Forestry and Land Scotland
Coilltearachd agus Fearann Alba

Kilgallioch

Land Management Plan

2022 – 2032

V1.0

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

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

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Property details	
Property Name:	Kilgallioch
Grid Reference (main forest entrance):	NX 2869 7900
Nearest town or locality:	Barrhill
Local Authority:	Dumfries & Galloway Council South Ayrshire Council

Applicant's details	
Title / Forename:	Carol
Surname:	Finch
Position:	Forest Planner
Contact number:	07584 336 505
Email:	carol.finch@forestryandland.gov.scot
Address:	Forestry and Land Scotland, Creebridge, Newton Stewart
Postcode:	DG8 6AJ

Owner's Details (if different from Applicant)	
Name:	N/A
Address:	N/A

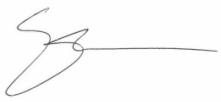
1. I apply for Land Management Plan approval for the property described above and in the enclosed Land Management Plan.

2. I apply for an opinion under the terms of the Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017 for afforestation / deforestation / roads / quarries as detailed in my application.

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

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

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

Signed, Pp Regional Manager		Signed, Conservator	
FLS Region	South	SF Conservancy	South
Date	15/12/2022	Date of Approval	
		Date Approval Ends	

Contents

1.0 Objectives and Summary

1.1 Plan overview and objectives

Plan name	Kilgallioch
Forest blocks included	Kilgallioch
Size of plan area (ha)	2,583 ha
Location	NX 2687 7802. See Location map (**Map 1**)

Long Term Vision
Carefully managed silvicultural interventions will sustain a healthy and productive coniferous woodland, capable of generating high quality timber products. Through sensitive conifer removal, expansive peatlands are restored with key peat-forming species becoming the dominant ground flora. Areas of wet woodland contribute to a mosaic of open, native wooded, and clean water habitats that support healthy populations of flora and fauna. Both recovering bogs and establishing woodland contribute to the national carbon sequestration effort, while site planning and management continue to work in synergy with renewable developments to generate green energy.
Management Objectives
• To produce a sustainable supply of timber. • To manage extensive conifer natural regeneration. • To continue enhancing the structural diversity and species richness of the woodland to benefit biodiversity and water quality. • To restore afforested deep peats to functioning peatland systems for the benefit of carbon storage.
Critical Success Factors
• Timely silvicultural intervention, including management of naturally regenerating conifer, to realise crop potential. • Protection of soft conifers and broadleaves from damage to ensure successful establishment. • Application of appropriate harvesting and forwarding techniques to minimise surface impact to the valuable carbon storage potential of bog habitats. • Realise biomass potential of harvesting waste, ensuring removal of harvesting waste to leave a clean site that will assist with bog restoration and improving water quality. • Timely initiation of peatland restoration to limit carbon loss and assist with bog recovery. • Application of current best practice and expertise to restore peatlands using suitably experienced contractors.

1.2 Summary of planned operations

Table 1

Summary of operations over the plan period	
Clear felling (gross)	507.6 ha
Thinning (potential area)	210.3 ha
Restocking (gross)	417.9 ha
Afforestation	0.0 ha

Summary of operations over the plan period	
Deforestation	91.2 ha
Forest roads (including forest road upgrades)	12,000 m
Forestry quarries (including extensions to existing quarries)	3.0 ha

The forest is managed to the UK Woodland Assurance Standard – the standard endorsed in the UK by the *Forest Stewardship Council and the Programme for the Endorsement of Forest Certification*. Forestry and Land Scotland is independently audited to ensure that we are delivering sustainable forest management.

2.0 Analysis and Concept

The planning process was informed by collecting information about the woodland, which is presented in Appendix I and on the Key features map (Map 2). During the development of this plan we have consulted with the local community and other key stakeholders; a consultation record is presented in Appendix III.

Below lists the objectives for the site and how the key features present opportunity or constraint. The Analysis of these form the concept for this Land Management Plan.

1. Objective: To produce a sustainable supply of timber.
Opportunities:

- Contribute to regional timber production through revised felling, thinning and restocking plans.
- Contribute to the national effort to limit the spread of P. ramorum by felling Larch.
- The well-established forest road network provides access to most coupes for forest management purposes.
- Design management coupes to encourage wind firmness.

Constraints:

- Site conditions are not favourable to thinning across most of the site.
- High DAMS means the occurrence of wind throw is likely to continue.
- Extensive peatlands with restoration potential will reduce restocking potential.

Concept:

- Maximise productive potential by restocking to suit site conditions. Design coupes to encourage wind firmness and, where feasible, incorporate Larch into clearfell coupes.

2. Objective: To manage extensive conifer natural regeneration.
Opportunities:

- Utilise extensive conifer regeneration as a productive crop.

Constraints:

- The high density of conifers will require careful management and timely intervention.
- There is no control over where natural regeneration occurs.

Concept:

- Where is it appropriate to do so, work with natural processes to manage regenerating conifers as a productive crop.

3. Objective: To continue enhancing the structural diversity and species richness of the woodland to benefit biodiversity and water quality.

Opportunities:

- Increase broadleaf and alternative conifers in restocking plans to bring future resilience benefits (e.g. climate change and pests and disease).
- Improved habitat linkage, in addition to retaining mature trees/deadwood, would benefit resident wildlife.
- Enhance terrestrial and aquatic habitats, and generally improve water quality across catchments.

Constraints:

- There is a high suitability of Sitka Spruce to site conditions across the block.
- Colonisation of open ground and fallow areas by naturally regenerating non-native conifer.
- Browsing pressure from deer on palatable species threatens establishment of broadleaf and alternative conifer species.

Concept:

- Restock with species appropriate to site conditions, utilising alternative species where conditions permit. Support connectivity and general enhancement of habitats through forest re-design and, where resources allow, commit to controlling non-native natural regeneration, especially in riparian zones and in peatland fringes. Appropriately site palatable species to facilitate focused wildlife management.

4. Objective: To restore afforested deep peats to functioning peatland systems for the benefit of carbon storage.

Opportunities:

- Contribute to the Scottish Government's Climate Change Policy and 250,000 ha target of peatland restoration by 2030.
- To improve environmental quality by reducing the loss of aquatic carbon.
- Contribute to the delivery of other key objectives (i.e. diversifying the forest, benefitting biodiversity and water quality, and producing timber).

Constraints:

- Operational delivery will be subject to contractor availability and require specialist equipment.

Concept:

- Initiate a phased forest to bog restoration programme, working with relevant professionals to identify qualifying sites and to determine any associated impact(s).

Different management options for achieving the plan's objectives were considered against the constraints and opportunities identified during scoping and consultation. The preferred approach is summarised on the Concept map (Map 3).

3.0 Management Proposals – regulatory requirements

This land management plan was produced in accordance with a range of government and industry standards and guidance as well as recent research outputs, recognised at the time of its production. A full list of the current standards and guidance which guide the preparation and delivery of FLS Land Management Plans can be found using the link HERE.

3.1 Designations

The plan area forms part of, includes, or is covered by the following designations and significant features. The Key Features map (**Map 2**) shows the location of all designated areas and significant features. Any deep peats are indicated on the Soils map (**Map 9**).

Table 2

Designations and significant features		
Feature type	**Present**	**Note**
Site of Special Scientific Interest (SSSI)	Yes	Kirkcowan Flow SSSI
National Nature Reserve (NNR)	No	
Special Protection Area (SPA)	No	
Special Area of Conservation (SAC)	Yes	Kirkcowan Flow SAC River Bladnoch SAC
World Heritage Site (WHS)	No	
Scheduled Monument (SM)	Yes	Well of Rees Laggangairn Standing Stones (neighbouring only)
National Scenic Area (NSA)	No	
National Park (NP)	No	
Deep peat soil (>50 cm thick)	Yes	Extensive across the block
Tree Preservation Order (TPO)	No	
Biosphere reserve	Yes	Galloway and Southern Ayrshire
Local Landscape Area	Yes	South Ayrshire ENV8
Ancient woodland	No	
Acid sensitive catchment	Yes	Cross Water (at risk) Polbae Burn (failing) Pulganny Burn (at risk) Tarf Water (failing)
Drinking Water Protected Area (Surface)	No	Private water supplies only
Environmentally Sensitive Area	Yes	Western Southern Uplands ESA2

3.2 Clear felling

Sites proposed for clear felling in the plan period are identified as Phase 1 and Phase 2 coupes on the Management map (**Map 4**).

Table 3

Clearfell summary by phase and coupe number			
Phase	Coupe Number	Fell Year	Gross Area (ha)
1	19002	2023/24	18.0
1	19036	2023/24	9.8
1	19053	2023/24	7.0
1	19064	2023/24	45.9
1	19070	2023/24	2.4
1	19502	2023/24	9.4
1	19050	2024/25	11.9
1	19061	2024/25	26.7
1	19007	2025/26	50.8
2	19049	2027/28	4.0
2	19067	2027/28	88.6
2	19028	2028/29	27.8
2	19072	2028/29	72.4
2	19615	2028/29	5.9
2	19054	2029/30	48.3
2	19015	2030/31	25.9
2	19041	2030/31	51.4
2	19075	2030/31	1.4
		Total	507.6

Table 4

Clearfell by species													
		Net Area (ha) by Main Species >20% (or MC, MB)											
Coupe Number	Fell Year	CP	DF	EL	HL	JL	LP	NS	SP	SS	MC	MB	**Coupe Total**
19002	23/24	-	-	-	3.0	-	5.5	-	-	6.0	-	1.0	15.5
19036	23/24	-	-	-	6.7	0.7	-	-	-	0.5	-	-	7.9
19053	23/24	-	-	-	2.4	2.3	-	-	-	-	-	-	4.7
19064	23/24	-	-	-	-	-	-	-	-	43.2	-	-	43.2
19070	23/24	-	-	-	1.8	0.6	-	-	-	-	-	-	2.4
19502	23/24	-	-	-	-	-	-	-	-	1.9	-	-	1.9
19050	24/25	-	-	-	-	-	-	-	-	10.4	-	-	10.4
19061	24/25	-	-	-	1.6	-	-	-	-	21.9	-	-	23.5

Clearfell by species													
19007	25/26	-	-	-	0.5	-	2.7	-	-	36.1	-	-	39.3
19049	27/28	-	-	-	-	3.3	-	-	-	-	-	-	3.3
19067	27/28	-	-	-	-	-	1.1	-	-	73.6	-	-	74.7
19028	28/29	-	-	-	0.1	8.3	2.9	-	-	10.2	1.2	5.8	28.5
19072	28/29	-	-	-	1.0	2.4	-	-	-	55.4	-	-	58.8
19615	28/29	-	-	-	1.5	-	-	-	-	1.5	-	-	3.0
19054	29/30	-	-	-	0.3	-	-	-	0.8	46.1	-	0.5	47.7
19015	30/31	-	-	-	2.7	-	-	-	0.2	17.1	-	-	20.0
19041	30/31	-	-	-	5.5	-	-	-	-	38.8	-	-	44.3
19075	30/31	-	-	-	-	1.0	-	-	-	-	-	-	1.0
Plan Area Total		0.0	0.0	0.0	27.1	18.6	12.2	0.0	1.0	362.7	1.2	7.3	430.1

NB Coupe totals: Table 3 shows gross coupe area / Table 4 shows net area of species

Table 5

Scale of proposed felling areas										
Total Woodland Area		2583 ha								
Felling	Phase 1	%	Phase 2	%	Phase 3	%	Phase 4	%	Long Term Retention	%
Gross Area (ha)	181.9	7.0	325.7	12.6	106.0	4.1	188.7	7.3	21.5	0.8

3.3 Thinning

Potential sites for thinning cover a gross area of 210.3 ha and are identified on **Map 5**.

Table 6

Thinning summary				
Phase	Coupe Number	Thin Year	Gross Area (ha)	Species (ha)
1	19002	2023/24	138.6	SS 95.0, LP 10.0
1	19003	2024/25	71.7	SS 48.3

Thinning will normally be carried out at, or below, the level of marginal thinning intensity (i.e. removing no more than 70% of the maximum MAI, or YC, per year). Higher intensities (no more than 140 % of maximum MAI, or YC, per year) may be applied where thinning has been delayed, larger tree sizes are being sought or as part of a LISS prescription. In all cases work plans will define the detailed thinning prescription before work is carried out and operations will be monitored by checking pre and post thinning basal areas for the key crop components.

3.4 Other 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 of

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

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

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

The maximum volume of felling in exceptional circumstances over the plan area covered by this approval is 75 cubic metres per calendar year.

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

[N.B. Trees may be felled without permission if they: are of less than 10 cm diameter at breast height (1.3 m); pose immediate danger to persons or property; are completely dead; or are part of Authorised Planning Permission works or wayleave agreements].

3.5 Restocking

Proposed restocking is shown on the Future Habitats and Species map (Map 6) and overleaf in Table 7.

Should the restock or natural regeneration should fail to reach 1,600 sph (stems per hectare) (native broadleaves) or 2,500 sph (productive conifers) the site will be beaten-up to the required planting density. This will be assessed at year 3 and year 5 after planting with beat-up by at least year 5.

Restocking							
Phase †	Coupe Number	Gross Area (ha)	Proposed Restock Year	Species	Method *	Minimum stocking density (s/ha)	Note
1	19002	14.5	27/28	NBL	R	≥ 500**	NBL/OG (100%) Kirkcowan Flow SSSI interface
1	19036	8.5	27/28	NF, SS	R	2500	NF 78%, SS 22%
1	19053	5.7	27/28	OC, SS	R	2500	OC 42%, SS 58%
1	19064	33.9	27/28	SS	R	2500	Includes minor OG component for priority habitat
1	19070	2.3	27/28	NBL	R	≥ 500** (NBL) 1600 (NBL)	NBL 31 % NBL 36%
1	19502	-	-	-	None	OG	Open ground
1	19050	10.4	28/29	BL, SS	R	1600 (BL) 2500 (SS)	BL 23% SS 77%
1	19061	21.0	28/29	LP, SS	R	2500	LP 13%, SS 87%
1	19007	37.0	28/29	BL, OC, NBL, LP, SS	R	≥ 500** (NBL) 1600 (BL) 2500 (CON)	NBL 16% BL 35% OC/LP 29%, SS 20%
2	19049	3.3	30/31	SS	R	2500	Link with existing crop
2	19067	88.5	28/29	NBL	R None	1600 OG	NBL 5% OG 95% (peatland restoration)
2	19028	20.3	31/32	BL, OC, SP, SS	R	1600 (BL)	BL 12%

Restocking							
						2500 (CON)	OC 31%, SP 37%, SS 20%
2	19072	58.4	31/32	BL, NBL, SS	R	≥ 500** (NBL) 1600 (BL) 2500 (CON)	NBL 51% BL 33%, SS 16%
2	19615	4.9	29/30	NBL	R	≥ 500** (NBL)	NBL 100%
2	19054	40.2	32/33	BL, NBL, SP	R	≥ 500** (NBL) 1600 (BL) 2500 (CON)	NBL 71% BL 28% SP 1%
2	19015	16.9	33/34	BL, SP, SS	R	1600 (BL) 2500 (CON)	BL 2% SP 8%, SS 90%
2	19041	51.4	33/34	BL, LP, SS	R R None	1600 (BL) 2500 (CON) OG	BL 5% LP 5%, SS 46% OG 44% (peatland restoration)
2	19075	0.7	33/34	NBL	R	≥ 500**	NBL (100%)

Total	417.9

† recently felled awaiting restock (F) / Phase 1 (1) / Phase 2 (2)
* replant (R) / natural regeneration (NR) / plant alternative area (ALT) / no restocking (None)
** (peatland edge) wet woodland as per 'Deciding Future Management Options for Afforested Deep Peatland' (FCS, 2015).

3.6 Species diversity and age structure

The following tables show how the proposed management of the forest will help to maintain or establish a diverse species composition and age-class structure, as recommended in the UK Forestry Standard. The current woodland composition is shown on **Map 8**.

Stands adjoining felled areas will be retained until the restocking of the first coupe has reached a minimum height of 2 m. Where this is not possible (e.g. due to windblow risk), the planned approach to achieving height separation between adjacent coupes is outlined in section **4.1**.

Table 8

Plan area by species						
Species	Current Area (ha)	%	Year 10 Area (ha)	%	Year 20 Area (ha)	%
Sitka spruce	1499.5	58.1	1250.3	48.4	1081.1	41.9
Other conifers	170.8	6.6	143.5	5.6	139.4	5.4
Broadleaves	205.0	7.9	291.8	11.3	310.8	12.0
Fallow	30.7	1.2	45.7	1.7	96.0	3.7
Open ground	677.0	26.2	851.7	33.0	955.7	37.0
Total	**2583.0**	**100.0**	**2583.0**	**100.0**	**2583.0**	**100.0**

Chart 1

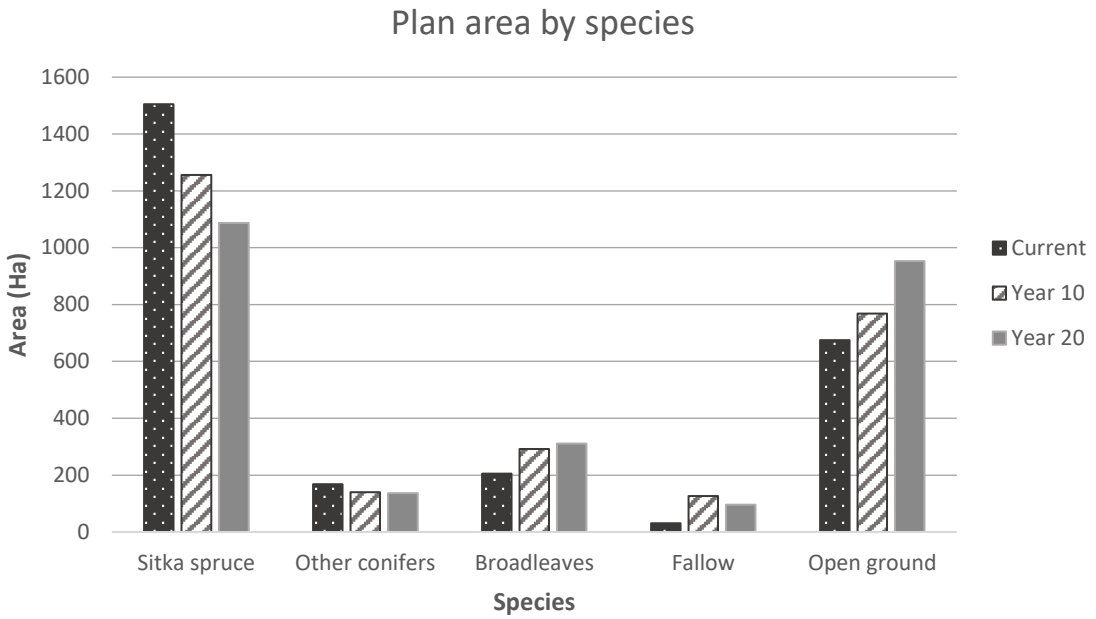
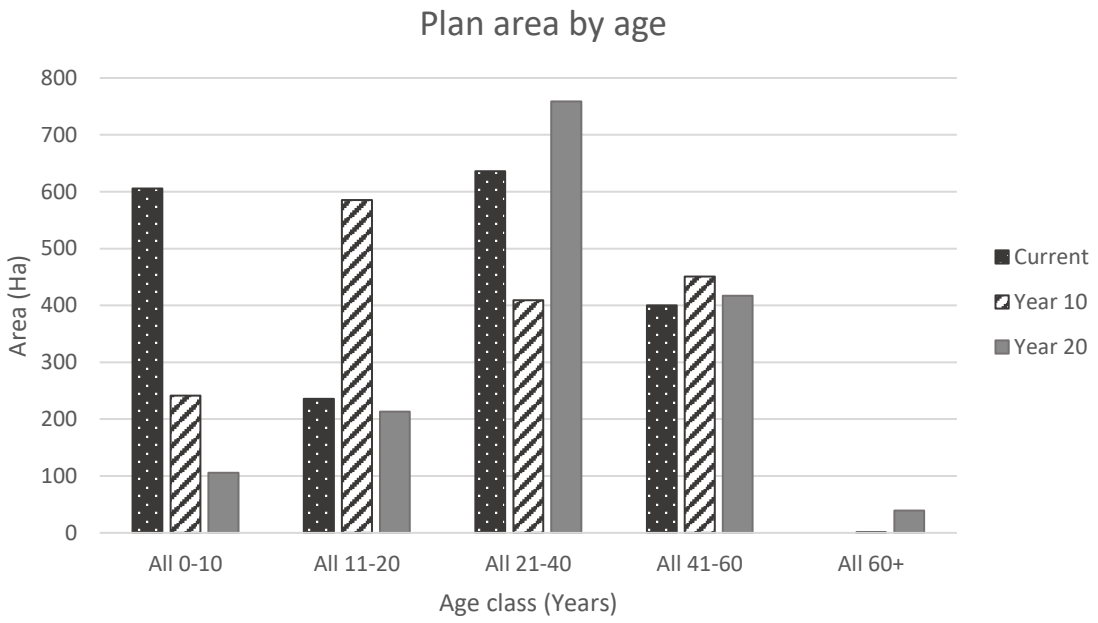


Table 9

Plan area by age (excluding open ground)						
Age Class (years)	Current Area (ha)	%	Year 10 Area (ha)	%	Year 20 Area (ha)	%
0 – 10	605.6	32.3	241.1	14.3	105.5	6.9
11 – 20	235.8	12.6	585.5	34.7	213.1	13.9
21 – 40	635.8	33.9	409.4	24.3	758.8	49.5
41 – 60	400.3	21.3	450.9	26.7	417.1	27.2
60+	0.0	0.0	0.8	≈ 0.0	39.0	2.5
Total	**1877.5**	**100.0**	**1687.7**	**100.0**	**1533.5**	**100.0**

Chart 2



3.7 Road Operations and Quarries

Planned new roads, road realignments, road upgrades, new quarrying, and timber haulage routes are shown on the Road Operations and Timber Haulage map (**Map 7**).

Table 10

Forest road upgrades, realignments, new roads and new quarrying		
Phase(s)	Length (m) / Area (ha)	Operation description
1	200 m	New forest road spur and turning point (2023/24)
1 + 2	11,800 m	Forest road upgrade only
1 + 2	3.0 ha	Existing quarry extensions

3.8 Environmental Impact Assessment (EIA)

Any operations requiring an EIA determination are shown in the table below. If required, the screening opinion request form is presented in **Appendix VIII**.

Table 11

EIA projects in the plan area		
Type of project	Yes / No	Note
Afforestation	No	-
Deforestation	Yes	91.2 ha for peatland restoration.
Forest roads	Yes	200 m new forest roads. 11,800 m forest road upgrades.
Forestry quarries	Yes	3.0 ha existing quarry extensions.

3.9 Tolerance table

Working tolerances agreed with Scottish Forestry are shown in **Appendix II**.

4.0 Management Proposals – guidance and context

4.1 Silviculture

4.1.1 Clear felling

To achieve the UK Forestry Standard of separation between adjacent crops, adjoining coupes should not be felled before the restocking of the first area has reached and average height of at least two metres. We expect this to be achieved in 5 years following planting.

Any unforeseen reduction in separation during the period of the plan will be formally agreed with Scottish Forestry as an amendment. Felling will be undertaken once trees in adjacent restocked coupes have reached 2 m height.

Prescriptions for clear felling during phases one and two are detailed in **Appendix V** (also refer to **Map 4**).

4.1.2 Thinning

Typically high DAMS figures and wet ground conditions across the forest block limit thinning opportunities at Kilgallioch. Thinning prescriptions are detailed in **Appendix V** (also refer to **Map 5**).

4.1.3 Low Impact Silviculture Systems (LISS) / Continuous Cover Forestry (CCF)

There are currently no coupes managed under Low Impact Silviculture Systems (LISS) or Continuous Cover Forestry (CCF) in Kilgallioch. Conversion to LISS and CCF will be explored in future iterations of the land management plan following forest restructuring for peatland restoration and native woodland establishment.

4.1.4 Long term retention (LTR) / Minimum intervention (MI) / Natural reserve (NR)

There are no natural reserves within Kilgallioch, however, the required UKWAS minimum area is met across the region.

Coupes identified as LTR/MI during the plan period (refer to Map 4) are:

Long term retention

- 19027
  BL (P2001) 9.5 ha, SP (P2001) 0.5 ha, SS (P2001) 2.3 ha
  Retained for Red squirrel habitat and to assist in improving water quality in the Tarf Water catchment (i.e. BL element).

- 19035
  BL (P1990) 1.2 ha
  Retained for structural diversity and as protected species habitat.

- 19508
  BL (P1973) 0.35 ha, SS (1973) 0.35 ha
  Retained for structural diversity and as potential Pine marten habitat.

- 19613
  BL (P1987/2018) 4.5 ha
  Retained for structural diversity and to assist in improving water quality in the Pulganny Burn catchment.

Minimum intervention

- 19025
  BL (P1991) 6.8 ha
  Isolated wetland area rich with insects and wildfowl that is also used by local schools for environmental projects. Low levels of disturbance will benefit wildlife and water quality of the Duisk River.

- 19089
  BL (P1987/2019) 5.6 ha, OK (P1987) 0.6 ha
  Existing BL will be retained for structural diversity and habitat linkage. Retention and low levels of disturbance will also assist with peatland edge habitat formation.

- 19607
  BL (P1987) 1.0 ha
  Stand isolated by future peatland restoration operations. Retained NBL will assist with peatland edge habitat formation and shading a tributary of the Haw Burn.

- 19608
  BL (P1987) 0.5 ha
  Low density natural regeneration is present. Retention and low levels of disturbance will assist with peatland edge habitat formation.

- 19614
  BL (P1999) 2.7 ha
  Low levels of disturbance will benefit this riparian zone, assisting with water quality improvement in the Pulganny Burn catchment.

- 19616
  BL (P1999/2005) 8.3 ha, SS (P2005) 0.3 ha
  Low levels of disturbance to benefit wildlife and maintain structural diversity following sanitation felling in surrounding area.

- 19619
  BL (P2007) 1.3 ha
  Shade provision and low levels of disturbance to benefit aquatic wildlife, assisting with water quality improvement in the Tarf Water catchment.

- 19622
  BL (P2005) 1.9 ha
  Low levels of disturbance within the Kirkcowan Flow SSSI buffer area and to maintain structural diversity.

4.1.5 Tree species choice / Restocking

A key objective of this plan is to return extensive forested deep peat areas to functioning peatlands. As such, there will be comparatively little restocking in the long term. Overall, the block's composition will undergo significant change with increased areas of other tree species and open habitat (i.e. peatlands), and a marked reduction in Sitka spruce cover by year 20. Refer to Map 13 for the long term vision for Kilgallioch beyond the period of this plan (this is subject to future revisions of the LMP as well as future research outputs and policies).

Detailed below and on Map 6 are the restocking proposals relevant to the current plan period. These are focused on restructuring by felling the first rotation crop in addition to windblow and larch extraction. Coupes identified for restocking are detailed in Appendix V.

Sitka spruce remains the primary species for timber with predicted average YC ranging up to 24 where site conditions are suitable. Where soils have low nutrient regimes, SS may be planted with Lodgepole pine as a nurse crop. Where ground conditions are suitable, alternative conifer planting is proposed to meet management objectives for timber and woodland diversity, whilst also contributing to habitat provision and aesthetic value (particularly along the SUW). Alternative species are primarily Norway spruce, Scots pine, and to a lesser extent Noble fir. The ESC (Forest Research Ecological Site Classification tool) has been used to identify site suitability and appropriate species choice. With timely interventions, higher yielding

areas should produce quality saw logs, with the remaining crop offering small round wood, pulp and biomass.

All broadleaf planting will be native and should complement and/or enrich existing naturally occurring scrub and woodland to give the most ecological value. As per **4.2.2**, broadleaf planting will be targeted to promote an improvement in water quality and to assist with future-proofing aquatic habitats. This is particularly relevant within the Tarf Water catchment where the aim is to achieve dappled riparian shading through low density broadleaf establishment. Likewise, ecosystem resilience will be the focus of broadleaf planting on/around peats where maintenance of hydrological function and defence against non-native seed rain will be crucial. Proposed for planting are pioneering species, primarily Downy/Silver Birch, Hawthorn, Rowan, Willow, and with Common Alder planting kept to a minimum in acidified catchments.

Areas where peatland restoration is unlikely to succeed (due to site topography and the practicalities of current restoration methods) will be flat planted with peatland edge woodland (low density native broadleaves) or managed as open ground (where deep peats areas are <10 ha) to benefit biodiversity.

In previous years some fallow sites with drier soils have been promptly colonised by naturally regenerating non-native conifer. Restocking will therefore be carried out swiftly where ground conditions and site objectives dictate.

The Restocking Strategy for Scotland's National Forest Estate explains that FLS will minimise chemical usage in restocking (insecticides and herbicides) by considering options at the site scale and using tactics such as delayed planting to achieve this.

4.1.6 Natural regeneration

Natural regeneration of the desired species will be recruited as the next rotation and it will be important that thinning interventions avoid damaging young trees.

There should be a preference for natural regeneration of broadleaf areas (to maintain provenance and improve the chances of establishment) but where this is unlikely or has not been successful then these areas should be planted/beaten-up to the required stocking density and site requirements.

It is expected that some of the riparian zones, designed open ground and broadleaf areas will fill in with natural regeneration of both conifers and broadleaves. This will be managed in such a way as to ensure that, where practicable, it does not significantly impose a negative impact upon the objectives of the plan or negatively impact upon the watercourse in terms of shading and acidification.

There are some productive sites where naturally regenerating conifers are occurring, most notably across Benbrake Hill (refer to **4.1.2**). These will be monitored and recorded in the FLS sub-compartment database. Where this is the desired species, we will endeavour to manage it to establish the required stocking density through respacing. Where the stocking density is too low it will be beaten-up by year five. Where natural regeneration is dense and respacing is not practicable, alternative management will be to grow on to a biomass crop (15-20 years from establishment) then clear fell and restock. Where the natural regeneration is not the desired species, it will be considered against the plan objectives and tolerance table, and either accepted (with a plan amendment if necessary) or removed.

4.1.7 New planting

There is no new planting proposed within the plan area.

4.1.8 Protection

Deer

The block sits within the FLS Galloway Main Deer Management Unit (DMU), where Red and Roe deer are the prevalent species. While Kilgallioch block has historically been less impacted than other blocks, overall conditions for establishing palatable species within the DMU are best described as 'frequently unfavourable - declining' due to high impact levels. The overall trend of deer impacts increasing in recent years has been supported by a marked cull shortfall during the recent COVID-19 pandemic. A short term increase in the cull rate target will therefore be necessary to counteract rising deer numbers.

Within Kilgallioch, restock areas have been selected based on accessibility for protection and to benefit biodiversity. Frequent monitoring of these areas and necessary interventions will be taken to assist establishment of palatable species. Should potential browsing occurrence be high, and where protection via deer population control alone is likely to prove difficult, alternative protection measures may be used. If used, plastic tree guards will be removed and recycled once trees have established and are less susceptible to browsing pressure. Additionally, species selection for restocking has used ESC and local knowledge to ensure species are suitable for their proposed sites and to encourage vigorous growth.

At the work planning stage, FLS will re-assess the forest design alongside site specific deer management requirements. Consent will be sought for restocking alterations beyond agreed tolerance.

Refer to Appendix X for the Kilgallioch Deer Management Plan (DMP).

Tree pests and disease

Kilgallioch lies within the current Management Zone for *Phytophthora ramorum* and infected Larch has been historically felled to comply with the requirements of a Statutory Plant Health Notice (SPHN). A minor component of diseased Larch remains present within the forest in both distinct and intimately mixed stands. Management interventions set out in this plan will remove remaining Larch in accordance with Scottish Forestry's *P. ramorum* Action Plan (2021) and the FLS Larch Strategy (2022). FLS guidance for biosecurity will be adhered to. Measures include removing debris, mud, soil and needles from equipment, vehicles and footwear before entering and leaving the site. This will apply to all staff and contractors and requirements will be included in all work plans. The public will also be advised to 'keep it clean' through ongoing awareness campaigns across the national forest estate.

Dothistroma Needle Blight (DNB) (*Dothistroma septosporum*) has been identified on Corsican and Scots Pine crops across the national estate within South Region. However, there is no known evidence of DNB within the plan area and it has not been identified in adjacent FLS blocks.

Ash dieback (*Chalara fraxinea*) is present within the national estate in South Region. However, there is no known evidence of Ash dieback within the plan area. Monitoring is ongoing and any identified specimens will be treated as per the *Chalara* Action Plan for Scotland (2013).

Large pine weevil (*Hylobius abietis*) can cause extensive damage to young crop (particularly conifers) and is found within Kilgallioch and South Region. FLS employ a *Hylobius* Management Support System (HMSS) to measure weevil numbers on clearfell sites and to establish the optimum time for restocking. This requires a flexible fallow period between felling and restocking, which can result in restocking taking place outwith agreed tolerances.

Continued risk posed by pests, disease and other tree health threats is expected because of a changing climate and globalisation of trade and travel. To assist with mitigating such risk, a range of tree species have been matched to suitable restocking sites, efforts have been made to diversify the forest structure

over time, and FLS encourage biosecurity best practice during the planning and delivery of all forestry operations.

Fire

FLS continues to work closely with the Scottish Fire and Rescue Service (SFRS) to prevent and tackle wildfires that threaten Scotland's National Forests and Land. FLS support SFRS in their lead role for fire prevention and suppression through creating annual fire plans, maintaining a duty rota, and providing additional logistical support. FLS's primary objective is always to protect people's health, safety and wellbeing.

4.1.9 Road operations, Timber haulage and other infrastructure

Map 7 shows the existing forest road network, planned new roads, main egress points, and agreed Timber Transport Routes.

200 m of new forest roads will be required and up to 11,800 m of road upgrades to facilitate forest management. Roadside tree felling will be undertaken where this is directly associated with the ground works.

Preferred haulage will be northeast along the existing forest road network that joins the A714 'agreed' timber transport route (and links Kilgallioch to the Upper Cree (Girvan Road) block). In the instance it is necessary to use alternative haulage options (e.g. the 'severely restricted' minor public road (C72) and the 'consultation' B7027 public road), FLS will consult with the local authority to determine route appropriateness and necessary haulage restrictions.

A total of 3.0 ha existing quarry extensions are proposed during the plan period to proffer material suitable for new roads and road upgrades within Kilgallioch and neighbouring FLS forests. A 1.7 ha extension is proposed for the quarry at Knockylaight (NX 2653 7771) and a 1.3 ha extension is proposed for the Tarff quarry (NX 2241 7276).

4.2 Biodiversity

4.2.1 Designated sites

Designated sites are shown on Map 2.

Kirkcowan Flow

The Kirkcowan Flow Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) borders Kilgallioch in the block's southeast. NatureScot's Sitelink and Protected Nature Sites Application cite the SSSI as 'unfavourable – declining', with key pressures listed as over-/under-grazing, presence of invasive non-native species, water management and morphological alteration (water dependent). Key pressures are similar for the SAC, with the blanket bog component last assessed as 'unfavourable – declining' and depressions on peat substrates assessed as 'favourable - maintained'. Steps have been taken to reduce non-native seed rain on the designated site with the recent establishment of a broadleaf/open ground buffer in the south. Further interventions to extend this buffer along the shared boundary and to improve the hydrological functioning of Kirkcowan Flow will be carried out when practicable and as indicated in Map 6. Due to a preference for wetter areas, going forward Birch species should be kept as a minimal component of native broadleaf areas within the buffer area to assist with improving the site's condition.

River Bladnoch

There is direct interaction with the River Bladnoch SAC as the headwaters of the Tarf Water are located within Kilgallioch. NatureScot's Sitelink and Protected Nature Sites Application state the SAC is in 'unfavourable - recovering' condition with key pressures listed as agricultural/forestry operations and water quality. A Designated Sites Management Plan for the River Bladnoch includes conservation management intentions for this SAC. Recent and ongoing efforts to establish an appropriate riparian zone, including the removal of naturally regenerating conifer, will continue along the Tarf Water and its tributaries to help improve Atlantic Salmon habitat. This will involve a riparian buffer extending beyond those recommended within the UKFS guidance for acidified catchments, in addition to continued collaboration with Galloway Fisheries Trust to establish low density broadleaf planting to assist with bank stabilisation and dappled shade provision (see 4.2.2 and Appendix V, restock prescriptions for coupe 19007). Future efforts beyond the period of this plan could involve a continued reduction in conifer establishment within the catchment, increased native broadleaf planting and peatland restoration (as indicated by the long term vision presented in Map 13).

4.2.2 Native woodland

This plan seeks to protect and enhance existing areas of native woodlands and, where appropriate, extend to maximise habitat connectivity. Efforts to extend/establish native woodland will be focused within riparian zones, in areas surrounding peatland restoration sites and, in the long term, on mineral soils adjacent to Kirkcowan Flow SSSI.

Where appropriate along watercourses, FLS intend to establish light broadleaf cover to improve overall water quality, assist with bank stabilisation, and to help protect aquatic habitats from the effects of climate change (e.g. through the provision of dappled shading and some woody debris/leaf litter). Establishment of an open-broadleaf woodland mosaic neighbouring the Tarf Water should consider the recommendations of FLS partner Galloway Fisheries Trust (GFT), who have recently published restoration aspirations for Salmonid habitat within the Tarf catchment. Planting will be on both banks, however, southern banks will be targeted where watercourses run east-west (and vice versa) to provide adequate shading. Planting should be focused where the watercourse widens while aiming to avoid areas prone to localised flooding (to alleviate tree stress/death). Native broadleaves will be grouped and consideration will be given to forming thorny shrouds (e.g. Hawthorn) around more palatable species.

Peatland restoration sites will typically be buffered using peatland edge woodland and/or open ground. Broadleaf establishment and ongoing low levels of disturbance will help maintain hydrological functioning of peatland units and offer protection from non-native seed rain. Broadleaves (typically pioneering Birch, Common Alder and Willow species) will form a natural component of the peatland ecosystem mosaic with woodland cover, improving the resilience of existing/restored peatlands to climate change by providing shading to ground flora, lowering exposure to wind, and reducing water level drawdown during drought conditions. Planting will be concentrated on drier, mineral soils above the water table to avoid significantly negatively effecting hydrology.

Whilst the occurrence of naturally regenerating broadleaves in heavily browsed areas is not generally expected, it will be encouraged where present and appropriate for the site. Regeneration of non-native conifer species is expected due to the presence of neighbouring plantation. Monitoring will be carried out to ensure conifer regeneration does not compromise the establishment and growth of broadleaved species.

Broadleaves present across the site are generally vulnerable to deer browsing, therefore more resilient species such as Common Alder, Downy Birch and Hawthorn, will be planted where suitable and in line with

UKFS best practice (e.g. limiting Alder planting within acidified catchments). The forest design aims to facilitate effective deer management, however, further consideration for lines of sight will be taken during the work planning process and plan amendments sought where necessary.

4.2.3 Ancient woodland / Plantation on Ancient Woodland sites (PAWS)

There are no known ancient woodlands or PAWS within the plan area. There are Long-established of Plantation Origin (LEPO) sites northeast of Kilgallioch and towards Drumlamford Loch.

4.2.4 Protected and priority habitats and species

All forest management operations involve a work planning process before commencement which includes checks for wildlife and important habitats as per legal requirements and described in the UKFS Requirements for Forestry and Biodiversity. If necessary, work plans will be adjusted to avoid disturbance and opportunities to further protect species or enhance habitats will be identified.

Following felling operations, planting will be re-designed around any priority habitats that are revealed. (This includes species rich groundwater dependent terrestrial ecosystems (GWDTE) which will be protected as per current best practice.) Deviations beyond tolerance will be referred to Scottish Forestry for consideration.

Blanket bog

As a UK BAP Priority Habitat, FLS has a duty to further the protection and enhancement of blanket bog under the Nature Conservation Scotland Act (2004). Afforestation is a threat to bog habitat and the restoration potential across Kilgallioch is high due to very wet ground conditions and abundant remnant bog vegetation that persists in rides and other isolated areas, especially where planted conifers have gone into check. FLS are committed to a long-term peatland restoration programme and have already restored similar sites both regionally and nationally. A key objective of this plan is to continue these efforts by initiating a phased restoration programme, utilising best practice techniques to achieve re-wetting of peat following tree removal. Sites identified for restoration in the short-medium term are currently occupied by first rotation plantation (see Map 6). Sites with restoration potential in the long term are included in Map 13; these sites are typically occupied by second rotation plantation and/or require further soils investigation. Refer to 4.6 and Appendix VII for further details.

Eutrophic standing water

FLS has a duty to protect this priority habitat at the three lochs (i.e. Black Loch, Loch Long, Loch Martle) and to ensure their condition does not deteriorate. Efforts will be made to remove encroaching naturally regenerating non-native conifers from the surrounding open ground and light woodland ecosystem.

Upland birchwood

FLS has a duty to protect this priority habitat and ensure the condition does not deteriorate. Efforts will be made to remove naturally regenerating conifers and invasive species from these areas.

Upland flush, fen and swamp

FLS has a duty to protect this priority habitat and ensure the condition does not deteriorate. Efforts will be made to remove naturally regenerating conifers and invasive species from these areas.

Upland heathland

FLS has a duty to protect this priority habitat and ensure the condition does not deteriorate. Areas such as Craig Airie Fell will remain open and efforts will be made to remove naturally regenerating conifers and invasive species (see Map 4).

Invertebrates

Open ground (including peatlands, rides and forest road corridors) has been incorporated into the design to ensure suitable habitat is available to support a range of invertebrates. Road and ride management will be planned carefully to minimise disturbance to these species.

Vertebrates

- Black grouse

Black grouse were last recorded on site in 1996 and possible sightings in recent years are unconfirmed. Future surveying will seek to confirm/deny their presence. As black grouse require a mosaic of open and wooded habitats, this plan presents an excellent opportunity to provide for the species via native broadleaf establishment and increased areas of open ground. Over time, traditional conifer forest food sources will decline, however, establishing native woodlands, upland heathland, and recovering peatlands should provide alternative nourishment (e.g. buds, berries, and invertebrates).

- Pine marten

In South Region, FLS employ staff licenced to conduct den checks and the presence of successfully breeding Pine marten has been confirmed within Kilgallioch. In line with the Scottish Biodiversity Strategy's aim to resolve species management issues, all works within the plan area will follow standard assessment and mitigation actions as part of the work planning process.

- Raptor

Raptors such as Common buzzard and Goshawk have been recently confirmed at Kilgallioch and there are also historical records of Short-eared owl and Tawny owl. Where appropriate, additional areas of mature conifer may be retained to provide nesting habitat. The projected increase in open habitat and native broadleaf cover should also benefit these species and potentially facilitate increased use of the block by raptor.

- Red squirrel

Red squirrel are present within Kilgallioch, however, it is not a designated 'stronghold' site. FLS has a single licence to cover forest management activities that may affect red squirrel on the national estate. All works within the plan area will follow the assessment and mitigation actions set out as conditions of this licence. This is in accordance with the Scottish Biodiversity Strategy's aim to resolve species management issues.

- Other

Riparian zones support both Otter and European water vole, while there is scope for the Tarf Water to support Atlantic salmon should their range extend further upstream within the River Bladnoch SAC. The plan design aims to positively contribute to aquatic habitat quality via the creation of riparian buffer zones and low density native planting (refer to 4.2.1 and 4.7.2). Fish species require clean and well oxygenated waters, making it vitally important that diffuse pollution is avoided through careful planning and delivery of all operations. Badger have also been recorded at Kilgallioch. Sett locations will be identified and protected during forestry operations, with necessary licences sought as part of the work planning process.

4.2.5 Open ground

Managed open ground contributes to approximately 37.0% of the plan area by year 20, including peatland restoration and open water areas (namely, the three lochs area at NX 2404 7627 and Chirmorie Loch at NX 2182 7698).

An additional 0.7% of open ground is classified as successional open, where natural regeneration will be tolerated where it is compatible with LMP objectives. These areas are predominantly located around proposed peatland restoration sites where future access will be restricted. These areas will be monitored to identify any significant changes and Scottish Forestry will be notified if amendments to this plan are required.

There are four quarries at Kilgallioch:

- Knockylaight, ref.: 1404, at NX 265 776 (active; 1.7 ha extension proposed during this plan)
- Knockylaight, ref.: 1438, at NX 232 761 (not currently active due to quality of stone)
- Derry, ref.: 1406, at NX 230 747 (for windfarm developer use)
- Tarf, ref.: 7627, at NX 224 727 (active; 1.3 ha extension proposed during this plan).

Fallow sites will contribute to transitional open space throughout the block.

Throughout the delivery of this plan FLS will manage non-native natural regeneration in such a way as to ensure that, where practicable, it does not significantly impose a negative impact upon the objectives of the plan. Natural regeneration will be managed to minimise negative impact upon designated, protected or promoted habitats, species, landscapes, historic environment features, and relevant catchments.

4.2.6 Dead wood

Opportunities for retaining or creating deadwood will be identified during the planning of all felling works, favouring areas with the highest deadwood ecological potential (typically within riparian zones). Valuable deadwood and deadwood areas will be marked on contract maps. Where it is safe to do so, and does not compromise plan objectives, standing mature dead trees will be retained as these offer excellent potential for a range of species.

4.2.7 Invasive species

While there are no known invasive non-native species within the plan area, FLS will endeavour to control incursions as per the FLS Invasive Non-Native Species (INNS) policy. FLS will also continue to support the control of Grey squirrel being co-ordinated by Saving Scotland's Red Squirrels.

4.3 Historic Environment

Refer to Appendix IV and Map 12.

Our key priorities for archaeology and the historic environment are to undertake conservation management, condition monitoring and archaeological recording at significant historic assets, and to seek opportunities to work in partnership to help to deliver Our Place in Time: the historic environment strategy for Scotland (2014) and Scotland's Archaeology Strategy (2015). Significant archaeological sites will be protected and managed following the UK Forestry Standard (2017) and the FCS policy document Scotland's Woodlands and the Historic Environment (2008). Harvesting coupes, access roads and fence lines will be surveyed prior to any work being undertaken to ensure that upstanding historic environment features can be marked and avoided. At establishment and restocking, work prescriptions remove relevant historic

environment features from ground disturbing operations and replanting. Where appropriate, significant historic assets are recorded by archaeological measured survey, see active conservation management and may be presented to the public with interpretation panels and access paths. Opportunities to enhance the setting of important sites and landscapes will be considered on a case-by-case basis (e.g. the views to and from a significant designated site).

The Regional Historic Asset Management Plan includes conservation management intentions for designated historic assets on the National Forest Estate. Details of all known historic environment features are held within FLS's heritage data and are included within work plans for operations to ensure damage is avoided. Significant historic environment features will be depicted on all relevant operational maps.

Areas of historic environment interest should be checked both on FLS's internal historic environment records (HER) and with the Council's HER prior to the commencement of forestry activities. Any upstanding features will be clearly marked, both on the ground and on operational maps. Care will be taken to avoid any damage to surviving structural elements.

4.3.1 Designated sites

Wells of the Rees, a Scheduled Monument (SM), lies within an area of open and light woodland mosaic along the Southern Upland Way. The site included in the FLS Regional Historic Asset Management Plan and is subject to regular scrub control. While there is currently limited scope for wider scale felling in the surrounding area, there is potential to re-associate the wells with other SM sites in the wider landscape through future forest restructuring (i.e. Laggangairn Standing Stones at NX 2223 7166 and Wood Cairn at NX 2524 6871). This will be given further consideration in consultation with Historic Environment Scotland (HES) and Dumfries & Galloway Council's Archaeologist during subsequent plan revisions (refer to Appendix IV).

4.3.2 Other features

Numerous heritage features are present within the plan area and details of all known historic environment features are held within FLS's internal historic environment records. These are included within work plans, operational maps, and will be clearly identified on the ground during operations to ensure they are appropriately protected.

4.4 Landscape

4.4.1 Designated areas

There are no designated landscape areas except for a minor overlap with the South Ayrshire Local Landscape Area in the northeast of the block. The proposed design has been carefully developed in consultation with FLS Landscape Architects to reflect landform, landscape scale, and achieve best fit with Landscape Character Types (LCT): pastoral valleys (LCT 72), plateau moorland (LCT 78 and 173), and plateau moorland with forest (LCT 174). Refer to Map 11.

4.4.2 Other landscape considerations

The majority of the plan lies within a large-scale, flat landscape, that is able to absorb relatively significant changes to forest cover. However, the Southern Upland Way (SUW) passes through the forest block and involves the ascent of Craig Airie Fell, offering a 360° view to the Solway Coast and Galloway hills in the north. As such, sites proposed for re-wetting will be visible in the mid-ground from this vantage and to ensure SUW user experience is not compromised in the long term, peatland restoration and native

woodland establishment should swiftly follow deforestation operations. It is also vital the long-distance hilltop views are maintained through the removal of regenerating non-native conifer and by keeping the tree line in adjacent coupes low.

Consideration has also been given to enhancing the immediate environs of the SUW route. The introduction of a range of species along the route has begun through restocking efforts and this will continue as per the proposed design with a focus to establish alternative species in former Larch areas and where site conditions permit (see Map 6).

Structural diversity will be achieved by retaining small areas of mature trees and by maintaining at least a 2 m height differential between adjacent coupes.

4.5 People

4.5.1 Neighbours and local community

Several neighbours and the local community council have taken an active interest in the development of the plan. Their aspirations have been incorporated where they do not conflict with the objectives of the plan and are consistent with FLS's approach to land management.

Due to restrictions associated with COVID-19 pandemic, FLS were unable to hold face-to-face consultation meetings with the local community. However, a publicised online consultation generated some interest; see Appendix III for details. Where available, relevant neighbours were also consulted for the purposes of on-site water supply investigations (refer to Appendix IX).

4.5.2 Public access

Third party access rights are established across much of the forest road network for Kilgallioch and Arecleoch windfarms, with others established along forest roads leading to neighbouring residential properties.

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

While there are no official FLS recreation facilities at Kilgallioch, the block does support low level public access along forest roads and the Southern Upland Way (SUW) Core Path. Dumfries and Galloway Council have recently completed an alternative grassy pathway at Craig Airie Fell to serve a range of SUW users (e.g. walkers, horse riders and cyclists). It is understood there are also plans to install visitor interpretation panels along the route and car parking facilities adjacent to the forest block. FLS will continue to work with Dumfries and Galloway Council to maintain, enhance and promote the route.

Woodland Management in Visitor Zones

Visitor Zones have been identified in areas where FLS encourage and manage access or where the woodland managed by FLS interacts with popular visitor sites or access routes. Visitor Zones are mapped on Map 2.

In these areas, single trees or small groups of trees will be removed when necessary to protect facilities, infrastructure and trails (i.e. the SUW), or to enhance the setting of features (i.e. Wells of the Rees SM), or to maintain existing views (i.e. from Craig Airie Fell).

Woodland in these zones will also be thinned, or trees re-spaced, for safety reasons (including to increase visibility to ensure that sites are welcoming and feel safe) and where it is necessary to enhance the experience of the forest setting through the development of large trees or preferential removal of trees to favour a particular species.

4.5.3 Renewables, utilities and other developments

Current on site renewables, utilities and other developments are illustrated on Map 2.

Renewables

Kilgallioch windfarm, with associated cabling and substation, lies within the forest block. There is a well-established road network with regular crossing points over underground cabling providing adequate access to many coupes. This plan provides for on-going management of open space as required around wind turbines. All windfarm infrastructure will be flagged during operational planning.

Having recently obtained planning consent, an extension to the on-site windfarm will be constructed south of Kilgallioch block and will involve extending the current road network. This development will connect to the on-site substation via additional underground cabling located along both sides of forest roads. As this will restrict coupe access, additional crossing points will be added to the road network where necessary. Windfarm construction is due to begin in early 2023.

Further renewable energy developments (wind and solar) to the areas immediately east and west (by Fell of Eldrig and Chirmorie respectively) of the forest's boundary are currently in the planning domain. Pending approval, these developments will require extending the forest road network and will introduce additional cabling and on-site battery storage within Kilgallioch. It is understood primary access to these developments will be via the existing forest road network through Kilgallioch.

An extension to the windfarm in the neighbouring Arecleoch block has also obtained planning consent. As above, site access will be through Kilgallioch.

Utilities

There are several overground power lines intersecting the block in the northwest and northeast, and by the Loch Derry access route.

Several private water supplies associated with neighbouring residences interact with the block (refer to 4.7).

Other

There is a Forest Research bio-soil site near Darnarroch Fell and a closed progeny site north of the Pollgowan Burn.

The B7027 public road intersects the block at NX 2687 7801 and a minor public road passes alongside Kilgallioch at NX 2204 7965.

There is a bridge crossing the Tarf Water at NX 2230 7174 that marks the boundary and leads to private plantation.

There are four quarries:

- Knockylaight, ref.: 1404, at NX 265 776 (active; 1.7 ha extension proposed during this plan)
- Knockylaight, ref.: 1438, at NX 232 761 (not currently active due to quality of stone)
- Derry, ref.: 1406, at NX 230 747 (for windfarm developer use)
- Tarf, ref.: 7627, at NX 224 727 (active; 1.3 ha extension proposed during this plan).

4.5.4 Support for the rural economy

FLS supports a sustainable rural economy by managing the national forests and land in a way that encourages sustainable business growth, development opportunities, jobs and investment. Kilgallioch is part of the local landscape that attracts investment and visitors to the local area. It also provides a more intimate backdrop for those following the Southern Upland Way. Careful forest design with these factors in mind, along with responsible delivery of forestry operations, will provide a positive visitor experience.

4.6 Soils

Site soils are presented in **Map 9**.

4.6.1 Protection and Fertility

There will be minimal soil disturbance and machine movement on sites with clayey soils to reduce the risk of compaction or damage to the soil structure. Brash mats (or alternative measures) will be used to protect sensitive soils. Except for sites targeted for peatland restoration and coupes located within acidified catchments, felling residue will usually be left on site to allow nutrient recycling, with consideration for the practicalities of restocking.

4.6.2 Cultivation

Where required, the choice of ground cultivation technique will consider the short-term benefits for establishment against any long-term side effects on tree stability, access for future forest operations and the environment. There will be a preference for the least intensive technique, with no cultivation (straight planting) being employed in wet woodland and riparian areas.

4.6.3 Deep peats

A combination of detailed soil data (1:10,000) and site investigation have identified deep peat as a significant component of Kilgallioch. Approximately 288.0 ha with restorative potential are currently afforested with first rotation crop.

Some peat types are edaphically unsuited to woodland, while 10a and 10b peat types are also associated with raised bog habitats. Lowland raised bog and blanket bog are UKBAP priority habitats and therefore FLS operate on a presumption to restore these. As such, there will be no restocking of commercial conifer on deep peats that are currently afforested with first rotation stands.

91.2 ha are planned for peatland restoration within the first ten years of this plan. Where required, specialist harvesting using low ground pressure machines and brash recovery will help deliver the extensive peatland restoration programme planned for Kilgallioch. Refer to **Appendix VI** for further details and an appraisal of Kilgallioch's peats.

Areas where peatland restoration is unlikely to succeed (due to site topography and the practicalities of current restoration methods) but should not be commercially restocked due to soil type, will be flat planted with low density native woodland (PEW) or managed as open ground (where deep peats areas are <10 ha) to benefit biodiversity.

There is potential for additional peatland restoration within Kilgallioch beyond the period of this plan (e.g. where peatlands are currently afforested with second rotation stands, where peats are hydrologically connected to designated sites, or where detailed soil surveys have yet to be undertaken). Map 13 presents an indicative long term vision of Kilgallioch that accounts for the restoration of these peatland units; this would be subject to the development and approval of subsequent LMP renewals, in addition to relevant policy and research.

An additional 14.3 ha (approximate) have been independently restored to peatland as part of the habitat management efforts of the Kilgallioch windfarm developer.

4.7 Water

4.7.1 Drinking water

Scottish Water records indicate there are no drinking water catchments or water abstraction sources which are designated as Drinking Water Protected Areas under the Water Framework Directive, in the area that may be affected by the proposed activity. There are also no known Scottish Water assets (including water supply and sewer pipes, water and waste water treatment works, reservoirs, etc.) in the area.

FLS obtained details of private water supplies (PWS) within the general area of Kilgallioch from the local authority. Via desk study, supplies were checked for relevance to the block and, where appropriate, ground truthed by FLS staff and/or via consultation with water supply users. Supply details and indicative watershed data were shared with forest hydrology and peatland professionals (respectively, Forest Research and FLS) to comment on potential impact caused by proposed forestry and peatland operations. A description of each water supply, expert opinion, potential impact from plan proposals and appropriate mitigations are detailed in Appendix IX.

All known drinking water supply points and pipes are internally recorded and this data is consulted during the work planning process. Sites are inspected ahead of operational commencement to ensure PWS details are correct and to assist with their protection. There will be close liaison with affected neighbours prior to work commencement and PWS features will be clearly marked on all contract maps and on the ground. Operations will be subject to a site specific assessment of risk and will strictly comply with FLS's regional Pollution Control Plan, conditions and mitigations prescribed in site risk assessments, UKFS Guidelines on Forests and Water, and Forestry and Water Scotland Know the Rules (2nd Ed.) handbook.

4.7.2 Watercourse condition

Management of waterbodies and catchment areas is a key environmental issue and FLS aim to comply with best practice in minimising sediment release and preventing further deterioration in their current/potential quality. All forestry operations will meet the requirements of the UKFS Guidelines on Forests and Water, Forestry and Water Scotland Know the Rules (2nd Ed.) handbook, and Managing Forests in Acid Sensitive Water Catchments best practice. Operations will also comply with FLS South Region's Pollution Control Plan and additional mitigations detailed within site specific risk assessments undertaken as part of the work planning process.

Kilgallioch sits within the River Bladnoch and River Stinchar catchments, with the quality of principal watercourses (i.e. Cross Water, Duisk River, Pulganny Burn and Tarf Water) described as 'moderate' or 'good'. SEPA's water environment hub indicates pressure on fish populations in the Pulganny Burn in particular.

Four acid sensitive catchments interact with the plan area: 'at risk' of acidification are the Cross Water and Pulganny Burn, while the Tarf Water and Polbae Burn reach 'failing' status. The proposed scale and timing of felling in the forest, along with increases in open ground and broadleaf cover in riparian zones, seeks to reduce significant negative impact within these catchments as per the Managing Forests in Acid Sensitive Water Catchments guidance. Refer to Appendix VI.

As the head waters of the River Bladnoch SAC, the Tarf Water is a particularly sensitive watercourse. Stringent care will be taken during the planning and delivery of all forestry operations to prevent pollution (refer to 4.2).

The proposed increase in open ground and restocking with permanent broadleaf woodland should result in a greatly reduced operational impact and overall enhancement of riparian areas. Furthermore, extensive (phased) peatland restoration operations should ultimately improve both the holding capacity and quality of water leaving the block.

4.7.3 Flooding

The plan area lies within the Potentially Vulnerable Area (PVA) for flooding (there is an overlap of 26.2 ha), with the target area being the community of Barrhill. The Cross Water catchment is described as the main source of flooding and some surface water flooding is also noted in SEPA's (2021) 'Flood Risk Management Plan: Ayrshire Local Plan District', although there are no historical records of flooding in the area. SEPA's current known objectives are to avoid inappropriate development that could increase flood risk in the area and to improve general understanding of flood risk at Barrhill. (While the Duisk River catchment helped form the PVA during SEPA's initial consultation, it has been omitted from the PVA published plan. Accordingly, for the purposes of this plan, the Cross Water catchment is considered the key flood risk catchment.)

There is <0.2 ha of felling proposed within the Cross Water catchment proposed herein. As such, it is expected proposals for the block will have limited influence over flood risk within the PVA. While there are no specific flood management interventions owing to crop maturity, careful consideration will be necessary for subsequent plan revisions which may involve forest to bog operations. There is, however, significant interaction between the neighbouring FLS block at Arecleoch and the Cross Water catchment. As such, flood risk management measures will be given full consideration as part of the upcoming Arecleoch LMP renewal (due 2023) to assist with mitigating significant negative impact within the PVA.

There is a high likelihood of localised flooding along the Tarf Water, Polbae Burn and Pulganny Burn which flow into the River Bladnoch near the village of Kirkcowan, and along the Lavery Burn, Pullower Burn and Pollgowan Burn which meet the Duisk River near the village of Barrhill. Additionally, there is a medium to high risk of surface water flooding in some areas, particularly surrounding Chirmorie Loch.

Through the establishment of open riparian buffers with appropriately sited broadleaves, the scale and timing of felling in Kilgallioch, along with an increasingly diverse age structure and establishment of permanent broadleaf woodland, it is not anticipated that FLS operations will have a measurable negative effect on downstream flood risk. Forestry operations may contribute to flood alleviation and, additionally, peatland restoration should slow the release of water following high flow events.

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Appendix I: Description of Woodlands

Description of woodlands
Topography and Landscape
The site elevation ranges from 120 – 320 m and the Kilgallioch wind farm dominates across the central belt. The northern end of the block is typically lower and flatter with extensive areas of deep peat interspersed with ridges of mineral ground and drumlins. The Pollgowan burn, Laggish burn, Haw burn and Pullower burns flow north and east into the Duisk River, a tributary of the River Stinchar. A cluster of four small lochs Cow Loch, Craigie Loch, Long Loch and Loch Martle lie immediately north of Darnarroch Fell. Benbrake Hill and Craig Airie Fell, the highest hill in the area, dominate the south. Liberland Burn drains north to the Pulganny Burn and east to Loch Maberry, while and the Tarf Water drains the western edge of the block south to the River Bladnoch. Loch Derry lies adjacent to the eastern edge, while Kirkcowan Flow neighbours the south-eastern boundary. Map 11 shows landscape types and designations relevant to Kilgallioch. These are: • Pastoral Valleys – Ayrshire LCT 72 (NatureScot) with key characteristics including narrow steep-sloping valleys with flat bottoms, uplands with occasional pronounced summits, diverse land cover dominated by broadleaf woodland, tree-lined winding roads, and a patterned landscape which has a rural/picturesque quality. • Plateau Moorland – Ayrshire LCT 78 (NatureScot) with key characteristics including extensive plateau rising to contoured ridges, extensive peatlands with blanket bog, heather and grass moorland, extensive areas of uniform coniferous forests, wind farm development, and a remote/exposed landscape that is wild in character. • Plateau Moorland – Dumfries and Galloway LCT 173 (NatureScot) with key characteristics including flat/very gently undulating land, numerous streams and waterlogged areas, grass moorland and improved pastures in upland valleys, rough vegetation with pockets of mixed woodland, areas of forestry and wind farm development, and a remote/exposed atmosphere. • Plateau Moorland with Forest – Dumfries and Galloway LCT 174 (NatureScot) with key characteristics including elevated flat/gently undulating land, forestry undergoing restructuring and superimposed on plateau moorland, wind farm development, large-scale open moorland, farmland and heathland in un-forested areas, occasional loch basins, and a remote/exposed character. • South Ayrshire local landscape area.
Geology and Soils
The bedrock lithology is primarily sandstones and siltstones of the Ordovician period. Superficial geology is largely Quaternary peat interspersed with till deposits. Soils are dominated by peats and surface-water gleys, with infrequent pockets of ironpan and brown earth coverage in elevated areas. Soil types within the forest block are shown on Map 9. Refer to 4.6, and Appendix VII for deep peat restoration details.

Description of woodlands

Climate

The climate station at Girvan (approx. 18 km from Kilgallioch) has recorded average maximum temperatures of 18.5 °C (summer) and 8.17 °C (winter), and an average monthly rainfall ranging from 56.8 mm to 123.0 mm.

Accumulated temperature (day-degrees above 5°C)
Min: 1483, Max: 1755, Mean: 1660

Moisture Deficit (mm)
Min: 65, Max: 91, Mean: 82

The climate of the LMP area is highlighted pink on the table below.

	Accumulated temperature (day-degrees above 5°C)									
		>1800	1800-1475	1475-1200	1200-975	975-775	775-575	575-375	375-175	<175
Moisture Deficit (mm)	>200									
	180-200	Warm	Dry							
	160-180									
	140-160									
	120-140	Warm	Moist		Cool	Moist				
	90-120									
	60-90		Warm	Wet						
	20-60				Cool	Wet		Sub-Alpine		
	<20								Alpine	

Climatic Zones in Great Britain (shading indicates combinations not present)

Hydrology

Map 2 shows all watercourses, open water, and recorded water supplies within the FLS holding.

Water catchments
The block sits across the River Bladnoch and River Stinchar waterbody catchments (as defined by SEPA).

Four acid sensitive catchments overlap the plan area. Refer to **Appendix VI** for full details.
Name: Cross Water Status: At risk Overlap area: 26.2 ha
Name: Pulganny Burn Status: At risk Overlap area: 516.8 ha
Name: Polbae Burn Status: Failing Overlap area: 13.9 ha
Name: Tarf Water Status: Failing Overlap area: 553.2 ha

Water quality
Bodies of surface waters (as identified by SEPA) in the plan area:

Name: Cross Water (ID: 10472) Overall Condition: Moderate
Impacted condition / Responsible pressures (Responsible activity):

Description of woodlands
No further information available via SEPA's water environment hub. Name: Duisk River (ID: 10470) Overall Condition: Good Impacted condition / Responsible pressures (Responsible activity): No further information available via SEPA's water environment hub. Name: Pulganny Burn (ID: 10511) Overall Condition: Moderate Impacted condition / Responsible pressures (Responsible activity): There is an unknown pressure on water animals and plants, with SEPA's assessments indicating fish populations may not be in good condition. Name: Tarf Water (ID: 10515) Overall Condition: Moderate Impacted condition / Responsible pressures (Responsible activity): No further information available via SEPA's water environment hub. **Flooding** The block overlaps with the Cross Water catchment by 26.2 ha. The plan partially lies within the Barrhill Potentially Vulnerable Area for flooding, with the target area being the community of Barrhill. The Cross Water is described as the main source of flooding and some surface water flooding is also noted. SEPA's (2021) 'Flood Risk Management Plan: Ayrshire Local Plan District' notes there are no historical records of flooding in the area. SEPA's current objectives are to avoid inappropriate development that increases flood risk in Barrhill and to improve data/understanding of river/surface water flooding in Barrhill. SEPA's flood map demonstrates that within the block there is a high likelihood of localised flooding from river water and areas at medium to high risk of surface water flooding, particularly surrounding Chirmorie Loch. There is also a high likelihood of localised flooding from the Tarf Water, Polbae Burn and Pulganny Burn as these watercourses flow downstream to meet the River Bladnoch at the village of Kirkcowan. In addition, there is a high likelihood of localised flooding from the Lavery Burn, Pullower Burn and Pollgowan Burn as these flow downstream to meet the Duisk River which flows through the village of Barrhill. There are no other known areas prone to significant flooding downstream from the plan area. **Water supply** There are several private water supplies either within or neighbouring Kilgallioch in the north. Refer to **Appendix IX** for details and requirements.
Windthrow
Map 10 illustrates the DAMS measurements for the plan area. In general, the site is highly exposed, with moderately exposed to sheltered areas limited to relatively small areas in the east. DAMS ranges from 14-20, with the greatest exposure on top of Craig Airie Fell.
Adjacent land use
Predominantly rough grazing, fields/farms, and plantation (public and private). Windfarms are abundant in the wider landscape, with new renewables projects (wind and solar) such as the Arecleoch extension and Chirmorie, currently in the planning domain for areas immediately east and west of the block. There are private dwellings surrounding the block, mostly concentrated in the north, with some also operating as holiday accommodation.

Description of woodlands

Public access

There are no formal FLS recreation facilities within the block, however, Kilgallioch supports low level public access for recreation (e.g. walkers and horse riders), which is mainly focused on forest roads outwith the windfarm and the Interactive Visitor Zone encompassing the Southern Upland Way (a Core Path and a Right of Way).

The Southern Upland Way is the main walking path routed across the block between NX 2604 7352 near Loch Derry and the Tarf bridge at NX 2232 7171. Recent upgrades and an alternative grassy pathway at Craig Airie Fell completed by the local authority serve multiple trail users (e.g. walkers, horse riders, and cyclists). The local authority's plans to install visitor interpretation panels along the core path, in addition to developing car parking facilities adjacent to the block, are welcomed.

Third party access rights are established across much of the forest road network for Kilgallioch and Arecleoch windfarms. Other third party access rights are established along the forest road between the B7027 public road and NX 2522 7784, and also in the west between NX 2210 7807 and NX 2260 7804. Access to the residential properties of Laggish Farm, Dochroyle Farm, and Dochroyle Cottage is possible via the forest road linking to the minor public road at NX 2205 7965.

There is local interest in the block, with particular interest in species diversity and recreational development. Refer to **Appendix III**.

Map 2 shows the location of forest roads and the Core Path.

Historic environment

There is one designated heritage feature within Kilgallioch:

Name: Wells of the Rees (SM20020.07) **Location:** NX 2299 372 326
Description: Church, well(s). Wells 500 m NNE of Kilgallioch. Three springs covered by stone structures currently identified within open space / stone dyke field system; SAM plan current. Of national importance.

Recent surveying commissioned by FLS in 2021 details the three wells individually:

- **Well at NX 2299 7233:** rectangular structure measuring 1.70 m NW-SE by 1.47 m and standing 0.65 m high. There are two recesses in the SE elevation of the structure. The upper recess is 0.36 m wide by 0.27 m high and 0.33 m deep, a lower recess 0.37 m wide is just visible, with lintel sitting 0.05 m above ground level.
- **Well at NX 2300 7232**: rectangular structure measuring 1.53 m N-S by 1.43 m and standing 0.39 m high. There are two recesses in the S elevation of the structure. The upper recess has lost its lintel, now being open above. This recess is 0.34 m wide by 0.36 m high (to top of stonework, where a lintel may have sat) by 0.23 m deep. A lower recess could be felt by probing directly below the upper recess but lay below ground level.
- **Well at NX 2299 7231**: the best preserved of the three wells is a rectangular structure measuring 1.62 m N-S by 1.15 m and standing 0.51 m high. There are two recesses in the S elevation of the

Description of woodlands
structure. The upper recess is 0.35 m wide by 0.32 m high and 0.37 m deep. The lower recess lies directly below the upper, measuring 0.53 m wide by 0.31 m high and at least 0.67 m deep. The wells are traditionally said to have been resorted to by penitents of religious ceremonies. They are supposedly named after the numerous nearby sheep rees, said to have been constructed from the fabric of the old church. There is future potential to re-associate the wells with other scheduled monuments in the wider landscape, the Laggangairn Standing Stones at NX 2223 7166 and Wood Cairn at NX 2524 6871, by opening visual corridors through the woodland. Future consideration should be given to maintaining the land around the wells as lightly wooded and open ground. There are numerous undesignated historic environment features recorded across the block. Historic environment records for the forest are shown in **Appendix IV** and on **Map 12**.
Biodiversity
Designated Sites The headwaters of the River Bladnoch SAC, namely the White Burn and Tarf Water, flow along the south-western boundary of Kilgallioch. Covering 272.6 ha in total, the SAC supports a Atlantic Salmon population and a salmon spring run. In 2011 its assessed condition was dubbed 'unfavourable – recovering', with cited negative pressures including acidification from agricultural and forestry operations. Kirkcowan Flow SSSI and SAC lies adjacent to the block in the southeast. An area of blanket and basin bog covering approximately 776.6 ha, it supports a range of bog vegetation including Sphagnum Moss, a variety of Sedge species, and Purple Moor Grass. In 2013 its assessed condition was 'unfavourable – declining', with negative pressures including water management, grazing and invasive species (including seed rain from plantation forestry). A degree of hydrological connectivity between Kilgallioch and Kirkcowan Flow is suspected but the extent is yet unknown; as per **4.2**, a mosaic of open ground (restored peatlands) and native woodland (on mineral soils) will be established accordingly following peat and soil surveying of the FLS boundary area. The block lies within the Galloway and Southern Ayrshire Biosphere. **Priority Habitats** UKBAP Blanket bog (unflushed upland *Sphagnum* bog) form extensive hydrological units in the north. Upland heathland is present, notably on Criag Airie Fell. Pockets of Upland flush, fen and swamp, Upland Birchwood and Wet woodland, particularly in the vicinity of peat soils and the three lochs (Black Loch, Loch Long and Loch Martle are Eutrophic standing waters). Refer to **4.2**, **4.6**, and **Appendix VII**. **Priority Species** The block supports a wide range of species. Red Squirrel are present and Pine Marten have successfully bred in recent years. Raptors such as Buzzard, Hen Harrier and Goshawk have been recently sighted. There are historical records of Barn Owl and Tawny Owl on site. Black Grouse were last recorded on site in 1996, however, sightings have been made in recent years and future surveying will look to confirm/deny their presence.

Description of woodlands

Riparian areas and watercourses support both Otter and Water Vole, and the wetland area at Loch Duisk supports wildfowl and insects. As the headwaters of the River Bladnoch SAC, there is scope for the Tarf Water to support Atlantic Salmon should their range extend further upstream and they would benefit from a mosaic of open and lightly wooded riparian buffers providing dappled shading as the climate warms. Other species noted within Kilgallioch include Brown Trout, Common Lizard, Short-eared Owl, Common Goldeneye, and Great Grey Shrike.

Ancient Woodland / PAWS

There are no known areas of ancient woodland or PAWS within the plan area. Scattered LEPO sites lie outwith the block to the northeast.

Natural Reserves

There are no Natural Reserve areas recorded within the plan area.

Deadwood potential

The greatest potential for deadwood is along riparian buffers and within areas managed under minimum intervention.

Open ground

There is a significant area of open ground across the plan area, in part to accommodate Kilgallioch windfarm infrastructure, an extensive forest road network, the scheduled monument, open water and riparian buffers. Areas of fen, marsh and swamp are scattered across the block; these combine with wet woodland to create a mosaic surrounding Loch Duisk, Loch Martle, Long Loch, Black Loch and Craigie Loch. Upland heathland covers the top of Craig Airie Fell, offering a 360° view to the Solway coast and the Galloway hills. There are four quarries within the block. Currently afforested intermediate lowland raised bog (soil type 10b) and blanket bog (soil types 9) are abundant and it is anticipated the open ground component will increase significantly in the long term as phased peatland restoration operations progress.

Invasive species

None recorded or known.

Woodland composition

The current woodland composition of the forest is shown on Map 8.

43.6 % (831.4 ha) of high forest is first rotation and 56.4 % (1076.7 ha) second or subsequent rotation.

Conifer stands are subject to windblow that is typically limited to coupe edges with a few internally blown areas along the main access route. The conifer stock on deep peat soils is generally not growing well. Broadleaves across the site are generally vulnerable to heavy browsing.

The current woodland management (and % of the plan area) is approximately:
2,515 ha (97.4 %) under Clearfell
51 ha (2.0 %) under Long term retention
17 ha (0.6 %) under Minimum intervention.

Description of woodlands

Plant health

Phytophthora ramorum is prevalent throughout southwest Scotland, with infection of Larch within the block confirmed. Several infected areas in the plan area were initially felled to comply with the requirements of a Statutory Plant Health Notice (SPHN), however, remaining Larch is now generally treated under a "Management Zone" approach in accordance with the Scottish Forestry '*P. ramorum* on larch action plan' (2021). At the present time, Larch will not feature in the future restock mix.

Infrastructure

Main vehicular access into the block is via a shared general access route at NX 2800 7892, with alternative access at NX 2603 7358 (east at Loch Derry), NX 2149 7894 (west at Arecleoch block).

Security gates are sited on forest roads leading to the windfarm between the substation and Darnarroch Fell, and along the Loch Derry access route.

Kilgallioch windfarm occupies the central area of the block. Associated infrastructure, including turbines, cabling, and the substation (NX 235 762), are detailed on **Map 2**. There are new renewables projects (wind and solar) that have either been recently approved or currently in the planning domain for areas immediately south, east and west of the block. There is also a planned extension to the windfarm at Arecleoch. Pending their approval, additional infrastructure (i.e. cabling, roads and battery storage) will be constructed within Kilgallioch block.

There is a well-established road network throughout the block. Regular crossing points above underground cabling provide adequate access to most coupes. Additional crossing points will be required should the abovementioned renewables projects obtain planning approval.

The B7027 public road intersects the block at NX 2687 7801 and a minor public road passes alongside Kilgallioch at NX 2204 7965.

There is a bridge crossing the Tarf Water at NX 2230 7174 that marks the block's boundary and leads to private plantation.

There are four quarries at Kilgallioch:

- Knockylaight, ref.: 1404, at NX 265 776 (active; 1.7 ha extension proposed)
- Knockylaight, ref.: 1438, at NX 232 761 (not currently active due to quality of stone)
- Derry, ref.: 1406, at NX 230 747 (for windfarm developer use)
- Tarf, ref.: 7627, at NX 224 727 (active; 1.3 ha extension proposed).

There are several overground power lines intersecting the block in the north-west and north-east, and by the Loch Derry access route.

There is an open Forest Research bio-soil site at Darnarroch Fell (NX 240 760) and a closed progeny site at NX 252 793.

Private water supplies interact with the block, notably those associated with the Dochroyle and Laggish properties, and the shared supply for the Knockycoid and Craigance properties; this supply's pipeline runs along the forest road. Refer to **Appendix IX** for full details.

Appendix II: Tolerances

	Maps Required (Y/N)	Adjustment to felling period *	Adjustment to felling coupe boundaries **	Timing of Restocking	Changes to Restocking species	Changes to road lines	Designed open ground ** ***	Windblow Clearance ****
FC Approval normally not required	N	• Fell date can be moved within 5 year period where separation or other constraints are met.	• Up to 10% of coupe area.	• Up to 3 planting seasons after felling.	• Change within species group e.g. evergreen conifers or broadleaves.		• Increase by up to 5% of coupe area	
Approval by exchange of letters and map	Y	• Advance felling of Phase 2 coupe into Phase 1	• Up to 15% of coupe area	• Between 3 and 5 planting seasons after felling, subject to the wider forest and habitat structure not being significantly compromised.		• Additional felling of trees not agreed in plan. • Departures of > 60m in either direction from centre line of road	• Increase by up to 10% of coupe area • Any reduction in open space of coupe area by planting.	• Up to 5ha
Approval by formal plan amendment may be required	Y	• Felling delayed into second or later 5 year period. • Advance felling (phase 3 or beyond) into current or 2nd 5 year period.	• More than 15% of coupe area.	• More than 5 planting seasons after felling, subject to the wider forest and habitat structure not being significantly compromised.	• Change from specified native species. • Change Between species group.	• As above, depending on sensitivity.	• In excess of 10% of coupe area. • Colonisation of open space agreed as critical.	• More than 5ha.

Notes

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

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

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

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

Working Tolerances Specific to Larch

Table of working tolerances specific to Larch and available for all approved forest plans in the Risk Reduction Zone (RRZ) – including the Management Zone (MZ) to help reduce sporulation of *Phytophthora ramorum* on larch spp.

Approval process	Adjustment to felling period	Timing of restocking and species component	Felling of Larch within a mixed coupe	Changes to road lines
SF approval normally not required	Fell date for phase 2 can be moved forward where larch comprises 50% or more of the coupe species component	Changes to restocking proposal that exclude larch and closely related species in the same genus e.g. Sitka and Norway spruce. Up to 3 planting seasons after felling		
SF approval normally by exchange of letters and map	Felling moved between phases 1 and 2 where larch comprises less than 50% of the coupe species component	Changes to restocking proposal that exclude larch and closely related species in the same genus e.g. Sitka and Norway spruce Between 3 and 5 planting seasons after felling	Areas of pure larch up to 20% of coupe area within phase 1 and 2 can be felled to remove the sporulating host with restocking deferred until the rest of the crop is felled. Where larch constitutes more than 20% of the coupe component then the whole coupe must be felled and restocked together	New road lines (subject to EIA screening opinion) or tracks within existing approved plans necessary to allow the extraction of larch material. Where necessary Prior Approval should be dealt with directly with the relevant Planning Authority
Approval by formal plan amendment is required	Advance felling into current or second phase for pre-emptive larch removal.			Where a new public highway entrance or exit is required. Where necessary Prior Approval should be dealt with directly with the relevant Planning Authority

Notes

Larch felled in the autumn and winter, when the presence of P. ramorum cannot be assessed visually must be treated as infected and will therefore require a movement licence. When carrying out operations where the clearance has not been on the Public Register or through the consultation procedure it is important that due diligence is undertaken to identify sites that will require to be protected. SPHNs will still be issued and should be complied with accordingly. This tolerance table is offered to assist in the pre-emptive early removal of the host species.

Appendix III: Consultation record

Consultee	Date contacted	Date of response	Issues raised	FLS response
Ayrshire Rivers Trust	03/06/2021	No response	N/A	N/A
Ayrshire Roads Alliance	29/06/2021	01/07/2021	Provided SEPA's draft Objective Target Area data sheet for Barrhill. The main source of predicted flood risk is river flooding from the Cross Water in Barrhill. Suspect Kilgallioch will not impact or influence this flood risk, however, still advocate good forestry management to manage flood risk and particularly the risk from rapid surface runoff because of clear felling. Peatland restoration is an effective ground management technique which has multiple benefits including flood risk management. There will be a number of flood risk issues in this area that we are not aware of. However any slowing of run off and upland storage will benefit the catchment in terms of flood risk. From a local authority perspective we do not currently have reported evidence of significant flooding that would verify what the SEPA flood mapping is indicating. Certain there will be flood risk issues in the area that we are not aware of which may well benefit from your proposals.	Appreciative of comments and participation in planning process. The Cross Water catchment has been identified as the Potentially Vulnerable Area (PVA) for flooding associated with the community of Barrhill. While the Duisk River catchment helped form the PVA during its initial consultation, SEPA's (2021) published 'Flood Risk Management Plan: Ayrshire Local Plan District' omits the Duisk River from the PVA. Accordingly, FLS have considered the Cross Water catchment as the key flood risk area for the purposes of this plan. FLS notes there are no historical records of flooding in the area and SEPA's current objectives are to avoid inappropriate development and to improve general understanding of potential flooding. There is <0.2 ha planned felling at Kilgallioch that falls within the Cross Water catchment. As such, it is expected FLS proposals for the block will have limited influence over flood risk within the PVA. While there are no specific flood management interventions proposed during the period of this plan owing to crop maturity, careful consideration will be necessary for subsequent plan revisions which may involve forest to bog operations. There is interaction between the neighbouring FLS block at Arecleoch and the Cross Water catchment. As such, flood risk management measures will be given full consideration as part of the upcoming Arecleoch LMP renewal (due 2023). Potential instances of localised flooding relevant to Kilgallioch have been considered within this plan. Mitigation measures include woodland establishment, phased felling, and peatland restoration. Refer to **4.7** (and **4.1** for timber transport).
Butterfly Conservation Scotland	03/06/2021	No response	N/A	N/A
Barrhill Community Council	03/06/2021	11/07/2021	There was agreement with the key management objectives of the plan; general opinion is that the plans are reasonable, apart from the lack of broadleaf zones. The distinct lack of broadleaved trees in the mix of tree species was viewed with disappointment.	Appreciative of comments and involvement in the planning process. FLS also welcome the council's agreement with key management objectives for Kilgallioch.

Consultee	Date contacted	Date of response	Issues raised	FLS response
			Queried if any consideration has been given to providing recreational activities.	As a productive forest, Kilgallioch is subject to a rolling felling and restocking programme to provide a sustainable timber supply. It is therefore necessary that timber production is balanced with other key management objectives. For timber production, FLS will typically restock with a main productive species (i.e. Sitka Spruce) alongside alternative species where ground conditions permit. Another aim is to establish broadleaved species where they will best benefit terrestrial and water ecosystems while not succumbing to damage from the large deer population in the area. The species mix presented during LMP consultation was the existing forest structure, while restocking proposals at Kilgallioch encompass increased areas of broadleaf woodland and open ground (for peatland restoration), in addition to a significant reduction in Sitka Spruce by year 20. These comply with the UK Forestry Standard, which has clear diversity prescriptions. Owing to the long term nature of forestry, some proposals will take time to achieve (in some cases beyond the LMP ten year period). FLS welcome access as per Rights of Way and in line with the Scottish Outdoor Access Code. The Southern Upland Way traverses the forest in the block's south and there is also an extensive forest road network across the site. Regrettably, it is unlikely that formal recreation facilities will be established within Kilgallioch at this time. The reasoning for this is multifaceted and includes (but is not limited to) the low use of the wider block by members of the public, lack of car parking options, the wind farm and its associated infrastructure. Formal recreational trails and facilities are provided locally on the national estate at blocks such as Tannylaggie, Penninghame, Kirriedarroch and Brigton (Glentrool), and Kirroughtree. FLS would welcome interest from the Barhill community to explore future partnership working opportunities. Refer to **4.1**, **4.5** and **Map 6**.
Kirkcowan Community Council	03/06/2021	No response	N/A	N/A
New Luce Community Council	04/06/2021	No response	N/A	N/A
CONFOR	03/06/2021	No response	N/A	N/A

Consultee	Date contacted	Date of response	Issues raised	FLS response
Crichton Carbon Centre (CCC)	23/06/2021	09/09/21	Representatives of FLS, Crichton Carbon Centre and SEPA met in September 2021 to discuss development of the Kilgallioch LMP. Points raised by Crichton Carbon Centre: Supportive of plan concept and peatland restoration hydrological unit approach. Re-wetting should ideally be done promptly following felling to encourage slow growing bog species. Consider integrating wet woodland creation within hydrological units, this could contribute to improved riparian zones. Kirkcowan Flow SSSI/SAC is in poor condition and seed rain from FLS and private forestry. It is unlikely forestry is the only factor contributing to site condition. CCC working with land manager to improve site. Recommends collaboration between all parties to improve SSSI condition. Contractor availability is a major issue and lack of expertise and desire to take restoration projects on. CCC currently working on peatland skills development strategy from school age to on-the-job. Agreed that precautionary approach with Acid Sensitive Catchments will mean water sampling not necessary. Recent sampling at Tannylaggie indicates acidification is still the case.	Appreciative of advice and involvement in the planning process. FLS also welcome CCC's support of peatland restoration proposals and acidified catchments approach. Peatland restoration operations will follow on-site clear felling. The methodology is detailed within this plan, while peatland sites and wet woodland establishment are integrated into the future habitats design. Regarding Kirkcowan Flow SSSI/SAC, FLS acknowledges seed rain onto the site from neighbouring forests. FLS have worked with NatureScot to determine an appropriate buffer within Kilgallioch to mitigate the issue. While FLS is unable to control private forestry operations, planned felling within Tannylaggie block could relieve conifer regeneration in the south, while native broadleaf and open ground establishment at Kilgallioch should also reduce seed rain in the north. There is potential for peatland restoration in the south of Kilgallioch, however, future soil surveying will need to confirm connectivity to the designated site. FLS's approach to this land management plan is to take the right action for the right reasons and in the right place. In agreement that the main limitation on restoration is likely to be contractor availability and requirement for proper equipment. Refer to **4.2**, **4.3**, **4.6**, **4.7**, **Maps 6**, **9 a**nd **13**, and **Appendix VII.**
DGC – Environmental Health	04/06/2021	No response	N/A	N/A
DGC – Access	04/06/2021	16/06/2021	No issues with what is proposed and note from the plans that the Southern Upland Way is identified as a key route. This is the only Core Path in this area and one that is also recorded as a right of way in the Scottish Catalogue of Rights of Way. The remaining areas of land are likely to be accessible by way of the responsible access rights granted under Part 1 of the Land Reform (Scotland) Act 2003, so should be managed in a way that respects these rights and by use of the guidance provided in the Scottish Outdoor Access Code.	Appreciative of comments and participation in planning process. Visitors are welcome to explore FLS blocks and will only be asked to avoid routes while certain work is going on that will create serious or less obvious hazards for a period. FLS welcome responsible access as per The Land Reform (Scotland) Act 2003 and will continue to responsibly manage access within the block. FLS will only restrict access where it is absolutely necessary and will endeavour to keep disruption to a minimum, and will instigate route diversions where required. FLS will continue to work with Dumfries and Galloway Council to maintain and enhance the Core Path. Refer to **4.5**.
DGC – Archaeology	04/06/2021	27/07/2021	The Council's Historic Environment Record (HER) has records for a number of heritage features within the forest boundary. All known assets have been accounted for on the supplied map.	Appreciative of comments, advice, and participation in planning process. FLS will maintain all heritage features as per the UKFS, agreed Asset

Consultee	Date contacted	Date of response	Issues raised	FLS response
			The Wells of the Rees are the only designated Scheduled Monument within the forest, and that the Laggangairn Standing Stones lie just outwith the boundary. However the woodland to the south-east of the standing stones, lying along the sight-line from the stones to the designated Wood Cairn on the summit of Eldrig fell to the south-east, does fall within this forest plan and has an impact on the setting of the designated monument and its relationship with contemporary landscape feature. The land management plan allows the opportunity to open this vista, along the eastern bank of the Tarf Water, to permit reciprocal views and to improve the landscape setting of the designated stones. Management proposals should follow the UKFS on the Historic Environment. This standard requires a 20m buffer of open ground be left round archaeological features on restocking. This is advisable for the most important sites, but on some features a smaller buffer may be more proportionate. A wider buffer should be considered for the Standing Stones of Laggangairn, as noted above. Any features or objects of archaeological interest coming to light as a result of ground disturbance resulting from the works should be notified to the Council Archaeologist so that they can be recovered and recorded.	Management Plans and, where reasonable, we will consider exceeding standardised buffers. The Well of the Rees currently sits within a predominantly open landscape with broadleaves and views south across Kirkcowan Flow towards Wood Cairn. The wells are subject to regular scrub control and monitored by the regional FLS Environment staff. FLS have commissioned terrestrial scanning to improve our records of the SM and to help inform future iterations of this LMP. Laggangairn Standing Stones are located on private ground, with the FLS holding lying on the eastern side of the Tarf Water. As such, while FLS is proposing a more 'natural' restocking with alternative species in the general area, the immediate SM buffer is not managed by FLS. FLS propose to maintain the important physical link between the scheduled monuments via the Southern Upland Way. Regarding visual relationships, there is potential to open views in the south as and when stands reach maturity (as FLS will contribute to both regional and national timber targets). During the timescale of this plan, FLS intend on establishing broadleaf cover in the area and it is hoped this will improve linkage between the designated sites. It is possible that there will be better restructuring opportunity at the next plan renewal as felling options in the south are currently limited by stand maturity. FLS must also consider biodiversity benefits in maintaining tree cover for species such as pine marten and red squirrel. Phased felling must be employed to gradually encourage species relocation. The area also sits within sensitive water catchments and as such the scale of felling is regulated. Refer to **4.3**, **Map 12**, and **Appendix IV**.
DGC – Flooding	04/06/2021	No response	N/A	N/A
DGC – Roads	04/06/2021	No response	N/A	N/A
DGC – Southern Upland Way	06/04/2021	07/04/2021	Kilgallioch is an important location for the Southern Upland Way (SUW) as it provides a considerable quantity of off road remote path and the first real summit on the route at Craig Airie Fell. This is also where route users get the first views of Galloway Forest Park and the landscape that makes up much of the way. We have our own	Appreciative of comments and participation in planning process. To clarify, the SUW overlaps the Kilgallioch forest between NX 2232 7171 and NX 2607 7351. FLS appreciate the point regarding key management objectives. There is no intent to overlook the importance of the SUW in this revision of the land

Consultee	Date contacted	Date of response	Issues raised	FLS response
			plan for the development of the Southern Upland Way in/around Kilgallioch. Key objectives do not include any reference to recreation. This and supporting tourism should be included as the Southern Upland Way is an important visitor attraction. FLS are an important partner in the Southern Upland Way and the inclusion of these in your plan and support from FLS would help significantly in the development of the route. Strongly support aim to provide a safe and enjoyable visitor experience. Clearing the windblow near Laggangairn would really tidy up this small area. Maintaining views on Craig Arie Fell is very important. Views from Craig Dhu Cairn are also important to keep clear. Opening up of some of the views along the stretch of forest road into Loch Derry would provide interest for route users. Increasing the amount of broadleaf along the corridor improves the visitor experience. Encouraging multi-user access is a priority in our own Route Development Plan. Kilgallioch is a very suitable part of the path for both cyclists and horse riders as well as walkers. As we push to open up access to other user groups problems may arise on FLS land and their boundaries. This may require widening sections of path and grading steep sections of path. Circular routes: as the length of the Southern Upland Way makes it difficult for many people to do the entire route it is a priority in our Route Development Plan to develop circular routes for day visitors to use. It would be good to have discussions with FLS about developing these. They would probably tie in with the alternative routes. Access points – car parking: we would like to see small official parking areas at the edge of the forest to encourage more use. Interpretation panels: we are currently developing new interpretation. We would hope to work alongside FLS to develop these. Route Maintenance: need to maintain access in and out the forest with vans for maintenance.	management plan. FLS support the visitor economy by supporting SUW work, in addition to welcoming access as per rights of way and in line with the Scottish Outdoor Access Code. However, FLS do not currently provide formal visitor facilities or attractions at Kilgallioch. The SUW is the main walking route and is detailed within the plan. Thank you for your support for the objective seeking to maintain a safe and enjoyable experience along the SUW. The windblow within coupe 19007 near Laggangairn is included for clear felling during the period of this plan. FLS request that SUW Rangers continue to bring any instances where safety is of paramount concern to our attention. FLS's Landscape Architecture team have assisted in the development of this plan and our aim is to maintain key views and achieve best landscape fit. Note that creation and maintenance of viewpoints can take some time as we have to work with recently restocked trees and would look to take these to their full rotation. Conifer regeneration clearance on Craig Airie Fell is included in this plan. FLS welcome the opportunity to contribute to interpretation panels along the SUW and to continue working in partnership with SUW Rangers on route development. Regrettably, there are limited car parking options within the site and it is unlikely that FLS will establish parking facilities at Kilgallioch at this time. It is noted the SUW Ranger's preferred parking options are located outside of the FLS boundary. FLS will only restrict access where it is absolutely necessary and will endeavour to keep disruption to a minimum, and will instigate route diversions where required. FLS will continue to work with Dumfries and Galloway Council to maintain and enhance the Core Path. FLS have noted the preference for broadleaved species along the SUW. Currently broadleaf planting flanks the route in some areas and an increase in alternative species is included in the future forest design where they will best benefit terrestrial and water ecosystems while not succumbing to damage from the large deer population. As a productive forest, Kilgallioch is subject to a rolling felling and restocking programme to provide a sustainable timber supply. It is therefore necessary that timber production is balanced with other key management objectives. FLS will restock to suite ground conditions and in compliance with the UK Forestry Standard.

Consultee	Date contacted	Date of response	Issues raised	FLS response
				Refer to **4.3**, **4.5**, and **Map 6**.
Galloway and Southern Ayrshire Biosphere	03/06/2021	No response	N/A	N/A
Galloway Fisheries Trust	06/04/2021	07/04/2021	The Water of Tarf contains suitable instream habitats for salmon and trout. It is presently considered too acidic to support salmon but in the last 5 years or so we have seen a very steady and consistent recovery of salmon stocks in the Tarf further downstream; it is realistic they will be by Kilgallioch in the next 5 -10 years. To assist the recovery of fish stocks GFT have been looking to undertake habitat restoration works in the area. Support riparian deciduous tree planting at a significant scale to address the climate change threats identified for freshwaters in Scotland. We are being told it is a priority of the Scottish Government / Marine Scotland too. A wonderful opportunity to consider / design a future riparian forest here that will help to control future predicted water temperature rises which are going to be worse for darker waters such as the Bladnoch and Tarf. Representatives of FLS, Galloway Fisheries Trust (GFT) and NatureScot met in August 2021 to discuss development of the Kilgallioch LMP. Points raised by Galloway Fisheries Trust: Percentage cover of broadleaves to provide adequate shading not concrete (e.g. dappled shading). Two way approach to the Tarf: 1. Practicalities to regulate the water temperature. To do so need to establish how many trees and how much canopy cover is needed. Kilgallioch could be used as experimental site. Possibility of adding temperature loggers to the Tarf Water within Kilgallioch area. 2. Improve acidification of the catchment through proactive forestry planning/ management at localised level. GFT can help with broadleaf siting. GFT encourage non-Sitka spruce planting within the catchment. There are no known fish barriers on the Tarf Water pertinent to Kilgallioch. The overlap with peatland restoration proposals at Kilgallioch will likely assist with continued recovery and improved water quality within sensitive water catchments.	Appreciative of comments, advice and participation in planning process. FLS welcome GFT input to relevant work planning and operational delivery for Kilgallioch, and will continue to work in partnership with GFT across the region. During the timescale of this plan, FLS intend on establishing broadleaf cover in riparian areas, with native woodland (low density BL/open ground) along key watercourses (i.e. the Tarf based on GFT recommendations). Tree establishment must balance appropriate siting for shade provision/bank stabilisation with where it will be possible to provide adequate protection against browsing. Consideration will therefore be given to planting in dense groups with thorny mantles and micro-siting will likely be required throughout work planning. However, it should be noted that felling options in the south of the block are currently limited by stand maturity and, as the Tarf Water is an acidified catchment, the scale of felling is also regulated. It is possible that there will be better restructuring and peatland restoration opportunities with future plan revisions. FLS are unable to control coniferous seeding on banks that are outwith the national estate. FLS will monitor and appropriately manage natural regeneration within FLS blocks. FLS welcome the positive comments regarding peatland restoration proposals, in addition to the precautionary approach of assuming catchments are acidified for the purposes of the LMP: restocking and felling proposals reflect this and practice guidance is to be followed during delivery of the plan. Refer to **4.2**, **4.3**, **4.6**, **4.7**, **Maps 6**, **9 a**nd **13**, and **Appendices VI and VII.**

Consultee	Date contacted	Date of response	Issues raised	FLS response
			In August 2021 GFT also visited Kilgallioch alongside FLS to review areas within the Tarf Water catchment and their recommendations included siting recommendations along the Tarf Water to assist with bank stabilisation/shade provision, planting density to aim for dappled shade, species choice to encourage succession and woody debris provision, and a catchment-scale approach.	
Historic Environment Scotland	03/06/2021	08/07/2021	Confirmed one scheduled monument (SM2002- Wells of the Rees) lies within the forest boundary. The Wells are likely to have formed part of a larger church site that extends beyond the scheduled area and may be of medieval or early medieval date. The UK Forestry Standard requires a buffer zone of at least 20 m and states that consideration should also be given to larger open areas. A larger open area would benefit the monument for the reason given above. We recommend a forest design which includes larger open areas, preserving visual relationships both towards the southwest towards Laggangarn Standing Stones SM90199 and towards the southeast around Wood Cairn, another scheduled monument (SM1953, NX 25253 68712). Recommend a forest design which preserves and enhances the relationship of Wells of the Rees to Laggagarn standing stones. This could take the form of a design which opened up views between the monuments, as well as preserving and enhancing the open corridor.	Appreciative of comments and participation in planning process. FLS will maintain all heritage features as per the UKFS, agreed Asset Management Plans and, where reasonable, we will consider exceeding standardised buffers. The Well of the Rees currently sits within a predominantly open landscape with broadleaf planting, and views south across Kirkcowan Flow towards Wood Cairn. The wells are subject to regular scrub control and monitored by the regional FLS Environment staff. FLS have commissioned terrestrial scanning to improve our records of the SM and to help inform future iterations of this LMP. FLS propose to maintain the important physical link between the scheduled monuments via the Southern Upland Way. Regarding visual relationships, there is potential to open views in the south as and when stands reach maturity (as FLS will contribute to both regional and national timber targets). During the timescale of this plan, FLS intend on establishing broadleaf cover in the area and it is hoped this will improve both linkage between the designated sites. It is possible that there will be better restructuring opportunity at the next plan renewal as felling options in the south are currently limited by stand maturity. FLS must also consider biodiversity benefits in maintaining tree cover for species such as pine marten and red squirrel. Phased felling must be employed to gradually encourage species relocation. The area also sits within sensitive water catchments and as such the scale of felling is regulated. Refer to **4.3**, **Map 12**, and **Appendix IV**.
IUCN Otter Specialist Group	03/06/2021	No response	N/A	N/A
NatureScot	03/06/2021	21/06/2021	Representatives of FLS, Galloway Fisheries Trust and NatureScot met in August 2021 to discuss development of the Kilgallioch LMP. Points raised by NatureScot:	Appreciative of comments, advice and participation in planning process. Welcome supportive comments regarding peatland restoration and FLS approach to sensitive water catchments.

Consultee	Date contacted	Date of response	Issues raised	FLS response
			Supportive of sensitive water catchment approach and appreciative of constraints. Kirkcowan Flow SSSI/SAC: Conifer regeneration is degrading this designated site. Ideally, would like to see no planting within the buffer zone and the buffer should start from the peatland edge (i.e. where the hydrological unit ends) rather than the ownership boundary. The peatland edge is unknown but encompasses some FLS land. NatureScot acknowledge that unfavourable condition is a result of multiple factors, including forestry, and intend on conducting a condition assessment for the SSSI. In February 2022, NatureScot advice is that this proposal is likely to have a significant effect on blanket bog and depressions on peat substrates of Kirkcowan Flow SAC, and Atlantic salmon of River Bladnoch SAC. Based on information provided, NatureScot concluded that the proposal will not adversely affect the integrity of the site.	Cabling will cross FLS land but otherwise renewables extensions are not on FLS land therefore any compensatory work would need to be done in these areas and in consultation with appropriate landowners. FLS are unable to carry out work on private land or provide monetary contribution towards such works. FLS can improve upon the designated site's buffer by bringing conifer planting line back, while native broadleaf planting can help catch conifer seed rain. FLS do not currently have detailed soils data for the south that would help identify the SSSI peatland edge. Note that due to prevailing winds, productive crop will continue to encroach on buffer zone from conifers planted further away across Kilgallioch and private forestry. Establishing broadleaf woodland could help deter conifer seeding. The condition of the SSSI will be multifaceted and not solely due to naturally seeding conifer. FLS welcome comments from NatureScot's Peatland Advisor as currently the UKFS does not specify buffers for designated sites. In November 2021, maps and site notes (detailing indicative soils and non-native regeneration) from a SSSI buffer walk conducted by FLS were provided to NatureScot alongside the FLS Peatland team's position regarding the bog habitat. FLS proposed to restore peats hydrologically connected to the SSSI and establish native woodland on mineral soils within a 100 m buffer of Kirkcowan Flow. Following their consideration, FLS welcomed NatureScot's conclusion that proposals for land adjacent to Kirkcowan Flow will not detrimentally impact the site and offer thanks for NatureScot's continued participation in matters concerning the national estate. Relevant correspondence between NatureScot and FLS will be provided to Scottish Forestry in support of this LMP for the purposes of a Habitats Regulations Appraisal (HRA). Refer to **4.2**, **4.6**, and **4.7**.
Neighbours	16/06/2021	Various	Owing to the Covid-19 pandemic, FLS hosted an online consultation process which encouraged members of the public to participate in an anonymous survey and/or contact FLS directly to discuss the LMP's development. Letters were also issued to residences immediately neighbouring Kilgallioch inviting participation in the consultation process. One response was received via the online	Appreciative of comments and participation in planning process. FLS also welcome support for peatland restoration proposals. While FLS cannot comment on the specifics of what was cited in windfarm application proposals, as a productive forest Kilgallioch is subject to a rolling felling and restocking programme that contributes to Scotland's

Consultee	Date contacted	Date of response	Issues raised	FLS response
			survey and one email was received (both in July 2021). Comments given: • The forest is an important part of our surroundings acting as a screen from the windfarm. The forest reduces the noise of the wind turbines and privacy in terms of view of the windfarm. • Importance of forest for supply of water from watercourses, local wildlife, natural habitats and sustainability, access along walking paths. • Concerned that the forestry work in the future could impact water supply (for several properties). • Supportive of peatland regeneration proposals. • Disappointed in terms of future broadleaf planting to preserve the squirrel population. A number of neighbours were also consulted as part of water supply investigations in November-December 2021. This was completed as a door knock exercise and discussion pertained to ground truthing water supplies.	sustainable timber sector. Coupes in proximity to residences in the northeast have been put forward for phased felling during the course of this plan. With south(-west) prevailing winds it is preferred to fell these sheltered coupes first to help prevent/minimise a potential windblow domino effect occurring. To assist in slowing the spread of Larch disease (*P. ramorum*), it is necessary to target areas of mature larch for felling as agreed with the sector's regulator (Scottish Forestry). There are currently no new roads planned for accessing the block's northeast during the plan period. FLS will give full consideration to the best route for accessing isolated northern coupes in future iterations of the plan. The preferred haulage route for Kilgallioch is to access the A714 using the existing forest road network away from residences on the B7027. Should the B7027 be used as an alternative, haulage would be subject to consideration and conditions determined by the local authority as the road is a Timber Transport Consultation Route. As a productive forest, it is necessary to balance timber production with other key management objectives. For timber production, FLS will typically restock with a main productive species (i.e. Sitka Spruce) alongside alternative species where ground conditions permit. Another aim is to establish broadleaved species where they will best benefit terrestrial and water ecosystems while not succumbing to damage from the large deer population in the area. The species mix presented during LMP consultation was the existing forest structure, while restocking proposals at Kilgallioch encompass increased areas of broadleaf woodland and open ground (for peatland restoration). These comply with the UK Forestry Standard, which has clear diversity prescriptions. Owing to the long term nature of forestry, some proposals will take time to achieve (in some cases beyond the LMP ten year period). As per current legislation and the UKFS, maintaining water at a potable quality is of high importance to FLS. Private water supply infrastructure has been ground checked and mapped FLS's geographic information system. This data is communicated during the work planning process for all forestry operations to help protect water supplies. Affected private water supply users will be consulted prior to work commencing and features will be clearly marked on all contract maps, as well as being buffered on the

Consultee	Date contacted	Date of response	Issues raised	FLS response
				ground. All forestry operations will meet the requirements of the UK Forestry Standard Guidelines on Forests and Water, which tie in with relevant water legislation. Additional protections are also put into effect if deemed necessary during site inspections. In the event of water supplies are disturbed, FLS would inform private water supply users and South Ayrshire Council's Environmental Health department, and carry out repairs promptly. Refer to **4.5** and **4.7**, **Maps 4**, **6**, **7** and **13**, and **Appendix IX.**
Raptor Study Group	03/06/2021	No response	N/A	N/A
RSPB	03/06/2021	No response	N/A	N/A
Saving Scotland's Red Squirrels	04/06/2021	18/06/2021	Minimise the impact of any forestry work on the red squirrels in this area whilst acknowledging that commercial conifers will be subject to cycles of felling and restocking, and that other factors also need to be considered such as windthrow. Suggest considering ways of improving/maintaining the habitat for red squirrels and, when planning felling, take into account the movement of squirrels and habitat connectivity. Other aspects to consider include planting regimes, which include a mix of species and age class to allow for a continuity of food supply. Relevant surveys to be carried out in advance and work is planned to factor in the breeding season. We would suggest that alongside the felling permission, landowners and contractors are made aware of the risk and responsibility they have to resident red squirrels.	Appreciative of interest and participation in planning process. Owing to high DAMS across Kilgallioch, opportunities for continuous cover forestry are limited, however, FLS practice phased felling while restocking with alternative (palatable) species and minimum interventions/long term retentions are encompassed by this plan where appropriate. Forestry operations are subject to work planning and site checks, with delivery staff fully briefed to minimise disruption to red squirrel and other wildlife. Refer to **4.1** and **4.2**.
Scottish Forestry	31/05/2021	Ongoing	Acid sensitive catchments checked and additional data provided.	Appreciate advice and data provided.
Scottish Power Renewables	03/06/2021	05/08/2021	No comment at this time.	Appreciative of interest and participation in planning process. Refer to **4.5**.
Scottish Water	03/06/2021	17/06/2021	There are no Scottish Water drinking water catchments or water abstraction sources, which are designated as Drinking Water Protected Areas under the Water Framework Directive, in the area that may be affected by the proposed activity. There are no Scottish Water assets (including water supply and sewer pipes, water and waste water treatment works, reservoirs, etc.) in the area. Proposals will be required to comply with Sewers for Scotland and Water for Scotland 4th Editions 2018, including provision of appropriate clearance distances from Scottish Water assets.	Appreciative of interest and participation in planning process. Refer to **4.7**.
Scottish Wildlife Trust	03/06/2021	No response	N/A	N/A

Consultee	Date contacted	Date of response	Issues raised	FLS response
Scottish Woodlands	04/06/2021	No response	N/A	N/A
Scottish Environment Protection Agency (SEPA)	03/06/2021	09/09/2021	Representatives of FLS, SEPA and Crichton Carbon Centre met in September 2021 to discuss development of the Kilgallioch LMP. Points raised by SEPA via discussion and subsequent correspondence: Supportive of plan concept and landscape scale approach. Area offers meaningful potential to maximise ecosystem outcomes and influence the wider catchment(s). Consider placing greater emphasis on this within the land management plan. Appreciative of shared boundaries with private landowners. SEPA and FLS are both signed up to Riverwoods initiative which fits well with peatland restoration and wet woodlands. Encourages untypical riparian zones (e.g. creation of mini coupes and glades with dwarf shrubs, pollination highways, etc.). Also be mindful of Water Framework Directive obligations; including brash recovery. Peatland restoration: intention to utilise stump flipping and ground smoothing is welcomed. Access tracks should ideally avoid areas of shallow and deep peat. There is education potential via school involvement with monitoring, etc. Sensitive water catchments: there are legacy issues influencing water quality in this area. An 'oasis' style approach with the creation of small woodlands, glades, etc. would be an attractive option. In agreement that sampling is not required as recent ecological and chemical work gives confidence that catchments are acidified. FLS have a responsibility under the Water Framework Directive to improve water quality. Given SAC status of the Tarf Water catchment, all works should aim for completion within 10 years rather than 20 if possible. Riparian buffers: UKFS is guidance on minimum buffers and is commercially orientated. With collaborative working, there is support to deviate from the UKFS for NBL planting where there are ecosystem benefits. NBL are fine within the buffer zones and should complement any restoration and climate change mitigation efforts. Expectation that 'Cultivation of Upland Woodland Creation Sites' is	Appreciative of advice and involvement in the planning process. FLS also welcome SEPA's support of peatland restoration proposals and catchment work. During the timescale of this plan, FLS intend on establishing broadleaf cover in riparian areas, with native woodland (low density BL/open ground) along key watercourses (i.e. the Tarf based on GFT recommendations). Tree establishment must balance appropriate siting for shade provision/bank stabilisation with where it will be possible to provide adequate protection against browsing. A tree guard removal plan will be in place if these are used to aid establishment, however, consideration will be given to planting in dense groups with thorny mantles and micro-siting will likely be required throughout work planning. The design is compliant with the riparian buffers recommended with the UKFS and goes beyond these in some instances along main watercourses. FLS have visited site alongside Galloway Fisheries Trust (GFT) to identify areas where riparian planting may benefit aquatic habitats. Riparian planting will be as described above and take GFT's advice into consideration. FLS are unable to control coniferous seeding on banks that are outwith the national estate. FLS will monitor and appropriately manage natural regeneration within FLS blocks. It should be noted that felling options in the south of the block are currently limited by stand maturity and, as the Tarf Water is an acidified catchment, the scale of felling is also regulated. It is possible that there will be better restructuring and peatland restoration opportunities with future plan revisions. Conflicting policies for sustainable forestry and peatland restoration are subject to ongoing discussion with Scottish Forestry at this time. FLS welcome the positive comments regarding peatland restoration proposals, in addition to the precautionary approach of assuming catchments are acidified for the purposes of the LMP: restocking and felling proposals reflect this and practice guidance is to be followed during delivery of the plan.

Consultee	Date contacted	Date of response	Issues raised	FLS response
			followed for restocking operations. Use of plastic-based guards to support broadleaf protection must come with removal plan. Flooding: best to consider pollution control and flood risk with felling operations and to slow. The LMP deviates from 'tradition' as there will be reduced restocking in peat areas and peatland restoration will likely have a positive influence. Advice is to increase and expedite flood risk management efforts. It is recommended that FLS consider the larger catchment and avoid fragmenting the landscape. Water supplies: need to consider source waters for PWS and potential impact on the supply of water to residences. It is recommended FLS ground truth information provided by the local authority, give due consideration to source waters, and be mindful throughout operations (e.g. the right machine in the right place). Any sources should be clearly mapped and walked with contractor and machinery should be kept outwith these areas. 50 m buffer is the de minimis guidance value and depending on source area extent this value should be increased accordingly. The buffer distances highlighted in the Know the Rules Booklet are minimum distances and greater zones should be allocated where source areas are extensive or boundaries unknown.	Maintenance and improvement of water quality is an objective of this land management plan. FLS will stringently comply with the UKFS, the latest UKFS Forests and Water guidance, Forestry and Water Scotland: Know the Rules 2nd Ed., and the FLS South Region Pollution Control Plan. Ground preparation will be appropriate to the site type and typically involve inverted mounding and/or flat planting. The Cross Water catchment has been identified as the Potentially Vulnerable Area (PVA) for flooding associated with the community of Barrhill. While the Duisk River catchment helped form the PVA during its initial consultation, SEPA's (2021) published 'Flood Risk Management Plan: Ayrshire Local Plan District' omits the Duisk River from the PVA. Accordingly, FLS have considered the Cross Water catchment as the key flood risk area for the purposes of this plan. FLS notes there are no historical records of flooding in the area and SEPA's current objectives are to avoid inappropriate development and to improve general understanding of potential flooding. There is <0.2 ha planned felling at Kilgallioch that falls within the Cross Water catchment. As such, it is expected FLS proposals for the block will have limited influence over flood risk within the PVA. While there are no specific flood management interventions proposed during the period of this plan owing to crop maturity, careful consideration will be necessary for subsequent plan revisions which may involve forest to bog operations. There is interaction between the neighbouring FLS block at Arecleoch and the Cross Water catchment. As such, flood risk management measures will be given full consideration as part of the upcoming Arecleoch LMP renewal (due 2023). Potential instances of localised flooding relevant to Kilgallioch have been considered within this plan. Mitigation measures include woodland establishment, phased felling, and peatland restoration. Water supply information was sought from the relevant local authority and ground truthed. Advice was sought from Forest Research and the FLS Peatland team to assist with appropriate development of felling, restocking and restoration proposals. The design complies with the UKFS and, where relevant to operations, supplies will be ground truthed and marked on site ahead of forestry operations. Operations will strictly adhere to the latest UKFS Forests and Water guidance, Forestry and Water Scotland: Know the Rules 2nd Ed., and the FLS South Region Pollution Control Plan. Refer to **4.2**, **4.4**, **4.6**, **4.7**, **Maps 4**, **6**, **13**, and **Appendices VI**, **VII**, and **IX**.

Consultee	Date contacted	Date of response	Issues raised	FLS response
South Ayrshire Council	04/06/2021	09/07/2021	There are some areas which are identified as sensitive area where the nature or combination of sensitivities restricts the scope to accommodate woodland expansion or removal. In this area, proposals should be of a scale and character which can be accommodated without significant negative impacts on the landscape. Diverse broadleaf/open ground edge could be considered to soften the edges of the boundaries. Riparian zones could be developed with mixed native broadleaves in order to create long term buffers and improve habitat networks. The Ayrshire and Arran Forestry and Woodland Strategy supports the ongoing restructuring of existing conifer plantations to achieve a better fit with the landscape. Restructuring of the forest will achieve more diverse age and species range. There may be a potential flooding risk and any private water supplies will need to be identified and protected from any forest works and their quality maintained. Consultation with SEPA and SAC Environmental Health should be undertaken in order that the impact on watercourses, including any domestic water supplies, on neighbouring properties as a result of the LMP is investigated. Details of PWS in the area and relevant legislation were provided. Access: woodland management can be used to create high quality opportunities for outdoor recreation. There is the right of responsible access for the public, as permitted under the Land Reform (Scotland) Act 2003, applies. The long distance route the SUW runs along the south of the site. It would be a great benefit if consideration is given to formalising public access links from the Southern Upland Way. Promote the role of woodland in contributing to water quality. Consultation with SEPA as there may be possible flooding due to the number of lochs and watercourses within the boundary of the site. There is a presumption in favour of protecting woodland and that removal should only be permitted where it would achieve significant and clearly defined additional public benefits. Attention should be taken of the views of NatureScot on the cumulative landscape and visual impact of the proposal.	Appreciative of comments, advice and involvement in the planning process. Kilgallioch is subject to a rolling felling and restocking programme to provide a sustainable timber supply. It is therefore necessary to balance timber production with other key management objectives, such as enhancing age and species diversity. FLS will likely restock with a productive species as well as alternative species where ground conditions permit and in compliance with the UKFS. Another aim is to establish broadleaved species where they will best benefit terrestrial and water ecosystems while not succumbing to damage from the large deer population in the area. FLS work with relevant partners, as well as our internal wildlife management and environment teams, to assist with this. This plan seeks to conform with landscape character types and has been developed with input and advice from the FLS Landscape Architecture team to achieve best landscape fit. FLS appreciate the concerns raised and the provision of water supply information. These details were ground truthed by FLS staff and advice was sought from Forest Research and the FLS Peatland team to assist with appropriate development of felling, restocking and restoration proposals. All FLS plans and operations are regulated by Scottish Forestry and complaint with the UK Forestry Standard. The design complies with the UKFS and, where relevant to operations, supplies will be ground truthed and marked on site ahead of forestry/peatland operations. Operations will strictly adhere to the latest UKFS Forests and Water guidance, Forestry and Water Scotland: Know the Rules 2nd Ed., and the FLS South Region Pollution Control Plan. At this time, FLS await further direction from the Scottish Government and Scottish Forestry (the forestry sector regulator) regarding any relevant policy changes on this topic. There is <0.2 ha planned felling at Kilgallioch that falls within the Cross Water catchment. As such, it is expected FLS proposals for the block will have limited influence over flood risk within the PVA. While there are no specific flood management interventions proposed during the period of this plan owing to crop maturity, careful consideration will be necessary for subsequent plan revisions which may involve forest to bog operations. Potential instances of localised flooding relevant to Kilgallioch have been considered within this plan. Mitigation measures include woodland establishment, phased felling, and peatland restoration.

Consultee	Date contacted	Date of response	Issues raised	FLS response
			Consultation with NatureScot and SWT recommended regarding potential fencing. Consult Nature.Scot for Wildlife Site No. 7 Loch Duisk. Consultation with West of Scotland Archaeology should be undertaken. There are a number of windfarms within the site area and consultation with the respective operators should be undertaken as well as conforming to any permission restrictions. All timber haulage should adhere to the Timber Transport Forum "Road Haulage of Round Timber – Code of Practice. The proposed Forest Plan should align with the South Ayrshire Local Development Plan and Ayrshire and Arran Woodland Strategy. The creation of a land management plan should meet UKFS and UKWAS requirements.	FLS welcome access as per Rights of Way and in line with the Scottish Outdoor Access Code. There is an extensive forest road network across the site and the Southern Upland Way traverses the forest in the south. Regrettably, it is unlikely that establishing formal recreation facilities at Kilgallioch will be possible at this time. Maintenance and improvement of habitats is an objective of this land management plan. The proposed restock design evidences an increase in species diversity and habitat linkage across the block, while an increased area of NBL and peatland restoration efforts will contribute to carbon sequestration. FLS will stringently comply with the UKFS, the latest guidance, and the FLS South Region Pollution Control Plan to avoid significant detrimental impact. Refer to **4.0**, **Maps 4**, **6**, **7**, **13**, and **Appendix IX**.
Tilhill Forestry	04/06/2021	No response	N/A	N/A
West of Scotland Archaeology Service (WOSAS)	03/06/2021	30/06/2021	Due to the Coronavirus pandemic, unresourced work, such as the provision of free advice to the forestry industry, has been assigned a lower priority. Consequently, it is unlikely that WOSAS will provide comment. This should not be taken as indicating that it does not raise an archaeological issue.	Appreciative of the difficult circumstances under which WOSAS have been working. Participation in the planning process is voluntary and FLS recognise that no comment does not necessarily constitute support for the Kilgallioch proposal. Refer to **4.3**, **Map 12**, and **Appendix IV**.
Visit Scotland	03/06/2021	No response	N/A	N/A

Appendix IV: Historic environment records

Refer to **Map 12**.

Historic Environment Records					
Designation	**Name**	**Feature description**	**Grid reference**	**Importance**	**Area (ha)**
Designated Scheduled monument SM20020.07	Wells of the Rees	Church, well(s). Wells 500 m NNE of Kilgallioch. Three springs covered by stone structures currently identified within open space / stone dyke field system; SAM plan current.	NX2299372326	National importance	0.2
Undesignated	Sheep ree	Sheepfold	NX228731	Local importance	0.6
Undesignated	HLA relict area	Later prehistoric settlement and agriculture	NX252788	Uncategorised	2.0
Undesignated	Craig Airie fell	Cairn (possible), cist (possible), sheepfold	NX232743	Regional importance	0.1
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX247773	Uncategorised	2.8
Undesignated	Benbrake hill, enclosure	Enclosure	NX229744	Uncategorised	0.1
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX256789	Uncategorised	1.6
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX241755	Uncategorised	3.0
Undesignated	Airyewn	Building	NX227754	Regional importance	0.1
Undesignated	Pulganny burn	Building	NX239751	Regional importance	0.1
Undesignated	Loch Mabrennie	Building	NX271779	Regional importance	0.1
Undesignated	Cairn hill	Marker cairn	NX227716	Uncategorised	1.0
Undesignated	Pullower burn	Structure	NX237772	Regional importance	0.1
Undesignated	Little burn	Structure	NX220787	Regional importance	0.1
Undesignated	Long stone' long stone rig	Standing stone (possible)	NX227714	Regional importance	0.1
Undesignated	Little burn	Structure	NX222788	Regional importance	0.1
Undesignated	Dochroyle	Castle (possible)	NX230793	Uncategorised	1.0
Undesignated	Drumean	Structure	NX242783	Regional importance	0.1
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX235760	Uncategorised	1.5
Undesignated	Enclosure	Sheepfold	NX210780	Local importance	0.1
Undesignated	Benbrake hill	Farmstead	NX232747	Regional importance	0.1
Undesignated	Sheepfold	Sheepfold	NX237760	Local importance	0.1

Historic Environment Records					
Undesignated	Long loch, Laggish	Hut circle (possible)	NX237766	Regional importance	0.1
Undesignated	Long loch	Cairnfield	NX238765	Uncategorised	1.0
Undesignated	Sheep ree	Sheepfold	NX224724	Local importance	0.1
Undesignated	Pullower burn	Shieling hut (possible)	NX221743	Regional importance	0.1
Undesignated	Craig Airie fell	Cairn	NX232743	Regional importance	0.1
Undesignated	Pollgowan burn, Knockycoid	Cairnfield (possible), cultivation remains (possible), enclosure	NX253781	Regional importance	3.1
Undesignated	Craig Airie fell	Enclosure	NX235743	Local importance	0.1
Undesignated	Darnarroch	Farmstead	NX241755	Regional importance	0.7
Undesignated	Darnarroch	Cairn (possible)	NX245757	Regional importance	0.1
Undesignated	Pollgowan burn, Knockycoid	Cairnfield, field boundary(s)	NX252785	Regional importance	3.8
Undesignated	HLA relict area	Later prehistoric settlement and agriculture	NX252784	Uncategorised	1.1
Undesignated	Benbrake hill, sheep ree	Sheep ree	NX229744	Local importance	0.1
Undesignated	Laggish burn	Field system	NX214785	Local importance	1.5
Undesignated	Laggish burn	Field system(s)	NX212781	Local importance	1.9
Undesignated	Craigance	Farmstead, head dyke, sheepfold, structure	NX245776	Regional importance	2.4
Undesignated	Knockycoid	Enclosure	NX254771	Local importance	0.6
Undesignated	Airyewn	Enclosure(s), farmstead, field system, kiln, sheepfold	NX224755	Regional importance	2.5
Undesignated	Craigance	Sheepfold	NX249775	Local importance	0.1
Undesignated	Knockylaight	Field system(s)	NX258780	Local importance	10.7
Undesignated	Killgallioch, 'kill fairy'	Enclosure (possible)	NX229720	Local importance	0.9
Undesignated	Killgallioch	Farmstead, field system, head dyke, sheepfold	NX227718	National importance	52.2
Undesignated	Tarf water	Structure(s)	NX221735	Regional importance	0.1
Undesignated	Benbrake hill	Farmstead	NX232747	Regional importance	0.1
Undesignated	Ward hill	Enclosure(s), field system, structure	NX242739	Regional importance	15.1
Undesignated	Craigairie	Farmstead	NX242736	Regional importance	1.2
Undesignated	Craigmoddie fell	Enclosure(s), field system, field system(s), structure(s)	NX240730	Regional importance	8.9
Undesignated	Craig dhu cairn	Cairn	NX232725	Regional importance	0.1
Scheduled monument	HLA relict area	Later prehistoric settlement and agriculture	NX227719	National importance	78.1

Historic Environment Records					
Undesignated	HLA relict area	Later prehistoric settlement and agriculture	NX253781	Uncategorised	2.2
Undesignated	Pullower burn	Shieling hut (possible)	NX221744	Regional importance	0.1
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX224755	Uncategorised	14.7
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX241757	Uncategorised	2.8
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX249777	Uncategorised	2.7
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX212781	Uncategorised	1.7
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX228776	Uncategorised	1.7
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX241728	Uncategorised	23.5
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX257789	Uncategorised	1.2
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX239731	Uncategorised	32.1
Undesignated	HLA relict area	Medieval/post-medieval settlement and agriculture	NX242742	Uncategorised	38.3
Undesignated	Chirmorie	Building (possible), enclosure	NX220760	Uncategorised	1.0
Undesignated	Loch Mabrennie	Sheepfold	NX272781	Local importance	0.1
Undesignated	Craigance	Chambered cairn (possible)	NX248774	Regional importance	0.1
Undesignated	Pollgowan burn, Knockycoid	Cairnfield, rig and furrow	NX257789	Regional importance	1.6
Undesignated	Little burn	Sheepfold	NX220787	Local importance	0.1
Undesignated	HLA relict area	Rcahms HLA data; type = plantation; relic types medieval/post-medieval medieval/post-medieval settlement and agriculture / 18th century-present rectilinear fields and farms / not applicable not applicable	NX228776	Uncategorised	1.9
Undesignated	HLA relict area	Rcahms HLA data; type = plantation; relic types medieval/post-medieval medieval/post-medieval settlement and agriculture / not applicable not applicable / not applicable not applicable	NX236761	Uncategorised	1.8
Undesignated	HLA relict area	Rcahms HLA data; type = plantation; relic types medieval/post-medieval medieval/post-medieval settlement and agriculture / not applicable not applicable / not applicable not applicable	NX229775	Uncategorised	0.5
Undesignated	HLA relict area	Rcahms HLA data; type = plantation; relic types medieval/post-medieval medieval/post-medieval settlement and agriculture / not applicable not applicable / not applicable not applicable	NX245777	Uncategorised	10.7
Undesignated	HLA relict area	Rcahms HLA data; type = plantation; relic types 18th century-present rectilinear fields and farms / not applicable not applicable / not applicable not applicable	NX231721	National importance	11.6
Undesignated	HLA relict area	Rcahms HLA data; type = plantation; relic types 18th century-present rectilinear fields and farms / not applicable not applicable / not applicable not applicable	NX227777	Uncategorised	4.4

Historic Environment Records					
Undesignated	HLA relict area	Rcahms HLA data; type = plantation; relic types 18th century-present rectilinear fields and farms / not applicable not applicable / not applicable not applicable	NX237782	Uncategorised	2.5
Undesignated	HLA relict area	Rcahms HLA data; type = plantation; relic types 18th century-present rectilinear fields and farms / not applicable not applicable / not applicable not applicable	NX275788	Uncategorised	197.3
Undesignated	HLA relict area	Rcahms HLA data; type = rough grazing; relic types medieval/post-medieval medieval/post-medieval settlement and agriculture / not applicable not applicable / not applicable not applicable	NX258739	Uncategorised	29.6
Undesignated	HLA relict area	Rcahms HLA data; type = rough grazing; relic types 18th century-present rectilinear fields and farms / not applicable not applicable / not applicable not applicable	NX277785	Uncategorised	5.3
Undesignated	HLA relict area	Rcahms HLA data; type = rough grazing; relic types 18th century-present rectilinear fields and farms / not applicable not applicable / not applicable not applicable	NX263794	Uncategorised	2.9
Undesignated	Sheepfold	Sheepfold	NX236761	Local importance	0.1
Undesignated	Long loch (unknown feature)	Un-identified stone feature	NX234764	Uncategorised	0.1
Undesignated	Co Const, P Const & UA Bdy	Boundary dyke	NX235753	Local importance	5.4

Appendix V: Management prescriptions

Refer to **4.1** and **Maps 4**, **5**, **6** and **7**.

Management prescriptions (felling, thinning & restocking)			
Coupe ID	**Management type**	**Species**	**Prescription**
19036	Clear fell Phase 1: 2023/24	HL 6.7 ha JL 0.7 ha SS 0.5 ha	Second rotation conifer, with infected crop. Good access from existing forest road (with roadside underground cabling associated with the windfarm). Coupe sits within the Tarf Water acid sensitive catchment, therefore best practice guidance should be followed (e.g. adhere to planned felling year, brash recovery, etc.). Subsequent establishment of NF and SS.
	Restock	NF 6.6 ha SS 1.9 ha	Plant NF and SS for timber production.
19002	Clear fell Phase 1: 2023/24	HL 3.0 ha LP 5.5 ha SS 6.0 ha BL 1.0 ha	Second rotation conifer. The coupe interfaces with Kirkcowan Flow SSSI therefore sensitive low-impact felling and extraction is required, in addition to strict adherence to the South Region Pollution Control Plan and robust on-site diffuse pollution mitigation. Retain BL for structural diversity. Coupe sits within the Polbae Burn acid sensitive catchment, therefore best practice guidance should be followed (e.g. adhere to planned felling year, brash recovery, etc.). Good access, however, note the Southern Upland Way bisects the coupe along the forest road. Subsequent establishment of low density NBL woodland with potential for small-scale restoration of peats hydrologically connected to the SSSI following site surveying. Consideration will be given to harvesting alongside 19053 and 19024.
	Restock	14.5 ha	This area lies within the Kirkcowan Flow SSSI buffer zone. Establish low density broadleaf woodland (BL/OG at 50:50) for ecosystem and aesthetic benefit. Potential for some of previous crop (BL P1999/2010) to have been retained for structural diversity. (There is also potential for small-scale restoration of peats hydrologically connected to the SSSI following site surveying.)
19053	Clear fell Phase 1: 2023/24	HL 2.4 ha JL 2.3 ha	Second rotation infected crop on steep ground and among heritage features. Good access, however, note the Southern Upland Way Core Path intersects the coupe in the northwest. Coupe sits within the Polbae Burn acid sensitive catchment, therefore best practice guidance should be followed (e.g. adhere to planned felling year, brash recovery, etc.). Consideration will be given to harvesting alongside 19024 and 19002. Subsequent SS and OC establishment.
	Restock	SS 3.3 ha OC 2.4 ha	Plant for timber production with alternative species offering habitat and aesthetic benefit along the Southern Upland Way.
19064	Clear fell Phase 1: 2023/24	SS 43.2 ha	First rotation conifer with large areas of windblow (edge and internal) and a disused quarry in the northeast. Access via the existing forest road (with roadside underground cabling associated with the windfarm); avoid haulage along the forest road passing through neighbouring private land in the west. Strict adherence to the South Region Pollution Control Plan, and a site specific risk assessment and robust on-site diffuse pollution mitigation, is necessary due to potential interaction with the Laggish Farm water supply via the Haw Burn. Consideration will be given to

Management prescriptions (felling, thinning & restocking)			
			harvesting alongside 19070. Subsequent establishment of SS, with a small area of OG to accommodate soils (10b) associated with priority open habitat.
	Restock	SS 33.9 ha	Plant for timber production with a small area of OG to accommodate priority open habitat (10b soils). (Note potential interaction with a residential PWS via the Haw Burn.)
19070	Clear fell Phase 1: 2023/24	HL 1.8 ha JL 0.6 ha	Infected and isolated crop in close proximity to the public road. Fell to recycle as access is limited by existing crop, wet ground conditions, and a roadside underground export cable associated with the windfarm. Consideration will be given to felling alongside 19064. Subsequent NBL establishment to blend with existing native wet woodland.
	Restock	BL 2.3 ha	NBL establishment to blend with existing native wet woodland, with minor low density (BL/OG at 50:50) woodland component as future peatland fringe.
19502	Clear fell Phase 1: 2023/24	Non-native natural regeneration	Open ground hill top along the Southern Upland Way (core path) route where naturally regenerating non-native conifer could potentially obscure the 360º views. Stems are a mix of above and below 10 cm dbh. Parking is possible on the nearby forest road, with direct on-foot access via the core path on the steep hillside. Area has recreational interest, therefore sensitive extraction is required. Coupe to be maintained as managed open ground going forwards.
	Restock	Maintain as open ground	Open hill top to preserve 360º view along the Southern Upland Way.
19050	Clear fell Phase 1: 2024/25	SS 10.4 ha	First rotation conifer with a minor windblow component (edge). New spur road construction is required for suitable access owing to surrounding underground cabling associated with the windfarm. Coupe sits within the Pulganny Burn and Polbae Burn acid sensitive catchments, therefore best practice guidance should be followed (e.g. adhere to planned felling year, brash recovery, etc.). Distinct BL and SS to be established.
	Restock	SS 8.0 ha BL 2.4 ha	Plant for timber production, with BL to provide biodiversity benefits.
19061	Clear fell Phase 1: 2024/25	HL 1.6 ha SS 21.9 ha	First rotation conifer with minor infected crop element. Large areas of windblow crop (internal and edge) on wet ground conditions. Good access via the forest road. However, note this is also the main access to the windfarm and private forestry, and the coupe's north-eastern boundary with the B7027 public road. Subsequent establishment of SS and LP.
	Restock	SS 18.3 ha LP 2.7 ha	Plant for timber production with a small area of OG to accommodate priority open habitat.
19007	Clear fell Phase 1: 2025/26	HL 0.5 ha LP 2.7 ha SS 36.1 ha	First rotation conifer on very wet ground conditions, among heritage features, and with areas of windblow (edge and internal). Access via the existing forest road (with roadside underground cabling associated with the windfarm). Note that the Southern Upland Way Core Path intersects the coupe. Strict adherence to the South Region Pollution Control Plan, in addition to robust on-site diffuse pollution mitigation, is necessary due to direct interaction with the Tarf Water, its tributaries, and the River Bladnoch SAC. Coupe also sits within the Tarf Water acid sensitive catchment, therefore best practice guidance should be followed (e.g. adhere to planned felling year, brash recovery, etc.). Distinct BL and SS to be established, in addition to riparian NBL planting.

Management prescriptions (felling, thinning & restocking)			
	Restock	SS 7.5 ha LP 3.2 ha OC 5.5 ha BL 20.5 ha	Plant for timber production (SS/LP 70:30). BL woodland to benefit biodiversity. Establish low density native cover (OG/NBL 80:20) within the Tarf Water buffer zone to continue efforts to improve water quality and to help regulate water temperature (for fish species, particularly Salmonids). NBL to be planted in groups, likely using Hawthorn as a shroud for more palatable species. NBL groups targeted: on both embankments (for stabilisation), with more concentrated on southern banks where the watercourse flows east/west (for dappled shade provision); where the watercourse widens but avoiding areas prone to localised flooding (to alleviate stress); and should be situated up to 5-10 m from the bank (to facilitate succession).
19049	Clear fell Phase 2: 2027/28	JL 3.3 ha	Infected and isolated crop in close proximity to the B7027 public road. Fell to recycle as access is limited by existing crop. Consideration will be given to felling alongside other phase two coupes. Subsequent SS establishment to link with surrounding crop.
	Restock	SS 3.3 ha	Plant for timber production and linkage to surrounding crop.
19067	Clear fell Phase 2: 2027/28	LP 1.1 ha SS 73.6 ha	First rotation conifer on very wet ground conditions with large areas of windblow (edge and internal). East of the spur, there is a small area of second rotation conifer. Coupe sits within the Pulganny Burn acid sensitive catchment, therefore best practice guidance should be followed (e.g. adhere to planned felling year, brash recovery, etc.). Good access from the main general access route and spur. Area to be restored to peatland, therefore sensitive low-impact felling and extraction required, with a minor native broadleaf component on mineral soils.
	Restore/Restock	BL 4.0 ha	Peatland restoration with minor broadleaf component on mineral soils.
19028	Clear fell Phase 2: 2028/29	HL 0.1 ha JL 8.3 ha LP 2.9 ha NF 1.2 ha SS 10.2 ha BL 5.8 ha	Second rotation conifer, with infected crop. Retain pure SS, NF and SS/BL stands for diversity. Access via the existing forest road (with roadside underground cabling). Coupe sits within the Pulganny Burn and Polbae Burn acid sensitive catchments, therefore best practice guidance should be followed (e.g. adhere to planned felling year, brash recovery, etc.). Consideration will be given to harvesting alongside 19053 and 19002. Subsequent SS, SP and OC establishment.
	Restock	OC 6.2 ha SP 7.5 ha SS 4.0 ha BL 2.6 ha	Plant for timber production with alternative species offering habitat and aesthetic benefit.
19072	Clear fell Phase 2: 2028/29	HL 1.0 ha JL 2.4 ha SS 55.4 ha	First rotation conifer with discreet pocket of infected crop to the south and some areas of windblow (internal and edge). Ground conditions are wet due to peat soils and topography is uneven. Cow Loch lies within the coupe. Access via the existing forest road, however, note this is also the main access to the windfarm. Consideration will be given to felling alongside coupe 19615. Low density wet woodland to be established, with SS and BL on mineral soils.
	Restock	BL 49.0 ha SS 9.4 ha	Flat plant low density native wet woodland (BL/OG at 50:50) to benefit biodiversity. Establish SS and BL with productive potential on mineral soils.
19615	Clear fell Phase 2: 2028/29	HL 1.5 ha SS 1.5 ha	First rotation mixed conifer with infected crop on very wet ground conditions. Surrounding open area consists of deep peat soils and three lochs, therefore sensitive low-impact felling and extraction required. Coupe sits within the Pulganny Burn acid sensitive catchment, therefore best

Management prescriptions (felling, thinning & restocking)			
			practice guidance should be followed (e.g. adhere to planned felling year, brash recovery, etc.). Access via existing forest road network, however, note this is also the main access to the windfarm. Consideration will be given to felling alongside coupe 19072. Subsequent restock will predominantly be BL.
	Restock	BL 4.9 ha	Flat plant low density wet woodland (BL/OG 50:50) to benefit biodiversity.
19054	Clear fell Phase 2: 2029/30	HL 0.3 ha SP 0.8 ha SS 46.1 ha BL 0.5 ha	First rotation conifer with minor infected crop element. Upgrade of the existing forest road is required to access the coupe. Note private water supply infrastructure (i.e. pipeline) runs alongside the road and the coupe's north-western boundary. Also note proximity of the area to powerlines, private residences and the B7027 public road. Very wet ground conditions, with sensitive low-impact felling and extraction recommended. Where feasible, retain mature SP on mineral soils, respecting designed OG/BL buffer for peatland recovery. Subsequent restocking with BL, with a minor SS element.
	Restock	SP 0.5 ha BL 39.7 ha	To benefit biodiversity establish low density native wet woodland (BL/OG 50:50), targeting non-priority peat soils for planting. Establish BL with productive potential in the north of the coupe. Minor SP component could potentially be fulfilled by retention of first rotation SP (P1977). (Note the residential PWS pipeline runs along the forest road.)
19015	Clear fell Phase 2: 2030/31	HL 2.7 ha SP 0.2 ha SS 17.1 ha	First rotation conifer with distinct pockets of infected crop. Both heritage features and watercourses are present within the coupe. Access via the existing forest road. Underground cabling associated with the windfarm is at roadside and along the north-western boundary. Retain existing SP for structural diversity. Subsequent restock will be predominantly SS and SP, with a minor BL element.
	Restock	SP 1.4 ha SS 15.3 ha BL 0.2 ha	Plant for timber production with a minor BL component and OG to accommodate priority open habitat.
19041	Clear fell Phase 2: 2030/31	HL 5.5 ha SS 38.8 ha	Predominantly first rotation conifer with distinct pockets of infected crop and second rotation conifer. Small areas of windblow (edge) are present, however, the coupe should be retained to late in phase due to raptor interest. (Potential to retain a minor element of mature SS on mineral soils to benefit raptor to be considered at work planning stage by Planning, Peatland, and Environment teams.) Access via the existing forest road, which will require upgrading. Strict adherence to the South Region Pollution Control Plan and site specific risk assessment due to potential for interaction with the Laggish Farm water supply via the Haw Burn. Area to be restored to peatland, therefore sensitive low-impact felling and extraction required. There will also be subsequent restocking of SS, LP and BL where appropriate.
	Restore/Restock	LP 2.6 ha SS 24.1 ha BL 2.5 ha	Restoration of priority peat soils in the north. Buffering the peatland, plant conifer for timber production on mineral soils, with minor BL component for biodiversity benefits. Minor SS component could potentially be fulfilled by retention of first rotation SS (P1974) to benefit raptor.
19075	Clear fell Phase 2: 2030/31	JL 1.0 ha	Two distinct pockets of infected crop: northern pocket is in close proximity to the forest road (which has a roadside underground export cable associated with the windfarm). Fell to recycle southern pocket where access is limited by existing crop and wet ground conditions. Consideration

Management prescriptions (felling, thinning & restocking)			
			will be given to felling alongside larger phase two coupes (e.g. 19015, 19041). Subsequent minor BL establishment and peatland restoration alongside coupe 19011.
	Restore/Restock	BL 0.7 ha	Restoration of priority peat soils in south alongside coupe 19011. Minor low density broadleaf planting (BL/OG 50:50) on mineral soils linking with existing BL woodland in the north.
19002	Thin Phase 1: 2023/24	SS 95.0 ha LP 10.0 ha	Dense naturally regenerating conifer with some evidence of self-thinning likely due to frost. Currently <1.5 m in height, SS dominates upper slopes and hill tops, with LP on lower slopes and level ground. Access is good via existing forest road network, however, note the presence of windfarm infrastructure including roadside underground cabling. Respace to 2,500 stems/ha using systematic and selective thinning as a single operation. If the intervention period has been missed (i.e. stems are >2 m in height), the crop will be considered for felling at 15-25 age class (i.e. as a biomass crop). This coupe sits within acidified water catchments, therefore best practice guidance should be followed (e.g. adhere to planned felling year, brash recovery, etc.). Strict adherence to the South Region Pollution Control Plan, in addition to robust on-site diffuse pollution mitigation, is necessary due to direct interaction with the Tarf Water (i.e. the River Bladnoch SAC) in the west. Peatland restoration is also planned in the coupe's western reaches, therefore sensitive low-impact felling and extraction required.
19003	Thin Phase 1: 2024/25	SS 48.3 ha	Dense naturally regenerating SS currently <1.5 m in height. Access is good via existing forest road network, however, note the presence of windfarm infrastructure including roadside underground cabling. Respace to 2,500 stems/ha using systematic and selective thinning as a single operation. If the intervention period has been missed (i.e. stems are >2 m in height), the crop will be considered for felling at 15-25 age class (i.e. as a biomass crop). This coupe sits within acidified water catchments, therefore best practice guidance is to be followed (e.g. adhere to planned felling year, brash recovery, etc.).

Appendix VI: Acid sensitive catchments

The purpose of this document is to demonstrate that felling and restock proposals for Kilgallioch are compliant with the 'Managing forests in acid sensitive water catchments' FC practice guide (2014). The acid sensitive catchments relevant to Kilgallioch are assessed as follows:

- 1.0 Critical loading is considered for water bodies with a 'failing' status: restocking proposals are evaluated to determine if the area of closed canopy forest (age > 15 years) will exceed 30% of the (sub-)catchment in 15 years' time.

- 2.0 Potential felling impacts on the site are assessed for catchments with a 'failing' or 'at risk' status: the scale of planned felling in any three year period is checked against a 20% (sub-)catchment threshold.

The relevant catchments are described below and shown in maps (3.0) at the end of this appendix:

- The Cross Water catchment is at risk of acidification (as per Forest Research's Acid Vulnerable Catchments 2020 dataset). It is a total area of 1,230 ha and overlaps both Kilgallioch (by 26 ha) and Arecleoch FLS blocks.

- The Polbae Burn catchment is an acidified catchment. It confluences with the Pulganny Burn to give a total catchment area of 6,763 ha. It overlaps Kilgallioch (by 539 ha), Penninghame and Tannylaggie FLS land management units, and privately owned woodlands.

- The Pulganny Burn catchment is at risk of acidification. It confluences with the Polbae Burn to give a total catchment area of 6,763 ha. It overlaps Kilgallioch (by 539 ha), Penninghame and Tannylaggie FLS land management units, and privately owned woodlands.

- The Tarf Water catchment is an acidified catchment. Its total area is 10,823 ha and it overlaps Kilgallioch (by 533 ha), Knock of Luce and Tannylaggie FLS land management units, in addition to privately owned woodlands.

Catchments and sub-catchments were generated using ArcMap and their accuracy checked against the approach described in practice guidance. For presentation purposes, catchments and sub-catchments have been labelled alphabetically. Felling and restocking information for the National Estate was accessed via FLS's internal geographic information system. For privately held forests, National Forest Inventory (2020) data was used with supplementary data provided by Scottish Forestry's South Scotland Conservancy.

Note that only results pertinent to (sub-)catchments that directly interact with Kilgallioch block are presented below. Threshold exceedances occurring in (sub-)catchments directly interacting with other FLS blocks (i.e. Arecleoch, Knock of Luce and Tannylaggie) will be addressed under the relevant land management plan revision.

1.0 Assessment of restock proposals

Polbae and Pulganny Burns catchment

As shown in the table below, there are two sub-catchments where the estimated area of closed canopy forest (age >15 years) in 15 years' time exceeds the 30% threshold, meaning these sub-catchments are

vulnerable to a forestry acidification effect. The threshold is only slightly exceeded across the entire Polbae and Pulganny Burns catchment, which encompasses both the National Estate and areas of private forestry.

Efforts to mitigate the forestry acidification effect may include introduction of appropriate riparian buffer zones and management of conifer natural regeneration. Additionally, during the period of this plan, there will be increases in native broadleaf cover (particularly in the vicinity of Kirkcowan Flow SSSI and Loch Martle) and extensive peatland restoration in coupe 19067. While these measures should make a positive contribution to water quality, mitigating opportunities are limited within the scope of this plan owing to the immaturity of the current crop. Threshold exceedances and potential mitigating measures will therefore be considered further in the subsequent land management plan renewal (e.g. earlier harvesting and forest to bog interventions, restock re-design, etc.).

Assessment of restock proposals Polbae and Pulganny Burns catchment		
Catchment	Estimated area of closed canopy forest (age >15 years) in 15 years' time	
	Hectares (ha)	Percentage (%)
A	34.0	16.0
B	58.8	23.3
C	13.7	13.6
D	107.1	53.8
E	73.6	41.7
F	503.1	26.4
G	310.0	24.7
H+	2210.7	32.7
Only (sub-)catchments directly interacting with Kilgallioch land management unit. + The entire catchment.		

Tarf Water catchment

As shown in the table below, there are three sub-catchments where the estimated area of closed canopy forest (age >15 years) in 15 years' time exceeds the 30% threshold, meaning these sub-catchments are vulnerable to a forestry acidification effect. The threshold is not exceeded across the Tarf Water catchment as a whole, indicating there is resilience to acidification at the catchment scale.

Efforts to mitigate the forestry acidification effect within Kilgallioch include management of conifer natural regeneration, wide riparian buffers and increases in native broadleaf planting (particularly in close proximity to larger watercourses such as the Tarf Water and Back Burn). However, there is limited opportunity to amend the restock design (as per the practice guide recommendations) within the period of this plan as the majority of the area within Kilgallioch is under young second rotation crop. Exceedances and potential mitigating measures will therefore be explored as part of the subsequent plan renewal (e.g. earlier harvesting interventions, restock re-design, etc.).

Assessment of restock proposals Tarf Water catchment		
Catchment	Estimated area of closed canopy forest (age >15 years) in 15 years' time	
	Hectares (ha)	Percentage (%)
A	95.8	72.9
B	73.9	32.3
C	459.2	36.3
D+	2431.7	22.5
Only (sub-)catchments directly interacting with Kilgallioch land management unit. + The entire catchment.		

2.0 Assessment of felling proposals

Cross Water catchment

As shown in the table below, proposed felling within sub-catchments directly interacting with Kilgallioch is unlikely to have a significant effect on the freshwater environment and proposed felling across the entire Cross Water catchment does not exceed the 20% threshold in any three year period.

Felling site impact for the Cross Water catchment	
3 year period	Estimated proposed felling in catchment (%)
	A+
2020/22	< 1
2021/23	8.9
2022/24	15.3
2023/25	15.3
2024/26	10.4
2025/27	4.0
2026/28	4.0
2027/29	4.1
2028/30	9.0
2029/31	10.1
2030/32	8.0
2031/33	3.1
2032/34	2.0
Only (sub-)catchments directly interacting with Kilgallioch land management unit. **+** The entire catchment.	

Polbae and Pulganny Burns catchment

As shown in the table below, there are two sub-catchments where the 20% threshold is exceeded. In an effort to reduce felling, Kilgallioch proposals have been revised so there is no felling within these sub-catchments within the relevant three year periods. Despite this, felling on private land remains in exceedance of the recommended threshold. Felling within Kilgallioch, however, is unlikely to have a significant effect on the freshwater environment and proposed felling across the Polbae and Pulganny Burns catchment does not exceed the threshold in any three year period.

Felling site impact for the Polbae and Pulganny Burns catchment									
3 year period	Estimated proposed felling in catchment (%)								
	A	B	C	D	E	F	G	H	I+
2020/22	24.1	12.1	-	-	-	-	12.8	-	4.5
2021/23	16.8	7.8	-	-	-	8.4	9.8	6.0	5.6
2022/24	16.8	-	23.6	-	7.9	10.1	5.6	7.3	6.0
2023/25	-	-	23.6	< 1	7.9	10.1	6.9	7.3	7.1
2024/26	-	-	23.6	< 1	7.9	3.0	6.9	3.3	5.8
2025/27	1.8	17.8	15.0	< 1	-	4.7	7.5	4.5	5.4
2026/28	1.8	18.8	15.0	< 1	15.7	4.8	4.3	5.5	4.6

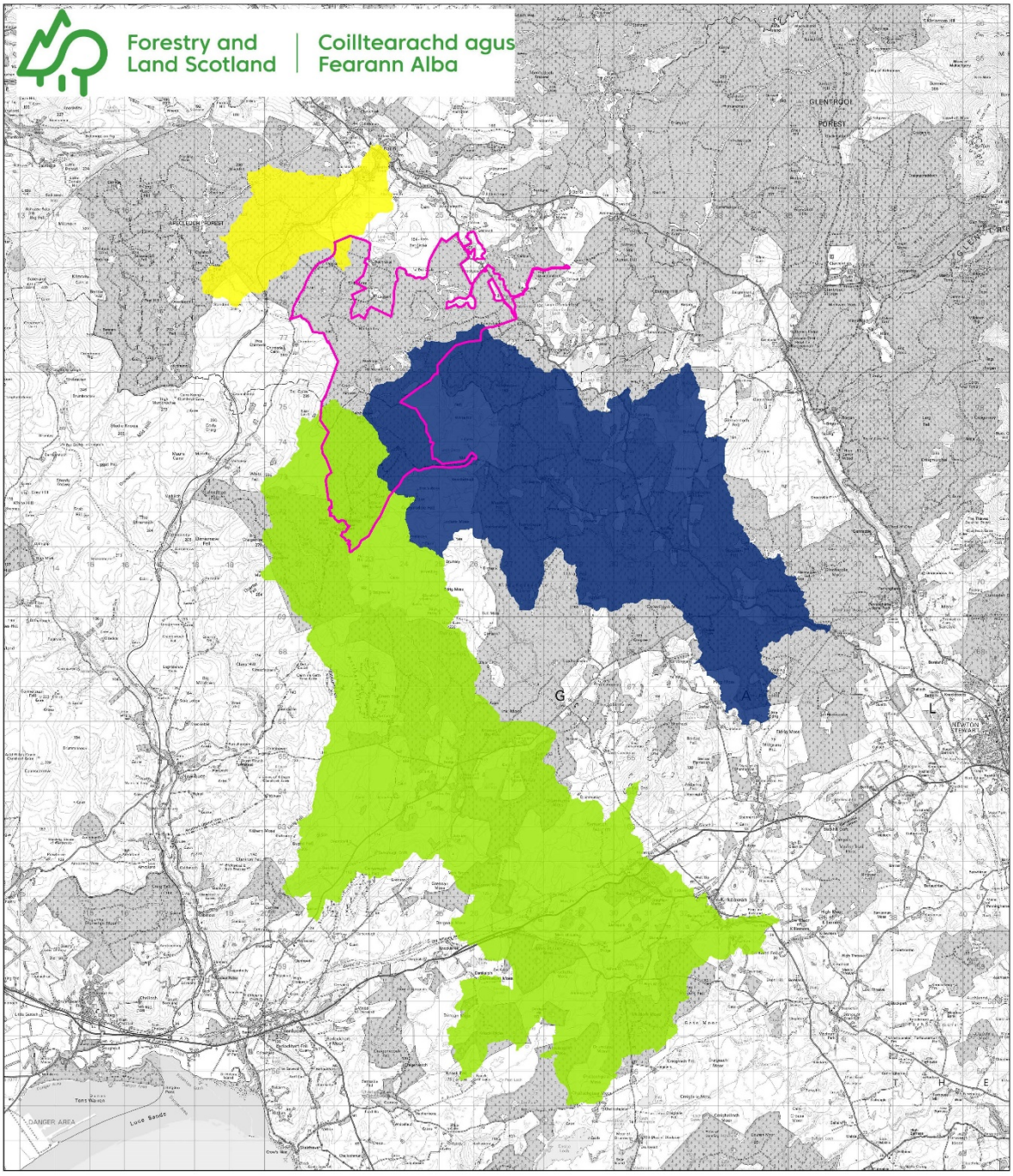
2027/29	1.8	18.8	15.0	< 1	15.7	3.6	4.3	3.4	4.0
2028/30	8.5	1.0	-	< 1	15.7	< 1	3.6	< 1	2.3
2029/31	8.5	-	-	-	-	-	2.7	-	1.4
2030/32	8.5	< 1	-	-	-	-	2.7	-	2.3
2031/33	-	< 1	-	-	-	-	< 1	-	1.8
2032/34	-	< 1	-	-	-	-	< 1	-	1.6
Only (sub-)catchments directly interacting with Kilgallioch land management unit. **+** The entire catchment.									

Tarf Water catchment

As shown in the table below, proposed felling within sub-catchments directly interacting with Kilgallioch is unlikely to have a significant effect on the freshwater environment and proposed felling across the entire Tarf Water catchment does not exceed the 20% threshold in any three year period.

Felling site impact for the Tarf Water catchment				
3 year period	Estimated proposed felling in catchment (%)			
	A	B	C	D+
2020/22	-	-	-	< 1
2021/23	-	-	-	1.9
2022/24	8.9	-	< 1	1.9
2023/25	8.9	-	< 1	1.9
2024/26	8.9	4.5	4.9	1.0
2025/27	-	4.5	4.0	1.1
2026/28	-	4.5	4.0	1.1
2027/29	-	-	-	1.6
2028/30	-	-	-	1.1
2029/31	-	-	-	1.1
2030/32	-	-	-	< 1
2031/33	-	-	-	-
2032/34	-	-	-	-
Only (sub-)catchments directly interacting with Kilgallioch land management unit. **+** The entire catchment.				

3.0 Acid sensitive catchment maps



Map i
Acid Sensitive Catchments

Scale @ A1: 1:50,000

Date: November 2022

0 0.5 1 2 3 4 Km

Legend

- Kilgallioch Block
- Polbae Burn & Pulganny Burn Catchment
- Tarf Water Catchment
- Cross Water Catchment

Forestry and Land Scotland
Coilltearachd agus Fearann Alba

Map ii
Cross Water
(Sub-)Catchments

Scale @ A3: 1:20,000

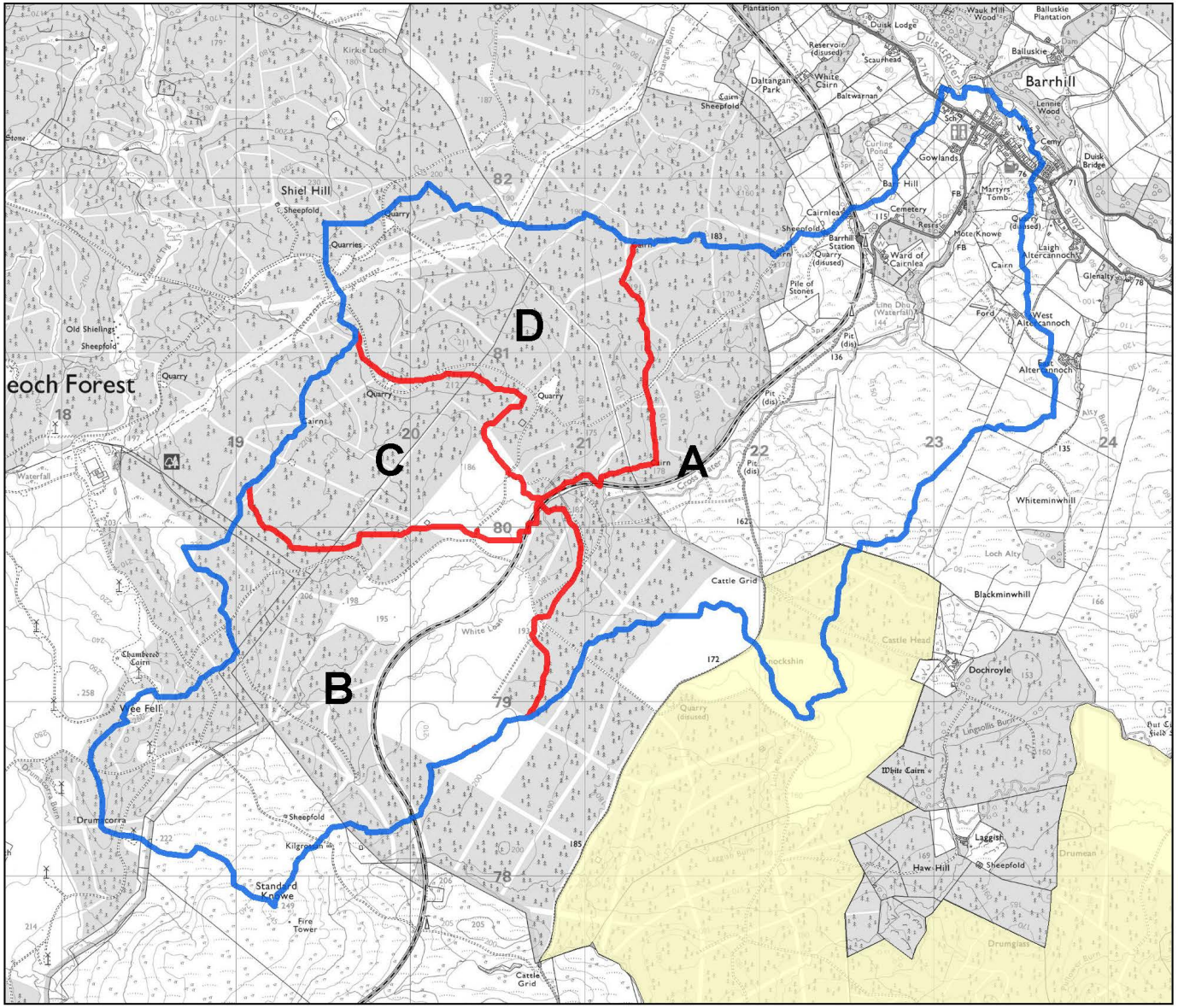
Date: 21/11/2022

Legend

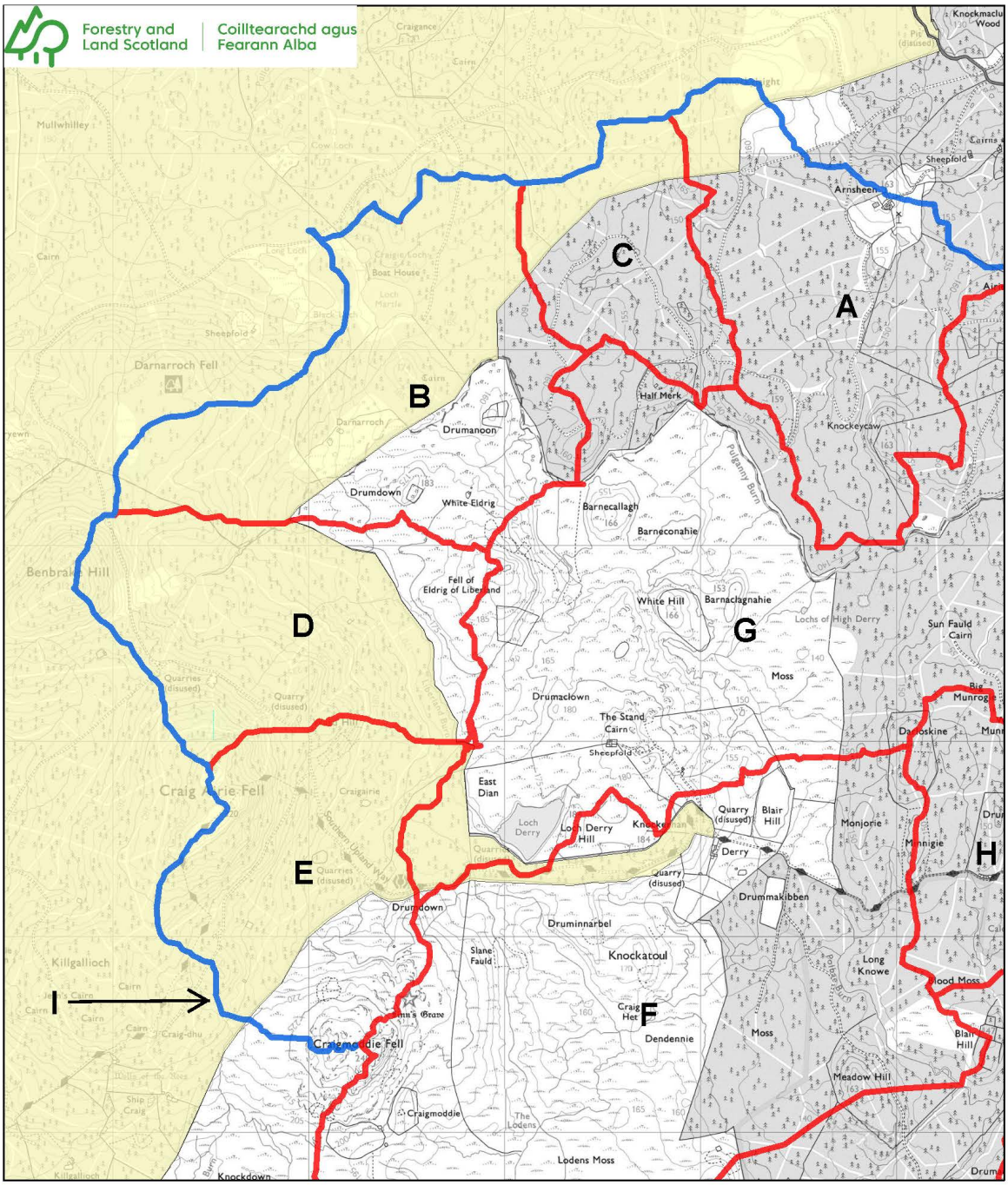
A: entire catchment

B; C; D: sub-catchments

Kilgallioch block



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



Map iii
Polbae & Pulganny Burn
(Sub-)Catchments

Scale @ A3: 1:18,000
Date: November 2022

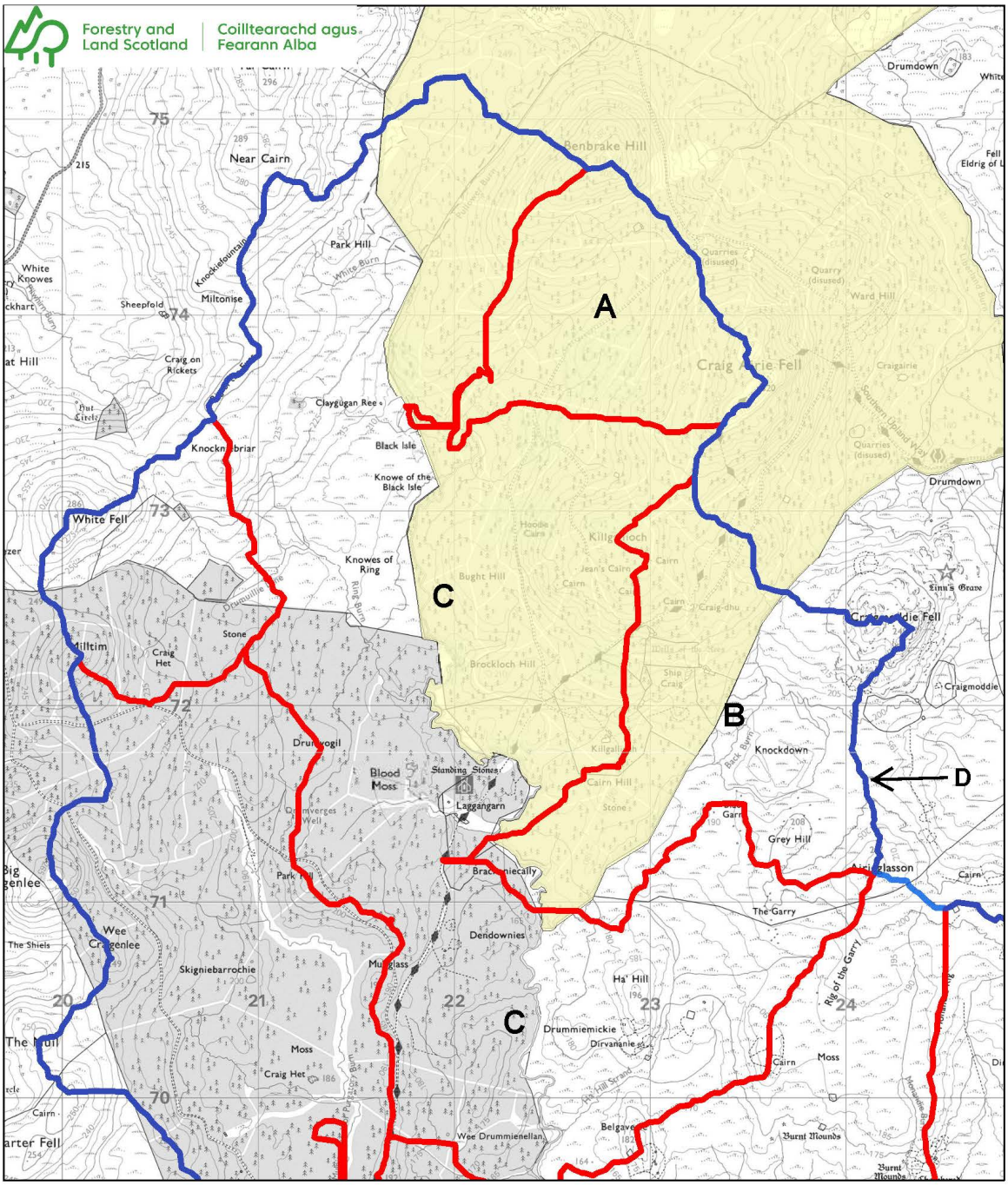
Legend

I: entire catchment

Sub-catchments

Kilgallioch block

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


Forestry and Land Scotland
Coilltearachd agus Fearann Alba
A
B
C
C
D
Benbrake Hill
Craig Harrie Fell
Drumdown
Near Cairn
Park Hill
White Knowes
Sheepfold
Miltonise
Craig on Rickets
Clayggan Ree
Black Isle
Knowe of the Black Isle
White Fell
Knowes of Ring
Stone
Craig Het
Drumvogil
Blood Moss
Standing Stones
Laggangarn
Brackeniecally
Dendownies
Skigniebarrochie
Drummiemickie
Dirvananie
Knockdown
Grey Hill
The Garry
Craigmoddie Fell
Craigmoddie
Linn's Grave
Brockloch Hill
Cairn Hill
Ha' Hill
Rig of the Garry
Wee Drummienellan
Burnt Mounds
Moss
Cairn
Map iv
Tarf Water (Sub-)Catchments
Scale @ A3: 1:18,000
Date: November 2022
Legend
D: entire catchment
Sub-catchments
Kilgallioch block
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PEFC
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Appendix VII: EIA screening supporting information (deforestation)

The purpose of this document is to provide supplementary information to support the EIA screening application for deforestation in the Kilgallioch LMP submission for the purpose of large scale peatland restoration in the Kilgallioch plan area. It includes:

- 1.0 Context
- 2.0 Operational methodology
- 3.0 Kilgallioch site appraisal
- 4.0 Assessment of potential impact
- Map i – Peatland units proposed for restoration (2022-2032)
- Map ii – Peatland soils
- Map iii – ESC suitability score for Sitka spruce
- Map iv – ESC suitability score for Lodgepole pine.

This document also demonstrates alignment with the following key Scottish Government and Scottish Forestry policies and practice:

- The Scottish Government Control of Woodland Removal Policy – in particular guidance on woodland removal without a requirement for compensatory planting
- FCS Practice Guide - Deciding future management options for afforested deep peatland
- Forestry on Peatland Habitats (FCS, 2000)
- UK Forestry Standard.

1.0 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 national estate.

Peatlands will play an important role 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 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, in the UK afforestation of unmodified peatlands is unnatural.

The purpose of the 'Deciding future management options for afforested deep peatland' practice guide is to ensure that principles of sustainable forest management are applied specifically in the context of managing the peatland asset. This is a shared objective of both FLS and SF, taking 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 modification imposed at establishment and the impact these have had on peatland condition since. Evans et al. (2017) estimated an average carbon emission rate of 9.9 tCO_2e/ha/yr, therefore the growth rate of trees on a particular peatland

must capture enough carbon to compensate for such carbon loss 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. Restoration of priority habitats is therefore 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.

1.1 FLS approach to peatland management

Restoration of blanket bogs and lowland raised bogs is a key action from the Scottish Biodiversity Strategy (both habitats are included on the Scottish Biodiversity List). Beyond their value as a carbon store, peatlands host a huge diversity of organisms and planting trees on peat leads to a fundamental change in the ecosystem (Payne et al. 2018).

As a Scottish Government agency, FLS's objectives and legislative framework has an added 'Biodiversity Duty' as stated in the Nature Conservation Scotland Act (2004). Protection of conservation values is mentioned in UKWAS and the principles of sustainability are outlined in the UKFS. What this means is that for afforested peatlands, restoration is considered ahead of replanting.

This is set out in 'Deciding future management options for afforested deep peatland' practice guidance. It deals with afforested peatlands that are not going to be restored for biodiversity reasons and states that replanting must be justified by considering if the crop will achieve YC 8 or more for Sitka spruce. The default is not to restock, unless there is evidence trees will achieve a good growth rate for harvestable timber. If it does not, the option to restock is unsustainable as the three legs (economic, environmental, and social) of the sustainability stool are not present. A slow growing crop would not result in profit, it would act as a carbon source and contribute to climate change, and society would be disadvantaged/threatened (based on current scientific information).

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 sites across 60 project areas between 2014-2020. In the same period, FLS restored 3,786 ha of existing open peatland habitat across 29 project areas. FLS anticipates the need to restore 35,000-60,000 ha of afforested peatlands before 2035.

2.0 Operational methodology

In many areas of the UK large expanses of deep peat blanket bog have been historically drained and replaced with trees for commercial forestry. This afforestation has resulted in the degradation and loss of large areas of peat bog. However, with a greater interest in soil carbon and the realisation that many of the trees on deep peat are vulnerable to growth check and wind-blow, there is a shift to restore these low return forests back to open bog.

Afforested peatland restoration, known more commonly as 'forest-to-bog' restoration, is thought to take a least 10 years (following 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 is achieved using a number of re-wetting techniques, the more common of which are detailed below. Methods are usually employed together in a sequence, beginning at the upper areas and working downslope towards main water courses or where water leaves the site, to achieve best results. Methods are under constant development and improved techniques result in much better surface re-wetting in previously forested peatlands.

These methods will be applied across the Kilgallioch restoration sites. Note that detailed restoration plans cannot be confirmed until after tree felling and windblow clearance has taken place. Access across the site, giving a clear view of the lie of the land, localised undulations, and where the flushed areas are, is needed to determine the exact location of drains and to determine their status in terms of peak and base flows. This then allows decisions to be made on the positioning of any 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 and mapped topography, however, this may not give a true picture of the site. In addition, a thorough survey of drains and their loading, peak flows, and depth of peat below the base of the drain can only be undertaken safely and efficiently after clear felling has taken place.

Drain blocking and peat dams

Where appropriate, peat dams are an effective way of blocking drains and furrows to encourage water dispersal across a peatland (whether on open peat or a forest-to-bog project). Drain re-profiling is carried out at the same time as installing peat dams 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).

Such 'traditional' methods of achieving hydrological restoration can help on damaged open bog habitat, however, on previously afforested sites intensive intervention is often required. The vast majority of these sites retain a legacy 'ridge' and 'furrow' pattern, with either single or double ploughed furrows varying from ~30 cm up to 1 m depth in extreme cases. These furrows act as drainage conduits, thereby lowering the natural water table and drying out the peatland. If left in situ, the water table and peatland vegetation are suppressed, while negative indicator species such as *Calluna* or tree regeneration are promoted.

Ground smoothing and stump flipping

FLS have been a key organisation in developing 'ground smoothing and stump flipping' methods, which aim to re-profile the uneven surface on previously afforested sites and restore the natural surface topography. This can be achieved by flattening any plough ridges and/or infilling furrows, allowing a greater proportion of the planar surface to be closer to the water table, thereby promoting the development of key peat-forming species (i.e. *Sphagnum* mosses) and reducing the opportunity for tree regeneration that typically occurs on uneven/drained sites.

The notable advantage of ground smoothing and stump flipping is that the vegetated surface of the peat is left upper-most rather than inverted, which helps to minimise the cover of bare, exposed peat. Where there are bigger and more solid wood stumps, the machine will invert the root plate into the furrow. Intact vegetation between the areas of the two plough ridges will assist with re-colonisation of bare peat where ridges have been removed. Once the 'mining' aspect of the work has been completed, the machine then cross-tracks across the furrows to further flatten out any topography or brash that is still standing proud.

Some afforested peatlands have suffered from surface cracking due to water deprivation which, alongside root structures, can lead to underground 'pipes' forming. These pipes act as a conduit to dissolved and particulate organic carbon loss, hampering the rewetting process by acting as 'hidden drains'. Forest Research have developed a method to tackle this problem which greatly improves restoration efforts and was trialed at the Lochar Mosses Longbridge Muir site near Dumfries. Barriers to prevent water flowing away through cracks are formed by digging trenches deeper than the cracks and repacking them with peat

with or without a plastic membrane lining one side of the trench, leading to a rise in the water table (i.e. the level the water is at underground).

2.1 Machinery specification

Ground smoothing techniques require the use of suitably equipped, low ground pressure (LGP) tracked excavators to allow safe working practice on wet and unstable terrain. FLS specify 360° LGP excavators on 1100 mm to 1400+ mm track pads, using wide toothed digging buckets, to achieve an average ground pressure of ≤3 psi.

2.2 Environmental protection

Surface management techniques, such as stump-flipping and cross-tracking, can potentially create areas of bare peat prior to vegetation establishing, and thus pose a risk to the downstream water environment via runoff and erosion of bare peat surfaces.

Stringent Pollution Prevention Control (PPC) are integral to any ground-smoothing project, including intensive management of on-site drainage, and protection of watercourses within proximity to restoration sites. This includes robust sediment management measures, particularly in areas where stump-flipping is carried out, and the appropriate design and siting of silt traps at these sites.

Generally, a cascade of silt traps made from plastic piling will be required on clear-felled sites, in addition to fabric dams to trap any sediment run-off. These may already be in place on recently felled sites, along with lengths of drain that have been dammed as part of pre-felling mitigation. If drains are not blocked or silt traps installed in preparation for harvesting operations, then this will be addressed prior to ground-smoothing works commencing.

Buffer zones of at least 20 m will be employed to mitigate against elevated levels of dissolved organic carbon, suspended solids, phosphates or nitrates from entering any river, burn, ditch, or wetland, towards which the land drains.

2.3 Monitoring

Sites are monitored on a regular programme to assess the change in surface vegetation (also a proxy indicator of water table level) and for non-native conifer regen. Where natural tree regeneration is considered to be problematic to the restoration trajectory, regenerating stems will be removed in years 5-10. However, the restoration techniques FLS now use minimise tree establishment potential and it is unlikely that more than a single intervention would be required, if at all.

FLS continue to work with Forest Research on the effects of restoration on water quality, FR having monitored Flanders Moss for over 10 years, and currently have a monitoring programme in place for upcoming peatland restoration elsewhere in South Region. Best practice recommendations made in the recent publication by Shah and Nisbet (based on 10 years data from Flanders Moss) will be followed.

3.0 Kilgallioch site appraisal

The restoration potential of UKBAP priority habitats (i.e. blanket bog and lowland raised bog) within Kilgallioch is considered to be high due to the very wet ground conditions and abundant remnant bog vegetation that persists in rides and other isolated areas, especially where planted conifers are in check. Based on Pyatt's 'FC Soil Classification' (1982), terrain, and FLS expert experience, site soils (i.e. 10b and 9) typically have a peat depth upwards of 0.5 m and are typically associated with National Vegetation Classification types M17 (*Scirpus cespitosus – Eriophorum vaginatum* blanket mire) and M18 (*Erica tetralix – Sphagnum papillosum* raised and blanket mire). FLS are committed to the long term restoration programme of these priority habitats.

Objectives within the LMP unit are to:

- Apply restoration treatments that encourage travel in the desired direction towards priority habitat, restoring these to function as near-natural peatland within 30 years
- Protect the storage of carbon in the soils
- Maximise the sequestration of carbon by peatlands in the future
- Improve water quality of the local area and help regulate flow.

The following appraisal was authored by Amanda Ophof of the FLS Peatland Team and a professional member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

3.1 Site description

Kilgallioch forest is a mix of afforested intermediate lowland raised bog (10b) and blanket bog (9) which has been historically ploughed and drained to establish a productive conifer crop. Due to the almost level nature of the terrain, there is a continuous link of coplanar peat soils within the local landscape which connect hydrologically within the same watershed. The hydrological connectivity between the Scenario A peat type and surrounding blanket bog renders these areas as having a 'Presumption to Restore' (as defined in the 'Deciding future management options for afforested deep peatland' practice guidance). These are edaphically unsuited to woodland and restoration would therefore prevent the significant net release of greenhouse gases (GHG). Re-wetting the site will benefit the peat soils as it will stop oxidisation and further degradation and erosion, ultimately improving the water quality of the local area by reducing run-off from the peatland. Overall, the goal at Kilgallioch is to create a hydrologically functioning intermediate raised-blanket bog complex.

3.2 Previous crop

To establish a productive crop on an intermediate-blanket bog, the site was cultivated by means of deeply ploughed ridges and furrows and ploughed drains, and was likely to have been heavily fertilised. The afforested peatlands have soft ground conditions with a consistently high water table. Taking this into account along with the historical input for crop establishment, it is considered difficult to achieve sufficient crop performance over the second rotation in line with UKFS, without causing significant soil disturbance and the subsequent release of greenhouse gasses.

3.3 Flooding

A small proportion of the Kilgallioch block falls within the Cross Water SEPA waterbody catchment and flood risk management zone. There will not be any peatland restoration within the Cross Water catchment within this LMP period. Therefore, the potential flooding impact as a result of peatland restoration will not be discussed here. Any potential impacts will be considered for the neighbouring Arecleoch forest block LMP review.

3.4 Private water supplies

A small proportion of the Kilgallioch block has the potential to interact with private water supplies. This will be addressed within the LMP proper.

3.5 Restoration proposal

Felling and re-wetting of the proposed peatland restoration areas will be undertaken using low impact techniques. The area is currently retaining water despite forestry drainage with key bog indicator vegetation present across the site. Re-wetting is essential to return the peatlands to a functional bog habitat which will allow the hydrology, and eventually the vegetation, to be restored to an intermediate-blanket bog habitat. There is sufficient existing seed source for *Sphagnum* and other bog species on site to make this successful.

Preliminary walkovers across site were conducted by the local Planning team and national Peatland Team to establish the condition of the peatlands, water table level, presence and abundance of vegetation indicator species, in addition to the connectivity and extent of the bog. The walkover identified the main afforestation modifications and feasibility of restoration, confirming that full restoration will be possible.

The main findings of the walkover were as follows:

- Kilgallioch contains multiple hydrologically connected peatland units, consisting of predominantly deep intermediate bogs with flushed blanket bog and shallow peaty gleys.
- The water table is at the surface across the peatland, which is a positive indicator for restoration given the level of forestry modifications. There is abundant Sphagnum cover with cotton grasses present throughout, indicating sufficient remnant species from which to reseed the site.
- The existing forest road network runs through some peatland areas, bisecting hydrological units across some management coupes. There will have been some compaction of the bog as a result of these roads where historically it would have formed one hydrological unit. As the road has existed in the landscape for sufficient time, any compromising factors for restoration of the bog would have become evident since. Therefore, for management purposes restoration can be phased with the aid of the forest road as an artificial boundary.

After clear-felling the first rotation crop, the next stage of the restoration will be to re-wet the site. A combination of standard re-wetting techniques will be used to re-instate the natural water table across the site to ensure it is optimal for appropriate bog vegetation recovery. A combination of drain blocking, ground smoothing, and potentially backfill trenches, will be used following standard techniques as developed by NatureScot (Peatland Action Fund) and FLS. FLS have a long-term commitment to the Scottish Government to reduce GHGs across the National Estate and re-wetting will be funded through the Scottish Government Climate Crisis Fund.

The following restoration methods will be used:

- Block all drains and, where necessary, plough furrows using peat dams or composite dams to disperse water across the peatland.
- Undertake stump flipping and ground smoothing across the previously afforested area to un-modify the pattern of ploughed ridges and furrows. If left in situ, the plough/furrow pattern will suppress the water table and development of peatland vegetation, and will promote regeneration of native or non-native tree species (negative indicators).
- Where there is suspected peat cracking, install backfill trenches to retain water on site. Backfill trenches counteract the excessive lateral flow of water within the peat, which 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.
- Re-profile hags to repair excessive erosion of peatlands and stop the development of artificial drains caused by surface water run-off.
- Monitoring and removal of tree regeneration (a negative indicator) and undesirable vegetation on the bog.

Re-wetting operations will be delivered within the LMP period and in line with the UKFS and UKWAS. Monitoring of the site will take place at year five following re-wetting. An evaluation of the restoration works will be completed and submitted to Scottish Forestry as part of the LMP mid-term review.

References

Billett et al. (2010) Carbon balance of UK peatlands: Current state of knowledge and future research challenges. Climate Research, 45, 13–29.

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

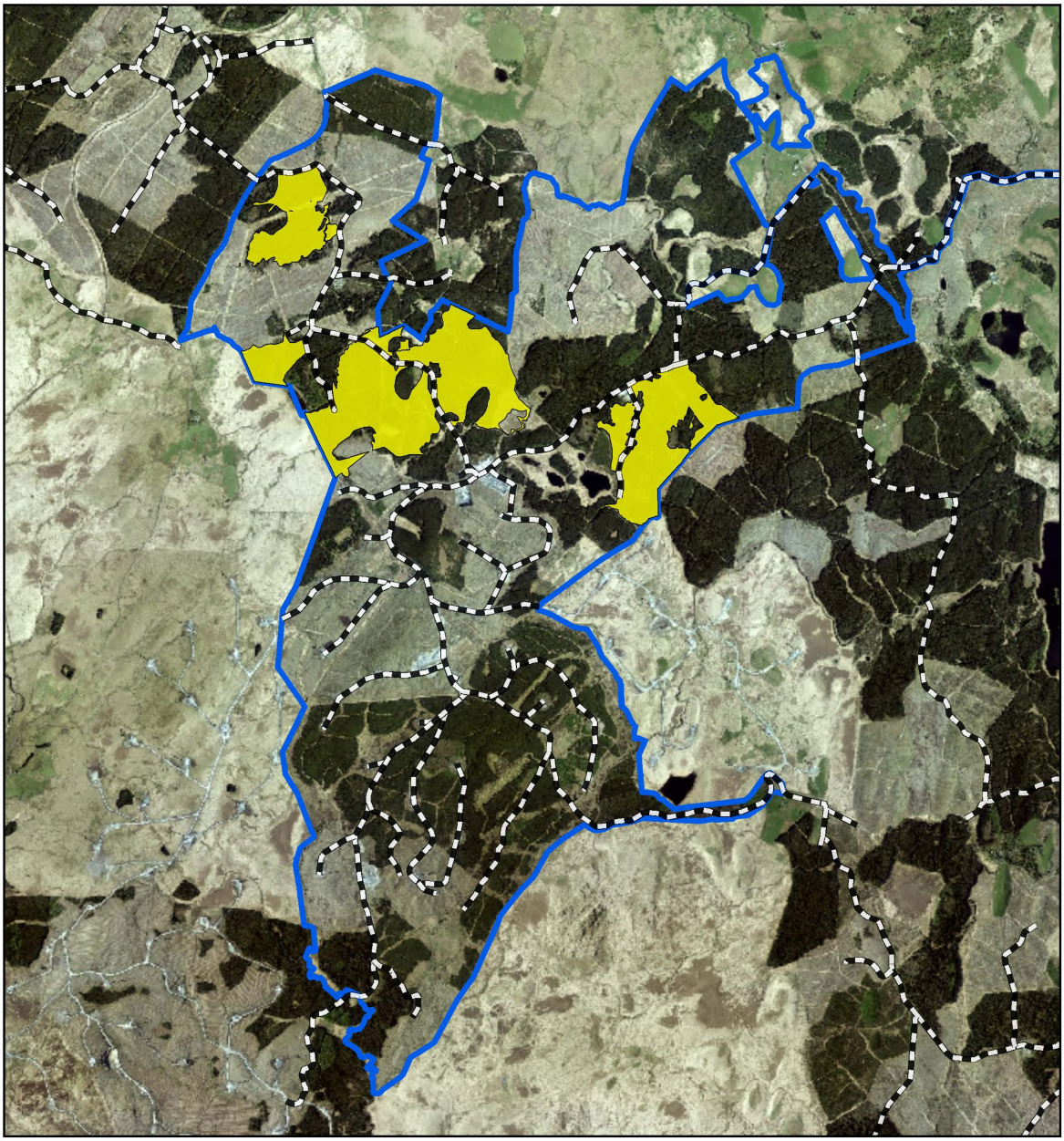
Shah, N. & Nisbet, T. (2019) The effects of forest clearance for peatland restoration on water quality, Science of The Total Environment, Volume 693.

Sloan, et al. (2018) Peatland afforestation in the UK and consequences for carbon storage. Mires and Peat, 23(01), 1-17.

4.0 Assessment of potential impact

Assessment of potential impact	
Key risk	**Impact assessment**
Population and human health	Low impact. Interaction with the Haw Burn catchment, which could potentially contribute to a residential water supply. Water quality within the water supply catchments will be protected by adopting low impact operational techniques and strict adherence to the latest UKFS Forests and Water guidance, Forestry and Water Scotland: Know the Rules 2nd ed., and the FLS South Region Pollution Control Plan. Removal of forest cover could increase water availability in the local area. Ground-truthed drains connected to water supplies will not be blocked to avoid compromising the supply. Ultimately, restored bogs will function as near-natural peatlands, helping to maintain a year-round near-constant water table. Refer to **Appendix IX**.
Biodiversity	Positive. Restoration of a degraded peatland will restore a priority open habitat, benefitting both habitat and associated species. Pre-operational surveys will identify any protected or breeding species to ensure suitable mitigation is in place to avoid disturbance.
Land	No known 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, geology and geomorphology	Positive. Re-wetting the site will benefit the peat soils as forestry modifications will be reversed to stop oxidisation and further degradation/erosion of the peat.
Water	Positive. Re-wetting techniques have shown to cause no significant adverse effect on water quality. Ultimately, water quality of the local area should improve with a reduction in run-off from exposed peat and degraded peatland.
Air	No known impact.
Climate	Positive. Afforested peatlands have the potential to emit more greenhouse gas 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 known impact.
Historic environment	No known impact. Pre-operational surveys will identify any cultural heritage features to ensure suitable mitigation is in place to avoid 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.



Map i - Peatland units proposed for restoration (first rotation only)

Scale @ A4: 1:46,287

Date: October 2022

Legend

Peatland units proposed for restoration

Forest Roads

Block

0 0.2250.45 0.9 1.35 1.8 Km

N

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

Forestry and Land Scotland | Coilltearachd agus Fearann Alba

Map ii - Peatland soils

Author: Carol Finch

Scale @ A4: 1:24,000

Date: October 2022

Legend

- 1 [Typical Brown Earth]
- 4 [Typical Ironpan Soil]
- 6 [Typical Peaty Surface-Water Gley]
- 9a [Molinia, Myrica, Salix Bog]
- 9b [Tussocky Molinia Bog, Molinia, Calluna Bog]
- 9c [Tussocky Molinia, Eriophorum vaginatum Bog]
- 9d [Non-Tussocky Molinia, Eriophorum vaginatum, Trichophorum Bog]
- 9e [Trichophorum, Calluna, Eriophorum, Molinia Bog (Weakly Flushed)]
- 10b [Upland Sphagnum Bog]
- 13p [Peaty Ranker]
- Forest Roads
- Peatland unit proposed for restoration
- Block

0 0.1 0.2 0.4 0.6 0.8 Km

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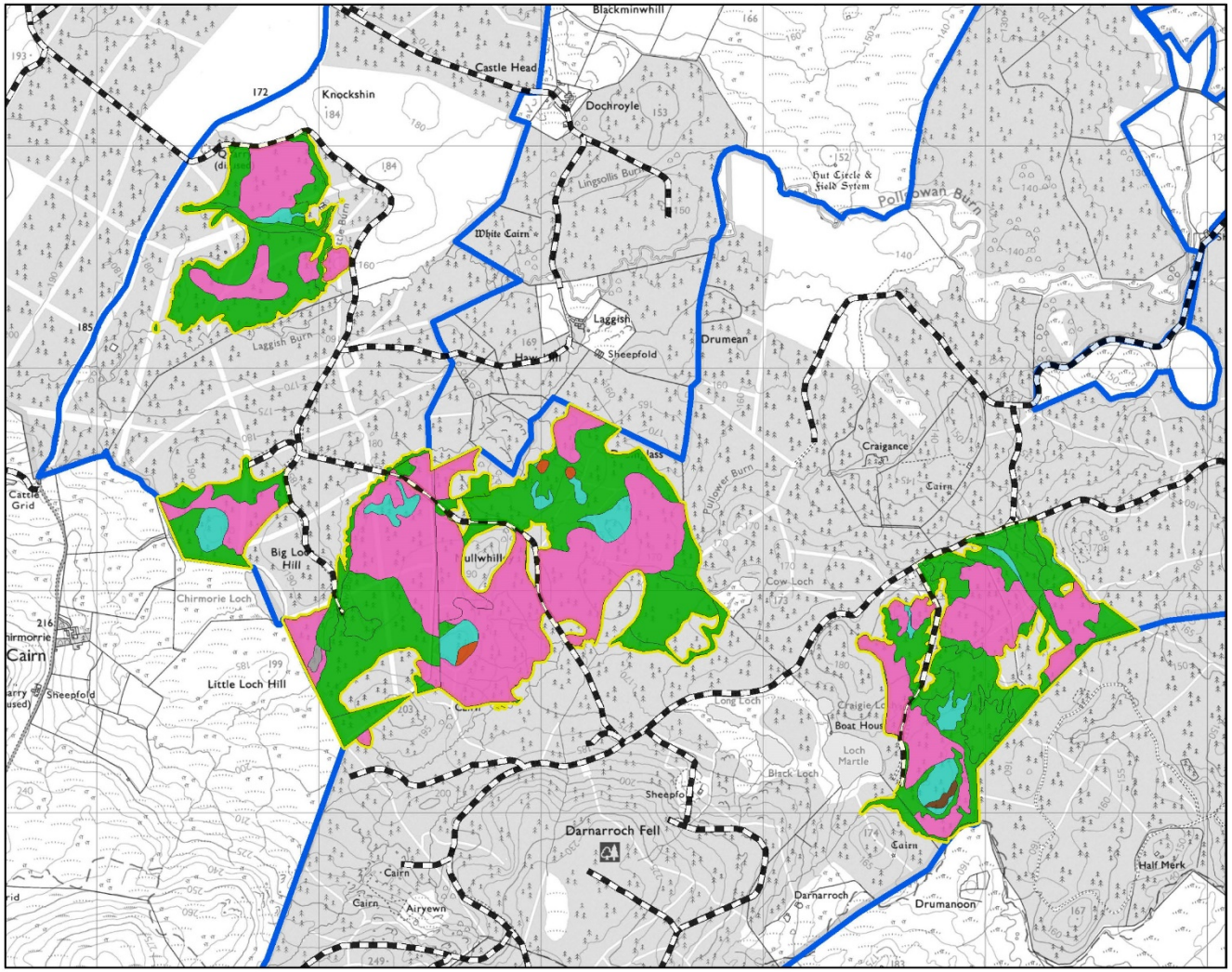

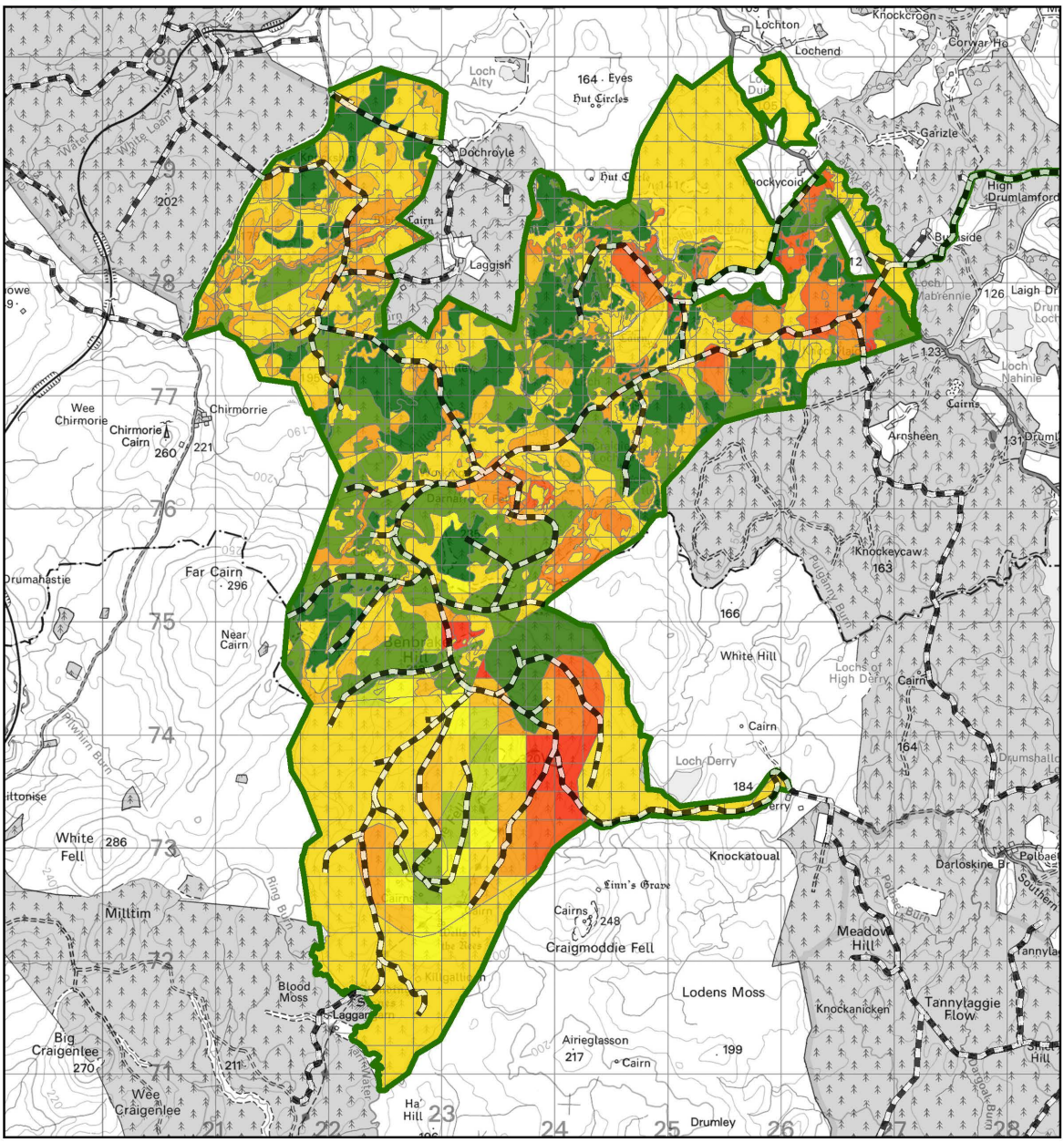

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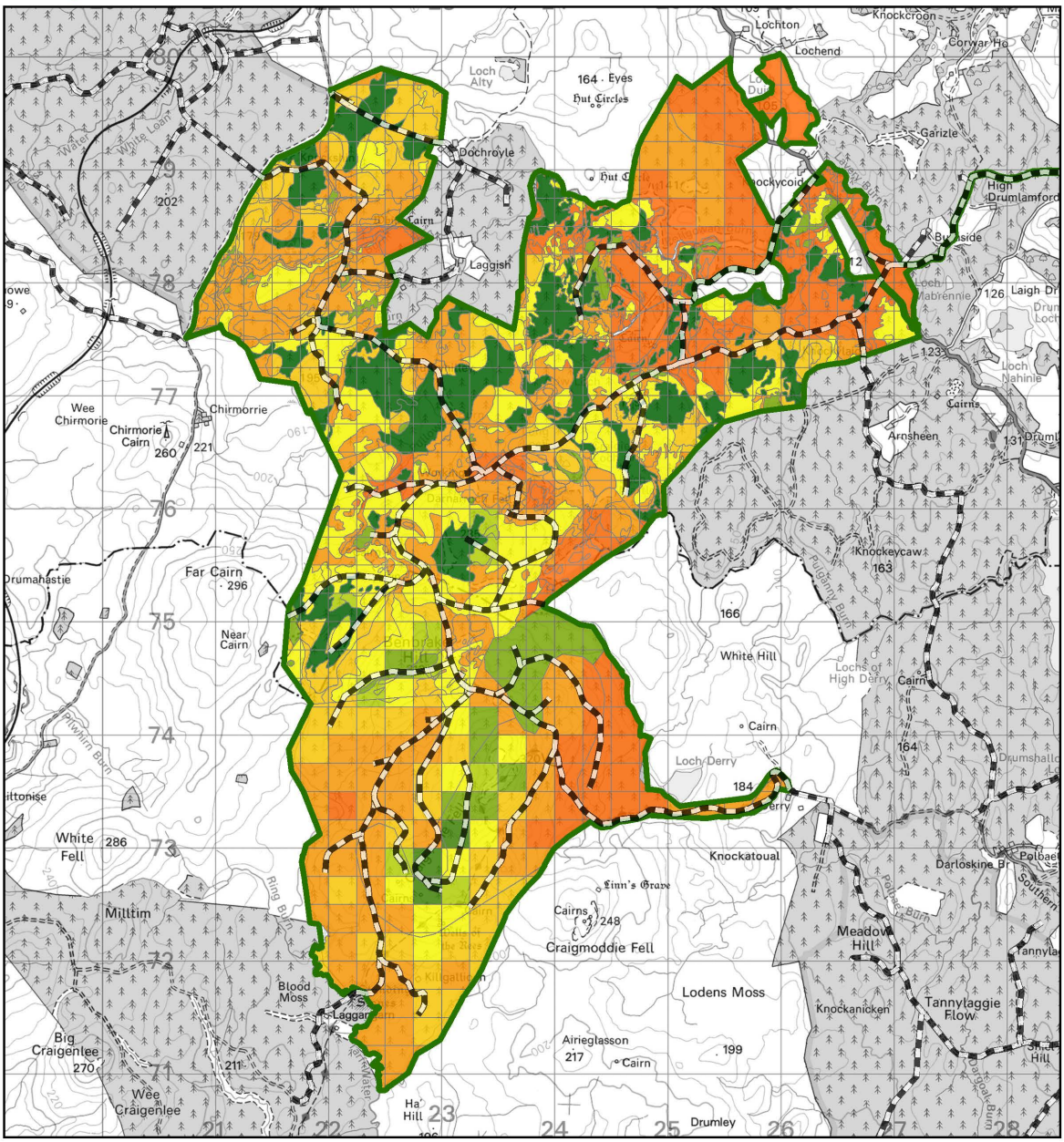
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Chirmorie Cairn
Knockeycaw
Far Cairn · 296
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White Hill
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Cairn
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Drumshallo
Knockatoual
Darloskine Br
Linn's Grave
Cairns
Craigmoddie Fell
Meadow Hill
Milltim
Blood Moss
Laggar
Lodens Moss
Knockanicken
Tannytaggie Flow
Big Craigenlee
Wee Craigenlee
Airieglasson
Cairn
Drumley
Map iv - ESC
Suitability for Lodgepole pine
Scale @ A4: 1:46,287
Date: October 2022
Author: Carol Finch
0 0.2250.45 0.9 1.35 1.8 Km
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Scotland's National Forest Estate is responsibly managed to the UK Woodland Assurance Standard.
FSC
PEFC

Appendix VIII: EIA screening opinion request form

Provided as an attachment.

Appendix IX: Private water supplies

Provided as an attachment.

Appendix X: Deer management plan

The following document was authored by Gareth Rae, Wildlife Ranger Manager for FLS South Region.

1.0 Introduction

Kilgallioch forest block extends to 2,583 Hectares and sits within the FLS Galloway Main Deer Management Unit (DMU). The forest is diverse, ranging from felling, replanting and protection of commercial conifers, establishing other more diverse tree species, peatland restoration work as well as significant renewables infrastructure across a large proportion of the LMP area.

2.0 Deer management objectives

2.1 Key objectives

- Protect the national forest estate from unacceptable impacts by deer (i.e. less than 10% leader browsing damage by deer on all planting year 1 to 5 coupes. Minimise bark stripping and fraying to all crop ages).
- Aim for total deer densities to be in the range of 2-9 deer/km^2.
- All biological resources on the forest estate are protected from negative impacts of browsing/grazing herbivores. This includes all tree crops, Sites of Specific Scientific Interest (SSSI's), Planted Ancient Woodland Sites (PAWS), Low Impact Silvicultural Systems (LISS), National Nature Reserves (NNR), and other locally designated areas.
- Meet the tree stocking density targets per hectare at year 5.
- Contractor and authorised controllers ensure good relationships with members of the public, other forestry customers, and FLS staff.
- To enable re-stocking to take place without the need for deer fencing and to achieve the appropriate stocking density at year five.
- To maintain a sustainable deer population.

2.2 Specific local objectives

- Immediate and long-term protection of replanted broadleaves along the Tarff water to improve water quality, bank stabilisation and shade provision in partnership with Galloway Fisheries Trust.
- Provide appropriate levels of protection for peatland restoration sites, supporting the establishment of non-conifer species and the provision of long term suitable woodland habitats for these areas.

3.0 Tree species

Sitka spruce remains the primary species to be planted with alternative conifer planting such as Norway spruce, Scots pine and possibly Lodgepole pine where appropriate. All broadleaf planting will be native and will predominantly be Downy/Silver Birch, Hawthorn, Rowan, Willow, and Common Alder (refer to section 4.1.5 in LMP).

Natural regeneration of Sitka spruce and broadleaves will generally be accepted and in areas where this is not taking place sites will be restocked by year 5 (refer to 4.1.6 in LMP).

4.0 Protection

The most recent data on deer browsing impacts on replanted sites taken from 2020/21 Nearest Neighbor Survey (NNS) shows three coupes surveyed with very different results.

Coupe 19026 (re-allocated to 19063 in LMP revision) had 40.9 ha of Sitka spruce, of which 0% impacts by deer were recorded. Although this is extremely good, there was a further 1.3 ha planted with broadleaves of which 56% were impacted by deer.

Coupes 19023 and 19610 (respectively 19088 and 19610 in the LMP revision) had a total of 2.4 ha planted with only broadleaf, of which had 38% impacted by deer.

National targets are <10% impact for all species so currently commercial Sitka spruce crops are achieving successful establishment. However, softer species of conifer are likely to suffer higher impacts and broadleaves, as expected (even more palatable), will be more challenging to establish without any physical protection.

Tree shelters may be considered in some areas which tend to be along riparian zones. If used, these shelters will need to be removed from site once trees have established.

Deer fencing may be considered in some specific circumstances but is not preferred due to the high associated costs and the necessity for a robust fence management plan to ensure any fence remains effective throughout the required period.

5.0 Deer species, densities and culls

Roe and Red deer are located throughout the Kilgallioch forest area with previous evidence of Feral pigs in the northern section, although pigs are not now thought to be present.

Arecleoch forest further to the west is managed by FLS and there is private forestry to the south and east. Although cull activity is not known on private holdings, it is expected some work is being done as these areas will include replanting areas requiring protection. Potential immigration from neighboring areas may provide extra deer pressure on vulnerable sites within the Kilgallioch plan area.

The most recent Deer Population Assessment (DPA) carried out in 2015 across Galloway included Kilgallioch and estimated a combined Red and Roe deer density at just over 11 deer per km^2, which is above FLS's national target of <7 km^2. An up-to-date DPA survey has recently been completed in 2022, however, these results have not yet been published.

Kilgallioch annual cull is currently set at 110 Roe deer and 30 Red deer for 2022/23. Future culls will remain high to ensure pressure is maintained across the whole forest area. These culls will fluctuate along with the forest structure which is a key factor in influencing deer carrying capacity. Deer culls will continue to be monitored via the FLS Wildlife Management System. This, along with annually updated population modelling, will allow for evidenced based culls to be allocated.

6.0 Resources to deliver deer culls

Culls in Kilgallioch are currently achieved by contracted teams (this will be the culling model for the foreseeable future). All personnel involved with culling deer on the national forest estate must comply with relevant Health and Safety legislation, hold all required certification/training, and work to industry best practice.

FLS will continue to apply to NatureScot for '5(6) Out of Season' and '18(2) Night Shooting' authorisations, which are key to delivering culls in commercial forestry plantations.

7.0 Future infrastructure

Future deer culling infrastructure is a vital component as the forest progresses through rotation. These requirements will be addressed through the work planning process for each individual coupes as they are felled and then replanted.

This process requires a member from the FLS Wildlife team to visit each individual site to assess specific requirements. This will include the location of any future deer glades with reference to suitable topography which has safe backstops for culling, wind direction, shelter, north/south facing and, most importantly, ground flora that attract deer, in addition to the suitability of ATV tracks for controller access and carcass extraction purposes. Any constructed ATV tracks may require planning approval from the Local Authority so this must also be part of the advanced planning process.

Kilgallioch windfarm has many high voltage cables running alongside several of the forest roads. These cables have designated ATV crossing points constructed to allow access on to replanted coupes and have appropriate signage to mark their locations.

8.0 Deer management groups and collaborative working

Currently there is no active Deer Management Group for Western Galloway. However, it is hoped that the Wigtownshire and South Ayrshire Lowland Deer Group will become active again soon.

Although there is vehicle access through part of Kilgallioch for neighboring private forestry, there is no current collaborative deer culling agreements in place.

FLS will seek to work with its neighbors where there is a mutual benefit in managing deer populations at a landscape scale wherever possible.

9.0 Venison

Deer culled on FLS land will be taken to the local FLS deer larder (at Glentrool) and processed for sale.

FLS subscribes to the Scottish Quality Wild Venison (SQWV) scheme with all venison quality assured and currently sold to Highland Game Ltd. based in Dundee for the provision of a natural, sustainable, healthy product for the food industry.