Forestry and Land Scotland
Coilltearachd agus Fearann Alba

Cologin

Land Management Plan 2025-34

Application for Land Management Plan Approvals in Scotland – Forestry and Land Scotland – Property

Region:	**West**
Woodland or property name:	Cologin
Nearest town, village or locality:	Oban
OS Grid reference:	NM 845262
Local Authority district/unitary Authority:	Argyll and Bute Council

Areas for approval (ha)	**Conifer**	**Native broadleaf**	**Non-native woodland**	**Mixed woodland**	**Open Space**	**Other Land**	**Peatland Restoration**
Clear felling	123.0	-	-	-	14.7		-
Restocking (plant)	77.5	16.3	5.5	-	38.3	0.5*	(5.3 net)
Restocking (natural regeneration)	-	-	-	-	-	-	-
Selective Fell (CCF)	-	-	-	-	-	-	-
Thinning (Commercial)	-	-	-	-	-	-	-
Thinning (Non-commercial)	0.1	9.0	4.1	-	16.0	-	-

* Existing broadleaved woodland not to be felled, retained at restocking.

1. I apply for Land Management Plan approval for the property described above and in the

enclosed plan.

2. I apply for an opinion under the terms of the Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999 for road building as detailed in my application.
3. I confirm that the initial scoping of the plan was carried out with FLS staff in 2016.
4. I confirm that the proposals contained in this plan comply with the UK Forestry Standard.
5. I confirm that the scoping, carried out and documented in the Consultation Record attached, incorporated those stakeholders which the SF agreed must be included.
6. I confirm that agreement has been reached with all of the stakeholders over the content of the forest plan and that there are no outstanding issues to be addressed. Copies of consultee endorsements of the plan are attached.
7. I undertake to obtain any permissions necessary for the implementation of the approved Plan.
8. Conifers will be restocked to a minimum density of 2500/ha net plantable area. Broadleaves will be established through natural regeneration to achieve a minimum stocking of 1600/ha over a 5-to-10-year period, and 2500/ha if planted. Assessment of regeneration areas in this plan will be made at year 5, when a decision on what actions are needed to achieve full establishment if not achieved by year 5, with further review of sites with inadequate regeneration at year 7. Full establishment will be achieved by year 10, planting when necessary to supplement natural regeneration (see Map 5.9 Proposed areas for natural regeneration).

Signed:
PP Regional Manager
Region: West

Signed:

Conservator
Conservancy: Perth and Argyll
Date:

Date of Approval: Date approval ends:

Forestry and Land Scotland
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West Region - Cologin Land Management Plan

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

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

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

Plan Reference No:

Plan Approval Date:

Plan Expiry Date:

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1.0 Summary of proposals

1.1 Overview

The new plan for Cologin covers 276.1 ha. Only an indicative forest plan formerly existed under which no operations requiring approval were permitted. The new plan therefore seeks to obtain approval for forest operations over the next 10 years.

The plan area is located just to the south of Oban. Parts of the forest are conspicuous from the A816. Edges are visible from Lerags Glen, the Kilninver area, Kerrera and Seil Island, with the southern half of the forest falling within an Area of Panoramic Quality. Cologin Forest contains an informal forest walk accessed from the chalet complex in Lerags Glen, which is classed as a Core Path. No other built access to the forest existed until forest road construction from Lerags Glen was built in spring 2021. Consequently, no harvesting or road infrastructure development within the forest had been undertaken prior to actioning an SPHN for infected larch in the forest, issued on 30th September 2021. This resulted in the manual felling of 13.3 ha of larch close to the reservoir. No extraction was undertaken. A second SPHN affecting two areas in the eastern part of the plan area was issued in 2023, with the intention of manually felling these areas and leaving the timber on site until forest road access is built and the associated coupes harvested. A third SPHN was notified early in 2024. Access for haulage along Lerags Glen is restricted, with a Timber traffic Management Plan in place for the Council managed section and negotiations required with the landowner and neighbours for any improvements and maintenance to the private section of tarred road. A solution to overcome these constraints arose in 2023 with the acquisition of the adjacent Ariogan Farm, lying predominantly between the forest and the A816. This allowed alternative access to be created directly off the A816 and will replace the access via Lerags Glen. This acquisition will be taken forward as a separate LMP and the road access as a separate approval exercise as far as the fisherman's path in Cologin. Loch Gleann a' Bhearraidh is managed by Scottish Water and forms part of Oban's public water supply. The forest area is partly within the catchment, which is an important consideration, affecting forest design and operations. A number of private water supplies are also present requiring protection, along with pockets of deep peat for restoration.

1.2 Plan Objectives

The primary objectives of the plan for the next 10 years, primarily from the design brief can be summarised as follows: -

1. Timber production – commercial conifer areas
2. New forest road network construction to serve Cologin
3. Protection of the public water supply – Loch Gleann a’ Bhearraidh
4. Protection of private water supplies
5. Landscape enhancement
6. Development of forest health resilience against tree diseases
7. Blanket bog/deep peat restoration
8. Enhancement of social benefits through forest design
9. To comply with UKWAS guidance for certification and UKFS

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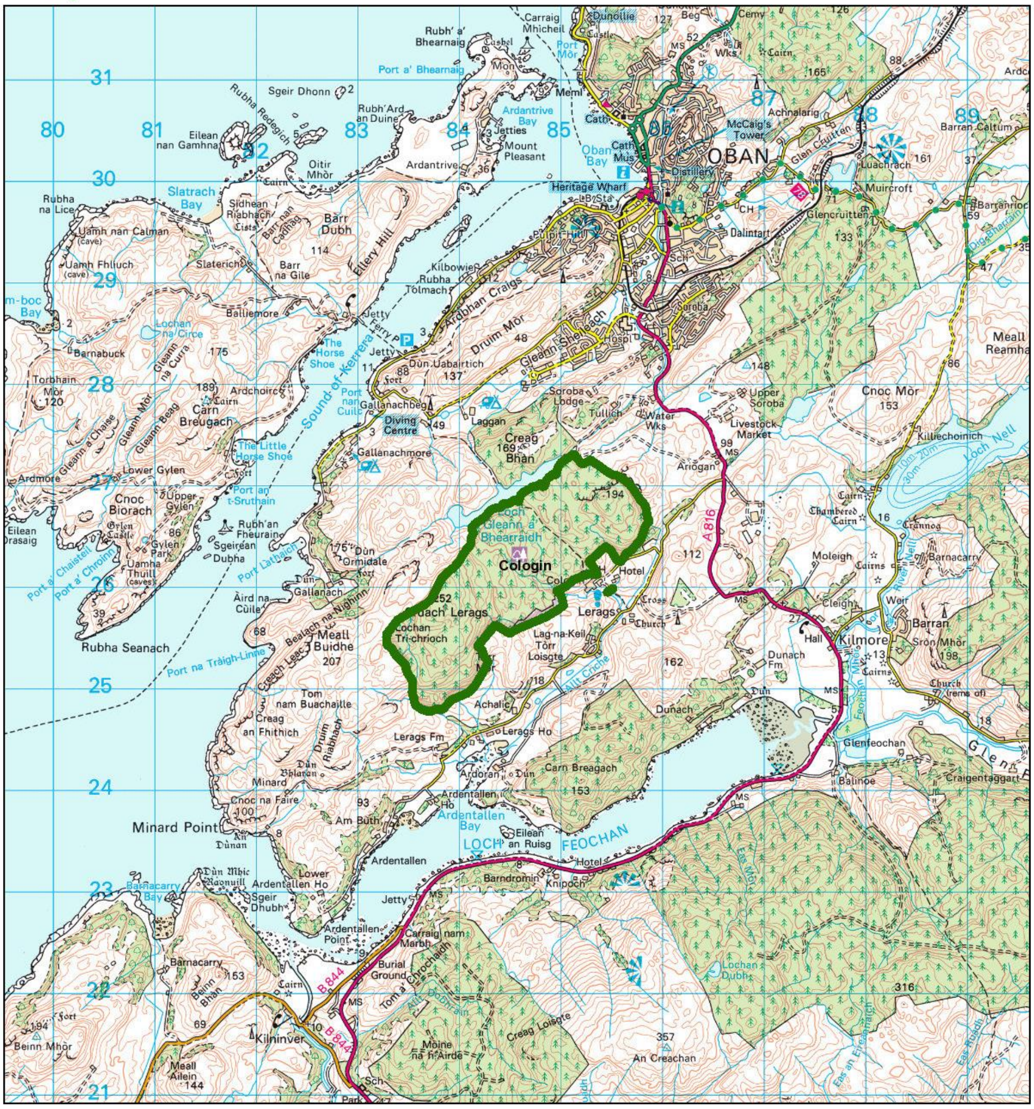


Map_1.1 Location Map

Legend

Blocks

Scale @ A4: 1:50,000

Date: 10/02/2021

Author: Roger Wilson

0 0.25 0.5 1 1.5 2 km

N

Map 1.1 Location Map

1.3 Summary of management proposals

The management of proposals in the 10-year plan period can be summarised as follows: -

Table 1.1 – Summary of operations requiring approval (2025 – 2034) or an EIA screening opinion (2025- 2029)

Operation	Description	Quantity
Forest roads	New forest roads	4.0 Km
Forest quarry	Quarry	0.5 ha
Deforestation	Bog restoration areas	5.3 ha
Felling	See map 5.3. This includes SPHN areas already notified.	123.0 ha
Restocking	See map 5.6	99.3 ha
Thinning	See Map 5.11 Silvicultural Amenity & other	 - 13.2 ha

2.0 Regulatory requirements

Scottish Forestry (SF) is responsible for approving felling and restocking operations on FLS land and ensuring that these operations are compliant with the UKFS. Thresholds for where approval must be sought are contained in an agreed Tolerance Table (section 2.10). Approvals are valid for the life of the plan (normally 10 years). SF maintains a Public Register online of all operations for which approval is being sought. The Cologin LMP contains felling, restocking, thinning, and roading requiring consent in the 10-year plan period.

2.1 EIA scoping enquiry requests

2.1.1 Deforestation

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	X	5.3	100		Forest quarry		
Location of work		Cologin					
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.							

(See Map 4.12) Small areas of deep peat scattered around the forest, to be restored primarily through conifer removal, buffering of features at the next rotation, and drain blockage. Some surface smoothing and stump overturning may also be implemented. Gross area 5.3 ha.
Provide details on the existing land use and the environmental sensitivity of the area that is likely to be affected by the forestry project.
Areas for restoration are planted with SS. Drains in Area 5 (See Map 4.12) feed private water supplies. Areas 6 and 11a fall within the reservoir catchment, with a small feeder burn present in each. Area 8 falls within the catchment of the chalet complex private water supply and is cut through by a drainage conduit feeding water into the catchment. Area 10 is close to a private water supply intake.
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.
None identified.
Include details of any consultees or stakeholders that you have contacted in order to make this assessment. Please include any relevant correspondence you have received from them.
Statutory stakeholders made aware of the proposal via LMP website and e-mail. Private water supply owners contacted by mail.
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.			
N/a			
Sensitive Areas			
Please indicate if any of the proposed forestry project is within a sensitive area. Choose the sensitive area from the drop down below and give the area of the proposal within it.			
Sensitive Area			Area
Deep peat area			5.3
Property Details			
Property Name:	Cologin		
Business Reference Number:		Main Location Code:	501
Grid Reference: (e.g., NH 234 567)	NM 843262 (center of forest)	Nearest town or locality:	Oban
Local Authority:	Argyll and Bute Council		
Owner's Details			
Title:	Mr	Forename:	Roger
Surname:	Wilson		
Organization:	FLS	Position:	Planning Forester
Primary Contact Number:	07776171413	Alternative Contact Number:	
Email:	roger.wilson@forestryandland.gov.scot		

Address:	West Region, Whitegates, Lochgilphead, Argyll		
Postcode:	PA31 8RS	Country:	UK
Is this the correspondence address?		Yes	
Office Use Only			
GLS Ref number:			

2.1.2 Roadlines

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	X	10.4
Deforestation					Forest quarry		
Location of work	Cologin						
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.							

Standard FLS road specification. The roadline construction will conform to The Design and Use of the structural pavement of unsealed roads.pdf and with SNH's document SNH Constructed tracks in the Scottish Uplands.pdf Material will be won along roadlines, from borrow pits, from the proposed quarry within the forest at NM 8457 2626 and imported from the nearby Upper Soroba private sector quarry. Where any deep peat is crossed, roads will be floated over rather than excavating peat. Geotextiles may also be used to assist. The road will be built in stages, from the entrance off the A816, approximately 1 Km per year. One bridge is anticipated at NM 8428 2609. Timescales for the construction of the final section to coupe 57012 will be dependent on resources and timing of felling allotted to this coupe. The spur road to serve 57002 and the northern side of 57003 may both be shortened and/or built as a forwarder track. Timing will be determined by whether it is needed to serve the steep slopes on the northern side of 57003 and to provide additional access to 57001. A separate application covers the section of new road across Ariogan to the proposed stacking area at NM 8482 2661.
Provide details on the existing land use and the environmental sensitivity of the area that is likely to be affected by the forestry project.
The new forest road will be built through existing forest and internal open space. The primary environmental sensitivity is the reservoir, but road construction is almost entirely outside of the catchment or marginally within at only one point (NM 843263). A band of deep peat for restoration (Map 4.14 - Area 6) is cut across by the route of the proposed roadline at this point, but the route chosen minimizes the impact. Further deep peat is found at the eastern end of Cologin, where the roadline cuts along the edge of an area planned for deep peat restoration (Area 11). The spur road to coupe 57002 and serving the north side of 57003 also cuts along the southern edge on an area of peatland restoration. In both cases, adopting a line on the harder slope base above will be sought. The roadlines for approval will not affect any visually sensitive areas within Cologin Forest.
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.			
No significant effects anticipated.			
Include details of any consultees or stakeholders that you have contacted in order to make this assessment. Please include any relevant correspondence you have received from them.			
Statutory stakeholders made aware of the proposal via LMP website and e-mail. Stakeholders made aware through e-mail and/or the public consultation.			
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.			
Sensitive Areas			
Please indicate if any of the proposed forestry project is within a sensitive area. Choose the sensitive area from the drop down below and give the area of the proposal within it.			
Sensitive Area			Area
Deep peat			0.9
Property Details			
Property Name:	Cologin		
Business Reference Number:		Main Location Code:	501

Grid Reference: (e.g., NH 234 567)	NM 845262	Nearest town or locality:	Oban
Local Authority:	Argyll and Bute Council		
Owner's Details			
Title:	Mr	Forename:	Roger
Surname:	Wilson		
Organization:	FLS	Position:	Planning Forester
Primary Contact Number:	07776171413	Alternative Contact Number:	
Email:	roger.wilson@forestryandland.gov.scot		
Address:	West Region, Whitegates, Lochgilphead, Argyll		
Postcode:	PA31 8RS	Country:	UK
Is this the correspondence address?		Yes	
Office Use Only			
GLS Ref number:			

2.1.3 Forest quarries

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	X	0.5
Location of work	Cologin NM 8454 2624						
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.							
Proposed quarry site currently under SS P85. Ride-line chosen for upper edges to provide temporary windfirm edge until the coupe (57009) is felled in 2034. The quarry lies immediately above the proposed roadline.							
Provide details on the existing land use and the environmental sensitivity of the area that is likely to be affected by the forestry project.							
The quarry will not be readily visible in the landscape. There is a watercourse, at its closest, 20 m below the line of the proposed forest road. The quarry faces away from the reservoir and is not within its catchment.							
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.							
No significant effects anticipated.							
Include details of any consultees or stakeholders that you have contacted in order to make this assessment. Please include any relevant correspondence you have received from them.							

Statutory stakeholders made aware of the proposal via LMP website and e-mail. Stakeholders made aware through e-mail and/or the public consultation.			
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.			
N/a			
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
Property Details			
Property Name:	Cologin		
Business Reference Number:		Main Location Code:	501
Grid Reference: (e.g., NH 234 567)	NM 8454 2624	Nearest town or locality:	Oban
Local Authority:	Argyll and Bute Council		
Owner's Details			
Title:	Mr	Forename:	Roger
Surname:	Wilson		

Organisation:	FLS	Position:	Planning Forester
Primary Contact Number:	07776171413	Alternative Contact Number:	
Email:	roger.wilson@forestryandland.gov.scot		
Address:	West Region, Whitegates, Lochgilphead, Argyll		
Postcode:	PA31 8RS	Country:	UK
Is this the correspondence address?		Yes	
Office Use Only			
GLS Ref number:			

2.2 Summary Management Proposal Tables

Table 2.1 Clearfelling in the first 20 years of the plan

Felling	Phase 1	Phase 2	Phase 3	Phase 4
Area in ha	84.4*	38.6	36.1	49.7
% of area (wooded) (not including other land)	37	17	16	22
Volume (K m^3)	48.9	29.0	25.8	37.8

*Includes larch already felled under SPHN.

Table 2.2 Species composition over the first 20 years of the plan

Species Group	Current – 2022*		2034		2044	
	Area (ha)	%	Area (ha)	%	Area (ha)	%
Sitka Spruce	187.2	72	121.6	48	86.3	38
Norway Spruce	-	-	11.2	4	14.4	6
Larches	19.5	7	-	-	-	-

Species Group	Current – 2022*		2034		2044	
	Area (ha)	%	Area (ha)	%	Area (ha)	%
Mixed Conifers	2.7	1	30.8	12	38.9	17
Mixed Broadleaves	5.5	2	12.5	5	16.0	7
Native Broadleaves	12.0	5	24.5	10	33.4	15
Failed	2.5	1	0.7	-	-	-
Internal Open Space	31.3	12	51.9	21	38.1	17
Total	**260.7**	**100**	**253.1**	**100**	**227.1**	**100**
Open Hill	5.6		6.2		14.1	
Lost/Extra land	3.6		2.9		2.9	
Reservoir	6.2		6.2		6.2	
Bog restoration	-		7.7		25.8	
Total	**276.1**		**276.1**		**276.1**	

See Section 4.2 and Table 4.5 for more details and caveats. *Figures are pre-SPHN.

Table 2.3 Age class composition over the first twenty years

Age Class	Current – 2022*		2034		2044	
	Area (ha)	%	Area (ha)	%	Area (ha)	%
0 – 10 yrs	-	-	99.3	50	72.2	38
11 – 20 yrs	-	-	-	-	99.3	53
21 – 40 yrs	225.9	100	-	-	-	-
40 – 60 yrs	0.2	-	100.7	50	16.9	9
60+ yrs	0.4	-	0.6	-	0.6	-
Total	**226.5**	**100**	**200.6**	**100**	**189.0**	**100**

See also Chart 4.1 Future Forest Structure. *Figures are pre-SPHN.

2.3 Detailed Summary Tables

Table 2.4 Clearfelling Phase 1 and 2 (See Map 5.3)

Clearfelling (Phase 1)												
Coupe No	Total Area (Ha)	Volume (K m3)	Spp by Ha (SS)	Spp by Ha (SP)	Spp by Ha (LP)	Spp by Ha (NS)	Spp by Ha (Larch)	Spp by Ha (X Con)	Spp by Ha (B/L)	Open Land by Ha (Open)	Restock Year	Monitoring Comments
57003	33.9	16.8	23.7				5.6		(0.1)*	4.5	2028	
57006	19.3	12.0	16.0	0.5			1.4		(0.1)*	1.3	2028	
57007	16.4	6.6	9.8	1.5			2.1***		(0.5)*	2.5	2028	Larch mostly felled under SPHN
57010	26.0	13.6	17.6				6.2			2.2	2028	
Totals	**95.6**	**49.0**	**67.1**	**2.0**			**15.3****		**(0.7)***	**10.5**		
Clearfelling (Phase 2)												
57005	9.1	6.5	8.0	0.2			0.1		(0.1)	0.7	2035	
57009	33.4	22.6	29.7				0.6		(0.1)	3.0	2035	
Totals	**42.5**	**29.1**	**37.7**	**0.2**			**0.7****		**(0.2)***	**3.7**		

*B/L (broadleaves) not to be felled ** Mostly due to be felled under SPHN's *** Includes larch already felled under SPHN.

Table 2.5 Commercial Thinning

Thinning (Phase 1 & 2)						
Coupe No	Total Area (Ha)	Volume to remove (m3)	Pre-Thin Vol/Ha (m3)	Post Thin Vol/Ha (m3)	Prescription for Thinning	Monitoring Comments
	Nil					
Totals	Nil					

No commercial thinning operations are currently planned in the foreseeable future.

Table 2.6 Non-commercial thinning (See Map 5.10)

Thinning (Phase 1 & 2)						
Type	Total Area (Ha)	Volume to remove (m3)	Pre-Thin Vol/Ha (m3)	Post Thin Vol/Ha (m3)	Prescription for Thinning	Monitoring Comments
Hardwood thinning	13.2	28	113	85	Individual tree selection	No program to date, may not happen
Open habitat restoration	Negligible	Negligible	N/a		Removal of woody growth, primarily regeneration, from deep peat restoration sites and priority habitat areas	Not surveyed
Protection of fence lines	Negligible	Negligible			Removal of trees blown over fences or inhibiting fence maintenance operations.	None presently known, as and when required
Protection and maintenance of roads and roadside edges	Negligible	Negligible			Removal of woody growth during road maintenance operations, windblown trees	No program to date, as and when required, awaiting road construction

Thinning (Phase 1 & 2)						
Type	Total Area (Ha)	Volume to remove (m3)	Pre-Thin Vol/Ha (m3)	Post Thin Vol/Ha (m3)	Prescription for Thinning	Monitoring Comments
Amenity areas	Negligible	Negligible			Maintenance of Core Path and forest walk access	No program to date
Totals	13.2	28	113	85		

NB. Some of the thinning types above overlap. Areas highlight both existing management needs and those that may develop needs in the future. Estimates of maximum thinning area only due to variables and uncertainties inherent in the woodland types, management prescriptions and incidences of future exotic regeneration.

Table 2.7 Summary of Total Felling for Approved Plan Period

Total Felling (2024 – 2033)											
Method	Total Area	Volume (K m^3)	Spp by Ha (SS)	Spp by Ha (SP)	Spp by Ha (LP)	Spp by Ha (NS)	Spp by Ha (Larch)	Spp by Ha (X Con)	Spp by Ha (B/L)	Open Land by (Ha)	Monitoring Comments
Clearfell	137.2	78.5	104.8	2.2	-	-	16.0	-	-	14.2	
Respacing	-	-	-	-	-	-	-	-	-	-	None
Thinning (Silvicultural, including CCF)	-	-	-	-	-	-	-	-	-	-	(No conifer thinning planned due to age of crop). (Gross areas thinned).

Total Felling (2024 – 2033)											
Method	Total Area	Volume (K m^3)	Spp by Ha (SS)	Spp by Ha (SP)	Spp by Ha (LP)	Spp by Ha (NS)	Spp by Ha (Larch)	Spp by Ha (X Con)	Spp by Ha (B/L)	Open Land by (Ha)	Monitoring Comments
Amenity	29.2	0.03	-	0.1	-	-	-	-	13.1	16.0	Thinning of no commercial volume
Totals	**166.4**	**78.53**	**104.8**	**2.3**	**-**	**-**	**16.0**	**-**	**13.1**	**30.2**	

Table 2.8 Restocking (See Map 5.6)

Restocking – Phase 1 felling													
Coupe No	Total Area (Ha)	SS (Ha)	SP (Ha)	LP* (Ha)	NS (Ha)	DF (Ha)	XC (Ha)	B/L (Ha)	EXISTING B/L (Ha)	Open (Ha)	Restock Year	Restock Method & Density	Monitoring Comments
57003	33.9	15.4	1.0	-	-	1.3	1.9	3.1	0.2	11.0	2027	R/S	Includes peatland restoration areas and priority open habitat expansion – monitor for conifer regeneration. Private water supply to be monitored during harvesting and peatland restoration.
57006	19.3	2.4	0.4	-	2.9	4.4	3.1	2.5	0.1	3.5		R/S	Monitoring of private water supplies during ground preparation. Peatland restoration area – monitor for conifer regeneration.
57007	16.4	-	4.1	-	-	-	-	6.8	0.1	5.4	2027	R/S	Within reservoir catchment – monitor for diffuse pollution and run-off.
57010	26.0	7.1	0.1	-	5.3	3.6	-	1.7	0.1	8.1	2028	R/S	Some peatland restoration area – monitor for conifer regeneration. Private water supplies present.

Restocking – Phase 1 felling													
Coupe No	Total Area (Ha)	SS (Ha)	SP (Ha)	LP* (Ha)	NS (Ha)	DF (Ha)	XC (Ha)	B/L (Ha)	EXISTING B/L (Ha)	Open (Ha)	Restock Year	Restock Method & Density	Monitoring Comments
Totals	**95.6**	**24.9**	**5.6**	**-**	**8.2**	**9.3**	**5.0**	**14.1**	**0.5**	**28.0**			
%	**100**	**26**	**6**	**-**	**9**	**10**	**5**	**15**	**-**	**29**			

Restocking – Phase 2 felling													
Coupe No	Total Area (Ha)	SS (Ha)	SP (Ha)	LP* (Ha)	NS (Ha)	DF (Ha)	XC (Ha)	B/L (Ha)	EXISTING B/L (Ha)	Open (Ha)	Restock Year	Restock Method & Density	Monitoring Comments
57005	9.1	4.9	-	-	-	-	1.7	-	-	2.5	2034	R/S	Private water supplies to be monitored during harvesting.
57009	33.4	6.3	4.0	-	3.0	2.2	2.4	7.7	-	7.8	2034	R/S	Within reservoir catchment – monitor for diffuse pollution and run-off. Monitor private water supplies to the south-east, monitor during mounding operations especially.
Totals	**42.5**	**11.2**	**4.0**	**-**	**3.0**	**2.2**	**4.1**	**7.7**	**-**	**10.3**			
%	**100**	**26**	**10**	**-**	**7**	**5**	**10**	**18**	**-**	**24**			
Totals Phase 1 & 2	**138.1**	**36.1**	**9.6**	**-**	**11.2**	**11.5**	**9.1**	**21.8**	**0.5**	**38.3**			
%	**100**	**26**	**7**	**-**	**8**	**8**	**7**	**16**	**-**	**28**			

Conifers will be restocked to a minimum density of 2500/ha net plantable area. Broadleaves will be established through natural regeneration to achieve a minimum stocking of 1600/ha over a 5-to-10-year period, and 2500/ha if planted. Assessment of regeneration areas in this plan will be made at year 5, when decisions on what actions are needed to achieve full establishment if not achieved by year 5, with further review of sites with inadequate regeneration at year 7. Full

establishment will be achieved by year 10, planting when necessary to supplement natural regeneration (see Map 5.9 Proposed areas for natural regeneration).

Table 2.9 Civil Engineering projects requiring EIA determinations (See sections 2.1 and 4.9.2)

Proposed Activity (Road/Quarry)	OS Grid Reference	Forest/Coupe	Description (Length/Area/ Construction)	Area to be felled (ha)	Monitoring Comments
Spur off main haul route	NM 852 268	Cologin	0.5 Km of standard forest road. Phase 1 timing	1.2	Beside peatland restoration area. Drainage towards reservoir.
Main haul route from forest boundary to proposed quarry.	NM 847 264	Cologin	0.6 Km of standard forest road. Phase 1 timing.	5.2	Private water supplies
Quarry	NM 845 263	57009	Fell trees above proposed forest road to windfirm edges	0.5	
Main haul route from quarry to road end	NM 842 257	Cologin	1.5 Km of standard forest road including one bridge. Phase ½ timing in stages, yet to be planned.	4.0	Any drains feeding the reservoir. Private water supplies. Pockets of deep peat.

2.4 Tree felling in exceptional circumstances

FLS will normally seek to map and identify all planned tree felling in advance through the LMP process. However, there are some circumstances requiring small scale tree felling where this may not be possible and where it may be impractical to apply for a

separate felling permission due to the risks or impacts in delaying the felling. Felling permission is therefore sought for the LMP approval period to cover the following circumstances: -

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

Table 2.10 Other Felling

Other Felling				
Date	**Coupe/Area**	**OS NGR**	**Volume**	**Comments**

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

The maximum volume of felling in exceptional circumstances covered by this approval is 75 Cubic metres per Land Management Plan per calendar year. A record of the volume felled in this way is detailed above and will be considered during the five-year Land Management Plan review.

2.5 Other projects

Table 2.11 Other Projects

Regional Team	Activity	Area/Location	Indicative Date
Environment	Species Monitoring & Surveying.	Whole forest.	2025 - 2034
Recreation and Tourism	Maintenance of existing trails; management of public access to operational sites.	Forest walk.	2025 - 2034
Deer Management	Deer Culling as per the DMP to meet target densities to permit successful establishment of vulnerable crops – see Appendix VII.	Whole forest.	2025 - 2034

Regional Team	Activity	Area/Location	Indicative Date
	Fence Maintenance as required.	External fences.	2025 - 2034
Civil Engineering	Prior Notification for new roads as required.	As per roads program.	As required.
	Roads maintenance as required.	All forest roads.	As required.
Plant Health	DNB Surveys, *P. ramorum* surveys.	Pine and larch Sub-cpts.	Annually.
Planning	Crop surveys – Monitoring of natural regeneration and stocking density; production and attribute surveys of timber crops; SDA's, plant health inspections.	Restock coupes at year 1 and 5.	As required.

A number of other activities not requiring approval will be undertaken within the plan area during the plan period. The table above lists the majority, but is no exhaustive.

2.6 Departure from UKFS guidelines

No departures anticipated.

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 full list of these standards and guidance can be found here: Link to management documents
Other relevant external policies and documents are listed in Appendix II Section 3.10

2.8 Summary of additional regulations

The roads and tracks on Map 5.8 will require local authority Prior Notification (PN) approval. These will be submitted following EIA screening approval by Perth and Argyll Conservancy.

2.9 UKWAS requirements

Table 2.12 UKWAS summary

Description	% of LMP Area[1]	Location of Data
Restock main conifer spp	31	Forester Restock Layer
Restock other conifer	19	Forester Restock Layer
Non-native/other broadleaves	6	Forester Restock Layer
Open Space[2]	32	Forester Restock Layer
Native broadleaves[3]	12	Forester Restock Layer
Management for biodiversity as primary objective (incl NR and MI area)	41	Forester Management Layer
LISS	11	Forester Management Layer
Natural reserves	0	Forester Management Layer

Notes: **1.** The % will total more than 100% as the species and management categories overlap.
2. Only the larger areas of open space area recorded here. There many more small areas of open space within the broadleaf woodland.
3. The native broadleaves will be at variable stocking densities.

2.10 Conservancy approval thresholds

Table 2.13 Tolerance table

	Adjustment to felling coupe boundaries	Timing of restocking	Changes to species	Changes to road lines	Designed Open Ground	Wind blow clearance
Scottish Forestry Approval not normally required (record and notify SF)	10% of coupe size	Up to 5 planting seasons after felling (allowing for fallow periods for Hylobius)	Change within species group e.g., Native broadleaves Non-native conifers e.g., Sitka spruce to Douglas fir Non-native to native species (allowing for changes to facilitate Ancient Woodland policy) For Caledonian pine woodland – SP to native BL to allow for disease issues	Departures of up to 60 m from the center of the roadline	Increase by up to 5% of coupe area	
Approval by exchange of emails and maps	10-15% of coupe size	5 years +	Change of coupe objective likely to be consistent with current policy e.g., from productive to open, open to native species	Departures of greater than 60 m from the center of the roadline	Increase between 5-10% coupe area. Any reduction in open ground within coupe area	Up to 5 ha
Approval by formal plan amendment may be required	> 15% of coupe size		Major change of objective likely to be contrary to policy e.g., native to non-native species, open to non-native	As above, depending on sensitivity	Increase >10% of coupe area	More than 5 ha

3.0 LMP Analysis

3.1 Previous plan (see also Appendix II/2.0)

Cologin was covered by an Indicative Plan without any operational outputs, so none of the indicative aspirations have been achievable. The Indicative Plan does not now fully reflect current policies. The ability to revise the Indicative Plan was hampered by the lack of access and potential community asset transfer. Developments regarding road access and the issuing of SPHN's for larch have prompted the need for a Land Management Plan to be put in place.

3.2 Key challenges

3.2.1 Timber production – commercial conifer areas

The road network will need to be developed in order to gain access to coupes for harvesting and to provide access to larch areas, subject to or potentially vulnerable to *Phytophthora ramorum* infection. However, haulage of timber from the Achalic section through the Cologin section requires agreement with the adjoining landowner, who holds rights in this respect. Some Phase 1 larch is present in this area. Cologin is just within the Priority Action Zone as described in the Larch Action Plan, which proposes a 50% reduction in larch through felling over the next five years. It requires prompt action to fell infected trees following issuing of an SPHN (Statutory Plant Health Notice), typically by the end of February or August following notification. Meanwhile, as a consequence of the lack of haulage access, felled larch will degrade until access is achieved, having been manually felled and left in situ.

Exposure is a threat to higher elevation sites and to south-western parts of the forest. This limits the ability to restructure the forest over a longer time period. Felling of the roadline and of larch pockets will create brown edges and thereby increase windblow risk. Forest Gales suggests a high risk of windblow where brown edges area created (See Maps 3.4 and 3.19).

Thinning of hardwood areas is desirable, but is hampered by accessibility, steep slopes and commercial viability.

3.2.2 Protection of the public water supply – Loch Gleann a' Bhearraidh.

Working methods within the public drinking water catchment are particularly sensitive. The main challenges relate to sedimentation and run-off into the reservoir. Additionally, issues that can be caused by brash, such as nutrient leaching, odour and algal growth have been raised.

3.2.3 Protection of private water supplies

Sedimentation and discolouration of water are a risk when undertaking forest operations. Woody debris entering watercourses during harvesting could cause blockages. Exceeding permitted mineral content is a current issue for the chalet complex supply. The poor quality of the supply sources is another issue.

3.2.4 Landscape enhancement – A816 and visitor areas.

Landscape is sensitive from key viewpoints, although much of the forest is either not visible, is visible only as edges, or is seen in part from a restricted set of geographical areas. Landscape design must strike a balance between coupe size and associated roading cost.

Felling diseased larch in isolation may create landscape issues. Minimizing the felling of non-larch species to gain access whilst achieving felling shapes acceptable in the landscape requires some compromises.

Following the acquisition of Ariogan by FLS, FLS is in the process of engaging stakeholders and creating a Land Management Plan for the area. The current intention is for this to blend in with the proposals for Cologin, whilst considering whether the proposals for Cologin are sufficiently accommodating to allow flexibility in the design for Ariogan.

3.2.5 Development of forest health resilience measures against tree diseases

Dealing with most remaining larch areas is currently difficult due to access constraints until a road network is in place. Larch is distributed in pockets around the forest, requiring felling of non-larch species to gain machine access. Some larch falls within sensitive private water catchments. Steep slopes may make this operation more difficult.

Ash in the forest is affected by *Chalara fraxinea,* with plenty of evidence of dieback visible. Most of the ash is in pure planted blocks that are currently inaccessible for management interventions.

3.2.6 Blanket bog/deep peat restoration

Areas of deep peat are relatively small, disconnected and scattered throughout the forest, falling within different felling phases. Some are associated with private water supplies, where full restoration will not be possible. Some fall within the reservoir catchment where restoration methods need to be sensitive to water quality protection. All areas may be vulnerable to unwanted conifer regeneration in the future.

3.2.7 Enhancement of social benefits through forest design

The current walking route/Core Path is not maintained or marked. It is not currently advertised. Local tourism business clients and local residents use the paths. A circular route around the reservoir would be popular but the terrain is challenging. Current views within and out of the forest along the existing routes are severely restricted by the existing forest. The current forest road access is intended to follow the track to the reservoir. Forest operations therefore can restrict public access and impact on local tourism businesses. The existing tree crop is largely commercial Sitka spruce. No formal recreation facilities are provided or maintained. Car parking is limited to private parking available at the chalet complex. Access via the private field is restricted by gates and livestock. Purchase of Ariogan Farm with the intention to develop recreational facilities, including linkage with Cologin, will have a positive influence on recreation provision in the area, but will take time to establish.

3.2.8 New forest road network construction to serve Cologin

A Timber Traffic Management Plan is in place for the Lerags minor public road maintained by the Council, which imposes restrictions on timber traffic. This would have constrained timber production from the forest. This might have been reduced if mitigation measures were agreed with Argyll & Bute Council, such as limited road improvements. Similarly, the minor road to the chalets would also have need to be maintained and safe-guarded to ensure safe public and neighbour access to the chalet complex. This is a private road requiring consultation with the landowner should any widening be required. A suspect culvert may also be needing replacement, which would require consultation with users and the landowner. However, following the purchase of the Ariogan grazing in 2023, a new access will be created from the A816 across the grazing to access the forest, thereby avoiding the need to use the Lerags access. The Ariogan access however requires consultation with Scottish Water regarding the crossing of major water pipes to agree crossing points and methodology. Given the length of new road, it will need to be done in stages over two to three years, to reach all the coupes currently affected by *Phytophthora ramorum.* This will delay harvesting and restructuring.

3.3 Plan objectives

3.3.1 Timber production – commercial conifer areas

Timber production is the primary objective for the forest area. The forest is even-aged and approaching economic maturity and upper limit of stability. Restructuring is necessary; initiation of restructuring having already been delayed through the lack of a road access solution prior to 2021. Future commercial timber production will be delivered primarily through planting of Sitka spruce in areas where water and landscape constraints are not an issue. Elsewhere, mixtures of conifer species will fulfil amenity objectives aswell as commercial objectives. In regard to larch SPHN felling, the current policy is to minimize non-larch felling due to lack of road access, rather than adjust temporary felling boundaries for landscaping reasons or increase the amount of timber degrading in the forest until haulage is available. Similarly, only larch specified under an SPHN will be felled, rather than dealing with adjacent larch at the same time, to avoid more timber being left to degrade and to minimize costs of manual felling until mechanized harvesting has access.

3.3.2 Protection of the public water supply – Loch Gleann a' Bhearraidh.

A buffer will be established through clearfelling; the buffer area comprising of open ground and native species planting with long rotation length or CCF management to reduce impacts. Access for fisherman will be respected. The buffer will comprise ground falling within the catchment as defined by drainage indicators and contours. Felling will be undertaken to avoid cutting more than 20% of the catchment in a 3 - year period (UKFS requirement). Liaison with Scottish Water will be instigated at least 3 months ahead of operations and site meetings arranged as necessary. Operations will conform to relevant guidance. Site inductions will refer to the presence of the drinking water supply.

3.3.3 Protection of private water supplies

Standard buffers will be established through clearfelling, including for intake points and pipes. Buffers are likely to contain some native woodland. The UKFS guidance on protection of water features will be followed. Private water supply owners will be consulted, and agreement reached on any mitigation measures required prior to operations taking place. All private water supplies have been recorded and owners identified.

3.3.4 Landscape enhancement – A816 and visitor areas.

Those parts of the forest that are visible from public roads, residential dwellings and facilities, have been subject landscape enhancements in the design. These will be delivered through matching coupe shapes and species groups to landform, species diversity and improvement of forest edges.

Tourism is important for the Oban area. The chalet complex and hotel provide adjacent recreational clientele with access to the forest walk. Consequently, landscape enhancements to potential Visitor Zones will form part of the future species design.

3.3.5 Development of forest health resilience measures against tree diseases

National policy is to avoid planting disease-prone species and to target removal of susceptible species where possible. The plan therefore reflects these policies, aims to facilitate the early removal of vulnerable species and aims to diversify the tree species to improve forest resilience. Areas containing larch are targeted for felling in Phase 1, in response to the threat posed by *Phytophthora ramorum.* Larch is not planted in the next rotation. Policies detailed in the June 2021 '*Phytophthora ramorum* on larch Action Plan' under the Priority Action Zone will be followed.

There are no current plans to fell the ash infected with *Chalara fraxinea.* However, it is thought that natural senescence will contribute positively to deadwood volumes, so removal is unlikely, allowing diverse natural regeneration to fill gaps in what are generally pure ash stands.

3.3.6 Blanket bog/deep peat restoration

Deep peat restoration is a national policy, as outlined in the document; 'Deciding future management options for afforested deep peatland', and also in the Scottish National Peatland Plan Scottish National Peatland Plan . The aim is carbon storage and future carbon capture. Opportunities for deep peat restoration have been identified and funding is available. Areas of deep peat are relatively rare within the forest. Those present will be restored as far as possible, with the majority within the national target timescale.

3.3.7 Enhancement of social benefits through forest design

Social benefits will be increased in several ways. Firstly, through the diversification of the forest, both in terms of species composition and structure. Secondly, through the development of the forest road network, which will provide an alternative pedestrian access route through the forest when forest operations are not ongoing. FLS will explore partnership and external funding opportunities to develop new trails within the forest, where these do not conflict with the interests of neighbours. FLS will work with stakeholders to encourage the development of recreation linkages with Oban via the new Ariogan acquisition. This is likely to become the more important focus for future recreation development.

3.3.8 New forest road network construction to serve Cologin

The new access off the A816 through Ariogan will be constructed as a priority, in stages, to reach the intended stacking area on the fisherman's path within three years. Building access to the quarry beyond will also be required in order to provide stone. Larch beyond the quarry in the planned Phase 1 coupe 57006 is already the subject of an SPHN so road extension will be required to extract this material. Construction of the road to the planned road end will be required during the plan period in order to access the early Phase 3 coupe 57012. EIA Scoping Enquiry Request for the roadline through Ariogan to the Cologin boundary will be done as a separate exercise to this plan in order to expedite construction of the road ahead of plan approval.

3.3.9 To comply with UKWAS guidance for certification and UKFS 5th Edition

The certification standard is designed to reflect the requirements set out in the governmental UK Forestry Standard and thereby the General Guidelines adopted by European Forestry Ministers at Helsinki in 1993, the Pan-European Operational Level Guidelines subsequently adopted at Lisbon in 1998 and other relevant international agreements. The certification standard is also designed to reflect the requirements of the two leading global forest certification schemes – the Forest Stewardship Council and Programme for the Endorsement of Forest Certification. Products certified through these schemes are in much demand in the UK and global timber market as they provide a widely recognised way to inform customers that timber products come from responsibly managed sources. West Region aims to manage its forests for certification in accordance with these standards.

Table 3.1 Summary of Opportunities, Issues and Constraints against Plan Objectives with resultant Concept over the next 10 years (See maps 4.2 and 4.3)

Objective	Opportunities	Issues and Constraints	Concept
1 - Timber production from commercial conifer areas	• Sitka spruce grows well on most sites. • Potential for minor conifer species on some sites. • Some areas could be thinned	• Achieving sustainable timber production will be difficult in this first rotation even-aged forest of relatively small size. • Road infrastructure is needed. • Tree health issues limit species choice and affect harvesting priorities.	• Move the forest towards sustainable production through restructuring. • Develop a robust coupe structure and roading infrastructure, with coupe size optimised

Objective	Opportunities	Issues and Constraints	Concept
	in the next rotation. • Increase species diversity for resilience against climate change and environmental concerns.	• Exposure will affect terminal height and species choice for around half the forest area. • One third of the forest is too exposed to thin. The remainder is too old to thin in this rotation, apart from broadleaved areas. • Felling of larch for SPHN's will open up brown edges, vulnerable to windblow. • Water sensitivities associated with the public water supply. • The Timber Traffic Management Plan on the minor public road access and the shared access to the chalet complex impose constraints on timber traffic and lorries/low loader, permissible haulage only between April and September; and estimated 25K m^3 per annum, but only becomes a consideration if haulage is needed before the Ariogan access becomes operational. • Agreement required with landowner holding rights over haulage from Achalic section to Cologin section. • Road construction from Ariogan will take several years to build.	dependent upon landscape considerations and economic appraisal. • Prioritise planting of SS where there are no overriding constraints and match species to site. • Prioritise felling of crops with disease or are disease-prone. • Assume legal issues regarding haulage from Achalic to Cologin section can be resolved. • Assume that any issues affecting planned haulage levels over access the Lerags access will be avoided through the construction of the Ariogan access.
2 – Protection of the public water supply	• Opportunity to create resilient buffer along the	• Loss of productive ground. • Possible additional maintenance costs to control	• Establish a buffer zone, through clearfelling the

Objective	Opportunities	Issues and Constraints	Concept
– Loch Gleann a' Bhearraidh	side of the reservoir with additional landscape benefits. • Some existing edges are steep, so not suited to commercial forestry. • Forest restructuring and access provision will aid deer control, reducing deer impacts on water quality.	unwanted conifer regeneration. • Thin soils and steep ground do not lend the buffer area to native woodland establishment. • Felling of more than 20% of the catchment in any 3-year period will require a Site Impact Assessment	catchment in one operation and planting parts with native species on long rotation or LISS management. • Respect access for fishermen where possible. • Felling not to exceed 20% of the catchment in any 3-year period. • New roading to be kept out of the catchment. • Water guidelines to be adhered to in order to prevent pollution through run-off or through any existing drainage channels, and woody materials not to enter the reservoir.
3 – Protection of private water supplies	• Opportunity to improve riparian buffers along associated watercourses. • Opportunity to establish buffers around intakes and along pipelines.	• Potential loss of commercial forest area • Increased cost of operations to protect supplies and comply with guidance.	• Water guidelines to be followed. • Buffers to be established to prescribed widths. • Owners to be consulted.
4 – Landscape enhancement – A816 and visitor areas.	• Opportunity to address issues caused by hard straight edges in	• Some loss of economic potential through increased use of broadleaves, minor	• Create a balanced design that brings visual benefits to higher profile and

Objective	Opportunities	Issues and Constraints	Concept
	views from the A816. • Opportunity to enhance potential Visitor Zones with increased species diversity. • Opportunity to remove skyline fringes, particularly as seen from Kerrera. • Consideration can be given to joined up design with Ariogan.	conifer species and open space. • Increased establishment costs. • Few external native woodland habitat network linkages exist.	amenity areas; and also, a commercial focus to less visible or constrained areas. • Improve forest edges through use of appropriate shapes, species and use of open space. • Develop native woodland habitat corridors • Design for
5 – Development of forest health resilience measures against tree diseases	• Opportunity to remove all larch from the plan area within the plan period.	• Will have some negative impact on visual and species diversity, particularly in the short-term. • Will require some minor compromises to restructuring in order to remove all the larch in the plan period.	• All larch to be felled during the plan period. • Build in diversity into the next rotation. • No larch to be planted.
6 – Blanket bog/deep peat restoration	• Only a small area of deep peat within the plan, so restoration more easily accommodated. • Opportunity to secure carbon and encourage future carbon capture.	• Checked trees will require felling to waste. • Deforested areas may require ongoing control of conifer regeneration. • Open areas may hinder future access to sites beyond. • Private water supplies associated with some areas. • Some areas fall into the reservoir's catchment.	• Restore deep peat areas as far as possible. • Ensure adequate buffering, including establishing hydrological units. • Monitor sites and implement effective maintenance.

Objective	Opportunities	Issues and Constraints	Concept
		• Loss of productive area • Some unavoidable roading impacts where alternative routes not available. • Minor areas will remain inaccessible at the south-eastern end until Phase 3/4.	
7 - Enhancement of social benefits through forest design	• Diversification of species composition, improved landscape design and restructuring will bring amenity benefits. • Ariogan acquisition will bring new recreation opportunities.	• Access and parking issues to the forest. • Forest operations will impact on recreational use. • Current walking routes are not maintained or advertised. • The existing forest is unattractive. • Few if any views out of the forest	• Enhance the future forest through improved design. • Review recreation provision and linkages in conjunction with development plan for Ariogan.
8 - New forest road network construction to serve Cologin	• Purchase of Ariogan Farm allows development of new road network without constraints present in Lerags Glen • Stone available in the forest and in nearby private quarry	• Roading needed as soon as possible, given SPHN notifications and crop characteristics. • Road construction may induce windblow. • Presence of deep peat to consider • Private water catchments to consider	• Built new access as a priority off the A816 as staged construction • Follow national guidelines to protect environmental sensitivities.
9 - To comply with UKWAS guidance for certification	• Opportunity to design next rotation forest to comply with	• Deer numbers need to be kept down to achieve establishment of minor conifer species and native broadleaves.	• Ensure the plan complies with all current policy documents and guidance.

Objective	Opportunities	Issues and Constraints	Concept
and UKFS 5th Edition	UKWAS and UKFS 5th Edition.		

4.0 Management practices

4.1 Harvesting, marketing and silvicultural systems

4.1.1 Clearfelling and timber marketing

Due to late restructuring, clearfelling of conifers is the only viable option. Some constraints will be imposed by water sensitivities and public access. Steep ground is present in some areas, notably above the reservoir and above some parts of the fenced forest edge. Extraction by forwarder is envisaged for most of the areas, with only small sections possibly needing winch work. Growth is variable in places. Prioritizing felling of larch is realistically achievable within the plan period. Forest Gales software suggest windblow may arise as a result of the insertion of the roadline corridor and subsequent Phase 1 felling. Rides with green edges have been used as far as possible for stability, but some rides are narrow. Felling of the south-eastern section in Phases 3 and 4 is largely determined by the timing of road construction and the need to attempt some degree of restructuring in the forest.

Haulage will use the Ariogan access when built. Otherwise, any haulage using the Lerags access will have to adhere to the Timber Traffic Management Plan (See Appendix VIII). Timber will be marketed by Standing Sale, except for SPHN working, which will be undertaken by the FLS in-house team. Timber markets are likely to remain outwith the forest district. Woodfuel as a by-product to normal harvesting operations may become available, with potential local demand from Oban. In the longer term, some hardwood timber may be obtained from LISS management activities, most likely as woodfuel. Haulage from the Achilic section may require payment of a royalty to the previous owner.

Table 4.1 Felling area analysis

Phase	1	2	3	4	5	6+	LISS*	Open and other	Sum
Area	84.6**	38.4**	36.1	49.7	-	-	29.1	38.2	276.1
%	31	14	13	17	-	-	11	15	100

* Includes open space within this ** Includes larch already felled under SPHN's.

Table 4.2 Felling volumes (conifers)

Average Annual Felling volumes by period	Felling (K m^3)
2025 – 2029	9.8
2030 - 2034	5.8
2035 - 2039	5.2
2040 - 2044	7.6
2045 - 2049	-

4.1.2 Thinning

Due to the age of the crop, the thinning window has been missed. Consequently, any conifer thinning for commercial purposes will only be undertaken in the next rotation. Hardwoods may offer potential for thinning in the future. However, most are not readily accessible. Most are also located on steep ground or close to watercourses. Given their amenity value in the landscape and to the forest walk, thinning would be desirable. This might also help deliver diversification of species, as pure blocks have been planted. Opportunities to thin sections may arise when adjoining conifer crops are felled.

4.1.3 Low Impact Systems (LISS)

4.1.3.1 Long-term retentions

No suitable conifer Long-term retentions have been identified.

4.1.3.2 Minimum Intervention Areas

A couple of areas of existing, mature native woodland have been identified beside the reservoir and at the south-western edge of the forest along the watercourse there. These are on steep ground. Their location is not particularly conducive to thinning. They perform valuable landscape enhancement and provide seed sources for further regeneration.

A few pockets of Scots pine may be left for amenity where they do not interfere with harvesting and restocking operations, do not detract from any landscape goals, and appear stable. Consequently, they are unmapped at this stage.

4.1.3.3 Continuous cover areas

No thinning has been undertaken due to the access issues; hence no areas of conifer are suitable for conversion to CCF. However, existing areas of planted broadleaves offer some scope for hardwood production, although access to many of these areas, due in part to steep ground, makes working these sites problematic. However, networks of old tracks might offer some potential for tractor-trailer based systems in the future. Further landscape enhancements are required as the edges to some of these areas are noticeably straight and blocky in appearance. LISS opportunities in second rotation crops on lower slopes will be considered further into the life of these crops. Ash dieback may affect locations with pure blocks of ash. Some mortality of alder has also been noted.

Table 4.3 Current area summary – Low Impact Systems (LISS)

Type of woodland	Area (ha)	%
Continuous cover areas	29.1*	11
Natural reserves	0	0
Minimum Intervention areas	1.4	1
Long-term retentions	0	0

* Gross area

LISS Woodland management therefore contributes 12% of the wooded area, and towards the area managed for conservation and enhancement of biodiversity as the primary objective (UKWAS 2.11.1). LISS also easily constitutes the minimum 1% of the plan area under UKWAS Maintenance of biodiversity and ecological functions (UKWAS 4.6.2). In the future, it should be possible to manage some or all of the area within the reservoir catchment under LISS, but the final management prescriptions will only be determinable when the crop is well-established. A combination of Irregular Shelterwood and Minimum Intervention may be possible.

4.1.4 Restructuring, diversity and landscape

4.1.4.1 Restructuring

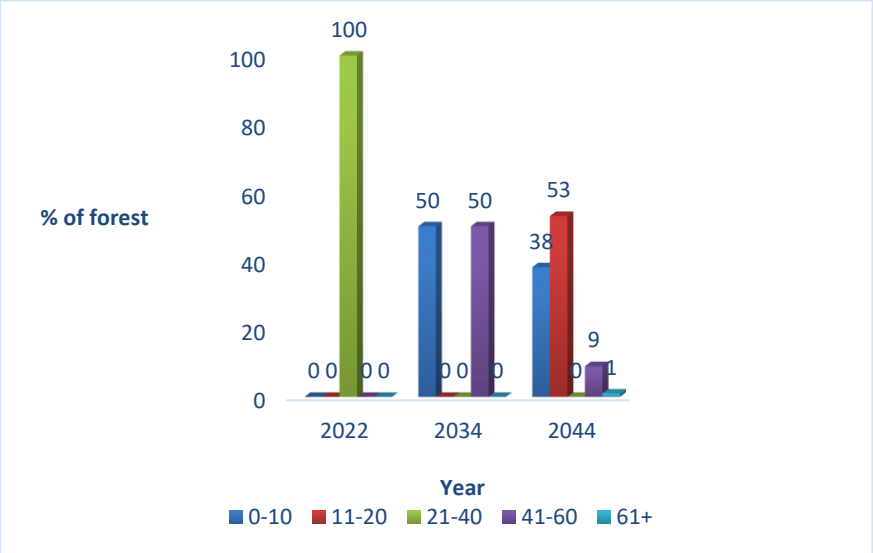
Restructuring is behind schedule due to difficulties in delivering access for haulage to the forest. However, there has only been a small amount of windblow, and crops currently look stable.

Restructuring will take more than one rotation in a forest of this size, given the late start date to restructuring and even-aged character of the forest. Development of a well-balanced age structure will take several rotations. No fallow management for *Hylobius* is currently planned within the forest. Excessive weed growth tends to limit use of fallow or delayed restocking. The current policy is to restock with a 2-year fallow period. Longer fallow periods may also arise for operational reasons, such as plant shortages and contractual advantages of working a particular geographical area in a given year. Where restocking is delayed, there will be a presumption that felling of adjoining coupes will also be delayed to aid restructuring. Hot planting may be employed where excessive weed growth is anticipated or is recommended as part of a *Hylobius* weevil control strategy. Low impact cultivation techniques and/or the use of direct planting will be employed within the reservoir catchment, so hot planting to head-off weed competition here may be more critical if successful establishment is going to be achieved in reasonable time. The process of restructuring has a cost implication in terms of forgone revenue through not adopting economic rotation lengths.

Table 4.4 Future forest structure

Age of Trees (Years)	**Successional Stage**	**Percentage of Forest over Year**		
		2022	**2034**	**2044**
0 – 10	Establishment	0	50	38
11 – 20	Scrub and early thicket	0	0	53
21 – 40	Thicket and pole stage	100	0	0
41 – 60	Mature high forest	>1	50	9
61+	Old forest	>1	>1	>1
		100	100	100

Chart 4.1 Future forest structure



The process of restructuring shall continue through successive rotations to achieve a minimum 2 m height growth difference between adjacent coupes, based on a minimum of 7 years between felling dates, as per the UK Forestry Standard.

Differences in growth rates and variations in exposure give some flexibility in timings of felling and restructuring. Higher yield classes from improved species provenances and cultivation techniques may shorten rotation lengths in the future. The development of old growth and mature high forest conifer woodland is limited by exposure. Older woodland is likely to be represented by broadleaved areas for the foreseeable future. Use of slower growing minor conifer species may extend rotations.

4.1.4.2 Diversity

There are environmental, landscaping and social reasons for increasing diversity. Increasing diversity may have possible benefits for countering possible effects of climate change. Aswell as the potential for increasing structural diversity, potential for greater species diversity is possible over much of the forest (see 4.2 Restocking proposals). Plan policies will seek to increase diversity aswell as protect what is already there, such as deep peat areas and Upland heathland on Cruach Lerags. Opportunities to diversify blocks of pure hardwoods may take longer to achieve, given their longer rotation lengths and CCF management.

4.1.4.3 Landscape

The suggested specific landscape guidelines that are pertinent to the plan area from SNH's former Landscape Character Assessment for 'Craggy Upland' are as follows: -

- manage and extend broadleaved woodland, designing woodland edges to reflect and emphasise irregularities in landform
- restrict development of conifer plantations in scenic valley or coastal landscapes, where the forest will mask the distinctive landform and diminish the scale of the landscape

The forest offers opportunities to increase native woodland and to redesign edges, both of conifer and also of broadleaved plantations. The guidelines also make reference to the sensitivity of coastal areas to change. Whilst Cologin is not on the coast, it is close to the Sound of Kerrera.

The Council's Areas of Panoramic Quality covers the Achilic section of the forest. Road construction in this section is unlikely to be an issue as it will not be visible from public roads and settlements. Forest redesign will deliver improvements to forest edges and through increased species diversity. These include some withdrawal of conifers from the skyline on Cruach Lerags, which is visible from Kerrera and Seil Island.

4.1.4.4 Landform

(See Map 4.4 – Landscape Character Analysis). Steep, often heather-clad slopes are seen around the forest edges, though rarely of any great height and largely without rock exposure. Internally, low knolls arise in groups along low ridges aligned north-west south-east, with narrow gullies between them. These ridges and gullies lend themselves to forming the basis for defining coupe shapes. Some variation in edges is however needed to avoid linear edges disappearing over the horizon. Use of one particular species or species mix within individual coupes can also help emphasise particular coupe shapes in the landscape. Use of different species choices between coupes further distinguishes coupe shapes.

4.1.4.5 Visibility

Specific viewpoints and focal points in the landscape have been identified for more detailed assessment and design. Cruach Lerags is more massive, forming the highest point in the forest, rising to 252 m and capped with Upland heathland. However, it is only a feature when seen from the south and west (See views 7, 8 & 9), due to intervening landform in the other directions. Addressing skyline fringes along its northern edge is necessary, but otherwise the hill is seen at a distance and is not particularly sensitive in the landscape. The loss of commercial forest area will not be significant.

The steep face above Achalic is prominent from the A816 (See views 1 & 2). Existing planted sycamore appears blocky at the edges angular. There is also a hard edge between the conifers and pasture along the lower boundary. Conifers are entirely monoculture SS, but broken up with unplanted, steep, heathery or bracken-covered banks or failed areas. A more graded transition from open pasture to conifers through use of increased native woodland would be helpful. Softening of angular shapes, including reducing those caused by unplanted banks would aid appearance, even at reduced stocking density. The site has good soils, so offers potential for species diversity.

Only glimpses edges tend to be visible from certain points though Lerags Glen and from points to the north, such as the cattle market and Soroba (See views 3 to 6). Use of broadleaves around the lower edges of the forest will help improve these views. However, some afforestation of Ariogan may, in the future, further limit views of Cologin from this side and strengthen broadleaved habitat networks between the two forest areas. Internal landscaping may become more significant if public access increases as a result of improved access and aesthetic enhancements. Consolidation and linkage of broadleaved areas would aid visible unity internally. Linking these with external native woodland will also improve connectivity.

4.1.4.6 Land use

Nearly all the forest area is under commercial conifers or planted broadleaves. The remainder comprises unplantable areas, useful for deer management. Neighbouring landuse comprises predominantly rough and semi-improved pasture. Neighbouring land use may be affected if forest operations affect watercourses or water tables associated with springs. Adherence to the UKFS guidelines in relation to water will minimise disturbance.

Concerns about water quality entering the reservoir have been noted by Scottish Water, although the likely source of contamination is from agricultural land surrounding Loch Nell. Their concerns are in relation to deer numbers in the catchment and associated coliform bacteria. Scottish Water will be routinely consulted ahead of any operations within the catchment.

4.1.4.7 Native woodland

Native woodland presence, excluding that planted in the forest, is very limited. Several native woodland NVC types were noted in riparian areas in the open habitats survey. Native woodland regeneration was absent. Elsewhere, planting is most likely the only

option for native woodland expansion. Very little native woodland exists outside the forest area, largely confined to fragments in gullies and on steep banks.

4.2 Restocking proposals

4.2.1 Conifers and mixtures

Conifer species choice is orientated towards SS in low sensitivity areas as the main commercial species that is suitable on most sites. Most pines cannot be planted due to *Dothistroma*. Scots pine is suitable over much of the lower areas. Soils are mostly reasonably good, so no requirement for SS/LP self-thinning mixtures is envisaged. Other minor conifer species are also suitable on lower slopes, particularly Brown earths, including DF and NS, providing deer numbers remain low. NF is particularly suitable of the Peaty gleys. Other minor conifer species are largely restricted to Brown earths sites at lower elevations. Use of minor conifer species and mixtures is supported as a measure to build in resilience against climate change. Minor conifer species are also used for amenity, which will become more important over time with potential increasing public usage of the forest. Availability of minor conifer species may limit choices. More prominent ridges and faces in the landscape are emphasized with mixtures or minor species where possible. Larch was previously used for texture, contrast and amenity, but is currently prohibited due to *Phytophthora ramorum*. Scots pine/broadleaved mixtures will form a significant part of the public water supply catchment in the future. This will provide longer rotations, greater stability, and more opportunities for LISS, hence will help buffer the water supply whilst maintaining tree cover. Forest Development Types (FDT) reflect the good range of available options on lower slopes, but significantly fewer options on the more exposed areas and deep peats.

4.2.2 Broadleaves

Broadleaves are typically planted in mixture for amenity. Planted broadleaves are envisaged for most broadleaved areas. As there are no Ancient Woodland sites in the plan area and non-native species such as beech and sycamore have generally performed well, planting of non-native species will form an element of the species composition in the next rotation. This will have benefits for amenity and offer increased commercial opportunities. An allowance of 25% additional planting of non-native species in suggested, but site dependant. Use of more extensive planting of sycamore may be required as a substitute for ash if the apparent developing mortality of ash due to *Chalara fraxinea* in the forest becomes a significant issue. Existing pure stands of ash may also require interventions to deal with diseased trees. A variety of broadleaved species are suitable. Birch, sycamore, oak and ash have all done reasonably well,

though species such as Sessile oak are largely only suitable on the Brown earths at lower elevations.

4.2.3 Analysis

The figures in Table 4.5 show an increase in the area of broadleaves and minor conifer species in order to diversify the forest, but larch decreases as it is not replaced. Internal open space increases with further roading and development of coupe buffers. Sitka spruce area falls as a result of these changes. Semi-natural habitats constitute more than the 5% requirement under UKWAS 4.4.3. Unwanted conifer regeneration will be removed in line with the region's policy on when to intervene (see section 4.8).

Table 4.5 LMP Species distribution

Wooded areas	**2022**	**2022**	**2034**	**2034**	**2044**	**2044**
Species	**Area (ha)**	**%**	**Area (ha)**	**%**	**Area (ha)**	**%**
Sitka spruce	187.2	72	121.6	48	86.3	38
Norway spruce	-	-	11.2	4	14.4	6
Larches	19.5	7	-	-	-	-
Noble fir	-	-	4.0	2	4.0	2
Scots pine	2.7	1	9.9	4	16.0	7
Douglas fir	-	-	11.5	5	13.5	6
Pacific red fir	-	-	1.1	-	1.1	-
Grand fir	-	-	2.8	1	2.8	1
Western red cedar	-	-	1.5	-	1.5	1
Mixed Native Broadleaves	12.0	5	24.5	10	33.4	15
Non-native broadleaves	5.5	2	12.5	5	16.0	7
Failed	2.5	1	0.7	-	-	-

Wooded areas	2022	2022	2034	2034	2044	2044
Species	**Area (ha)**	**%**	**Area (ha)**	**%**	**Area (ha)**	**%**
Internal open space	31.3	12	51.8	21	38.1	17
TOTALS	**260.7**	**100**	**253.1**	**100**	**227.1**	**100**
Open hill tops	5.6		6.2		14.1	
Lost land/extra land	3.6		2.9		2.9	
Bog restoration	-		7.7		25.8	
Reservoir	6.2		6.2		6.2	
TOTALS	**276.1**		**276.1**		**276.1**	

The figures for 2022 predate and therefore exclude the SPHN felling, which forms a more meaningful baseline to demonstrate how forest composition changes over time.

Table 4.6 Forest landuse

Land Use (Productive area)	Threshold limits	Plan outturns 2043
SS	75	38
Other conifers	10	30*
Native Broadleaves	5	15
Open space (internal)	10	17
Total	100	100

*Includes non-native broadleaves

Species distribution will move towards the future goal in one rotation for clearfell coupes, but much more slowly where LISS management is undertaken.

4.3 Recreation

No new recreation facilities are currently planned. Some potential opportunities may arise with new road construction and the acquisition of Ariogan. Improvements to the existing lightly

maintained walk will be dependent upon external funding or input. The existing path is boggy in places and offers little in the way of viewpoints. Potential to reroute the existing walk will be explored in the next rotation and in conjunction with future access arrangements to the forest. Opportunities to design in improvements, such as permanent vistas, could also improve the existing route. The route is classed as a Core Path. Walkers are also known to access the forest via the access to the reservoir dam. Informal access routes such as this will be protected. Community aspirations will be noted and acted upon where possible, but funding will need to come from external sources. The angling club appear to take vehicles over the old track from the chalet site to the reservoir in connection with their boats on the reservoir, which has caused some minor rutting on the wetter sections. Some of this route will be replaced by new forest roading. Further landscape improvements and forest redesign will improve the attractiveness of the forest over time. Partnership working with local groups, such as the mountain bike club, may bring further opportunities to develop recreational use within the forest.

The existing path crosses an area of private farmland above the chalet complex. The owner has expressed concern about disturbance of livestock.

4.4 Protection

4.4.1 Deer management

(See Appendix VII for Cologin Deer Management plan)

Red, sika and roe deer are all present in the forest in low numbers. Deer stalking will be the preferred method of deer control, in line with the Region's Deer Management Strategy. Deer management will comply with SNH's 'Code of Practice on Deer Management'; Code of deer management - Scottish Natural Heritage Night shooting is not currently undertaken, but West Region will give this further consideration, given the difficulties of shooting in the forest arising from lack of open space and public access. Deer fencing will comply with the Joint Agency Fencing guidance; Deer fencing guidance - Scottish Natural Heritage. Neighbours practicing stock grazing largely border the forest area. The forest is not covered by a local Deer Management Group. External deer pressure is low. The sporting rights for the forest are held by FLS. Stalking is undertaken by FLS ranger staff as of 2021/22, having previously been by permit. There are no built ranger tracks in the forest, but there is over a kilometre of rides used for quad access, which will be maintained and possibly enhanced or supplemented in the future. Open space for use as deer glades is in short supply and is very important for deer control activities.

Stock fencing largely surrounds the forest. A deer fence borders the reservoir, which was erected by Scottish Water in 2016 to prevent deer access to the reservoir. The need to renew stock fencing will be discussed with neighbours as needs arise. No concerns have been raised by neighbours. There have not been any reports of stock ingress into the forest. There is no current intention to replace the external fence with a deer fence, or to introduce internal deer fences to protect restocking.

4.4.2 Fire

Due to climate change, there is an increasing risk of fires across the National Forest Estate (NFE). The proposals within this plan aim to limit the risk through species and age diversity, as well as having open rides. The road network will also provide a barrier for fires and enable access to areas if a fire were to occur.

There are no known incidents of forest fire having arisen in the forest. Policies of neighbouring estates have not included muir-burning. Access is currently poor, but will improve with forest road development. The reservoir might be used as a source of water for heli-buckets if Scottish Water approval was forthcoming. The region maintains a Fire Plan which sets out the policies and procedures during the fire season (Feb-May). There are no planned structural changes to the forest design specifically related to fire protection.

4.4.3 Flood risk prevention

4.4.3.1 Incidence of Flooding

Some minor watercourses are present in and beside the forest. No cases of flooding associated with these are known. A couple of very minor watercourses flow directly into the reservoir. Flooding in Oban is connected to water flows partly associated with the Soroba Burn, which flows out of the reservoir, but is largely thought to be unconnected to the forest as no operations have been undertaken in it in since establishment in the 1980's. Water levels are managed by Scottish Water. The reservoir receives most of its water by pipeline from Loch Nell.

4.4.3.2 Catchment management

Scottish Water abstractions are designated as Drinking Water Protected Areas under Article 7 of the Water Framework Directive. The primary concern is from run-off from operational sites. No more than 20% of the reservoir catchment (catchment area about 141 ha) will be felled within a 3-year period (UKFS requirement), as woodland dissipates runoff from heavy or prolonged rainfall. The maximum % felled in the plan period is 11% in Phase 1, with slightly less in Phase 2.

2.7 ha of larch was felled and left in situ as a result of an SPHN in 2022. This will be extracted along with Phase 1 felling. Standard cultivation practices will be employed, but with additional care in water catchments, adhering strictly to UKFS guidelines for water management. Cultivation methods will be employed that are sensitive to flood risk, including avoiding drainage where possible. Mounding rather than ploughing will be preferred for cultivation, to minimize runoff and erosion risk. However, consideration will be given to employing direct planting, dependent upon site conditions after harvesting. Ideally, it is hoped to avoid cultivation altogether within the reservoir's catchment. Cultivation best practice guidance is given in Scottish Forestry's Cultivation of Upland Woodland Creation Sites -Applicants Guide to help offset carbon and soil losses from the forest. All new and restored drains will not flow into drains and watercourses that flow directly into the reservoir. Planting along loch edges and watercourses with broadleaves will help buffer against the effects of heavy precipitation events. The document 'Guidance on Forestry Activities near SW Assets' will be taken into account, along with associated precautions, site specific risk assessments and mitigation measures (see https://www.scottishwater.co.uk/about-us/energy-and-sustainability/sustainable-land-management). (See also Appendix IX: SW List of Precautions for Drinking Water and Assets Forestry EdC). The Confor Forestry & Water Know the Rules booklet (know-the-rules-booklet-2nd-edition.pdf) will also be followed. Flood risk areas are shown on SEPA's website: Flood Risk Management Maps
Flood Risk Management Plans are outlined by SEPA here: SEPA Flood risk Consultation

There are a number of private water supplies in the forest (see Map 3.2). All supplies have been identified and owners contacted. Owners will also be contacted ahead of operations that might affect their supplies.

4.4.4 Climate change

Climate change models suggest that the general trend will be towards a significantly warmer climate with higher winter rainfall and lower rainfall in the summer leading to a partial soil moisture deficit during the summer months. In terms of the next rotation these figures have limited impact on species choice according to ESC models. However, this level of climatic change is likely to interact in the longer term with soil characteristics and this may have a positive impact on soil structure and widen the range of species potentially suitable for the site. There are also threats to the suitability of SS as a timber species if significant summer droughts become normal.

Wind strengths and the frequency of gales may increase with Climate Change. This may reduce opportunities for thinning. Restructuring and roading may cause some windblow. Stability

otherwise appears greater than might otherwise be predicted. Opportunities exist to design in open buffers around coupes. This will increase resilience against windblow.

Development of robust habitat networks is seen as part of the strategy for developing resilience against the effects of Climate Change. Broadleaved networks will be strengthened to increase resilience against climate change, particularly around the lower edges of the forest.

4.5 Heritage

There are no archaeological sites currently identified within the forest. There are, however, two sites immediately outside the FLS boundary. The scheduled fort of Dun Cologin lies on the south-eastern edge of the forest. The edge of the scheduled area was trimmed to match the FLS boundary, but there were no archaeological features present on the adjoining FLS side of the fence. This area contains open space and a few scattered broadleaves, which compliments the area surrounding the fort. No change to this is proposed in the new plan. A small enclosure lies adjacent to the forest edge above Achilic. It is unlikely to be impacted by forest operations. Old field dykes are known to exist in the forest, but are unmapped. The lack of archaeological sites within the forest may reflect the low intensity management the forest has received since establishment, so new sites may be identified when pre-operational work site checks are undertaken.

The region's Cultural Heritage Strategy details working methods around sites. The region's heritage records have been consulted which include data from searches of RCAHMS inventories, WoSAS online data and NMRS data. Sites are managed in accordance with the following guidance Forests & the historic environment

4.6 Monitoring

Monitoring of outputs within the plan area are handled in accordance with the region's Monitoring Plan. Specific methodologies are detailed under separate guidance documents. Responsibilities for undertaking, recording and responding to the results of ongoing monitoring are also detailed in these documents. Any relevant to LMP delivery will be reviewed at the mid-term review stage. Monitoring of water quality in the reservoir is undertaken by Scottish Water. Argyll & Bute Council monitor water quality for private water supplies. FLS will also undertake monitoring of private water supplies ahead of and during forest operations within their catchments.

4.7 Habitats and wildlife

4.7.1 Wildlife

4.7.1.1 Birds

There is only one potential raptor nest. There is an adjacent Golden eagle range. Golden eagles are an Annex 1 species (EU Birds Directive). The impacts of the forest on them is likely to be minimal. The proposed increased open space on existing open hill tops may have slight benefits for raptors. The planned increase in broadleaves around the lower perimeter of the forest will also encourage prey species. White-tailed eagles are seen in the general area, but no known nest sites as yet. A recent search for raptor nests along the side of the reservoir proved negative. Red-throated divers have been seen around Loch Gleann as' Bhearraidh, but no nest sites are known. Mallard appeared to be nesting in the reservoir (April 2016). The lack of sightings reflects the inaccessibility of the forest, low management presence and the uniform nature of the forest. Increased diversity and management presence in the future will likely see an increase is sightings and discovery of nest sites.

4.7.1.2 Other wildlife

Badger setts have been identified in the forest. The Badgers Act provides legal protection. No proposed forest operations in the plan period are likely to affect the site. Red squirrels are present in the forest. One drey has been identified, but not within a coupe planned for felling approval. Other wildlife may be present elsewhere, but has yet to be identified.

4.7.2 Open habitats

Open habitats are generally in short supply within the forest. These will largely be retained, unless prone to broadleaved regeneration in the future, and will be valuable for deer control and conservation.

4.7.2.1 Peatlands (See also maps 4.12, 4.13, 4.14, 5.11) (See also appendices XI – XV)

Peat probing in and around the areas of deep peat shown on the Soils Map (Map 3.1) has shown some differences, including deep peat outwith the deep peat polygons and shallow peat or even absence of peat within the polygons. Consequently, some minor adjustments to the boundaries of the areas to be restored have been made. The FCS document 'Deciding future management options for afforested deep peatland' will be followed. Where edge woodland comprising of native woodland is to be established, stocking will fall within the range 20-25%. The total gross

area of peatland in the forest amounts to 28.1 ha, though the net figure is slightly less due to existing open space within the restoration areas. In addition, there are small hydrological units associated with Presumption to Restore sites, totalling 0.5 ha.

Two important habitat points on the western edge of the forest are classed as M9 Basin mires. The most westerly site is associated with the hydrology of Lochan Tri-Chrioch and both sites contain boggy soils classed as Upland Sphagnum bog and Carex bog. The FLS sites are not directly linked as a low ridge separates them. Some buffering to protect the hydrology of both is required, which has been determined by site survey. Internally, the habitat is fragmented, but connected by watercourses and narrow riparian corridors, which have been broadened for habitat linkage in the design. Due to the small size of the area to be restored, the restoration area remains associated with a Phase 4 felling coupe.

Several small areas of Upland Sphagnum bog (10b), generally with an equal proportion of Juncus effusus bog (8c) or Juncus articulatus or acutiflorus bog (8b), and frequently with an equal or lower percentage of Peaty gley exist in the central section of the forest. The prescription for these is restoration to open space with a surrounding open buffer. Two areas (6 and 11) partially fall within the public water supply catchment. Peatland restoration is anticipated to help protect the reservoir by filtering runoff. Three areas (5, 8 & 10) fall within private water supply catchments and are associated with feeder watercourses to the supply points. Discussions with the owners will be entered into regarding any changes to water management. Area 10 is cut through by a drainage ditch dug to divert water from a burn to the west into a drainage system feeding the chalet complex private water supply. Restoration is therefore partly hindered by the presence of this ditch, although replacement of the supply with a borehole may remove this hindrance. Again, discussions with the owners of the business will be undertaken if any changes are proposed. Restoration techniques will vary according to site and may include elements of drain blocking, surface flattening and stump overturning (See Appendix XIII).

Native broadleaved Edge Woodland is proposed for area 12 where there is a mosaic of non-deep peat areas and rankers amongst 11b deep peat. Heather check is probably the main reason for poor SS growth. SS is unlikely to grow on this site. Native broadleaved seed sources are available just to the north and will probably establish on those areas currently carrying better growth of SS (up to YC 20). Unwanted conifer regeneration will be removed. The area falls within the catchment of the Soroba Burn, noted under section 4.4.3.1 in relation to flood risk. However, change in management is unlikely to have much affect given the checked nature of the existing forest and the relatively small area involved.

An area of checked conifer (Area 3) on a plateau in the southern section of the forest will also be restored after harvesting in Phase 3, where this coincides with deep peat (11c). This site falls within a larger area of peaty gley and deep peat, where the deep peat is undefined other than constituting about 20% of the area. Some pockets of check probably coincide with deep peat, but are too small to map or to be restored. The area to be restored is particularly wet and unlikely to be drainable if further drainage were attempted. The proposed roadline will skirt round the edge of this area. Road access to the site will take some years to construct, which affects the timing of peatland restoration works.

Area 7 contains 20% Presumption to Restore soil type 10b, plus 20% 8c, but is a complex mosaic. Watercourses and drains within it generally flow into the reservoir. Crop growth is good (SS YC 22) so restocking is proposed. There is one small open area within it which is wet. Any additional areas to be left open will be assessed after felling.

4.7.2.2 Open hill tops

Landscape has been taken into consideration when designing the upper planting edges. Whilst open ground here is integral to the design, a low level of conifer regeneration may be acceptable where this visually softens the upper edge transition from conifer woodland to open hill. Unwanted conifer regeneration will be removed. This is particularly important on skylines, such as Cruach Lerags and the hilltop in 57003. Both contain elements of priority open habitat, including Blanket bog and Upland heathland, although soil survey suggests peaty gleys. Some reshaping and some expansion of the open areas will help conserve these areas. Cruach Lerags links with large tracts open priority habitat to the north, outwith the FLS land holding. It has also been the subject of a habitat survey, identifying this as Blanket bog. This probably coincides with 11c soil type noted as a component in the surrounding soil mapping.

4.7.2.3 Water and riparian management

Loch Gleann a' Bhearraidh is currently bordered by a band of steep, grassy or heathery open ground, varying in width from 5 meters to over 60 meters. Soils are typically peaty gleys with an element of peaty rankers. There are very few trees in the corridor, mainly isolated stunted rowan trees. Some of the conifers planted on steep rankers are in check. Some potential therefore exists to expand the buffer area, both as open space on the steeper rankers and elsewhere as native woodland at variable stocking due to the nature of the site. A degree of

open access is needed for fisherman and general access to the loch. Some degree of scalloping and shaping of the transition from the open/broadleaved area to the productive conifer area above is needed in order to prevent skyline conifer edges in the future. Drainage is unnecessary on the slopes. Scottish Water have requested adequate buffers be given to all watercourses and drains flowing into the reservoir. UKFS guidelines for water will be rigorously applied. Existing drains/watercourses in hollows that flow into the loch will not be redug and new drainage channels will not feed directly into them. Some of these drains lie within area of deep peat planned for restoration. Use of treated trees within the catchment is not envisaged. Direct planting may be employed in areas more sensitive to cultivation. Scottish Water recently deer-fenced the reservoir edge to keep deer from entering it.

Although there are few riparian corridors in the forest, those present will benefit from the removal of conifers and replacement with native woodland. This will have amenity and landscape benefits, aswell as improving broadleaved woodland habitat connectivity. It will also help protect private water supplies, including that serving the chalet site. FLS will liaise with private water supply owners regarding their supplies, particularly ahead of operations that may affect the supplies. FLS will adhere to the Forestry and Water guidance guidance-on-forestry-activities-near-pws-sept-2018.pdf (confor.org.uk) and Managing forests in acid sensitive water catchments (forestresearch.gov.uk)

4.7.3 Deadwood

Pockets of windblow are likely to create deadwood in the short term. Hardwood areas may also develop some deadwood. Monitoring will be required to ensure the minimum UKWAS target is met. Work plans will consider options for creating deadwood where shortfalls arise, to achieve the desired target of 20 m3/ha. Deadwood will routinely be identified at Work Plan stage; selection being based on available opportunities and with reference to deadwood management guidance. Deadwood resource mapping is not currently identified geospatially in the region, but a generalized evaluation based on anticipated deadwood content of different woodland types and histories has been produced. This ranks sites as either; low, medium or high, but has not been ground truthed. Ash dieback and mortality will contribute to deadwood volumes.

4.8 Invasive species

Rhododendron regeneration will be removed as part of the district's eradication policy.

Rhododendron presence will be reassessed at mid-term review and again for the next plan. Monitoring will be undertaken every 5 years. No instances of the presence of invasive species are currently known in the forest.

4.9 EIA scoping enquiry requests for forestry projects

Scottish Forestry (SF) is responsible for EIA determinations for afforestation, deforestation, forest roads and forest quarries, and where consent is required; an EIA report will be needed. National thresholds form part of the regulations and can be found in FCS Briefing Note No. 10. SF maintains an online EIA register. Operations falling below the threshold for a determination/screening opinion will still be submitted to SF under current arrangements. Consent is valid for 5 years. Consequently, operations planned for the second 5-year period requiring a screening opinion can only be sought at the end of the first 5 years of the plan in order to be valid for the remaining plan life.

Table 4.7 Projects requiring EIA scoping enquiry requests during the plan period

Operation	Description
Deforestation	Restoration of deep peat areas (5.3 ha).
Forest roads and tracks	Construction of 4.0 Km of new forest road
Forest quarry	Excavation of about 0.5 ha to facilitate road construction.

4.9.1 Proposed deforestation for peatland restoration (See Maps 4.12, 4.13, 4.14)

Small areas of deforestation arise in all four felling phases. Consequently, an EIA Scoping Enquiry is required for Phase 1 project areas (5.3 ha).

The Phase 1 areas are relatively small. Areas classed as Upland sphagnum bog and Juncus bogs of different types require complete tree removal with no edge woodland and will be provided with an open buffer. Peat probing suggests typical peat depths of one metre. Only very minor extensions for hydrological units are required due to adjoining soil types being mineral or shallow peat.

Area 5 – 1.4 ha of conifers to be felled (Soil code 8b/10b (6lf)) (40/40/20), so is 40% Presumption to Restore Scenario A peatland. There is 0.35 ha of non-deep peat that is integral to the site and

0.4 ha of open ground in deep peat polygon that partly falls into the adjacent LISS coupe. There are numerous watercourses combining to feed private water supplies. There are no associated hydrological units. Despite the good SS yield class (21.4), drainage, private water supplies and Presumption to Restore peat favour complete restoration. Existing broadleaves (0.1 ha) on the site will not be felled.

Area 6 – 1.7 ha of conifers to be felled in Phase 1 (Soil code 8c/10b/6lf) (40/40/20), so is 40% Presumption to Restore Scenario A peatland. Restoration will be affected by positioning of new roadline that will cut through the area. There are no associated hydrological units. It falls within the reservoir's catchment, and contains a small feeder watercourse. Given the area falls within the reservoir's catchment and the 40 % Presumption to Restore peatland, complete restoration is favoured. Associated areas of peaty gley and rankers will be planted with Edge Woodland in the form of native broadleaves. The southern part is mainly open space and scattered broadleaves within an adjoining LISS management coupe.

Area 8 – 0.1 ha of conifer felling (Soil code 10b), so is a Scenario A Presumption to Restore peatland. Full restoration may be limited by the presence of the feeder drain serving the private water supply to the chalet complex. The small associated hydrological unit is also affected by this drain.

Area 10 – 0.7 ha of conifer felling (Soil code 10b/8c/6l) (35/35/30), so is 35% Presumption to Restore Scenario A peatland. There is a private water supply intake immediately below the site on the burn that flows through the peatland. There are associated small, external hydrological units, though one of these is affected by the proposed new main forest road. Given the sensitivity of the private water supply, full restoration is favoured.

Area 11 – 1.4 ha of conifer felling (Soil code 10b/8c/6l) (35/35/30), so is 35% Presumption to Restore Scenario A peatland. Only Phase 1 section will be felled at this stage due to access considerations affecting the remainder, which will be felled in Phase 4. A small burn flows through the site into the reservoir. The southern edge of the site will be affected by the new m access construction to serve the Phase 4 coupe. Given the sensitivity of the reservoir and presence of Presumption to Restore peatland, full restoration is favoured.

4.9.2 Proposed forest roads and tracks (see Map 5.8)

Investment is needed in road construction to access coupes planned for harvesting over the next ten years and beyond. Access for deer control is considered satisfactory.

All roads will be built from material won from local borrow pits mostly yet to be identified, and from the quarry site proposed in the forest. Road construction will be UKFS compliant. Stream crossings will be processed under the SEPA CAR Regulations in advance of construction. The design will conform to the Timber Transport Forum document 'The design and use of the structural pavement of unsealed roads, 2014'; The Design and Use of the structural pavement of unsealed roads.pdf
It will also conform to SNH's 'Constructed tracks in the Scottish Uplands' revised September 2015;
SNH Constructed tracks in the Scottish Uplands.pdf

The guidance contained in the Forestry Commission Civil Engineering Handbook, 3rd Edition (Revised 2016) will also be followed.

The proposed new forest roads will be: -

- From the forest boundary at NM 8563 2705 to the proposed stacking area at NM 849 266.
- From the proposed stacking area at NM 849 266 to the quarry at NM 8454 2624.
- From the quarry at NM 8454 2624 to the planned road end at NM 8376 2546, in possibly two stages and including a bridge at NM 8428 2609.
- A spur from NM 8523 2669 to NM 8543 2702.

Hydraulic peckers will be used on the roadlines. Borrow pits will be approximately 20 m by 20 m by 6 m high and are routinely backfilled after use. One borrow pit site has been identified at NM 8487 2653, which may be about 50 m by 10 m. Passing places will be positioned roughly every 200 m and turning places every 500 m, including at the road end. No additional built ranger tracks are currently envisaged.

In addition to the above, road maintenance of the existing main access roads will be required, in agreement with other users where appropriate.

An EIA screening opinion request was submitted for a forwarder track and ramp associated with the proposed main stacking area at NM 849 266, for which a response (See Appendix XVI) stating that EIA consent was not required was received on 15th March 2022. This is valid for 5 years. These facilities have not been constructed as yet due to the decisions not to extract felled larch,

not to fell the associated Phase 1 coupe and not to extend the Lerags access road to the stacking area for haulage, but await the arrival of the road access from Ariogan. The need for both will be reviewed in conjunction with the construction of the associated forest road, whose line now cuts through the proposed ramp.

Haulage will be onto the A816 across the Ariogan grazing, Haulage via Lerags will only be considered as a last resort. Here, timber would have initially come onto the private road serving the chalet site, over which FLS have access permission under the title deed. FLS had undertaken minor improvements to this road and would continue to maintain it at no less than its current standard if used for haulage. Haulage then would access the minor road within Lerags Glen; timber being hauled in accordance with the Timber Traffic Management Plan agreed with the Council. Access is then onto the A816. FLS will work with residents, neighbours and stakeholders regarding its use of these roads.

Haulage will adhere to the following protocols 'The ATTG Protocol for Timber Haulage in Argyll and Bute'; The ATTG Protocol for Timber Haulage in Argyll and Bute and with the 'Protocol for Timber Transport Operations (Appendix 1)';Protocol for Timber Transport Operations Appendix 1

4.9.3 Proposed quarry at NM 8454 2624 (see Map 5.8)

A site has been identified with potential for development as a quarry, along the route of the proposed road into the Achilic section. The quarry forms a steeper shoulder above a bend in the proposed road. It does not lie within the catchment of any known private water supplies. It is currently under mature spruce, within a coupe planned for felling in Phase 3. Its boundaries are defined by existing rides and open space. It is not an area that is visible in the landscape from any external viewpoints. Viewshed analysis (see maps) suggests it will largely not be visible in the landscape. It will be visible from the Core Path, which runs just below it. Once the full road network is built, it is likely to have very limited use. Although stone is likely to be available from borrow pits on Ariogan, establishing a quarry there is undesirable due to the proximity of public and private infrastructure and dwellings.

5.0 Critical success factors

The following outcomes are required:-

- Timber production (77.9 K m^3) requires completion of felling program (123.0 ha) and completion of the roading infrastructure.
- Restocking program (99.3 ha) requires completion of the felling program, and establishment within prescribed fallow period or regeneration period
- Roading – construction of 4.0 Km required to facilitate felling of the Phase 1 & 2 coupes, and associated tree felling along the roadlines; quarry to provide stone.
- Removal of all larch (16.0 ha) in the plan period requires completion of the felling program
- Peatland restoration – requires 5.3 ha of conifer removal in Phase 1.
- Protection of water supplies requires adherence to the UKFS guidelines (5^{th} Edition)
- Social benefits require implementation of the forest design, notably species composition diversification, landscape enhancement and restructuring

Appendix I: Land management plan consultation/Scoping record

Consultee type	Details of consultation			
Statutory Consultee	Date contacted	Date response received	Issue raised	Forest Region Response
SNH/Nature Scot	09/05/2022	30/05/2022	Presence nearby or historically of raptors. Comments about managing rhododendron and riparian areas, use of deer fencing.	Said would pass bird information to FLS Environment team for comment. Deer numbers do not merit deer fencing use at present.
SEPA	09/05/2022	16/05/2022	Comments about using the right techniques/machinery in sensitive catchments, especially to minimize carbon and soil loss. Suggested a local working group be set up with relevant external stakeholders to review operations as they are ongoing.	Said would get back to him regarding the local working group idea.
HES	18/10/2023	26/10/2023	Requested FLS look at moving the roadline to the south, or north lower down the hill.	
Neighbours	Date contacted	Date response received	Issue raised	Forest Region Response
Gallanach Estate (Charles W MacDougall)	18/01/2017			

James Hodge for the Hodges	17/05/2022	14/06/2022	• Continues to challenge FLS's position on right of access • Comments on interests in private road, multiple users, not suitable for significant lorry movements without improvements • Issues with livestock disturbance from public access – wishes to discuss further if public access is encouraged • Requested update on SPHN felling • Made FLS aware of existing and proposed new private water supply	• Ongoing • Ongoing, as per plan • SOAC/Core Path – not an issue with FLS as outwith our control. • Update provided • Noted in plan
Ariogan Farmhouse (Murphy)	16/03/2022			
Cologin Country Chalets and Lodges (Linda Battison) and The Barn Bar	08/11/2021	8/11/2021	Concern about raised magnesium levels in water supply following previous new road construction.	Tom Nisbet asked for advice. Water specialist brought in to analyze samples.
	23/02/2022	07/03/2022	FLS asked for confirmation that it was magnesium, not manganese and requested a copy of the sample report.	Confirmed as manganese plus provided report. Said that plan would have negative impact on their business and were contacting their lawyer.

	16/03/2022	16/03/2022	Linda Battison pointed out that the Barn Bar was a separate leased out establishment. Explained concerns about the water quality. Raised concerns about haulage and requested meeting with FLS	FLS met with the Battison's on 21/4. A borehole consultant is to be asked by FLS to provide a report on potential solution to the concerns raised about water quality.
The late Ms Anne McLarty, Ariogan grazing, c/o 3 Dunard Terrace, Oban, PA34 4BJ	Various dates over the last 10 to 15 years	Various verbal responses to Land Agents	Not willing to support access over the grazing due to negative impacts	Eventually negated by FLS's acquisition of the farm.
Liam Griffin, An Tobar, Lerags		14/03/2022	Concern about FLS use of public road for timber haulage.	
Community Groups	Date contacted	Date response received	Issue raised	Forest Region Response
Kilmore Community Council	08/11/2021			
Cologin Community Forest (Seymour Adams, Battison's, Sally Weaser)	Various, post 26/06/2018	Various by Rebecca Carr	Community explored option to purchase under CATS but ran into access issues.	
	08/11/2021	09/11/2021	Awaiting a satisfactory reply on CATS from FLS.	21/04/22 - Rebecca Carr to be asked to resume contact with community group and update them on options
Oban Community Council	08/03/2022	08/03/2022	Said that Cologin was in Kilmore CC	Suggested they might want to consider public

				water supply and recreation links
Others	Date contacted	Date response received	Issue raised	Forest Region Response
Argyll & Bute Council: - Flood prevention Planning Access officer Roads Environmental health	Various dates by different FLS teams 09/05/2022 13/06/2022	19/06/2022	Information only, noting regulated supplies. Asked for what information FLS had.	Information supplied.
SEPA	09/05/2022	16/05/2022	Comments about using the right techniques/machinery in sensitive catchments, especially to minimize carbon and soil loss. Suggested a local working group be set up with relevant external stakeholders to review operations as they are ongoing.	Said would get back to him regarding the local working group idea.
RSPB	09/05/2022	08/06/2022	Site boundary does overlap with Plantlife Scotland's Zones of Very High/High Opportunity for the restoration of Scotland's Rainforest	We focus our resources on the restoration of PAWS areas which have remnant features to kick start the restoration process and a suitable soil structure and population of mycorrhizae. In addition, we are enhancing our existing

				ASNW through the control of rhododendron and control of deer to allow natural regeneration and expansion where possible. The plan seeks to expand on the extent of native woodland and diversify the conifer species on this formally open hill site.
Tom Nisbet	05/10/2021	13/10/2021	In regard to the reservoir, will silt be colloidal or suspended? What will be the impact? Also is the proposed scale of proposed felling in the catchment an issue here?	Little superficial deposits over basalt, so no real concerns about colloidal clay material, but no detailed maps available. SW should be able to advise on any historic issues.
Laggan Hill Forest – M & K MacLeod Ltd –Scottish Woodlands Ltd	07/10/2015	Meeting on 19/11/2015	Purpose of meeting was to see if any joint access was possible. No other issues. No further response from them.	Not pursued as alternative access found and Civil Engineering challenges presented by the route were considerable.
Scottish Water	12/03/2015 03/2016, 28/07/2016	None Meeting on day	Concerns about bacterial counts in reservoir related to livestock or deer.	Agreed more likely source was agricultural land around Loch Nell. Agreed that Water Guidelines would be followed, and open buffers created along existing

				watercourses/drains feeding the reservoir.
	09/05/2022	16/05/2022 13/06/2022	Plan poses high risk to water quality due to potential runoff during harvesting and mounding operations. Requested note be made that the plan is within a drinking water catchment and this fact is made clear in site inductions. Requested 3 months' notice of operations to allow opportunity for the Catchment Liaison Officer to attend and give advice. Requested brash removal to reduce nutrient leaching, odour issues and algae. Requested FLS take account of 'Guidance on Forestry Activities Near SW Assets' and other precautions, site specific risk assessments and mitigation measures. Protection procedures for SW Assets in the area also detailed.	Notified them of our intention to fell and leave at stump the SPHN larch in June, provided copy of SPHN. Working methods to be discussed with Catchment Liaison Officer on site. Issues where differences may arise include handling of brash and extraction methods.
	25/05/2022	25/05/2022	SW's HAUC team requested sight of access route plan or traffic management plan	Provided roading map
	13/06/2022	13/06/2022	Requested contacting HAUC team before any	Questioned whether any SW assets affected by

		14/06/2022	operations relating to SW assets be reviewed and approved by them and Catchment Liaison Officer to attend site visit. HAUC team now content no assets likely to be affected by SPHN felling	proposals and hence need to contact HAUC. Agreed to attendance of Catchment Liaison Officer at a site meeting.
Public drop-in meeting -	15/02/2022	15/02/2022	• Concern about use of C33 and private road for timber haulage • Desire for cycle routes and better walking routes • Impact of current and proposed operations on walkers, anglers, chalet users • Community buyout/partnership working • Increase in broadleaves welcomed, more species variety and spacing wanted • Connectivity with Oban via new paths • Private water supplies concern	• TTMP in place • If funding available • Winter working conflicts with TTMP. No easy alternatives. • Open to suggestions. • Socking densities to conform to Scottish Forestry requirements. • Open to possibilities. Looking for opportunities. • Will monitor. Expert advice sought.

Appendix II: Supporting information

List of Appendix II

II/1.0 The existing forest and land holding

II/1.1 History of the land holding

The forest area was acquired in two stages. Cologin Farm was acquired in 1967. Achalic was acquired in 1984. The area was planted between 1984 and 1987. A forest walk was constructed thereafter. An indicative forest plan for the woodland was approved on 31/12/2004. Full crop assessment was undertaken in 2013. The woodland was placed on the disposal list in 2016/17, but was unmarketable without an agreed access route. A local community group then applied to acquire it under the CATS scheme, but also ran into legal and access difficulties. FLS subsequently resumed efforts to secure access, which were overcome in 2020, allowing road access construction from Lerags Glen in spring 2021. This was replaced with the intention to create more favourable access through Ariogan following the acquisition of the grazing in 2023.

II/2.0 Analysis of the previous plan

II/2.1 Aims of the previous plan and achievements

The previous plan was an indicative plan, comprising a single map with annotated objectives. Indicative plans were produced as a means of gaining FC plan approval where no operations planned over its 10-year life. This plan expired on 31/12/2014 and was extended to 31/10/2016.

The indicative plan brief identified users/viewers of the forest, including motorists, walkers, fisherman using the reservoir and local residents. In terms of context, it described the forest as having a distinct character, because of its varied terrain and orientation, occupying the top and upper slopes of a ridge. It raised issues of lack of roading, woodland forming a barrier to habitat networks, visibility from the A816, uniform species and lack of integration, and the presence of reservoir Loch Gleann a' Bhearraidh and its catchment, the reservoir serving as the public water supply for Oban. The indicative plan highlighted angular forest boundaries as another issue. It also stressed the need for a design solution that catered both for the commercial and landscape/habitat needs, suggesting a balance was needed.

The indicative plan analysis and concept primarily addressed landscape issues, making suggestions as to how these would be dealt with in a full plan. These included; development of native woodland and riparian networks, integration and diversification of tree species, use

species choice to accentuate landform, provision of a circular forest walk, and modification of the forest edge to integrate with the surrounding landform. It identified visually sensitive areas, with a significant viewpoint along the south side of Loch Feochan on the A816. It also suggested areas in which Phase 1 felling would ideally take place, based on a road running down the spine of the block. This felling was proposed for 2015, but has been unachievable due to lack of an agreed access across private ground over which to haul timber (see section 3.32 for further details).

Construction of a circular forest walk with some enhancements has been undertaken. However, this walk has since been declassified and way-markers removed as part of a rationalisation of recreation facilities in the region. All other issues remain unaddressed, but the issues raised and solutions suggested largely remain valid.

II/2.2 How the previous plan relates to today's objectives

A number of general issues and events have arisen within the plan area. These include: -

- forest resilience to climate change would encourage further species diversification.
- plant health issues have resulted in bans on planting larch, ash and Lodgepole pine (with the exception of Alaskan provenance in mixture with spruce).
- new policy guidance relating to the conservation of deep peat will impact on the existing proposals to restock areas of low yield class Sitka spruce.
- access has been provided from Lerags Glen.
- access through Ariogan is now achievable.
- community acquisition through the CATS scheme has been initiated.
- small pockets of windblow have arisen in one or two places.
- reservoir water quality has been raised as an issue by Scottish Water.

II/3.0 Background information

II/3.1 Introduction

The forest lies a couple of miles south of Oban. Since planting, no operations requiring approval have been undertaken due to the lack of road access. Access to date has been restricted to foot or quad access using the forest walk path up from the chalet site. Efforts to secure access across Ariogan grazing were unsuccessful, so the more restricted option via the chalet site access have been progressed in spring 2021. As a result of the lack of access, development of the forest has been handicapped, preventing harvesting, restructuring, landscape improvement and recreational access improvement. Forest operations within the area are largely restricted to deer

stalking via a lease and to minor forest management maintenance operations relating to the old forest walk and boundary fences. Two SPHN's have affected the area, which required manual felling and leaving of timber on site until forest road access is built. The Ariogan grazing was purchased in 2023, creating an opportunity for a new access.

II/3.2 The existing land holding

Cologin Forest comprises 276.1 ha. The area is mostly planted with commercial conifers, but there are also some areas of planted broadleaves that offer both amenity and some commercial potential. Open habitat networks are largely non-existent, although there are a few open hill-tops, riparian corridors and unplanted steep slopes. Native woodland is very limited. Loch Gleann a' Bhearraidh borders the north-western side, the solum of which partially belongs to FLS. Ariogan, acquired by FLS in 2023, amounts to 177.4 ha, forms the north-eastern boundary to Cologin. This area does not form part of the Cologin LMP and will have its own LMP in the short term.

II/3.3 Setting and context

The forest lies along a ridge between Lerags Glen and Loch Gleann a' Bhearraidh. Although it is close to Oban, it is largely outside of the boundary for qualification as a WIAT woodland, hence reducing its potential for recreational investment. It is partially visible from the A816 and a number of other locations, but is not particularly prominent. Apart from the reservoir, it is surrounded by farmland. There is no direct connection with any other woodland areas. Its small size means it cannot offer much in the way of local employment opportunities. It is however, a very productive forest in terms of growth rates, owing to good soils. The presence of the chalet site offers scope and proximity to Oban offers scope for further recreational development, with chalet owners being part of the CATS project of 2018.

II/3.4 Physical site factors

II/3.4.1 Geology, soils and landform

Soils comprise brown earths, often with a stony composition and some skeletal soils on the lower slopes. The upper areas comprise mostly peaty gleys, a small percentage of skeletal soils and brown earths. In addition, there are a few small pockets of sphagnum and juncus bogs, plus a couple of small areas of composite soil types containing a lower proportion of Unflushed blanket bog. The few small areas of poorly grown or checked spruce highlight either skeletal or boggy soil conditions.

Steep ground within the forest (over 35% slope) (See Map 3.14), is very limited, comprising short, steep banks. These banks may be continuous for some distance. About half have been planted. Only a very small percentage of the banks are associated with stream gullies.

Solid geology comprises largely of Andesite lavas, with some intruded dykes of different compositions, including gabbro, felsite, basalt and andesite. There are also a few bands of sandstone in the southern area on the steeper faces.

II/3.4.2 Water

Only minor watercourses flow from the area, although some of these are significant, either because they flow into the reservoir or have private water supplies on them. The Black Lynn Burn flows out of the reservoir into Oban. SEPA have assessed its condition in 2014 as 'Moderate', due to water flows and levels, and water quality. Target date of 2021 was given for condition improvement to 'good', but with comments that the cost of addressing water flows was disproportionately expensive and improving water quality was not technically feasible. Scottish Water erected a new deer fence around the reservoir in 2016 to help combat perceived issues with water quality (*Cryptosporidium*) arising from deer and livestock.

A private water supply to a chalet was installed in 2015 above Cologin. The intake and tanks are on FLS land. There is an associated drainage ditch feeding into the catchment. Other properties in the area also tap burns coming off FLS land, including the Cologin chalet complex and hotel, Achalic, Lerags Beg, Shore House and the new lodge at the top of the field above the chalet complex. An artificially dammed pond is located north of Achalic, partly fed by a small burn coming off FLS land from which Achalic's water supply is served. Another pond is located immediately beside the car parking area at the foot of the forest walk, again fed in part by a small burn rising from FLS land. Several springs are located along the edge of and within the forest. All private water supplies have been checked on the ground as part of the plan process. Lochan Tri-chrioch lies just outside the legal boundary on the extreme western end of the forest. Although small, it is associated with an area of discontinuous boggy ground, including boggy pools along this edge of the forest, and extending across the legal boundary.

II/3.4.3 Climate

Continentality is in the range 20-22, being fairly typical for much of Scotland, apart from the north-west. The climate data for the forest indicates the upper parts are moderately to highly exposed, and wet. The south-western section is further described as 'cool', the

remainder of the ridge being 'warm'. The lower slopes are described as 'warm, moist, and moderately exposed'. A few small pockets of windblow have arisen within the last 3 years.

Effective joined up habitat networks help mitigate the effects of climate change by facilitating the movement of site type species through the network. However, the woodland is isolated, with only a couple of minimal native woodland riparian linkages with similar sparse and incomplete external native woodland networks. Open networks within the forest are also incomplete and existing open hill tops do not link with existing internal or external open habitats (see section 3.2 Landscapes & Ecosystems).

No cases of flooding directly attributable to the forest area are known. There are no flood risk areas immediately adjoining the forest, but the Eas Charran (west of the chalet site) flows into the Allt Criche, which flows down the main glen into Loch Feochan. The Allt Criche, south of Lag-na-Keil, is canalized and the data suggests it regularly floods the surrounding low-lying fields down to the loch. Approximately 25% of the forest falls within the catchment of the Oban public water supply. The outlet from the reservoir, the Soroba Burn, is a tributary to the Black Lynn Burn which is a flood risk concern in Oban. Flood Risk Management Maps

There are no renewable energy schemes in the woodland. A meteorological mast associated with a possible windfarm development is situated on Lerags Farm, to the south of the forest boundary. It is reported to have been there for some years. The landscape sensitivity of the area is likely to reduce potential for windfarm development. It is not identified as a preferred area/landscape type for windfarm development on the Council's website.

II/3.5 The existing forest

II/3.5.1 Age structure, species and yield class

Age class (see Table 4.4)

There is little variation in age class, the forest having been planted over the space of 4 years, from 1984 to 1987. There is some variation in tree height related to exposure levels, although yield classes suggest a more uniform growth pattern than is actually seen on the ground (see map 3.11).

Yield class (see Map 3.11)

Pure Sitka spruce has achieved high yield classes (YC's) in the plan area (18-26). The exceptions are small areas of check or poor growth associated with boggy ground or thin soiled heathery banks. Hybrid larch has also achieved high YC's in places (14, 16). No commercial broadleaves are present; existing broadleaved plantings are assumed to have been planted for amenity, although some, notably Sycamore which has reached a maximum of 10, and Ash 8, whilst Beech and Oak have a more modest YC of 4. There is no Lodgepole pine in the forest, although there are several small stands of pure Scots pine, achieving YC 6 -12. Assessment of crop attributes was undertaken during 2013.

Species choice (see Table 5.5)

Sitka spruce is the main commercial conifer species, occupying 72% of the forest area. Larch makes up just over 6% of the area. Scots pine adds a further 1%. Ash accounts for 5%. Non-native broadleaves, being beech and sycamore, account for a further 5%. Other broadleaved species contribute a further 5%. *Phytophthora ramorum* and *Chalara fraxinea* are present in the forest. *Dothistroma* Needle Blight has not been identified in the forest.

II/3.5.2 Access

FLS has a servitude right of access reserved over a neighbour's land at Cologin. This has recently been established as a forest road. However, the title deeds only allow for haulage of timber from the northern half of the block (Cologin section), leaving the southern half (Achalic) without agreed access for haulage. The new forest road connects onto the private tarred road serving the chalet site and in the ownership of a neighbour, requiring negotiations with these parties should widening or maintenance works be envisaged. This connects onto a minor public road (C 33 Lerags) which has onerous restrictions placed upon it for timber haulage by the Council (See Appendix VIII). Access options to the north of the reservoir are restricted by steep ground. FLS more recently acquired full rights of access over the Ariogan grazing, following the acquisition of that property, although the route is constrained by Scottish Water assets. There is an existing entrance off the A816 that will be developed and extended into the forest.

II/3.5.3 LISS potential

No thinning has been undertaken or is likely in the current conifer crops, but second rotation crops may offer potential in the more sheltered areas. Hardwood plantings offer potential for

LISS management, although access to them may prove difficult given their location in relation to the planned road.

II/3.5.4 Thinning potential

Half of the forest appears suitable for thinning based on DAMS data. Exceptions include steep ground, more exposed areas to the south and areas without any access in the near future. In addition, much of the forest has either missed the first thinning window. Hardwood planting s are the only exception, though few are likely to be accessible in the short term. Thinning opportunities will arise in the next rotation, both commercial and in association with Visitor Zone management.

II/3.5.5 Current and potential markets

Timber supply

No timber from commercial timber sales have yet taken place. Timber supply in the future is likely to be irregular, due to the small number of coupes available for harvesting and haulage restricted to the summer months.

Timber felled as a result of *Phytophthora ramorum* under a SPHN, must go to approved sawmills for processing. Felling of larch must be completed within an agreed timescale. All larch within 250 m of an infected site must also be felled under the notice.

Conifer timber quality

The forest grows Sitka spruce of reasonable form, although no detailed survey has been undertaken as no timber has yet been marketed from the woodland. Stocking densities are reasonably good in most places. Larch form is mixed.

Hardwood timber

No commercial assessment of hardwood timber quality has been undertaken. Hardwood timber appears to have potential for timber production. Woodfuel is another possible end use with Oban a potential local market. However, there will be no direct access to these stands from the proposed forest road.

Timber in construction

Markets for spruce exist outside the forest district. High spruce yield classes may reduce suitability of use in construction. Local markets for small roundwood for fencing may also arise.

Small Roundwood

Local markets for small roundwood for fencing may also exist.

II/3.6 Land use

II/3.6.1 Agricultural land

There is no agricultural land within the plan area.

II/3.6.2 Neighbouring land use (see Map 3.14)

Most of the forest area is surrounded by rough pasture under several different farms and estates, including Lerags, Ariogan (now FLS) and Gallanach. Scottish Water's Loch Gleann a' Bhearraidh reservoir borders on the northern side. Two small blocks of private conifers lie against the southern edge of the woodland. That known as Cologin Fort is managed under a WGS 1 for the local landowner and incorporates a scheduled dun. The Laggan Hill plantation is owned by M & K MacLeod Ltd and is managed for them by Scottish Woodlands Ltd. This plantation appears younger than Cologin and has no road access provision. Topography is likely to prove challenging should a forest road be needed into the higher part of Laggan Hill, adjoining the reservoir. Scottish Woodlands Ltd has been contacted and access discussed, but their access arrangements have yet to be resolved. This plantation is separated from Cologin by the reservoir and land associated with the dam and spillway. An access track leads from Scottish Water's treatment works up to the dam. A second track runs from Ariogan to the dam.

The forest boundary is currently stock fenced against agricultural neighbours. The fence is reported as in poor condition. Two areas of lost land exist on the southern edge. The larger area is a fenced-out stream gully of just over 2 ha. The new deer fence along the side of the reservoir was erected by Scottish Water at their expense in 2016.

II/3.6.3 Land holding

Some minor boundary discrepancies have been noted as part of the ongoing Land Registration process. The Ariogan acquisition does not form part of this LMP, but may do so in the future.

II/3.7 Biodiversity and environmental designations

II/3.7.1 Designations

Natura sites and SSSI's (see Map 3.5)

There are no designated sites in the woodland or adjacent to it.

II/3.7.2 Habitats and species

Ancient Woodland Sites

Ancient Woodland is recorded on NCCS Inventory maps. No areas of Ancient Woodland occur within or immediately adjacent to the forest.

Species and habitats (see Map 3.6)

Birds

- Mallard have been seen on Loch Gleann a' Bhearraidh
- Black grouse have been recorded in the general surrounding area
- White-tailed eagles are seen in the area
- Buzzards nest in the forest
- Red-throated divers have been seen around Loch Gleann a' Bhearraidh

Other wildlife

- badger setts are present in the forest
- Red, roe and sika deer are present in the forest
- Red squirrels are present in the forest. One drey has been identified
- A rock with potentially important bryophytes has been identified in the forest

Native woodlands

Small amounts of native woodland can be found along some of the open riparian corridors. Mixed broadleaves were predominantly planted at various locations along the southern edge of the forest, largely as pure blocks. These include ash and oak, but also non-native beech and sycamore.

Deadwood

Deadwood priority has been assigned according to the ecological classification of the site. Deadwood within the plan area is currently extremely limited, given crop age. No areas have been identified in the draft deadwood mapping exercise as of medium or high priority. A deadwood target of 20 m 3/ha across the whole forest is an UKWAS target.

Habitat networks

Native woodland habitat networks are fragmented in the general area. None are present within the plan area or immediately adjoining, although a limited corridor of mature broadleaved woodland extends down the Lerags Burn above the farm. Two small blocks of conifer woodland on the south-eastern edge of the forest do not link with any other woodland.

II/3.7.3 Open and riparian habitat

Open land

Open habitat survey is complete. Two important habitat points were recorded, both assessed as:-

- M9 Carex rostrata-Calliergon cuspidatum/giganteum mire. Due to the waterlogged nature of the site, any threat from conifer regeneration was considered low

Open habitats are extensive around the edges of the woodland, but there are no significant internal areas of open space. Small areas of open space either as steep slopes or hill-tops are present, with some priority habitat, but no important sites. Cruach Lerags has priority habitat comprising Blanket bog and Upland heathland on a Peaty gley. Above the Lerags Burn is an area of steep ground with some Upland heathland, Upland Mixed Ashwood and bracken. Another low hill-top at the northern end of the forest has a mixture of Acid grassland, Blanket bog and Upland heathland. An area of open and planted alder woodland contains Wet woodland, Blanket bog, Upland Flush, fen and swamp, and a little Upland heathland.

External open habitats extend along the ridge on which the forest is planted and down to the shores of Loch Feochan and the Sound of Kerrera. An undifferentiated heathland habitat network borders on the northern and western sides of the forest, with a separate section between the north-eastern boundary and the A816. However, these are isolated tracts of heathland.

Open Water

There is no open water within the forest. However, Lochan Tri-chrioch was, until the land registration process, considered partially on FLS land, but is now excluded. It is part of a basin mire along the forest edge, associated with the important habitat points noted above.

II/3.7.4 Invasive species

Rhododendron seedlings were noted in an open habitat survey in two areas in the north-east of the forest. One large bush has also been identified here.

II/3.7.5 Pests and diseases

No pests or diseases have been identified to date.

II/3.8 Landscape

II/3.8.1 Landscape character

SNH's Landscape Character Assessment (Landscape Assessment of Argyll and the Firth of Clyde, Review No. 78, 1996) puts the area within the 'Craggy Upland' landscape type. Its key pertinent characteristics include:

- upland moor with irregular, rather amorphous landform
- rounded knolls, rock outcrops and numerous lochs in low-lying hollows
- open moorland predominates, but extensive conifer plantations camouflage the landscape pattern in some areas
- oak-birch woodland on lower slopes
- isolated farmsteads and small villages in sheltered sites within glens
- numerous archaeological remains, often concentrated on rounded knolls on lower slopes
- historic, irregular landscape pattern in valleys

This landscape type occupies nearly all the area between the coast, Loch Etive and Loch Awe. Cologin Forest occupies a ridge comprising a number of large knolls, bounded by Lerags Glen to the south and a shallow glen containing the reservoir and Bealach Mor. Cruach Lerags (252 m) is the highest point on the ridge. The ridge falls away slowly to the south-west to Minard Point and the Sound of Kerrera. Further parallel ridges and hollows separate Cologin from the Sound of Kerrera to the north-west. Lerags Glen descends to Loch Feochan, which rounds Ardentallen Point to join the Sound of Kerrera.

II/3.8.2 Landscape designations

Argyll & Bute Council's Local Plan maps the south-western half of the forest as within their Areas of Panoramic Quality (APQ) (formerly Areas of Great Landscape Value (AGLV)). These areas are highlighted where any proposed development would be looked at more critically. The plan also identifies the eastern fringes as falling within 'sensitive countryside', which extends towards Oban. These areas are highlighted where any proposed development would be looked at more critically. Oban Lorne and the Isles Local Plan Maps | Argyll and Bute Council

II/3.8.3 Visibility

Improving landscape quality is of particular importance along the main tourist routes. Parts of the forest are visible from several locations along the A816 and from properties and holiday accommodation in Lerags Glen. The south-western edge is visible from the north end of Seil Island. Skyline edges around Cruach Lerags are visible from the Isle of Kerrera and the Sound of Kerrera.

The original planting design focused hardwoods, Scots pine and larch plantings on the more visible parts of the southern aspect. These were also used to break up any straight lower edges on this side. Much of the forest is not seen from public vantage points due to intervening topography and low sightlines.

II/3.9 Social factors

II/3.9.1 Recreation

Tourism

Tourism is very important to the Oban area, centred on the town and communication routes. The woodland itself is not a tourist destination. There is a hotel immediately adjoining the southern edge of the woodland in Lerags Glen. Cologin Country Chalets and The Barn Pub are also located here Oban self-catering accommodation - Cologin Country Chalets and Lodges Oban, Scotland. In addition, accommodation is offered at their Cologin farmhouse, Lerags Lodge and Lerags House. Bed & Breakfast is also provided at Ariogan Farmhouse. Chalet accommodation is also available in Lerags Glen at Lagnakeil Highland Lodges Lagnakeil Highland Lodges

Making access easier

An informal forest walk is provided from the chalet site at Lerags, the first part of the walk being across private land. It follows ride lines through the conifer plantation. However, no FLS car park is provided, although there is a car park at the start of the walk associated with the chalet complex. The forest walk is classed as a Core Path. A rough hill path runs off the forest walk to the reservoir, used by local anglers. Access is otherwise possible under the Scottish Outdoor Access Code. The new Ariogan forest road will offer improved access opportunities once in place.

Recreation

Walkers use the forest walk up from the Cologin chalet site. (See Map 3.13). There is a threshold sign at the start of the walk, but no waymarking along the route. There is a picnic table at the end of the fisherman's track to the reservoir. The angling club have a couple of boats on the reservoir. There are no Visitor Zones currently associated with the forest. The forest does not constitute a WIAT woodland, there being only about 41 ha at the northern end of the forest that fall within the qualifying area.

II/3.9.2 Community

Community Engagement – Neighbours

Kilmore Community Council covers the area.

Partnerships

There are no existing community partnerships associated with the forest.

Community Ownership and management

A local community group expressed interest in acquiring the forest in 2018, through the CATS scheme.

II/3.9.3 Heritage (See maps 3.17 and 3.18)

There are no scheduled monuments in the plan area. A scheduled fort (Cologin) lies along a section of the south-eastern boundary Site Record for Colagin Fort. No part of the scheduled area is on FLS land. The 20 m Heritage Features Impact Zone extends from the

legal boundary into the forest area, but is not planted with trees (See Map 3.5). There are no known unscheduled monuments in the plan area.

Policy - Archaeological features will be protected in accordance with the Forestry and Land Scotland's Archaeological Guidelines, and UK Forest Standard guideline 'Forests and the Historic Environment'. Standard prescriptions from the West of Scotland Archaeology Service include; leaving 5 meters either side of walls and linear features unplanted and 20 meter buffers around localized sites. Breaches in linear features will be kept to an absolute minimum. Other buffer zone widths are defined for each monument on the conservation plan and against the overlay key.

The Historic Landuse Assessment mapping does not provide any additional information for the forest area. It identifies the area as 20th. C plantation woodland.

II/3.10 Statutory requirements and key external policies

The following official designations exist in the plan area (See Map 3.5): -

- APQ – Area of Panoramic Quality

Key external policies include: -

- Scottish Government policy on Woodland Removal
- Scottish government woodland expansion aspirations
- latest advice on tree diseases, species choice and biosecurity protocols (FLS Larch Strategy)
- measures to combat Climate Change (Climate Change (Scotland) Act 2009)
- Scottish Outdoor Access Code
- Community Empowerment Act (2015) (see FLS Community Asset Transfer Scheme (CATS)
- Wild Scotland Best Practice Guidelines
- Land Reform (Scotland) Act 2003

Nature Scot, and Argyll and Bute Council are West Region's statutory consultees. SEPA, RSPB and ConFor are also routinely consulted on plan revisions. The Community Council has been made aware of the plan revision proposals. Scottish Water has also been consulted in relation to the adjoining public water supply. The Consultation Record provides a summary of all formal correspondence, issues raised and FLS responses (see Appendix II).

Appendix III: LMP Brief and Introductory Information for the Internal Stakeholder Meetings

1. Key background information

Introduction

The plan for Cologin covers 276.1 ha. It is located 2 miles south of Oban. It is primarily a commercial conifer forest with some amenity hardwoods. No harvesting or roading has been undertaken to date (as at the end of 2020). The surrounding land is predominantly low grade agricultural land. Loch Gleann a Bhearraidh borders the northern part of the forest, and is public water supply for Oban.

The forest area was acquired in two stages. Cologin Farm was acquired in 1967. Achalic was acquired in 1984. A field above the chalet complex was sold off soon after, but retaining a right of access for a forest road across it.

The previous plan was an indicative plan, comprising a single map with annotated objectives. Indicative plans were produced as a means of gaining SF plan approval where no operations planned over its 10 year life. This plan expired on 25/01/2015 and was extended to 31/08/2015.

The existing crop and silvicultural potential

The area was planted between 1984 and 1987, so is uniform in age, with height differences reflecting only difference in growth rates and species choice. Full crop assessment was undertaken in 2013. Growth rates for SS are good, yield classes typically in the range 18 to 26. This reflects reasonable soils over much of the area. 72% of the forest area is under SS. Larch occupies 6% and also has achieved high yield classes, but of mixed form and now with *Phytophthora ramorum* infection present. Scots pine is quite variable. ESC suggests good growth potential for a variety of conifer species over the lower half of the forest. Hardwoods have also performed well, particularly sycamore, birch and ash. Ash, however, is suffering from *Chalara fraxinea.* Beech is more variable in both stocking and form. Some alder stands have died off, perhaps due to poor site selection. No thinning has been carried out. The window for thinning first rotation crops has been missed, but hardwood stands could be thinned where and when accessible.

Access

A forest walk was constructed; it is a Core Path, but is not maintained. It is served by a private car park at the chalet complex. Fishermen access the reservoir using the path. Forest road access from Lerags Glen was built in 2021 after establishing that FLS had a right of access to do so across private land and also using a private road to the chalet complex. However, the public road section is highly constrained and has a TTMP in place, with onerous conditions, such as no winter haulage. The private road is only marginally suitable for timber haulage. Furthermore, there is no right to haul timber from the Achalic section of the forest to the Cologin section, requiring further legal work to sort out. There is no road infrastructure as yet within the forest, apart from an extension built early in 2022 to access the SPHN area. Issues with raised levels of magnesium in chalet water supply were notified after the first phase of road construction by the proprietors.

Natural environment and wildlife

There are several small pockets of deep peat, mostly under conifers. Those on Unflushed blanket bog are mostly checked. One or two mires contain priority open habitat. Upland heathland is present on the open hill tops. Few conservation sites or sightings have been recorded, though badger setts are found in the southern corner of the forest. Some rhododendron seedlings have been noted in the north-eastern section. There are no Ancient Woodland sites present, but here are a couple of ribbons of mature riparian native woodland. Deer numbers are low.

Landscape

The forest falls within the 'Craggy Upland' landscape character type. The south-western half falls within the Council's Area of Panoramic Quality, aimed at protecting local coastal views. There is little in the way of woodland habitat network connectivity outside the forestry boundary. External views of the forest are very limited and internal views restricted by mature conifers.

Cultural environment

There are no scheduled or unscheduled monuments in the forest. There are a couple of old field walls within the forest. The scheduled Dun Colagin is located immediately beside the south-eastern corner of the forest.

Community use

Little use is made of the forest by the community. Fishermen use the reservoir. A community group expressed interest via the CATS scheme in the woodland a few years ago, but could not overcome the access issues, so did not pursue further.

Neighbouring reservoirs/fisheries

Loch Gleann a' Bhearraidh is the public water supply to Oban. The north-western section of the forest falls within the catchment, though few and only minor watercourses flow into it. Most of the water feeding the reservoir is piped in from Loch Nell. Scottish Water manage the loch. Downstream flooding in Oban has been an issue, but water flows from the reservoir are controlled by Scottish Water and very few watercourses from the forest flow into the catchment of the Black Linn. The angling club have a boat on the reservoir.

Progress

The indicative plan brief identified users/viewers of the forest, including motorists, walkers, fisherman using the reservoir and local residents. In terms of context, it described the forest as having a distinct character, because of its varied terrain and orientation, occupying the top and upper slopes of a ridge. It raised issues of lack of roading, woodland forming a barrier to habitat networks, visibility from the A816, uniform species and lack of integration, and the presence of a reservoir and its catchment. The indicative plan highlighted angular forest boundaries as another issue. It also stressed the need for a design solution that catered both for the commercial and landscape/habitat needs, suggesting a balance was needed.

The indicative plan analysis and concept primarily addressed landscape issues, making suggestions as to how these would be dealt with in a full plan. These included development of native woodland and riparian networks, integration and diversification of tree species, use of species choice to accentuate landform, improvement to and provision of a circular forest walk, and modification of the forest edge to integrate with the surrounding landform. It identified visually sensitive areas, with a significant viewpoint along the south side of Loch Feochan on the A816. It also suggested areas in which Phase 1 felling would ideally take place, based on a road running down the spine of the block. This felling was proposed for 2015, but has been unachievable due to lack of an agreed access over which to haul timber.

Construction of a circular forest walk with some enhancements has been undertaken. All other issues remain unaddressed, but the issues raised and solutions suggested largely remain valid. The walk is no longer advertised.

COLOGIN INTERNAL STAKEHOLDER UPDATE MEETING – July 2016

(Outcomes from meeting added in italics)

1. No agreement to haul timber from the western section across the eastern section. *Land Agent to take forward with neighbour.*
2. The forest walk is enclosed and uninspiring. Parking to access the forest walk is on private land.
3. Sensitivity of public water supply. *Meetings with Scottish Water ongoing.*
4. Need to restructure – should have started by now. Current assessments suggest the forest will be vulnerable to wind damage as soon as forest roadline felling and coupe structuring commences. Some pockets of windblow now evident.
5. Need for further landscape enhancement and integration into the wider landscape/habitat network. The current broadleaved woodland is 50% non-native.

COLOGIN INTERNAL STAKEHOLDER UPDATE MEETING - 14th June 2021

1. Cologin was as a potential disposal, but now that the access road is built, there is a chance to reassess how we move forward
2. Legal right of access for Cologin Farm (N) section, not yet for Achalic (S) section for timber movement, but for okay for maintenance activity.
3. Plan to be drawn up on presumption we will manage to negotiate access to south section.
4. TTMP 8 loads per day – April till October. Restricts lorry speed. Timber can be removed at ~25,000 tons max per year.
5. Three red coupes, one crossing boundary into Achalic section.
6. Question about putting car park on new road; access and neighbour considerations – unlikely option to pursue in the short term.
7. Limited recent communications with community; they had not reached a stage of a small working group looking at potential purchase. Right to Buy still exists even if block not an FLS sales target. Need communications with community re draft of plan and getting their views and input, prior to open public consultation. Making a case for funding community purchase would likely be challenging.
8. How do we build in visitor zones and future walk route options? Work with community re their aspirations; what is achievable by FLS and what needs other routes to enable aspirations to be delivered?

9. Previous recreation routes have been decommissioned – only SOAC routes at present. Work to SOAC baseline. No current signage. Some minor guerrilla work by horse riders, fishing access, etc.
10. Reservoir drinking supply limits potential quarry location. Road-lines in draft generally good. Some concerns about tarred road section owned by the Hodges. This has been improved by FLS but has a weak culvert and other challenges. Might be an option to look at STTF re tarred roads leading to main road. No rights to widen or realign tarred road without agreement from the Hodges.
11. Some shallow peat and possibly some areas of deep. Could deal with on a coupe-by-coupe basis, need exact info for any future funding schemes. No heritage features or wildlife records from this forest.
12. Reservoir will be biggest delivery constraint. Very sensitive. Previous consultation with SW and more needed as part of plan revision. Replacement forest in SW catchment should be of lower intensity type to avoid future intervention for second rotation e.g., bdlvs. Suggestion to target felling to reservoir catchment area – would need to balance with need for larch intervention
13. Blocks of pure ash and other bdlvs – Chalara concern.
14. SW corner and NE corner most visible parts of the forest for landscaping. Pocket views from several places e.g. A816, Gallanach Beag road, Kerrera, etc.
15. WRM input that deer ring fence unlikely to be necessary based on current information. Future deer decisions need to be evidence based. Known SW concerns about deer (coliform) densities in reservoir catchment.

Arrange catch up meeting with community once plan tweaked with meeting feedback. Need to manage expectations re resource from FLS and how we can help enable aspirations.

2. Strategic drivers

To realize the vision as set out in the Scottish Forestry Strategy 2019-2029, six priorities for action have been identified for implementation:

- Ensuring forests and woodlands are sustainably managed
- Expanding the area of forests and woodlands, recognising wider land-use objectives
- Improving efficiency and productivity, and developing markets
- Increasing the adaptability and resilience of forests and woodlands
- Enhancing the environmental benefits provided by forests and woodlands

- Engaging more people, communities and businesses in the creation, management and use of forests and woodlands

To demonstrate how we will have regard to the Forestry Strategy in our work, we have identified the relevant Forestry Strategy 'Priorities for Action' in our Corporate Outcomes section of the FLS Corporate Plan 2019-2022. These, alongside key issues and site-specific challenges, have informed our draft land management objectives, as illustrated in Table 12 below.

3. Draft land management plan objectives

Broad objectives

1. To comply with UKWAS guidance for certification.
2. To comply with UKFS.
3. To comply with all other relevant guidance and policies, West Region Business Plan and overarching FLS plans.

Table III/3.1 – Relationship between relevant corporate outcomes and LMP outputs

Corporate Outcomes Relevant to LMP	Operational Actions To Deliver Outcome Relevant to LMP	LMP Outputs
Outcome 1: Supporting a Sustainable Rural Economy **FLS supports a sustainable rural economy by managing the national forests and land in a way that encourages sustainable business growth, development**	• Managing the national forests and land in accordance with the UK Woodland Assurance Scheme (UKWAS) to ensure that timber and other products produced by FLS are guaranteed to be from a sustainably managed resource • Developing our forest planning processes to ensure long-term sustainable productivity of the national forests and land • Providing a sustainable supply of timber to Scotland's timber processing sector Implementing the Restocking Strategy for the national forests and land and	• Maintenance of Small Round Wood, pallet log and biomass production (maintained timber income, clearfell/restock) • Road to be built to access crops and provide access for deer control. • Forest design to move forest towards a more diverse mix of age classes through restructuring, in order to

Corporate Outcomes Relevant to LMP	Operational Actions To Deliver Outcome Relevant to LMP	LMP Outputs
opportunities, jobs and investments.	develop a new plant and seed supply strategy • Supporting Scottish tourism and the visitor economy through the provision of visitor attractions • Support the venison processing sector through our deer management	provide a more sustainable flow of timber • Enhancement of the visual aesthetics of the forest to benefit local tourism sector establishments and visitors
Outcome 2: Looking after Scotland's national forests and land **Scotland's national forests and land are looked after; biodiversity is protected and enhanced; and more environmental services are provided to people.**	• Managing the national forests and land to further the conservation and enhancement of biodiversity • Maintaining and enhancing our work on peatland restoration • Collaborating with partners on integrated landscape-scale approaches to habitat management and restoration • Continuing to implement the Larch Strategy in order to reduce the rate of expansion of *Phytophthora ramorum*	• Restoration and maintenance of bog habitat (reduce carbon release, diversify habitat) • Protection of historical features • Mitigation against excessive water runoff in catchments. • Pre-emptive remove larch • Control rhododendron • Management of deer numbers • Protection the Oban public water supply, working with Scottish Water; protection of private water supplies, working with owners; adherence to relevant guidance • Felling all larch during plan period

Corporate Outcomes Relevant to LMP	Operational Actions To Deliver Outcome Relevant to LMP	LMP Outputs
Outcome 3: National forests and land for visitors and communities **Everyone can visit and enjoy Scotland's national forests and land to connect with nature, have fun, benefit their health and wellbeing and have the opportunity to engage in our community decision making.**	• Maintaining walking and biking trails to promote fun in the outdoors, focussing on improving entry level experiences for everyone to enjoy and gain health benefits • Continuing to remove barriers to ensure that people from all backgrounds can and do access the full range of benefits of the national forests and land • Enabling outdoor learning and encouraging schools and community groups to make use of the national forests and land • Continuing to engage communities in decisions relating to the management of the national forests and land • Continuing to support community empowerment by enabling communities to make use of the national forests and land to benefit their communities	• Provision for potential increased use by local community • Consultation with local community and community groups

4. Stakeholders

In addition to West Region's statutory stakeholder's (SNH & Argyll & Bute Council), SEPA is routinely consulted. Scottish Water has been consulted in relation to the public water supply. The RSPB, Confor and SSE have also asked to be routinely consulted (although in the case of Cologin, there are no powerlines in or adjacent to the forest, so no consultation is necessary). Kilmore Community Council will be consulted. Representatives of Cologin Community Forest will be contacted. Neighbours, where identifiable, will also be consulted. A drop-in public consultation exercise will be held when draft proposals have been prepared. Information will be posted online on the FLS website at various stages of the plan development, with the approved plan eventually being made available here. Private water supplies will be identified and their owners contacted.

Appendix IV: Glossary

Abbreviation	Description
ASNW	Ancient Semi-natural Woodland
ATC	Alternative to clearfell management
BAP	Biodiversity action plan
CATS	Community Asset Transfer Scheme
CCF	Continuous cover forestry
Confor	Confederation of Forest Industries (UK)
DMP	Deer Management Plan
ESC	Ecological Site Classification
FCS	Forestry Commission Scotland
FD	Forest District
FLS	Forestry and Land Scotland
FCS	Forestry Commission Scotland
HAP	Habitat action plan
HES	Historic Environment Scotland
HLA	Historic Landuse Assessment
HS	Historic Scotland
LIFE	Financial Instrument for the Environment
LISS	Low Impact Silvicultural System
LMP	Land Management Plan
Nature Scot	Nature Scotland, formerly SNH

Abbreviation	Description
NFE	National Forest Estate
PAWS	Plantation on Ancient Woodland Sites
RCAHMS	Royal Commission on the Ancient and Historical Monuments of Scotland
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SAM	Scheduled Ancient Monument
SF	Scottish Forestry
SNH	Scottish Natural Heritage
SDA	Stocking Density Assessment
SOAC	Scottish Outdoor Access Code
SPA	Special Protection Area
SPHN	Statutory Plant Health Notice
SSSI	Site of Special Scientific Interest
STTF	Scottish Timber Transport Fund
UKFS	UK Forestry Standard
UKWAS	UK Woodland Assurance Scheme
WAFD	West Argyll Forest District
WoSAS	West of Scotland Archaeology Service
WR	West Region
YC	Yield Class

Species abbreviations	
Species	AR = Alder BI = Birch (downy/silver) CAR = Common Alder DF = Douglas Fir EL = European Larch HAW = Hawthorn GF= Grand Fir GWL = Goat Willow HAZ = Hazel HL = Hybrid Larch JL = Japanese Larch LP = Lodgepole Pine MB = Mixed Broadleaves SS = Sitka Spruce MC = Mixed Conifers MCP = Macedonian Pine NBL = native broadleaves (including SP where suitable for conservation) NF = Noble Fir NS = Norway Spruce OK = Oak (robur/petreae) RC = Western Red Cedar ROW = Rowan

	SP = Scots Pine SS = Sitka spruce WCH = Wild Cherry / Gean WH = Western Hemlock XL = Larch XWL = Other Willows

Appendix V: Provenance guide chart

Species	Guidance
SS	Improved QSS standard throughout
VPSS	Limited use in best locations
SP	High rainfall type specified as standard
NSP	From the nearest appropriate zone near CFR areas
LP	Only ALP being used in mixture with SS on poorer sites
DF	Seed stand or coastal origin
ESF	Czech or central European
NF	Registered seed stands
GF	Scottish registered seed stands
WH	Registered seed stands with low fluting
WRC	Scottish seed stands
NS	Seed stands, Eastern European or Harz
JCR	Northern Japanese range
XC	PSSB will advise on any other minor species
Notes: PSSB can provide the most up to date guidance on provenance selection including advice on best suited seed stands. Virtually all seed supplied by PSSB comes from registered seed stands and is based on geographic area compatibility. Use of VPSS has declined as seed orchard QSS improves, and this also has a wider genetic base for resilience purposes.	

Appendix VI: Programme summary from the main proposals 2024 – 2033

Operation type	Period	Program quantities	Comments
Total plan area	276.1 ha	Plan period 2025 to 2034	
Felling (conifers)	**Phase**	**Area**	**Comments**
Cologin	1	84.6	Includes SPHN larch
Cologin	2	38.4	
Restocking	**Phase**	**Area**	**Comments**
Cologin	1	67.3	Planting
Cologin	2	32.0	Planting
Road construction	**Phase**	**Length (Km)**	**Comments**
Cologin	1	4.0	May extend into Phase 2
Cologin	2	-	
Road maintenance	**Phase**	**Details**	**Comments**
All forest roads and potentially repairs to tarred private road if used.	1 & 2	4.0	During and after operations
Deer Management/fencing	**Year of project**	**Length/details**	**Comments**
None at present			
CVS projects	**Year of project**	**Details**	**Comments**
None at present			

Operation type	Period	Program quantities	Comments
Environment projects	**Year of project**	**Details**	**Comments**
Peatland restoration	Phase 1	5.3 ha	Some subsequent drainage blocking.
Peatland restoration	Phase 2	-	
Other projects	**Year of project**	**Details**	**Comments**
Quarry	Phase 1	0.5 ha	Within Phase 2 coupe

Appendix VII: Cologin Deer Management Plan

Deer Management Plan

West Region Land Management Plan Information Sheet

Deer Management (Internal)

Land Management Plan Area: Cologin

(Information sheet completed by: John Jackson)

Part A

Background Information

- Species information: See text
- Designated areas within LMP (SSSI/SAC): None
- Condition of designated sites as per Habitat Impact Assessment: n/a
- Deer species: Red and Roe deer are common, Sika deer are present in low numbers
    1. Population numbers: Population fairly low
    2. Density breakdown: Red deer are at low density, Roe are at low density, Sika are at low density.
    3. Annual cull: 2017/18 – 4 Roe, 3 Red; 2018/19 – 1 Roe, 3 Red; 2019/20 – 2 Roe, 4 Red; 2020/21 – 1 Roe, 4 Red; 21/22 - 4 red; 22/23 - zero

Deer species information

- Last Formal Survey/Results: No recent Nearest Neighbour assessment.
- Tree/Establishment Challenges in Previous Plan: No current obvious challenges
- Deer Management Group Information, Membership and Update of Current Issues: Cologin is not in a Deer Management Group.
- Neighbouring Deer Density Pressures: Density is generally low.
- Current Challenges: No current obvious challenges.
- General Comments: Cologin is surrounded by agricultural activity; water supplies also relevant.

Part B

General plan requirements and schedule:

Targets in Plan Period with indication of timing, Year 1, maintain existing stock. Year 2, monitor direct control. (Information sheet to be accompanied by map/s if appropriate).

Deer species: Red, Roe and Sika

- Target Population: Target is under 10 per km/sq.
- Tree/Establishment Challenges in Plan Period: Soft conifer may be vulnerable.
- Fencing: Stock fence must be stock-proof.
- Protection Methods (Direct/Contract/Lease…): Deer control is currently by Permission holder; this will cease this year and come back in-house.
- Deer Management Protection Zones (Open Space/Glades/Corridors): Open space/Glades are vital to aid deer control tracks are essential for carcass extraction.
- Indicative Access Requirements (ATV/ATC): Access tracks are essential on restock sites, existing tracks (approx. 1000 m) must be retained and maintained.
- General Comments: Cologin is protected by a stock fence; neighbours are all agricultural with low deer numbers.

Appendix VIII: Timber Traffic Management Plan – C33 Lerags Road

Pre-conditions for the use of: C33 Lerags from Ardoran to A816

The following schedule relates to the sensitive Council road, C33 Lerags from Ardoran junction out to A816. Proposed haulage operations must be discussed with the council at least one month in advance of commencement.

Lorry configuration – The C33 is narrow and has many tight bends which make the use of articulated trailers undesirable. The use of individual 6 or 8 wheeled vehicles running to a secondary loading point adjacent to the A816 would be preferred. The council must be consulted on the use of alternative lorry configuration.

Secondary Loading Point – Stacking timber at any secondary loading point must be sufficiently clear of the public road to allow standard articulated vehicles to re-load off the public road and maintain adequate sightlines past the works.

Frequency – Maximum of 8 loaded lorries per day.

Seasonal restrictions – Haulage should only be carried out April – October, this road is particularly susceptible to the impact of frost/thaw damage. Consultation with the council would be required if haulage was required outside this operational period and is unlikely to be endorsed.

Driver awareness – Drivers involved with the haulage must be familiar with the nature of the road and should have read and be in possession of this management agreement, prior to operating on this route.

Speed limit – The maximum speed (loaded or empty) will be 20 mph. This may be reduced to 15 mph during excessively wet periods.

Monitoring – Road conditions are subject to fortnightly inspections by council staff during the period of operations. Parallel inspections by the ATTG Project Officer will be carried out when practicable. Any deterioration of the road surface observed by interested parties (hauliers,

landowner, agents etc.) should be notified to the local council Roads Operations office as soon as practicable.

The purpose of this local agreement is specifically to ensure that reasonable access is maintained for the forestry owner, and their neighbours, but in a sustainable fashion, in accordance with regional and national strategy.

Prepared by ATTG/Council

Callum Robertson, Roads asset Manager
Kirsty Robb, ATTG Project Officer

8th November 2011

Appendix IX - SW List of Precautions for Drinking Water and Assets Forestry EdC

Annex 1: Precautions to protect drinking water and Scottish Water assets during forestry activities

General requirements

1. If you are aware the activity is taking place within a drinking water catchment the proposed timing of the works, including planned start and completion dates, should be submitted to Scottish Water 3 months in advance of any activities taking place on-site. This information should be submitted to **protectdwsources@scottishwater.co.uk.**
2. If a connection to the water or wastewater network is required, a separate application must be made via the Scottish Water Development Operations Team Portal for permission to connect, this can be found at Scottishwater/portal. It is important to note that the granting of planning consent does not guarantee a connection to Scottish Water assets. The Development Operations Team can be contacted by telephone on 0800 389 0379 or via email at **developmentoperations@scottishwater.co.uk**.
3. In the event of an incident occurring that could affect Scottish Water we should be notified without delay using the Customer Helpline number 0800 0778 778 and the local contact if known.

Protecting drinking water quality

Regulatory requirements

4. Scottish Water is required to ensure that any activity within a drinking water catchment does not affect the ability of Scottish Water to meet its regulatory requirements.
5. Water Treatment Works are designed to treat the specific parameters of the raw water source they receive (i.e., the specific chemical, biological and other characteristics of natural, untreated water). If the characteristics of the raw water change or deteriorate, it can affect the ability of the works to supply drinking water to customers at the required standards.
6. The regulations relating to the quality of drinking water supplied by Scottish Water are the Public Water Supplies (Scotland) Regulations 2014 as amended. Quality Standards are derived from the European Drinking Water Directive 98/83/EC.
7. Drinking water catchments feed Scottish Water abstractions which supply water to water treatment works. Under Article 7 of the Water Framework Directive, waters used for the abstraction of drinking water are designated as Drinking Water Protected Areas (DWPA). The objective of the Water Framework Directive is to ensure that no activity results in the

deterioration of waters within the DWPA. If an activity falls within a DWPA or drinking water catchment, it is essential that water quality and quantity are protected.

Specific precautions for drinking water protection during forestry activities

8. Locations where public water supplies may be vulnerable should be identified in the site forest plan and the environmental risk assessed in the accompanying application and/or documents relating to the forestry works.

9. Any potential effect on the hydrology of the area resulting from the forestry activity should be assessed and the findings presented in the application and/or documents relating to the forestry works. This should include consideration of natural and man-made drainage patterns, base flows/volume, retention/run-off rates and potential changes to water quantity. Any required mitigation measures and proposed monitoring should also be detailed.

10. When constructing roads, drainage ditches and trenches, drainage should not be directed into adjacent catchments but retained within the existing catchment.

11. It is recognised that forests can assist with the protection of water quality. However, there can also be potential large scale impacts such as sediment delivery, nutrient enrichment, fuels oils/lubricants, pesticides, fertilisers, etc. from poor forestry operations. Sediment can discolour water and have a high content of nutrient, carbon, metal (such as iron and manganese) or pesticide, which can seriously interfere with water treatment. Any alterations to the pH of the watercourses e.g., old fashioned land drains in peat directly connected to watercourses within the catchments could also impact on the treatment works. Alterations to water quality can lead to a failure of microbiological and chemical water standards. Any potential pollution risk which could affect water quality should be considered and mitigation measures must be implemented to prevent deterioration in water quality and pollution incidents.

12. If the catchment is deemed susceptible to acidification a catchment-based critical load assessment may be required. This will help protect water supplies from acidification and related effects on the solubility of aluminium and manganese.

13. Mitigation measures to prevent pollution to watercourses should be outlined in the application and/or required documents for the forestry work prior to work starting onsite. Any mitigation measures implemented should be checked regularly, maintained and improved if deterioration in water quality or potential pollution pathways occur.

14. Sustainable drainage (SUDs) options should be considered, such as settlement ponds and designated filtration areas.

15. If helicopters are being used for any reason you must detail this within the submitted documentation. We would request that no refuelling takes place within the catchment where possible. If not possible, please provide as large a buffer as you can from the watercourse and certainly no less than the 50 m, locate equipment on a level area sloping away from the

watercourse and have spill kits available. Flying directly over the source should be avoided, where possible.

16. Watercourses that feed into any watercourses or reservoirs that Scottish Water abstracts from should be considered when developing new road or access infrastructure. Any crossing of these watercourses should be kept to a minimum. Pollution prevention measures should be put in place at each crossing point and silt traps, or equivalent, should be installed at regular intervals to minimise the risk from pollution.

17. Once constructed, site roads and access routes should be regularly maintained to ensure minimal erosion, and hence run-off and pollution, from the road surface. Avoid using material resulting in metallic, sulphide-rich or strongly acidic polluted water run-off, ideally using inert materials with low erodibility

18. Restoration or reseeding of access routes should be considered as routes can become degraded as work progresses.

19. No refuelling or storage of fuel or hazardous materials should take place within the drinking water catchment area. If this can be demonstrated to be impracticable, then the appropriate Pollution Prevention Guidelines (PPGs) or updated Guidance for Pollution Prevention (GPPs) should be followed. This includes, GPP 2: Above ground oil storage tanks, GPP 5 Works and maintenance in or near water, PPG 6: Working and Construction and Demolition Sites, GPP 8: Safe storage and disposal of used oils, GPP 21: Pollution incident response planning and PPG 22: Incident response – dealing with spills. Rather than 10 m buffers from watercourses, we would request 50 m buffers are applied to watercourses and 50 m applied to spring, well or borehole. Oil storage should be in accordance with The Water Environment (Oil Storage) Regulations (Scotland) 2006. There should be dedicated oil storage areas created. Spill kits should be located within all vehicles, plant and high risk areas, as well as the consideration and use of nappies and booms.

20. Welfare/wastewater facilities should preferably be located outside the drinking water catchment. If not practicable, then portable toilets should be used and waste disposed of off-site.

21. All waste must be removed safely from site for the required treatment and disposal.

22. Any proposed abstractions for activities such as welfare facilities or cement batching plants should be detailed in the application and/or documents for the forestry works, which should be done by agreement form SEPA.

23. Induction training should be given to all personnel on-site and should include Scottish Water site sensitivities in relation to drinking water catchments and assets (see below), as well as spill response as outlined in PPG 22: Dealing with spills.

24. Applications and/or other required documents for the forestry work should include the Scottish Water Customer Helpline Number 0800 0778 778 and the local contact details.

Protecting drinking water in peatland areas

25. When peat is present within the proposed area of activity the application and/or other required documents for the forestry work should include an assessment on the potential release of colour and dissolved organic carbon quality as a result of changes to hydrology and/or physical disturbance which can affect drinking water supplies.

26. The following guidance should be considered in areas of deep peat (peat exceeding 50 cm in depth);

- Forestry on peatland habitats, Guideline Note July 2000
- Deciding future management options for afforested deep peatland, Forestry Commission Scotland, 2015.

27. Ground disturbance in areas of deep peat should be avoided. The use of brash mats can be effective in protecting soil. Brash should be kept clear of watercourse, ditches and buffer areas. Brash left on site can affect soils and water, and result in nutrient enrichment. The short and long term overall effect and management for each site should be taken into account. The most current best practice guidance should be used.

28. The natural hydrology within peat should be maintained and/or restored. Any necessary measures to maintain natural drainage of peat and sub-surface hydrology, such as tailored drain spacing on access tracks, should be implemented as part of any design.

29. Scottish Water requests that, where possible, access tracks in the drinking water catchment are constructed as floating tracks with adequate provision for maintaining existing drainage patterns.

30. Exposed soils and peat can release sediment, colour and dissolved organic carbon. The use of geotextiles, turf replacement and/or reseeding, should be undertaken as soon as possible.

31. Restoration of any degraded peat should be considered for areas within the drinking water catchment.

32. Turves should be carefully removed and stored vegetative side up so they can be placed back over any excavated soils to ensure the soils surface stabilises and recovers as quickly as possible.

33. Any historic drains or ditches within the site boundary that discharge directly to a watercourse in the drinking water catchment should be blocked and slowly discharged to a buffer area in line with current Forestry and Water Scotland Know the Rules Booklet. Where possible, this should be undertaken in advance of any work being carried out on-site, to provide protection for watercourses during site activities.

Monitoring requirements to protect drinking water quality

34. During forestry activities, daily visual assessments of the watercourses, flow conditions, prevailing weather and any other pertinent observations, will be required and recorded by the site manager or delegated authority.

35. Depending on the vulnerability of the public water supply, Scottish Water may request for a sampling programme to be undertaken and for the sampling parameters to be agreed with Scottish Water.

36. Site inspection / monitoring records should be taken and made available if requested.

37. The Contractor should have relevant knowledge and experience to provide advice and monitor compliance with protection measures for the protection of water quality in relation to abstractions for water supply.

38. Depending on the vulnerability of the public water supply, Scottish Water may request that a dedicated Environmental Manager be appointed and present on-site to assess and monitor any effects caused by the activity.

Guidance documents

39. The current edition of the UK Forestry Standard, appropriate General Binding Rules under the Controlled Activities Regulations, and guidance provided by the Scottish Environment Protection Agency (SEPA) on pollution prevention should be adhered to.

40. Minimum buffer widths from forest edge to watercourses or abstraction points, as detailed within the UK Forestry Standard Guidelines, should be adhered to.

41. Forestry and Water Scotland also provides some useful guidance documents including forestry activities near Scottish Water Assets, information can be found at; https://www.confor.org.uk/resources/forestry-water-scotland/guidance-documents/

42. For information on sustainable drainage options CREW have produced guidance on Rural Sustainable Drainage Systems (visit https://www.crew.ac.uk/sites/www.crew.ac.uk/files/sites/default/files/publication/Rural%20SuDS%20Design% 20and%20Build%20Guide%20December%202016.pdf)

Protecting Scottish Water assets

43. If an activity associated with any third party works is located within the vicinity of an existing Scottish Water asset, it is essential that these assets are protected from damage. To this end, the developer will be required to comply with Scottish Water's current process, guidance, standards and policies in relation to such matters.

44. Copies of Scottish Water's relevant record drawings can be obtained from the undernoted Asset Plan Providers. This is distinct from the right to seek access to and inspect apparatus

plans at Scottish Waters area offices, for which no charge is applied.

Site Investigation Services (UK) Ltd

Tel: 0333 123 1223

Email: sw@sisplan.co.uk
www.sisplan.co.uk

National One-Call

Tel: 0844 800 9957

Email: swplans@national-one-call.co.uk
www.national-one-call.co.uk/swplans

Cornerstone Projects Ltd

Tel: 0151 632 5142

Email: enquiries@cornerstoneprojects.co.uk
http://www.cornerstoneprojects.co.uk/index.php/scottishwaterplans

45. It should be noted that the site plans obtained via the Asset Plan providers are indicative and their accuracy cannot be relied upon.

46. It is recommended for EIA's, housing and mixed developments that the developer contacts the **Scottish Water Development Enablement Team** via the Development Services portal - **https://swastroprodweb.azurewebsites.net/home/default** for further advice if assets are shown to be located in the vicinity of the proposed development, and where the exact location and the nature of the infrastructure shown could be a key consideration for the proposed development. An appropriate site investigation may be required to confirm the actual position of assets in the ground. Scottish Water will not be liable for any loss, damage or costs caused by relying upon plans or from carrying out any such site investigation.

47. Proposals for Forestry, Hydro Projects, Mining/Quarries, Peatland Restoration and Utility Projects should be sent to the HAUC Diversions Team via the Development Services portal - **https://swastroprodweb.azurewebsites.net/home/default** for further advice if assets are shown to be located in the vicinity of the proposed development, and where the exact location and the nature of the infrastructure shown could be a key consideration for the proposed development. An appropriate site investigation may be required to confirm the actual position of assets in the ground. Prior to any activity commencing, all known Scottish Water assets should be identified, located and marked-out. Please note that Scottish Water records are indicative only and it is your responsibility to accurately locate the position and depth of these

pipes on site before preparing and submitting your plans. No intrusive site investigation works (e.g., trial holes) should be undertaken without written permission from Scottish Water.

48. Scottish Water requires Risk Assessment Method Statements (RAMS) and Safe Systems of Work (SSoW) to be prepared and submitted in advance to Scottish Water for formal review and acceptance. These documents shall consider and outline in detail how existing Scottish Water assets are to be protected and/or managed for the duration of any construction works and during operation of the development if relevant. These documents must be submitted to Scottish Water for formal prior written acceptance.

49. The developer shall obtain written acceptance from Scottish Water where any site activities are intended to take place in the vicinity of Scottish Water's assets. The relevant team can advise on any potential risk mitigation measures that may be required.

50. Scottish Water and its representatives shall be allowed access to Scottish Water assets at all times for inspection, maintenance and repair. This will also ensure that the Scottish Water assets are protected and that any Scottish Water requirements are being observed.

51. Any obstruction or hindrance of access to Scottish Water assets should be avoided. The prompt and efficient use and manipulation of valves, hydrants, meters or other apparatus is required at all times. There should also be no interference with the free discharge from water main scours or sewer overflows.

52. In the event of an incident occurring that could affect Scottish Water, including any damage to assets, Scottish Water should be notified without delay, using the Customer Helpline number 0800 0778 778, and the local contact if known. Scottish Water apparatus should not be interfered with or operated by anyone other than Scottish Water personnel.

53. Minimum Distances of Sewers/Water Mains from Buildings/Structures/other Obstructions – There are two critical issues relating to how close you can build to water mains and sewers.

    1. Scottish Water has a legal right of access in order to maintain and repair assets and there are minimum distances required in order to facilitate future SW access to water mains and sewers. No buildings, structures or any other obstructions that will restrict our access or put at risk the integrity of the assets is permitted within this distance.

    2. For pressurised pipes there is a recommended distance to be used in order to protect adjacent buildings and structures should the asset burst. This is the recommended distance to minimise the risk of damage to adjacent properties and structures in the event of a water main failure. It is suggested that this distance may include garden areas but should not include inhabited structures.

    3. The details of these requirements should be confirmed with Scottish Water as an early part of the design process.

54. Stationary plant, equipment, scaffolding, construction or excavated material, etc. should not be placed over, or close to, any Scottish Water assets without the prior written consent of Scottish Water which may be withheld depending on circumstances on-site.

55. Special care should be taken to avoid the burying of Scottish Water assets or the obstruction of sewers or manholes with fill or other material. Arrangements for altering the level of any chambers should be agreed in advance with Scottish Water and these should be constructed in accordance with Scottish Water requirements. The cost of any work to Scottish Water assets will be met by the project developer.

56. Excavation works (e.g., of wind turbine foundations) should not be carried out in the proximity of a water or wastewater main without due notice having been given to Scottish Water and prior written acceptance obtained. The developer will comply fully with any Scottish Water specific site requirements.

57. Any tree planting associated with the development (e.g., compensatory planting or screening etc.) should be undertaken in line with Water for Scotland 4th Edition 2018 and Sewers for Scotland 4th Edition 2018 to ensure that Scottish Water's assets are not put at risk by future growth of tree roots.

58. Vibration in close proximity to Scottish Water pipelines or ancillary apparatus should be managed in accordance with British Standard 5228-1:2009 (Code of practice for noise and vibration control on construction and open sites). The predicted levels of vibration should be agreed in advance with Scottish Water as part of the risk assessment and method statement and agreed vibration monitoring arrangements will be required.

59. The developer will consider the possibility of increased loading on Scottish Water apparatus and measures will be taken to eliminate or mitigate increased loading on assets. Care should be taken to identify the exact location (line and level) of any assets, which may be crossed by vehicles on the access route to the site and crossing points will be engineered to the requirements of Scottish Water. Any pipe crossing proposals are subject to prior written acceptance by Scottish Water.

60. Scottish Water will not accept liability for any costs incurred in fulfilling any of the above requirements during the development planning, construction or operational phases, either by the developer, the developer's associates, contractors or any other person or organisation involved in the project.

61. If the developer damages any Scottish Water asset, they will be held liable for any costs resulting from this.

62. Scottish Water may require costs associated with the development to be reimbursed by the developer or the developer's agents.

Appendix X: Supplementary Information

Available for inspection at:

West Region
Whitegates
Lochgilphead
Argyll
PA31 8RS
Tel: 0300 067 6650

Documentation includes: -

- roadline surveys
- Production Forecast
- Sub-compartment database
- Landscape Character Assessment by Nature Scot
- forestry guidelines
- Recreation Plan
- Scottish Forestry approval procedures
- soil surveys
- crop surveys
- Inventory of Ancient, long-established and semi-natural woodland, Argyll & Bute District (NCCS)

Appendix XI - Supporting document for Land Management Plan or amendments involving restoration of afforested and open peatlands proposals

Overview of supporting documents

This appendix is the main document to support Peatland restoration proposals in LMP's or amendments. Its structure, and the accompanying appendices as found in the LMP are:

- Introduction
- Afforested deep peatland restoration and restock decisions
- Peatland restoration
- Appendix XII – Peat type/NVC summary translator table
- Appendix XIII – Peatland restoration methods
- Appendix XIV – LMP table template
- Peatland maps - see
- Decision tool for restoration of afforested peatlands not yet available)

These documents form a package to support Land Management Plans with proposals of restoration or restocking of afforested deep peatlands.

1. Introduction

The supporting documents are to append Land Management Plan (LMP) submissions and LMP amendments which contain proposals for restocking or restoring areas of afforested peatlands.
The purpose of these supporting documents are to:

- outline the implementation of the principles and suggested approach as set out in the Scottish Forestry (SF) Practice Guide 'Deciding future management options for afforested deep peatland'.
- state the format of the supporting information for the proposals.

The supporting documents must be read along with the SF Practice Guide to fully understand the decision-making process.

An interpretation of the Practice Guide, which has formed the context of these LMP supporting documents, is included in Appendix I.

Context

The Scottish Government has set a target of net zero carbon emissions by 2045. In order to help meet this target, Forestry and Land Scotland (FLS) are currently in the process of preparing a Peatland Strategy. The strategy will set out the best way to manage its peatlands, and to determine which afforested peatlands will be restored or restocked on Scotland's public forests and land.

Peatlands will play an important part in achieving this net zero target, due to their natural ability to store and sequester carbon. It is estimated that UK peatlands store 2,300 Mt of carbon (Billett et al. 2010). Peatlands in the UK are naturally treeless due to the wet oceanic climate (Sloan et al., 2018). This differs from European continental peatlands which naturally support a tree cover due to the drier, and generally warmer, summer climate. In their natural state, UK peatlands are too wet and nutrient poor to sustain tree cover, except in exceptional circumstances, such as pine or oak bog woodland. In general, afforestation of unmodified peatlands in the UK is unnatural.

The purpose of the SF practice guide is to ensure that the principles of sustainable forest management are applied specifically in the context of the management of the peatland asset. This is a shared objective of both FLS and SF, and takes account of the valuable ecosystem services provided by peatlands. Specifically:

- The importance of peatlands in relation to climate change. Afforested peatlands have the potential to act as significant sources of carbon, depending on the levels of modifications imposed at establishment and the impact these have had on the peatland condition since that time. (Evans et al., 2017) estimated an average carbon emission rate of 9.9 t CO_2e/ha/yr. The growth rate of a stand of trees on a particular peatland must capture enough carbon to compensate for the loss of carbon from the modified peatland if a net carbon capture outcome is to be realised.
- The contribution towards enhancing biodiversity. Article 8(f) of the Convention of Biological Diversity, signed by the UK Government on 12th June 1992, encourages the repair of damaged ecosystems. As a result, restoration of priority habitats is a key component of the Scottish Biodiversity Strategy.
- The potential ability of peatlands to grow trees to capture carbon, although there are unknown risks to the security of the carbon store, and the ability of restoring peatlands, after the end of subsequent rotations.

Since 2014 FLS has undertaken peatland restoration on a number of peatland types, including the restoration of unproductive plantations on peatlands. FLS restored 2,786 Ha of 'forest to bog' peatland restoration between 2014/15 and 2019/20 inclusive, across 60 project areas. In the same period, FLS restored 3,786 Ha of existing open peatland habitat, across 29 project areas.

FLS anticipates the need to carry out restoration of 35,000-60,000 Ha of afforested peatlands before 2035. This will ensure that no peatland is acting as a net carbon source by 2045. Peatlands are found in an estimated 75% of public forests, and there will be approximately 2,000 peatland areas within those forests that will need to be assessed using the principles set out in the SF Practice Guide.

The approach outlined in this document aims to ensure that a consistent approach is adopted across all Regions for presenting information to SF, as part of the LMP review process and submission. This should make gathering information, presenting and reviewing it easier and quicker for both agencies.

2. Afforested deep peatland restoration and restock decisions

The step-by-step decision flow process is based on the SF Practice Guide 'Deciding future management options for afforested deep peatland.' An interpretation of this practice guide can be found in Appendix I, and notes are given to clarify questions that have been commonly asked by FLS staff in the past.

Restoration categories, terminology, definitions

The supporting documents uses the terminology as per the definitions within the SF Practice Guide. This is to avoid confusion and allow good understanding in subsequent discussions amongst FLS staff, SF, and external stakeholders. The only term that has been introduced, and not previously used within the SF Practice Guide, is "Assessed peatlands." This term has been used to clearly mark the fact that the "presumption to restore" sites are *identified* using features and the hydrological relationship to them, whilst the "assessed peatlands" and the proposed outcomes result from an *assessment or analysis* and consideration of many factors, within a *decision* flow process.

Please note that all peatlands are assessed based on their entire hydrological unit and the soil types within those. This is not emphasized very strongly in the SF Practice Guide, but has proved to be an essential and practical approach. The Practice Guide does state the decisions are made on a site-by-site basis, and since ESC, peatland characteristics and potential tree growth is governed very strongly by peat type, it is sensible to define 'site' as a soil polygon on the 1:10,000 soil mapping layer. For further definitions and clarification regarding peatland hydrological unit, see 'Box 1 - Understanding the functional connectivity (hydrology) of adjacent peatland' in the SF Practice Guide.

Afforested peatland type definitions:

Restoration sites for which there is a 'presumption to restore.'

These are currently afforested deep peat sites that are:

- Likely to negatively impact on habitats designated as qualifying features in the UK Biodiversity Action Plan (UKBAP), or on Natura sites, Ramsar sites, Sites of Special Scientific Interest (SSSI's) or National Nature Reserves (NNR's);
- Sites or parts of sites where restocking is likely to adversely affect the functional connectivity (especially hydrology) of an adjacent Annex 1 peatland habitat (as defined in the EU Habitats Directive), or a habitat associated with one (priority habitats);

- Sites where deforestation would prevent the significant net release of greenhouse gases (Scenario A peat type). These are peat types that are known to be edaphically unsuited for growing plantation trees.

Assessed peatland sites which will be either restored or restocked.

Afforested deep peat sites (Scenario B and Scenario C peat categories) which, after assessment, are found to be:

- Sites for which there is clear evidence that they can grow a commercial crop the equivalent of Sitka spruce yield class 8 or more, despite being managed with minimal inputs, and on peatlands which are not acting as a significant carbon source. These sites will be **restocked**.
- The remaining sites will be **restored** unless it is not feasible to do on an ecological basis.

Establishment of Peatland Edge Woodland (PEW)

Afforested deep peat sites (Scenario B and C categories) which cannot grow a commercial crop the equivalent of Sitka spruce yield class 8 or more, and where restoration is not thought to be possible.

This will be under constant review. Restoration progress has been impressive on most sites, but direction of travel is not yet clear on sites with a very specific set of characteristics (for example, Lodgepole pine plantations on an unflushed blanket bog where the peat depth is less than 1.0 meters and on a slope of more than 5 to 10%). If it decided these sites are not restorable, then PEW may be the only alternative sustainable land use option. However, past attempts at establishing native trees on deep peatlands, even with excessive drainage and ground preparation have not been encouraging. Also, a partial restoration of the hydrology may be required on cracked peats to ensure they are not releasing an excessive amount of carbon dioxide.

3. Decision verification

The information sources and verification that have been used in the decision making process for restoration or restocking of a deep peatland site are provided in this section.

As much information is provided spatially in maps as possible, though some of the information is provided in a table (see the last part of appendix IV).

Appendix II is the LMP summary table used to provide context and a summary of:

- Total area of deep peat soils,
- Total area of afforested peatland,
- Total area of existing open peatland,
- Total area proposed of 'presumption to restore',

- Total area of proposed restoration after assessment,
- Total area of deep peat to be restocked.

No deep peatland should be planted as part of a new woodland creation. Note, that the 1:10 K soil survey uses the Forestry Commission Soils Classification. Within this classification, a peat depth range is described which is typical for that peat type (see Appendix III – NVC summary table for peat depths). In most cases, this negates the need for a peat depth survey where 1:10 K soils data is available. The soil survey will help inform areas of deep peat and the wider boundaries of the hydrological unit. A description of the map templates supplied are found in Appendix IV.

Restoration decisions

1. Sites for which there is a **presumption to restore**:
   - Spatial assessment based on boundaries of Designated Sites and existing priority habitats.
   - Soil survey with 1:10 K mapping accuracy. Soils have been classified according to the FC Field Guide 'The identification of soils for forest management'. Soil maps will have been verified and confirmed fit for purpose by ground truthing of FLS staff on a sample and methodical basis.
   - Sites without 1:10 K soils maps will have been verified by FLS staff field surveys using botany, topography/landscape, soil knowledge and extrapolation based on survey and experience. Peat depth survey may also be provided.

2. Afforested deep peat sites which require an assessment of crop performance – **assessed peatlands** (Scenario B and Scenario C peat types):
   - Soil survey with 1:10 K mapping accuracy.
   - ESC prediction
   - First crop rotation yield class (if measured)
   - Harvesting data (if available)
   - Description of historic site modifications
   - Current crop deficiencies
   - Predicted yield class for second rotation

Restock decisions

3. Afforested deep peat sites which require an assessment of crop performance – **assessed peatlands** (Scenario B and Scenario C peat types):
   - Soil survey with 1:10 K mapping accuracy.
   - ESC prediction for species chosen
   - First crop rotation yield class (if measured)

- Harvesting data (if available)
- Description of historic site modifications
- Current crop deficiencies (should be none)
- Predicted yield class for second rotation and proposed establishment methods.
- Intention to rewet the site (i.e., drain blocking and back fill trenching) may need to be undertaken if historic modifications exceeds current UKFS limits, or the site's hydrological function is significantly altered, to ensure that the plantations do not act as a carbon source.

4. Afforested deep peat sites which cannot grow a commercial crop the equivalent of Sitka spruce yield class 8 or more and cannot be restored.

- Establish low density native woodland (500 stems/Ha) and block drains where possible.
- Fell to waste non-native trees if they are likely or have exceeded making up 49% cover of the canopy (see SF Practice Guide for details).

Table 1 Overview of information that will be provided within the LMP for each peatland category. The template for provided this information can be found in Appendix II.

CATEGORY OF RESTORATION/ RESTOCKING BEING PROPOSED	INFORMATION PROVIDED
Presumption to restore	Essential: • Location of restoration proposal • Designated Sites (if present) • Existing priority habitats (if present) • Location of all Scenario A peat types and their hydrological units • Annotation of any features of note Not required: Crop data (the objective is to ensure the existing sites hydrological unit is intact, regardless of modifications and tree size).

Assessed Peatlands – where deforestation *would prevent a significant net release of greenhouse gases*	Essential: • 1:10 K soil maps, or map illustrating peat soil types drawn from survey • ESC statement • Peatland modifications • Statement confirming any deficiencies in 1st rotation • Comment on correction factors • Predicted YC for 2nd rotation If available: 1st Rotation YC (if measured) and actual outputs (if available)
Suitable for Restocking	Essential: • 1:10 K soil maps, or map illustrating peat soil types drawn from survey • ESC statement • Peatland modifications • Statement confirming there were no deficiencies in 1st rotation • Comment on correction factors • Predicted YC for 2nd rotation • Statement of actions required to limit carbon loss from modifications to minimal levels that do not negate the carbon captured by trees If available: • 1st Rotation YC (if measured) and actual outputs (if available)
Not suitable for restocking	Essential: • 1:10 K soil maps, or map illustrating peat soil types drawn from survey • ESC statement • Peatland modifications • Predicted YC for 2nd rotation • 1st rotation statement of deficiencies present • Justification of correction factors used to adjust ESC prediction. If available: • 1st Rotation YC (if measured) and actual outputs (if available)
Peatland Edge Woodland	Essential: • Confirmation that peatland restoration is not possible. • Confirmation that establishing natives is possible with a minimally modified peatland. • Statement of actions required to limit carbon loss from modifications to minimal levels that do not negate the carbon captured by trees.

Appendix XII – Peat type/NVC summary table

Overview of the FC Soil Classification and related peat types, legislative EU Habitats Directive – Annex 1, UKBAP Priority Habitats, and NVC type. For each peat type, the range of likely peat depths are given. These are based on Pyatt's FC Soil Classification (1982) of peat types, terrain, and local experience. Where soil survey information is available (at 1:10,000 accuracy), it eliminates the need for site-specific peat depth surveys.

FC Soil Group		Peat type	FC Soil Code	Peat depth (Pyatt 1982)	EU Habitats Directive Annex 1	UKBAP Priority Habitats	NVC type
Flushed peatlands	8 *Juncus* or basin bogs	*Phragmites* (or fen) bog	8a	0.5 – 4 m	Can include H7140	Lowland Fen + Upland Flush, Fen & Swamp	Various neutral or slightly base-enriched wetland types including M5, M9, M23, M25c, M27, M28, S25, S27, S28 and (non-NVC) MX
		Juncus articulatus or *J. acutiflorus* bog	8b				Description reads most like M6d, but *Juncus articulatus* is scarce in M6d and more common in its neutral counterpart M23a
		Juncus effusus bog	8c				M6c
		Carex bog	8d				M4 and M6a/b
	9 *Molinia* or flushed blanket bog	*Molinia*, *Myrica*, *Salix* bog	9a	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Purple Moor-Grass & Rush Pasture if in lowlands	M25a co-dominated by *Molinia* and *Myrica*
		Tussocky *Molinia* bog, *Molinia*, *Calluna* bog	9b			Lowland M25 = Purple Moor-Grass & Rush Pasture; M15/16 = Upland+ Lowland Heaths	M25a and examples of M15b/M16 co-dominated by *Calluna* and *Molinia*

FC Soil Group		Peat type	FC Soil Code	Peat depth (Pyatt 1982)	EU Habitats Directive Annex 1	UKBAP Priority Habitats	NVC type
		Tussocky *Molinia*, *Eriophorum vaginatum* bog	9c			Blanket Bog	M25a on deep peat, and M20-M25 intermediate (but abundant *Eriophorum vaginatum* suggests a lack of flushing)
		Non-tussocky *Molinia*, *Eriophorum vaginatum*, *Trichophorum* bog	9d				M17 (but abundant *Eriophorum vaginatum* suggests a lack of flushing)
		Trichophorum, *Calluna*, *Eriophorum*, *Molinia* bog (weakly flushed)	9e				M17 (but abundant *Eriophorum vaginatum* suggests a lack of flushing)
Unflushed peatlands	10 *Sphagnum* (or flat or raised) bogs	Lowland Sphagnum bog	10a	0.5 – 12 m	H7110, H7120 (all occurrences) and H7150 (occurrences on raised peat surfaces in agricultural lowlands).	Lowland Raised Bog	Mostly M18 but can include some M17, M19, M20 and small M1/2/3 bog pools
		Upland *Sphagnum* bog	10b			Blanket Bog	Mostly M17 but can include smaller areas of M18 and small M1/2/3 bog pools in the wetter parts
	11 *Calluna*, *Eriophorum*, *Trichophorum* (or unflushed blanket) bog	*Calluna* blanket bog	11a	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed Upland situations)	Blanket Bog	M19 (relatively dry and strongly *Calluna*-dominated forms)
		Calluna, *Eriophorum vaginatum* blanket bog	11b				M19
		Trichophorum Calluna blanket bog	11c				M17 and, where blanket bog surface has dried out to some

FC Soil Group		Peat type	FC Soil Code	Peat depth (Pyatt 1982)	EU Habitats Directive Annex 1	UKBAP Priority Habitats	NVC type
							degree as a result of draining and/or burning (and *Eriophorum vaginatum* very sparse or absent), M15/M16
		Eriophorum blanket bog	11d				M20
	14 Hagged / eroded bog	Shallow hagged eroded bog	14	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Blanket Bog	Hag tops mainly M19 but can also include M17 and, where more dried-out, M15/16 and (driest) H12. Bare peat, M3, M6, M17, M19 or M20 in depressions between hags.
		Deeply hagged eroded bog	14h				Hag tops mainly M19 but can also include M17 and, where more dried-out, M15/16 and (driest) H12. Bare peat, M3, M6, M17, M19 or M20 in depressions between hags.
		Pooled eroded bog	14w				M1/2/3/17, pools with *Menyanthestrifoliata* (no NVC type) and deeper unvegetated pools of open water

APPENDIX XIII – Peatland Restoration: Forest-to-Bog methods

Restoration treatment method descriptions and specifications have been produced by several organizations over the years.

FLS values advice from Peatland Action Nature Scot, and follows the terms and conditions set out in the terms and conditions of this grant funding.

This document serves to distil any advice and information published by Nature Scot, and it should be noted that Nature Scot will be publishing information notes on the various restoration treatment methods, and indeed is preparing a Restoration method compendium. Please read this document in conjunction with other sources of information.

FLS uses the FC soils classification system to categorize the various peat types. This is useful because these give us an indication of the peatland vegetation we would expect and indeed are aiming to restore in many cases. It is also useful because when considering 'forest to bog' sites when specifying restoration specifications, because the layout and density of drains is strongly correlated to peat type, and the foresters at time of woodland creation seem to have approached the drainage specifications in the same way.

Forestry Commission Soils Classification

The FC Field Guide 'The identification of soils for forest management' identifies and describes several different peat types. Within the FC classification, the peat types are classified according to dominant species found in the vegetation communities. This is governed or described by the same factors as that used by the Ecological Site Classification system, the Ellenberg values. The main environment factors that govern the vegetational community of peatlands are their nutritional status and their wetness (hydrological behaviour). Their nutritional status is strongly influenced by how peatlands receive water, such as from higher or surrounding ground (flushed peats) or through precipitation only (rain fed only, or unflushed peats).

Each peat type corresponds with a National Vegetation Classification type and UKBAP priority habitat, which is outlined in a summary table in Appendix III. Therefore, each peat type directly translates to a priority habitat for the purposes of assessment under The Environmental Impact

Assessment (Forestry) (Scotland) Regulations 1999' (as amended) and the Scottish Government's policy on Control of Woodland Removal.

Outlined in Table 1 below are several types of peatland that FLS will aim to restore. This will be on three scales:

1. Large peat catchment scale – notable iconic projects like Dalchork, Flanders and Lochar mosses

2. Medium, whole coupes and package of coupes within a block
3. Small, 'parts of coupes' scale.

Table 1 FC Soil Classification - overview of peat types

PRIORITY HABITAT TYPE	FC SOIL TYPES (PEAT TYPES)	TYPICAL FORESTRY MODIFICATIONS	SCALE OF PEAT TYPE WITHIN NFE	ESTIMATED AREA OF PEAT TYPE ON THE NFE
Blanket bog (BB)	Flushed blanket bogs (9)	Deep ploughed ridges and furrows, intensively ploughed drains	Can cover large areas, especially on long slopes leading into riparian zones. Also found locally within unflushed peats.	40,400 Ha Likely that just under half of this will be restored.
	Unflushed blanket bogs (11)	Medium ploughed ridges and furrows, with a low to medium intensity of ploughed drains	Probably the greatest extent of peatland on the NFE	91,800 Ha Likely that just under half of this will be restored.
	Upland or intermediate bogs (10b)	Deep ploughed ridges and furrows and ploughed drains. Very similar to LRBs	More than is mapped. Many areas mapped as included within 11 and 9 peat types. Resolution and preciseness issue.	5,000 Ha – often under-represented on JHI maps. All of this will be restored.

	Lowland Raised bogs (10a)	Medium to deep ploughed ridges and furrows. Large hand and machine dug drainage channels sometimes, some predating afforestation.	Many sites, some large, but many small (<30 Ha). Found in Lowlands, Carse of Stirling, and South. Also, Drumfern in Lochaber. Amounts total between 2000-3000 Ha.	2,400 Ha – under-represented due to JHI maps covering a large proportion of this type, and incorrectly categorising it as an 8. All of this will be restored.
	Parts of blanket bogs (9), and Basin bogs (8)	Intensive drainage. Usually grew very large trees but only because of the drainage density.	Usually a small component of a larger peat catchment.	Incorporated above.
	14	Deep ploughed, often unevenly and in small patches. Drainage low intensity but effective, along with the hagged nature of these areas.	Usually a small component within a larger peat catchment. Usually only smaller areas were planted, larger areas avoided. Largest expanses are on upland sites on the upper reached of what was regarded plantable.	5,400 Ha. Mostly on open ground, but likely that all of this will be restored. Hags on open ground are thought to act as very high emitters of carbon dioxide.

Forest-to-bog restoration methods

Afforested peatland restoration, known more commonly as 'forest-to-bog' restoration, is thought to take a least 10 years (after re-wetting) to change from acting as a carbon source to a carbon sink. Therefore, there

is an inherent urgency to begin restoration as soon as possible after felling, with respect to the Scottish Government target of net zero carbon emissions by 2045.

Restoration will be achieved through the use of a number of re-wetting techniques. The most common techniques used in forest-to-bog restoration are listed below. These methods are usually employed together, across a site in a sequence, beginning at the upper areas and working downslope towards main water courses, or where water leaves the site. Note, these methods are under constant development.

- **Peat dams**: usually the most effective way of blocking drains and furrows, where appropriate, and dispersing water across a peatland, whether on open or a forest-to-bog project. **Re-profiling the drains** is also carried out at the same time as installing peat dams, but only if they do not have high peak or base flows, indicated by the absence of vegetation in and on the sides of the drain.

Figure 1a. Peat dams installed at Criadadh More, Isle of Mull on 19/03/2015

Figure 1b. Site response after almost three growing seasons on 07/09/2017

Figure 1c. Site response after seven growing seasons on 20/11/2021

Stump flipping and ground smoothing: this un-modifies the ploughed ridges and furrows which in most cases, if left in situ suppresses the water table and development of peatland vegetation, and promotes regeneration of negative indicators such as too much Calluna or non-peatland species or undesirable non-native and native trees. Care is needed when restoring sites planted with Lodgepole pine, as the root-ball penetrates into the peat much deeper than the flat root plate of Sitka spruce. When flipping LP stumps, it is undesirable to bring catotelmic (deeper) peat to the surface, so a 'light touch' ridge and furrow reprofiling should be carried out if possible, leaving stumps in situ, to smooth most of the surface. This is only possible where stumps were cut low using a shears head (because stumps of standard height will throw the tracks on the machine), or access routes will need to be carefully planned and stump flipped, to allow access to particular parts of the site

Figure 2. Gow moss after clear felling prior to restoration.

Figure 2. Gow moss after site has been treated using stump flipping and ground smoothing techniques.

Backfill trenches (trench linear bunding, but without a high bund): this counteracts excessive lateral flow of water within the peat, usually promoted by historic events or modifications, such as fire, peat bank cutting, or peat cracking. This can result from the ploughing and draining carried out during afforestation, and the subsequent drying and suppressing effect of the mature trees on the peat and water table.

Figure 3. Example of backfill trenches at Gow moss. Note the positive indicators – the high water table and extent of cotton grass.

Peat hag and gully re-profiling: this is used to repair excessive erosion of peatlands, usually in an upland setting. Gullies can be caused by excessive surface water run-off, or promoted by artificial drains catching

water across a natural shedding area, and bringing it to a confluence where erosion begins and continues indefinitely. Hags probably have several triggers, including saturated peats, freezing and unfreezing conditions, over grazing, and perhaps are a legacy of the mini-ice age in the 1700's. Many appear to develop from peat pipes which eventually collapse.

Figure 5a. Extensive peat hags at Glen Affric prior to restoration.

Figure 5b. Re-profiling of peat hags and the resulting higher water table.

Figure 5. Landscape perspective of Beinn a Mheadhoin before restoration.

Figure 6. Landscape perspective of Beinn a Mheadhoin after restoration.

Deciding upon restoration methods (to be replaced by separate document)

In deciding upon restoration treatments, the methods and specifications used in all forest-to-bog projects are often very similar. Usually, a combination of the techniques described above will be applied. Peat damming and re-profiling of forestry drains is always carried out. Stump flipping and ground smoothing is carried out on a majority of sites, and back fill trenching is usually only carried out where cracking is present or where the water table is lower than can be explained by the drainage network or other modifications. The main aim across all sites is to restore the peatland's hydrology and behaviour by raising the water table.

Details of restoration plans cannot be confirmed until after the trees have been clear felled as the standing trees or windblow obscures a proper view of the site. Access across the site, giving a clear view of the lie of the land, localized undulations, and where the flushed areas are, is needed to determine the exact location of drains, to determine their status in terms of peak flow and base flows, allowing decisions to be made on the positioning of peat dams and spotting if the underlying peat is cracked or not. Some indication of the positions and intensity of drainage may be apparent from studying aerial photographs, but usually only where Sitka spruce plantations are uniformly growing and not windblown.

Despite this, the layout of drains is often fairly predictable, most individual forests were ploughed and drained by the same people using the same machines to the same specifications. The foresters who designed afforestation drainage had a very high technical knowledge of how to drain peatlands in an optimal manner. There is a strong correlation of drainage density and peat

type as described in table 3. In our experience, estimates of the number of peat dams required can be made during the contract procurement stages of the project.

Table 2 Overview of typical drainage intensity or spacing of drainage by peat type.

Peat type	Typical drainage intensity	Typical spacing
8	Very dense, wettest peat of all	5 to 15 metres. Drainage plough often incorporated into ploughed ridges and furrows, if not all
9	High density of drains	10 to 25 metres
10	Very dense	5 to 15 metres. Drainage plough often incorporated into ploughed ridges and furrows, as well as across ridges/ furrows
11	Low density	30 to 50 metres.
14	Low density	20 to none. Very variable depending on topography and layout of hags.

Peat cracking lowers the water table, drying the peat, especially for longer periods and more thoroughly during drought conditions. This increases the amount of oxidization of the peat, leading to high carbon dioxide emissions. Identifying areas of peat cracking is easier after clearfell as the patches of drier than expected peat are possible to identify in the context of the topography. Understanding the landscape and terrain helps to find which areas are most likely to contain cracking, such as slightly raised areas and hummocks, or where the plantation trees have grown better. In addition, a thorough survey of the drains and their loading, peak flows, and depth of peat below the base of the drain can only safely and efficiently be done after the trees have been clear felled.

Table 4 (on the next page) is in draft, and will be developed and expanded upon into a decision support tool

Table 4 Decision flow approach in deciding upon restoration treatments to be employed.

FACTOR	QUESTION	ANSWER	CONCLUSION

Drainage	Are the drains scoured?	Yes	Do not block, unless base flow and peak flow will be significantly altered by blocking and distributing water out of the feeder drains upstream
		No – the sides are vegetated, showing that peak flows and base flows are consistently low throughout the year	Go to next question
	Are the bases of drains on at least 50 cm of peat?	Yes	Block drains using *standard peat dams*, and re-profile drains
		No, and base flow is very low	Block drains using *peat plugs* (similar to peat dams, but without excavating oxidised peat from underneath the drain base) and re-profile drains
Ridges and furrows	Are the furrows filled with sphagnum and the height difference between the top of ridges and sphagnum less than 25 cm?	Yes, and the water table appears to be consistently high, and sphagnum is also found growing on the original ground surface and on tops of the ridges.	Do not Stump flip and ground smooth
		No, the plough ridges and furrows are prominent, and sphagnum is confined to the base of the furrows. The water table is low, especially when comparing the impact of the drains	Stump flip and ground smooth
Peat cracking	Is the peat cracked?	Yes	Install back fill trenches no longer than 25 m, and across the slope, at right angles to the furrow and ridges, if possible, but up to 45 if not.
Hagged peat	Are there hags present on the site?	Yes	Hag re-profile these areas

APPENDIX XIV – Future management of afforested peatlands

SUMMARY AREAS	Hectares (Ha) 1:10k soils map	Hectares (Ha) JHI map	Comments
Current management of peatlands in LMP			
Afforested deep peatlands	18.1		Total area size (Ha) of afforested peatlands based on SCDB information.
Existing open habitat on deep peat	10.0		Total area of open peatland (Ha) from SCDB.
TOTAL - All deep peat soils	28.1		Total area size (Ha) of deep peat soils within the forest block/LMP area based on the soils data. Deep peat soils are defined as per the SF Practice Guide: Scenario A, B and C soils.
Future management of afforested peatlands			
'Presumption to restore' peatlands Forest-to-bog restoration of afforested peatlands including the hydrological catchment	13.2		Only includes afforested peatlands which lie next to open existing peatlands, or Scenario A peatland types, as per the SF Practice Guide. The area of their hydrological units is also included.
'Assessed' peatlands Forest-to-bog restoration to secure carbon store and sequestration, and maximize ecosystem services.	2.4		Total area of afforested peatlands that will be restored following an assessment of predicted growth (YC). Restoration of assessed peatlands are concluded where no evidence is found to support that the next rotation stand would grow Sitka spruce YC 8 or more with minimal disturbance and low level of peatland modifications. Assessed peatlands includes the hydrological catchment.
Peatlands to be restocked	3.7		Total area of afforested peatlands that will be restocked because evidence was found to support the conclusion that the second rotation will clearly be YC 8 or more with minimal disturbance and with a low level of peatland modifications.

Presumption to restore table

The table below is only relevant for Presumption to Restore peatlands (Scenario A peat types) where deforestation would prevent the significant net release of greenhouse gases.

	Description	Location of described attribute (peat types, part of the forest)
Description of any designated sites, priority peatland habitats which require	Illustrated on map 3.17	None

protection and enhancement.		
Description of peat types present in the LMP forest block(s), and any characteristics of interest	Illustrated on map 3.17	Westernmost area contains important habitat points; M9 Carex rostrata-Calliergon cuspidatum/giganteum mire.
Description of hydrological units, extent, relation to peatlands to be restored, and the topography.	Illustrated on map 4.12	Only minor hydrological units identified through peat probing and may identify inaccuracies to soils mapping.
State any points of note from survey	Illustrated on map 5.11	Peat depths can be quite variable. Two areas area associated with private water supplies. One area contains a watercourse running into the reservoir.

Assessed peatlands table

The table below is only relevant for Assessed Peatlands (Scenario B and C peat types) where there needs to be clear evidence that restocking on peat soils will produce a yield class equivalent to Sitka spruce 8 or more.

Attribute described	Description	Location of described attribute (peat types, part of the forest)
ESC statement (range) State range respective to peat types	Illustrated on map 4.12	ESC suitability for SS is 0.35, peat type 8b, with no drainage installed. With drainage, the figure rises to 0.53.
Accumulated Annual Temperature (range)		1462 to 1596
DAMs score (range)	Map 3.4	13 - 17
Crop deficiencies (needles, colour, leader length)	Aerial photo only	None observed
Location and extent, proportion of healthy crops (no signs of deficiencies) and reason	Aerial photo only	All healthy
Statement of correction factors used to predict of next rotation from ESC outputs (drainage, fertilising, flushing, heather control, peat compaction, and the combination of all of these per peat type)	ESC	SNR limits use of SS without drainage to YC 10. Alternative species include WH and pines. No fertilising or heather control applied. A variety of broadleaved species are also suitable. Default models used. With drainage installed, SS achieves YC 15.

Statement of actions required to limit carbon loss from peatland soil. For example, partial re-wetting, referencing average water table height and density of drains.		Unassessed
Where PEW is proposed, confirm and explain why restoration of deep peatland is not possible	Maps 4.12 & 5.11	Area in north-east corner is 40% Scenario C, but also has 40% 6e which probably accounts for some of the checked growth. Peat depths are very variable with no consistency. Patches of good SS growth may reflect areas of non-peat.

Restoration proposals

The table below is to state and describe the restoration techniques to be applied to the proposed restoration areas.

Attribute described	Description	Location of described attribute (peat types, part of the forest)
Treatments used to restore the hydrology	**Please see standard approach** (appendix XIII) State any site specific specifications or alterations of the approach:	Not assessed as yet
Treatments used to restore the topography (remove afforestation modifications, and previously hagged sites)	**Please see standard approach** (appendix XIII) State any site specific specifications or alterations of the approach:	No assessed as yet
Treatments used to counter-act peat cracking or other modifications caused by the afforestation of the peatland	Is peat cracking present?	No

EIA risk assessment

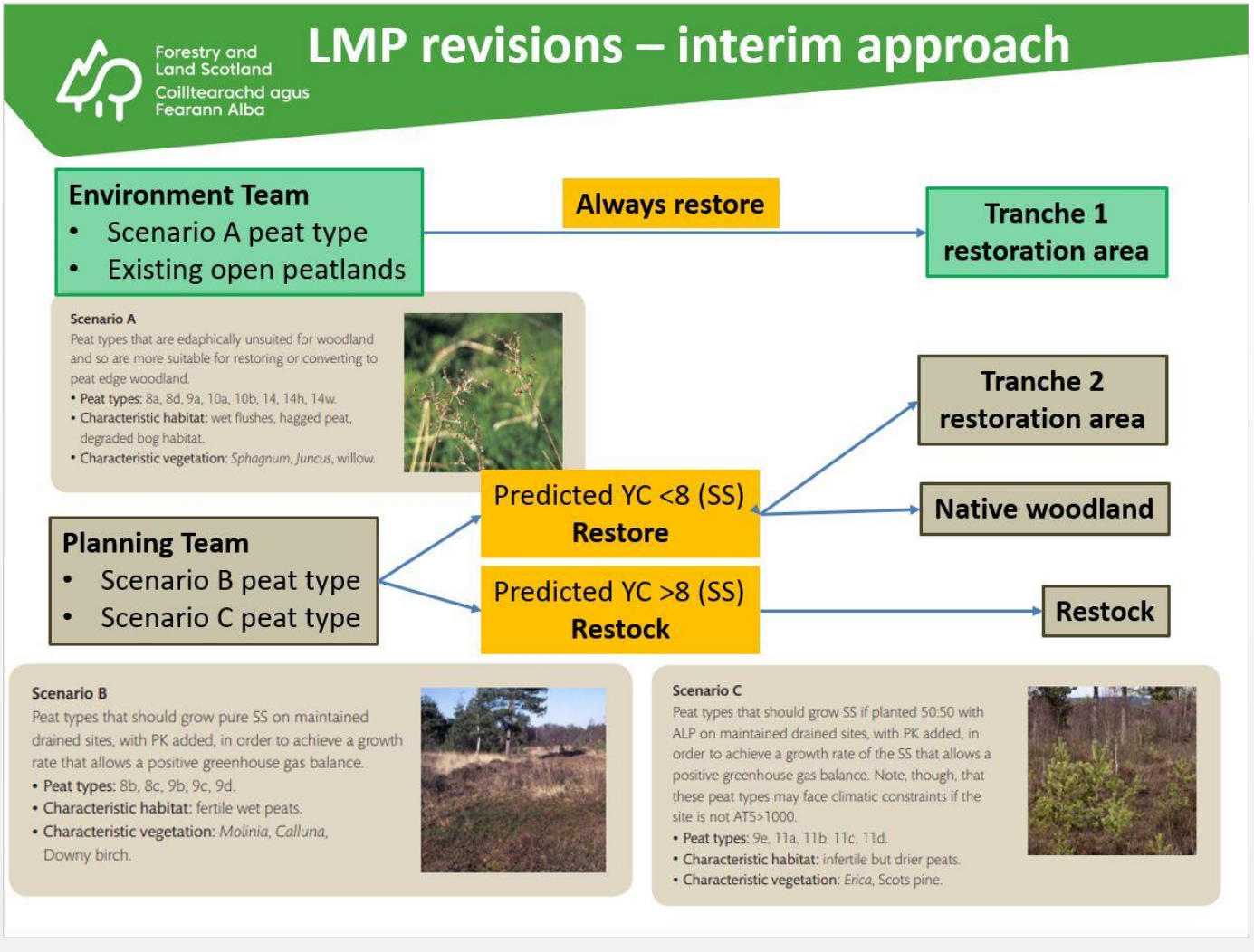
Forest-to-bog peatland restoration is classified as a forestry project under the Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017. To obtain consent from Scottish Forestry, an assessment of potential environmental risks as a result of the proposed forestry project is required to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

Main risks to assess	Impact assessment
Population and Human Health	**No impact**. Core paths/private water supplies.

Biodiversity (habitats, species)	**Positive**. Restoration of a degraded peatland will restore a priority open habitat, benefitting both habitat and its associated species. Pre-operational surveys will identify any protected or breeding species to ensure suitable mitigation is in place to avoid any disturbance.
Land	**No impact.** Where the restoration project is adjacent to agricultural land, boundary drains will not be blocked to ensure neighbouring land is not compromised by re-wetting and increased potential to flooding.
Soil – and geology, geomorphology	**Positive.** Re-wetting the site will benefit the peat soils as forestry modifications will be reversed to stop oxidisation and further degradation and erosion of the peat.
Water	**Positive.** Re-wetting techniques have shown to have no significant adverse effect on water quality. Ultimately, the water quality of the local area will be improved by reducing run-off from the exposed peat and degraded peatland.
Air	**No impact.**
Climate	**Positive.** Afforested peatlands have the potential to emit more GHG emissions than can be absorbed by a growing woodland. Restoration of afforested peatlands, especially Presumption to restore peatlands, will prevent the significant net release of greenhouse gases, ultimately benefitting the local climate.
Material Assets	**No impact.**
Cultural Heritage	**No impact.** Pre-operational surveys will identify any cultural heritage features to ensure suitable mitigation is in place to avoid any disturbance.
Landscape	**Positive.** Peatland restoration will create more open space within the LMP forest blocks and their local area. This will add more diversity to the forest structure by creating open and associated native woodland habitats.

Control of Woodland Removal Policy: Peatland restoration projects meet the requirements of the Scottish Government's Control of Woodland Removal Policy as the deforestation and subsequent restoration will enhance a priority habitat and its (hydrological) connectivity.

APPENDIX XV – Peatland restoration flow chart



APPENDIX XVI – EIA consent not required letter from Scottish Forestry for ramp and forwarder track

Scottish Forestry
Coilltearachd na h-Alba

Perth & Argyll Conservancy

Upper Battleby

Redgorton
Perth PH1 3EN

Email: panda.cons@forestry.gov.scot
Conservator - Cameron Maxwell

15th March 2022

Dear Roger,

The Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017 Cologin Forest road, ramp, stacking area and forwarder track

I refer to your application at Cologin (NM 8486 2662), near Oban for our screening opinion as to whether the work you are proposing which is 1.1 hectares of forest roads is an EIA project and will require EIA consent.

The work includes construction of a standard 5 m wide forwarder track and 35 m ramp to access the approved coupe containing SPHN larch felling. Material to be won on site. Combined length of forwarder track and ramp is about 130 m. Combined length of roads is about 950 m plus large stacking area to be constructed at the end. This application incorporates all construction within the last 5 years and is therefore over the threshold and requires screening. The application is as per attached map.

I can confirm that the work you propose will **not** require EIA consent and the attached maps and supporting list of documentation should be considered as a component of the screening opinion determination.

Water:

Previous 'under threshold' letters of 19.1.21 and 1.2.21 have highlighted the private water supply to the chalet complex and hotel adjacent to the project.

Road construction must:

- rigorously follow Forest Research Practice Guide - Managing Forest Operations to protect the water environment;
- be carried out in accordance with UKFS
- be carried out in accordance with CAR general binding rules
- be constructed in accordance with the Forestry Commission Civil Engineering Handbook, 3rd Edition (Revised 2016).

Good forestry practice is also available from the Forestry & Water Scotland initiative, in particular on identifying the full catchment of a water supply for protection.

guidance-on-forestry-activities-near-pws-sept-2018.pdf (confor.org.uk)

(please note that SF do not approve operational plans)

Adherence to the above guidelines will provide sufficient mitigation measures to avoid or prevent significant adverse impacts on the environment during construction and felling operations.

The roadline avoids the catchment for the public water supply from Loch Gleann a'Bhearraidh.

People- I note that you have started a process of consultation with neighbours and interested parties, which is ongoing. Good communication will be an essential part of the preparation and operation of this proposal, with particular regard to the water supply to the hotel and chalet complex.

There is a core path and limited recreation which will require management during operations.

Landscape – Landscape impact is envisaged to be minima las there are internal views only from the core path. Landscape considerations are being further developed through the Long Term Management Plan currently at scoping stage.

Soils – No deep peat areas have been identified in the information provided. Soil disturbance will relate to the infrastructure footprint only.

This decision is valid for only 5 years from the date of this letter and shall cease to have effect beyond 15th March 2027. If you propose to carry out any of the work in your application after 15th March 2027 please inform us immediately. We will screen the proposals again to decide whether your proposals require EIA consent under these Regulations.

Yours sincerely

Elaine Jamieson

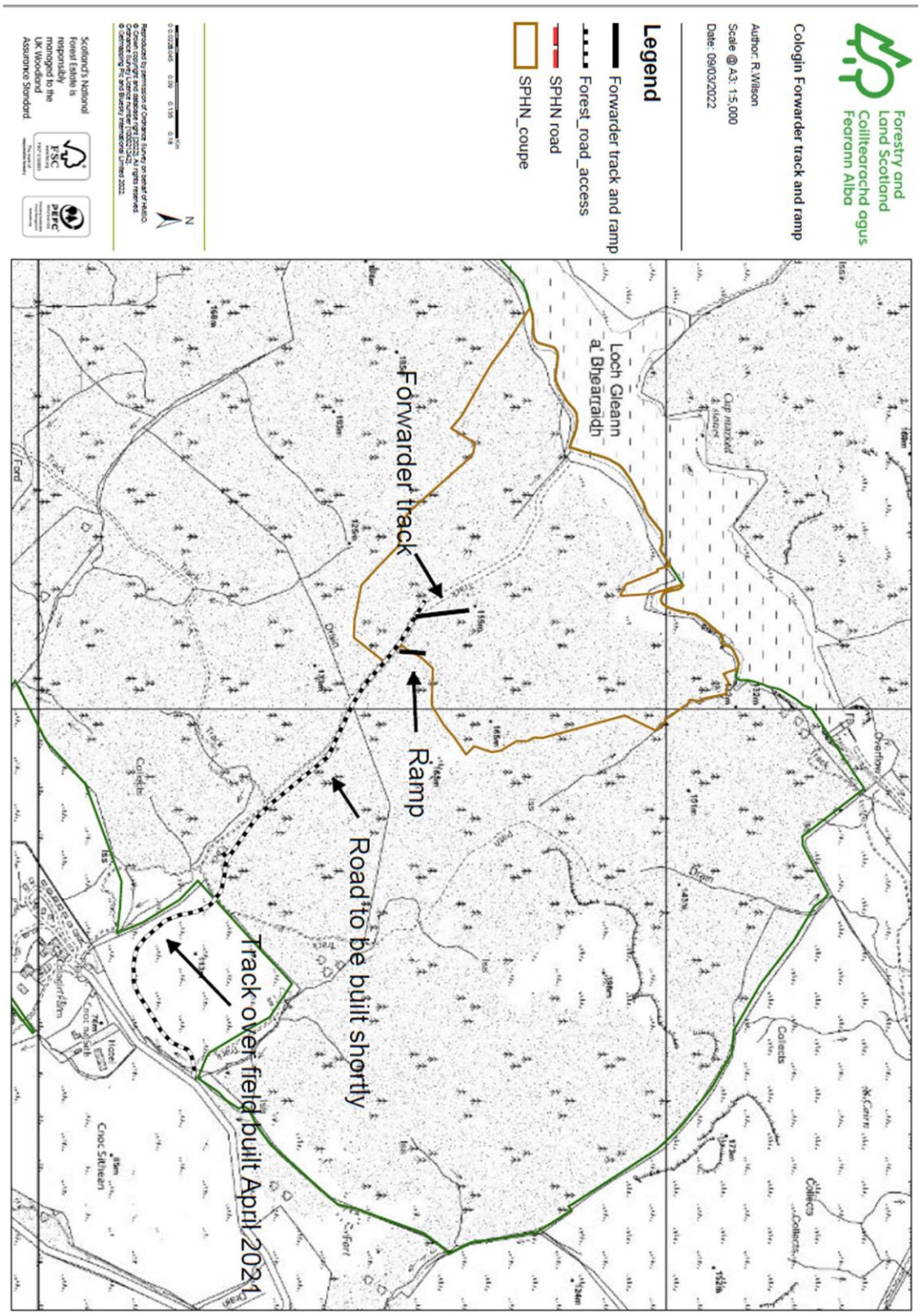
Elaine Jamieson

Operations and Development Officer

Scottish Forestry is the Scottish Government agency responsible for forestry policy, support and regulation

S e Coilltearachd na h-Alba a’ bhuidheann-ghnìomha aig Riaghaltas

na h-Alba a tha an urra ri poileasaidh, taic agus riaghladh do choilltearachd


Forestry and
Land Scotland
Coilltearachd agus
Fearann Alba
Cologin Forwarder track and ramp
Author: R.Wilson
Scale @ A3: 1:5,000
Date: 09/03/2022
Legend
Forwarder track and ramp
Forest_road_access
SPHN road
SPHN_coupe
Scotland's National Forest Estate is responsibly managed to the UK Woodland Assurance Standard
Loch Gleann a' Bhearaidh
Forwarder track
Ramp
Road to be built shortly
Track over field built April 2021