



Forestry and
Land Scotland
Coilltearachd agus
Fearann Alba

Land Management Plan

Ardgartan





Ardgartan Land Management Plan 2020-2030

Central Region

ARDGARTAN

Land Management Plan

Approval date:

Plan Reference No:

Plan Approval Date:

Plan Expiry Date:



CSM 6 Appendix 1b

FOREST AND LAND SCOTLAND - Application for Land Management Plan Approvals in Scotland

Forest and Land Scotland - Property

Region:	Central
Woodland or property name:	Ardgartan
Nearest town, village or locality:	Lochgoilhead
OS Grid reference:	NS 231988
Local Authority district/unitary Authority:	LLTNP

Areas for approval

	Conifer	Broadleaf
Clear felling	496	
Selective felling (including thinning)	162	195
Restocking	302	194
New planting (complete appendix 4)		

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 roads, tracks and quarries as detailed in my application.
3. I confirm that the initial scoping of the plan was carried out with FLS staff on 9th October 2019.
4. I confirm that the proposals contained in this plan comply with the UK Forestry Standard.
5. I confirm that the scoping, carried out and documented in the Consultation Record attached, incorporated those stakeholders which SF agreed must be included.
6. I confirm that consultation and scoping has been carried out with all relevant stakeholders over the content of the of the land management plan. Consideration of all of the issues raised by stakeholders has been included in the process of plan preparation and the outcome recorded on the attached consultation record. I confirm that we have informed all stakeholders about the extent to which we have been able to address their concerns and, where it has not been possible to fully address their concerns, we have reminded them of the opportunity to make further comment during the public consultation process.
7. I undertake to obtain any permissions necessary for the implementation of the approved Plan.

Signed 

Regional Manager

Signed

Conservator

Region Central

Conservancy.....

Date 12th March 2020

Date of Approval.....

Date approval ends

Environmental Impact Assessment Screening Opinion Request Form

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

Proposed Work							
Please put a cross in the box to indicate the type of work you are proposing to carry out. Give the area in hectares and where appropriate the percentage of conifers and broadleaves							
Proposed Work	select	Area in hectares	% Conifer	% Broad-leaves	Proposed work	select	Area in hectares
Afforestation	<input type="checkbox"/>				Forest roads	<input checked="" type="checkbox"/>	1.67
Deforestation	<input type="checkbox"/>				Forest quarry	<input type="checkbox"/>	
Location of work		Ardgartan Land Management Plan					

Description of Forestry Project and Location
Provide details of the forestry project (size, design, use of natural resources such as soil, and the cumulative effect if relevant). Please attach map(s) showing the boundary of the proposed work and other known details.
See section 3.0 and relevant maps

Provide details on the existing land use and the environmental sensitivity of the area that is likely to be affected by the forestry project.
These are described in section 4.0 and 8.0 of the plan

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Description of Likely Significant Effects

Provide details on any likely significant effects that the project will have on the environment (resulting from the project itself or the use of natural resources) and the extent of the information available to assist you with this assessment.

See LMP text

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

Mitigation of Likely Significant Effects

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

See section 3.0 of the plan.

Sensitive Areas

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

Sensitive Area	Area
National Park (NP)	1.67ha
Select...	

Property Details

Property Name:	Ardgartan		
Business Reference Number:		Main Location Code:	
Grid Reference: (e.g. NH 234 567)	NS 231988	Nearest town or locality:	Ardgartan
Local Authority:	LLTNP		

Owner's Details

Title:	Ms	Forename:	Shirley
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Ardgartan Land Management Plan 2020-2030

Surname:	Leek		
Organisation:	FLS	Position:	Planning Manager
Primary Contact Number:	0131 370 5674	Alternative Contact Number:	07885592015
Email:	enquiries.central@forestryandland.gov.scot		
Address:	FLS		
Aberfoyle			
Postcode:	FK8 3UX	Country:	
Is this the correspondence address?	Yes		

Agent's Details			
Title:		Forename:	
Surname:			
Organisation:		Position:	
Primary Contact Number:		Alternative Contact Number:	
Email:			
Address:			
Postcode:		Country:	
Is this the correspondence address?	Select...		

Office Use Only	
GLS Ref number:	

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1.0 Summary

1.1 Introduction

The Ardgartan Land Management Plan area occupies a peninsula of land between Lochs Long and Goil in the eastern part of Argyll. The closest larger settlements are Lochgoil immediately to the west and Arrochar, further away to the north east. The strategically important A83 trunk road runs to the north of the block. Both commercial non-native conifer plantations and significant areas of native woodland are concentrated in narrow strips along the shores of the lochs. The central part of the area is open hill ground making up almost 60% of the 3354ha total area. Of the woodland area 64% is Sitka spruce, 20% other conifers (including Scots pine) and the remainder is broadleaved woodland (the majority of which is native woodland). Over 50% of the woodland is greater than 50 years of age and there is very little less than 20 years old.

Key objectives include diversification of both species and age structure. Also, although retaining a significant element of timber production is important, restoration of ancient woodland sites is a fundamental concern. A programme of progressive removal of larch will be implemented and alternative species sought at restocking that continues the landscape interest provided by larch.

1.2 Objectives

- Create a coupe structure that progresses the restructuring process started in the previous plan aiming to diversify both species and age diversity. Include coupes already incorporated into the Regional felling programme.
- Incorporate stands with significant proportions of larch into first phase felling coupes in line with FLS policy to remove 50% of larch from zone C by 2023.
- Remove the majority of accessible non-native conifer from the western part of the plan area within the plan period. Outline longer term management options for remaining stands.
- Restore ancient woodland sites and re-establish commercially non-viable sites with native woodland, avoiding isolation of commercially viable sites.
- Retain majority of the southern tip of the peninsula as natural reserve, but incorporate larch stands into felling coupes due to threat from Ramorum disease. Where feasible create a buffer zone around the reserve.
- At restocking seek to maximise production using Sitka spruce as the predominant species in a clearfell management system. Use alternative species to improve diversity and landscape, where site conditions are favourable.
- Restore PAWS indicated as 1a and 2a on the ancient woodland layer in line with Forestry and Land Scotland Policy.
- Establish a definitive forest habitat network and outline management approaches to be adopted within it.
- Where feasible seek to improve habitats for a range of bird and mammal species including golden eagle, black grouse and red squirrel.

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- Seek to soften landscape impacts through careful coupe design, expansion of a forest habitat network (FHN), modification of upper treeline and judicious use of alternative species.
- Examine management options in the area around Coillesen taking into account recreation interest along trail networks and the Your Park areas.
- Establish and maintain a deer control programme that allows successful establishment of vulnerable species.

1.3 Key proposals

Total Plan Area	3354 (ha)
Planned operations	
Felling	496ha.; 243250m ³
Thinning	367ha; 7200m ³
Restock	302ha of conifer; 194ha of broadleaf.
New planting	0ha
Roads and tracks	8411m track; 47000m road upgrade
Public access	

1.4 Species diversity

Species group	2020	2030	2040
Sitka spruce	26.0%	23.0%	21.0%
Other conifers	6.2%	3.5%	3.3%
Scots pine	1.0%	0.6%	0.3%
Broadleaves	7.2%	11.3%	17.0%
Open space	59.7%	61.7%	58.5%

1.5 Major issues

Issue	Description/mitigation
Issue 1	Steep, challenging sites, particularly in western part of area. Use contractors with adequate skills base and machinery to manage sites.
Issue 2	Extensive areas of plantation on ancient woodland sites. Establish extent of priority ancient woodland and outline a sustainable restoration plan that can be sustained into the future.
Issue 3	Threat from Ramorum disease impacting management of non-larch trees. Incorporate larch into a felling programme that meets FLS objective of removing 50% of that species before the end of 2023.
Issue 4	Poor road access. Find cost effective, long lasting, solutions to improve road system and provide access into isolated coupes.

1.6 Critical success factors

The following are critical to success of the plan:

- Timely construction of new, or upgrading of, existing roads, and roads/tracks to access approved felling coupes.
- Availability of contractor base capable of working in challenging situations.
- Adequate deer control measures for protection of broadleaved species and soft conifers.

1.7 Standards and guidelines

This plan takes account of Scottish Government and Forestry and Land Scotland policy and strategy. It has been developed in accord with the latest UKFS Guidelines and is audited under the UK Woodland Assurance Standard. Forest and Land Scotland Woodlands are certified as being sustainable by both FSC and PEFC.

1.8 Consultation

During the development of this plan we have consulted with stakeholders known to have an interest in this plan area. A list of stakeholders and their response can be found in Appendix I.

1.9 Contacts and further information

For further information on this or any other land management plan please contact:

Forest and Land Scotland
[Central Region \(Aberfoyle Office\)](#)
Aberfoyle
FK8 3UX
tel. 0131 370 5674

2.0 Scottish Forestry regulatory requirements

2.1 Context and rationale for concept

Ardgartan forest is situated amidst dramatic coastal scenery in relative isolation from the surrounding land. It is surrounded on two sides by narrow, fjord like sea lochs and there is only limited access from Glen Croe and Lochgoilhead. The woodlands have been dominated by commercial spruce plantations but there are significant areas of ancient semi natural woodland. Re-structuring of relatively even aged forests has been ongoing for some time though there have been some delays in recent years. The plan continues the restructuring process and takes into account key landscape and environmental issues whilst maintaining a large element of productive forestry.

2.2 Proposed felling in years 2020 – 2030

Phase	Area (ha)	Volume (m ³)
1	225	107350
2	271	135900
	496	243250

Table 2.1 Summary of felling proposals (net area)

Map M4 shows the coupes for which approval is being sought for clearfelling and thinning during the plan period. These are set in the context of longer term management proposals in Map M3. The future habitats map (M5) should also be referred to.

2.3 Proposed thinning in years 2020 – 2030

Phase	Area (ha)	Volume (m ³)
1	287	1500
2	367	5700
		7200

Table 2.2 Summary of thinning proposals

Indicative thinning coupes are shown on map M3 and further detail found in section 5.1.2.

2.4 Proposed restocking in years 2020 – 2030

Phase	Species	Area (ha)
1/2	Conifer	302
1/2	Broadleaf	194
		496

Table 2.3 Summary of restocking proposals

Restocking proposals are shown on map M5 and further details found in section 5.2. The overall objective has been to maintain a high level of production whilst introducing greater diversity and restoring large areas of plantation on ancient woodland sites.

Where production is the key objective, conifers will be planted at densities of approximately 2700 stems per hectare (sph) and broadleaves in the region of 3500. Restocking will be within two to three years of felling.

Target densities for natural regeneration, of native and non-native species, will vary depending on site objectives. On any given site, density might vary between 250 sph to 1600 sph with an overall figure of 1100 sph. Natural regeneration sites will be assessed five to eight years after felling. If it seems unlikely regeneration will become established by year 10, the site will be planted to achieve the desired stocking level at year 10.

Open areas will be allowed up to 20% tree cover. Sitka spruce regeneration will be kept within agreed tolerance limits on both open ground and in areas designated for broadleaved woodland. Large amounts of rhododendron are known to be present and appropriate measures to control this species will be put in place.

2.5 Access and roading in years 2020 – 2030

Phase	Type	Length (m)	Area (ha)
1/2	New roads	n/a	n/a
1/2	Tracks/ramps	8411	1.67

Table 2.4 Summary of roads and tracks

Proposed roads and tracks are shown on map M7 and more detail is to be found in section 3.0.

2.6 Departures from UKFS guidelines

There are no departures from UKFS guidelines.

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2.7 Tolerance table

	Adjustment to felling coupe boundaries	Timing of restocking	Change to species (including boundaries)	Windblow clearance	Changes to road lines
SF Approval not normally required	Up to 1ha or 10% of coupe - whichever is less (including parts of coupes without formal approval through the LMP)	For productive species, up to 3 planting seasons after felling Up to 10 planting seasons for natural regeneration	Change within species group i.e. diverse conifers; broadleaves; Sitka spruce. Non native conifers in native woodland areas and designated open space up to 400 stems/ha. <20% increase in area of Sitka spruce		Departures of <60m in either direction from centre line of road
Approval by exchange of letters and map	1ha to 5ha or 20% of coupe - whichever is less (including parts of coupes without formal approval through the LMP)	For productive species, 3 – 5 years after felling	>20% increase in area of Sitka spruce	Up to 5ha	Departures of >60m in either direction from centre line of road
Approval by formal plan amendment may be required	> 5ha or 10% of coupe	For productive species, over 5 planting seasons after felling	Change from specified native species Change between species groups	More than 5ha	As above, depending on sensitivity

3.0 EIA screening determination for forestry projects

3.1 Proposed deforestation

There are no deforestation proposals.

3.2 Proposed afforestation

There are no afforestation proposals.

3.3 Proposed forest roads, tracks and other facilities

This is a request for an EIA determination for works covering construction of tracks in Ardgartan LMP area. The request covers proposals for a number of first phase coupes only. For other first and second phase coupes, access to and within operational work areas is very difficult, particularly in the western side of the block. These sites need more detailed on site assessments and separate screening requests will be prepared when these are complete.

About 300m of new road are required to facilitate harvesting and extraction in coupe 03011. This is shown on the roads and tracks map but is already the subject of a previous screening request (SOR 375).

Approximately 8411m of tracks will be required to facilitate harvesting, silvicultural and deer management operations in first phase coupes in the north eastern part of the plan area.

Tracks will be about 2m wide and the nominal area amounts to 1.7ha. ATV tracks will be constructed in line with the principles described in the SNH guidance on Constructed Tracks in the Scottish Uplands. Construction will also conform to the Forests and Water Guidelines (Fifth Edition). During construction ground disturbance will be kept to a minimum. ATV tracks will not be treated as permanent features; once operations are complete tracks will be allowed to grass over and the running surface and side batters will be left in a condition that will promote vegetation regeneration. Tracks will be constructed with a top-side drain and will have regular drainage cut-offs to prevent erosion of the trackside drain. No water from the trackside drains will discharge directly into any watercourse.

Indicative positions of the tracks are shown on the roads and tracks map (M7) and final positions will be within $\pm 60\text{m}$ of these. The actual lines will be planned to minimise landscape impact and ground disturbance, reflecting existing topography, avoiding steep gradients where possible and avoiding sensitive habitats.

Harvesting facilities for the above coupes have already been through the determination process (SOR 313). All other features required for harvesting and restocking (e.g. forwarder tracks, ramps) need further, more detailed, investigation and a determination will be sought prior to operations commencing.

A summary of roads and tracks is found in the table in section 3.5.

3.4 Proposed quarries

There are several quarries within the plan area (map M7), all but two are active or disused. Proposals to re-open or extend quarries will be the subject of a separate screening request.

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3.5 Screening opinion request summary

Coupe	Length (m)	Area (ha.)	Purpose	Landscape	Water quality	Archaeology	Biodiversity	Access	Recreation	Material
03003	1975	0.40	crop establishment and deer management	visible from Three Lochs Way – plan appropriately	steep slopes – careful planning and enhanced protection measures	no known issues	no significant issues	from forest road	n/a	to be found on site
03005	1627	0.32	crop establishment and deer management	visible from Arrochar, plan appropriately	steep slopes – careful planning and enhanced protection measures	no known issues	Coilessan Burn – spawning salmonids	from forest road	n/a	To be found on site
03011	2409	0.47	crop establishment and deer management	no major impact	enhanced protection measures	no known issues	Coilessan Burn – spawning salmonids	from forest road	potential diversion route for Cowal Way /a	to be found on site
03012	1261	0.25	crop establishment and deer management	no major impact	standard protection measures	no known issues	no significant issues	from forest road	n/a	to be found on site
03017	437	0.09	crop establishment and deer management	No major impacts	standard protection measures	no known issues	no significant issues	from forest road	n/a	to be found on site
03025	702	0.14	crop establishment and deer management	no major impact	steep slopes – careful planning and enhanced protection measures	no known issues	no significant issues	from forest road	n/a	to be found on site

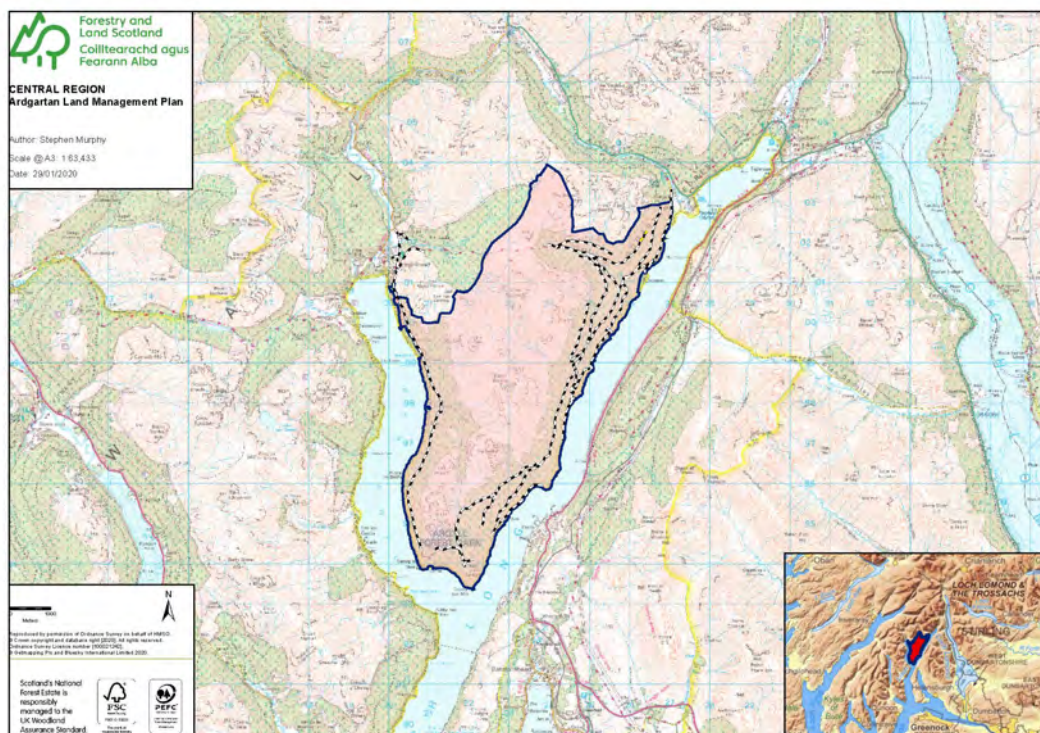
4.0 Land management plan

4.1 Introduction

This is a re-submission of a plan first developed by Forest Enterprise Scotland (now Forestry and Land Scotland) in 2006. This plan describes proposals to continue the work of re-structuring described in the previous work but sets it in the context of revised aspirations and policy. A summary of the plan proposals is found in section 1, whilst sections 2 and 3 deal with Scottish Forestry regulations and EIA screening requirements respectively. This section covers the context, key issues and the broad proposals of the plan. Section 5 provides greater detail on management proposals summarised in previous sections. Section 6 repeats the critical success factors and section 7 summarises broad management prescriptions. Background information is found in section 8. Several appendices deal with the consultation process, proposed quarry development and provide a summary of management proposals in tabular form.

4.2 Setting and context

The Ardgartan Land Management Plan area (see Figure 4.1) occupies a peninsula of land between Lochs Long and Goil in the eastern part of Argyll. The closest larger settlements are Lochgoil immediately to the west and Arrochar, further away to the north east. The strategically important A83 trunk road runs to the north of the block. Both commercial non-native conifer plantations and significant areas of native woodland are concentrated in narrow strips along the shores of the lochs. The central part of the area is open hill ground making up almost 60% of the 3354ha total area. is located on the northern slopes of Ben More to the south and east of the village of the same name. Ardgartan LMP area is wholly within the Loch Lomond and the Trossachs National Park.



4.3 Analysis and important issues

Factors that have been taken into account in developing the LMP proposals are summarised in the analysis and context (map M1) these include:

- Extensive areas of existing and plantation on ancient semi-natural woodland. FLS is committed to maintaining or restoring the majority of such sites.
- Very steep slopes, frequently rocky, bouldery and difficult to access. Some potential for instability.
- Larch stands, often isolated, at general risk of Ramorum disease. Plan area falls within a zone within which FLS aim to remove 50% of larch before the end of 2023.
- Relatively poor forest road network.
- Warm moist climatic conditions rapidly becoming cool and wet with elevation. Combined with acidic moist to wet soils commercial planting is restricted to below about 300m to 400m.
- Loch Goil is a Marine Protected area and salmonids spawn on burns within the plan area.
- Known black grouse leks nearby and several birds of prey range over the area.
- Significant amounts of Rhododendron ponticum.
- Limited access to main transport routes.
- Popular walking routes in parts of the plan area.
- Landscape value from key viewpoints.

4.4 Key challenges and liabilities

Significant challenges are:

- The reduction in the area of commercial spruce forest through implementation of the PAWS policy and removal of difficult sites from the productive area.
- Significant areas of PAWS restoration requiring rapid establishment of native woodland and removal of non-native natural regeneration.
- Extensive areas of very steep, difficult to access, ground which require to be restocked with native woodland.
- Removal of larch in line with FLS policy.
- Significant road improvement requirements.
- Rhododendron control.

4.5 Concept

The Analysis and Concept (map M1) summarises how the important issues will be addressed, including:

- Identification and restoration of PAWS, seeking opportunities to extend the area of native woodland around these.
- Assessing slope instability and adopting management options suitable for these situations, including protection of third party infrastructure and environmentally sensitive sites.

- Seek to remove a significant proportion of larch within the first 5 year period of the plan.
- Taking into account site conditions when selecting species for restocking and providing adequate protection for vulnerable species.
- Continue to expand the forest habitat network and improve conditions for priority species.
- Seek to maintain and enhance landscape value of the area.

4.6 Management objectives

Plan objectives are to be found in section 1.2. Broad objectives are illustrated in the management zones (map M2) though it should be stressed that there will be overlap between zones.

5.0 Management plan proposals

5.1 Management

Management will be guided by the key objectives of the plan. The main management technique will be clearfelling and re-planting of commercial woodland; where there is adequate seed source natural regeneration will be preferred when establishment of native woodland is the objective

5.1.1 Clearfelling

Map M4 shows the coupes for which approval is being sought for clearfelling during the plan period. These are set in the context of longer term management proposals in Map M3.

Table 5.1 indicates net felling area and volume figures for the plan area for the first two phases. These values are approximate and coupes will be surveyed to provide more precise figures prior to felling. A breakdown of species to be felled is to be found in Appendix III.

Phase	Area (ha)	Volume (m ³)
1	225	107350
2	271	135900
	496	243250

Table 5.1 Proposed felling

The proposed felling sequence is a balance between achieving optimum economic return and other key objectives, in particular improving forest structure and resilience and early removal of larch. In general the felling sequence is similar to that proposed in the previous plan, lending a certain amount of continuity. Most stands will be between 45 and 55 years of age when felled and all are within 10 years of optimum felling age. The timing and spatial distribution of felling coupes fall within the parameters set out in the UK Forest Standard to mitigate risk of flooding and deterioration of water quality. Retention of some stands for a longer period will aid restructuring, improving future resilience and achieving a better age class balance. Several

coupes present severe operational difficulties and more detailed planning will take place before these are harvested.

First phase coupes are concentrated in the north eastern part of the block. These will be felled early in the period, which will allow the restructuring programme to get underway whilst access is improved to other areas. In the south eastern part of the peninsula, coupes to be felled in phase 1 contain significant proportions of larch. There is a similar pattern in the western part of the block overlooking Loch Goil; two small coupes in the north are relatively easy to access, coupe 03052 requires significant improvements to infrastructure and contains larch which, even then, will be very difficult to harvest.

Second phase coupes are more evenly distributed throughout the block though there remains a focus on removing those that contain larch. Coupes may be brought forward if larch becomes infected with Ramorum disease. Tracks will be required to access both coupes 03058 and 03060; detailed requirements will be assessed in the early part of the plan period and any necessary permission sought.

All harvesting operations will be carried out in accordance with the UK Forestry Standard Guidelines, and Forests and Water Guidelines (5th edition). On steep ground above potentially vulnerable property, a risk assessment will be carried out prior to operations and best practice will be observed, to minimise risk of debris flows and rock falls. Prior to operations any known heritage features will be marked to ensure protection during the operation. Where necessary public access will be managed so as to reduce disruption without compromising safety. Potential impacts on infrastructure will be taken into account during operational planning and the relevant organisation contacted prior to operations.

5.1.2 Thinning

There is limited scope for thinning in the LMP. Stands that might be thinned in the 10 year period of the plan are shown on map M4, Management phases 1 and 2.

There is some potential for first thinning of stands planted around 2010 and the following criteria will be used to assess suitability.

- Planting year around 2010
- Slope $\leq 30\%$
- DAMS score (exposure) ≤ 14
- Soil type (from maps)
- Accessibility

A more detailed assessment of the stands will be made at the operational planning phase and a final decision whether to proceed with the work will be made at that point. First thinning will be to marginal thinning intensity, dependent on survey data. Racks will be cut at appropriate spacing and matrix trees taken to achieve the recommended thinning intensity. Volume from first thinning is likely to be in the order of $50\text{m}^3\text{ha}^{-1}$.

Mainly for conservation reasons it will be beneficial to carry out a light thinning in some spruce stands on native woodland sites. This might be halo thinning around native tree species or opening up small areas to improve light conditions for ground flora. The ability to carry out this work will depend on site priorities, an assessment of stand stability, access and availability of skilled operators. The volume of timber from this work will be substantially less than marginal thinning intensity amounting to perhaps no more than $10\text{m}^3\text{ha}^{-1}$ over the plan period.

Management of native woodland sites might also include some cleaning of younger stands removal of occasional larger trees. Volumes are likely to be relatively insignificant, in the order of $5\text{m}^3\text{ha}^{-1}$ to $10\text{m}^3\text{ha}^{-1}$ over the plan period.

5.1.3 Potential for Continuous Cover Forestry

Although site conditions exist that would favour the use of Continuous Cover Forestry (CCF) techniques, no commercial stands have been identified that would justify using them at present. In the future the best opportunities for CCF will be found on drier, sheltered sites with good road access. Most of the existing native woodland area has been designated as CCF. The most likely management system will be single tree selection for conservation, rather than commercial, benefit.

5.1.4 Timber haulage

Timber will be hauled either north from Lochgoilhead or Ardgartan. From the western part of the forest a forest road allows lorries to avoid the village of Lochgoilhead and access the B839 at Inveronich. From there timber will be taken north then east up Gleann Mor using the forest road. Lorries will come back onto the B828 at the top of Gleann Mor and travel the short distance to meet the A83 trunk road at the Rest and be Thankful. From Inveronich, some timber may be taken directly north to the A815, via the B839, and thence to Sandbank but the amounts are likely to be very small. The appropriate authorities will be consulted if and when the latter route is to be used. From Ardgartan timber lorries will access the A83 trunk road at the FLS car park and visitor centre in Glen Croe.

The volume of timber to be moved and the approximate number of lorry loads is shown in table 5.2.

Phase	Lochgoilhead		Ardgartan	
	Volume (m ³)	Lorrie loads	Volume (m ³)	Lorrie loads
1	22250	718	85100	2746
2	59100	1906	76800	2477
Total	81350	2624	161900	5223

5.2 Future habitats and species

The management zones map (map M2) indicates the broad aspiration for future habitats which are shown in more detail in the future habitats map (map M5).

Table 5.3 summarises the establishment proposals for the plan area during the first two phases.

Phase	Species	Area (ha)
1/2	Conifer	302
1/2	Broadleaf	194
Total		496

Table 5.3 Proposed establishment

A significant proportion of the woodland area is on ancient woodland sites. Where these are currently occupied by exotic commercial species they will be restored to native woodland following clearfelling. Where possible a buffer will be established around these sites and native species will be preferred in the forest habitat network. The native woodlands will be a mix of oak, birch and Scots pine, though other native species will also be encouraged. Where there are adequate seed sources natural regeneration will be the preferred establishment option. Elsewhere, or where natural regeneration is not developing quickly enough, planting will take place. Crucial to the success of native woodland establishment is effective deer control. Reducing the number of deer per hectare from the current 30 or more to less than 10 will be a key priority. Even so fencing might be required to protect some sites.

In the north eastern part of the plan area large seeded native species will initially be avoided - this is to reduce the risk of spread of grey squirrels into the Cowal Peninsula. We will continue to work with partners to monitor and control grey squirrels and review this approach at mid-term review and plan resubmission

In the natural reserve at the southern tip of the peninsula the woodlands will be allowed to develop without interference other than for conservation reasons (e.g. rhododendron clearance). Over the long term a mixed species, mixed age woodland of exotic conifer and native woodland is expected to develop.

In principal, climatic conditions favour a wide range of species that could be used for commercial planting, though exposure becomes an increasingly limiting factor above about 250m. In practice site conditions – a combination of wet, acid or steep and rocky ground – mean that Sitka spruce will remain the species of choice in most situations. Where large areas of pure Sitka spruce are indicated these will be broken up along riparian zones and by not planting very poor ground. It is not possible to show this in detail until sites can be assessed following clearfelling. The use of extensive stands of Sitka spruce will help maintain a barrier to the potential spread of grey squirrels into Cowal.

On sites lying between the ancient woodland areas and Sitka dominated ground opportunities will be sought to use alternative species, concentrating on sites with better soil conditions, especially where this will maintain or improve landscape diversity. The use of species other than Sitka will also help improve age diversity in the future due to the different rotation lengths associated with these. Typical species will include Norway spruce, Douglas fir and western red cedar. Scots pine will be considered on any drier acidic sites. Where feasible the use of broadleaved species will also be used to add visual and species diversity.

In general the existing commercial treeline will be modified when the ground is restocked. This is for both commercial and landscape reasons. Mixed natural regeneration will be allowed in these areas.

At restocking the latest advice and guidance will be followed where there are areas of deep peat. Proposed restocking will be reviewed and modified if necessary.

5.3 Management of open land

Open land ranges from high elevation hillsides and plateaus to riparian and bare steep slopes at all elevations. It includes roadline wayleaves and other open space around buildings, for example.

The open hill ground is covered by a long term grazing let and this will remain in place. There is an aspiration to improve some of the priority habitat. One area that would immediately benefit from restoration is centred around Cnoc Coinnich at GR NN233008, where there are good examples of priority bog habitat.

Roads will be routinely maintained during the plan period and this will include drain maintenance and removal of natural regeneration where it interferes with the integrity and use of the road. Wayleaves will also be kept open and managed in accordance with terms agreed with the relevant utility companies.

Much of the open space within woodland areas will be considered transient and is not mapped. Buffer areas around riparian zones will not be restocked with commercial conifer, as per guidelines, but an open woodland habitat will be allowed to develop. In this case non-native species will be kept to within tolerable limits.

5.4 Visitor zones and access

Maintenance and improvement of existing trails will continue throughout the plan period. In particular cycle routes and trails in the north west will be reinstated or improved and repairs made to infrastructure. Maintenance of the Peninsula Circuit will also take place. Improvements are also necessary for the car parking facility and the National Park Camping Management Zone. The aim will be to maintain and create a more pleasant and diverse network of woodland walks and cycle trails. Work will include ditching and road improvements. Some small trees may be removed during the plan period but volumes will be small and are incorporated into the overall thinning figures. More detailed specifications will be developed prior to any work being carried out and any necessary permissions not covered by this submission will be applied for.

5.5 Deer management

The LMP area is covered by a deer management plan which includes Glen Croe, Cruach Tairbeirt and Butterbridge LMPs; those sections relevant to Ardgartan are to be found in Appendix IV. This plan is currently under review but the overall aim is to reduce deer numbers (currently in the region of 30 or more per hectare) to around 10 or less per hectare and limit leader browsing on restocking to less than 10%. It is recognised that protection of both native and more vulnerable softer non-native species is crucial to plan objectives and early in the plan

period around 300 deer per annum will be culled from the plan area. A key part of deer management is to liaise with neighbouring properties and local deer management groups.

Deer control will be carried out by FLS wildlife rangers and contract staff. The use of fencing will be considered when deer numbers remain a threat to more sensitive species, for example if immigration from neighbouring deer populations cannot be reasonably controlled by shooting. Consideration will be given to strategic fencing of the southern part of the peninsula and small exclosures might be used where groups of just a few trees each are desirable.

Part of deer management will include the creation and maintenance of deer glades and rides and tracks to give adequate access to both restock sites and open hill ground. More detailed planning will take place over the course of the plan period and any necessary permissions sought prior to work commencing.

5.6 Other proposals

Road maintenance will proceed as and when necessary during the plan period. This might include removal of roadside vegetation including occasional trees in excess of 10cm dbh. Similarly management associated with wayleaves and other facilities may include removal of some larger individuals or groups of trees. The volumes involved will not amount to more than 40m³ per annum.

Detailed proposals for major upgrades and/or larger tracks will be developed when requirements are better understood. Any necessary permissions will be sought prior to work commencing.

There are several quarries in the plan area, most of which are disused or inactive. If a decision is made to re-open and expand any of these the appropriate permissions will be sought.

5.7 Restructuring

5.7.1 Summary

The felling proposals renew the process of restructuring the forest developed in previous plans. The aim of restructuring is to gradually convert the commercial woodland into one with a more balanced age structure and a more diverse species range. It is believed that a more diverse forest encourages greater resilience to both disease and damage from extreme climatic events. Creating a coupe structure where adjacent coupes are not felled and restocked within five to fifteen years of each other is a standard method of achieving diversity. So called “adjacency” issues have been avoided as far as possible. The retention of several stands beyond the age of 60 years will afford improved age structure and resilience in the medium to long term. Retention and expansion of native broadleaved woodland will help maintain diversity and further improve resilience.

5.7.2 Species diversity

Table 5.4 indicates the change in relative species composition between 2020 and 2040. There is a reduction in the amount of Sitka spruce relative to other species over the 20 year period, but it remains the dominant species. There is a large increase in the percentage of native woodland as commercial conifer on ancient woodland sites is felled. The slight reduction in conifers other than Sitka spruce is compensated for by the increase in broadleaves on sites where alternatives were planted. The amount of larch is reduced as a response to the threat of Ramorum disease. Diversity is maintained due to the significant increase in native broadleaves.

Species	2020	2030	2040
Sitka spruce	64.5	60.0	50.5
Native broadleaves	17.8	29.4	41.0
Scots pine	2.5	1.6	0.8
Larch	6.0	1.0	0.4
Other conifer	9.2	8.0	7.3
	100.0	100.0	100.0

Table 5.4 Change in species diversity over time as a percentage of woodland area.

5.7.3 Age structure

Table 5.5 shows the change in relative age structure between 2020 and 2040. Early in the plan period younger age classes are very poorly represented. This is reversed in the early 2030s as approved coupes are restocked. Older age classes become dominated by native woodland as non-native conifer which have grown well beyond normal rotation age are finally removed. These figures indicate that it will take some time to achieve a balanced age structure.

Age Class	2020	2030	2040
0-10	2.6	44.8	48.2
11-20	3.3	1.5	30.6
21-40	31.5	9.4	4.3
41-60	29.2	27.2	7.6
60+	33.5	17.1	9.3
	100.0	100.0	100.0

Table 5.5 Age structure in Ardgartan (percent of forested area)

6.0 Critical success factors

The following are critical to success of the plan:

- Timely construction of new, or upgrading of, existing, roads, and roads/tracks to access approved felling coupes.
- Adequate deer control measures for protection of broadleaved species and soft conifers.

7.0 Management prescriptions

Clearfelling is the dominant management system that will be used. Coupe design takes into account topography, landscape and operational constraints and is intended to facilitate future restructuring. Several coupes on steep ground present severe operational difficulties and detailed workplans will be drawn up prior to work commencing. Age of clearfelling will generally be in the range 40 to 60 years.

Some younger stands will be assessed for thinning towards the end of the plan period to determine the most suitable methodology. In general thinning will be to marginal thinning intensity. A rack system will be established with racks at appropriate intervals, any outstanding volume being taken from the matrix. The potential to continue thinning into the future will be assessed on a stand by stand basis.

Restocking for productive purposes will be by planting following any necessary site preparation. The latter will include brash management, necessary drainage and, in general, mounding to provide a sheltered weed free planting site. On steep ground flat planting might be necessary. Fallow periods will be used to help mitigate weevil damage in line with aspirations to minimise use of chemical deterrents. Softer species may be protected by fencing from animal browsing.

There is a large seed source for native species and natural regeneration will be the preferred option for establishment of native woodland. The success of this will be monitored and supplementary planting used if necessary.

8.0 Background information

8.1 Previous plan

8.1.1 History

This is the third plan for the Ardgartan block the last one having been produced in 2006. The block was one of the earliest pieces of ground to be acquired by the then Forestry Commission and the earliest planting took place in the 1920s and 1930s. Although Sitka spruce was the most frequently planted species older stands of Norway spruce, larch and Scots and lodgepole pine remain. Another wave of planting took place during the 1970s, at least some of which would have been second rotation. The intention was to establish a productive forest and the previous plan examined ways in which a range of other objectives could be achieved without compromising production. This plan takes into account the aspirations of the previous plan and builds on these in light of changing policy and new circumstances.

8.1.2 Analysis of previous plan

The broad aims of the previous plan were:

- To diversify age structure whilst maintaining timber production.
- Where possible diversify species structure.

- Enhance or restore ancient woodland sites.
- Provide other conservation and social benefits including improvements to access and landscape.

Several approved coupes were not felled during the plan period and this has led to delays in restocking and therefore restructuring. Those that were felled have been restocked in accordance with plan proposals. There have also been impacts on achieving conservation and landscape objectives that are being re-assessed in the current submission. Despite the delays the broad aspirations of the plan remain relevant.

8.1.3 Continuity with previous plan

The broad objectives of the previous plan are relevant to the new land management plan, though there is a slight change in emphasis with regards to some of these. Sustainable timber production remains a key objective and the plan seeks to maximise the productive potential of the area without compromising other objectives. In addition, due to climatic and site conditions it is recognised that opportunities to use species other than Sitka spruce might be limited. Larch can no longer be used to provide landscape interest. The area mapped as PAWS has been re-examined and there will be a continued restoration of these sites as non-native species are felled, adding to diversity. Diversification will also be achieved by continuing to increase the amount of native species in FHNs. The felling programme will follow guidelines to minimise risk to water quality and minimise risk of instability on steep ground. The landscape remains a key element in forest design. The zones map (map M2) illustrates the relative importance of the main objectives throughout the area, though there is a degree of overlap.

8.2 Physical site factors

8.2.1 Geology, soils and landform

Ardgartan is sandwiched between the two sea lochs, Long and Goil. From the shores of these lochs the land rises steeply to a series of minor peaks running south to north along a ridge which reaches its highest point at The Brack (787m asl). To the north are the first high peaks of the southern highlands reaching elevations over 900m. Due to its position between the lochs, aspect is generally south east or south west. Everywhere slopes are steep but particularly alongside Loch Goil where they are also often bouldery with frequent rock outcrops. Upper slopes are steep, frequently in excess of 40% and there are many examples of exposed rock faces. The slopes are incised by steep fast flowing streams, only a few of which open out into wider glens.

The plan area is to the north of the Highland Boundary Fault and the solid geology is dominated by fine grained metamorphosed sedimentary rocks with low base status. Because of the steep slopes there is little or no cover with more recent glacial material, this generally being confined to the upper parts of the wider glens. This material might be prone to instability in places. There are small areas of marine deposits around the coastal fringe.

Detailed soil survey is restricted to an area to the north and south of Coilessan Glen - the remainder of the area is covered by national mapping at a much smaller scale. Indications are that brown earths occur on steeper slopes, at lower elevations, but that peaty gleys dominate at higher elevations. Iron pan soils occupy intermediate ground and there are small areas of flushed and unflushed peat on a range of slope types. Rocky and boulder ground with shallow soil occurs on steep ground at all elevations.

8.2.2 Water

The area is drained by many steep fast flowing burns which drain directly into the sea lochs. Several of these, e.g. Coilessan and Guanán, are larger and occupy less steep side glens. The smaller burns are frequently incised into any underlying softer material and bedrock. SEPA flood risk maps indicate that there is a risk of flooding within short distances of burns where their gradient is not very steep but these are not extensive. There will be some potential for erosion and resulting sedimentation downstream. There are several private water supplies in the block and the adjacent Donich catchment is in a drinking water protected area but this is not at risk from forestry activity within the Ardgartan block.

8.2.3 Climate

Using the measures of warmth and wetness defined in the Ecological Site Classification (ESC, see Forestry Commission Bulletin 124) the Ardgartan LMP area is categorized as warm and moist between sea level and about 200m elevation. Above that level climate becomes increasingly cold and wet, the highest elevations being considered sub-alpine. Average annual rainfall at Lochgoilhead is in the region of 1650mm, about 60% of which falls between October and March, however there is significant rainfall throughout the year. The coastal fringe is considered sheltered, but exposure increases rapidly with elevation, becoming severely exposed on open hillsides above 400m.

8.2.4 Future climate

Predicting the impact of future climate change presents one of the biggest challenges in forest planning. Analysis carried out by Forest Research indicates an overall increase in average temperatures with warmer summers and milder winters. There will be regional variation in the future rainfall pattern and distribution, with a predicted decrease in summer rainfall in the east but a predicted increase in the west of the country. This will lead to more frequent drought in the east but a reduction in moisture deficit in the west.

There is less confidence in predicting changes in other climatic parameters such as windiness and extreme winter cold or summer heat. However, there is a general belief that the number of frost days will decrease and that the incidence and severity of extreme events (e.g. gales and heavy rain) will increase.

Data for the LMP area suggest an increase in accumulated temperature of over 50% by 2050, compared to baseline 1960 – 1990 data, and about 75% by 2080. Relative increase is even greater at higher elevations and all parts of the forest are predicted to be classed as warm as

early as 2050. Annual rainfall is predicted to remain more or less the same, a decrease in summer rainfall being compensated by a similar increase in winter. Despite the decrease in summer rainfall moisture deficit is predicted to also decrease. The impact of these changes on soil properties is uncertain. Potentially there could be an increase in growth rate in all tree species and a wider range of species may become suitable. However where exposure is currently a limiting factor it seems likely to remain so, and this potential for increased growth rate will be restricted to more sheltered parts of the forest.

8.3 Biodiversity and environmental designations

The commercial planting is dominated by Sitka spruce though there are older stands of Norway spruce and both Scots and lodgepole pine. Outwith these areas there are a number of different woodland and open ground habitats. On the shores of both lochs are large areas of semi-natural native woodland and these are only the remnants of a larger area of ancient woodland now planted with non-native conifer; both native and non-native sites harbour important lower plant species and ground flora. The high moorland above the tree line consists of a mosaic of priority open habitat including areas of blanket bog and upland heath.

A number of bird and mammal species utilise the forest. The area falls within a golden eagle territory and the influence zone of at least one black grouse lek is to be found in the north west. Both osprey and white tailed sea eagle are being seen more regularly and there are several sites suitable for nesting raven, peregrine and kestrel. Red throated divers use Corran Lochan. A number of important mammal species are present including red squirrel, pine marten and badger and bats of various species will use the native oakwoods.

There are no designations within the plan area but Loch Goil is part of a larger Marine Protected Area which includes the upper part of Loch Fyne.

Rhododendron ponticum is widespread and has a negative impact on natural habitats.

8.4 The existing forest

8.4.1 Species, age structure and yield class

The forested area is dominated by Sitka spruce, the earliest planting of which was in the late 1920s. The information in table 8.1 below includes open space but if the latter is excluded Sitka spruce makes up about 64% of the forested area. Native broadleaves, including extensive stands of oakwood, are the next most abundant group making up about 17% of the woodland. The woodlands are relatively old – about 30% in the 41 – 60 age class; and slightly more is aged over 60. Less than 10% of the woodland is younger than 20 years old. Productivity can be very good with yield classes in excess of $20\text{m}^3\text{ha}^{-1}$ on sheltered sites with good soil conditions. At higher elevations a combination of lower temperatures, poorer soil conditions and increasing exposure reduce yield class to no more than $12\text{m}^3\text{ha}^{-1}$. Across all sites yield class can change over a very short distance for example where freely draining raised sites sit adjacent to flatter, poorly drained sites.

Species	Area ha	Area %
Sitka spruce	872.5	26.0
Larch	80.6	2.4
Scots pine	34.0	1.0
Native broadleaves	230.0	6.9
Other broadleaves	10.6	0.3
Norway spruce	68.9	2.1
Other conifers	56.0	1.7
Open	2000.7	59.7
	3353.3	100.0

Table 8.1 Species diversity, 2020 (gross plan area)

Age Class	Area ha	Area %
0-10	34.8	2.6
11-20	44.1	3.3
21-40	424.8	31.5
41-60	394.8	29.2
60+	451.7	33.5
	1350.2	100.0

Table 8.2 Age diversity, 2020 (figures are for woodland area only)

8.4.2 Access

Access to the forest block is limited. From the north east there is a forest entrance at the visitor centre off the A83, in the lower part of Glen Croe. The first part of this road is surfaced with tarmac as far as a car park from where a more extensive road network reaches as far as the southern tip of the peninsula. Much of this network is in the process of being upgraded. The western part of the block is currently accessible only from a forest road which leaves the B839 to the north of Lochgoilhead, near Inveronich, and runs behind the village partly through open ground. Although this road also runs to the southern tip of the peninsula it does not connect to that on the eastern side. This road was not designed for modern timber traffic and is in need of major upgrade before felling and haulage operations can begin.

8.5 Landscape and land use

8.5.1 Visibility, landscape character and value

The plan area falls within the “Steep Ridges and Hills” Landscape Character Type as described by Scottish Natural Heritage. The key characteristic is that of steep sided hills rising dramatically from narrow sea lochs and glens to prominent summits. The hills are often seen in

conjunction with the higher “Highland Summits” that lie to the north, for which they are a sort of precursor, and with the sea lochs result in a Fjord-like seascape. Settlement is largely absent and there is a sense of remoteness.

The northern part of the block is visible from Arrochar but views from the A814 to the south are restricted by roadside vegetation. Better views are obtained, from the east, at higher elevations, for example along the Three Lochs Way. To the west the steep slopes form a dramatic backdrop to Loch Goil from Lochgoilhead and Carrick.

8.5.2 Neighbouring land use

The villages of Arrochar and Lochgoilhead lie to the north east and north west of the area respectively. Both cater for the tourist industry and provide vital facilities for local residents. The wider area is dominated by commercial forestry, both public and private. There is some agriculture in the wider straths and there is rough grazing at higher elevations.

8.6 Social factors

8.6.1 Recreation

Ardgartan is described as a key gateway to the Argyll Forest Park in the Visitor Strategy for the latter. There are few formal facilities in the LMP area but close by are the Ardgartan Forest Holidays site and a hotel run by a major tourist company. In addition there are parking and toilet facilities at the old visitor centre in Glen Croe. On the western side there are caravan parks in Lochgoilhead. There are both short and longer distance promoted trails and bike routes and these are indicated on the recreation map (M9).

There are two key long distance trails which form the backbone of the core paths in the area – the Cowal Way and the Peninsula Circuit. The latter will be one of the first routes to be designated ‘Explore Further’ as part of FLS’ visitor offer. As the name implies it allows a longer distance circular tour of the whole peninsular. Shorter trails include the Lochshore Trail and a cycling trail between Ardgartan and Coilessan. There are also short trails from Lochgoilhead, currently not formally promoted by FLS. There is a parking area at the entrance to Coilessan Glen and this is used to access trails and is the closest point for vehicle access to Mark Cottage which is managed by the Mountain Bothy Association. The Coilessan area is within the National Park camping management zone and contains a camping permit area.

The Peninsula is also frequently used as a training area by both British and foreign military personnel, generally during the period September to December. There are also several externally organised sports events which use the forest trail and road network.

8.6.2 Community

Local communities use the forest informally and Lochgoilhead Community Council have been closely consulted during the development of this plan.

8.6.3 Heritage

A number of heritage features have been identified and these are shown on the conservation and heritage (map M6). Most are remnants of shielings or sheep enclosures though there are farmsteads at Guanabeg, Dial and Mark. There is a possible township, including platforms, buildings and kilns at Corran. Other features include cup marked stones, and a lighthouse or beacon at Carraig nan Ron. Several features identified in a Historical Land Use Assessment exercise have scant if any evidence of their existence on the ground..

Appendix I: Consultation record

Consultee	Date contacted	Date response received	Issue raised	Forest District Response
Forestry Commission Scotland	n/a	n/a	n/a	information only
Loch Lomond and The Trossachs National Park	n/a	Attended internal scoping and provided additional information by email.	<p>Would like to see improvements to Forest Habitat Network and improvement to poor upper edges.</p> <p>Suitable alternatives to larch should be used to break up visual appearance of spruce stands.</p> <p>Be aware of Management Camping Zone.</p> <p>NPA are considering landscape scale rhododendron control in the wider area.</p> <p>Raised concern regarding spread of Sitka spruce onto open hill ground and landscape impacts of maintaining current treeline.</p> <p>Suggest using broadleaves to soften top edges.</p> <p>Poorly growing areas of conifer on deep peat should be considered for restoration at restocking.</p>	<p>FHN will be extended as spruce stands are felled providing more diversity and connectivity.</p> <p>Where site conditions allow, and there is no significant loss in productivity, alternative species to Sitka will be considered when restocking.</p> <p>Rhododendron control will be referred to in plan.</p> <p>Where feasible Sitka regeneration will be managed, top edges will be modified at restocking though the use of broadleaves may be limited.</p> <p>Consideration will be given to restoring peat areas at restocking.</p>
Scottish Water	20.11.19	18.12.19	<p>Part of the plan area falls within a Drinking Water Protected area and there are associated Scottish Water Assets on the Donich Water.</p> <p>All SW assets potentially affected by operations should be identified prior to them taking place.</p> <p>Proposals should comply with UKFS Forest and Water Guidelines and take account of Guidance on Forestry Activities Near SW Assets.</p>	<p>The DWPA lies outside areas of forest operations and the Donich Water is outside the plan area.</p> <p>Presence of SW assets will be checked prior to operations and SW contacted if necessary.</p> <p>Proposals will comply with relevant guidelines.</p>
SNH (Nature Scotland)	20.11.19	17.12.19	<p>Support the overall strategic approach of improving structure and diversity of the woodland, including PAWS restoration and establishment of a forest habitat network.</p> <p>The western side of the site lies adjacent to the Upper Loch Fyne and Loch Goil Nature Conservation Marine Protected Area noted for several important marine environments and communities which are sensitive to sedimentation and pollution. Advise strict adherence to Forest and Water Guidelines, particularly</p>	<p>Adjacency to MPA will be noted in operational workplans and operations will comply with Forest and Water Guidelines.</p> <p>FLS are aware of eagle territory and elements of the plan will seek to improve habitat for that species.</p> <p>Black grouse are known to be present to the north of the site and operations will be timed to avoid disturbance and FLS will look at options to improve habitat within the site.</p> <p>Use of spruce will continue to help provide barriers to spread of</p>

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			<p>referencing silt and sediment control, to avoid negative impacts on the MPA.</p> <p>Site lies within the range of an occupied golden eagle territory. Felling operations provide opportunities to improve habitat for golden eagle. Several specific measures recommended:</p> <ul style="list-style-type: none"> Improve riparian habitat by expanding native woodland; Improve open hill habitat for species such as black grouse, including low density planting and feathering tree margins; Increase the amount of internal open space; Leave prominent features unplanted. <p>Any use of helicopters need to follow best practice guidelines. Black grouse may be present on site. Woodland design should incorporate measures for this species. Operations should be timed to avoid disturbance to breeding birds.</p> <p>Parts of the woodland are noted as a red squirrel priority woodland. Design should mitigate against spread of grey squirrel into Cowal.</p> <p>Other protected species may be present and checks made prior to operations.</p> <p>Measures should be put in place to control the spread of invasive species such as Rhododendron ponticum and luteum.</p> <p>Avoid any new planting on deep peat and seek to avoid or protect Ground Water Dependent Terrestrial Ecosystems.</p> <p>A competent deer management plan is required.</p>	<p>grey squirrel. FLS have consulted with other partners and will continue to monitor and control grey squirrels if they are found on FLS land. The use of large seeded species will be avoided in the north-eastern part of the plan area to the north of Coileissan Glen. This approach to be reviewed with partners at 5 and 10 years. FLS will consider placing nest boxes for pine martens (known to prey on grey squirrels) in this area.</p> <p>Checks for breeding birds will be made prior to operations and timing of these managed as appropriate.</p> <p>Rhododendron presence will be assessed and appropriate control measures put in place.</p> <p>No new planting is envisaged in the plan area.</p> <p>A deer management plan will be included in the LMP.</p>
RSPB	20.11.19	20.12.19	<p>Welcome the inclusion of a habitat network with its potential to extend native woodland and biodiversity.</p> <p>Management for black grouse, , would be of benefit for this species. This would include:</p> <ul style="list-style-type: none"> Maintenance of internal open space; planting low density native species along the boundary of commercial plantation; restriction of encroaching non-native species onto open habitat. improving age diversity of commercial plantations; marking existing fences and sensitive design of any new fences. 	<p>Where appropriate habitat FLS will seek to improve habitat for black grouse.</p> <p>The plan seeks to improve age diversity through felling and restocking.</p> <p>Marking existing fences will be considered and any new fences sensitively designed.</p>
Butterfly Conservation	20.11.19	19.12.19	<p>Plans to retain, restore and expand native woodland should bring benefits to the moth fauna in the area.</p> <p>One species of moth of particular conservation concern may be present in the area. Retaining eared willow and improving connectivity between suitable habitat patches would be of benefit.</p>	<p>Possible presence of important moth species noted and habitat improvements will be part of the plan.</p>

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Lochgoilhead Community Council	Several meetings with community representatives from November 2019 to January 2020. Meeting with Community Council 24 th February 2020	Concern regarding water management and slope stability on felling sites above Inverlounin Road – what efforts will be made to avoid flooding and land slips. Requirement to protect water supplies. Desire to return conifer sites to native woodland where possible. Access and leisure activity should be taken into account, making trails good after felling. Would like to see specific viewpoints maintained in commercial plantations. Operations should be sensitive to wildlife and habitats. Are there plans for control of Rhododendron ponticum and deer. Timber traffic should be minimised. There should be consultation with the owners of private woodland along Inverlounin Road prior to felling.	Prior to operations FLS will carry out detailed site assessments and ensure procedures are in place to minimise risk of flooding and landslide. This will include detailed geotechnical appraisal, if necessary. Water supplies will be protected. The plan proposals include extensive restoration of native woodland sites with scope for possible expansion. The plan describes aspirations for trail management. Relevant guidelines will be followed regarding access during operations and in restoring trails following them. FLS can work with the community to identify and maintain specific viewpoints. FLS are aware of a number of important species and associated habitats within the plan area. Relevant guidelines will be followed. The plan considers removal of both R. ponticum and deer control. Timber lorries from the west side of the plan area will bypass Lochgoilhead and meet the public road system at Inveronich. FLS will consult with private woodland owners prior to felling operations.	
Arrochar, Tarbet and Ardlui Community Council	20.11.19	20.11.19	None raised	
Mountain Bothy Association	20.11.19	05.02.20	Point out that main access to bothy is on foot from the Coilessan car park. Communication re operations are important. MBA users are made aware of potential forest operations.	Any restrictions on public use of forest roads will be communicated during operations.
Transport Scotland	20.11.19	05.11.19	Noted that timber production remains a key objective of the plan. Requested a transport statement be included in the plan which provides an estimate of the number of lorry trips generated by the plan and indicates the potential impact on the A83(T), in particular the access junctions.	Statements regarding timber haulage will be included in the plan and approximate volumes accessing the trunk road network indicated in map form.
SEPA	20.11.19	none received		
Raptor study group	20.11.19	none received		
Ministry of Defence	20.11.19	none received		
Mountaineering Scotland	20.11.19	none received		
WoSAS	20.11.19	none received		
Scottish Wild Land Group	20.11.19	none received		
Sustrans	20.11.19	none received		
Argyll and Bute Council	20.11.19	none received		

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SSE	20.11.19	none received		
Scottish Power	20.11.19	none received		
CONFOR	20.11.19	none received		
BSBI plant recorders	20.11.19	none received		
Argyll District Salmon Fisheries Board	20.11.19	none received		

Appendix II: Scoping record and design brief

Ardgartan Land Management Plan

Scoping was carried out by email and a number of stakeholders contacted between November and December 2019.

A summary of responses is given in Appendix I

An internal meeting was held on 9th October 2019 and a draft set of objectives drawn up. Further advice was taken from operational staff and final objectives reflect the aspirations of both internal and external stakeholders.

Design brief

The objectives of the new plan, which were developed following the internal and external consultation, are summarised overleaf and emphasise the key principals of maintaining the productive potential of the forest whilst delivering a range of other ecosystem services into the future.

- Create a coupe structure that progresses the restructuring process started in the previous plan aiming to diversify both species and age diversity. Include coupes already incorporated into the Regional felling programme.
- Incorporate stands with significant proportions of larch into first phase felling coupes in line with FLS policy to remove 50% of larch from zone C by 2023.
- Remove the majority of accessible non-native conifer from the western part of the plan area within the plan period. Outline longer term management options for remaining stands. Re-establish ancient woodland and commercially non-viable sites with native woodland, avoiding isolation of commercially viable sites.
- Retain majority of the southern tip of the peninsula as natural reserve, but incorporate larch stands into felling coupes due to threat from Ramorum disease. Where feasible create a buffer zone around the reserve.
- At restocking seek to maximise production using Sitka spruce as the predominant species in a clearfell management system. Use alternative species to improve diversity and landscape, where site conditions are favourable.
- Restore PAWS indicated as 1a and 2a on the ancient woodland layer in line with Forestry and Land Scotland Policy.
- Establish a definitive forest habitat network and outline management approaches to be adopted within it.

- Where feasible seek to improve habitats for a range of bird and mammal species including golden eagle, black grouse and red squirrel.
- Seek to soften landscape impacts through careful coupe design, expansion of FHN, modification of upper treeline and judicious use of alternative species.
- Examine management options in the area around Coillessen taking into account recreation interest along trail networks and the Your Park areas.
- Establish and maintain a deer control programme that allows successful establishment of vulnerable species.

NB: All forests managed by FLS are certified under the UK Woodland Assurance Scheme (UKWAS), which requires forests to be managed sustainably. The UKWAS is part of the Forest Stewardship Council (FSC) scheme, which allows timber sourced from certified forests to carry the FSC label. Ardgartan FDP will incorporate the various requirements of UKWAS within its proposals.

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Appendix III: Summary of operations

Coupe	Fell Year	Phase	Gross Area	Felling		Establishment			
				Species	Net Area	Species	P/NR	Year	Area
03003	2022	1	35.3	SS	30.5	SS	P	2025	30.0
				JL	0.4	NW	NR	2032	1.8
03005	2023	1	32.3	SS	22.1	SS	P	2026	19.9
				HL	0.1	MC	P	2026	0.8
						NW	NR	2033	1.8
03006	2029	2	25.9	SS	10.5	SS	P	2032	16.3
				XL	8.5	NW	NR	2039	3.9
				MC	0.7				
03009	2029	2	16.7	SS	14.0	SS	P	2032	11.1
				SP	0.2	MC	P	2032	0.5
						NW	NR	2039	2.6
03011	2022	1	40.6	SS	27.1	SS	P	2025	30.0
				LP	8.9	NW	NR	2032	7.2
				JL	1.2				
03012	2021	1	28.6	SS	26.0	SS	P	2024	14.3
				NS	0.3	MC	P	2024	4.0
						NW	NR	2031	6.1
03017	2021	1	10.3	SS	8.5	MC	P	2024	2.7
				JL	0.5	NW	NR	2031	5.5
				MB	0.5				
				SP	0.1				
03020	2028	2	20.0	SS	13.9	SS	P	2031	3.9
				MC	4.6	MC	P	2031	7.0
						NW	NR	2038	7.6
03023	2024	1	0.6	JL	0.4	NW	NR	2024	0.4

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Coupe	Fell Year	Phase	Gross Area	Felling		Establishment			
				Species	Net Area	Species	P/NR	Year	Area
03025	2021	1	12.6	SS	12.0	SS	P	2024	9.3
				LP	0.2	MC	P	2024	1.2
						NW	NR	2031	1.8
03026	2027	2	20.8	SS	12.9	MC	P	2030	1.5
				JL	0.6	NW	NR	2037	10.5
				MC	1.8				
				MB	1.1				
03027	2026	2	16.7	SS	15.0	SS	P	2021	15.9
				XL	1.7	NW	NR	2025	1.0
				SP	0.4				
03032	2029	2	24.8	SS	20.3	SS	P	2032	17.1
				JL	1.8	MC	P	2032	2.3
				WH	0.2	NW	NR	2039	3.1
03038	2024	1	9.0	SS	2.6	SS	P	2027	4.7
				XL	4.6	MC	P	2027	0.5
				MC	0.3	NW	NR	2034	2.5
03041	2024	1	6.5	SS	4.3	NW	NR	2034	6.1
				MC	0.8				
				JL	1.2				
03044	2026	2	33.5	SS	23.5	SS	P	2029	25.2
				XP	0.5	MC	P	2029	1.0
				JL	1.9	NW	NR	2036	2.5
03046	2024	1	22.9	SS	4.2	SS	P	2027	5.8
				JL	3.4	MC	P	2027	5.8
				NS	6.7	NW	NR	2034	6.9
				XP	3.0				
03047	2025	2	18.0	SS	8.3	SS	P	2028	11.4
				JL	2.4	MC	P	2025	1.5
				MC	2.8	NW	NR	2035	1.0

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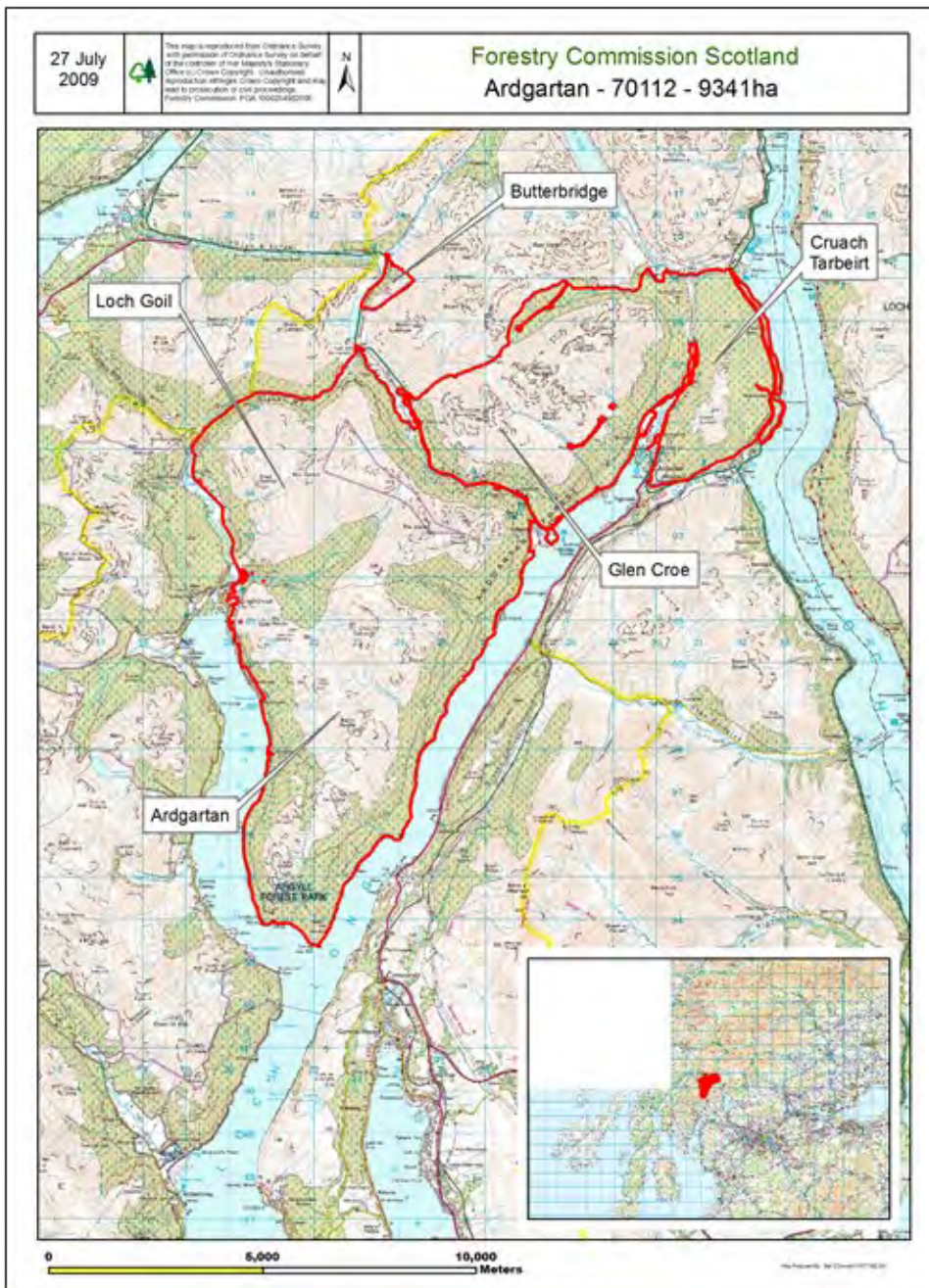
Coupe	Fell Year	Phase	Gross Area	Felling		Establishment			
				Species	Net Area	Species	P/NR	Year	Area
03051	2024	1	12.6	SS	6.5	SS	P	2027	7.6
				JL	2.6	NW	NR	2034	2.7
				MC	0.4				
03052	2024	1	50.4	SS	27.8	NW	NR	2034	41.3
				JL	9.1				
				NS	2.1				
				WH	1.4				
03054	2029	2	60.5	SS	24.1	NW	NR	2039	48.3
				XL	9.1				
				MC	6.7				
				NS	5.4				
				WH	1.9				
03058	2026	2	24.0	SS	16.1	SS	P	2029	12.7
				XL	1.3	NW	NR	2039	4.8
03060	2026	2	74.0	SS	43.7	SS	P	2029	38.2
				XL	9.2	NW	NR	2036	16.2
				MC	1.7				
03062	2024	1	10.6	SS	3.7	NW	NR	2034	6.2
				JL	3.0				
				MC	1.0				
03063	2024	1	2.9	SS	1.4	NW	NR	2034	1.9
				MC	0.1				
Gross area			610.1	Net felled	495.9				
						SS			273.4
						MC			28.8
						NW			193.7
						gross			495.9

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Appendix IV Deer management plan

Deer Management Plan Name - Ardgartan

This plan covers the Deer Management Units of Ardgartan



- 1. Description:** Heavily wooded on the lower slopes with occasional restock and hardwood regeneration areas. Extensive open ground areas rising up to approx 900 meters.

Total Area 9341 Ha

Both Red and Roe deer are present with Red Deer being dominant.

The plan area is from Tarbet on Loch Lomond heading South West to Lochgoilhead, and North West to rest and be Thankful.

The forest is a mixture of first and second rotation, mainly commercial woodland, and is diverse in structure and age class.

Designations: Glen Loin NN 308 064 Upland oak woodland Broad-leaved, mixed and yew woodland Notified feature.

Altitude: From 100m to 900m at the summit of Ben Arthur.

Perimeter fencing is mainly stock with the occasional internal Deer fence (details to be found in the FD Fence Plan)

Forest Design Plan Areas: **Ardgartan - 3354 Ha, Butterbridge - 63 Ha, Glen Croe - 3082 Ha, Cruach Tarbeirt - 896 Ha, Loch Goil - 1946 Ha**

- 2. Neighbours:**

Agriculture. farmed by Duncan's/Patersons with Luss estate to the South. Cobblar neighbours are Paterson/ in the East, Duncan to the North, and Davidson to the South West which is all agriculture ground. Ardgartan has a grazing lease to Jackson of Pole farm, which lies to the East of the river Goil.

Sporting. Luss estate which is pheasants and Deer stalking.

The village of Tarbet is to the East and Arochar to the West.

- 3. Main Objectives and Key Issues:** Ongoing restocking is vulnerable to deer impacts and the target of <10% leader browsing on restocking and new planting. Protection of native woodland natural regeneration within the forest habitat network is crucial to the design plan objectives.

- 4. Deer Management Methods and Resources:**

Deer control is currently carried out by directly employed FLS Wildlife Ranger staff and deer control contractor. Some permit stalking may be offered where this does not detract from other objectives being achieved. There are also two Deer shooting leases at Cruach Tairbet and Ardgartan peninsula.

Out of season shooting will conform with FLS policy.

Night shooting will be utilised where serious damage may occur despite having used all other methods including out of season control.

Deer fencing will be used where immigration from neighbouring deer populations cannot be reasonably controlled by shooting.

FLS attendance will be maintained at the relevant Deer Management Groups.

5. Monitoring.

All year 1 restocking will be monitored by Nearest Neighbour assessment, this is currently undertaken via a central contract with Strath Caulaidh Ltd. .

Population monitoring using the national SCL contract will be used as required. The last assessment was in 2009.

SDA assessments are conducted at years 1 & 5 by the Operations team.

SCL reports can be accessed through Land management drive/technical services.

6. Cull Targets

Cull targets will be set using any previous population's data, cull data from the WMS, impact assessments and using the Wildlife Rangers local knowledge.

Cull progress will be monitored via the WMS and regular reports will be produced by the deer administration hub.

7. Historic Culls

All culls are available through the wildlife management system.