and restock operations approved in previous plan have been completed.	This may be one of the outcomes of implementing the new plan but is not an objective in its own right.
		Species diversity	Where practical increase/retain existing proportions of Scots pine, Norway spruce, Larch and broadleaves for biodiversity.	**3 –** The current species percentage breakdown closely reflects the proposed breakdown in the previous plan.	This may be one of the outcomes of implementing the new plan but is not an objective in its own right.

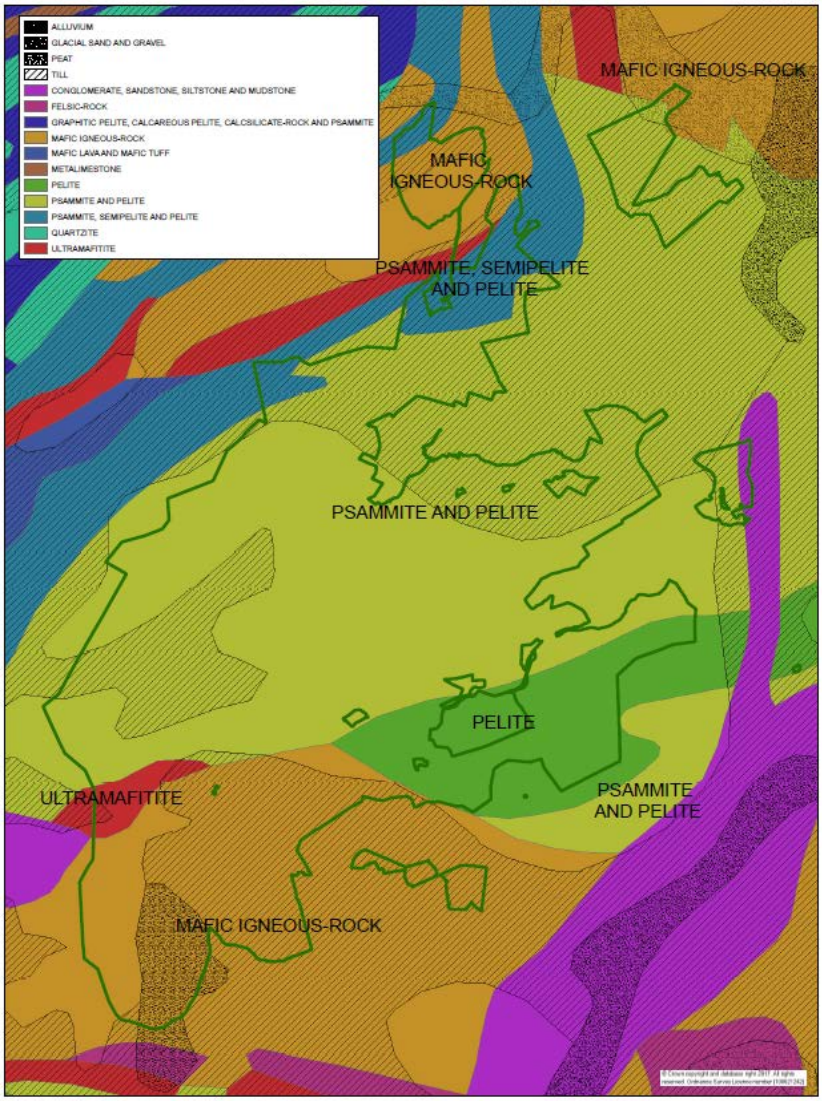
		Riparian zones	Prioritise riparian zones as main habitat corridors.	**2 –** Work in the riparian zones has been ongoing through the plan period.	This will continue to be an objective in the current plan.
		Open habitats	Seek opportunities to restore degraded non-forest habitats	**3** – The amount of open habitats has been increased through felling and not restocking as per the approved plan.	This will continue to be an objective in the current plan.
Social	**Low**	Recreation	Maintain and enhance existing recreational use, in particular equestrian and Nordic skiing.	**2 –** The Nordic ski areas have been successfully maintained with LISS where suitable. Other recreation infrastructure has been reduced to reflect the level of usage and resource availability.	Maintenance of the current recreation provision will be an objective in the new plan.

6.0 Background information

6.1 Physical site factors

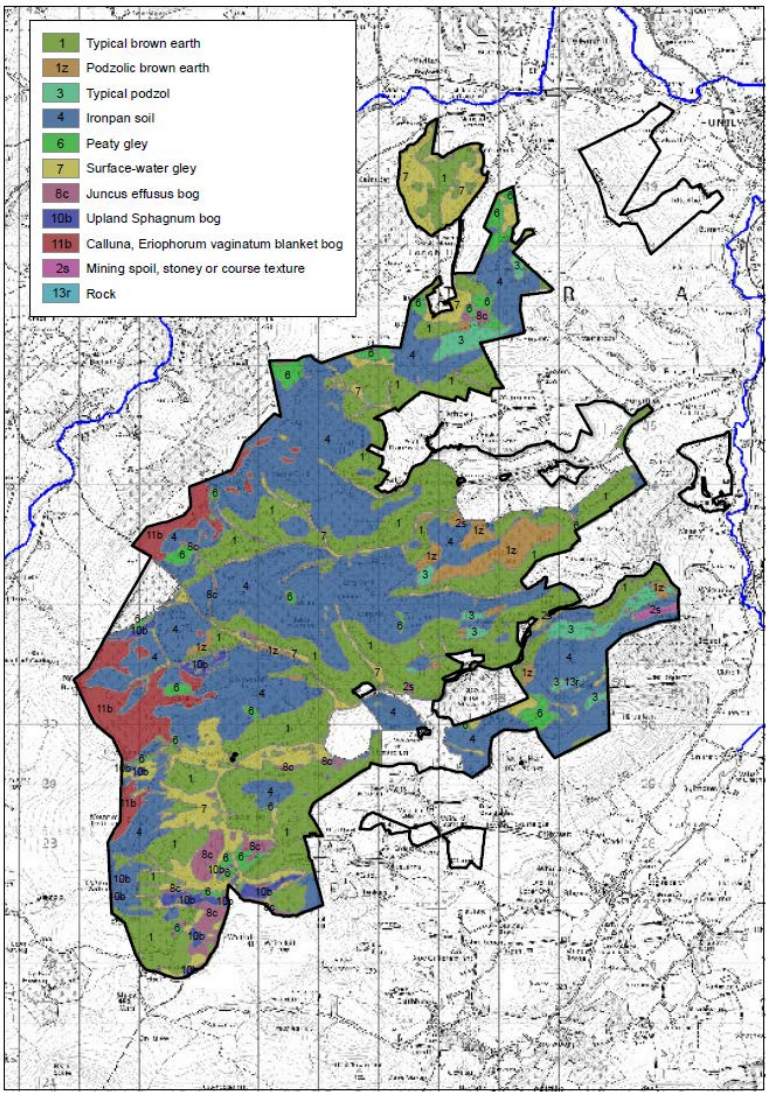
Refer to Map 4: Key Features.

6.1.1 Geology, Soils and Topography



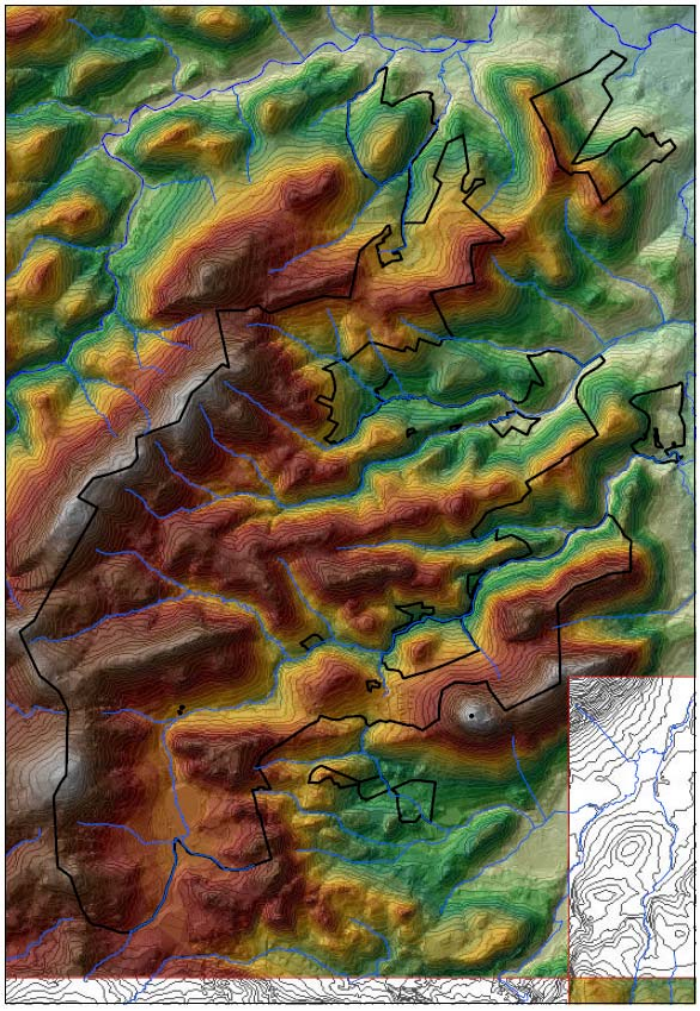
Geology - According to the British Geological Survey the majority of the plan area is underlain with various combinations of Psammite, Semipelite and Pelite (which are all sandstones of differing textures from course to fine). There are also smaller areas of Ultramafitite and Mafic igneous-rock (both with very low silica content but higher magnesium and iron content). These are overlain by a drift geology of mostly Diamicton till, which is a terrigenous (resulting from dry land erosion) sediment that is poorly sorted and contains particles ranging in size from clay to boulders, suspended in a matrix of mud or sand.

These geological conditions lead to soils with a medium to high levels of nitrogen available for tree growth.



Soils – The majority of the Clash block has typical brown earths and ironpan soils with smaller areas of other types (see table below). These soils have a wide range of moisture regimes from very wet through to moderately dry and nutrient regimes that run from very poor to medium. These factors influence the species of trees that will grow successfully in these woodlands. With such a range of conditions these blocks are able to support a wide range of different species.

FLS soil code	Soil type	Area (ha)	%age
1	Typical brown earth	1727	32
1z	Podzolic brown earth	149	3
3	Typical podzol	124	2
4	Ironpan soil	2146	40
6	Peaty gley	178	3
7	Surface-water gley	565	11
8c	Juncus effusus bog	121	2
10b	Upland sphagnum bog	75	1
11b	Calluna, Eriophorum vaginatum blanket bog	273	5
2s	Mining spoil	12	>1
13c	Rock	4	>1



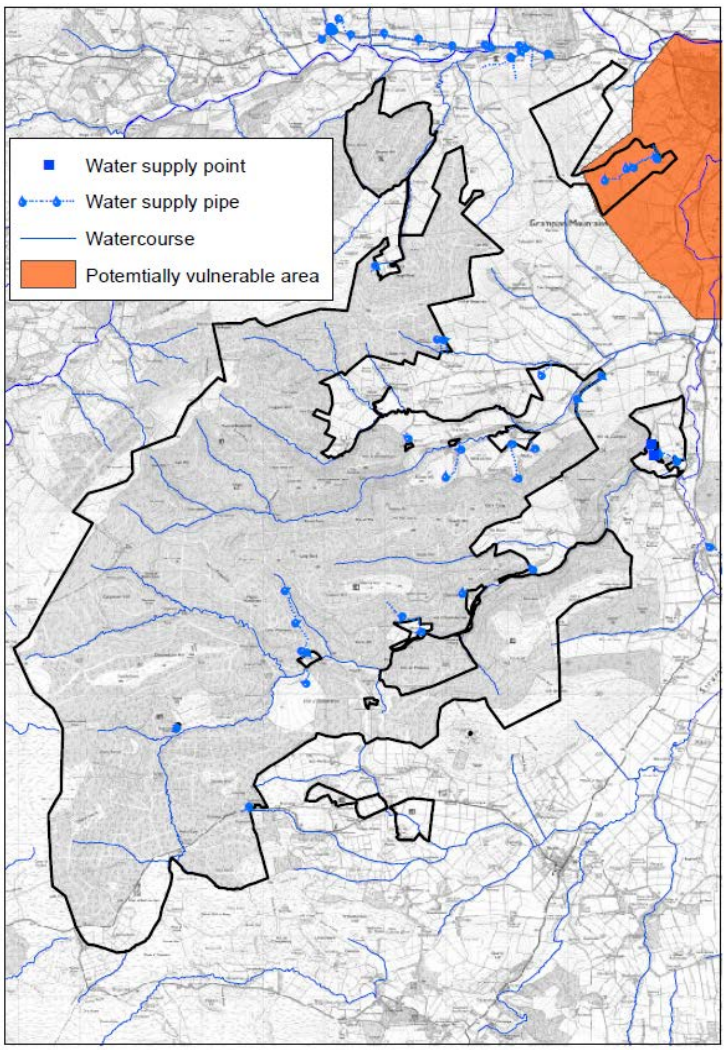
Topography - The elevation of the plan area runs from about 130m on the banks of the river Deveron at Ittingstone up to approx. 520m at the top of the Hill of Noth. The block runs over a number of watercourse valleys giving the block the full range of elevations and aspects.

6.1.2 Water

All the woodlands that make up the Clashindarroch land management plan are within the River Deveron major catchment.

Additionally there are a number of private water supplies that are supplied from within the woodland area. All these will be protected during any operations by following the UK forest standard guidelines for forests and water as a minimum.

According to the SEPA website there is a Potentially Vulnerable Areas (PVA) to flooding. This is PVA 06/10 Huntly. The main flood risk is associated with the river Deveron on the Meadows area in the north of Huntly. This coincides with the floodplain of the Deveron and the Meadow Burn. The vast majority of the



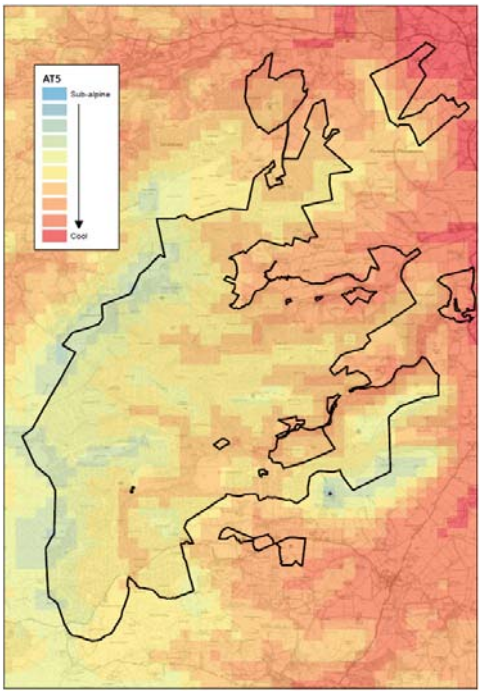
watercourses emanating from Clashindarroch forest feed into the river Bogie which feeds into the Deveron downstream of the vulnerable site so will have little impact. The PVA report does not highlight natural flood management studies or works as an action that will have a major impact on alleviating the flooding threat. However all forest operations will be undertaken in accordance with the forest and water guidelines to ensure no additional flooding risk is created. If opportunities present themselves to undertake work to help alleviate flood risks during the course of operations these will be discussed with the relevant flood management authority and undertaken if appropriate.

6.1.3 Climate

The climate data for the design plan area is obtained from the Ecological Site Classification system (ESC).

The results of interrogating this system gave the following data.

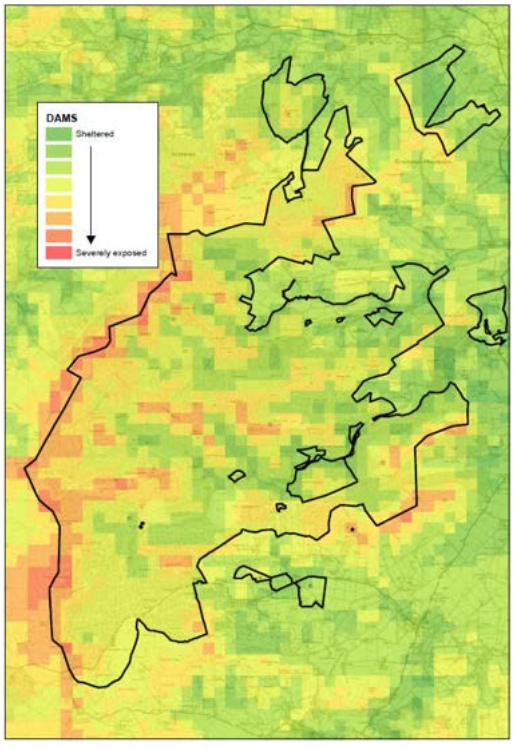
AT5	DAMS	MD
669 - 1133	7 - 20	13 - 115
sub alpine - cool	sheltered – severely exposed	wet - moist

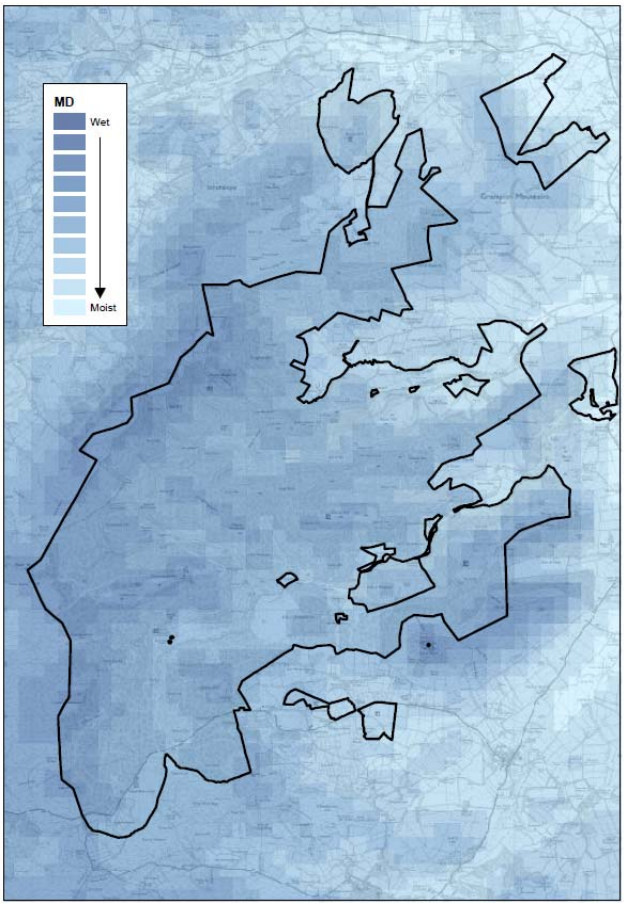


AT5 (Accumulated Temperature) is the accumulated total of the day-degrees above the growth threshold temperature of 5º, which provides a convenient measure of summer warmth. The results for AT5 place nearly all these blocks in the "cool" zone.

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

The range of DAMS is from 3 to 36 and windiness is the most likely limiting factor to tree growth at higher elevations in Britain. Clashindarroch varies from sheltered to severely exposed so windblow is likely to be a factor that needs to be considered in its management.





MD is the Moisture Deficit for the area. Moisture deficit reflects the balance between potential evaporation and rainfall and therefore emphasises the dryness of the growing season (rather than the wetness of the winter or whole year). These results place the blocks mostly in the wet zone.

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

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

6.2 Biodiversity and environmental designations

See Map 3 Biodiversity and environmental areas

6.2.1 Designated Sites

(See Appendix 7)

Site of Special Scientific Interest (SSSI) / Special Area of Conservation (SAC)

Hill of Towanreef SSSI is located at the southern end of Clashindarroch. This is a large designated area (1885.9ha) that extends beyond the boundary with only 18ha on the national forest estate.

The site has several notified natural features:

Geological	Igneous Petrology	Caledonian Igneous
Biological	Upland habitats	Upland assemblage
		Calaminarian grassland & serpentine heath
	Vascular plants	Vascular plant assemblage
		Marsh saxifrage Saxifraga hirculus

This SSSI is also designated a SAC for the European habitats and species listed below.

Habitats: Grasslands on soils rich in heavy metals
Dry heaths
Alpine and subalpine heaths
Blanket bog
Juniper on heaths or calcareous grasslands
Species: Marsh saxifrage *Saxifraga hirculus*

The designated area on the national forest estate is at Meikle Turf Hill. This area consists of heath habitats that support a wide range of vascular plants including the nationally scarce intermediate wintergreen.

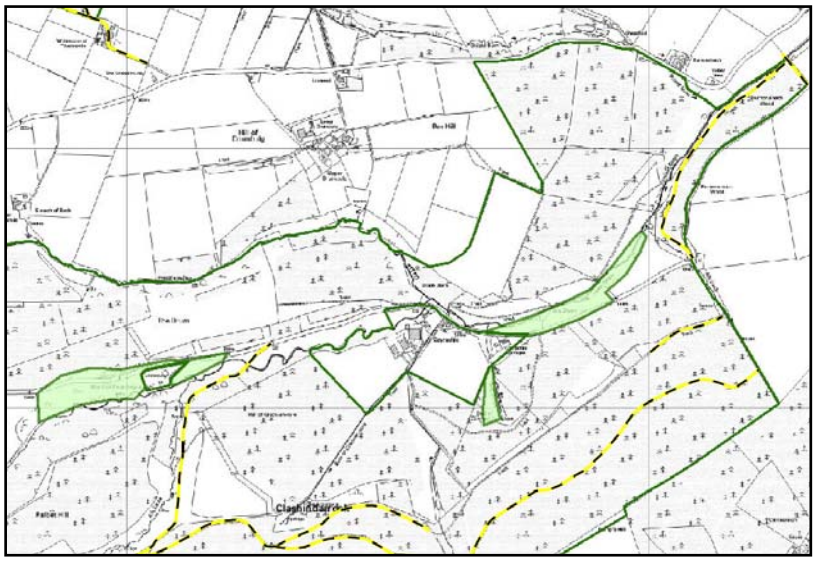
The extent of juniper scrub is an important feature of the site and needs to be maintained. The Scots pine trees on the Hill of Towanreef could spread from the juniper scrub to the detriment of the adjacent moorland habitats.
The broom and gorse bushes that have already colonised the moorland as scattered bushes should be removed before they spread any further, in particular on the Hill of Towanreef itself. The gorse here may protect the juniper from grazing but may also prevent it from regenerating.

The Craigs of Succoth SSSI also bounds the plan area towards the north of the block. This site is 220ha that have the two notified natural features below:

Biological	Upland habitats	Calaminarian grassland and serpentine heath
		Subalpine flushes

There is a risk of exotic conifers seeding onto the site, as the majority of the site is surrounded by non-native conifer plantations.

Ancient semi natural woodland (ASNW)



There are three areas of ASNW within Coynachie. (See map to left) These were monitored in 2016. There are opportunities to enhance these sites through enrichment planting and expansion into adjacent open ground.

Plantation on ancient woodland site (PAWS)

There are four PAWS sites within Clashindarroch. (See map 3) These have all been monitored and are in a stable condition. The aim is to gradually restore all four sites to native woodland.

6.2.2 Native woodland

Darroch woods

The Darroch Woods comprise three distinct new native woodland plantings at Coynachie, Merdrum and Blackmiddens. They were established between 2003 and 2006 through a BP funded Scottish Forestry Alliance (SFA) project. Sustainable Forestry - Scottish Charitable Incorporated Organisation (SF-SCIO) is the successor project to the SFA.

These woodlands were established with the key aims of locking in carbon, enhancing biodiversity and encouraging natural processes within these broadleaf woodlands. These three sites are now offering structural diversity and increased biodiversity to Clashindarroch with their matrix of open space and native broadleaves.

Coynachie – despite pressure from deer browsing, the components of these woodlands are predominately established although disease issues are affecting Ash and Juniper.

Merdrum – native woodland well-established

Blackmiddens – incorrect provenance selection has led to poor stocking resulting from tree deaths, particularly in the Birch and heavy deer browsing has held back palatable species such as Oak.

6.2.3 Priority Open Habitats

Upland and Montane Heaths - Along with blanket bog, these heaths comprise the largest open habitats in Clashindarroch. In matrix with blanket bog, they are found on the unplanted hilltops and forest edges. These moorland expanses and edges provide important habitat for woodland grouse, hen harriers, merlin and short eared owl, along with red grouse and other moorland species. Currently unmanaged, these priority habitats are currently threatened by tree regeneration.

Blanket Bog - As described above, blanket bog is found in matrix with upland heath on the edges of the plantation. There are also some areas of blanket bog that were planted when Clashindarroch was established. Some of these

areas have now been felled and are undergoing restoration where this is practical.

Upland Fen, Marsh and Swamp - There are sizeable areas of upland fen at Moss of Essie, Moss of Fuie and Moss of Bad-na-moin. At Moss of Essie, work has already been undertaken to maintain the fen clear of trees. Moss of Bad-na-moin is unplanted and clear of scrub whilst the fen at Moss of Fuie is becoming re-established following the removal of the conifer plantation in 2010. Tree regeneration remains an ongoing threat to this habitat.

Inland Rock and Scree - Although areas of rock and boulders are not uncommon throughout the plan area, they are generally small. There is a larger area of exposed rock at Cats Craigs that supports lichen and bryophyte assemblages.

Juniper - Craigs of Longley is a large area of juniper scrub, with other clumps of juniper found throughout the plan area.

Afforested Peat - Most areas of deep peat within Clashindarroch are open ground (heath, fen or bog). However, some areas were afforested. In line with FS Practice Guide: Deciding Future Management Options for Afforested Deep Peatland, these sites will be assessed to identify the most appropriate future management – conventional restock, peat edge woodland or restoration to open ground.

6.2.4 Priority Species

Juniper – At Craigs of Longley, there is a large area of W19 Juniper woodland and otherclumps of Juniper are recorded within the LMP area, including new planting areas within the Darroch Woods. Some bushes are showing signs of phytopthora austrocedri.

Water Vole - A survey for water vole was carried out in 2017 and were found to be present both in the south west of the block and at Coynachie in the north. The preferred habitat of wide fringes of dense rushes, grasses and sedges next to slower moving waterourses are in good condition with no tree cover at both these locations. Work is undertaken with the Deveron, Bogie and Isla Rivers Charitable Trust to monitor and remove American mink, an invasive non-native species, from the main watercourses in Clashindarroch forest.

Scottish Wildcat - Clashindarroch is within the Strathbogie wildcat conservation area and they are known to be present within forest. FLS is working with Scottish Wildcat Action to survey and monitor the population, improve habitat, provide artificial dens and ensure they are considered fully during the workplan process.

Black Grouse - Recent monitoring results show black grouse are present in the south and west of Clashindarroch with birds being recorded on the national forest estate at Blackmiddens, Meikle Turf Hill and Black Hill. A large lek exists adjacent to the NFE at Silverford, to the south of Blackmiddens. Recent work to block ditches, restore bog and fen adjacent to areas of open broadleaf woodland has increased the habitat suitability for this species.

Red Squirrel - Areas of Clashindarroch are important for red squirrel, particularly mature, thinned stands of larch, Scots pine and Norway spruce. The workplan process ensures that a survey is carried out prior to all operations. The population size is assessed and any mitigation measures required are put in place.

Other Species - A number of other sensitive plants, birds and mammals are located within the LMP and surrounding area. The term 'sensitive' refers to species that are vulnerable to persecution or over-exploitation.

Notable bird species include goshawk, hen harrier, merlin, sparrowhawk, buzzard, short-eared and barn owls and kestrel.

Pine marten have also been recorded. Otter are present on a number of watercourses throughout the LMP area including the Kirkney Water.

The district maintains a database of all known species (flora and fauna) in the forest, made up from sightings and previous surveys. In addition FLS has access to public biological records and datasets from both statutory conservation bodies and NGO's such as the Botanical Society of the British Isles. These records and sightings are used along with pre-operational site checks to ensure mitigation or habitat improvement is written into the regions work plans and budgets. Where necessary, operations can be scheduled to take place outside the relevant breeding season or, in the case of protected species, carried out under licence conditions from SNH.

6.2.5 Water Environment

Kirkney Water and Lag Burn
These two watercourses are part of the River Deveron catchment and are both classed as being in moderate ecological status. Pressures on these burns are modified banks due to forestry planting. Previous work undertaken to improve their status has included clearfelling and creation of riparian buffers. This will continue to be a theme in this plan, to ensure the ongoing improvement in condition of these key watercourses and their major tributaries.

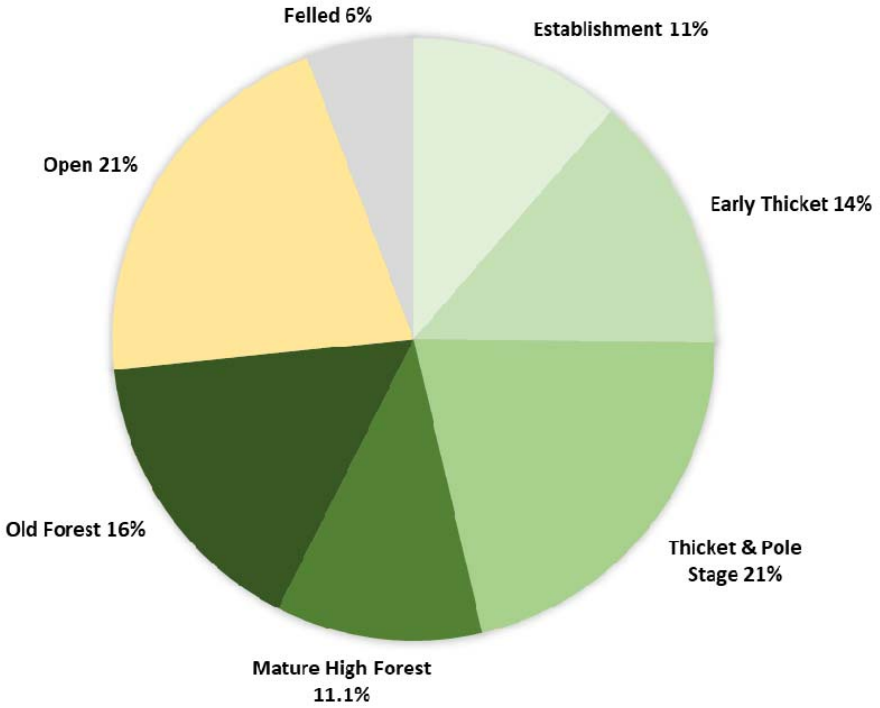
6.3 The existing forest

6.3.1 Age structure, species and yield class

Age Structure
As can be seen from the following table and chart the spread of age classes across the plan area is reasonably even. The current high percentage of felled ground is due to the felling undertaken to facilitate the construction of the windfarm. This area is currently in programme to be restocked in the next two years.

The area of open ground within the blocks is above the guideline of 10% and therefore we are not seeking opportunities to increase this further. However if there are areas where additional planting can be undertaken without compromising the plan objectives these will be considered as part of this plan.

Ages of Trees (years)	Successional Stage	Area (ha)	%
0 -10	Establishment	714.3	11.4
11 – 20	Early Thicket	865.1	13.8
21 – 40	Thicket & Pole Stage	1330.7	21.2
41 – 60	Mature High Forest	695.4	11.1
61+	Old Forest	1003.2	16.0
	Open	1307.6	20.8
	Felled	362.1	5.8

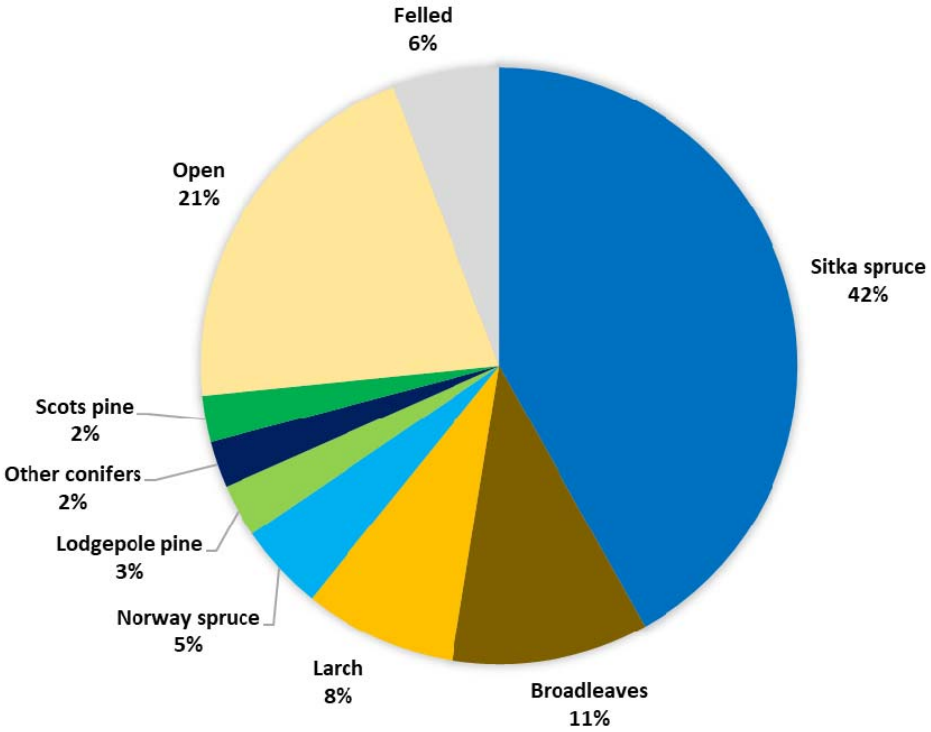


Species

Sitka spruce makes up the largest components of the forest area but is still less than 40% of the forest area. Broadleaves are reasonably well represented with 8 % of the area. This figure will increase as the woodland creation sites are planted during the period of this plan.

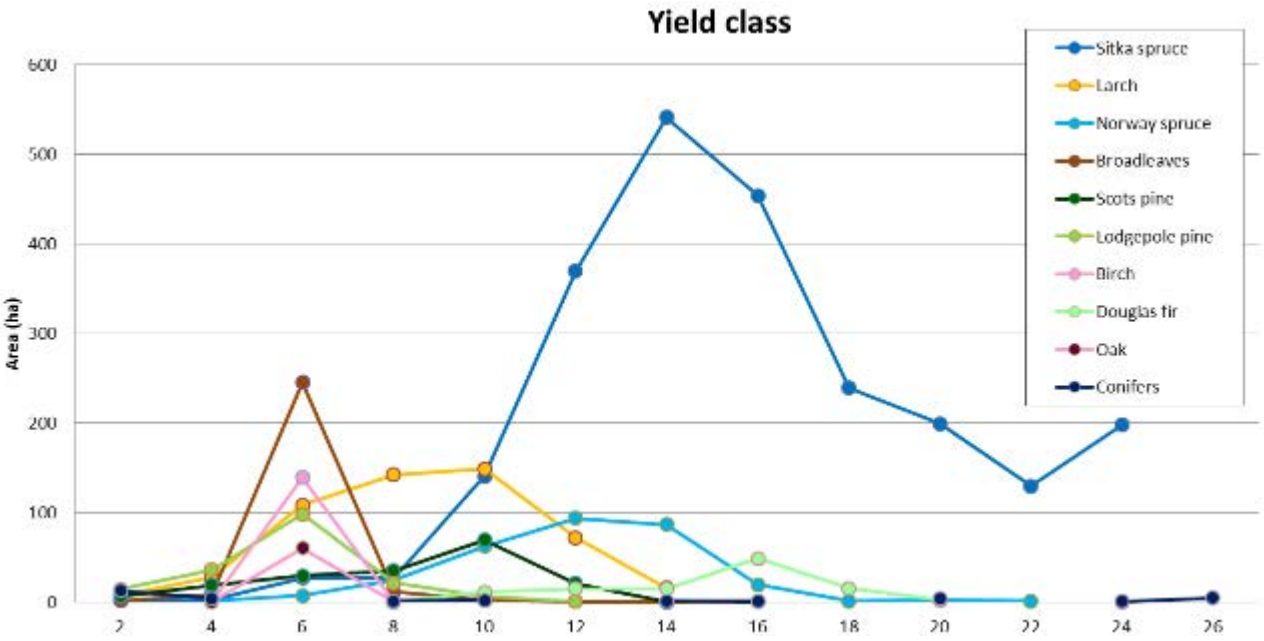
The Shannon index for the plan area is currently 1.87 which puts it in the "very good" category. The 42% cover of the dominant tree species (SS) also puts it in the "very good" category. Therefore the aim of this plan will be to retain the current level of species diversity while ensuring the productivity of the forest is also maintained.

Species	Area (ha)	%
Sitka spruce	2629.5	41.9
Broadleaves	669.0	10.7
Larch	519.1	8.3
Norway spruce	294.8	4.7
Lodgepole pine	180.2	2.9
Other conifers	158.1	2.5
Scots pine	158.1	2.5
Open	1307.6	20.8
Felled	362.1	5.8



Yield Class

The yield classes for all species are around what would be expected given the climate and soil types within the forest. The average yield class of Larch is 10 with Norway spruce at 12 and Sitka spruce at 14.



6.3.2 Access

Access both to and within much of the plan area is good. The A97 runs through the plan area towards the east of the block while the A920 runs across the north end of the block. Both roads are connected to the forest road network by several minor roads that are agreed transport routes (http://www.timbertransportforum.org.uk).

The forest road network is adequate and well maintained.

6.3.3 LISS potential

Currently 966ha or 16% of the plan has been designated for LISS management.

These are defined as '… silvicultural systems whereby the forest canopy is maintained at one or more levels without clear felling.' This means there will be no felling areas larger than 2 ha.

The potential for LISS is based on the wind hazard class of the crop, the soil nutrient regime, the suitability of the species to the site and the past management of the crop, has it been sufficiently thinned.

All areas of LISS will be assessed and if it is clear that this is not the best system to use to achieve the objectives of the coupe then it will be changed to clearfell.

6.3.4 Current and potential markets

The current breakdown of the timber being harvested from this design plan area across the range of sites, species and ages is shown in the table below.

Material	End product	Percentage
Small/Short roundwood	Chip board, Orientated strand board (OSB), Paper, Fuelwood	35%
Fencing	Posts & rails	5%
Short log	Pallets & slats	20%
Log	Construction	40%

Most of this production is sold into markets in the north east of Scotland as part of long term contracts. The majority of the logs, short logs and fencing goes to James Jones, BSW, Tullochs or Cordiners. The remainder goes to smaller local sawmills. The bulk of the short roundwood goes to Norboard at Dalcross for the production of orientated strand board (OSB).

6.4 Landscape and Land Use

6.4.1 Landscape character and value

Clashindarroch is on the eastern edge of an Area of Great Landscape Value, which stretches away to the north and west over the Deveron Valley.
The design plan falls within the area covered by the Scottish Natural Heritage Review No102, South and Central Aberdeenshire: Landscape Character Assessment, produced in 1998. Clashindarroch falls into the "Moorland Plateau" Landscape Character Type. The predominant landscape of Moorland Plateaux is essentially 'Highland' in character with heather clad windswept moors, mountainous exposure and, often, a thick mantle of coniferous plantation.
Clashindarroch is part of the 'Grampian Outliers,' which is one of two landscape areas, which make up the Moorland Plateaux character type. The Landscape Character Assessment lays out guidance for land managers in order to achieve the following aims:

- To increase diversity of landcover
- To conserve the distinct moorland edge.
- To preserve and extend moorland area.

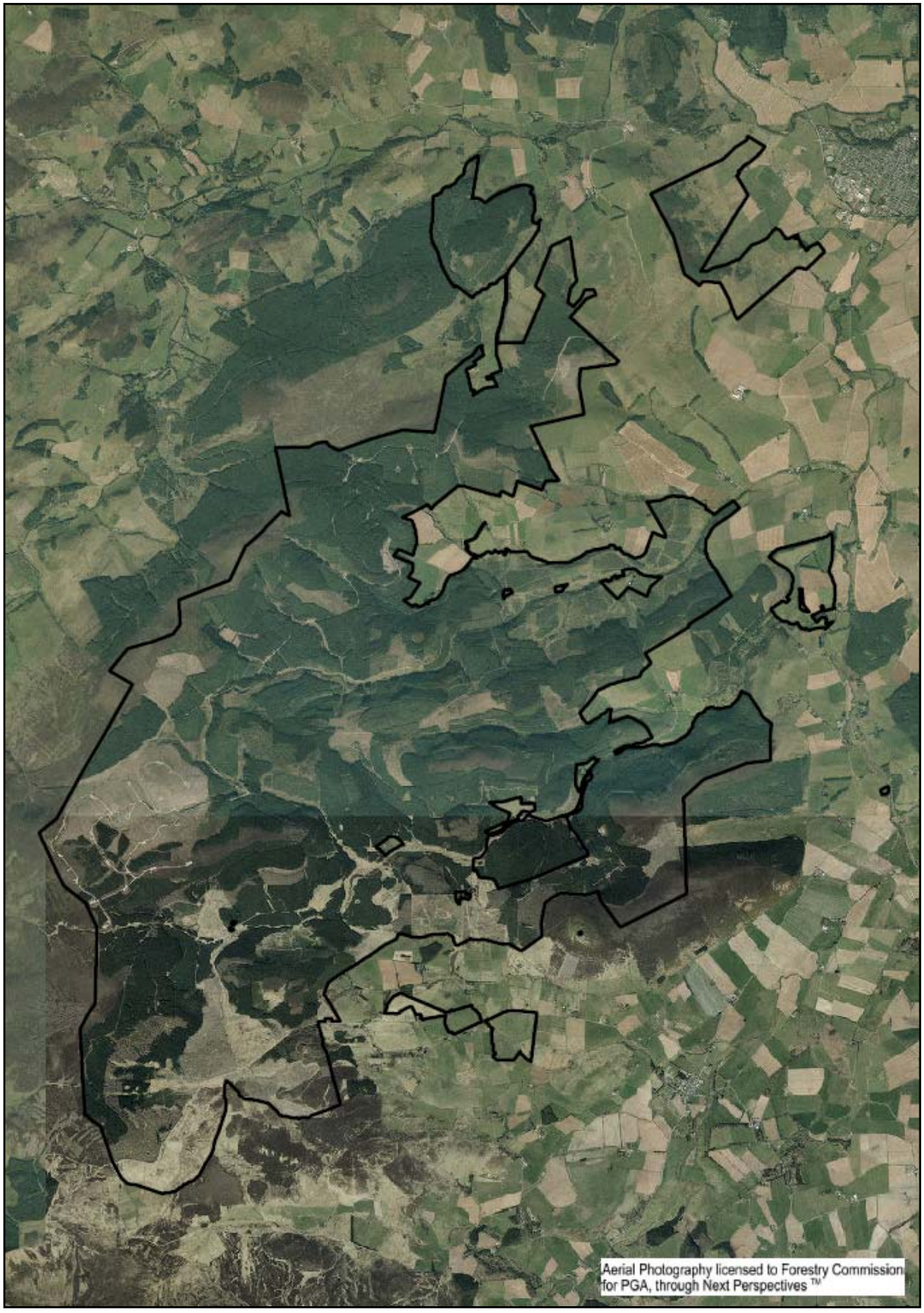
Where appropriate, and where it does not conflict with FLS policy, the guidelines contained in the Landscape Character Assessment will be followed.

6.4.2 Visibility

Despite its size, the forest is not particularly visible from the surrounding villages, towns and main communication routes. The exception is from the A941 Rhynie to Dufftown road which passes along the southern boundary of the forest in the Cabrach area. Extensive views of the forest can be seen from Tap O'Noth, a prominent summit on the south-east boundary of the forest. However this is not a heavily visited site and most views are limited range from within the forest.

6.4.3 Neighbouring land use

Land use around Clashindarroch is mostly mixed agricultural land with privately owned woodland along the eastern and southern boundaries. While it is moorland with some privately owned woodland along the remainder of the boundary.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6.5 Social factors

6.5.1 Recreation

Although relatively close to Huntly and the A96 Clashindarroch does not attract a large number, or wide range, of recreational visits. Access from the A96 is via the A97, A941 and several unclassified single track roads. This serves to increase the sense of remoteness, which many associate with the forest and this, along with its large size, limits visits from larger numbers of potential users.

The Darroch Wids project has allowed the opportunity for some way-marked trails through the newly established native woodland around Coynachie and although popular these do not take walkers into the wider forest.

There are a number of local people who use the forest informally to walk, cycle and exercise dogs but the biggest user groups, in terms of organised recreation, are horse riders and cross country skiers.

Most horse riding in the forest is linked to Corrylair stables, which lies adjacent, and has direct access to, the forest.

Due to its altitude and aspect Clashindarroch can receive substantial falls of snow, especially in the south of the block, most of which lies above 350m. The presence of the conifer crops helps retain this snow for some time making the area suitable for cross-country skiing. In partnership with Huntly Nordic Ski Club the forest district has waymarked a network of ski trails in this area which are 'groomed' by the club to provide a nationally important winter recreational resource which is used by recreational skiers as well as a training area for the UK Junior Development Squad. Its importance is further

supported by the presence in Huntly of the Nordic and Outdoor Centre, a facility run by Aberdeenshire Council. The centre is equipped with artificial ski trails, hires equipment and provides ski lessons for school groups and the public.

6.5.2 Community

Community interaction in Clashindarroch is fairly low currently. There was more in the past as part of the Darroch wids project but this has since tailed off.

The Huntly Nordic ski club have a vehicle access permission to groom the trails to improve them for cross country skiing during the winter season. They also organise about five skiing events each year, provided the snow conditions allow.

When we announced that we intended to reduce the number of waymarked trails at Coynachie we received a number of objections. We ended up working with the Gartly Community Association to reach a final solution.

6.5.3 Heritage

There are three Scheduled Monuments, (SMs), within the forest:

Wormy Hillock – The monument is a small ritual enclosure (or henge) dating from the late neolithic period, the late 3rd millennium BC. The monument measures about 21m in diameter over an earthen bank surrounding a ditch and a central platform. The bank measures about 3m in thickness and up to 1.25m in height; the internal ditch is c. 22.5m wide and c. 2-2.75m deep; and the central platform measures c. 6m in diameter. There is an entrance through the ditch and bank at the SE. wormy Hillock is a rare and unusually well-preserved northern example of a small henge monument and, as such, may be expected to contain extremely important and potentiall vulnerable archaeological deposits. The monument is set within a clearing and is currently free from trees and scrub.

Gallows Hill – The monument comprises a burial mound that lies in a stony, semi-improved pasture on the NE flank of The Peirk, 460m SSE of Mains of Lesmoir. The mound is made of earth and stone, and measures 20m in diameter and approximately 2m in height. Gallows Hill is said to have been erected as the place of execution for criminals condemned by the feudal lords - the Gordons of Lesmoir. The name and tradition are still known locally, but

the size and regular shape suggest that it was burial cairn utilized as a gallows mound.
An excavation on its S side, approximately 5m in diameter and 1m in depth, and a smaller shelf on its NW side may be the result of quarrying. The cairn, which is composed of earth and stone, is being eroded currently by the burrowing of rabbits.

Tap O'Noth – Only part of the monument is on the National Forest Estate and extends to an area of less than 0.5 Ha located at the northern boundary of the fort, the site of a fire look-out point , now dismantled and removed.

There are a wide range of unscheduled sites across the forest, some of which have been known of for some time and others discovered more recently through pre-operation site checks and surveys carried out by a local archaeologist.

A check of both internal records and the SMR has been undertaken to establish the location of these features. The details of these will be included in the work plan that is drawn up for every operation carried out within the plan area

6.6 Pathogens and diseases

The upsurge in the disease threat over the last decade has a range of causes linked to globalization and associated climate change. Disease risk management has always been an integral part of forestry management; however the pace of recent events has created a great deal of uncertainty. While specific outcomes for species are hard to predict, the general principles for creating resilient forests are well known, and these include such actions as maintaining diversity in all its forms.

Given the dynamic nature of the disease threat it is proposed to focus on maintaining the current diversity of species and age structure within the forest during the plan period and thinning to promote tree vigour and adjust microclimate.

6.6.1 Hylobius

Hylobius can cause extensive feeding damage to young trees used to restock clearfell sites but damage is often highly variable. Previously it has not been possible to predict damage and so insecticides have been routinely used to protect the trees to try to safeguard the young crop. However on clearfells where Hylobius numbers are low this treatment may be unnecessary and conversely when numbers are very high the treatment may be unable to protect the trees. Both of these situations result in losses in valuable resources.

6.6.2 Dothistroma needle blight (DNB)

Dothistroma needle blight is a fungal pathogen affecting the woods within East region of FLS. It is present within Clashindarroch but at a very low level currently.

Dothistroma needle blight is an economically important disease affecting a number of coniferous trees, pines in particular. The disease has a world-wide distribution but until recently was mainly of concern in the southern hemisphere. In much of the world, including Britain, it is caused by the fungus Dothistroma septosporum. Dothistroma needle blight causes premature needle defoliation, which results in the loss of timber yield and, in severe cases, tree mortality. Since the late 1990s the incidence of the disease has increased

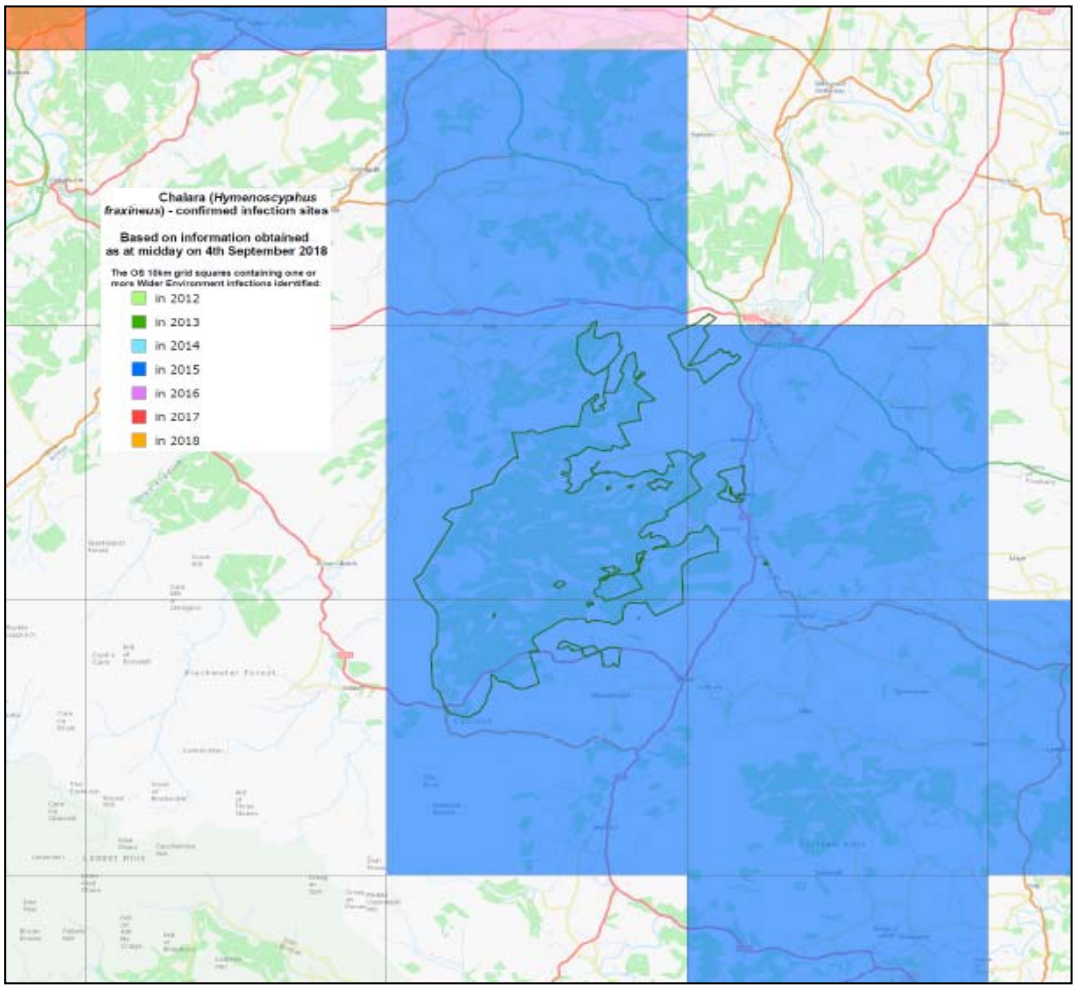
dramatically in Britain, particularly on Corsican pine. More recently the disease has caused significant damage and death to Lodgepole pine and Scots pine. Due to the extent and severity of the disease there is now a five-year moratorium on the planting of Corsican Pine on the national forest estate.

The reasons for the increase in the incidence of this disease are unclear but could be due to increased rainfall in spring and summer, coupled with a trend towards warmer springs, optimising conditions for spore dispersal and infection. Such conditions may become more prevalent in Britain over the next 20 years if current trends in climate change continue. On the national forest estate disease management is currently focused on silvicultural measures to reduce inoculum loads and the use of alternative, less susceptible species in future rotations.

It is not a major issue within the plan area at present. Currently the low levels of infection are not having a significantly impact on the forest structure. We will continue to monitor the situation and keep up to date with the latest research and implement the guidelines produced.

6.6.3 Hymenoscyphus fraxineus (previously Chalara fraxinea)

Ash dieback is an aggressive fungal disease and is caused by Hymenoscyphus fraxineus (previously Chalara fraxinea). The disease causes leaf loss and crown dieback in affected trees, and usually leads to tree death. Ash trees suffering with the infection have been found widely across Europe since trees believed to have been infected with this newly identified pathogen were reported dying in large numbers in Poland in 1992. These have included forest trees, trees in urban areas such as parks and gardens, and also young trees in nurseries. The map below shows the confirmed infection sites based on the OS 10km grid squares and is based on information current as of 4 September 2018.



6.6.4 Phytophthora ramorum

P. ramorum is a fungus-like plant pathogen which attacks a wide range of tree and shrub species. It was first found in nursery stock in Scotland in 2002 and in an established garden in September 2007. It was first detected on Japanese larch in south west England in 2009 and in Scotland late in 2010.

Although European and hybrid larch are also susceptible to P. ramorum, current evidence indicates that the impact of the disease is greatest on Japanese larch which can die within one to two seasons, with consequential economic, environmental and amenity impacts. The disease on larch showed a significant expansion in 2013 with a core area of some 5-6000 ha of larch within South West Scotland showing extensive signs of infection. Further, smaller and more sporadic infections have also been identified along the western seaboard of Scotland principally in the Argyll and Cowal areas. There have been isolated outbreaks in the north east of Scotland. The total infected area within Scotland is estimated to be now in excess of 6,500 ha.

7.0 Analysis and Concept

Refer to Map 6: Analysis and concept.

Theme	Analysis	Concept
Timber	Despite the predominance of soil with a poor or very poor nutrient regime a quality crop of timber is growing across much of the plan area.	Optimise thinning and felling to achieve a sustainable yield of quality timber over a longer rotation period.
Access & health	Formal recreation provision is focused on Nordic skiing and waymarked trails at Coynachie, but informal access is widely taken across the plan area.	Maintain the provision of recreation facilities at its current level and standard.
Environmental quality	There are areas of priority open habitats within the plan area.	Maintain the biodiversity value of the open habitats with appropriate management regimes and seek opportunities to increase their value where appropriate.
Environmental quality	There are several watercourses that run through the plan area.	Identify riparian zones around the more major watercourses that can be managed to provide linear connections between areas of biodiversity value, both native woodland and open habitats.
Environmental quality	There are areas of deep peat within the plan area.	Identify areas where restoration of deep peat areas is more appropriate than restocking with commercial conifers.
Environmental quality	There are several European Protected Species (EPS) and other protected species present in the plan area.	Improve the forest habitat to benefit EPS and other protected species.

8.0 Forest Design Plan Proposals

8.1 Management

Refer to Map 7: Management.

8.1.1 Thinning

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; and
- Thinning is unlikely to improve poorly stocked or poor quality crops.

The majority of Clashindarroch forest has a history of successful thinning. However there are some no thin areas due to wet ground conditions, mature crops with high windblow potential, crops are beyond their thinning window or the basal area of the crop is below threshold.

All the blocks are on a five year cycle due to their good growth rates.

All thinning decisions will be guided by Operational guidance Booklet No 9 'Managing thinning.'

8.1.2 Low Impact Silvicultural Systems (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 also helps 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.

While reviewing LISS coupes other factors are also taken into consideration:

- Does LISS meet the objectives for that area of the forest?
- Is there sufficient site suitability information available (soils, wind hazard data, thinning history)?
- What level of ground vegetation competition is there with any natural regeneration?
- Are the existing species suitability for the site?
- Is any advanced natural regeneration present?

In the plan area those stands selected for LISS management are those that are in the south of the block where recreation is a high priority. We want to retain tree cover to assist with the retention of snow cover in the winter to maintain the quality of the area for Nordic skiing.

Most of the crops in this are showing signs of natural regeneration or have the potential to do so. The main issue that needs to be addressed for successful regeneration is the ground cover of grass. Scots pine and larch do not regenerate well in these conditions so the grass mat will need to be broken up to expose mineral soil. This will either be undertaken during harvesting operations or shortly after.

A second issue will be the likely dominance of Sitka spruce as the main species to regenerate. This will need to be addressed during the establishment and thinning phases to ensure a stand of mixed species is created without the dominance of Sitka spruce.

Areas selected for LISS management are highlighted on the Management map. The general prescription for this area will be to manage it with a group shelterwood system as this is the best means of retaining a permanent tree cover without making the harvesting and establishment operations so expensive they can’t be sustained. Detailed prescriptions have been prepared for each area and can be seen in appendix 3. Each prescription will be included in the site management plan before any operation commences.

Restocking by natural regeneration will be the aim in these areas provided this will meet the plan objectives of producing a quality crop of timber. For this to be successful deer numbers will need to be controlled and a figure of 5 deer per 100ha is seen as the appropriate level.

All areas identified for restocking by natural regeneration will been recorded and programmed for inspection on a five yearly basis. At each inspection an assessment will be made to establish if the natural regeneration is, or is likely, to achieve the objectives for the site. 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 Conservancy woodland officer.

Enrichment planting will be used to ensure the target stocking density is reached if there is insufficient natural regeneration.

8.1.3 Clearfell

Ensuring a forest has a varied structure in terms of age, species and open space provides a range of benefits. It endows the forests with the resilience necessary to cope with emerging threats and changing climatic conditions, and will provide for flexibility in management options.

Structural diversity can be increased through phased felling and restocking to ensure that, over time, a varied woodland, including open space, develops. As part of this, some trees are retained as long-term forest cover to produce standing and fallen deadwood.

Open space is a key element of diversity within woodland. It can be used to develop permanent internal edges, structural diversity, and flexibility for operational management. Wildlife habitat can be enhanced by developing non-woodland elements, such as streams, ponds, roads, utility wayleaves and rides.

Many forests, particularly those established in the 20th century, were planted or felled and replanted over a short timescale and have little diversity. Felling and restocking presents the opportunity to restructure age classes and improves diversity. In even-aged woodlands, this may involve bringing forward felling in some areas and delaying felling and restocking in others. Following initial restructuring, further age class diversity can be introduced in subsequent rotations, especially where the nature of the forest site limited the initial scope.

In this plan we have tried to identify future felling boundaries as part of the long-term forest structure and manage compartment edges to increase stability and make use of permanent features such as watercourses and open space.

Felling and restocking can be used to address issues such as buffer areas, drainage systems, biodiversity habitats and forest landscape design.

Therefore felling followed by replanting will be the silvicultural system employed in the vast majority of the Clashindarroch plan area. The scale of clearfells will be in keeping with the scale and topography of the local landscape.

One of the aims of the plan is to move this block towards a structure where the various age classes have a roughly equal distribution. This allows the

periodic removal of produce that equals the growth increment, and can thus be continued indefinitely without endangering future yields.

Within Clashindarroch 3946ha are to be managed by felling and restocking with an average rotation length of 65 years. Therefore we can sustainably harvest 60ha per year, or 300ha per five year felling phase.

The felling coupes in this plan have been scheduled to remain below this sustainably cut in the long term. However individual years or phases my exceed this figure on occasions depending on the size of coupes planned for felling. Currently the restocking area is greater than would normally be expected due to the felling undertaken to accommodate the windfarm. This restocking will be completed in the first phase of plan period.

8.1.4 Natural reserves

Areas have been designate as a Natural Reserve (NR) where biodiversity is the primary objective and we are committing the area of land in question to minimum intervention management in perpetuity. The function of NRs is to provide a continuity of habitat to allow sedentary species to establish and thrive. NRs provide reservoirs of permanent habitat from which more mobile species can expand into adjacent managed forests.

NRs can be derived from semi-natural native woodland, planted native woodland and non-native plantations.

Within NRs, natural processes will normally predominate. Intervention should only take place to protect the NR or adjoining areas of forest. See "Natural Reserves – Guidance for their selection and management on the NFE in Scotland" for further information.

8.2 Future Species

Refer to Map 10: Future habitats and species.

8.2.1 Restocking

The restocking of felled areas is guided by the objective for the plan area which is the production of a sustainable crop of quality. In order to achieve

this conifers will be replanted at minimum of 2500 trees per hectare. While broadleaves will be planted at 1600 trees per hectare.

The actual species choice for restocking has been guided by the ESC results for this climatic area and soil types (see section 3.1). 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.

The aim of the restocking will be to maintain the current level of species diversity despite the fact that we are unable to include larch in the planting mix.

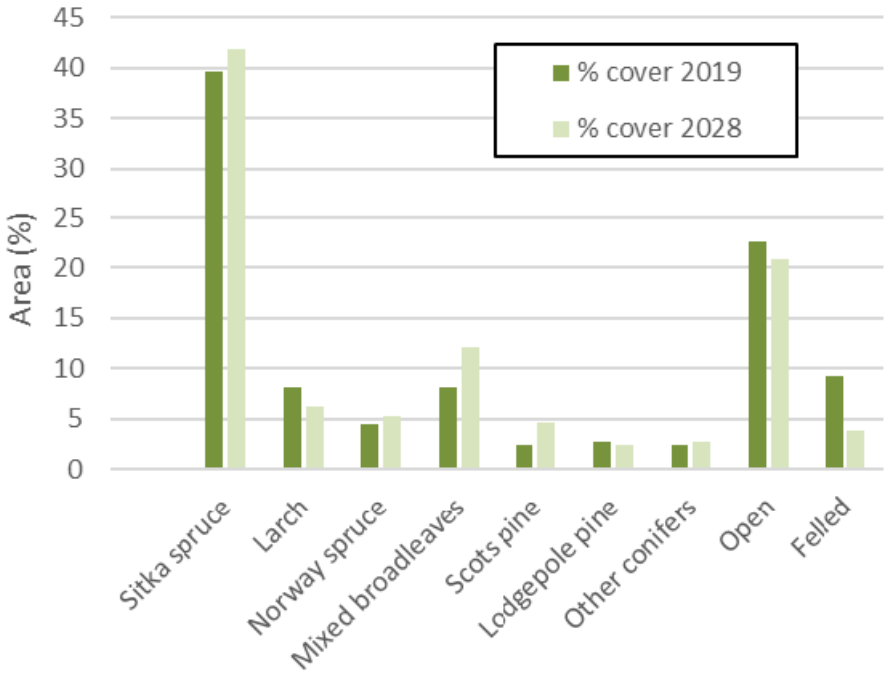
Restocking will be undertaken following preparation of the ground to receive the trees. The minimum ground preparation suitable for the site conditions and the species to be planted will be undertaken, ranging from no ground preparation through to ditch mounding, to minimise the level of soil disturbance and so minimise the impact on the soils carbon storage capacity.

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 (see section 8.8 pathogens – large pine weevil) will be applied and the minimum 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 and Darroch woods will use native broadleaves of local origin. Out with these areas native broadleaves of local origin 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 nursey is able to supply them in sufficient quantities. If appropriate site present themselves, i.e. good soils and low risk of Hylobius attack, then VPSS will be used, again if available. Over and above this only certified material will be used for species covered by the Forest Reproductive Material Regulations.

8.3 Species tables

Species	Current species (%)	Projected species 2028 (%)
Sitka spruce	39.6	41.9
Larch	8.2	6.2
Norway Spruce	4.5	5.3
Broadleaves	8.2	12.1
Scots pine	2.5	4.7
Lodgepole pine	2.8	2.4
Other conifers	2.4	2.7
Open	22.6	20.9
Felled	9.2	3.9

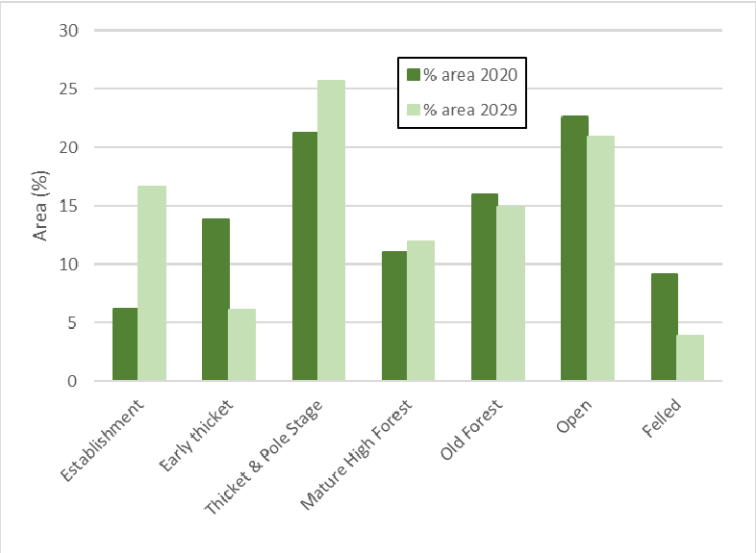


As can be seen from the figures above there is little change in the overall proportions of species across the plan area. There is a reduction in the area of larch as areas of mature larch are felled but as we are unable to replant like

for like due to the current moratorium on the planting of larch on the national forest estate we are unable to replace it. There is a reduction in open ground and felled areas as the new planting sites and the restock of the area felled for the windfarm are completed. This leads to an increase in broadleaves.

8.4 Age Structure

Age of Trees (years)	Succession Stage	Current Distribution 2020 (%)	Projected Distribution 2029 (%)
0 -10	Establishment	6.2	16.7
11 – 20	Early Thicket	13.8	6.1
21 – 40	Thicket & Pole Stage	21.2	25.7
41 – 60	Mature High Forest	11.1	11.9
61+	Old Forest	16.0	14.9
	Open	22.6	20.9
	Felled	9.2	3.9



The age structure across the plan period sees a large increase in the area of establishment stage forest. This is a reflection of the fact that the new planting sites and the restock of the area felled for the windfarm are completed. This leads to a reduction in open ground and felled areas. The area of the remaining successional stages remain fairly constant.

8.5 Management of Environmental Assets

8.5.1 Designated Sites

SSSI / SAC
See Appendix 7 which contains the details of the management of Hill of Towanreef SSSI/SAC.

ASNW
These woodlands will continue to be monitored with the next monitoring due in 2022. We will aim to reduce deer pressure on these areas. Native woodland expansion zones have been identified for open ground within Darroch Wids that will enhance connectivity. See recommendations in second report by Richard Thompson (FLS native woodland advisor) dated 15 October 2018 (Appendix 5) . The recommendations in the first report, dated 20 December 2017, will not be enacted. The moving topsoil with an excavator or bulldozer into mounds and ridges, creating hollows and flat areas in sub-soil and the subsequent planting of scrub species into the topsoil and sowing tall herb mixes into flat areas of sub-soil would be prohibitively expensive and run counter to FLS's policy of minimising any soil disturbance. Also the use of cattle grazing to diversify stand structure would be logistically very difficult and expensive due to the lack of a drinking water supply for livestock.

PAWS
Monitoring will continue across all PAWS sites to monitor for recruitment of native woodland, deer pressure and threats such as non-native regeneration and shading.

Burncruinach – this site was monitored in 2017 and although found to be developing towards W7/W9, there is a threat from spruce and red-berried elder regeneration. These will be felled to waste along with any other non-native species. However, Sycamore may be accepted as an alternative species to Ash due to the threat from chalara.

Dry Burn – this site was monitored in 2017 and has, from this, been split into 3 areas for management purposes with an additional 4th area identified for native woodland expansion to create more robust riparian woodland:

1. An area of mature Beech – during next thinning in 2024, the Beech will be heavily thinned to reduce the canopy and allow sufficient light to undertake the underplanting of sessile oak, birch and aspen to begin the gradual conversion to native upland oakwood.

2. Mature Norway spruce plantation – due to stability issues, this area will be clearfelled. The area will be fenced and planted with oak, aspen, birch and rowan with alder along the streamside.
3. Felled area – this area will be fenced and planted with oak, aspen, birch and rowan and with alder along the streamside.
4. New native woodland – this area will be monitored for non-native tree regeneration which will be removed

Tillyminnate – This area will be clearfelled, retaining the component of mature Beech to maintain an element of canopy in the streamsides where vegetation hotpots may prevail. Following this, the site will be restocked with sessile Oak, birch and aspen.

Brownhill – Grand fir was felled from this area in 2015. This site will be restocked within the lifespan of this plan with Sessile Oak, Hazel and Aspen, supplemented with natural regeneration of Birch to create W10/11 woodland.

8.5.2 Native Woodlands

Darroch Woods
These woodlands are helping to restore biodiversity to our land by building heathier ecosystems (in line with **2020 Challenge for Scotland's Biodiversity**). As this woodland develops there is an opportunity to develop a local biodiversity action partnership if the region and the community so wish. In 2020 forest research will research the area to see if the biodiversity of the woods has increased compared with original surveys that were undertaken before the woodland was planted. In addition the amount of carbon the woodland is locking up will also be assessed.

Towards the end of the LMP period there is potential to undertake formative pruning and thinning to improve the timber potential in parts of the wood plus some coppicing in parts - this work will have to be agreed beforehand with The Sustainable Forestry SCIO. Currently this work is not covered by the carbon code. By the time this work is required we expect that these operations will be added to the carbon code calculations. If this is not the case we will discuss the work with The Sustainable Forestry SCIO as the benefits of undertaking it are far greater than just the carbon credits involved.

Blackmiddens
In order to re-establish this woodland in this LMP we will erect a deer fence (marked to prevent black grouse collision) and replanted with downy birch, oak and other native broadleaved species.

Merdrum
This native woodland area will be expanded and planted with native trees to create W11 woodland on the north, west and down the Burn of Merdrum to join with Kirkney water. In the improved grassland areas we will stop grass cutting and plant mainly shrubs and occasional trees due to power lines.

Coynachie
The improved grassland areas will be left uncut and we will allow some areas to "re- wild". In addition we will plant pockets of shrubs with trees as per the recommendation from Richard Thomson our native woodland advisor (see appendix 5) so as to increase the biodiversity of the area and expand ancient semi natural woodland area. Previously felled areas will also be planted with native trees and shrubs as per the new planting areas.

8.5.3 Non-designated UKBAP Priority Open Habitats

Upland Heath – Monitoring has shown that the main threat to the heath within Clashindarroch forest is tree regeneration. This is predominately spruce, but locally also scots pine and larch. The district will monitor tree encroachment on other Upland Heath areas and this will be cleared as resources allow. No muirburn is planned for the heath within Clashindarroch. Upland heath will be re-established within the habitat management plan area of Clashindarroch windfarm.

Blanket Bog – similarly to the upland heath, areas of blanket bog are at risk from tree regeneration but adjacent forest operations could also potentially have an impact. Care will be taken during the planning of operations adjacent to areas of blanket bog to ensure that ground preparation, drainage and tree planting does not impact on the condition of this habitat. Tree regeneration will be monitored and removed as resources allow.

Existing areas of blanket bog will be enhanced by the restoration of further areas within the Clashindarroch windfarm area. Trees in these areas were felled during the construction phase of the Clashindarroch windfarm. To achieve re-wetting of the site, ground smoothing will be undertaken to remove the plough lines. Regional staff are working with Vattenfal and Natural Power

on the detail of the ground-smoothing and this will be carried out in 2020. The site will continue to be monitored and any subsequent tree regeneration removed as required.

Upland Fen, Marsh and Swamp
Moss of Essie – Tree regeneration was removed from this site in 2010 and will be monitored and removed during the lifespan of this plan
Moss of Fuie – the site will be monitored for tree regeneration and this will be removed as recourse allow.

Inland Rock and Scree
These pockets of habitat will be kept clear of trees.

8.5.4 Priority Species

Wildcat
The region will continue to work in partnership with SWA contributing to the survey and monitoring of wildcats in Clashindarroch. This will include:

- Work with Wildcru on GPS tagging and monitoring of wildcats.
- Plan operations and activities to minimise disturbance to wildcats in line with SF Guidance Note 35D and other relevant guidance, avoiding key wildcat habitat during the breeding season and carrying out pre-operational surveys ahead of all forest operations.
- Carry out prey surveys (Spring/Autumn).
- Create and monitor artificial dens utilising deadwood, windthrow, drystone dykes and boxes.
- Raise awareness of Scottish wildcats through joint-working, media and encouraging the reporting of sightings.
- Provide staff/contractor wildcat awareness training and provision of crib sheet.

Water Vole
Watercourses of suitable gradient and habitat were monitored in 2017. Priority streams are identified on Map 3. These streams are currently open and will be monitored for water vole presence and to assess habitat condition annually. Tree regeneration will be removed as required to maintain these as open. Pre-operations surveys will also include water vole checks where watercourses are affected.

Black Grouse
Peatland edge woodland (as per pages 11 & 12 of "Deciding future management options for afforested deep peatland" practice guide) will be created at Moss of Fuie, west of the Kirkney Water and on the windfarm site and this along with the development of the open bog areas and native woodland will enhance the habitat for this species.

Other Species
Pre-operations surveys are and will continue to be carried out in advance of all forest operations and activities. Mitigation is included at the work plan level in line with relevant policy and procedure.

8.5.5 Water Environment

The River Deveron catchment includes the major tributaries of the River Bogie, River Isla and Turriff Water. Within Clashindarroch, the Kirkney Water and Priests Water/Lag Burn are tributaries of the River Bogie. Both these watercourses are at moderate ecological status due to pressures from forestry. As a cycle one priority catchment, SEPA have a target of these achieving good condition by 2027. The previous plan delivered a number of clearfells which have removed dense conifers from streamsides with the streamsides being restocked with broadleaf woodland. Further clearfells along the Burn of Tillathrowie and its tributaries, Killin burn, Lag burn, Dry burn, Burn of Brockholes and Ealaiche burn have all been identified that will be felled in the plan period. All operations will be carried out in accordance with the Forest and Water guidelines. Buffer zones will be applied which will be open broadleaf woodland. We will work with the Deveron, Bogie and Isla Rivers Trust to monitor habitat quality and programme exotic conifer removal as resources permit. The establishment of riparian corridors and associated woodland along the many burns within the plan area will contribute to the improvement of the water quality.

8.5.6 Retentions

Within the LMP, areas have been identified as minimal intervention or long-term retention to increase diversity through the creation of areas of woodland where management will be minimal and the trees retained beyond their economic felling age.

In addition of retention the deadwood resource within the forest will be managed according to "Managing deadwood in forests and woodlands" FCS practice guide and "Deadwood management – summary guidance for FES staff".

8.5.7 Heritage

Our key priorities for archaeology and the historic environment are to undertake conservation management, condition monitoring and archaeological recording at significant historic assets; and to seek opportunities to work in partnership to help to deliver *Our Place in Time: the historic environment strategy for Scotland* (2014) and *Scotland's Archaeology Strategy* (2015). Significant archaeological sites will be protected and managed following the *UK Forestry Standard* (2017) and the SF policy document *Scotland's Woodlands and the Historic Environment* (2008). Harvesting coupes, access roads and fence lines will be surveyed prior to any work being undertaken in order to ensure that upstanding historic environment features can be marked and avoided. At establishment and restocking, work prescriptions remove relevant historic environment features from ground disturbing operations and replanting. Where appropriate, significant historic assets are recorded by archaeological measured survey, see active conservation management and may be presented to the public with interpretation panels and access paths. Opportunities to enhance the setting of important sites and landscapes will be considered on a case-by-case basis (such as the views to and from a significant designated site).

Gallow's Hill Cairn comprises a relatively well-preserved but visually unspectacular Bronze Age burial cairn. It is not prominent in the landscape nor appropriate for public presentation. Although it has a potential textual relationship with contemporary heritage features in the surrounding landscape (including the much-reduced stone circles of Nether Wheedlemont and Upper Ord 1km to the SE, and the cup marked boulder at Brawland 1km to the S), this wider landscape setting is fragmentary at best. Therefore no work to enhance its current setting are planned.

The *Regional Historic Asset Management Plan* includes conservation management intentions for designated historic assets on the National Forest Estate. Details of all known historic environment features are held within the *Forester Web Heritage Data* and included within work plans for specific

operations to ensure damage is avoided. Significant historic environment features will be depicted on all relevant operational maps.

Objective	Opportunities	Constraints	Concept
Caring for the Historic Environment	We will ensure positive conservation management at significant historic assets, undertaking scrub control, condition monitoring and archaeological recording where necessary.	We will undertake suitable work practices on operational sites with known historic assets (and those discovered during operations).	We will ensure that historic assets (both designated and un-designated) are included within our land management and operational plans and are managed in line with *UK Forestry Standard*.

Scheduled Archaeology

Wormy Hillock
Annual monitoring will continue to be undertaken. All scrub and tree regeneration will be removed as required to maintain the scheduled area and a 20m buffer as open ground. Within the lifespan of this plan, the buffer to the north east of the monument will be extended to 20m by felling the adjacent spruce trees. During any adjacent operations, the location of the scheduled area will be marked on site plans and no machinery will enter the scheduled area. An exclusion zone will be marked on the ground with tape ahead of any operation.

Gallows Hill
Annual monitoring will continue to be undertaken. New planting of native broadleaf woodland in adjacent fields is due within the lifespan of this plan. An open buffer of 20m will be maintained around the scheduled area (See Map 10 Future habitats and species). This scheduled area and buffer will be included within the fenceline for the site and will be a deer fence with rabbit netting. Rabbits will be controlled once this fence is in place.
Tap o' Noth

No management or monitoring required.

Unscheduled Archaeology

All known unscheduled monuments will be included in the work planning process and will be identified on site plans and marked on the ground to protect them during operations. During new planting/restocking, the appropriate buffer (in line with UK Forestry Standard guidelines) will be applied to sites.

8.6 Deer management

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

The strategy and Code of Practice takes 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 where this does not conflict with our primary objective of maintaining deer impacts at an acceptable level, in line with 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.

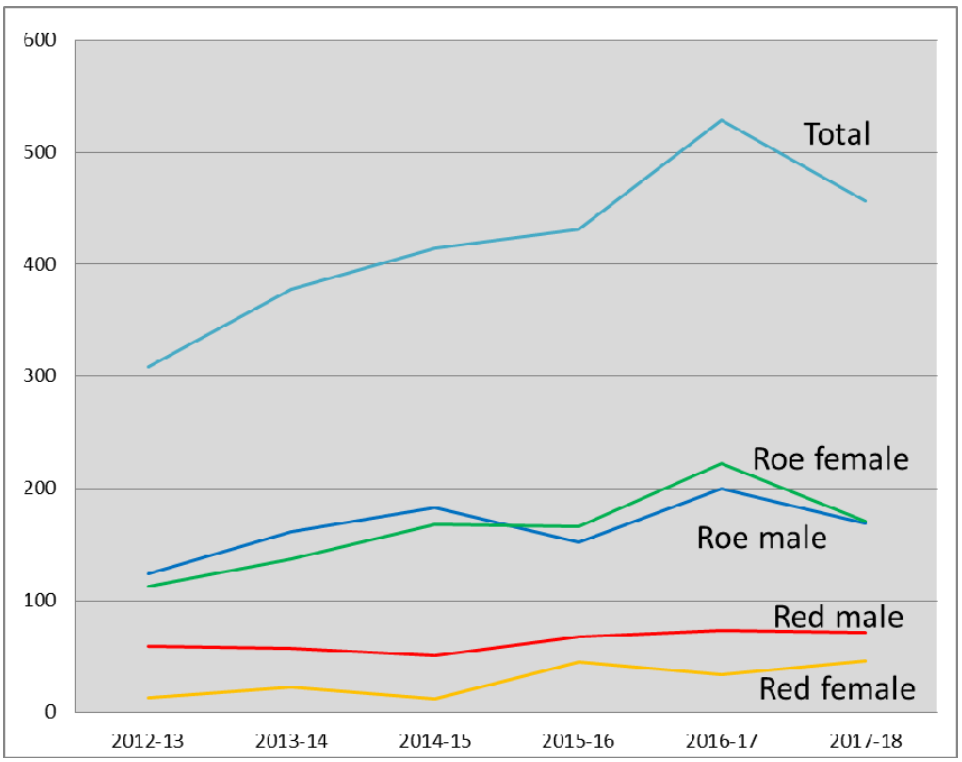
All deer management will be carried out in accordance with OGB 5 - Deer management. The aim is to manage deer density safely and humanely at a

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 prepare for each Deer Management Unit and are the responsibility of the Wildlife Ranger Manager. Currently deer control in the Clash is undertaken by an Forest and Land Scotland employed wildlife ranger but in the future contractors may be used where required. Deer fencing is required to allow the successful establishment of broadleaves and occasionally soft conifers but all other crops can normally be successfully grown without additional protection over and above culling.

The most recent deer cull figures are shown in the table and graph below and future years cull figures are predicted to be of a similar magnitude.

	Red male	Red female	Roe male	Roe female	Total
2012-13	59	13	124	113	309
2013-14	57	23	161	137	378
2014-15	51	12	183	168	414
2015-16	68	45	152	166	431
2016-17	73	34	200	222	529
2017-18	71	46	169	171	457



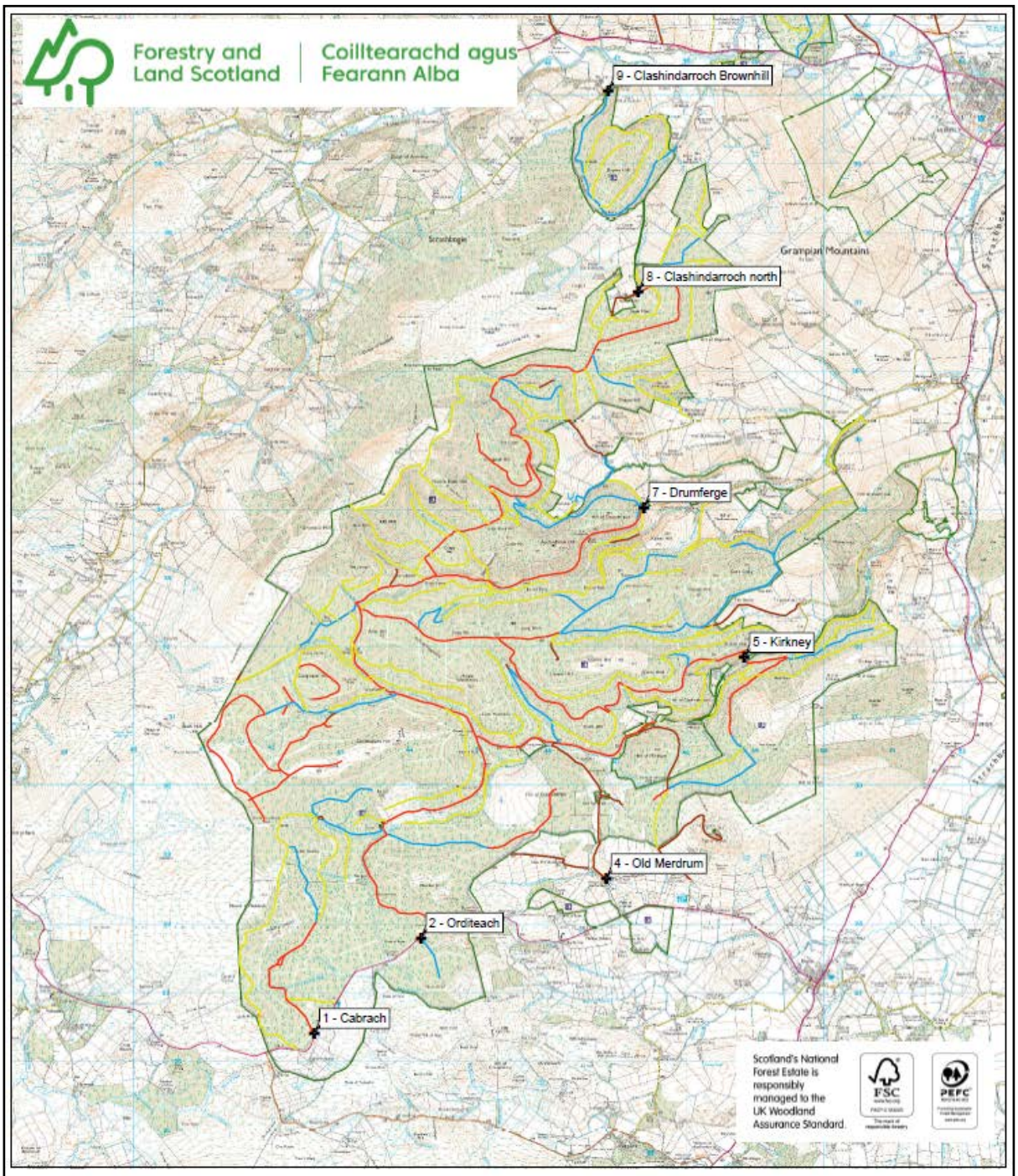
In order to maintain this level of deer control we intend to create additional areas of transitional open space. Permanent deer lawns are not effective when there is a high culling pressure, as we currently have. Transitional open space will be identified at the work plan stage and appropriate areas for deer control left unplanted. These areas will then be allowed to regenerate by which time the adjacent crops will be established and areas in other locations will be identified as alternative transitional open space.

8.7 Access

Access to and within Clashindarroch is good therefore there are no plans for additional roading within the period of the plan. However we will continue to undertake a programme of maintenance and post operation repairs. In order to ensure there is a ready supply of suitable material the quarries at Drumfergue (NJ 472 340) and Kirkney (NJ 487 307) will be extended. Drumfergue, the larger of the two quarries, will be extended by 50m to the west, an area of 0.9ha. Kirkney will be extended by 50m to the south, an area of 0.7ha. An EIA determination for these quarry works have been submitted.

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.

The map below 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. The volumes have been passed to the TTG to allow for future planning of work on local roads.



Clashindarroch timber egress point

Scale @ A1: 1:25,000

Date Dec 2019

0 0.35 0.7 1.4 2.1 2.8 Km

Egress point ID	Egress name	Access grid ref	Timber outputs (tonnes) 2020 -2024	Timber outputs (tonnes) 2025 - 2029
1	Cabrach	NJ42642639	34994	20622
2	Orditeach	NJ44162779	7084	4175
3	Bogancloch	NJ44382797	75561	44527
4	Old Merdrum	NJ46872859	10573	6230
5	Kirkney	NJ48853183	25782	15193
6	Clashindarroch Central	NJ49423205	63073	37168
7	Drumfergue	NJ47353402	0	43811
8	Clashindarroch North	NJ47323713	31002	18269
9	Brownhill Clash	NJ46884006	9587	5650
		Total	**257656**	**195644**

8.8 Pathogens

The large pine weevil (*Hylobius abiatis)* can cause extensive feeding damage to young trees used to restock clearfell sites but damage is often highly variable. This species lays its eggs in deadwood/stumps on clearfell sites and the emerging adults feed on the bark of young trees, often with devastating effect on newly planted conifer crops.

Previously it has not been possible to predict damage and so insecticides have been routinely used to protect the trees to try to safeguard this valuable young crop. However, on clearfells where *Hylobius* numbers are low this treatment may be unnecessary and conversely when numbers are very high the treatment may be unable to protect the trees. Both of these situations result in losses in valuable resources.

The *Hylobius* Management Support System (MSS) is based on a simple monitoring protocol using billet traps to measure *Hylobius* numbers on individual clearfell sites. The numbers recorded are used, with other information entered into the *Hylobius* MSS software, to determine the best way to manage clearfell sites for successful, cost effective and environmentally friendly restocking. This Support System will be used along with past results and experience to determine the optimal time to restock while minimising the use of chemicals.

Restocking has traditionally taken place within two years of sites being clearfelled. However, many seedlings were badly damaged or killed by the Large Pine Weevil, *Hylobius abiatis.* In order to "reduce the use of insecticides where feasible" restocking is planned to take place at the end of year 2. Restocking may take place up to four years following felling if monitoring, using MSS shows that it is expected that there will be a high level of Hylobius.

Ash dieback is an aggressive fungal disease and is caused by Hymenoscyphus fraxineus (previously Chalara fraxinea). The disease causes leaf loss and crown dieback in affected trees, and usually leads to tree death. The whole of the Clash falls within 10km survey squares where an outbreak of ash dieback was first recorded in 2015. There will be no planting of ash trees as there is currently a moratorium on the planting of ash within FLS woodlands to try and help slow the spread of the disease. However as this disease is endemic to the wider environment no action will be taken regarding mature established trees that contract the disease beyond felling for safety reasons in recreation areas. In areas of young ash if there are groups greater than 0.2ha of pure ash then these will be replaced with another native site appropriate

broadleaf species if they succumb to ash dieback . However if the ash is in an intimate mixture then replacement will not be practical or appropriate.

Phytophthora ramorum is a fungus-like plant pathogen which attacks a wide range of tree and shrub species. European and hybrid larch are particularly susceptible to P. ramorum but current evidence indicates that the impact of the disease is greatest on Japanese larch, which can die within one to two seasons, with consequential economic, environmental and amenity impacts. Therefore there is currently a moratorium on the planting of larch within FLS woodlands to try and help slow the spread of the disease. We will try to retain existing larch stand where practical to maintain the species diversity within Clash.

8.9 Critical Success Factors

- Undertake the planned thinning and felling and restock programme in order to increase the quality of the timber within the plan area and to meet the production targets.
- Undertake the thinning planned for the LISS areas in order to manage the light levels to encourage the development of the appropriate ground vegetation and natural regeneration while ensuring this work does not compromise the snow holding capacity of the area.
- Continue with the maintenance of the forest road network to allow forest operations to be successfully completed.
- Control of deer populations to allow natural regeneration within LISS areas and successful establishment of restocked crops.
- The successful establishment of the new woodland areas.
- Improvement of the non-forest habitats.
- Improvement of the riparian corridors and the wider forest habitat for EPS, other protected species and the whole biodiversity of the forest.

Appendix 1 – Scoping report

Prior to the scoping we assessed the impacts of our potential proposals on the local community and local interests. This was discussed at an internal scoping meeting that included the Woodland Officer .We agreed key issues, and which stakeholders should be included in the scoping exercise. Scoping was undertaken by email, and below is the list of stakeholders that we contacted. Copies of documents sent out for scoping attached.

The scoping exercise highlighted the difference in opinion between different stakeholders on certain issues. We will use best evidence/research/experience to determine the best course of action.

Open habitats were highlighted as an area of the plan that will need to be considered carefully to ensure a high level of biodiversity potential is achieved across the plan area.

Wildcats will be an issue that will be a major factor in the preparation of this LMP. We will continue or close working relationship with SWA and the other project partners. Forest and Land Scotland is one of the active partners.

Stakeholders			
A copy of the pre-scoping map and a summary of the woodland were sent to the following stakeholders.			
Name	Organisation	Address	Response received
James Davidson	Aberdeenshire Council	j.davidson@aberdeenshire.gov.uk	Yes
Richie Miller	Deveron, Bogie, Isla rivers charitable trust	richiemiller@deveron.org	Meeting held 22 May 2018
Alison Wilson	SEPA	Planning.aberdeen@sepa.org.uk	Yes
Ian Cameron	Moray Council	Ian.Cameron@moray.gov.uk	
Gillian Forbes	SNH	Gillian.Forbes@snh.gov.uk	Yes
Hywel Maggs	RSPB	Hywel.Maggs@rspb.org.uk	Yes
Peter Thorn	Huntly Nordic ski club	huntlynordicsc@yahoo.co.uk	Yes
Steve Wright	Neighbour		Yes
John Mackenzie	Cabrach estate	johnmackenzie@outlook.com	No
	Wildcat Haven	info@wildcathaven.com	No

Dr Ruairidh Campbell	Scottish wildcat action	roo.campbell@scottishwildcataction.org	Yes
Richard Thompson	Darroch Wyds	Richard.Thompson@forestry.gsi.gov.uk	Yes
Peter Kunz	Vattenfall Wind Power Ltd.	peter.kunz@vattenfall.com	Yes
	Gartly community association	bookingsgartlyca@gmail.com	No
Jamie Farquhar	CONFOR	jamie.farquhar@confor.org.uk	No
Fiona Maxwell	SSE	Fiona.Maxwell@sse.com	No
	Huntly Community Council	huntlycommunitycouncil@googlemail.com	No
Dr Eleanor Anderson	Strathbogie community council	strathbogiecc@gmail.com	No
Janice Smith	Tap O Noth community council	janice.smith@tesco.net	No
Caroline Palmer	Archaeology service	caroline.palmer@aberdeenshire.gcsx.gov.uk	No
Richard	Historic	richard.heawood@hes.scot	Yes

Heawood	environment Scotland		
Andrew Little	63 Car Club (organise the Speyside Stages)	dittle3883@gmail.com	No
Warwick Taylor	Tilhill agents for Grumack forest	warwick.taylor@tilhill.com	Yes

Part 2 – Key Issues				
Key Issues	Raised by	Issue raised	Action(s) to be taken to address key issues and identify location within Forest Plan	Notes
Water quality	Steve Wright	Lack of progress to date in achieving UKFS water guidelines.	Continue to improve all watercourses as adjacent operations allow to fully comply with UKFS.	Main watercourses highlighted for more input to improve well above UKFS minimum.
Woodland creation	Richard Thompson	Potential to increase native broadleaf woodland area in Darroch Wyds with further planting.	Report with suggested implementation method provided by Richard Thompson. Report to be implemented where feasible and practical.	Report included as appendix to LMP.
Biodiversity	Aberdeenshire council	Highlight red squirrel as key species.	Management of the forest will continue to take full account of red squirrels.	Section on species and habitat management will be included in the LMP.

Part 2 – Key Issues				
Key Issues	Raised by	Issue raised	Action(s) to be taken to address key issues and identify location within Forest Plan	Notes
		Moss of Essie bog restoration.	This area is already open and will remain so due to the very wet ground conditions.	
Biodiversity/landscape	Steve Wright	Maintaining open ground in Darroch Wyds.	See "Woodland creation" key issue above.	
Control of deer and other pest species	Steve Wright	Damage to existing broadleaves by deer and potential for damage from wild boar.	The local Wildlife Ranger Manager will be involved in the creation of the LMP and his recommendations will be taken into account.	Section on control of deer and other pest species will be included in the LMP.
Recreation (Nordic skiing)	Peter Thorn	Continuation of LISS management in ski area.	The current LISS designation for this area will continue into the new LMP.	FLS appreciates the positive comments on past interactions between FLS and the club and fully supports the desire to continue this positive relationship.
Water quality	SEPA	There are no water bodies within or adjacent to the plan	This will be highlighted in LMP.	

Part 2 – Key Issues				
Key Issues	Raised by	Issue raised	Action(s) to be taken to address key issues and identify location within Forest Plan	Notes
		area which are currently at less than good ecological status/potential as a result of forestry activities.		
Flood risk	SEPA	Assess the impacts of the works on flood risk to both the site and any downstream receptors.	This will be fully considered during the preparation of the LMP and any mitigation measures appropriate will be included where appropriate.	Section on water, including flooding, will be included in the LMP.
Open habitats	SEPA	Supportive of concept of the restoration of deep peat areas.	The restock on deep peat guidance will be followed to ensure the most appropriate decision for carbon sequestration is taken.	Section on the management of open habitats will be included in the LMP.
Biodiversity	RSPB	Wetland habitat creation for black grouse.	The Moss of Essie is already open and will remain so due to the very wet ground conditions.	

Part 2 – Key Issues				
Key Issues	Raised by	Issue raised	Action(s) to be taken to address key issues and identify location within Forest Plan	Notes
		Consider management of Blackmiddens area for benefit of winchat. Wildcats and the studies into their occurrences and behaviour should be considered as part of the plan.	This area is part of the Darroch Wyds project to create more native broadleaf woodland. Work is required to meet this objective but requirements for whinchat will be kept in mind if possible. FLS will continue to work closely with and take advice from SWA.	
Renewable power	RSPB	Consider how this plan aligns to habitat management plans as part of the operational windfarm and potentially the future extension.	We will continue to work with the developer of the existing windfarm to deliver the required habitat management. The extension to the existing windfarm is subject to the council	

Part 2 – Key Issues				
Key Issues	Raised by	Issue raised	Action(s) to be taken to address key issues and identify location within Forest Plan	Notes
			planning process and will not impact the LMP until it gains planning approval.	
Archaeology	HSE	Scheduled monuments	Scheduled monuments will be identified on management maps and appropriate buffers for operations observed.	
Neighbours	Warwick Taylor (Tilhill)	Management of ground on the boundary.	Management of the area between FLS and Grumack forest will be planned to fit in with both land holdings.	Restock along Torry burn will be with native BL once felling undertaken. This may be beyond this plan period.
Biodiversity	SNH	Hill of Towanreef SAC & SSSI and Craigs of Succoth SSSI adjacent to LMP area and potential for negative impact from tree natural regeneration on designated sites.	All designated features within and adjacent to the LMP area will be highlighted on maps and in text. Management proposals for controlling natural regeneration of trees will be detailed.	

Part 2 – Key Issues				
Key Issues	Raised by	Issue raised	Action(s) to be taken to address key issues and identify location within Forest Plan	Notes
		The LMP area is in the Strathbogie Wildcat priority area.	SWA (Emma Rawlings) has been sent the scoping documents and their recommendations will be included within the LMP.	SWA have requested an extension to the time period for scoping returns and to date no reply has been received. However personal contact will be made with SWA during the LMP preparation process.
Biodiversity	Scottish wildcat action	See response below.	FLS will continue to work closely with SWA to ensure our operations do not have a detrimental impact on wildcats in Clashindarroch.	

SCOTTISH WILDCAT ACTION

4th Feb 2019

Clashindarroch Forest Management Plan – Consultation Response

Dear Mark Reeves,

Scottish Wildcat Action welcomes the opportunity to contribute to the consultation on the Forest Management Plan (FMP) for Clashindarroch forest, and we are pleased to see the presence of Scottish Wildcats listed in the FMP briefing as one of the Key Themes/ Issues.

We believe this process presents Forest Enterprise Scotland (FES) with an ideal opportunity to not only integrate best practise in woodland management for Scottish Wildcats, but to trial innovative and sector leading mitigation and habitat improvement for this threatened species. To this end we would like forest management in Clashindarroch to form an important component of the *Wildcats & Forestry Project*, currently in drafted between Scottish Wildcat Action, Forestry Commission Scotland and the Wildlife Conservation Research Unit. More details of this project can be provided on request.

Appended to this letter are some further comments written by Emma Rawling and I that are more specific to Clashindarroch and the FMP (though applicable elsewhere). We look forward to discussing these with you further.

Yours sincerely

Roo Campbell

Scottish Wildcat Action Priority Areas Project Manager

Scottish Natural Heritage
Great Glen House
Inverness IV3 8NW
Tel: 01463 72 5130 | Mob: 07880 721 488
roo.campbell@scottishwildcataction.org

www.scottishwildcataction.org

1) Our Knowledge of Wildcats in Clashindarroch

The presence of Scottish Wildcats in Clashindarroch has been known for many years with camera trap surveys in 2013[1] confirmed their presence , and led to this forest being included as one of the initial six Wildcat Priority Areas in the new Scottish Wildcat Action Project, commencing in 2015. FES is a project partner in SWA. SWA defines a wildcat based on a 21 point pelage scoring system[2], with wildcats scoring 17 or above on this system.

Since 2015, extensive survey work with camera traps has been undertaken each winter (by SWA staff and volunteers) with FES access permission and cooperation of FES district staff. These surveys were designed to establish the presence and quality of all wild-living cats – not to establish the location of wildcat den sites specifically. Given the elusive nature of Scottish wildcats and their movements, the absence of survey sightings in any given area of the forest is not proof of absence. The survey will miss some individuals, though statistical analysis has shown the results are likely to provide accurate population estimates.

These surveys have led SWA to an exhaustive knowledge of the cats in Clashindarroch and these sightings have been shared regularly with FES district staff. Wildcats have been detected throughout the forest during our surveys. Detailed records, including photographs, are available on request from SWA.

In addition, GPS collaring of wildcats in collaboration with the Wildlife Conservation Research Unit at the University of Oxford have led to detailed knowledge of the habitat use, resting areas and movements of collared individual wildcats. Where available these data should be used to assess impacts to known wildcats from individual forestry operations. However, not all wildcats in Clashindarroch are collared. Also there are currently no plans to collar wildcats in Clashindarroch after March 2020.

2) Benefits to wildcats from past management

From GPS and trail camera data collected to date, it is apparent that wildcats make use of clear-felled and recently restocked coupes for hunting. We believe that one reason Clashindarroch is used currently by wildcats is that the rotational clear-felling provides a diversity of habitat that wildcats can use for both shelter and hunting. While we currently cannot yet confidently state that this diversity is better or worse than unmanaged woodland composed of native deciduous species (noting that Clashindarroch contains this habitat type in addition), retaining the rotational clear-felling operations in commercially managed areas of Clashindarroch will help maintain Clashindarroch as a site suitable for wildcats.

3) Risks to Wildcats in Commercial Forest Environments

Scottish Wildcats are critically endangered in Scotland and threats identified by experts include: hybridisation with domestic origin cats, disease, persecution, habitat fragmentation, and prey species decline.

In the context of commercial forest operations, more research is needed to better understand the risks (and benefits). From current knowledge, we suggest that the risks to wildcats may include:

a) Loss of grassland margins, scrub and gorse areas, and other valuable prey species habitats they hunt in if forest management removes these.

[1] https://www.nature.scot/sites/default/files/2017-07/Publication%202014%20-%20SNH%20Commissioned%20Report%20768%20-%20Survey%20and%20scoping%20of%20wildcat%20priority%20areas.pdf

[2] Kitchener A, et al. 2015. A Diagnosis for the Scottish wildcat: a tool for conservation action for a critically-endangered felid. *Animal Conservation*. 8:223-237. http://www.scottishwildcataction.org/media/1379/publication-kitchener-et-al-2005-wildcat-diagnosis.pdf

www.scottishwildcataction.org

b) Physical destruction of den sites in cairns, brash piles, root plates, wind-blow areas etc during forest operations.
c) Disturbance of breeding sites by vehicles, noise and people, at its most extreme potentially leading to breeding failure.
d) A small risk of collision with vehicles or machinery on forest roads and work sites.

4) Legal and FCS Guidance note recommendations

Scottish Wildcats are legally protected and it is an offence to "deliberately or recklessly capture, injure or kill a wildcat; to disturb it while it is occupying its breeding sites/ resting places; or to obstruct access to its breeding sites/ resting places. It is an offence to damage or destroy breeding sites/ resting places even accidentally."

Forest Guidance Note 35d: Forest Operations and wildcats in Scotland[3] should be followed.

It states: " In sites with recent signs and/or local records [of wildcats] you should carry out basic survey work to establish whether wildcat are using your woodland and identify possible den sites." The whole of Clashindarroch forest falls under this definition, so pre-work checks are therefore required on all work sites. Such checks should be carried out at all times of year

It also states "If physical evidence of a den site is found, mark an exclusion zone of 200m around the site... avoid carrying out operations in the vicinity [completely] or carry out operations between August and January when wildcats are not breeding"

"If dens are found during operations, halt work immediately and seek advice form SNH on how to proceed. If operations are necessary within the exclusion zone / time above, you must apply for and obtain a license"

5) Forest Management for Wildcats

Scottish Wildcats are thought to benefit from the following forest management, and we recommend these are trialled and that observations on wildcat activity by forestry staff are collated following the application of these practices:

a) In some felled coupes, especially larger coupes, look to retain patches of cover.
b) Preserve features that offer cat denning opportunities such as rocks cairns and outcrops, ruined buildings, stone dykes, large brash piles, wind-throw areas etc.
c) Promote areas of unimproved grassland and fringe scrubland that offer valuable prey habitat and hunting opportunities for wildcats
d) Ensure connectivity of habitat types for prey species such as unimproved grassy corridors for short-tailed vole *Microtus agrestis*.
e) Where possible avoid or reduce disturbance during the breeding season (Feb to July).
f) Where possible spread out work areas affected in a given year and consider the cumulative effect of all operations, not just felling, to avoid affecting the whole of an individual wildcat's territory negatively.
g) Plan to provide escape routes/ corridors of cover to other shelter areas during works for all wildlife.
h) Look to retain any hotspot sites of wildcat activity identified, even if not a den site or assess whether mitigation can be carried such as habitat creation nearby.
i) In the absence of a formal pelage score from detailed observation or camera trap images by trained staff, assume a tabby striped cat with a blunt tail and no white feet is a wildcat.
j) Be proactive in surveying for cats and finding dens, if possible regularly and in advance.

[3] https://scotland.forestry.gov.uk/images/corporate/pdf/epswildcat.pdf
www.scottishwildcataction.org

6) Improving Habitats for Wildcats

SWA feels the following principles and suggestions for further improving habitat quality of wildcats are worth considering. To inform future management evidence should be collected on later use by wildcats where possible:

a) Retain more scrub and gorse areas for rabbits and therefore wildcat hunting habitats.
b) Planting hedgerows, corridors and promoting connectivity between forest blocks
c) Since clear fell and restock sites have been identified as used by wildcats for hunting, the fallow period for clear-fell sites could be extended by a year or two if the landowner felt that there was additional benefit in reducing weevil infestations as it would also maintain vole-rich grassland for longer – but we respect that this is ultimately a commercial decision
d) We would encourage additional natural den site creation, for example: retaining some small wind-throw patches, or cross-felling some low value standing timber near stand edges, or creating some brash-piles in clear-felled areas, all of which may create denning opportunities for wildcats.
e) Don't create large areas of denning habitat such as brash piles or windthrow where they will need to be disturbed in future - plan to leave such brash piles permanently as habitat features.
f) Providing artificial cat den sites- in old buildings or artificial cairns etc. FES in Angus had pioneered artificial wildcat den creation, the design of which can be learned form.

We note that under the Environment Quality theme, the proposal to improve connectivity of both closed and open habitat in riparian areas goes some way to fulfilling points 5c, 5d, 5g and 6b above.

7) Current Management for Wildcats in Clashindarroch

Former SWA project officer Emma Rawling established a good working relationship with the FES Environment ranger team, and helped them understand which areas of Clashindarroch are most likely to contain wildcats.

In order to help FES comply with its obligations to protect wildcat den sites, the SWA Project officer and FES Environment Ranger Jackie Cumberbirch have undertaken extensive walk over surveys of many proposed work sites in Clashindarroch over the last 2 years. Emma has trained Jackie in identifying potential den sites and assisted camera trapping these (under SNH license) to establish if in use by cats. This has led to some sites being realigned, postponed or removed from work plans in order to protect Wildcats.

SWA would like to see the relationship between SWA and FES staff continue for the duration of the project. Ultimately however, FES needs to ensure its Environment Rangers are enabled to carry out effective wildcat surveys by training and the provision of suitable resources and time. In addition FES staff will need to apply for an SNH license to camera trap wildcat den sites in future - rather than working under SWA license as currently.

SWA also collaborated with FES in training all local FES staff in wildcat awareness and distributing a Wildcat Den Awareness hand-out to all contractors, hauliers and staff. See Appendix 1. We would encourage regular use of this with all future contractors. The FES ranger team have electronic copies.

8) Recommended further actions to protect wildcats

SWA would like to see FES continue to fulfil its obligations to protect wildcats and their den sites by:

a) Resourcing the environment team to undertake thorough checks of all Clashindarroch work sites well before works commence- ideally integrating these checks into long term work plans to allow long lead times. Also invest in camera traps and train more staff in the techniques for den site ID and surveys.
b) FES staff adopting a 'risk matrix' approach to decide which areas require the most attention and which types of forest works present the greatest risks to wildcats. See Appendix 2.
c) FES researching and considering adopting novel ways of undertaking such pre- work checks more efficiently and cost effectively. For example the use of trained specialist contractors with pointer dogs to identify cat dens (as is done for monitoring other conservation priority species such as capercaillie and pine marten, without disturbing them) may be an excellent way of covering large areas efficiently and vastly improve den finding. Similarly there are some Ecological contractors who specialise in den site detection using snow tracking, and investment in their services may ultimately save time and money.
d) Wildcats are most vulnerable during their breeding season (March to August but which peaking in April to June) when they have dependant young in den sites, which are of course legally protected. Wildcat mothers may move dens regularly. We recommend an evaluation on whether a trial voluntary moratorium of high risk forest activities during this period in Clashindarroch would be feasible. We recognise that such a broad-brush approach to scheduling forestry operations may entail opportunity costs, such as other environmental impacts from rescheduling operations to other times of year, or reducing the area that can be felled annually (with knock-on effects for prey habitat created by clear-felling). A good first step would be assessing these environmental costs alongside a scientific estimation of the level of risk to breeding wildcats from felling operations.
e) FES to impose exclusion zones on their work plan maps around any wildcat dens sites identified, similar to those already used for other at risk species such as Goshawks, so these are easily visible to and understood by all staff.
f) FES should consider running their own long term assessment of whether such measures affect or benefit the wildcats in Clashindarroch over the term of the FMP.

Appendix 1

SCOTTISH WILDCAT ACTION

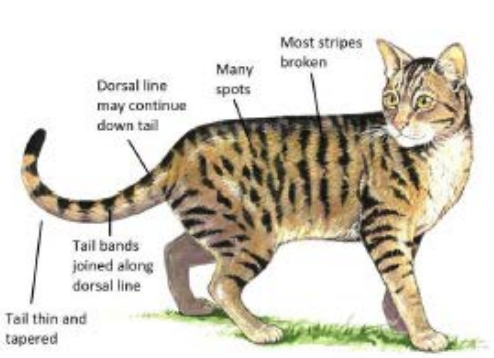
Watch for Wildcats

Scottish Wildcats are known to inhabit this area of forest. They are a critically endangered native mammal with legal protection. We need your help to make sure they are not at risk from forest operations.

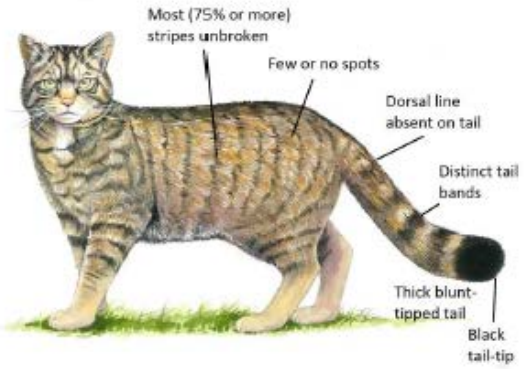
Seen a Wildcat or a feral cat? Please tell us!

Finding and reporting wildcats or signs of wildcats is vital to protect the few animals that remain, and will not necessarily stop all works.

Wildcat identification



Domestic tabby cat



Scottish wildcat

If a cat has all the following, assume it is a wildcat:

- Tabby markings
- No white feet
- Thick, ringed, blunt tail
- No stripe down tail

Did you know?

- Scottish wildcats are a different species from domestic cats, and differ in their genetics, appearance, and behaviour.
- Wildcats are most active between dusk and dawn, and are mostly solitary. They often hunt around the edges of forest and scrub and frequent travel along forestry tracks.
- Wildcats are under threat from hybridisation (cross-breeding) with domestic cats and cat diseases, as well as persecution, habitat loss and a lack of prey animals.

Contact us:

www.scottishwildcataction.org

or your local project officer on 07733308002

Are you Wildcat Den Aware?

Wildcats breed in dens between March to June. The will leave kittens alone in these dens whilst the adult comes and goes, with very few external clues:

All wildcat dens are legally protected all year.

If you see a cat active around one of these den sites, do not damage it or approach- report it.




Wildcat dens can be: rock cairns, fieldstone piles, stone dykes or walls, brash piles, wind-throw areas, tree root hollows, abandoned buildings, pipes or drains.

Thank you for your help in protecting Scottish Wildcats. You are helping save a species - the Scottish Wildcat Action Team.

Appendix 2: 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*		**March- end June** - *peak breeding season with highly dependant young most vulnerable to disturbance. There is some variation in timing of breeding therefore the higher risk period could extent to July.*
	July to September- *semi dependant young with some vulnerability to disturbance*	

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

Activity	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
Clear felling												
First thinning												
Second/third thinning												
Mounding/brash raking												
Planting												
Road works/ quarrying												
Flailing (roadside)												

Risk level (see preceding page)				**Recommended precautions**
				Do not proceed without further investigation; consider licensing issues carefully; consider requesting specialist help with checks.
				Plan ahead for extra time to do necessary prior work checks- at least 2 months in advance
				If possible survey site proactively for general cat activity of cats in previous winter (collaborate with SWA);
				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.
				Statutory checks and normal precautions such as walk through to check to brash piles, windthrow areas, cairns and stone features for den site signs. Camera trap these is any field signs seen.
				Consult with experts (SWA, WildCRU) for very latest information on wildcat use of the area and also consult SWA survey records.
				Camera trap any possible cat dens if any field signs seen at least 2 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.
				Camera trap any possible cat dens if any field signs seen at least 1 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.
				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.
				Train all staff and contractors in wildcat awareness– hand-out available.
				Prepare to adapt if there are new sightings whilst work in progress.

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

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

If a suspected den site is found, options include:

3. Leave out destructive work (e.g. leave the brash or rocky pile undisturbed)
4. 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 2 – Final consultation record

Consultee	Date contacted	Date response received	Issue raised	Region response
Aberdeenshire council	6 July 2019 by email	12 July 2019	"…there are three identified public Rights of Way on the southern side of the forest in the vicinity of Tap o Noth, Merdrum and in the area of the ski trails. These do not have a huge bearing on the plan itself, but it is worth noting the need to keep them unobstructed during management operations." "One of our Local Nature Conservation Sites – Hill of Townanreef/The Buck covers a wide area which includes Blackmiddens area. As things stand your objectives for Blackmiddens don't give us any concerns in relation to this designation." "We are supportive of the aims/key objectives of the plan and welcome the commitment to balance timber production with other uses/benefits that the forest delivers."	No issues to address.
CONFOR	6 July 2019 by email	9 July 2019	"…it's good to see the area of spruce being slightly increased, given the prime objective to maintain a commercial resource in the holding. However one thing that appears at odds	The woodland creation sites are well suited to increasing the amount of broadleaved woodland within the region. The majority will be planted with

Consultee	Date contacted	Date response received	Issue raised	Region response
			with that is that it looks as though the majority of the new woodland is going into broadleaves – why is that?"	species, and at a spacing, that have the potential to be managed commercially in the future.
Vattenfall	6 July 2019 by email	15 Aug 2019	Habitat management plan (HMP) for windfarm.	There have been ongoing discussions between FLS, Vattenfall and Aberdeenshire council to amend the original HMP to better reflect the current site conditions. Aberdeenshire council will need to approve the revised HMP through the planning process.
Archaeology service	6 July 2019 by email	12 July 2019	"I note that SMR (now renamed the HER – Historic Environment Record) has been checked and archaeological surveys have been carried out and have no comment regarding the general management proposed."	No issue to address.
Huntly Nordic ski club	6 July 2019 by email	23 July 2019	"I made a submission last year which I attach here along within an updated comments document made after reading the latest online documents of the plan." See copy of letters below.	FLS recognise the importance of this facility to the local and wider skiing community and will continue to work proactively with the club within the resources available. When felling and/or thinning operations are planned further

Consultee	Date contacted	Date response received	Issue raised	Region response
				detailed discussions will be undertaken with the ski club. Adjustments to work will include felling only one side of the trail during LISS fellings and removing trees adjacent to the trail during thinning to allow more snow to reach the ground.
Member of public	From FLS website	24 July 2019	"…how the land management plan will cater for the endangered Scottish Wildcat."	FLS will continue to work closely with SWA to ensure plans and operations continue to provide suitable habitat for Scottish wildcats.
Member of public	6 July 2019 by email	25 July 2019	Water quality	FLS will continue to follow UKFS to ensure water quality within the plan area is maintain and/or improved. It is accepted that opportunities to improve water quality have been missed in the past but planning processes are being bolstered to try to reduce the chance of this happening in the future. The conservation ranger has been on site with the consultee to

Consultee	Date contacted	Date response received	Issue raised	Region response
				discuss the issues raised.
RSPB	6 July 2019 by email	30 July 2019	"..content that comments raised by RSPB Scotland during the scoping exercise have been adequately addressed."	No issues to address.
Member of public	From FLS website	3 Aug 2019	Relocation of beavers.	We have no plans to investigate this issue.
Member of public	From FLS website	9 Aug 2019	Diversity of forest structure and species	The plan should continue to create a forest with structural diversity and the planting of species, including broadleaves, appropriate to the site conditions will ensure the diversity species in the plan area.
Member of public	From FLS website	11 Aug 2019	Recreation and reduced maintenance of walks at Coynachie.	Following previous discussions with the local community it was agreed that the level of maintenance of the paths at Coynachie would be reduced. This remains the position of FLS given the resources available for recreation across the region.
Member of public	From public meeting	12 Aug 2019	Use of horse lorries at Coynachie.	Open access is encouraged in all FLS forests and horse riders come under this provision. The detailed issues raised around horse lorry use at

Consultee	Date contacted	Date response received	Issue raised	Region response
				Coynachie have been past to FLS visitor services team for resolution.
SNH	6 July 2019 by email	14 Aug 2019	See email below.	No issues to address.
Neighbour	From FLS website	14 Aug 2019	Private water supply. Management of broadleaves. Deer control.	FLS will follow UKFS guidelines to ensure the private water supply is not adversely affected. Previous management of broadleaf areas have not delivered the results required. Areas identified in this LMP as broadleaves on the future species map should now receive the necessary management to ensure they are successfully established. As detailed in the LMP additional contractor resource may be introduced to Clash to reduce the deer population.
SEPA	6 July 2019 by email	15 Aug 2019	"We consider the plan is a good exemplar of excellent practice in native woodland, ancient woodland expansion, and in supporting biodiversity. As such we have no further advice/comments."	The positive comments are warmly welcomed.

Consultee	Date contacted	Date response received	Issue raised	Region response
Member of public	From FLS website	16 Aug 2019	"…recognition given to cross country skiing in the LMP is much appreciated." Recreational access to woodland creation site at Ittingstone.	The planting of Ittingstone is not yet complete so this is still considered an active site therefore public access cannot yet be encouraged. When planting is complete the area will be open for informal public access under SOAC.
Historic Environment Scotland	6 July 2019 by email	16 Aug 2019	See letter below.	See FLS response below.
Wildcat haven	6 July 2019 by email	17 Aug 2019	See letter below.	See FLS response below.
Deveron, Bogie, Isla rivers charitable trust	6 July 2019 by email	No response		
Neighbouring estate – Cabrach	6 July 2019 by email	No response		
Scottish wildcat action	6 July 2019 by email	No response		
SFA – now SF_SCIO	6 July 2019 by email	No response		
Gartly community association	6 July 2019 by email	No response		
SSE	6 July 2019 by email	No response		
Glenlivet Community council	6 July 2019 by email	No response		
Huntly Community Council	6 July 2019 by email	No response		
Strathbogie	6 July 2019	No		

Consultee	Date contacted	Date response received	Issue raised	Region response
community council	by email	response		
Tap O Noth community council	6 July 2019 by email	No response		
Huntly development trust	6 July 2019 by email	No response		
63 Car Club (organise the Speyside Stages)	6 July 2019 by email	No response		
Members of public (approx. 30)	Advertising in local press.	Drop in session in Stewarts Hall Huntly 31 July 2019	Most concerned about maintenance of paths at Coynachie.	See previous comments above.

Letter from Huntly Nordic Ski Club.

Clashindarroch Forestry Management Plan

Comments from Huntly Nordic Ski Club

13th April 2018

Author: Peter Thorn (Secretary Huntly Nordic SC)

huntlynordicsc@yahoo.co.uk / Tel: 01464 831429

- We recognise that the Forestry Commission Scotland (FCS) have responsibility for the management of the Clashindarroch Forest and that this wider responsibility may result in activities not fully compatible with the skiing but by discussion and consultation any potential detrimental affects can be mitigated for.
- We note your commitment to maintain the provision of recreational facilities at the current level and standard.
- We also are encouraged by your recognition of a wider recreational use of the forest beyond the current Nordic ski trails and the waymarked trails at Coynachie.
- We take from this that you recognise that "maintaining" current recreational facilities is not a passive action but requires active intervention. And past actions of the FCS show that you do indeed take active intervention to maintain the ski trails.
- We wish to continue our already healthy and proactive relationship with FCS in maintaining and enhancing the ski trails. Our expertise in the skiing aspects should be tied with FCS's land management skills. We will welcome such opportunities as may be given to comment on proposed forest operations (e.g. felling, thinning, road operations) which may have an impact on the Nordic skiing resource.
- The skiing experience on the trails depends on adequate tree cover along with strategic felling and thinning to enhance snow collection and protection, suitable surfaces/tracks and well maintained drainage. The club can identify problem areas.
- The club would like to be able to continue our maintenance work on the trails that falls within our capabilities and health & safety responsibilities of FCS.
- The club would like to be able to propose new trails or modifications that would improve the skiing experience. The club may be able to access funds for such works to go ahead for example our funding of the new Wildcat trail allied to the clearance done by FCS.
- Car park on A941: adequate snow clearance is an important part of the Nordic skiing resource and also helps to prevent the road itself from being obstructed by parked cars. The Club recognises that FCS cannot take on full responsibility for snow clearance, but would like to explore options with FCS and other parties for delivering snow clearance on a consistent basis.
- It is possible for the club not only to disseminate information on the forest to its members but also to the wider skiing community.

Second letter from Huntly Nordic Ski Club.

Clashindarroch Forestry Management Plan

Follow Up Comments from Huntly Nordic Ski Club

23rd July 2019

Author: Peter Thorn (Secretary Huntly Nordic SC)

huntlynordicsc@yahoo.co.uk / Tel: 01464 831429

These comments follow on from the submission I made last year (13th Apr 2018) on behalf of Huntly Nordic Ski Club. Those comments are still relevant and should be referred to along with these additional comments. I have personally been activity involved with the management of the trails from a skiers perspective for the past 25 years and have been the main focal point for skiers. The Ski Club took over responsibility from the Huntly Nordic & Outdoor Centre of liaising with Forestry about the ski trails. The club owns and operates the snowmobile with permission of Forestry and Land Scotland.

We skiers recognise the support and work done on the ski trails by Forestry and wish to continue working closely with you on maintaining and improving the trails. We would like to see Forestry become more proactively involved in not only just maintaining but also enhancing the trails with our support. Forestry could more actively promote the skiing in the Clash and make it more of a flagship in your recreational provision. You could gain good PR on a facility that has seen many young skiers progress from these ski trails to skiing at senior international level in both cross-country skiing and biathlon. The Clash is unique and by far the best snow holding forest in Scotland with almost double the number of ski days (50) compared to the Glenmore ski trails (26).

We realise that thinning and felling operations will take place in the ski trails area but that you plan to do this in a way that is sympathetic to the skiing. Should you need to clear fell an area we would prefer to see felling only done on one side of a trail and not both sides at the same time. Where this has happened on some of the trails we have seen that snow still collects along the tree margin and the trail remains useable. We would welcome some consultation before felling starts in any area to see if there is any way to mitigate against any damage to the skiing.

Currently the biggest issue affecting some trails is the overhanging tree canopy and thinning would be extremely beneficial. For example the top of both Short Cut and the new Wildcat trail (all trail names found on Ski Trails Map). Ideally ski trails have a grassy surface with trees about 10m apart such as seen along Hedder Wye where some of the deepest snow collects along this wide gap in the trees. Strategic felling and thinning can enhance the skiing.

Another immediate problem is the boggy surface at the bottom of Short Cut. I think drainage ditch or pipe over the bottom 50m is needed. I keep a list of trail problems that I can feed through to Forestry at time you wish. Most are fairly minor but beyond the scope of a Ski Club work party. We wish to continue our ad hoc work parties to do minor work such as installing short sections of drainage ditches or repairing toilets etc.

It is very important that ski trail loops are continuous as any gaps in snow mean that races can't take place. This is a major reason why the Ski Club found funding for the Wildcat trails as a by-pass to Leids Leap when mobile mast vehicles drive onto the trails. However, the tree canopy at the top is severely affecting this trail.

We see the opportunity of more trails in the forest and have skied a potential route through the heart of the forest. From our experience with the construction of the Wildcat trail we do not see any major problems with installing this trail but obviously experts would need to evaluate. While Forestry may be reluctant in putting in more ski trails there are potential benefits. It could act as a by-pass route to mitigate felling operations. And a grassy trail is always better for skiing than forest roads. It could mitigate should vehicles have to access the forest along this main trail in the winter. It is appreciated that Forestry restrict vehicle access to the Ski Trails over winter but sometimes this is unavoidable.

We have already tentatively approach Forestry with the creation of a "terrain park" area near to the Biathlon Range. We were given permission to investigate this further and come back with more definite plans. This is ongoing.

The Ski Club recognise that Forestry may not have funding for these kind of projects but the Ski Club could apply to funding bodies. For Wildcat Forestry did the required felling/thinning while the Ski Club found the funds for the contractor to create the trail.

The car park is a major issue on snowy weekends and fills up very quickly. It is difficult for cars to access the far part of the car par because of a restricted entrance made more difficult as cars fill up the front part. Only part of the far car park has a hardcore surface so is inaccessible to non 4-wheel drive vehicles. Also snow clearance in the car park is erratic. Discussions with Aberdeenshire Council are warranted on how best to keep this car park fully open so that cars do not park along the A941. Skiers and shovels is not the best way to solve this.

One thing not mentioned in my original submission was the creation of a long distance footpath/cycle way from Huntly to the Clash. Seeing that Forestry now have land on the Clashmach Hill by Huntly is there an opportunity open up such a route. I know some members of the Huntly community have expressed an interest in this idea. And also possibly the opportunity of a sledging slope on the Clashmach incorporated with suitable tree planting on this hill.

Letter from SNH.

Dear Mark

Thank you for consulting us on the draft land management plan for Clashindarroch. We have the following comments:

Hill of Towanreef SAC and SSSI
The area of the plan includes land within the Hill of Towanreef Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), on the northern slopes of Meikle Turf Hill. It is also adjacent to Moss of Tolophin, Moss of Fuie and White Hill of Bogs which are part of the SAC and SSSI.

Appendix 7 contains a plan for the part of the SAC/SSSI within the National Forest Estate. We support the proposed programme of management to benefit H16 heath which is part of the dry heath interest of the SAC and upland assemblage interest of the SSSI. It would also be beneficial to intermediate wintergreen, which forms part of the vascular plant assemblage interest of the SSSI.

We note that FLS will not undertake muirburn but will continue a programme of swiping instead to manage the heath, every 3 years during the lifespan of the plan and that the cut material will be raked off swiped areas.

We support the proposal to remove tree and scrub. For the avoidance of doubt, this should not include juniper scrub which is part of the interest of the designated site.

Craigs of Succoth SSSI
The forest plan area is partially adjacent to the southern boundary of Craigs of Succoth SSSI. The management proposed in the plan should not affect the special interest of the SSSI.

Wildcat
As you know, Clashindarroch forest is within the Strathbogie priority area for Scottish wildcat, a European Protected Species. There are five such priority areas and Strathbogie is one of three for which we have better knowledge of the extent of wildcat presence. Survey work indicates that the numbers of known Scottish wildcat in Strathbogie are very low. Consequently the remaining Scottish wildcat population in Clashindarroch forest is potentially of national importance. A report by the IUCN[1] concluded that there is no longer a viable wildcat population living wild in Scotland.

We note that it is intended to continue the close working relationship with Scottish Wildcat Action (SWA). We support the recommendations made to you by SWA at scoping and recommend that their proposed measures, for instance habitat improvements, are more clearly incorporated into the plan.

Regards

[1] Conservation of the wildcat in Scotland: Review of the conservation status and assessment of conservation activities, International Union for Conservation of Nature's Cat Specialist Group, February 2019

Letter from Historic Environment Scotland.

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

By email to:
mark.reeve@forestryandland.gov.scot

Mr Mark Reeve
Planning Forester
Scottish Forestry (Grampian)
Moray & Aberdeenshire Forest District
Portsoy Road
Huntly
Aberdeenshire
AB54 4SJ

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

nicola.hall@hes.scot

T: 0131 668 8919

Our case ID: 300027368

16 August 2019

Dear Mr Reeve,

Forestry Act 1967
Clashindarroch Land Management Plan

Thank you for your email of 9 July 2019 2019 seeking Historic Environment Scotland's views on the above.

Our comments concentrate on our statutory remit for world heritage sites, scheduled monuments, category A-listed buildings, historic gardens and designed landscapes and battlefields in their respective Inventories and historic marine protected areas: http://portal.historicenvironment.scot/downloads

Please contact the Council's archaeological advisors for their comments on any undesignated and unknown archaeology that may be affected by the proposals: archaeology@aberdeenshire.gov.uk

Potential impacts to be considered
I welcome the consideration given in the plan to the protection of heritage assets and the commitment to using the guidance in the UK Forestry Standard (UKFS).

Our previous response of 24 April 2019 (Our Ref: 300027368) identified two scheduled monuments within the land management boundary:

- **Wormy Hillock, henge 690m WNW of Finglenny (SM 3278):** http://portal.historicenvironment.scot/designation/SM3278
- **Gallows Hill Cairn, 460m SSE of Mains of Lesmoir (SM 11576):** http://portal.historicenvironment.scot/designation/SM11576

Historic Environment Scotland – Longmore House, Salisbury Place, Edinburgh, EH9 1SH
Scottish Charity No. SC045925
VAT No. GB 221 8680 15

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

And a third scheduled monument in the vicinity:

- **Tap o'Noth, fort (SM 63):** http://portal.historicenvironment.scot/designation/SM63

Scheduled monuments are legally protected sites under the Ancient Monuments and Archaeological Areas Act 1979. Any works to a scheduled monument requires the prior written consent of Scottish Ministers - a process known as Scheduled Monument Consent (SMC) which is administered by us. Such works include any felling or planting and SMC is separate to, and without prejudice to, any felling licenses or planting.

Specific comments on the proposals

Wormy Hillock, henge 690m WNW of Finglenny (SM 3278)
The monument comprises a late Neolithic or early Bronze Age henge which is situated below the SSE end of natural mound on the left bank of the Ealaiche Burn and in the vicinity of existing woodland.

I welcome that the monument will be marked out on the ground and excluded from any works within the scheduled area. I am also pleased to note that the monument will be monitored annually and maintained within an open area of ground with a 20m buffer around the scheduled area in order to manage the regeneration of vegetation, and that a this buffer will be extended to the NE by felling adjacent spruce trees.

Gallows Hill Cairn, 460m SSE of Mains of Lesmoir (SM 11576)
The monument comprises a Bronze Age burial cairn which is located within semi-improved pasture on the NE flank of The Peirk.

I welcome that the monument will be marked out on the ground and excluded from any works within the scheduled area. I am also pleased to note that the monument will be monitored annually and maintained within an open area of ground with a 20m buffer around the scheduled area in order to manage the regeneration of vegetation. I also welcome proposals to control rabbits with a fence in the first instance, but would recommend that you seek advice about any proposals to eradicate rabbits from within the scheduled area as this may require SMC.

While we are pleased with the proposed management of the monument, we do however have concerns about the new woodland creation comprising native broadleaf trees which are proposed in the adjacent fields outwith the buffer. The monument is presently located within a river valley with good, open views both from and towards the monument and towards, and from, other heritage assets in the surrounding landscape.

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The creation of new woodland will impact on its setting and its relationship with other heritage assets in the vicinity. As this has not been addressed in the plan, we strongly recommend that further consideration is given to this issue. It is difficult at this stage to be more specific about what might be more appropriate, but we would be happy to meet with you on site to discuss proposals that are more sympathetic to the setting of the monument.

Tap o'Noth, fort (SM 63)
The monument is outwith the land management boundary and is therefore not considered in the plan. However, we advise that any new woodland creation in the vicinity of the monument is carefully considered so that is doesn't impact on important views both towards, and from, the monument so that retains its prominence in the landscape.

I hope this is of assistance to you. Please contact us if you have any questions about this response. The officer managing this case is Nicola Hall who can be contacted by phone on 0131 668 8919 or by email on nicola.hall@hes.scot

Yours faithfully,

Historic Environment Scotland

Historic Environment Scotland – Longmore House, Salisbury Place, Edinburgh, EH9 1SH
Scottish Charity No. **SC045925**
VAT No. GB **221 8680 15**

Response to Historic Environment Scotland.

Thank you for your response to the consultation on the Clashindarroch draft land management plan. I have consulted with our archaeology advisor Matt Richie for his guidance.

The key **UKFS Good Forestry Practice Guideline** in relation to the **setting** of the historic environment within our planning framework is that we should "[11] *Plan an appropriate area of open space around features of historical significance; for Scheduled Monuments this will normally be a minimum of 20 m. Consider the setting as well as the individual features*" (UKFS 2017, 89).

Planning Teams should consider requirements for open space and setting on a case-by-case basis, such as the views to and from a significant designated site. In general terms, setting should be considered an important element to consider in relation to prehistoric funerary and ritual monuments (such as prominent burial cairns, standing stones and stone circles) [where views to and from the site may have had real cultural significance] and purposefully visible monuments (such as hill forts and castles) [where their original purpose was to dominate and command the landscape]. However, consideration of the landscape context and an assessment of cultural significance should influence any land management decision. In general terms, well-preserved, prominent and accessible sites will have more significance that poorly-preserved and inaccessible ones. The HES *Managing Change in the Historic Landscape: setting* (2016) guidance note provides lots of detailed discussion of setting in the context of the historic environment.

Gallow's Hill Cairn comprises a relatively well-preserved but visually unspectacular Bronze Age burial cairn. It is not prominent in the landscape nor appropriate for public presentation. The creation of new woodland as described within the LMP will have a limited impact on the immediate setting of the cairn (and may indeed be beneficial). Although Gallow's Hill has a potential contextual relationship with contemporary heritage features in the surrounding landscape (including the much-reduced stone circles of Nether Wheedlemont and Upper Ord 1km to the SE, and the cup marked boulder at Brawland 1km to the S), this wider landscape setting is fragmentary at best. The creation of new woodland as described within the LMP will have a limited impact on the cultural significance of the wider landscape setting of the cairn.

The Mains of Lesmoir site that includes Gallow's Hill Cairn already has an approved land management plan and we are simply including it, along with the other woodland creation sites around the periphery of Clashindarroch, into the current plan as an administrative exercise. When HES were consulted on the original Mains of Lesmoir plan the issue of the setting was not raised and additional open space was not requested therefore we do not intend to amend the current plan at this time.

All the best.

Letter from Living law on behalf of Wildcat Haven.

By email only: Mark.Reeve@forestryandland.gov.scot

FAO: **Mr Mark Reeve**

Planning Forester

Forestry and Land Scotland

Portsoy Road

Huntly

AB54 4SJ

LIVINGLAW

*"The **tradition** you'd expect from a Scottish Law Firm. The **innovation** to keep pace with a changing world."*

Our Reference: WHL/RR/2019/2/SDS

Your Ref: N/A

17 September 2019

Dear Mr Reeve,

Our Clients: Wildcat Haven C.I.C
Submission to Consultation on Draft Clashindarroch Land Management Plan
European Protected Species at Clashindarroch Forest, Aberdeenshire – European wildcat (*Felis silvestris*)

We refer to the above-mentioned consultation in respect of the proposed updates to the Clashindarroch Land Management Plan and to our previous submission to you (dated 16 August 2019).

On behalf of our clients, we welcome the decision to extend the period for comment by the 'public concerned' beyond the original consultation deadline in view of the busy summer period and the sizeable number of documents associated with this consultation. We have had the opportunity to review this matter in further detail within resource constraints at this time of year and are pleased to now be able to offer the following substantive comments to you for due consideration.

About our Clients

As previously advised, our clients are internationally recognised experts in the protection and preservation of the iconic wildcat species. We affirm that they have key knowledge and expertise which would assist greatly the conservation efforts in the Clashindarroch to ensure that sustainable forestry management operations are able to co-exist with the iconic wildcat. Our clients take this opportunity to underscore that the wildcat population within the Clashindarroch is of national and wider international importance. The population find at this site must now be responded to by FLS with the degree of seriousness which it merits. Our client's concerns have been well documented in substantive details to FLS (and its predecessor agency) previously. To this end, we welcome the updated Land Management Plan as progress in the right direction in beginning to address these matters, as well as others relevant to the forestry operations. However, thus far the proposals do not go far enough to address our clients concerns and fall far short in several key respects. On behalf of our clients, we seek that the plan is updated prior to finalisation to address these matters.

Governance Issues

- It is of key concern to our clients (as well as Living Law) that the governance arrangements proposed for the Clashindarroch appear to fall some way short of what is now considered best practice for good environmental governance (in line with the requirements of the UNECE Aarhus Convention).
- On behalf of our clients, we respectfully suggest that there is a discernible lack of inclusivity to ensure that the views of a range of stakeholders are taken duly into consideration at an appropriate stage when all options are open so that any differences of view about the overall conservation efforts, applicable legal requirements and best-practice can then be aired in the most constructive manner possible. For example, our clients do not accept or endorse the arbitrary "scoring" methods which are asserted by Scottish Wildcat Action (see, page 78 for example).
- We note that at page 33 it is acknowledged that *the "Clashindarroch is within the Strathbogie wildcat conservation area and they [the wildcat] are known to be present within forest. FLS is working with Scottish Wildcat Action to survey and monitor the population, improve habitat, provide artificial dens and ensure they are considered fully during the workplan process."* It is important that other relevant and interested stakeholders are afforded the opportunity to participate in this and similar such processes to guide and inform decision-making.
- Similar such comments apply at various places in the draft plan (including, page 59 at section 8.5.4, page 68, page 74 and 76).

Continued/ pg 1-of-4

Regulated by THE LAW SOCIETY of SCOTLAND

Living Law
346 Leyland Road, Wester Inch, Bathgate, West Lothian, EH48 2UA
• **m.** [+44] (0)7929 996105
e. contact@livinglaw.co.uk • **w.** www.livinglaw.co.uk

- This process of inclusivity is a formal policy objectives of the Scottish Government, following endorsement by the First Minister of the recommendations of the Human Rights Leadership Group. You may already be familiar with the said recommendations, but a copy of the final report and recommendations can be accessed here for ease of reference.
- In particular, Part 3 of the recommendations outlines the right to a healthy environment in Scotland – it is proposed that the "right to a healthy environment" will in due course be brought forward explicitly into Scots Law. This will include *"the right of everyone to benefit from healthy ecosystems which sustain human well-being as well the rights of access to information, participation in decision-making and access to justice"*. The content of this right will be outlined within a schedule to the forthcoming Act with reference to international standards, such as the Framework Principles on Human Rights and Environment developed by the UN Special Rapporteur on Human Rights and the Environment, and the UNECE Aarhus Convention. These are requirements which the Scottish Government and its agencies should already be adopting and in many instances are required to do so.
- By embracing these existing requirements of international environmental and domestic law (which will shortly be made more explicit for Scotland by virtue of the forthcoming Act) in the FLMP process, this will mitigate the prospect of further legal challenge(s) due to poorly managed forestry operations by helping identify activities and operations within the Clashindarroch which represent risks to the future conservation efforts at an early opportunity. Our clients reiterate that they are willing and wish to be actively and constructively involved in such efforts.
- We note the reference to our client's details at page 69 of the consultation – these should for future be updated to Dr Paul O'Donoghue / admin@wildcathaven.co.uk

Summary of Concerns

In addition to previous comments, our clients maintain that the consultation does not adequately recognise or address the threats posted to the Wildcat population by planned and future development activities. In particular, it is noted that a primary objective of the plan is stated as *"the management of the woodland for the production of a sustainable quality crop of timber"*. There are *"additional secondary objectives"* identified for the future management of the woodland in certain areas of the plan (which include the improvement of biodiversity potential in riparian corridors; the restoration of non-forest habitats; new woodland creation; and the maintenance of existing recreational facilities).

On behalf of our clients, we submit that a key objective of the management plan should also be ensuring compliance with existing and any future legal requirements through the plan-led process (including, in so far as they relate to key biodiversity and species protection considerations). Although we welcome the long-term view taken by the plan, equally it is important that reviews are undertaken at more regular intervals and that these include appropriate participation.

1. Windfarm Development

   - Our clients remain extremely concerned that the proposed windfarm development within the Clashindarroch poses a potentially terminal threat to the resident wildcat population. Following the release of the recent IPBES Report earlier this year, it is now recognised at the international level that the biodiversity crisis is of equal importance to that of the climate crisis. It is therefore essential that Government agencies demonstrate leadership in this field by ensuring that renewable energy developments are sited sensitively to take account of key biodiversity concerns (here, the critically endangered Scottish Wildcat).
   - We therefore welcome that the consultation explicitly does not pre-empt the outcome of the associated consenting determinations (page 18).
   - Any further updates to the LMP consequent on the outcome of the development consenting process must likewise also ensure due opportunities for public participation.

2. Current and Proposed Future Logging Plans

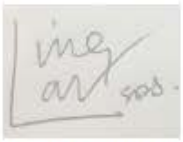
   - Our clients welcome and endorse the statement at page 78 by Scottish Wildcat Action that more research is needed to better understand the risks from commercial forestry operations. However, overall the plan still falls far short of demonstrating due recognition of the risks posed.
   - We reiterate that is essential that forestry operations are only conducted with specific licences in place in accordance with applicable EU law requirements. We are aware that to date such forestry operations have been, and are continuing to be, undertaken under generic licences which do not accord with these requirements.
   - At page 34 it is noted that *"operations can be scheduled to take place outside the relevant breeding season or, in the case of protected species, carried out under licence conditions from SNH"*. We stress that any such operations must only be authorised in accordance with the strictly framed derogations specified in Article 16 of the Habitats Directive. To this end, we submit that the proposed moratorium (proposed at page 81 of the SWA addendum) is required. Moreover, our clients support the stated need for checks for dens etc to be conducted at all times of the year.
   - Overall however, we remain concerned that the "Legal and Guidance note recommendations" outlined at page 79 are not comprehensive or robust. We would be happy to elaborate further on the basis of that assertion in dialogue with FLS staff.
   - Our client again stresses that investment must be made to ensure that there is a proactive management of the forestry operations in light of the presence of the wildcat (and other such protected species). This means that surveys must be undertaken to ascertain the whereabouts of key den and resting sites in order that appropriate mitigation strategies can be actively developed and implemented. We reiterate that our clients' expertise and data would be of considerable value to such efforts.
   -

- It is of concern that the approaches proposed in the LMP still remain too reactive. We reiterate that both the forestry staff and any contractors engaged by them must be given appropriate training to ensure that the impacts of their activities are understood and minimised.

We look forward to hearing from you and to acknowledgement of receipt of the foregoing.

Please do not hesitate to contact us should you require further information or clarification of any of the foregoing points raised.

Yours sincerely,



Ms Susan D. Shaw – LLM, LLB, DipLP, NP

Founder of Living Law; Member IUCN World Commission on Environmental Law; Expert Member, UN Harmony with Nature initiative

For and on behalf of Living Law

Response to Wildcat Haven via Living Law.

Forestry and Land Scotland
Coilltearachd agus Fearann Alba

Ms Susan D. Shaw
Living Law
346 Leyland Road
Wester Inch
Bathgate
West Lothian
EH48 2UA

Huntly office
Portsoy Road
Huntly
AB54 4SJ

Tel 0300 067 6380
mark.reeve@forestryandland.gov.scot

Regional manager
John Thomson

29 October 2019

Dear Ms Shaw

Response to public consultation on draft Clashindarroch Land Management Plan.

Thank you for your response to the public consultation on the draft Land Management Plan (LMP) for Clashindarroch on behalf of your clients Wildcat Haven.

It is suggested that there was a lack of inclusivity in the consultation process during the preparation of the draft LMP. In preparing the plan we consulted widely with a broad range of groups and individuals who have an interest in the management of Clashindarroch as can be seen in Appendix 1 (page 72) of the draft plan. This included holding a public drop in session to enable any interested party to raise and discuss any issues that was advertised both on our website and in the local press. Copies of the consultation documents were also sent directly, via the email address on Wildcat Haven's website.

Your clients request the opportunity to participate in discussions to guide and inform our decision making. As noted above we have consulted and worked with a wide range of stakeholders during the preparation of the LMP. More specifically in relation to wildcat management, Forestry and Land Scotland (FLS) is part of Scottish Wildcat Action (SWA), the joint partnership task force coordinated by Scottish Natural Heritage (SNH) to monitor and protect the Scottish wildcat. We encourage Wildcat Haven to work collaboratively with SWA partners to assist with the process of making well informed wildcat management decisions.

Wildcat Haven also suggest that ensuring compliance with existing and future legal requirements should be an objective of the LMP. In respect of this, section 2.7 (page 15) confirms that the management plan has been produced in accordance with applicable government and industry standards and guidance as well as recent research results. A full list of standards and guidance can be found at the link provided. FLS works with Scottish Forestry (SF), the industry regulatory body that approves all our LMP's, to ensure that each plan meets all relevant legal felling and

restocking requirements. Following SF approval, the LMP will be reviewed mid-way through the plan period (i.e. after five years) to ensure it continues to meet all relevant legal requirements; followed by a full more intensive review within ten years.

In terms of the ongoing management of the area, the need for specific licences for forestry operations within Clashindarroch is referred to. We are guided by SNH on this matter to ensure that all operations are compliant with Article 16 of the Habitats Directive and apply for any licences that we are advised are necessary. Also, in line with current best practice guidance, FLS routinely undertakes checks for dens and resting places prior to all operations at all times of the year.

Concerns are also expressed about possible impacts on the wildcat population of the proposed renewable energy developments within Clashindarroch. Any developments will require approval through the local planning authorities planning process. This process provides the opportunity for public comment on the proposed development.

Finally, your client stresses that investment must be made to ensure there is proactive management of forestry operations in light of the presence of wildcats. FLS and its partners undertake a range of surveys and monitoring to inform proactive management and mitigation measures during forest operations. We are happy to receive additional data from any stakeholders on wildcats along with details of the methods and protocols used to gather the information, and would be pleased to receive any such data from your clients to assist us in our work to conserve the wildcat population within Clashindarroch.

Yours sincerely

Mark Reeve

Planning forester
East Region
Forestry and Land Scotland

Scottish wildcat action recommendation and FLS response

	Recommendation	Response
1	Where available data from camera traps should be used to assess impacts to known wildcats from individual operations.	FLS Environment team are aware of the latest available data and feed into the work plan process prior to the commencement of any forestry operations. Additional site checks are made prior to any operations starting.
2	Retaining the rotational clear-felling operations in commercially managed areas will help maintain Clash as a site suitable for wildcats.	One of the aims of the current plan is to work towards a "normal" forest with an age structure where all ages of forest are present and so approximately the same area of clear-felling is undertaken in each five year plan period.
3	More research is needed to better understand the risks (and benefits) of commercial forestry operations.	FLS will continue to work in close co-operation with SWA to facilitate ongoing research within Clash. The HLF project ends in 2020, but the SWA partnership will continue and the steering group will continue to meet. FLS will be partners in the new funded project #SWAfor Life, which will be led by RZSS. This project will focus on conservation breeding of wildcats.
4	Risk from loss of grassland, scrub and gorse areas.	The plan includes the planting of 241ha of broadleaf woodland which will have a more diverse shrub and ground vegetation layer than conifer forest. These areas are targeted to riparian corridors, windfarm areas and Darroch Wyds sites and includes new planting and restocking.
5	Risk from physical destruction of den sites.	The latest data from camera trapping and additional site checks by FLS staff are used to inform the detailed planning of all operations to ensure the risk of damage to dens sites is minimised. Areas of natural reserve have been identified to help provide undisturbed denning sites. Areas of wind blow will be identified and retained as deadwood habitat to provide additional denning opportunities. If dens sites are located they will be excluded from operations and/or the necessary licenses will be applied for to allow the operation to be completed.
6	Risk of disturbance of breeding sites by vehicles, noise and people.	The latest data from camera trapping and additional site checks by FLS staff are used to inform the detailed planning of all operations to ensure the risk of disturbance to breeding sites is minimised. There are no plans to increase the level of recreation with the plan

		area so no additional disturbance from this source is envisaged. All larger recreational activities are subjected to a permissions process that allows environment colleagues the opportunity to highlight any potential disturbance issues and the event can then be relocated, rescheduled or other mitigation measures put in place.
7	Risk of collision with vehicles.	All FLS staff and contractors are informed of the presence of wildcats in the forest at contract pre commencement meetings. A 15 mph speed limit is in place on forest roads. All staff are aware of this and it is part of the terms on all contracts.
8	Forest Guidance Note 35d:Forest Operations and Wildcats in Scotland should be followed.	All planning and operations will all be undertaken to ensure Forest Guidance Note 35d is adhered to at all times.
9	FGN 35d states - "In site with recent signs and/or local records [of wildcats] you should carry out basic survey work to establish whether wildcat are using your woodland and identify possible den sites". The whole of Clash forest falls under this definition so pre-work checks are therefore required on all work sites. Such checks should be carried out at all times of year.	FLS Environment team are aware of the latest available data and feed into the work plan process prior to the commencement of any forestry operations. Additional site checks are made prior to any operations starting.
10	FGN 35d states “If physical evidence of a den site is found, mark an exclusion zone of 200m around the site… avoid carrying out operations in the vicinity [completely] or carry out operations between August and January when wildcats are not breeding”	All operations will all be undertaken to ensure Forest Guidance Note 35d is adhered to at all times.
11	FGN 35d states “If dens are found during operations, halt work immediately and seek advice form SNH on how to proceed. If operations are necessary within the exclusion zone / time above, you must apply for and obtain a license”	All operations will all be undertaken to ensure Forest Guidance Note 35d is adhered to at all times. This clearly states that should a den site come to light during operation all work will stop immediately and the relevant licence will be applied for to complete the operation.
12	In some felled coupes, especially larger coupes, look to retain patches of cover.	Where appropriate areas of cover a present these will be highlighted by the FLS environment team for retention and included in the work plan prescription for the site.
13	Preserve features that offer cat denning opportunities such as rocks cairns and outcrops, ruined buildings, stone dykes, large brash piles, wind-throw areas etc.	Where such features are found they will be highlighted by the FLS environment team and excluded from the operation. They will be highlighted in the work plan prescription for the site to ensure operators on site are aware of their presence.

14	Promote areas of unimproved grassland and fringe scrubland that offer valuable prey habitat and hunting opportunities for wildcats	Where these habitats are found they will be highlighted by the FLS environment team and included in the work plan prescription for the site. Areas where these habitats can be expanded will also be highlighted and included in the detailed planning of the site.
15	Ensure connectivity of habitat types for prey species such as unimproved grassy corridors for short-tailed vole Microtus agrestis.	Opportunities to improve the connectivity of this habitat will be highlighted by the FLS environment team and included in the work plan prescription for the site. This will include improving riparian corridors and linking them with existing and new open ground areas.
16	Where possible avoid or reduce disturbance during the breeding season (Feb to July).	All operations will be undertaken to ensure Forest Guidance Note 35d is adhered to at all times. The risk of direct harm to wildcats is very small given the respective spatial and temporal scales at which wildcats and operations occur. All available data from camera traps, site checks and from third parties will be used to inform the planning of operations. FLS will continue to risk assess on an operation-by-operation basis. Operations during the breeding season that are estimated to carry a high risk for wildcats will be deferred to a time out with the breeding season. Timber market, operational and environmental considerations make it very difficult to commit to a total ban on felling operations in Clashindarroch during the wildcat breeding season. Although FLS undertake all the "recommended precautions" detailed in the "risk matrix" approach recommended by Roo Campbell in his letter of 4/2/19 we will not formally be adopting the use of the "risk matrix". The recommendations in the "risk matrix " are all based on FGN 35d which we will be adhering to at all times. If research indicates that such an approach is necessary, then FLS will alter this position. However, ongoing research indicates that wildcats primarily use areas not subject to felling operations e.g. previously clear-felled areas and open habitats. Felling of closed canopy crops is unlikely to have a direct impact on wildcats, because they largely avoid this habitat type. However clear felling of these and all other crop types will be subject to detailed site checks prior to commencement. FLS will work with SWA and Wildcru to derive a scientific estimate of the level of risk to breeding wildcats from felling operations, and will alter policy if necessary.

17	Where possible spread out work areas affected in a given year and consider the cumulative effect of all operations, not just felling, to avoid affecting the whole of an individual wildcat's territory negatively.	The site objectives meetings look at all the operations (work plans) planned in any one year and provide the opportunity to identify where the accumulative effects of those operations could negatively affect wildcats. Operations will then be rescheduled to avoid such negative impacts on wildcats. During discussions with SWA it was suggested that a wildcat breeding territory was around 6 km^2 and that no more than 20% of any one territory should be subject to disturbance during a single operation. However FLS believe that the 120ha per 600ha 'rule' is arbitrary and is not founded on any research on the impact of disturbance of wildcats. There is no published evidence to support this rule. However, FLS will assess the potential for, and consider the merit of, developing such an empirical rule, based on the ongoing WildCru research project. In the meantime, FLS planners will make every effort to distribute felling work as evenly as possible in space and time.
18	Plan to provide escape routes/ corridors of cover to other shelter areas during works for all wildlife.	All operations will all be undertaken to ensure Forest Guidance Note 35d is adhered to at all times.
19	Look to retain any hotspot sites of wildcat activity identified, even if not a den site or assess whether mitigation can be carried such as habitat creation nearby.	Where such hotspots occur they will be highlighted by the FLS environment team and retentions and/or mitigation measures will be put in place.
20	In the absence of a formal pelage score from detailed observation or camera trap images by trained staff, assume a tabby striped cat with a blunt tail and no white feet is a wildcat.	Where evidence to the contrary is not available all tabby striped cats with a blunt tail and no white feet will be assumed to be a wildcat.
21	Be proactive in surveying for cats and finding dens, if possible regularly and in advance	FLS Environment team undertake site checks are made prior to all operations starting.
22	Improving Habitats for Wildcats	Opportunities to improve the forest habitat for wildcats will be highlighted by the FLS environment team and included in the work plan prescription for the site.
23	Retain more scrub and gorse areas for rabbits and therefore wildcat hunting habitats.	Opportunities to retain and/or increase such habitats will be highlighted by the FLS environment team and included in the work plan prescription for the site.
24	Planting hedgerows, corridors and promoting connectivity between forest blocks.	This is work that is most appropriate out with FLS managed land and therefore out with our control.

25	Since clear fell and restock sites have been identified as used by wildcats for hunting, the fallow period for clear-fell sites could be extended by a year or two if the landowner felt that there was additional benefit in reducing weevil infestations as it would also maintain vole-rich grassland for longer – but we respect that this is ultimately a commercial decision	The length of fallow period is primarily decided by use of the Hylobius decision support tool. Where there would be a benefit to extending this beyond the recommended timescale this will be highlighted by the FLS environment team.
26	We would encourage additional natural den site creation, for example: retaining some small wind-throw patches, or cross-felling some low value standing timber near stand edges, or creating some brash-piles in clear-felled areas, all of which may create denning opportunities for wildcats.	Opportunities to increase the number of potential den sites will be highlighted by the FLS environment team and included in the work plan prescription for the site. This will include the designation of areas of natural reserve and the retention of appropriate windblown areas as deadwood habitat.
27	Don't create large areas of denning habitat such as brash piles or wind throw where they will need to be disturbed in future - plan to leave such brash piles permanently as habitat features.	Through planning and programming we will endeavour to avoid creating potential den sites that may need to be disturbed in the future.
28	Providing artificial cat den sites- in old buildings or artificial cairns etc. FES in Angus had pioneered artificial wildcat den creation, the design of which can be learned form.	FLS Environment team will consider the use of artificial den sites in appropriate locations.
29	SWA would like to see the relationship between SWA and FLS staff continue for the duration of the project	FLS will continue to work in close co-operation with SWA staff.
30	FLS staff will need to apply for an SNH license to camera trap wildcat den sites in future - rather than working under SWA license as currently.	All the appropriate licences will be applied for to ensure all work in Clash is carried out legally.
31	FLS needs to ensure its environment rangers are enabled to carry out effective wildcat surveys by training and the provision of resources and time.	Environment rangers will receive the appropriate level of training to allow them to undertake the site checks required. They will be provided with the resources and time allocation to allow these checks to be undertaken to the appropriate standards.
32	We would encourage the regular use of the Wildcat Den Awareness hand-out with all future contractors.	The Wildcat Den Awareness hand-out will be provided to all contractors at pre-commencement meetings. FLS staff will be regularly reminded of and/or reissued with the hand-out.
33	Resourcing the environment team to undertake thorough checks of all Clashindarroch work sites well before works commence- ideally integrating these checks into long term work plans to allow long lead times. Also invest in camera traps and train more staff in the techniques for den site ID and surveys	FLS Environment team will continue to undertake pre-operational site checks before any operations starting. The HLF project ends in 2020, but the SWA partnership will continue and the steering group will continue to meet. FLS will be partners in the new funded project #SWAfor Life, which will be led by RZSS. This project will focus on conservation breeding of wildcats.

34	FLS staff adopting a 'risk matrix' approach to decide which areas require the most attention and which types of forest works present the greatest risks to wildcats.	All operations will all be undertaken to ensure Forest Guidance Note 35d is adhered to at all times.
35	FLS researching and considering adopting novel ways of undertaking such pre- work checks more efficiently and cost effectively. For example the use of trained specialist contractors with pointer dogs to identify cat dens may be an excellent way of covering large areas efficiently and vastly improve den finding. Similarly there are some Ecological contractors who specialise in den site detection using snow tracking, and investment in their services may ultimately save time and money.	FLS is investigating alternative approaches.
36	Wildcats are most vulnerable during their breeding season (March to August but which peaking in April to June) when they have dependant young in den sites, which are of course legally protected. Wildcat mothers may move dens regularly. We recommend an evaluation on whether a trial voluntary moratorium of high risk forest activities during this period in Clashindarroch would be feasible. We recognise that such a broad brush approach to scheduling forestry operations may entail opportunity costs, such as other environmental impacts from rescheduling operations to other times of year, or reducing the area that can be felled annually (with knock-on effects for prey habitat created by clear-felling). A good first step would be assessing these environmental costs alongside a scientific estimation of the level of risk to breeding wildcats from felling operations.	FLS will commission work to estimate the level of risk to breeding wildcats from felling operations. However the risk of direct harm to wildcats is very small given the respective spatial and temporal scales at which wildcats and operations occur, and given we conduct pre-operational checks.
37	FES to impose exclusion zones on their work plan maps around any wildcat dens sites identified, similar to those already used for other at risk species such as Goshawks, so these are easily visible to and understood by all staff.	FLS will impose exclusion zones around breeding sites during the breeding season.

38	FES should consider running their own long term assessment of whether such measures affect or benefit the wildcats in Clashindarroch over the term of the FMP.	FLS will continue to support research on the cat population on FLS land.

Wildcat haven recommendations and FLS response

	Recommendation	**Response**
1	A reasonable timeframes to enable the public to prepare and participate effectively in them. Moreover, that such consultation must take place at an early stage when all options are open for consideration.	The timeframe for consultation responses was extended. Wildcat Haven were included in the initial scoping for the plan.
2	Do not accept or endorse the arbitrary "scoring" methods which are asserted by SWA.	The pelage scoring method advocated by SWA is the agreed scientific method used to identify a wildcat where no DNA evidence is available. The FLS use a lower level of scoring than SWA to identify wildcats to ensure there is a safe margin of error.
3	Contact details of Wildcat Haven are incorrect.	The contact details have been corrected as requested.
4	The plan needs to be regularly reviewed.	As with all LMP's the plan will undergo a formal recorded plan review after five years. However the plan will be under constant informal review to ensure that it conforms to the latest legislation, policy and guidance throughout its lifetime.
5	Extremely concerned that the proposed windfarm development poses a potentially terminal threat to the resident wildcat population.	The windfarm development will need to gain approval from the Energy Consent Unit of Scottish Government. This will involve a public consultation process and the production of an Environmental Impact Assessment. If the windfarm development is ultimately approved then this will supersede the LMP for the development area.
6	The current and proposed future logging plans pose a serious threat to the resident wildcat population. We submit that this risk is still not being properly or fully assessed in line with the applicable EU law requirements	FLS believe the plans for Clashindarroch are compatible with wildcat conservation and are compliant with EU and UK legislation. FLS will continue to take advice from stakeholders, including SNH, on all aspects of wildcat conservation in Clashindarroch.

7	Current survey and mitigation efforts are woefully inadequate.	Survey and mitigation measures currently in place follow best practise guidance. FLS works closely with SWA to ensure the best practise is used. If the advice changes then the approach will be updated to reflect the revised advice.
8	Logging has previously and is currently being carried out in the wildcat breeding season which renders such activities illegal.	Prior to all felling operations sites are checked to ensure that no denning sites will be impacted by the operation. See comments at point 36 above.
9	The governance arrangements proposed for the Clashindarroch appear to fall some way short of what is now considered best practice for good environmental governance (in line with the requirements of the UNECE Aarhus Convention).	The Land Management Plan consultation process used by FLS is designed to ensure that local people, relevant organisations and other interested parties have reasonable opportunities to participate equitably and without discrimination. This approach is consistent with approaches to public participation in decision making advocated by the Aaruhus Convention.
10	There is a discernible lack of inclusivity to ensure that the views of a range of stakeholders are taken duly into consideration at an appropriate stage when all options are open so that any differences of view about the overall conservation efforts, applicable legal requirements and best-practice can then be aired in the most constructive manner possible.	Wildcat Haven were sent the original scoping documentation, along with all the other consultees listed in the plan, and invited to feed into the process at that early stage. No response was received from Wildcat Haven. Appendix 2 - Final consultation record highlights all the comments made during the consultation process details how they have all be addressed and the plan amended where appropriate.
11	We note that at page 33 it is acknowledged that the “Clashindarroch is within the Strathbogie wildcat conservation area and they [the wildcat] are known to be present within forest. FLS is working with Scottish Wildcat Action to survey and monitor the population, improve habitat, provide artificial dens and ensure they are considered fully during the work plan process.” It is important that other relevant and interested stakeholders are afforded the opportunity to participate in this and similar such processes to guide and inform decision-making.	Wildcat Haven, and a wide range of other stakeholders, were invited to comment at the initial scoping stage and again during the consultation on the final draft plan. FLS is part of SWA, the joint partnership task force coordinated by Scottish Natural Heritage (SNH) to monitor and protect the Scottish wildcat. We encourage Wildcat Haven to work collaboratively with SWA partners to assist with the process of making well informed wildcat management decisions.
12	A key objective of the management plan should also be ensuring compliance with existing and any future legal requirements through the plan-led process (including, in so far as they relate to key biodiversity and species protection considerations).	The following text has been added to section 4.3 LMP objectives "The improvement of the forest habitat for European Protected Species (EPS) and other protected species present;"

13	Any further updates to the LMP consequent on the outcome of the windfarm development consenting process must likewise also ensure due opportunities for public participation.	The planning process for the windfarm development will include the opportunity for public comment and if the application is approved this will supersede the LMP which will need to mirror the planning approval.
14	Welcome and endorse the statement at page 78 by Scottish Wildcat Action that more research is needed to better understand the risks from commercial forestry operations. However, overall the plan still falls far short of demonstrating due recognition of the risks posed.	FLS have worked with SWA to ensure the current plan takes into account the latest research information available and also adheres to Forest Guidance Note 35d. See also the comments at points at 34, 35 & 36 above.
15	It is essential that forestry operations are only conducted with specific licences in place in accordance with applicable EU law requirements. We are aware that to date such forestry operations have been, and are continuing to be, undertaken under generic licences which do not accord with these requirements.	We are guided by SNH on this matter to ensure that all operations are compliant with Article 16 of the Habitats Directive and apply for any licences that we are advised are necessary. Also, in line with Forest Guidance Note 35d, FLS routinely undertakes checks for dens and resting places prior to all operations at all times of the year. If any are found then they will be avoided and/or the necessary licence to undertake the work will be applied for.
16	We stress that operations must only be authorised in accordance with the strictly framed derogations specified in Article 16 of the Habitats Directive. To this end, we submit that the proposed moratorium (proposed at page 81 of the SWA addendum) is required. Moreover, our clients support the stated need for checks for dens etc. to be conducted at all times of the year.	We are guided by SNH on this matter to ensure that all operations are compliant with Article 16 of the Habitats Directive and apply for any licences that we are advised are necessary. Also, in line with Forest Guidance Note 35d, FLS routinely undertakes checks for dens and resting places prior to all operations at all times of the year. See comments at point 36 above.
17	We remain concerned that the “Legal and Guidance note recommendations” outlined at page 79 are not comprehensive or robust.	FLS have worked with SWA to ensure the current plan and ongoing operations comply with Forest Guidance Note 35d. We would urge Wildcat Haven to engage with SWA to discuss any concerns they may have SWA recommendations and/or advice.

18	Investment must be made to ensure that there is a proactive management of the forestry operations in light of the presence of the wildcat (and other such protected species). This means that surveys must be undertaken to ascertain the whereabouts of key den and resting sites in order that appropriate mitigation strategies can be actively developed and implemented. We reiterate that our clients' expertise and data would be of considerable value to such efforts.	FLS and its partners undertake a range of surveys and monitoring to inform proactive management and mitigation measures during forest operations. We are happy to receive additional data from any stakeholders on wildcats along with details of the methods and protocols used to gather the information, and would be pleased to receive any such data from your clients to assist us in our work to conserve the wildcat population within Clashindarroch.
19	It is of concern that the approaches proposed in the LMP still remain too reactive. We reiterate that both the forestry staff and any contractors engaged by them must be given appropriate training to ensure that the impacts of their activities are understood and minimised.	The LMP sets out the long term plan for the management of the forest and details the coupes planned for felling, thinning and restocking for the next ten years. The work plan process is initiated approx. two years prior to the start of operations. The provides time to undertake pre-operational checks and camera trapping to establish the presence or otherwise of wildcats. Them work plan details the prescription for the work to be undertaken and this is carried forward into contracts and is passed to onsite operators at a pre-commencement meeting. The Wildcat Den Awareness hand-out will be provided to all contractors at pre-commencement meetings. FLS staff will be regularly reminded of and/or reissued with the hand-out.

Appendix 3 – LISS prescriptions

- The size and number of groups in the group selection is indicative only. The actual size will depend on the conditions found in each coupe.
- The shape of the groups in the group selection coupes do not have to be circular. Oval shaped with the long axis orientated to receive the most light is preferred.
- The location of the felling areas in the group selection coupes will be located to reflect the conditions in each coupe. Felling areas will be located to:
    - expand existing groups,
    - start new groups taking advantage of existing natural regeneration,
    - start new groups in areas where there is currently no natural regeneration.
- The preferred restocking method is by natural regeneration. However if restocking by natural regeneration is
  not successful within 10 years of felling then the option of replanting will be discussed with FS.

LISS no. (See map 8)		Management objective / Reason for selection	Long-term structure and desirable species	Age Trans. period and return time (years)	Regeneration and ground flora	Observations (e.g. likely barriers to achieving objective)	Next treatment required	Other useful information
1	Group selection 145.2ha	Create a diverse forest structure to help retain the maximum amount of snow for cross country skiing.	Complex structure. 50% SS, 20% NS & 30% MC	Age – 58+ years Trans period – 100 years Return time – 7 years	Some SS regeneration under SP & larch crops. In the other parts regeneration is sparse due to current light levels.	Deer browsing & weed competition. Incorrect thinning to create stable future seed trees.	Selective thinning and fell groups (12 1ha groups).	Area of group felling reduced from 24ha, which is what would be needed to complete conversion within 100 year period, to allow the reaction of the crop to such an intervention to be assessed before taking the full required

								cut.
2	Group selection 43.8ha	Create a diverse forest structure to help retain the maximum amount of snow for cross country skiing.	Complex structure. 90% L & 10% MC	Age - 65 years Trans period – 200 years Return time – 7 years	Some SS regeneration under SP & larch crops. Very little SP & larch due to grassy ground flora.	Incorrect thinning to create future stable seed trees. Weed/ground flora competition.	Selective thinning.	When groups felled in future replanting will be necessary to maintain species diversity.
3	Group selection 33.7ha	Create a diverse forest structure to help retain the maximum amount of snow for cross country skiing.	Complex structure. 100% SS	Age - 49 years Trans period – 80 years Return time – 7 years	Little regeneration due to low light levels.	Incorrect thinning to create future stable seed trees.	Selective thinning.	
4	Group selection 99.9ha	Create a diverse forest structure to help retain the maximum amount of snow for cross country skiing.	Complex structure. 90% SS & 10% LP	Age – 36 years Trans period – 80 years Return time – 7 years	Little regeneration due to low light levels. SS regeneration in felled areas.	Incorrect thinning to create future stable seed trees.	Selective thinning.	
5	Group	Create a diverse	Complex	Age – 23	Young	Incorrect	Crown	

	selection 38.5ha	forest structure to help retain the maximum amount of snow for cross country skiing.	structure. 100% SS	years Trans period – 80 years Return time – 7 years	plantation	thinning to create future stable seed trees.	thinning when coupe reaches thinning age.	
6	Group selection 15.9ha	Create a diverse forest structure to help retain the maximum amount of snow for cross country skiing.	Complex structure. 100% SS	Age – 16 years Trans period – 80 years Return time – 7 years	Young plantation	Incorrect thinning to create future stable seed trees.	Crown thinning when coupe reaches thinning age.	
7	Long term retention 647.6ha	Retain broadleaves to create species diversity.	Complex structure. 100% MB	Age – Various Trans period – 200 years Return time – 7 years is appropriate	Mostly young planted MB areas.	Competition from conifer regeneration.	Thin/remove conifer regeneration when adjacent coupes are being thinned.	

Appendix 4 – LISS management

LISS is an approach to forest management in which the forest canopy is maintained at one or more levels without clearfelling.

The word 'approach' is important because:
• we are not following a system;
• there are no standard prescriptions; and
• flexibility is important – to take advantage of opportunities as they arise.

Any preconceived ideas about systems of managing forests can act as a 'straight jacket' to thinking about CCF.

Stands that have been regularly thinned are more likely to be successful with CCF. Crown thinning will be undertaken when transforming stands to CCF rather than low or intermediate types, as used in plantations. The basis of crown thinning is to remove competition from around selected trees (Frame trees), even if the trees to be removed are as big. Using crown thinning usually increases the average tree size, so there is potential for more income.

There are two main types of structure:
• Simple – in which there will be one or two canopy layers of trees
• Complex – where there are three or more canopy layers of trees

1. Transformation of a young (<40 yrs) stand to a simple structure

The objective is to achieve reasonably even regeneration of the desired species and then remove the canopy in a number of thinnings.

- Early crown thinning will be heavier (10-20%) than management table intensity and aim to develop 100 equally distributed 'frame' trees per hectare.
- 'Frame' trees are well-formed dominant trees with good crowns at reasonably even spacing.
- When the trees begin to cone (see table 1 below) stands will be thinned to the basal areas shown in table 2 to develop good conditions for regeneration to establish.
- If/when natural regeneration occurs it will be more variable than on a planted site, giving more variability in age, density and species.
- Canopy removal will aim to maintain a leader-to-lateral ratio of >1 in the regeneration (see figure 1), generally this will be achieved using the basal areas in table 2.
- The final removal of the overstorey may not involve all the trees depending on management objectives and windthrow considerations (green tree retention).

- If natural regeneration is only partially successful in terms of number and species mix planting will be undertaken. Planting will be concentrated so the location of trees is known and they can be maintained. This will be by using a minimum of 16 trees in distinct group with the trees planted at 1.5 m x 1.5 m to form robust groups.
- If natural regeneration has been completely unsuccessful and CCF is still seen as appropriate planting will be undertaken to form the new canopy layer.
- Before planting the stand will be thinned to the basal areas for 'seedling growth' in the table 2.
- The felling and extraction of the canopy trees will be considered when deciding where to plant.
- Planting will be at 2500 trees per hectare in a well-defined pattern so they can be found for subsequent maintenance. 'Blanks' will be left when the planting position is close (<1 m) to canopy trees. This should ensure restocking compliance with OGB 4, as the area under the canopy is not part of the net area.
- Attention will be paid to site preparation, vegetation management, plant quality and reducing the impact of mammals to make sure of successful establishment. In general opportunities for site cultivation will be constrained by the overstorey.
- If the established crop is between the ages of 20 and 40 years, a transformation period of up to 50 years is expected.

Table 1. Species seed production details.

Species	Age of first good seed crop	Age of max seed production	Interval between good seed crops (yrs)
Sitka spruce	25-35	40+	3-5
Scots pine	15-20	60+	2-3
Douglas fir	30-35	50+	4-6
European larch*	25-30	40+	3-5
Japanese larch*	15-20	40+	3-5
Hybrid larch*	15-20	40+	3-5
Western hemlock	25-30	40+	2-3
Corsican pine	25-30	60+	3-5
Lodgepole pine	15-20	30+	2-3
Norway spruce	30-40	50+	**
Noble fir	30-40	40+	2-4
Grand fir	35-45	40+	3-5

Table 2. Basal area guidance for natural regeneration

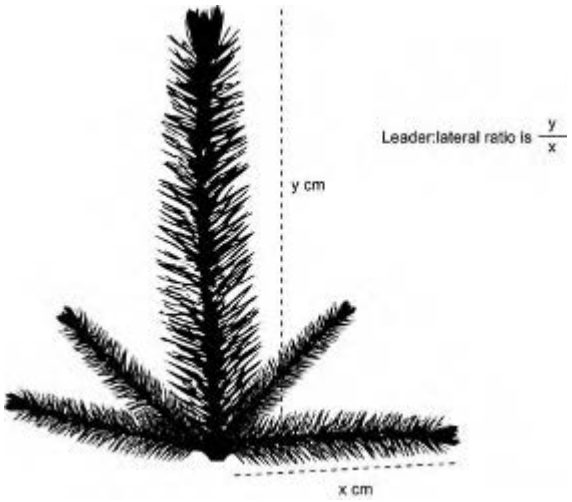
Species/ group	Shade tolerance of seedlings	BA (m2 ha-1) Establishment*	BA (m2 ha-1) Seedling growth**
Larches	Intolerant	20-25***	15-20
Pines	Intolerant	25-30***	20-25
Sitka spruce	Intermediate	30-35	25-30
Douglas fir	Intermediate	35-40	30-35
Norway spruce	Tolerant	40-45	35-40
Western hemlock	Tolerant	40-45	35-40

* On moderate to fertile sites where vegetation regrowth will be faster and more severe the BA for establishment will be increased.

** Seedlings and saplings are growing well under a canopy when the ratio of the length of the leader to the length of laterals in the upper whorl is ≥1, as shown in figure 1.

*** Stands of larch and pine at these basal areas will usually have well-developed ground vegetation layer and control or cultivation will be needed to start regeneration.

Figure 1. Leader-to-lateral ratio.



2. Transformation of a young (<40yrs) stand to a complex structure

The objective is to create a wider dbh range than under a simple system by:
- retaining small trees; and
- encouraging fast growth of selected frame trees

- The pattern of regeneration will be different to a simple structure, and will be arranged in groups that only cover up to 20% of the area at any one time.
- Up to 50 'Frame' trees will be selected per hectare and these will be crown thinned so as to keep as many small trees as possible.
- 'Frame' trees are stable, well-formed dominant trees. They may need to be present on the site for a long time; spacing should be 'clumpy' and not regular. Stable trees will have a larger diameter for a given height.
- The stand will be thinned to a residual basal area of about 18-25 m2 per ha for larches and pines, and 25-35 m2 per ha for spruces and Douglas fir. The choice within this range will depend upon the site and the balance between the overstorey and any regeneration. If there is little or no regeneration a higher value will be chosen to provide suitable conditions for seedlings to establish. If there is enough regeneration, which needs to be released, then a lower value will be favoured. The aim at each thinning is to remove enough trees to achieve the chosen residual basal area.
- If there is too much regeneration thinning will be concentrated on releasing the best regeneration and attempting to hold it back in other areas.
- Planting in complex structures will be considered to increase chances of success.
- Trees will be planted in canopy gaps of 0.1 ha minimum size.
- Trees will be planted in half the area of the gap in the centre.
- Close spacing (1.5 m x 1.5 m) will be used to make the groups robust. For example, when planting a canopy gap of 0.1 ha 200 trees will be planted at 1.5 m spacing on half the area in the middle of the gap. Close spacing will ensure rapid canopy closure and planting only half the area ensures minimal competition from the canopy trees, allowing opportunities for natural regeneration and increasing operational access.

3. Transformation in older (>40yrs) stands

Transformation of stands older than 40 years may be possible, especially on wind-firm sites, but the opportunity to steer the development of the young stand in thinning has been lost.

The main implications of this are:

- for simple systems there will be reduced opportunities for developing the crowns of 'Frame' trees and the window for natural regeneration is reduced. Therefore more 'frame' trees will be retained and a longer regeneration period used.
- in complex systems the main risks are that 'Frame' trees will become too large to be marketable, and the stand will still be quite uniform when windthrow starts. The aim is to establish groups of regenerating seedlings under an irregular overstorey while older trees are progressively felled.

Appendix 5 – SFA site visit report

Date: 6th December 2017

Present
Alastair Younger (for Black Middens and Merdrum)
Jackie Cummerbirch
Richard Thompson

Background
Three New Native Woodlands were established through the Scottish Forest Alliance (SFA) project in the 2002/2003. The Sustainable Forestry Scottish Charitable Incorporated Organisation (SF -SCIO) was set up as a successor project to the SFA. I took over from Alan Stevenson on the Board of Trustees in October 2017 and am in the process of travelling round the SFA sites that I am less familiar with. Staff within M&A area were unclear as to management options for a number of issues and were looking for some clarification.

Black Middens
This New Native Woodland (NNW) was established on a high elevation site on the south-east edge of the existing forest estate. It was initially decided to use electric stock fencing as this was thought to be adequate to dissuade deer. However, it shorted on vegetation and proved ineffective. Resulting browsing impact was variable, being severe in places but only targeted at palatable species in others. There had been good stocking across the site initially but subsequently widespread birch dieback which was possibly related to provenance as some birch have grown well. It is also possible that some birch were *B. pendula* and some were *B. pubescens*. For the purposes of this note, I will divide the site into three: south-west, central and north-east.

North-east
This section has established fairly well with less palatable species such as birch and bird cherry generally growing well. Oaks in particular have been heavily browsed since planting although there are occasional oaks getting away. If

local protection of oaks can be sorted out, this area will establish into a good NNW in the fullness of time and is beginning to sequester carbon in a meaningful way.

Central

This area has the worst establishment. Frequent dead birch stems can be seen. There are a few live stems although, again the more palatable species have been heavily browsed. A major beat-up will be needed to bring this section up to standard. Suggested species are rowan, hawthorn and downy birch with a 20% sessile oak component. Soils here appear to be upland brown earths although there was limited evidence for this. In the lower section towards the mire, purple moor-grass indicates that eared willow will be the best species. If you can get local provenance dark-leaved or tea-leaved willow from high elevation, these will be suitable species too. Locating appropriate planting material may be difficult though. Bizarrely, this site is in the same seed zone as Ben Lawers so you could see if material was available from their NTS nursery subject to framework contract obligations with Cheviot. As this site is not near a new population, matching truly local provenance is not as critical.

NTS will have dark-leaved willows from high elevation which will be better than something really local from lower elevation. If you *can* get hold of any dark-leaved willow, plant this in the more fertile moist/wet locations.

We agreed that ideally, this site should be deer fenced as there is strong migration of red deer from neighbouring estates. There are so few trees remaining in this section that an excavator can be used for ground prep.

South-west

This area has abundant tufted hair-grass which indicates that it is surface water gley and well suited to a NVC W7 community. There is c. 30% stocking of the original planting with alders growing really well and providing some shelter. Again, there is access for an excavator here and I would beat up with mainly common alder and some groups of hawthorn on drier soils; grey willow on wetter soils. Ideally, this area should be included in the deer fence as well.

There was some excellent common juniper growing above this section which was apparently planted. Unfortunately, this species cannot be included in any beating up due to outbreaks of *Phytophthora austrocedri* in the locality.

Merdrum

NNW is very well established across this site except within the designated open areas and the shelterbelt (see below). The main deer fenced areas are becoming dense thicket and some respacing will be needed over the next 10 years to ensure the continuity of shrubs/understorey species (e.g. hazel and hawthorn) although there are some groups of these species that will survive further canopy closure of high forest species. Most if not all rowan have suffered with a canker and we wondered about the provenance used. It would be good to do some innovative felling such as what used to be known as sloping benches; keeping the tree on the stump so that it continues to grow as a phoenix. Similarly, opening up some patches to promote open grown trees would be good as would leaving other areas unthinned to minimise vegetation competition so that we can consider introducing woodland flora through sowing or use of plugs (Rick Worrell is doing a project on this currently).

There has been high deer pressure in the exclosure for some time judging by the strong browse-line and old bark stripping on elms. It would be good if deer could be pushed out and the fence re-secured.

The shelterbelt running north/south at the western end of the site has not been felled yet (apart from a roadline corridor has just been felled – see below). The original aim of the Clash NNW management plan (which described work planned under the SFA project) intended this to be felled and planted with a W19,18,17 mixture. There is a new forest road-line in the process of being constructed up through this shelterbelt and across a small field into an adjacent felling coupe off the SFA area (see image below: Alastair demonstrating the link across the field). Part of the object for this visit was for AY to show me this to make sure that the route is acceptable to the SF – SCIO. I will discuss this road with other members of the board at our next meeting. We agreed that the shelterbelt should all be felled whilst the road is being prepared and that the ground should be restocked with native woodland. Judging by adjacent vegetation, a NVC W11 community is likely to be suitable

(sessile oak, birch dominated with some rowan and hazel in large groups/ on edges). This section was not included on Mark Reeves's validation map.

The section of planting to the north-west is similarly not included on the validation map. It is dominated by planted Scots pine and the ground flora again indicates NVC W11 (oak/birch bluebell woodland). To be fair to the planners of the original proposals, pre-cursor vegetation may have been hard to see in a heavily grazed field at the time. We agreed that c.50% of the Scots should be felled and replaced with hazel in the biggest gaps (there is a reasonable density of birch within the Scots pine).

See Coynachie below for thoughts on open habitat management.

Coynachie

As with Merdrum, there are substantial areas of open ground in Coynachie, managed for silage. In some cases, rides are cut but there are also larger open areas including a big field above Priest's Water. This intensive agricultural use seems at odds with the SFA objectives of biodiversity and carbon and therefore the following management is recommended: The large field and other significant areas of open ground are likely to have at least moderate depth of fertile topsoil. In order to substantially increase biodiversity, I recommend moving topsoil with an excavator or bulldozer into mounds and ridges, creating hollows and flat areas in sub-soil. Subsequent planting of scrub species into the topsoil (e.g. hawthorn, blackthorn, guelder rose, dog rose and crab apple). Also, sowing tall herb mixes into flat areas of sub-soil. I appreciate that this is a significant departure from recent management but understand from Robin Waddell that loss of silage from these fields is unlikely to be a political issue with the neighbouring farmer if the rationale above is explained. Ian McKee may wish to comment on this proposed management.

In the areas of NNW visited, birch was growing well and other less vigorous species were planted in groups which are so far not being over-topped. However, as with Merdrum, some respacing/early thinning in the next ten years will help to diversity stand structure. This was particularly the case in

the section of birchwood that Jackie and I looked at outwith the deer fence where really dense planting had been carried out. This area could be respaced now (see image left).

There are some pure areas of ash planting which has grown well. However, there were signs of *Chalara* and if extensive die back does take place as predicted, suitable replacement species would be hazel, goat willow, hawthorn and rowan.

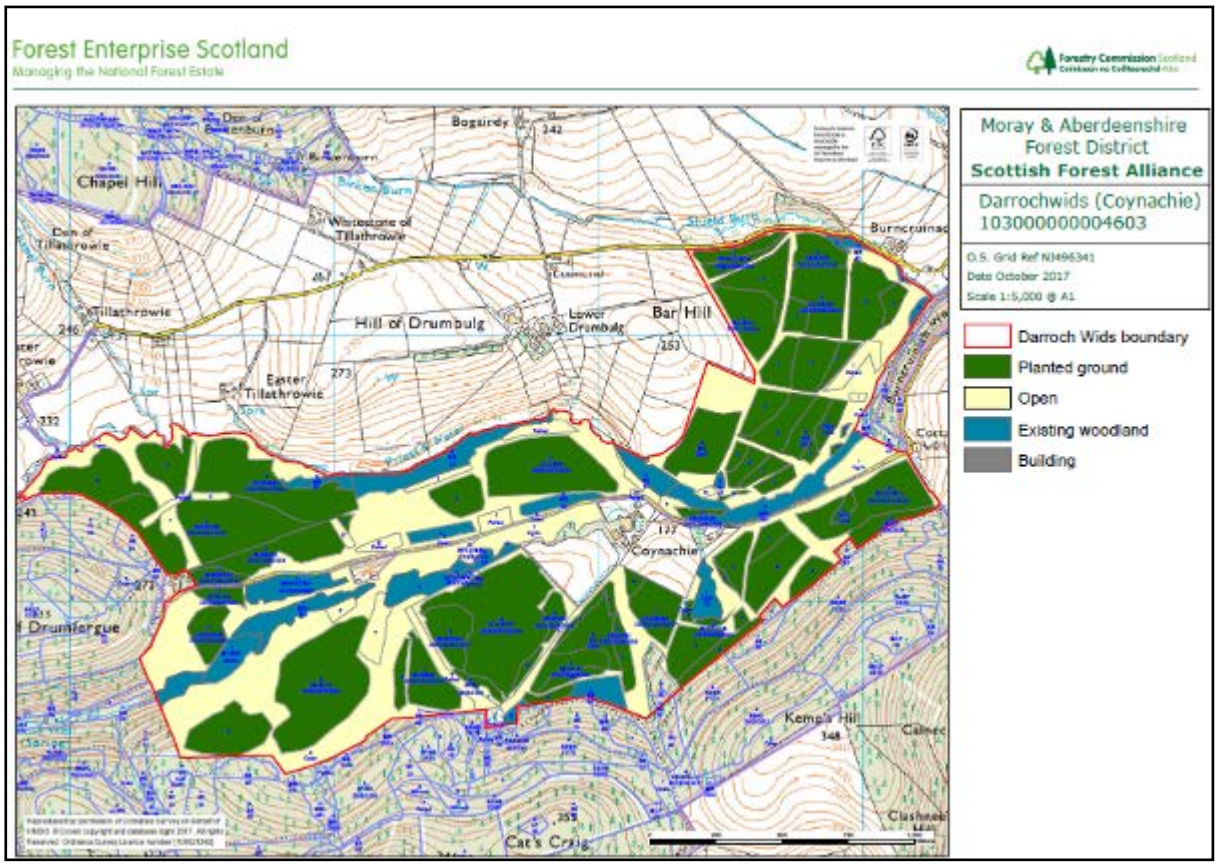
In the long-term, (20 years' time) extensive cattle grazing is recommended to further diversify stand structure and move away from uniform plantation structure. Given layout of the woodland here, it is likely that 2 to 3 separate enclosures would be required.

There is sufficient canopy shading to allow introduction of woodland flora. I can speak to Rick Worrell about this site and Merdrum to discuss whether these would be good candidate sites. I will also speak the SF SCIO to discuss whether this would be acceptable given the objective of monitoring biodiversity change.

RT
20/12/17

Coynachie

For simplicity, I will divide the open areas at Coynachie into two.
The first, non-contiguous section (red symbols) consists of the field on the right hand side of the lane as you approach Coynachie from the main road. This is bordered on the lower slopes by birch ASNW. The first section also included the field above the new native woodland on the opposite slope in the corner of our ownership.
The second section (Blue symbol) is the large fields further up the valley on the right hand side.



I suggest the following management in section one. The driver for this approach is to reduce cost and create an attractive and bio-diverse habitat.

1) Plant patches of thorny species at close density to create a 'thorny mantle' which will act to provide some protection for palatable species such as pedunculate oak, hazel , aspen and gean. Thorny species (of the local seed zone) should include hawthorn, blackthorn, dog rose and guelder rose. Crab apple is intermediate, having some thorns when younger. If local provenance

of native crab apple can be found, this would be good to add (suggest advice from Rick Worrell – I can liaise with him if required).

2) Plant 30-40% of the available ground in variable density, inter-planting palatable species into the densest areas of thorny species but planting a lighter scatter of thorny species within otherwise more open areas.
3) It should not be necessary to deer fence this area as long as a medium-term view is taken as to successful establishment. It is likely that there will be browsing on all/most species and that gradually, thorny thickets should develop and allow palatable non-thorny species to establish.
4) The longer term vision for this approach would be to establish a mosaic within which, there is continued open ground , scrub thickets and open grown 'wood pasture' trees such as oaks and gean. Given the adjacent seed sources, within the 'thorny mantle' , there should also be natural regeneration of birch and other wind-blown seed as well as localised natural regeneration of larger seeded species distributed by wood mice, jays etc.
   Whilst this approach may seem laissez-faire it should ultimately be much cheaper than conventional techniques, deliver higher biodiversity values and an attractive and varied landscape.

For section 2, a range of options are possible and, given the extent and quality of the ground, a 'productive broadleaves' approach may be appropriate if it fits with Regional objectives. Native species should be used to avoid seeing of invasive non-native species into the native woodland established under the Darroch Wids project. A more intensive approach would obviously require a deer fence.

Richard Thompson
15th of October 2018

Appendix 6 – Proposed management of deep peat around windfarm

Report from site visited on 24/01/2016 by Jackie Cumberbirch (FLS Conservation Ranger) and Ian McKee (FLS Open Habitat Ecologist)

Summary

- Restoration of priority habitat was considered in a part of Clashindarroch forest, near the windfarm
- Areas were identified that could be restored to **Blanket bog and intermediate bog** habitat, and low density **priority native woodland** habitat (Peatland Edge Woodland)
- Methods are suggested for doing this, but need **further discussion within the District teams** and with the Windfarm company to consider other factors beyond biodiversity enhancement

- There is an opportunity to establish native woodland **beyond the extent of the deep peat area**; in the wider vicinity of this area, to complement **the vision of establishing a significant scale of biodiverse mosaic of open and woodland habitats over this site**.
- This would complement the Ecosystem Services approach to managing FLS forests, and may be a good exemplar for doing so
- The areas of shallow and deep peat have a very low potential for growing SS due to the peat types, the local climate, the ability of the heather to rejuvenate on them, and the legacy costs that would be required to establish these crops for a second rotation.

Introduction

Management approach and priorities

The management proposal and advice given is designed to contribute to the Scottish Biodiversity Strategy and follow FS guidance in relation to deep peats, particularly the policy "Supplementary guidance to support the FS Forests and Peatland Habitats Guideline Note (2000)", link here: http://scotland.forestry.gov.uk/images/corporate/pdf/peatland-habitats-supplementary-guidance.pdf

Priorities are as follows:

1. Protect the peatland asset to store as much carbon as possible, and
2. capture as much carbon as possible in the future.
3. Restore appropriate priority open and woodland habitats, possibly in a mosaic, that contribute to the Scottish Biodiversity Strategy
4. Select management techniques that are most likely to minimise legacy management costs.

This report is intended to be used by Moray and Aberdeenshire Forest District staff in their discussions with the Windfarm company in relation to what are the best habitats to restore to comply with the planning consent conditions.

Information sources

Soil map

1:10k FLS soil map covers this particular area, though not neighbouring. The site visit found that the area of 11c peat was depicted on a larger more extensive area on the map than was found on the ground, except on two

relatively small areas around the centre. These are shown on the options map, as hatched within the purple areas.

The reason why there are inaccuracies in the soil map is because most of the area has peat hovering around the 50cm mark. The peat properties do not appear to be that

different either side of this arbitrary depth, both in terms of the natural vegetation found growing there, and the capacity of the peat to grow trees at a reasonable growth rate.

Please see attached soil map "Soils map Clashindarroch".

Site visit

The site was walked over, checking peat depth with a peat probe rods. The most appropriate habitat type to restore was decided upon, based on an approach outlined below.

Deep peat areas here are a relatively small part of the landscape, with shallow peat in the surrounding landscape. These peatland areas would have supported priority Upland Heath and Blanket bog vegetation.

It should be noted that the shallow peats (peaty podsols) also present a low capacity to grow Sitka spruce. When the 1st rotation is felled and replanted, heather seems to establish very well, to then dominate and cause SS to suffer heather check. The first rotation was easier to establish because they had a determined programme of heather suppression, using fire and/or 2,4 D.

If this site was being considered for replanting SS, this would be taken into account during the application of FLS Business Guidance on replanting deep peatlands.

See aerial photograph attached.

Identification of suitable areas to restore and considering appropriate complimentary habitats to restore in neighbouring areas and within as mosaics

The focus was on identifying the areas that are actually deep peat.

The approach was to walk over the areas already identified by Jackie as deep peat. These were confirmed as suitable for restoration, by considering the slope, what positive indicator Blanket bog typical species were present, and looking for signs to indicate how high or low the water table was. This is a simple approach, but appropriate for this site, as most of it has been felled.

Three categories of suggestions have been made:

1. **Shown as solid purple on the below map**: Areas for restoration to Blanket bog or Intermediate bog, as a medium priority. Blanket bog vegetation (cotton grass and Shagnum species) is already recovering on these areas, and the water table is generally high.
2. **Shown as yellow on map**: Lower priority for restoration to Blanket Bog due to the difficulty of doing this on the steeper slopes. These areas are certainly very dry, with no signs of sphagnum or cotton grass even in the lowest furrows. They could be restored to upland heathland, which is a priority habitat, although they will be prone to natural regeneration of conifers for several years until a dense heather vegetation develops. It is therefore suggested that these areas have Peatland Edge Woodland established on them, after any major drains have been dammed (to ensure the peat isn't acting as a Carbon source).
3. **Shown as green on the map**: These areas are also deep peat, but are low lying and are flushed. They could be restored to priority Upland flush, fen and swamp habitat. However, it is also suggested that they could be planted with willows and birch, with oak and perhaps Scots pine on the raised knolls (check ESC). This option would require less ground disturbance, and would also create a healthy riparian zone, improving water quality.

These areas are shown on the attached map "Deep peatland proposals Clashindarroch".

Complimentary habitats and woodlands in surrounding areas (not deep peats)

Restoration of Upland Heath would be a complimentary habitat type to have in the surrounding areas of shallow peat. However, if resources allow, the establishment of what would be site local native woodland would also be desirable. Costs would depend very much on deer fence requirements that should be determined by the Wildlife Ranger Manager.

Conifer plantations would not be desirable from a priority habitat context, and this option would be unlikely to comply with the FS guidance anyway. Detailed assessment would need to be carried out to justify replanting with SS as with other deep peat sites.

Please study attached map "Holistic view Clashindarroch".

Hatched area indicates areas that should be considered for a mosaic of Open heathland and Native woodland.

The larger lighter green areas should be planted with native woodland.

Management interventions required for each proposed option

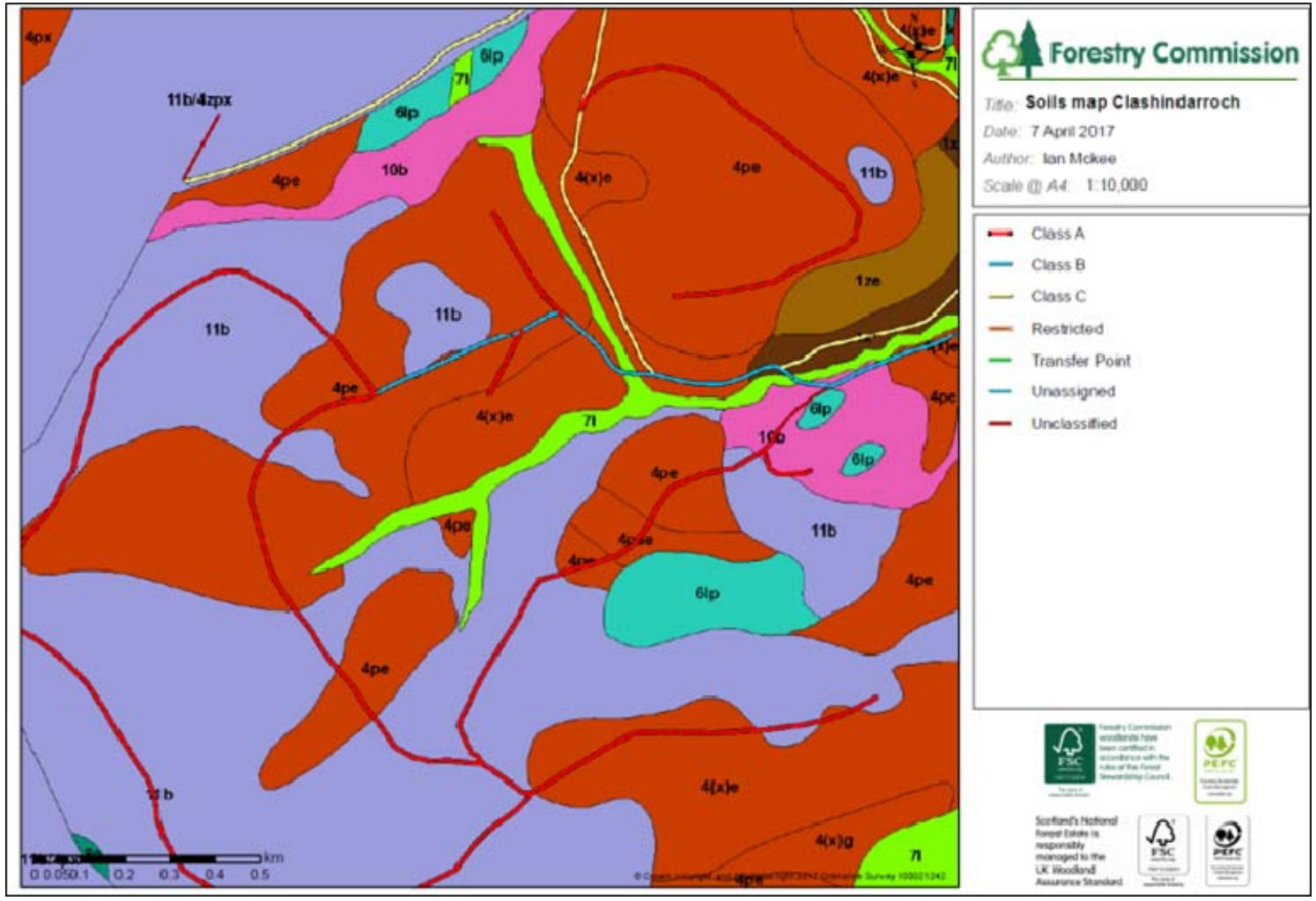
Type	Intervention year 0	Intervention year 3	Intervention year 8	comments
Restoration to BB and IB	Insert peat dams in drains, extending out above areas upstream for 50 metres Stump flip and ground smooth part of the area	Stump flip and ground smooth remaining part of the area	Remove non-native regeneration	Sequencing stump flipping and ground smoothing is to reduce impact of run off and siltation
Peatland Edge Woodland (PEW)	Insert peat dams in drains, extending out above areas upstream for 50 metres Fence for deer if WRM deems this is required Plant birch, willow, oak, SP(?) in low		Remove non-native regeneration if above 10% canopy cover	

	density			
Surrounding areas of native woodland	Same as for PEW above		Remove non-native regeneration if above 10% canopy cover	

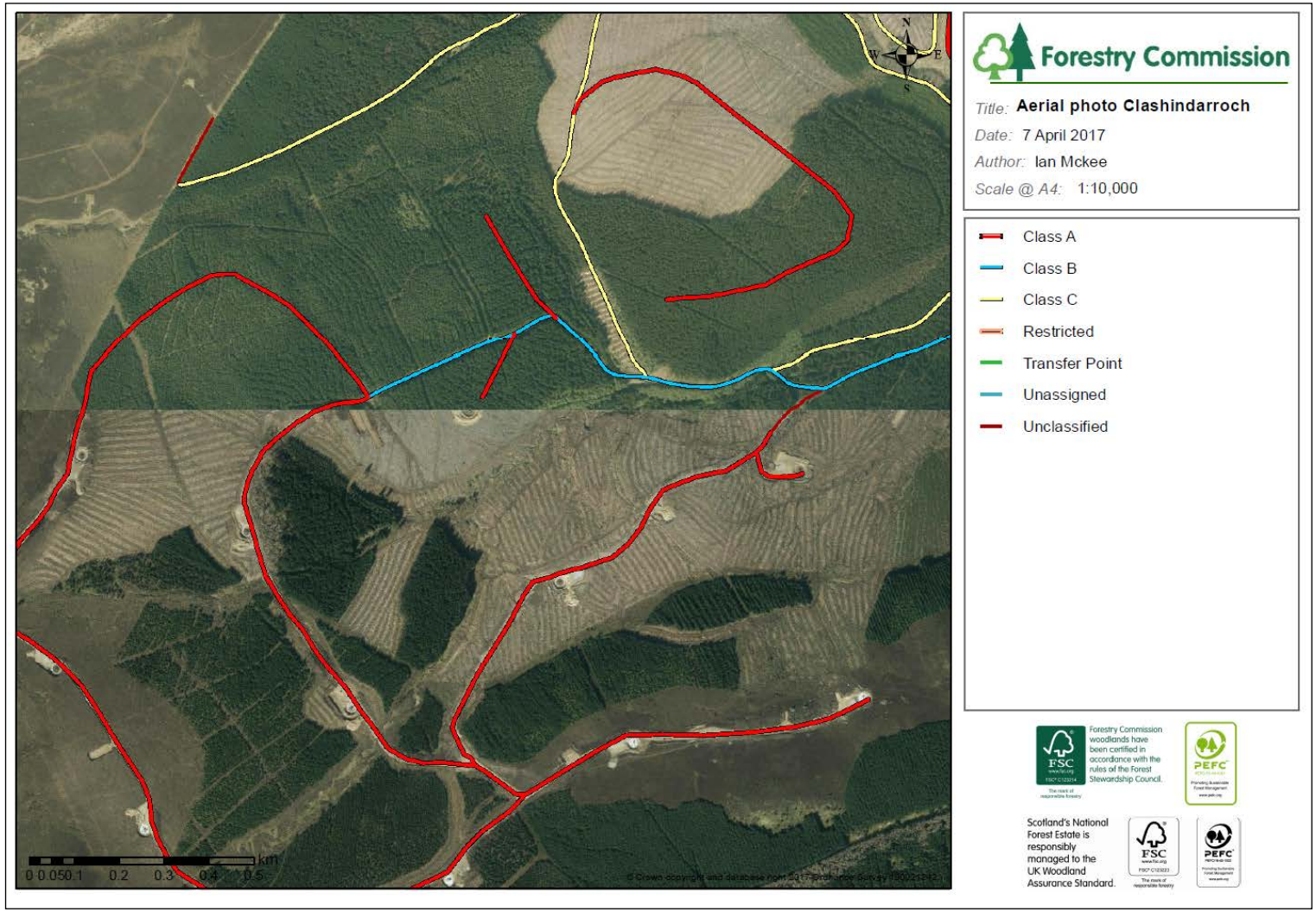
Recommended further information gathering

1. Check historic aerial photos for identifying length and location of drains (so that they can be blocked)
2. If conifer replanting of any of the deep peat in surrounding areas is being considered, need to record evidence that tree growth will be => 8 Yield Class, as part of implementing the FLS Business Guidance (draft). Andy Kennedy and Ian McKee are available to visit and support this implementation.
3. Ian McKee can consider restoration methods and costs further if required. Since this site was visited, a field sheet has been developed to record pertinent information used to identify suitable areas for restoration, record a baseline of vegetation cover for monitoring purposes, and estimate costs of restoration.
4. Richard Thompson should be consulted on species choice and methods of establishment of native woodland in this locality.

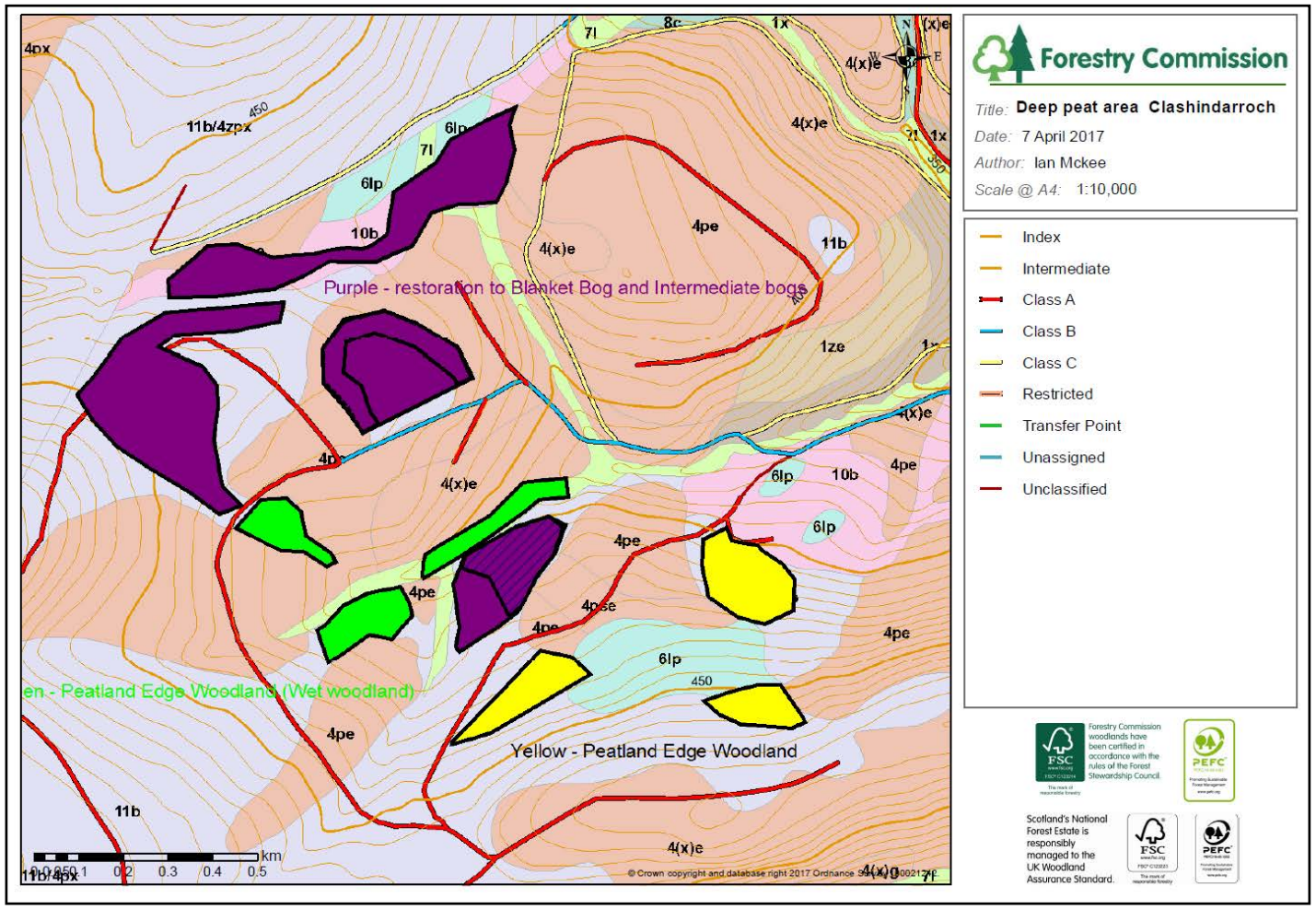
Soils map Clashindarroch



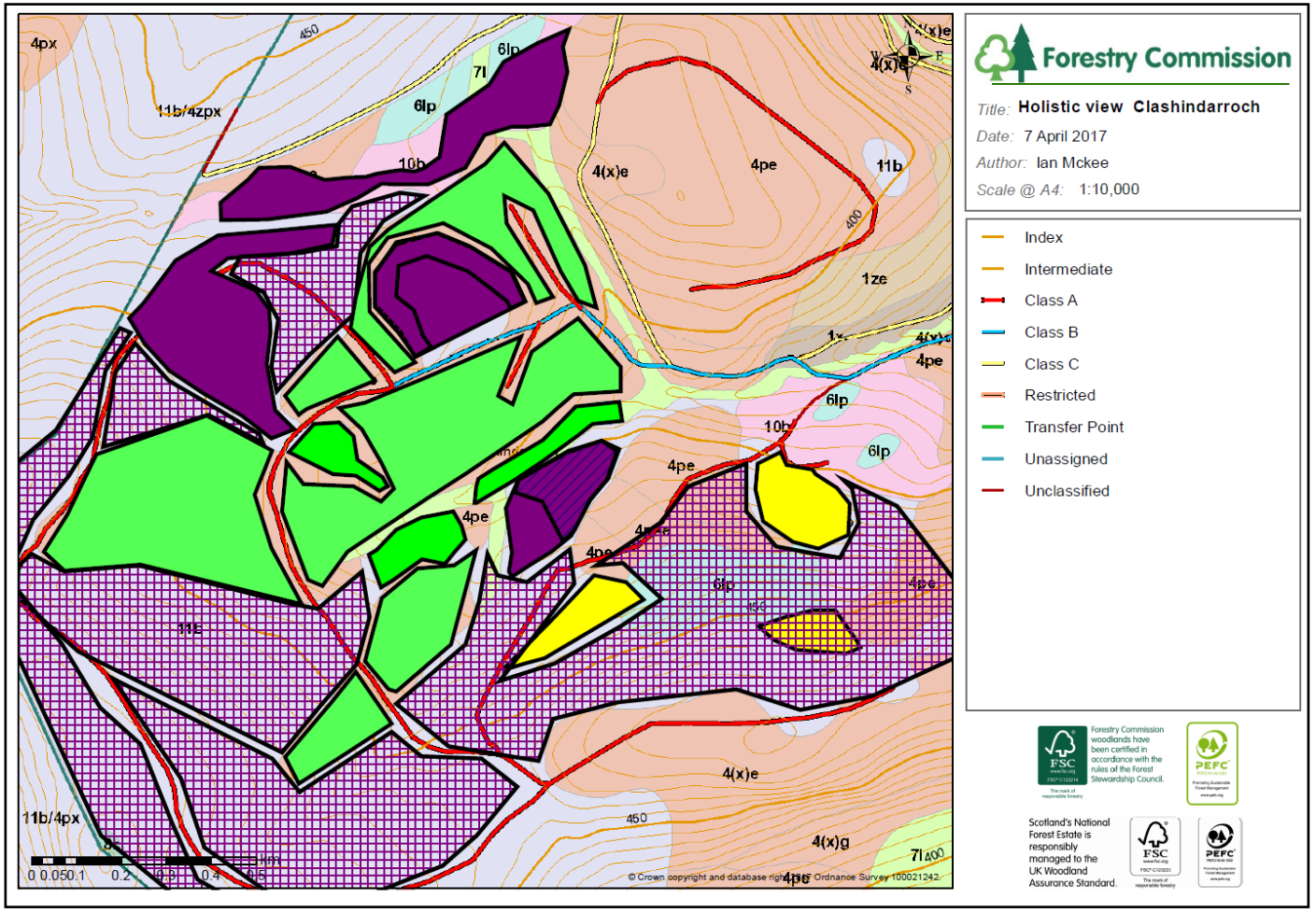
Aerial photograph



Deep peatland proposals Clashindarroch



Holistic view



Appendix 7 – Hill of Towanreef SSSI / SAC

Start Date of Plan – Same as LMP

End Date of Plan – Same as LMP

Overall Management Aims & Objectives for each designated site

The overall objective for Hill of Towanreef is to protect the site and to maintain or where necessary, enhance the special features of the site. In essence, the key aim for the area within the management of Forest and Land Scotland will be to undertake a programme of management beneficial to the H16 heath that will help maintain and spread the intermediate wintergreen element of the vascular plant assemblage.

Section 1 Designated Sites covered by this appendix

Designated Site Name	Site code	Site Type	Total Area of designated site	Area within this LMP	% within this LMP	Annex containing SNH site documentation
Hill of Towanreef	786	SSSI	1889.66 ha	21.0ha	1.1%	Annex 2
Hill of Towanreef	8271	SAC	1755.7ha	21.0ha	1.2%	Annex 3

Refer to the Map 3 – Biodiversity and environmental areas which highlights the location of the above designated sites in relation to the LMP boundary and the NFE management area. Hill of Towanreef extends to a large area south of the national forest estate boundary and only 1.1% is under management by Forest and Land Scotland.

For further detail on the designation refer to the SNH documentation in the above listed annexes, which refers to the entire designated site area. The remainder of this plan will refer in detail to the element of the above designated sites on the NFE.

Only 1.1% of Hill Towanreef SSSI is within the national forest estate boundary of Clashindarroch Forest. The feature of the SSSI that is present on the national forest estate is the Upland Assemblage. The SAC interests on the 1.2% of Hill of Townareef within the National Forest Estate are Alpine & Sub-Alpine Heaths and Dry Heaths.

Section 2 Features on the NFE and condition

Only features that exist on the NFE within this LMP are listed in the table below.

Site Type	Site code	Feature description	SCM Condition (Date assessed)	Condition on NFE	Management Classification (if relevant)
SSSI	786	Upland Assemblage	Unfavourable Declining (31st March 2005)	Unfavourable Recovering due to management	
SSSI	786	Vascular Plant Assemblage (Intermediate Wintergreen only recorded on NFE)	Unfavourable Declining (31st March 2005)	Unfavourable Recovering due to management	
SAC	8271	Alpine and Sub-Alpine Heaths	Favourable Maintained (18th May 2011)	Favourable	
SAC	8271	Dry Heaths	Unfavourable Declining (19th May 2011)	Unfavourable Recovering due to management	

The site is a small part of a much larger SSSI. The FLS managed area on the northern slopes of Meikle Turf Hill is dominated by H16 heath with areas of heather-bearberry heath around the rocky outcrops. These areas also support Intermediate Wintergreen which is part of the vascular plant assemblage feature of Hill of Towanreef.

Section 3 Pressures and proposed actions

Site Type	Feature description	Pressures	Proposed action	Timescale	Location Map highlighting work & other key limiting factors
SSSI	Upland Assemblage	Burning	FLS will not undertake muirburn on the NFE and will continue a programme of swiping in preference to muirburn.	3-yearly during the lifespan of the plan	
SAC	Alpine & Sub-Alpine Heaths	None			
SAC	Dry Heaths	Burning	FLS will not undertake muirburn on the NFE and will continue a programme of swiping in preference to muirburn	3-yearly during the lifespan of the plan	

Section 4 Operations within the LMP that could impact on the designated features on the NFE

Operation Type	Detailed description of operation and method	Mitigation measures to be applied	Timing	Map reference & other relevant comments
Swiping of heather	Swiping will be undertaken using scrubsaws. Cut material will be raked off swiped areas.	Operations will be undertaken outwith bird breeding season to avoid disturbance to ground nesting birds. Locations of wintergreen gps'd to protect and target swiping. Juniper will be marked on site and on site plans and will not be cut.	2018,2021,2024	
Removal of non-native conifer tree regeneration, broom and gorse	Tree and scrub will be removed using scrubsaw/chainsaw.	Operations will be undertaken outwith bird breeding season to avoid disturbance to ground nesting birds. Juniper will be marked on site and on site plans and will not be cut.	As required throughout the period of the plan	
Deer control	Deer control to be		Throughout	

	undertaken with the aim of achieving a population at density level of 5 deer per 100 hectares.		lifespan of plan	

Section 5 Operations within the LMP or aspects of the national forest estate within the LMP that could impact on designated sites adjacent to national forest estate

Operation Type / Aspect of forest	Detailed description of issue or operation	Proposed action &/or mitigation	Timing	Map reference & other relevant comments
Tree regeneration	Restock of areas on the NFE adjacent to designated sites on private ground	The restock proposals have maintained a buffer of open space and native woodland to minimise seeding of non-native conifers on designated sites adjacent to the NFE.	As required throughout the period of the plan	
Deer control	Deer control to be undertaken with the aim of achieving a population at density level of 5 deer per 100 hectares.		Throughout lifespan of plan	

Section 6 Appropriate Assessment/s undertaken on work contained within the LMP

Appropriate assessment of forestry proposals which are likely to have a significant effect on a European site under the Conservation of Natural Habitats, &c.) Regulations 1994. Regulation 48.

1. Name of European site affected by the application and current designation status, including name of component SSSI (if relevant).

Hill of Towanreef SAC (Hill of Towanreef SSSI)

2. Features of European qualifying interest, whether priority or non-priority; and conservation objectives for qualifying interests.

SAC – qualifying interests

Alpine and Boreal heaths

Blanket Bogs*

Calaminarian grasslands of the violetalia calaminariae

European dry heaths

Juniperus communis formations on heaths or calcareous grasslands

Saxifraga hirculus

(*denotes priority)

Only a small amount, 1.2% of the SAC is within the boundary of the LMP and within this area, the relevant interests are the dry heaths and alpine and sub alpine heaths.

Conservation objectives for qualifying interests

To avoid deterioration and distribution of the habitats of the qualifying features (above), thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying features.

To ensure for the qualifying habitats that the following are maintained in the long term:

- Extent of the habitat on the site
- Distribution of the habitat within the site

- Structure and function of the site
- Processes supporting the habitat
- Distribution of typical species of the habitat
- Viability of typical species as components of the habitat
- No significant disturbance of typical species of the habitat

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within the site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

3. Details of proposal.

Name: Clashindarroch Land Management Plan ***Location:*** Aberdeenshire

Applicant: Forestry and Land Scotland ***Reference:*** LMP 37

Description of proposal:

LMP to cover the on-going management of Clashindarroch Forest as per FLS objectives laid down in the LMP proposals

Operations:

- **Clearfelling – mechanised harvesting and extraction**
- **Mechanised thinning**
- **Restocking of felled areas**
- **Ground preparation and drainage**
- **Road construction and upgrade**
- **Afforestation**
- **Respacing and maintenance of native woodlands**
- **Maintenance of open habitats – removal of tree regeneration etc from priority habitats (heath, bogs, riparian zones and rock and scree**
- **Deer management**

4. Appraisal of impact on European interest.

4.1 *Is the proposal directly connected with or necessary to the management of the site?*

Yes /No **(if Yes go to 5.)**

Yes – only a small percentage of the designated site is within the LMP area (1.2%) and only the dry, alpine and sub-alpine heaths are relevant.

The management proposed for the compartment impacting the SAC includes swiping of the heather on rotation (instead of burning), removal of non-native trees/scrub and deer control. Juniper will not be cut or swiped during these interventions.

This management will benefit the heath component of the SAC habitats and also the intermediate wintergreen (component of the vascular plant assemblage interest of the SSSI)

4.2 *Is the proposal likely to have a significant effect on the European interest on the designated site?*
Yes/No **(if yes assess impact on site)**

No

5. Conclusions.

Will the proposal adversely affect the integrity of the European site?

No.

With reference to the Assessment in section 4 and subject to the Conditions in section 6, the proposal should not have any adverse impact on the integrity of the site.

Section 7 Approvals, agreements & signatures

I confirm that the above management plan which covers the SSSI "Hill of Towanreef" (Site code 786) within land management plan "Clashindarroch" contains the necessary detail, content and mitigation measures to comply with the statutory requirements contained within the Nature Conservation (Scotland) Act 2004 and in particular in relation to Part 2, Chapter 1, Section 14 (d), which covers consents via an agreed management plan (i.e. "SNH's consent under section 13 is not required in relation to carrying out an operation of the type described in subsection (1) of that section – …….(d) in accordance with the terms of a management agreement between SNH and the public body or office-holder carrying out the operation").

SNH Signature …… Date ……..

SNH Name ……..

SNH Job Title ……..

Address……..

Email ……..

Contact telephone number ……..

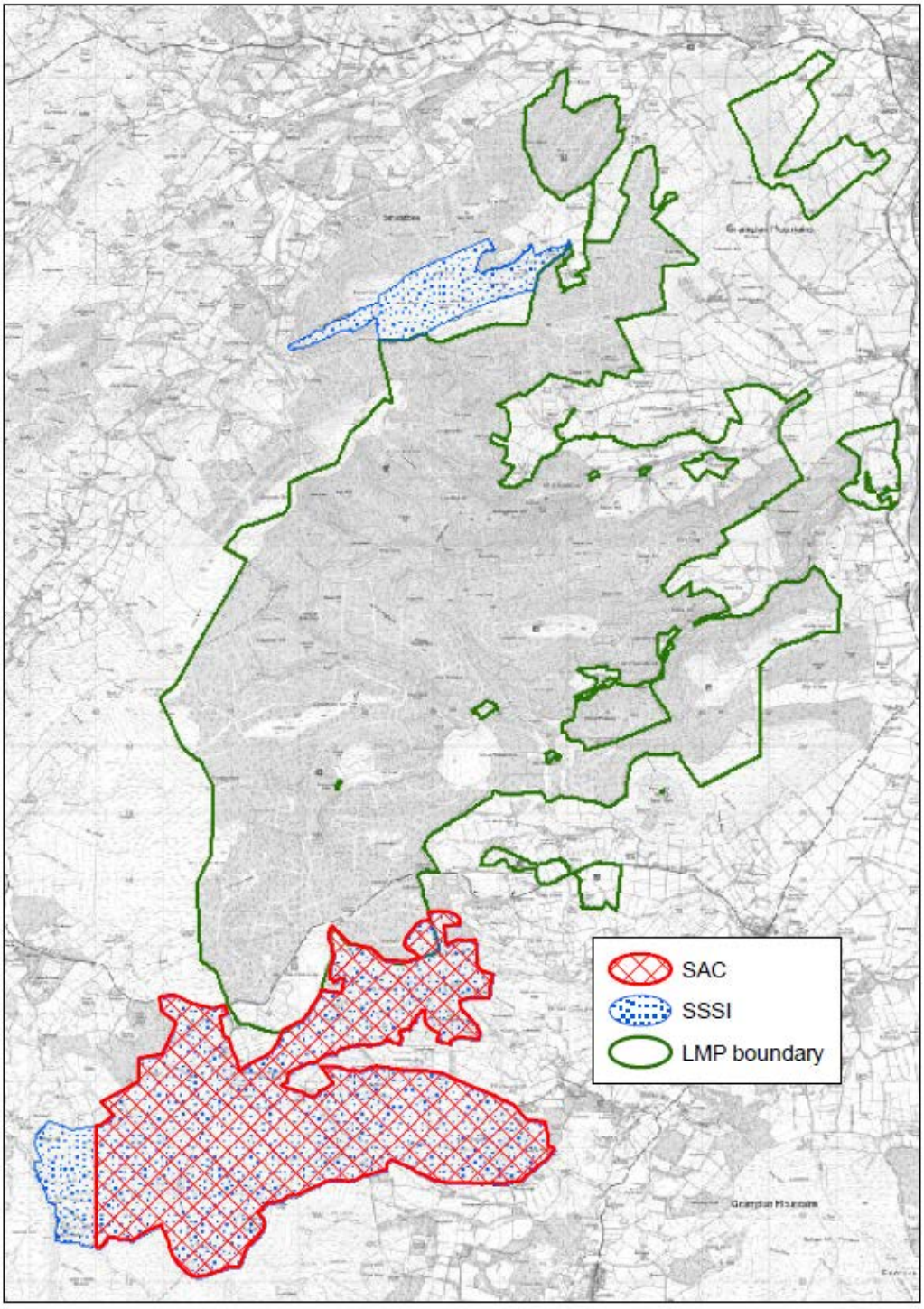
FLS has a corporate requirement under UKWAS (4th edition) and under the FLS Framework Document for FLS (2010) to manage all designated sites in accordance with plans approved by the statutory authority, I therefore sign below to approve the contents of this plan in relation to the designated site Hill of Towanreef that fall within its boundary on the NFE.

SNH Signature …… Date ……..

SNH Name ……..

Annex 1

Map highlighting the location of the designated sites in relation to the LMP boundary and the NFE management area.



Annex 2

Scottish Natural Heritage
All of nature for all of Scotland

HILL OF TOWANREEF
Site of Special Scientific Interest

SITE MANAGEMENT STATEMENT

Site code: 786

MORAY:
Address: 32 Reidhaven Street, Elgin, Moray IV30 1QH
Tel: 01343 541551
Email: ELGIN@snh.gov.uk

ABERDEENSHIRE:
Address: Inverdee House, Baxter Street, Torry, Aberdeen AB11 9QA
Tel: 01224 266500
email: Tayside_Grampian@snh.gov.uk

Purpose

This is a public statement prepared by SNH for owners and occupiers of the SSSI. It outlines the reasons it is designated as an SSSI and provides guidance on how its special natural features should be conserved or enhanced. This statement does not affect or form part of the statutory notification and does not remove the need to apply for consent for operations requiring consent.

We welcome your views on this statement.

Description of the site

Geological

Hill of Creagdearg is a Geological Conservation Review (GCR) site. It is part of the Insch Intrusion which formed about 490 million years ago when NW Scotland was part of the eastern margin of an ancient continent (Laurentia). The Insch Intrusion stretches from Cabrach in the west to Oldmeldrum in the east and formed when molten rock (magma) rose from the earth's centre and gradually solidified deep below the earth's surface. As the rock cooled, a succession of different mineral assemblages crystallised until no magma remained and a solid rock body, or 'intrusion' was formed.

Hill of Creagdearg (and nearby Red Craig) shows excellent exposures of two rock types which originated from molten rock: peridotite and diorite. The peridotites, which are very rich in iron and magnesium, were among the first rocks to form as the magma cooled. The rocks of the Insch Intrusion have been divided into three "zones": the peridotites belong to the 'Lower Zone', whilst the later-formed diorites belong to the upper 'Middle Zone'. However, there is a discontinuity in the rock succession at Hill of Creagdearg, since none of the rock types which are normally seen between the peridotites and diorites are present. It is thought that the two rock types were brought together by earth movements which occurred during the mountain building event which created the Highlands, so that the peridotite rocks were uplifted and placed alongside the diorite rock.

Some of the peridotite rock has subsequently been altered by heated fluids circulating through the rock, producing a mineral called serpentine. Rocks largely

made up of serpentine, such as heavily altered peridotites, are properly referred to as serpentinites.

The Hill of Creagdearg GCR is important as a resource for teaching and research in earth sciences since it provides a clear illustration of igneous activity processes, and also records the effects of tectonic (earth) movement activity generated by the collision of the two continents Laurentia and Baltica and later, the landmass Cadomia, over a period of about 90 million years.

Biological

This site contains a wide range of upland habitats, including dwarf-shrub heath, juniper scrub, blanket bog and flushes.

The habitats associated with the serpentine rock are particularly important. Serpentine has a higher concentration of alkaline minerals and metals than most other rock types and the vegetation is often quite species-poor, most obviously on and around outcrops and also in areas where the rock has weathered to a gravelly texture (serpentine debris). The low diversity of species may be because only a minority of plants can tolerate the concentration of metals, but the unstable nature of the debris and periods of water stress in spring probably also contribute to the limited growth of plants. Distinctive plant species of these areas include spring sandwort and the ferns black spleenwort and green spleenwort. Mosses of the genus *Grimmia* are also found in these areas.

In contrast, where the serpentine is covered by soil, the vegetation is relatively species rich. This is evident in the surrounding heath which has widely scattered juniper scrub and in the numerous flushes which are often base-rich and contain thrift, common scurvy-grass and the moss *Drepanocladus polygamus*.

Grampian is one of few places in Britain where serpentine outcrops occur. The other serpentine sites in Britain are located in the west of Scotland, Shetland and in Cornwall, where the climate is more oceanic. The outcrops in Grampian are less affected by the oceanic climate than these other areas, and comparable with continental sites in Norway.

In the north part of the site, the diorite rock on Turf Hill and White Hill of Bogs supports areas of dwarf-shrub heath with bearberry and species-rich grass heath.

Moss of Tolophin is an important area of raised or blanket bog, with an unusual range of fen types occur at the margins of the bog, some of which may be influenced by the serpentine.

The Buck marks the north-eastern limit of several arctic-alpine plants including least willow and spiked woodrush. Extensive areas of dwarf-shrub heath and blanket bog are found on the slopes of the Buck, including damp heath with dwarf cornel.

The site's wide range of habitats support an important assemblage of rare vascular plants. Flushes on the lower ground contain the nationally scarce hairy stonecrop and the nationally rare yellow marsh saxifrage. This species is declining internationally and one of its last strongholds is the UK. It is now very rare in Scotland, the Grampian

uplands being one of just two areas in Scotland where populations are known to survive. Intermediate wintergreen is also found and dwarf birch has recently been recorded.

Results of Site Condition Monitoring, Hill of Towanreef SSSI

Natural Features of Hill of Towanreef SSSI	Feature Condition (date monitored)	Other relevant designations
Caledonian Igneous	Not yet assessed	
Upland assemblage	Unfavourable, declining (July 2002)	SAC
Calaminarian grassland and serpentine heath	Favourable, maintained (September 2007)*	SAC
Vascular plant assemblage	Favourable, declining (July 2008)	
Marsh saxifrage *Saxifraga hirculus*	Favourable, maintained (August 2008)*	SAC

*Assessment for the SAC

Results of Site Condition Monitoring, Hill of Towanreef SAC

Natural Features of Hill of Towanreef SAC	Feature Condition (date monitored)
Alpine and subalpine heaths	Favourable, maintained (September 2007)
Blanket bog	Unfavourable, declining (September 2007)
Dry heaths	Unfavourable, declining (September 2007)
Juniper on heaths or calcareous grasslands	Favourable, maintained (September 2007)

Site condition monitoring of the vascular plant assemblage feature was last carried out in 2008. The vascular plant assemblage feature was recently assessed as 'Favourable, declining'. All the target species were recorded but intermediate wintergreen appears to have declined in the dry heath in the north of the site. The marsh saxifrage feature was in favourable condition in 2008, though some scrub encroachment onto the flushes where it grows was noted. The Calaminarian grassland and serpentine heath feature remains favourable, with an insignificant amount of scrub encroachment onto the feature. The Juniper scrub feature also remains in favourable condition, with this habitat increasing in at least one area.

The blanket bog and dry heath features (also surveyed in 2007), remain in unfavourable condition. Burning of blanket bog on the Aberdeenshire side of the Buck had resulted in exposure of the peat surface. The dry heath feature appeared to be declining, principally due to insufficient burning management in the north of the site. In addition, broom and gorse bushes have colonised several areas of moorland and flushes, in the north of the site and, in particular, on the southern slopes of the Hill of Towanreef itself, where gorse grows in dense stands surrounding juniper bushes. Scots pine are also established in this area.

Past and present management

The site has traditionally been managed by a combination of grouse moor management and livestock grazing. The presence of several abandoned crofts/small farms on the site indicates that grazing was probably more intensive in the past than at present. Peat was formerly cut for domestic use at the Moss of Tolophin. Commercial peat extraction using the "sausage" method was also undertaken for a brief period in 1986 but ceased when planning permission for the activity was sought and refused.

The site continues to be managed for a combination of grouse moor and livestock grazing. Burning management declined on parts of the site but has increased again in recent years.

Grazing is primarily by sheep, managed by several graziers. One area at Meikle Turf Hill was previously grazed by Highland ponies and an area just to the north of Craig valley is grazed by cattle in autumn and winter. Grazing intensity varies, but generally appears moderate in its impact. Red and roe deer are controlled; their contribution to the grazing pressure is limited.

Gorse is being controlled in the north of the site with funding from the The Scottish Rural Development Programme.

Two public roads run along the boundary of the site (the A941 and the B9002). Minor road improvements have in the past resulted in the loss of small areas of heath/juniper scrub.

A small area near Tamduff was damaged through small-scale mineral extraction (probably for agricultural use) and dumping of agricultural refuse.

Public access to the site is concentrated on a route to the summit of the Buck which is used by hillwalkers. This route is recommended in The Scottish Mountaineering Council's Guide Volume 2, "The Corbetts and Other Scottish Hills".

Objectives for management (and key factors influencing the condition of natural features)

We wish to work with the owners and occupiers to protect the site and to maintain and where necessary enhance its features of special interest. SNH aims to carry out site survey, monitoring and research as appropriate, to increase our knowledge and understanding of the site and its natural features.

The EU Habitats and Birds Directives oblige Government to avoid, in SACs and SPAs, the deterioration of natural habitats and the habitats of species, as well as disturbance of the species for which the areas have been designated, where such disturbance could be significant in relation to the objectives of these Directives. The objectives below have been assessed against these requirements. All authorities proposing to carry out or permit to be carried out operations likely to have a significant effect on the European interests of this SSSI must assess those operations against the relevant Natura conservation objectives (which are listed on our website through the SNHi – SiteLink facility).

1. **To maintain the assemblage of upland habitats, including serpentine grasslands, dwarf-shrub heath, juniper scrub and bogs, and the important populations of plants these support**

   These habitats are maintained by grazing and muirburn management.

   Reduction in grazing pressure could have negative impacts such as an increase in taller species and scrub in flushes at the expense of diminutive species including yellow marsh saxifrage. However, an increase in grazing pressure could also be detrimental to successful flowering and seed production. Increased grazing pressure could also have a negative impact through, for example, the spread of grass species in dwarf-shrub heath.

   Muirburn can benefit the species diversity of the moorland and can be used to induce sheep to spread and graze more widely. Muirburn is to be re-introduced on Turf Hill to benefit the dwarf-shrub heath with bearberry. All muirburn should be carried out in accord with the Muirburn Code and management plans for the site, so that sensitive habitats and plants are not burnt. Care should be taken to avoid burning blanket bog. The extent of juniper scrub, an important feature of the site, also needs to be maintained. The Scots pine trees on the Hill of Towanreef itself could spread from the juniper scrub to the detriment of the adjacent moorland habitats.

   The broom and gorse bushes that have already colonised the moorland as scattered bushes should be removed before they spread any further. SNH will continue to monitor stands of gorse, in particular on the Hill of Towanreef itself. The gorse here may protect the juniper from grazing but may also prevent it from regenerating. The ground is steep and stony making it difficult to control the gorse. If this gorse continues to spread, methods to eradicate it where it is light or contain it where it is dense will be considered. The Scottish Rural Development Programme can be used as a means to fund gorse control.

   The populations of yellow marsh saxifrage are being maintained by the current grazing regime. Although this feature is in favourable condition, slightly heavier grazing pressure would be preferable in order to stop the spread of willow and heather in the flushes where it occurs. These are currently cut by hand.

2. **To keep the exposures at Hill of Creagdearg clearly visible and accessible for study**

Other factors affecting the site

Hairy stonecrop has been lost from many sites in Scotland and northern England. One possible cause is sensitivity to nitrogen deposition. This cannot be remedied by on-site management. The plant has a very specific niche, and the locations where it could occur on the site are limited.

Date last reviewed: 23 June 2011.

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CITATION

HILL OF TOWANREEF
SITE OF SPECIAL SCIENTIFIC INTEREST
Aberdeenshire, Moray

Site code: 786

NATIONAL GRID REFERENCE: NJ420245

OS 1: 50 000 SHEET NO: Landranger Series 37
1: 25 000 SHEET NO: Explorer Series 420

AREA: 1885.9 hectares

NOTIFIED NATURAL FEATURES

Geological	:	Igneous Petrology	: Caledonian Igneous
Biological	:	Upland habitats	: Upland assemblage
			: Calaminarian grassland & serpentine heath
	:	Vascular plants	: Vascular plant assemblage
			: Marsh saxifrage *Saxifraga hirculus*

DESCRIPTION

Located between Alford and Dufftown, the site comprises low hills and undulating moorland on either side of the B9002 Lumsden-Cabrach minor road, rising up to the peak of The Buck (721 m). The east part of the site, around the Hills of Towanreef and Creagdearg, has relatively extensive outcrops of the rock serpentine.

GEOLOGY

The area around the Hill of Creagdearg contains excellent exposures of two principal types of igneous rocks: peridotites and quartz-biotite norites. Hill of Creagdearg itself (and the nearby Red Craig), are composed of massive peridotite, which is mostly serpentinised. Exposures of this rock, with characteristic orange-brown weathered surfaces, are locally relatively fresh (dark green), compared with other exposures of ultramafic rocks among newer gabbros elsewhere in the region. The peridotites are surrounded by characteristically grey-weathering, slabby-jointed, quartz-biotite norites (or diorites), believed to be of slightly later intrusion, though there is no direct evidence of the age relationships, and the contacts may be tectonic.

BIOLOGY

Upland habitats

The site's assemblage of upland habitats is of special interest, containing a wide variety of vegetation types characteristic of north-eastern Scotland. These include rare serpentine habitats, base-rich flushes, juniper scrub, dry heath, alpine and boreal heath and blanket and intermediate bog.

The most notable of these habitats is the vegetation associated with the unusual chemical properties of soils derived from serpentine, in particular on the Hill of Towanreef itself and on Peddie's Hill, and to a lesser degree on the Hill of

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Creagdearg. The rock and gravel screes have a limited but very interesting flora which includes spring sandwort *Minuartia verna*, the serpentine form of black spleenwort *Asplenium adiantum-nigrum* and green spleenwort *A. viride*. Mosses associated with serpentine are also found, including *Grimmia* species. The surrounding heath has widely scattered juniper scrub and numerous flushes which are often base-rich and contain thrift *Armeria maritima*, common scurvy-grass *Cochlearia officinalis* and the moss *Drepanocladus polygamus*. Thrift is also present in the grassland on the slopes of the Hill of Creagdearg.

The site also contains the Buck which marks the north-eastern limit of several arctic-alpine plants including least willow *Salix herbacea* and spiked woodrush *Luzula spicata*. There are also extensive areas of heather moor and heather-cottongrass bog. Flushes on the lower ground contain abundant sedges and rushes as well as grass-of-Parnassus *Parnassia palustris*, hairy stonecrop *Sedum villosum* and the rare marsh saxifrage *Saxifraga hirculus*.

In the north, an area of norite rocks on Turf Hill and White Hill of Bogs holds small areas of heather-bearberry heath. The Mosses of Tolophin and Fuie, which combine some of the features of both raised and blanket bogs, are relatively undisturbed examples of bogs at these altitudes. Blanket bog is also found on higher ground on the slopes of the Buck.

Vascular plants

The site's wide range of habitats supports an important assemblage of rare vascular plants. This includes the colonies of marsh saxifrage, spring sandwort and hairy stonecrop. Intermediate wintergreen *Pyrola media* is also found and dwarf birch *Betula nana* has recently been recorded.

NOTIFICATION HISTORY

First notified under the 1949 Act: 1971.
Re-notified under the 1981 Act: 11 October 1983.
Notification reviewed under the 2004 Act: 23 June 2011.

REMARKS

Measured area of site corrected (from 1823 ha).

Hill of Towanreef SSSI is designated as the Hill of Towanreef Special Area of Conservation (SAC), for the European habitats and species listed below.

Habitats:	Grasslands on soils rich in heavy metals
	Dry heaths
	Alpine and subalpine heaths
	Blanket bog
	Juniper on heaths or calcareous grasslands
Species:	Marsh saxifrage *Saxifraga hirculus*

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23 June 2011

HILL OF TOWANREEF SITE OF SPECIAL SCIENTIFIC INTEREST

OPERATIONS REQUIRING CONSENT FROM SCOTTISH NATURAL HERITAGE

If you propose to carry out, or permit to be carried out, any of the operations listed below, you must first obtain consent from SNH unless a local authority has granted you planning permission (under Part III of the Town and Country Planning (Scotland) Act 1997) or a designated regulatory authority has given you written permission (under s.15 of the Nature Conservation (Scotland) Act 2004). If you have such a permission, you may proceed without obtaining consent from SNH for the same operation.

Standard Ref No	*Type of Operation*
1	Cultivation, including ploughing, rotovating, harrowing, re-seeding.
2	Changes in the grazing regime, including type of stock or level of seasonal pattern of grazing and cessation of grazing.
3	Changes in stock feeding practice.
5	Application of manure, fertilisers and lime.
6	Application of pesticides, including herbicides (weedkillers).
7	Dumping, spreading or discharge of any materials.
8	Changes in the pattern or frequency of burning, including muirburn.
9	The introduction of any wild, feral or domestic mammal or bird, plant or seed.
11	The destruction, removal or pruning of any plant or plant remains, including, shrub, herb, moss, lichen, fungus, turf.
12	Tree planting including afforestation.
13a	Modification of drainage, including the lowering of water tables, the use of mole, tile, tunnel or other artificial drains.
13b	Modification of the structures of water courses (e.g. streams, ditches, drains), including their banks and beds, as by re-alignment, re-grading and dredging.
15	Infilling of ditches, drains, pools, marshes or pits.
20	Extraction of minerals, including peat, sand and gravel.

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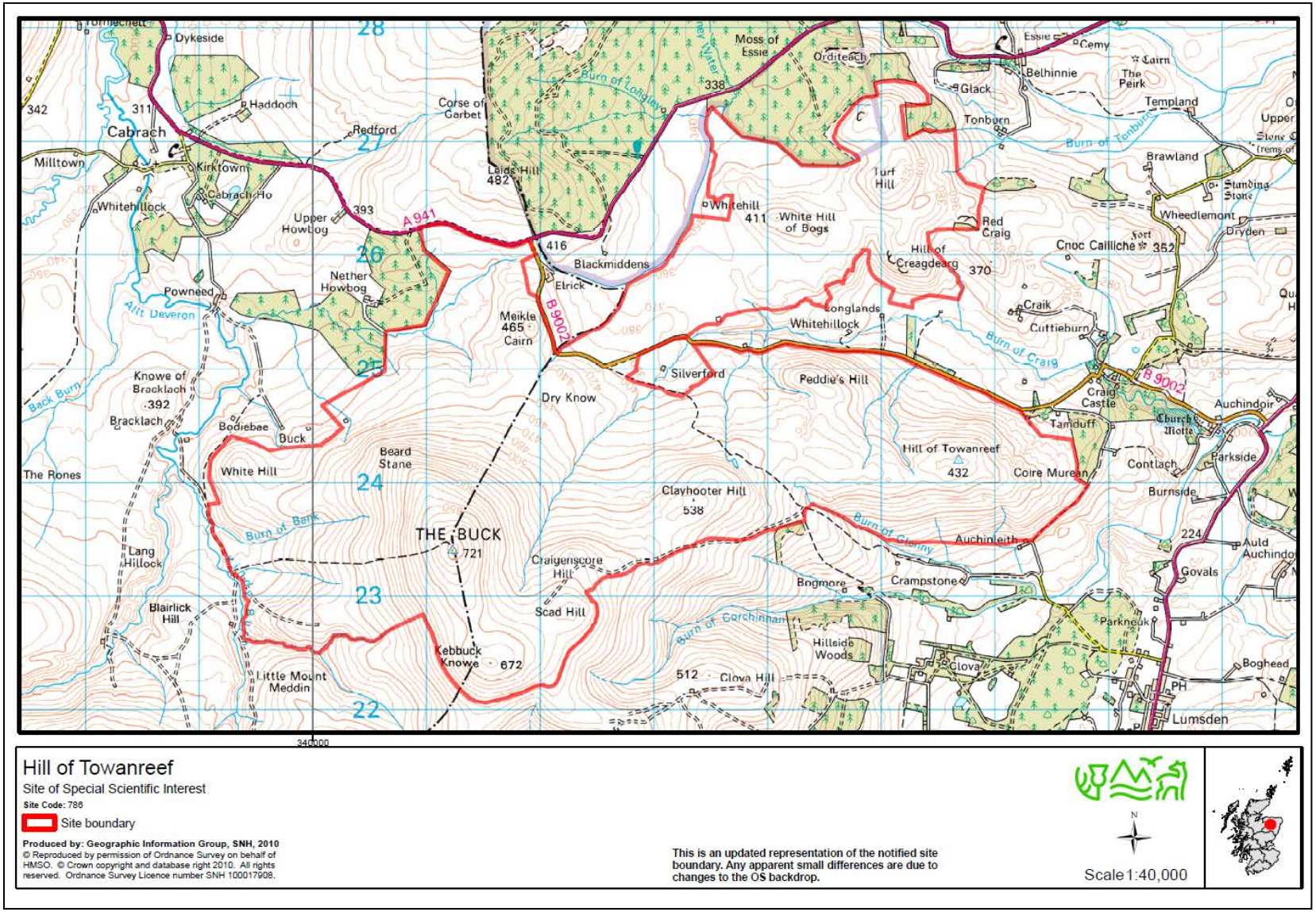
21	Construction, removal or destruction of roads, tracks, walls, fences, hard-stands, banks, ditches or other earthworks, or the installation, maintenance or removal of pipelines and cables.
23	Erection of permanent or temporary structures, or the undertaking of engineering works.
24	Modification of natural or man made features, clearance of boulders, loose rock or scree.
26	Use of vehicles or craft likely to damage vegetation.
27	Recreational, research or educational activities likely to damage vegetation other than those carried out responsibly in keeping with the Scottish Outdoor Access Code.
28	Changes in game and waterfowl management.


Hill of Towanreef
Site of Special Scientific Interest
Site Code: 786
Site boundary
Produced by: Geographic Information Group, SNH, 2010
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This is an updated representation of the notified site boundary. Any apparent small differences are due to changes to the OS backdrop.
Scale 1:40,000
N
Cabrach
Milltown
Kirktown
Haddoch
Dykeside
Redford
Upper Howbog
Nether Howbog
Whitehillock
Powneed
Alit Deveron
Back Burn
Knowe of Bracklach
Bracklach
Bodiebae
Buck
Beard Stane
White Hill
The Rones
Lang Hillock
Blairlick Hill
Little Mount Meddin
Kebbuck Knowe
THE BUCK
Burn of Bank
Scad Hill
Craigenscore Hill
Clayhooter Hill
Dry Know
Silverford
Meikle Cairn
Blackmiddens
Etrick
Laidy Hill
Corse of Garbet
Moss of Essie
Orditeach
Burn of Longlaw
Whitehill
White Hill of Bogs
Turf Hill
Hill of Creagdearg
Red Craig
Longlands
Whitehillock
Peddie's Hill
Hill of Towanreef
Coire Murean
Auchinleith
Burn of Glenny
Bogmore
Crampstone
Burn of Corchinnan
Hillside Woods
Clova
Clova Hill
Tonburn
Glack
Belhinnie
Templand
Brawland
Wheedlemont
Cnoc Cailliche
Craik
Cuttieburn
Burn of Craig
Craig Castle
Tamduff
Auchindoir
Contlach
Parkside
Burnside
Govals
Auld Auchindoir
Parkneuk
Boghead
Lumsden
B 9002
A 941

Annex 3

HILL OF TOWANREEF SPECIAL AREA OF CONSERVATION (SAC)

Designation date: 17 March 2005

Administrative area: Aberdeenshire; Moray

Qualifying Interests for which the site is designated:

SCIENTIFIC NAME	COMMON NAME
Alpine and Boreal heaths	Alpine and subalpine heaths
Blanket bogs*	Blanket bog
Calaminarian grasslands of the *Violetalia calaminariae*	Grasslands on soils rich in heavy metals
European dry heaths	Dry heaths
Juniperus communis formations on heaths or calcareous grasslands	Juniper on heaths or calcareous grasslands
Saxifraga hirculus	Marsh saxifrage

* Indicates a priority habitat

Conservation Objectives for
Hill of Towanreef Special Area of Conservation

To avoid deterioration of the qualifying habitats (listed below) thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying habitats that the following are maintained in the long term:

- **Extent of the habitat on site**
- **Distribution of the habitat within site**
- **Structure and function of the habitat**
- **Processes supporting the habitat**
- **Distribution of typical species of the habitat**
- **Viability of typical species as components of the habitat**
- **No significant disturbance of typical species of the habitat**

Qualifying Habitats:

- Alpine and subalpine heaths
- Blanket bog*
- Dry heaths
- Grasslands on soils rich in heavy metals
- Juniper on heaths or calcareous grasslands

* Indicates priority habitat

NB The conservation objectives for the qualifying species are on the next page

1

Conservation Objectives for
Hill of Towanreef Special Area of Conservation

To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

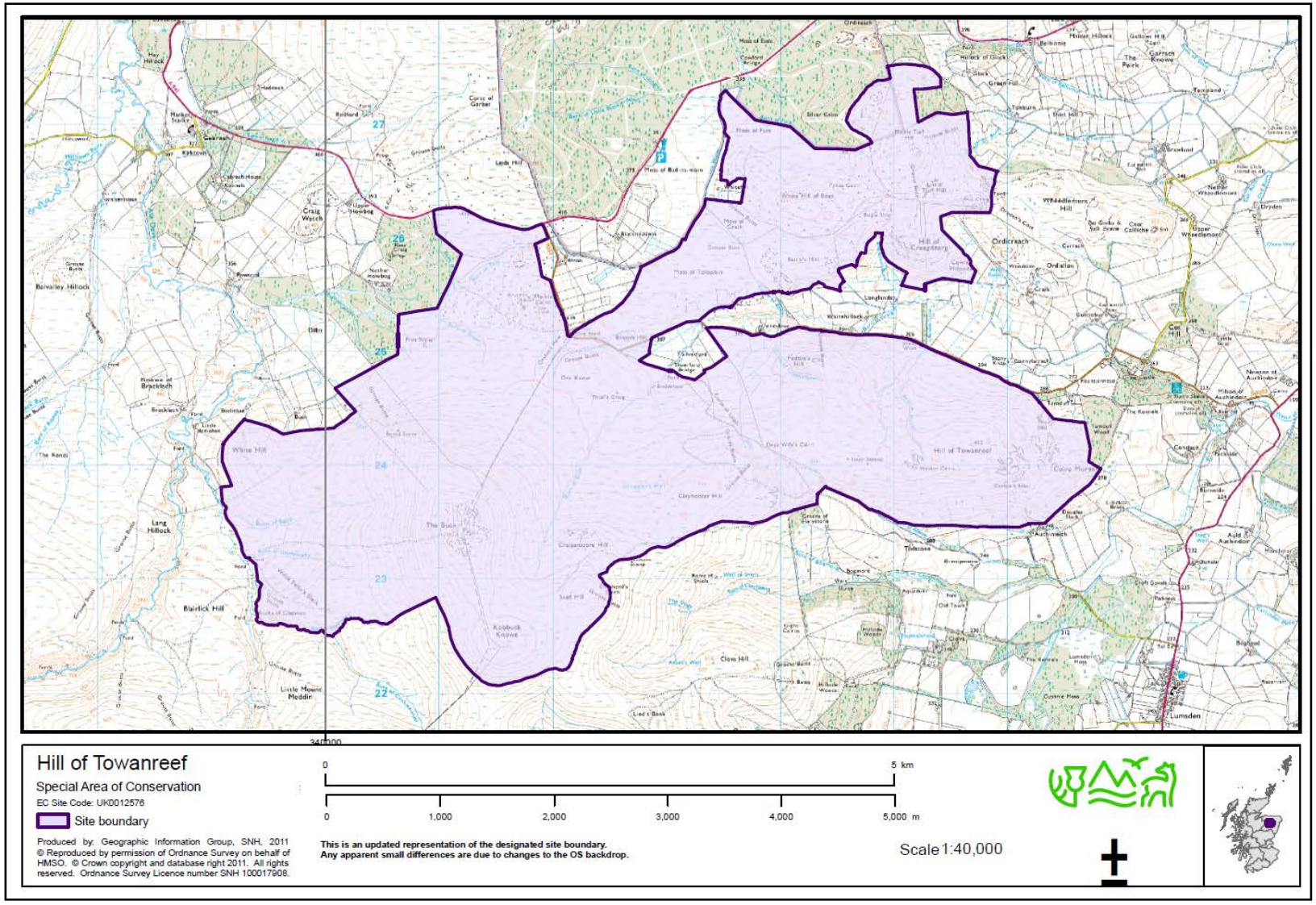
To ensure for the qualifying species that the following are maintained in the long term:

- **Population of the species as a viable component of the site**
- **Distribution of the species within site**
- **Distribution and extent of habitats supporting the species**
- **Structure, function and supporting processes of habitats supporting the species**
- **No significant disturbance of the species**

Qualifying Species:

- Marsh saxifrage

2


Hill of Towanreef
Special Area of Conservation
EC Site Code: UK0012576
Site boundary
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0
5 km
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1,000
2,000
3,000
4,000
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