



Forestry and  
Land Scotland  
Coilltearachd agus  
Fearann Alba

# Central Region

## Achray

### Land Management Plan

**Approval date:**

**Plan reference number:**

**Plan approval date:**

**Plan expiry date:**





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

Forest and Land Scotland - Property

<b>Feature</b>	<b>Name</b>
Region:	Central
Woodland or property name:	Achray
Nearest town, village or locality:	Aberfoyle
OS Grid reference:	NN 513045
Local Authority district/unitary Authority:	LLTNP

Areas for approval

	<b>Conifer</b>	<b>Broadleaf</b>
Clear felling	327.6	8.7
Selective felling (including thinning)	806.0	53.0
Restocking	209.0	208.6
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. An opinion under the terms of the Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017 for roads, tracks and quarries, as indicated in this plan, will be sought at a future date.
3. I confirm that the initial scoping of the plan was carried out with FLS staff on 30<sup>th</sup> April 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 Director  
Region Central  
Date 5<sup>th</sup> July 2022

pp..... Signed.....  
Conservator  
Conservancy .....  
Date of Approval .....  
Date approval ends .....



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# 1.0 Summary

## 1.1 Introduction

The Achray Land Management Plan area (Map M1) is bounded by the Highland Boundary Fault to the south and the western shores of Glen Finglas in the North. Ben Venue and the smaller, but equally dramatic, Ben A’an guard the western extremity whereas in the east the woodlands merge imperceptibly with private woodland on the northern slopes of the Menteith Hills. Aberfoyle lies at the southern end and from there the A821, Duke’s Pass, bisects the forest as it snakes its way towards the village of Brig o’ Turk in the north. Also to the south are the upper reaches of the River Forth, whilst in the north, Lochs Achray and Venachar are part of the River Teith Special Area of Conservation (SAC). The whole plan area is within the Loch Lomond and The Trossachs National Park and is one of the most iconic and popular tourist destinations in Scotland. The Lodge Visitor Centre provides a central hub, overlooking the larch covered slopes of the Achray Face. From there visitors can access a myriad of formal and informal trails and forest roads to further explore the area by foot, bike or car. The total plan area is 3,960ha, of which about 1,194ha is open hill ground; other permanent and transient open space within the woodlands accounts for a further 459ha. Topography is rugged and elevation varies from around 20m above sea level at Aberfoyle to 729m at the summit of Ben Venue. Of the woodland area 46% is Sitka spruce, 9% is larch and 20% other conifers (including Scots pine); the remainder is broadleaved woodland, the majority of which is native woodland, (Map M8). About 35% of the woodland is under 20 years of age, about 21% between 20 and 40 years of age and only 10% between 40 and 60 years. Around 20% is greater than 80 years (Map M9).

	<b>2022</b>	<b>2032</b>	<b>2042</b>
woodland	2307	2158	2254
integral open space	459	608	512
permanent open space	1194	1194	1194
total plan area	3960	3960	3960

Table 1.1 Distribution of woodland and open space

Achray is a truly multi-purpose forest and plan objectives aim to maintain and improve the already high levels of socio-economic and environmental diversity. The revised plan seeks to continue the restructuring process, started in the previous submission, aiming to increase both species and age diversity. Given the ongoing concern with Ramorum disease in larch a programme of progressive removal of this species will be implemented. Timber production will remain a significant objective but efforts will be made to lessen the impact of monoculture spruce plantation on habitats and landscape. In particular protection will continue to be afforded to the SACs and SSSIs and restoration of ancient woodland sites will see a considerable increase in native species in the coming decades. The significant recreation interest will be maintained. An effective deer management programme will be necessary to protect sensitive species.



## 1.2 Objectives

Achray is one of the most diverse forest blocks in Central Region and a key aspiration is to maintain that diversity and keep the unique sense of place that epitomises The Trossachs. It is important to retain the range of colour and texture provided by the mix of species and habitats, especially where seen from prominent viewpoints and well used tourist routes. Also central to this aspiration is sensitive management of the many native woodlands, enhancing or restoring these as appropriate. Productive management of the woodlands will continue and, although a variety of species will be used at restocking, Sitka spruce will remain one of the main species of choice. There will be an emphasis on low impact silvicultural systems where these meet objectives and conditions are suitable. Among the key challenges is the management of larch stands given the increasing threat of Ramorum disease.

- Progress the restructuring process started in the previous plan aiming to diversify both species and age. Include coupes already incorporated into the Regional felling programme.
- Fell a proportion of larch during the plan period to mitigate against the risk of Ramorum disease in line with FLS policy. Develop a programme that treats the Achray Face and Achray North sensitively, minimising, as far as possible, the visual impact of clearfelling, and seeking opportunities to maintain visual and species diversity at restocking.
- Continue to provide a high level of visitor services, centred on The Lodge, The Three Lochs Forest Drive and Duke's Pass, balancing visual and environmental diversity and recreation facilities with the operations necessary for a working forest.
- Maintain a high level of timber production using a range of management techniques and restocking with Sitka spruce where this is clearly the most suitable species for the purpose. Use alternative species where site conditions are favourable and there will be no significant loss of production.
- Review status of stands designated as Continuous Cover Forestry (CCF), and incorporate these into the clearfell fell programme if CCF management is no longer considered feasible or does not meet site objectives.
- Protect and enhance SACs and SSSIs and other existing native woodland and priority habitats. Restore ancient woodland sites when non-native species are clearfelled. Remove invasive natural regeneration, including Sitka spruce and western hemlock from priority sites.
- Examine longer term opportunities for modification of commercial treeline and expansion of native woodland onto open ground whilst retaining the element of wildness associated with the higher hillsides and crags.



## 1.3 Key proposals

Total Plan Area	3960.1 ha
Planned operations	Detail
Felling	336ha; 145860m <sup>3</sup>
Thinning	859ha; 43829m <sup>3</sup>
Restock	209ha of conifer; 209ha of broadleaf
New planting	0ha
Roads and tracks	1050m forest road; 23262m ATV and forwarder tracks; 3750m ramps
Public access	

## 1.4 Species diversity

Species group	2022	2032	2042
Sitka spruce	38.0%	31.5%	26.8%
Larch spp	7.1%	2.4%	1.3%
Other conifers	10.2%	12.3%	17.0%
Scots pine	6.4%	5.7%	5.5%
Broadleaves	21.7%	26.1%	30.9%
Open space	16.6%	22.0%	18.5%

NB figures exclude open hill ground; the majority of broadleaves are native species.

## 1.5 Major issues

Issue	Description/mitigation
Issue 1	Threat from Ramorum disease in landscape sensitive area and impacting management of non-larch trees. Incorporate larch into a felling programme that fits with FLS objective of removing 20% of that species before the end of 2023.
Issue 2	High numbers of visitors throughout the woodlands at all seasons. Careful planning of all operations to minimise impacts on visitors.
Issue 3	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 4	Several coupes wholly or partly difficult of access. Construction of suitable access routes and or/careful management of operations to access difficult areas.

## 1.6 Critical success factors

The following are critical to the success of the plan:

1. Early restocking of landscape sensitive felling coupes with a diversity of species.
2. Detailed operational planning to ensure minimum impact on and safety of visitors.
3. Timely construction of new, or upgrading of, existing roads, and roads/tracks to access approved felling coupes.
4. 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. Proposals for removing larch are based on Forestry and Land Scotland's 'Strategy for Managing Larch', July 2019.

Other key policy, strategy and guidance documentation can be found at:

[Links - Forestry and Land Scotland](#)

## 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

Achray forest is situated in the heart of the Trossachs, one of the most popular and iconic tourist destinations in Scotland. A combination of extensive woodlands, attractive lochs and steep sided, rugged peaks have made the area an attraction since Victorian times. In the south there are dramatic views over the Forth Valley and the Achray Face from the Lodge Visitor Centre. The Achray Face, marks the line of the Highland Boundary Fault, where Lowlands meet Highlands. Between here and Brig o' Turk, to the north, the Duke's Pass twists and climbs through a landscape of ever changing outlook, culminating with splendid views over Loch Achray and Ben A'an. This is a land of poets and warriors, of Scott and McGregor.

As well as being scenically important there is also substantial environmental interest. In particular there are a number of national and international designated sites and the extensive remnants of ancient semi-natural woodland fall within the Scottish Rain Forest zone. Several priority species are found in the area including golden eagle, black grouse and red squirrel. Timber production remains a key feature of the local economy and the woodlands of the area are dominated by commercial plantations. There is, however, a significant amount of species diversity within the forest, larch in particular standing out on many of the steeper slopes; re-structuring of relatively even aged forests and the use of low impact management practices will further expand the variation in both age and species. The potential impact of the spread of Ramorum disease in larch has greatly influenced the felling programme.

### 2.2 Proposed felling in years 2022 – 2032

Phase	Area (ha)	Volume (m <sup>3</sup> )
1	163	69689
2	174	76171
	337	145860

Table 2.1 Summary of felling proposals (net area)

Map M5 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 M4. The future habitats map (M6) should also be referred to.

### 2.3 Proposed thinning in years 2022 – 2032

Phase	Area (ha)	Volume (m <sup>3</sup> )
1	396	21363
2	463	22466
	859	43829

Table 2.2 Summary of thinning proposals

Indicative thinning areas are shown on map M5.

## 2.4 Proposed restocking in years 2022 – 2032

Phase	Species	Area (ha)
1/2	Conifer	209
1/2	Broadleaf	209
		418

Table 2.3 Summary of restocking proposals

Restocking proposals are shown on map M6 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. Maintaining the visual interest of the Achray Face has also been an important consideration.

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 sph. Restocking will be within two years of felling unless Hylobius Management Support System indicates a longer fallow period is necessary. In the latter case planting will be carried out within five years.

Where production is not the key objective target densities for planting, or natural regeneration, of native and non-native species, will vary depending on site objectives. On the majority of sites an overall density of at least 1600sph will be achieved; in transitional areas, such as upper treelines, lower densities, of between 500 and 1100sph, will be accepted, dependent on overall site objectives. 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 2022 – 2032

Phase	Type	Length (m)	Area (ha)
1	New roads	1050	0.74
1/2	Tracks/ramps	28720	6.49

Table 2.4 Summary of roads and tracks

Proposed roads and tracks are shown on map M10.

## 2.6 UKFS

Forestry and Land Scotland manage their properties in line with the requirements, guidelines and principles of the UKFS and as such there are no departures from UKFS guidelines.

In general, in order to meet UKFS best practice standards adjoining coupes will not be felled until the restocking in the previously felled coupe is a minimum of 2m high. In this plan the coupe structure is strongly influenced by the desire to begin removal of larch stands to mitigate the continued spread of *Phytophthora ramorum*. Because of this several first and second phase coupes are adjacent to each other and it may not be possible to meet this best practice guideline. However, this is seen as a better approach to larger scale felling in the event of *P. ramorum* becoming established. It is intended to fell first and second phase coupes as far apart as possible to allow restocking to become well established between those operations. Unfortunately, windblow in winter 2021/22 exacerbated this problem and the coupe structure is also designed to help manage the clearance of severely damaged areas. Several of the coupes, for example on the north east slopes of Ben Venue, will also be restocked with native woodland further mitigating any adjacency effect.

Appropriate permission will be sought for any departures from the approved plan. Requirements for permissions are set out in the tolerance table (Section 2.7).



## 2.7 Tolerance table

	<b>Adjustment to felling period</b>	<b>Adjustment to felling coupe boundaries</b>	<b>Timing of restocking</b>	<b>Change to restocking species</b>	<b>Changes to road lines</b>	<b>Designed open ground</b>	<b>Windblow clearance</b>
SF Approval not normally required	Felling date can be moved within 5 year period where separation or other constraints are met	Up to 10% of coupe area (up to a maximum of 1ha)	Up to 2 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	First phase felling delayed into second or later period. Second phase felling brought forward into first phase	Up to 15% of coupe area	Between 2 and 5 planting seasons after felling subject to the wider forest and habitat structure not being significantly compromised		Additional felling of trees not agreed in plan Departures of more than 60m in either direction from centre of roadline	Increase by up to 10% Any reduction in open ground within coupe area	Up to 5ha
Approval by formal plan amendment including maps	Felling date of third or later phase brought forward into first or second phase	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 groups	As above, depending on sensitivity	More than 10% of coupe area Colonisation of open areas agreed as critical	More than 5ha

## 3.0 Land management plan

### 3.1 Introduction

The Achray Land Management Plan combines two previous plans, Achray and Achray North which were last revised in 2008. 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 section 2 deals with Scottish Forestry regulatory requirements. This section covers the context, key issues and the broad proposals of the plan. Section 4 provides greater detail on management proposals summarised in previous sections. Section 6 summarises broad management prescriptions whilst background information is found in section 7. Several appendices deal with the consultation process and provide a summary of management proposals in tabular form.

### 3.2 Setting and context

The Achray Land Management Plan area (Map M1) is bounded by the Highland Boundary Fault to the south and the western shores of Glen Finglas in the North. Ben Venue and the smaller, but equally dramatic, Ben A'an guard the western extremity whereas in the east the woodlands merge imperceptibly with private woodland on the northern slopes of the Menteith Hills. Aberfoyle lies at the southern end and from there the A821, Duke's Pass, bisects the forest as it snakes its way towards the village of Brig o' Turk in the north. Also to the south are the upper reaches of the River Forth, whilst in the north Lochs Achray and Venachar are part of the River Teith Special Area of Conservation (SAC). The whole plan area is within the Loch Lomond and The Trossachs National Park and is one of the most iconic and popular tourist destinations in Scotland. The Lodge Visitor Centre provides a central hub, overlooking the larch covered slopes of the Achray Face. From there visitors can access a myriad of formal and informal trails and forest roads to further explore the area by foot, bike or car. The total plan area is 3960ha, of which about 1194ha is open hill ground; other permanent and transient open space within the woodlands accounts for a further 463ha. Topography is rugged and elevation varies from around 20m above sea level at Aberfoyle to 729m at the summit of Ben Venue. Of the woodland area 46% is Sitka spruce, 9% is larch and 20% other conifers (including Scots pine); the remainder is broadleaved woodland, the majority of which is native woodland, (Map M8). About 35% of the woodland is under 20 years of age, about 21% between 20 and 40 years of age and only 10% between 40 and 60 years. Around 20% is greater than 80 years (Map M9).

### 3.3 Analysis and important issues

Factors that have been taken into account in developing the LMP proposals are summarised in the analysis and context (map M2) these include:

- Centred in the heart of The Trossachs with dramatic and varying scenery, including the wild landscapes of Ben A'an and Ben Venue and the larch dominated slopes of the Achray Face.
- Nationally important tourist destination centred on The Lodge visitor centre with access to extensive roads and trails, Duke's Pass and Forest Drive.
- Extensive stands of larch in prominent positions at risk from Ramorum disease. Plan area falls in a zone within which FLS aim to remove 20% of larch before the end of 2023.
- Significant areas of existing ancient semi-natural woodland and plantation on ancient woodland sites. Several of these have national or international designations and Achray is on the eastern fringes of Scotland's temperate rain forest zone.
- In places both native woodland and open habitats are at risk from spread of Sitka spruce natural regeneration.
- Relatively high level of species diversity but commercial plantations dominated by Sitka spruce; some relatively large areas of even aged non-native conifer at or near the optimum age for clearfelling, increasingly at risk from storm damage.
- Large areas identified with potential for continuous cover forestry and managed following these principles.
- Some very steep slopes and relatively isolated stands.
- 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 400m to 500m and softer species to below 200m to 250m elevation.
- In the north Lochs Achray and Venachar are part of the River Teith Special Area of Conservation.
- Several important mammal and bird species occur throughout the plan area including black grouse, peregrine falcon, goshawk and red squirrel.
- Extensive road network allows access to most parts of the woodland area.

### 3.4 Key challenges and liabilities

Significant challenges are:

- Removal of larch, in line with FLS policy, in a landscape sensitive area.
- Continued 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 requires successful deer control and removal of non-native natural regeneration
- Managing operations in a heavily used tourist location.

## 3.5 Concept

The Analysis and Concept (map M2) summarises how the important issues will be addressed, including:

- Selection of management options that take account of landscape sensitivities and in line with The Trossachs as a tourist destination. Seek to maintain and enhance landscape value of the area, especially where seen from key viewpoints and tourist destinations.
- Early and rapid removal of a significant proportion of larch stands, including those in prominent landscape positions previously designated as continuous cover forestry. Prompt restocking with a diversity of suitable species to maintain landscape interest, biodiversity, potential for outdoor activity and timber production.
- Maintenance of existing ancient woodland and identification and restoration of PAWS, seeking opportunities to extend the area of native woodland around these.
- Protect, maintain and enhance designated sites, in particular avoiding damage during forest operations.
- Removal of Sitka spruce natural regeneration from designated sites and certain open hill situations.
- Continue to use continuous cover forestry principles in areas suited to these techniques. Elsewhere continue to re-structure even aged stands based on topography and site conditions, minimising risk of windblow.
- Continue to diversify species distribution at re-stocking, lowering reliance on Sitka spruce, whilst maintaining timber production. Take into account site conditions when selecting species for restocking and provide adequate protection for vulnerable species.
- Continue to expand the forest habitat network and improve conditions for priority bird and mammal species.
- Establish a road maintenance programme which allows access to first and second phase coupes. Consider options to access isolated stands.

## 3.6 Management objectives

Plan objectives are to be found in section 1.2. Broad objectives are illustrated in the management zones (map M3) though it should be stressed that there will be overlap between zones.

# 4.0 Management plan proposals

## 4.1 Management

Management will be guided by the key objectives of the plan. There will be a mix of clearfelling and continuous cover forestry; thinning will be an important part of both management approaches. Included in the plan are proposals for early and rapid removal of larch. Restocking of commercial stands will be by planting with a range of species. In CCF situations underplanting will be considered where there is an aspiration to change species or there is inadequate natural

regeneration from the overstorey. Where there is adequate seed source natural regeneration will be preferred when establishment of native woodland is the objective. A summary of operations is to be found in Appendix IV.

### 4.1.1 Clearfelling

Map M5 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 M4.

Table 4.1 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 the summary of operations in Appendix IV.

Phase	Area (ha)	Volume (m <sup>3</sup> )
1	163	69689
2	174	76171
	337	145860

Table 4.1 Proposed felling

The proposed coupe structure seeks to satisfy all the key objectives of the plan; in particular, it has been designed with the early removal of larch in mind. The Achray Face, previously designated as CCF, has been subdivided into a number of small coupes around 10ha in size using natural features as boundaries. The aim has been to fell discrete areas in a controlled manner, hopefully avoiding larger scale clearance that might result if infection from *Phytophthora ramorum* occurs. The south facing slopes above Loch Achray have been treated in a similar way. Elsewhere coupe size is often larger, a balance being achieved between accessibility and other considerations such as landscape impact. The impact of felling from key viewpoints is illustrated in the perspectives which support this plan. Coupe 21049 is not included in these perspectives as, despite, it's size it is not clearly seen from any prominent viewpoints.

Occasionally first and second phase coupes may be adjacent to each other. This is deemed more acceptable than felling a larger area and the intention is to fell second phase coupes as long as possible after the first phase coupes. This will allow time for the earlier coupe to be restocked and the trees to reach a suitable height before second phase felling. A number of coupes have been introduced into first phase because of storm damage. Many stands are beyond the usual economic rotation age, a legacy of retaining stands for biodiversity and landscape reasons and a policy of encouraging CCF principles. On the other hand there are several coupes under the age of 30 years which will be felled early to remove larch. Because of the concentration on larch removal and windblow some coupes which otherwise would have been felled in this plan period will be delayed further. Although there is increasing risk of windblow, retention of these stands will aid restructuring, improving future resilience and achieving a better age class balance.

All harvesting operations will be carried out in accordance with the UK Forestry Standard Guidelines, and Forests and Water Guidelines (5th edition). The necessity of avoiding

contamination of DWPA's, private water supplies and maintaining water quality in burns and rivers will be observed during operations. Designated sites (section 7.3) will be afforded high levels of protection and any special measures identified at operational planning stage. There will be no work within the boundaries of any SAC and operations in the southern section of coupe 21049 will be managed to avoid impact on the adjacent designated site. Known heritage features will be identified and marked on the ground, prior to operations, and any special protection measures identified at work planning stage. More detail is provided in Appendix VI. In areas of high public use winter working will be the preferred option. Where this is not possible operations, such as felling and haulage will be managed so as to minimise disruption without compromising safety. The latter will be particularly important in the vicinity of the Go Ape facility and nearby core paths below The Lodge, and along the Forest Drive. Prior to operations any known heritage features will be marked to ensure protection during the operation.

#### 4.1.2 Thinning

There is a long history of thinning in the Achray LMP area and current proposals are shown on Map M5. The actual area of the thinning coupes is around 600ha, the figures in section 1.3 and table 2.2 are larger as they double count coupes that are to be thinned twice during the plan period. The proposals include a number of coupes to be thinned for the first time. Other coupes have been thinned several times and FLS staff will continue to monitor these to determine whether it is feasible to continue this type of operation. The vast majority of the area to be thinned is of conifer species. During the plan period the intention is to carry out a first and second thin in about 27ha of naturally regenerated birch to the north east of Loch Achray. Recurring and timely thinning is vital to the success of continuous cover forestry, described in section 4.1.3.

Thinning will be to marginal thinning intensity, taking around 70% of yield class on an approximate 5 year cycle. At first thinning racks will be cut at appropriate spacing and matrix trees taken to achieve the recommended thinning intensity. Subsequent thinning will be of matrix trees, taking care to select for stand stability and promoting individual frame trees where CCF is considered to be a viable management option. Volume from thinning is likely to be in the order of  $50\text{m}^3\text{ha}^{-1}$  to  $70\text{m}^3\text{ha}^{-1}$ , dependent on yield class.

#### 4.1.3 Potential for Continuous Cover Forestry

Conditions that favour the use of Continuous Cover Forestry (CCF), deeper, freely drained soils on sheltered sites with good road access, occur throughout the plan area. In the previous plan much of the area to the east of the Duke's Pass, centred on the Achray Face and Forest Drive, was designated as CCF. Despite these favourable site conditions there has been extensive windblow throughout the plan area in the past 10 years or so, including within the CCF areas, resulting in the need to clear many stands and restock conventionally. In addition the threat of *Phytophthora ramorum* in larch stands has led to a decision to clearfell much of the Achray Face in a controlled programme of work. The area currently allocated to CCF is, therefore, much reduced, being restricted to sheltered sites where continued thinning is feasible (Map M4). Some

native broadleaved stands are now to be managed as minimum intervention or long term retention. In the longer term there is no reason why the area of CCF cannot be expanded, given timely thinning interventions and opportunities will be assessed in future plan revisions. 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.

#### 4.1.4 Timber haulage

Access and egress for timber haulage, with approximate volumes by phase, are shown on Map M11. The volume of timber to be moved and the approximate number of lorry loads, over the ten year period, is shown in table 4.2.

Phase	Volume (m <sup>3</sup> )	tonnes	loads
1	91052	74663	2987
2	98638	80883	3235
Total	189690	155545	6222

Table 4.2 Timber haulage

Most timber will be hauled through Aberfoyle and taken either south towards Glasgow or east to towards Stirling. The section of this route through Aberfoyle is a ‘consultation route’; the Local Authority and Community Councils will be informed of proposed timber movement prior to it taking place.

#### 4.2 Future habitats and species

The management zones map (map M3) indicates the broad aspiration for future of the LMP area and more detail is shown in the future habitats map (map M6). Further information is found in the table of operations in Appendix IV. The general trend is for there to be a reduction in the amount of Sitka spruce with a corresponding increase in alternative conifers for productive purposes and both native and non-native broadleaved species. Table 4.3 summarises the establishment proposals for the plan area during the first two phases.

Phase	Species	Area (ha)
1/2	Conifer	209
1/2	Broadleaf	209
Total		418

Table 4.3 Proposed establishment

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. Site conditions, for example, a combination of wet, acid or steep and rocky ground place restrictions on the suite of species available in some locations; on the latter Sitka spruce will remain the species of choice. 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 and sites will be assessed following clearfelling to determine planting patterns. On some sites, nurse species, such as Lodgepole pine will be used to improve establishment of spruce. Alternative confers to Sitka spruce will be used where site conditions allow and there is no



significant loss of production. Readily available species such as Douglas fir and Norway spruce are likely to be the most frequent species used, but others such as Western Red cedar, Noble fir and Silver firs will also be considered. Scots pine will be an important tree on poorer, drier sites.

Native and non-native broadleaved species will also be established for productive purposes. This will be especially the case on the Achray Face where finding a replacement for larch to maintain visual diversity is an important objective. In some situations conifer/broadleaved mixtures will be considered. Where non-native broadleaved species are used buffers will be established between them and designated and ancient woodland sites.

A significant proportion of the woodland area is on ancient woodland sites (Map M12). Where these are currently occupied by non-native commercial species they will be restored to native woodland following clearfelling. This emphasis on native species is seen particularly in the northern part of the area. Where possible a buffer will be established around these sites and native species will be preferred in the 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 current levels to less than 10 will be a key priority; fencing might be required to protect some sites.

In natural reserves, and stands designated as minimum intervention, the woodlands will be allowed to develop without interference other than for conservation reasons (e.g. rhododendron clearance). Over the long term there should be an improvement in the natural habitat.

In general the existing commercial tree line will be modified when the ground is restocked. This is for both commercial and landscape reasons, taking out unsuitable ground and breaking up unsightly straight edges. Mixed natural regeneration will be allowed to establish in these areas. This is likely to be of variable density and age and will add to visual diversity. There will be no significant loss of woodland area. The detailed pattern of these changes is not shown on the future habitats map. Part of coupe 21034 has been identified as suitable for bog restoration; more detailed assessments will be made as part of restocking operations and a SOR submitted for deforestation, if necessary.

### 4.3 Management of open land

Open land ranges from high elevation hillsides and plateaus to riparian and rocky, steep slopes at all elevations. It includes roadlines, wayleaves and other open space around buildings and heritage features, for example. At restocking appropriate open space buffers to meet UKFS standards will be left around the latter. A minimum width of 5m is generally applied.

Open ground management is a key factor in maintaining the diverse landscape and biodiversity element of The Trossachs. In particular the fringes of the Benmore Wild Land Area and the eastern slopes of Ben Venue are considered to be landscape sensitive. Where encroachment of



Sitka spruce at the forest/hill ground interface is considered undesirable it will be managed to keep it within acceptable tolerances. Some areas may be suitable for a variety of upland and montane woodland types and this might be investigated in the future. However, there are, currently, no proposals to carry out any establishment work during the next ten years.

A large proportion of the road network will be upgraded or have substantial maintenance work carried out during the plan period, including 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. The Dukes Pass corridor will be managed to maintain a diversity of open and woodland habitats.

## 4.4 Visitor zones and access

The main visitor facilities, including the lease area used by Go Ape and the Camping Management Zone, are shown on the recreation map, M13. The Lodge Visitor Centre provides a focus and hub from which the wider area can be explored. Visitor zones radiate from here incorporating the formal trail networks and Forest Drive. That part of the Achray Face seen from the Lodge is a key part of the visitor zone and demands sensitive management, not just of the felling sequence but of trees surrounding the buildings to maintain the view. Work within the wider visitor zones will be carried out to maintain and the diverse nature of trails, maintain open vistas and remove undesirable scrub and natural regeneration. Car parks, the camping management zone and Achray Camping Site will be included in this maintenance work. The work will include ditching and road and trail improvements throughout the visitor zones and, though some small trees may be removed overall volumes will be small. Additional detail is included in section 4.6

## 4.5 Deer management

The LMP area is covered by a single deer management plan (DMP). The DMP recognizes the potential impact on young broadleaf and soft conifer species and a key objective of deer control is to reduce leader browsing on planted and natural regenerated stock to less than 10%. Both red and roe deer are found in the area and a single sika has been culled in the past five years. The latter species will be rigorously controlled in keeping with FLS and NatureScot policy. Overall deer density is around 10 to 15 deer km<sup>-2</sup> but this varies with highest figures in the west and parts of Achray North. Cull levels across the plan area have been in the region of 280 to 320, the majority of these being red deer. It is expected that this level of cull will continue into the future. Deer control will be carried out by FLS wildlife rangers.

Feral goats are also present in the plan area and numbers of these will also be controlled.

In general the use of internal fencing should be considered the exception rather than the rule. However where necessary, for example, to protect sizeable areas of vulnerable species, or in areas of high public usage, fences will be considered as a management option.

Deer management will also 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.

## 4.6 Other proposals

There are substantial areas that will be managed for habitat, visitor services and infrastructure management. Management will include removal of undesirable natural regeneration, of any species, from, for example, sensitive habitats, visitor zones and roadlines. Although the majority of this work will be carried out before the species concerned become too large there will, inevitably, be some growth with diameters in excess of 10cm. The areas where this work might be carried out are indicated in Map M7.

In these areas, single trees or small groups of trees will be removed when necessary to protect facilities, infrastructure and trails, to enhance the setting of features, or to maintain existing views. Also, in these zones, woodland might be thinned, or trees re-spaced, for reasons other than safety, (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. Volumes from all these works are likely to be relatively insignificant, in the order of  $1\text{m}^3\text{ha}^{-1}$  to  $10\text{m}^3\text{ha}^{-1}$  over the plan period.

It is also likely that there is low density larch throughout the plan area and permission is sought to remove these and any necessary closely associated trees; the total volume of unmapped very low density larch and closely associated species is not likely to exceed  $1\text{m}^3\text{ha}^{-1}$  to  $2\text{m}^3\text{ha}^{-1}$  over the lifetime of the plan.

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 routes for vehicles, pedestrians and animals, buildings, utilities and services, and drains.)



The maximum volume of felling in exceptional circumstances covered by this approval is 75m<sup>3</sup> within the LMP area 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.

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

Several coupes have been designated as long term retention or minimum intervention. The former are for landscape or environmental reasons and the intention is still to manage them and ultimately fell them; some stands may be suitable for continuous cover forestry management in the future. Minimum intervention is mostly for biological reasons. Minimal management, and only for conservation reasons will take place in these stands, although they may be taken into commercial management in the future. One stand designated as natural reserve will also be managed for conservation reasons only but there is no intention of bringing it into commercial management. The stand consists of some of the older stands of both native and non-native conifer with variable amounts of natural regeneration under the main canopy. The shape of the reserve has been modified slightly since the last plan following a review of more up to date aerial photography and site investigation.

## 4.7 Restructuring

### 4.7.1 Summary

The felling proposals continue a process of restructuring the forest that has been 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, exceptions have been described in Section 4.1. 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.

### 4.7.2 Species diversity

Table 4.4 indicates the change in relative species composition between 2022 and 2042. 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 reflecting the amount of clearfell of non-native species on ancient woodland sites. The apparent reduction in Norway spruce and Scots pine is compensated for by the increase in mixed conifer. Mixed conifer will include both Norway spruce and Scots pine other species, such as Douglas and Noble fir, will also be used; final species selection will be determined following consideration of

individual site objectives and site conditions. The amount of larch is reduced as a response to the threat of Ramorum disease and may have to be totally removed before 2042 if the latter continues to spread. Diversity is maintained due to the significant increase in native broadleaves.

Species	2022	2032	2042
Sitka spruce	45.5	40.4	32.8
Norway spruce	8.2	6.4	5.4
Larch	8.6	3.0	1.6
Other conifer	4.0	9.4	15.5
Scots pine	7.7	7.4	6.9
Native broadleaves	18.3	25.2	29.2
Other broadleaves	7.7	8.2	8.6
	100.0	100.0	100.0

Table 4.4 Change in species diversity over time as a percentage of woodland area (these figures exclude integral open space)

### 4.7.3 Age structure

Table 4.5 shows the change in relative age structure between 2022 and 2042. Throughout the plan period stands in the 40 – 60 age range are poorly represented whereas there is a high proportion of trees in excess of 60 years. This is a reflection of the amount of woodland identified as CCF or long term retention in previous plans. The number of older stands will be reduced over the next 10 to 20 years, in part due to the removal of larch and continued windblow in some older stands. There are signs that beyond 2042 the 10 year classes up to age 60 will become more balanced. This final balance will ultimately depend on how many stands can be converted to CCF in the future. The proportion of older age classes will remain relatively high as many of these consist of semi natural ancient woodland.

Age Class	2022	2032	2042
0-10	12.8	18.0	18.3
11-20	21.6	13.1	16.0
21-30	11.0	19.8	12.6
31-40	10.0	9.7	18.3
41-50	5.1	6.1	6.2
51-60	4.6	4.7	6.0
60+	34.9	28.6	22.6
	100.0	100.0	100.0

Table 4.5 Age structure in Achray (percent of forested area)

## 5.0 Critical success factors

The following are critical to success of the plan:

1. Early restocking of landscape sensitive felling coupes with a diversity of species.
2. Detailed operational planning to ensure minimum impact on, and safety of, visitors.
3. Timely construction of new, or upgrading of, existing roads, and roads/tracks to access approved felling coupes.
4. Adequate deer control measures for protection of broadleaved species and soft conifers.

## 6.0 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. Coupe 21049 is on steep ground and difficult to access and detailed workplans will be drawn up prior to work commencing. Similarly access to coupe 22021 will require further investigation and planning. Age of clearfelling is variable, much being determined by age of individual larch stands.

Some younger stands will be assessed for thinning during the plan period to determine the feasibility of doing the work and the most suitable methodology. 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 CCF 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. 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. A more selective approach to thinning some mature stands will be considered.

Restocking for productive purposes will be by planting following any necessary site preparation. The latter will include brash management, 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.

## 7.0 Background information

### 7.1 Previous plan

#### 7.1.1 History

Originally the Achray LMP area was three divided into three blocks: Achray East and West, either side of the Duke's pass, were amalgamated in 2008 when the previous plan for these areas was approved; to the north of Loch Achray, the Achray North plan was also approved in 2008. In 2020 it was decided to combine the two 2008 plan areas into a single LMP.

The earliest planting of commercial conifers took place in the 1930s, concentrated on the Achray Face and what is now the Forest Drive. The next three decades saw significant expansion of the planted area until the early 1970s saw the beginning of clearfelling and second rotation planting. Although Sitka spruce was the most frequently planted species the plan area has a relatively high level of tree species diversity, especially where there are better site conditions. Both European and Japanese larch dominate the Achray Face and this is intermixed with species such as Norway spruce and Douglas fir. Significant pockets of ancient semi-natural woodland have been augmented by natural regeneration.

The main thrust of previous plans has been to begin and develop a process of restructuring to improve diversity and resilience, at the same time recognising the importance of landscape, environment and recreation. In particular the development of a wide habitat zone along the line of the Duke's Pass also brought added landscape benefits; the importance of restoring and enhancing ancient semi-natural woodlands was given emphasis in Achray North; the use of continuous cover forest techniques and long term retentions were ambitious attempts maintaining sustainable forest management in landscape sensitive and popular tourist areas. 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.

#### 7.1.2 Analysis of previous plan

The broad aims of the previous plan were:

- To diversify species and age structure whilst maintaining timber production.
- To retain significant areas of woodland beyond recognised optimum felling age and manage these using continuous cover principles.
- Enhance the landscape, recreational and biodiversity value of the forest.

Although the broad aims of the previous plan are continuing to be achieved there were significant changes to the felling programme during the plan period. In the main part of the area, to the south of Loch Achray all approved coupes have been felled and restocked in accordance with plan proposals. The major changes have largely been as a response to wind damage in 2012/13 when large areas around the Forest Drive and Braeval/Stonefield were severely

affected. Many of these stands had previously been designated as long term retention or continuous cover Forestry. There is a positive outcome to these events in that species and age diversity is being achieved earlier than expected. Achray North was also badly affected by these winter storms, with coupes being swapped and larger areas felled than was anticipated. Early restocking with native species has been a benefit in this instance. Several approved coupes were not felled during the plan period and this has led to delays in 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. The previous plan also included extensive areas designated as continuous cover forestry for environmental and social benefits. Table 7.1 gives figures for species distribution in 2004 and an approximate projection for 2044.

Species group	2008 %	2048%
Spruce	50.8	32.39
Larch	7.6	6.1
Mixed conifer	2.7	2.3
Pines	10.9	6.1
Native woodland	13.0	33.8
Integral open space	15.0	19.5
	100	100

Table 7.1 Change in species composition as envisaged in previous plan (these figures exclude open hill land)

### 7.1.3 Continuity with previous plan

The main objectives of the previous plan, namely creation of a diverse forest providing a wide range of socio-economic and environmental benefits remain relevant to this revised plan. However there are significant changes to the manner and timescale in which these benefits will be delivered. Widespread storm damage and the threat from *Phytophthora ramorum* to larch have led to a radical re-assessment of the balance between clearfelling and continuous cover forestry. This has resulted in an ambitious clearfell programme in landscape sensitive situations to expedite removal of larch. In general the future forest structure remains the same as previous plans, there being a reduction in Sitka spruce percentage and a large increase in native woodland as commercial conifer on ancient woodland sites are felled and these restocked with native species. Table 7.2 gives current species distribution (including integral open space) and approximate projections for 2032 and 2042. It can be seen that the estimates for the 2040s, in this and the previous plan are broadly similar.



Species group	2022 ha	2022 %	2032 ha	2032 %	2042 ha	2042 %
Sitka spruce	1051.4	38.1	871.6	31.5	742.5	26.9
Norway spruce	189.1	6.8	138.7	5.0	121.6	4.4
Larch	197.6	7.1	65.0	2.4	36.8	1.3
Mixed conifer	92.5	3.3	202.4	7.3	349.1	12.6
Scots pine	177.5	6.4	158.7	5.7	152.5	5.5
Native woodland	422.3	15.3	543.9	19.7	657.8	23.8
Mixed broadleaves	176.7	6.4	177.7	6.4	193.5	7.0
Integral open space	458.6	16.6	607.5	22.0	512.2	18.5
	2765.7	100	2765.5	100	2766.0	100

Table 7.2 Change in species composition envisaged in this plan

Sustainable timber production remains a key objective and the plan seeks to maximise the productive potential of the area without compromising other objectives. Relatively sheltered sites with good soil conditions provide opportunities to use species other than Sitka spruce. Larch can no longer be used to provide landscape interest and a range of native and non-native species will be used to compensate for this. The felling programme will follow guidelines to minimise risk to water quality and minimise risk of instability on steep ground. The zones map (map M3) illustrates the relative importance of the main objectives throughout the area, though there is a degree of overlap.

## 7.2 Physical site factors

### 7.2.1 Geology, soils and landform

The Achray LMP area lies on the boundary of Highlands and Lowlands, the south eastern limits being marked by the Highland Boundary Fault. A small part of the south eastern corner is underlain by sandstones and conglomerates and the Achray Face is part of the distinctive ridge feature of the Menteith Hills. A narrow strip of limestone, at Lime Craig, incorporates the site of a geological SSSI. The majority of the plan area is dominated by older, fine course grained metamorphosed sedimentary rocks with low base status. There is patchy coverage of superficial glacial material, mostly derived from the bedrock. To the south east lies the wide, open valley of the River Forth, in the north the upper Teith is narrower and includes the deep fresh water lochs of Achray and Venachar. Between the two river systems the rugged landscape which characterises The Trossachs reaches a maximum elevation of 729m at the summit of steep and rocky sided Ben Venue.

Most of the plan area is covered by soil survey at a scale of 1:10000. Upland brown earths dominate the area to the south of the Highland Boundary Fault; they also occur on the steeper slopes above Lochs Achray and Finglas. Surface water gleys are found on less freely drained sites. To the north of the fault iron pan soils, in close association with peaty gleys are more frequent than brown earths, perhaps reflecting the poorer base status of parent materials. Some steeper slopes, where parent materials are more freely draining, are characterized by even more acidic

podzols. To the west of the Duke's Pass there are much more extensive areas of deep peat. Rocky and bouldery ground with shallow soil occurs on steep ground at all elevations.

### 7.2.2 Water

The plan area is bounded by the upper reaches of both the River Forth and River Teith. The watershed cuts across the high point of the Duke's Pass. Steep, fast flowing burns feed into both systems, those into the Teith via Lochs Achray, Venachar, and Drunkie and the Finglas Reservoirs. On the south side of the Highland Boundary Burns feed either directly into the River Forth or via the Lake of Menteith. There is risk of annual flooding at Aberfoyle and SEPA flood risk maps indicate that there is similar risk on flatter ground around Lochs Achray and Venachar. To the north west of the plan area Loch Katrine is a critically important part of the public water supply for Glasgow; the Finglas Reservoir feeds into this system via a tunnel. There are large Drinking Water Protection Areas around Loch Katrine and the Finglas Reservoir and also south of Loch Achray (Map M14). A mains water supply runs along the southern boundary of the LMP area and Scottish Water have other assets in this area. In addition there are several private water supplies which are indicated in Map M14.

### 7.2.3 Climate

Using the measures of warmth and wetness defined in the Ecological Site Classification (ESC, see Forestry Commission Bulletin 124) the Achray LMP area is categorised as warm and moist between sea level and about 250m elevation. Above that level climate becomes increasingly cold and wet, the highest elevations being considered sub-alpine. Average annual rainfall at nearby Aberfoyle is in the region of 1750mm, about 60% of which falls during the autumn/winter months, October and March. Humidity remains high throughout the year. Those parts of the plan area below 250m elevation are considered to be relatively sheltered, above 450m exposure is generally severe with little opportunity for establishment of commercial tree species.

### 7.2.4 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 65% 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.

### 7.3 Biodiversity and environmental designations

The commercial planting is dominated by Sitka spruce though there are older stands of other species including Norway spruce, Douglas fir and Scots pine. Out with these areas there are a number of different woodland and open ground habitats. Above Aberfoyle and close to the shore of Loch Achray are remnants of ancient woodlands. Smaller remnants are scattered throughout the plan area, especially along more inaccessible burns. In more recent years there has also been a spread of younger native broadleaves, mostly birch, through the process of natural regeneration. Native woodland sites harbour important populations of lower plant species and ground flora. The high moorland above the tree line consists of a mosaic of open habitat including areas of blanket bog and upland heath.

A number of bird and mammal species utilise the forest. There are golden eagle territories around nearby Loch Katrine and osprey, peregrine and goshawk are also found, in addition to the commoner buzzards and sparrowhawks. Black grouse occur in several places. Both osprey and white tailed sea eagle are being seen more regularly and there are several sites suitable for nesting raven, peregrine and kestrel. A number of important mammal species are present including red squirrel, pine marten, water vole and badger; bats of various species will use the native oakwoods.

There are several important designated sites:

- The Trossachs Woodlands SAC incorporates several SSSI`s in the north and south of the plan area. Ben A'an and Brenachoile Woods are at the north western boundary. Cited for its ancient oak woodland the lichen flora is special because it is a mix of oceanic and more continental species. Cuilvona and Craigmore Woods, near Aberfoyle, form the largest example of oak-dominated slope flush woodland in the area. The slopes also support examples of alder-ash woodland.
- The River Teith SAC is noted for its fish assemblage – three species of lamprey and Atlantic salmon. Part of the Black Water Marches SSSI is within the SAC. The former is noted for its extensive and complex mosaic of wetland habitats.

- Lime Craig Quarry SSSI, above Aberfoyle, is a geological feature with international importance. Its fossil assemblage is unique in Britain and facilitates correlation with similar aged rocks in northern Europe and Canada. Spoil heaps are also botanically rich.
- Burns in the Braeval/Stonefield part of the plan area drain into the Lake of Menteith and are part of the SSSI notified for its mesotrophic loch and aquatic plant assemblage.

Rhododendron ponticum is widespread and has a negative impact on natural habitats. Piri Piri burr also occurs, especially along some popular paths and roads.

## 7.4 The existing forest

### 7.4.1 Species, age structure and yield class

Of the plan area of 3960.1ha about 2307ha is wooded. The woodland area is dominated by Sitka spruce, the earliest planting of which was in the 1930s. The information in table 7.3 below includes open space but if all the latter is excluded Sitka spruce makes up about 46% of the forested area. Native broadleaves, including extensive stands of oakwood, are the next most abundant group making up about 25% of the woodland. (this assumes the most of the other broadleaves category consists of native woodland species). Map M8 illustrates current species distribution. A relatively high proportion of the woodlands are aged 60 and above and similar proportion is aged 20 or less (Table 7.4, Map M9). The remaining 30% is spread fairly evenly across the 21 to 60 year old categories. Productivity can be very good with yield classes in excess of 20m<sup>3</sup>ha<sup>-1</sup> 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 12m<sup>3</sup>ha<sup>-1</sup>. 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	1051.4	26.5
Norway spruce	189.1	4.8
Larch	197.6	5.0
Scots pine	177.5	4.5
Other conifers	92.5	2.3
Native broadleaves	422.3	10.7
Other broadleaves	176.7	4.5
Open	1657.4	41.7
	3960.1	100

Table 7.3 Species diversity, 2022 (gross plan area and including open hill land; other broadleaves includes an unknown proportion of native species)

Age Class	Area ha	Area %
0-10	294.9	12.8
11-20	499.3	21.6
21-30	254.8	11.0
31-40	230.0	10.0
41-50	116.4	5.1
51-60	106.0	4.6
60+	805.9	34.9
	2307.3	100.0

Table 7.4 Age diversity, 2022 (figures are for woodland area only)

### 7.4.2 Access

There are eight entrance points, suitable for timber traffic into the forest block from all the major roads which border it (Map M11). Three other entrances are suitable for light vehicles only. The extensive road network is generally well maintained and allows access to most of the standing timber. The Forest Drive is also used by Invertrossachs Estate, to the east, for timber haulage. The section of public road through Aberfoyle is a consultation route.

## 7.5 Landscape and land use

### 7.5.1 Visibility, landscape character and value

Sitting in the heart of the Loch Lomond and The Trossachs National Park, the Achray LMP area has considerable value, and is of national importance, in terms of landscape and visual amenity. Popularised in the 18<sup>th</sup> century by writers and poets the area remains a draw for thousands of visitors each year. The value of this wild and rugged landscape of mountains, lochs and forest is recognised in the many formal designations and features:

- its central location in the Loch Lomond and The Trossachs National Park
- its inclusion in the Queen Elizabeth Forest Park, with the Lodge Visitor Centre as a key tourist destination
- the Trossachs National Scenic Area, covering a large proportion of the block
- the presence of the Three Lochs Forest Drive, NCN Cycle Route 7, the Rob Roy Way and the Great Trossachs Path
- the Ben More - Ben Ledi Wild Land area, to the north

The scenic drive over the Duke's Pass, numerous viewpoints, including from the prominent peaks of Ben Venue and Ben A'an mean that this spectacular landscape is visible and accessible to all. Landscape character, designations, and key viewpoints are shown on Map M15.

National Scenic Areas are defined as having 'outstanding scenic value in a national context'. The Trossachs NSA sees the transition from settled Lowlands to rugged Highland, through the intricate relationship of lochs, woodland and hills. Nature Scot's Landscape Character Assessment divides the area into five types the core of which is the elevated Rolling Forested

Plateau between The Lodge and Loch Achray. The dense woodland cover masks some of the complexity of the underlying landform but this is mitigated by mosaics of native woodland, open areas and the burns and lochs. Of unique interest are the Parallel Ridges of the Menteith Hills formed along the Highland Boundary Fault providing the dramatic backdrop to Aberfoyle and views outwards across the Forth Valley. The National Park's Trees and Woodland Strategy incorporates a landscape capacity study which, though it focuses on new woodland establishment, further emphasizes the unique character of The Trossachs and provides general guidance on management of existing forests.

### 7.5.2 Neighbouring land use

To the south lies the extensive Loch Ard Forest, also managed by FLS. There are private estates with a mix of farming and woodland interest to the west towards Kinlochard. To south and east is more private woodland and the fringes of more extensive farmland of the Forth Valley. In the north and north west is extensive open moorland forming the catchment of the Glasgow water supply centred on Loch Katrine. Much of this area is now part of The Great Trossachs Forest. Tourism is the dominant feature of the area, Aberfoyle being an important destination, providing a base to explore further afield. There are hotels on the margins of the woods and Loch Katrine is a major draw for tourists. Aberfoyle Golf Club shares the southern boundary.

### 7.5.3 Utilities

There are few above and below ground power lines, mostly on the fringes of the plan area. There are 5 antennae, mostly used for telecommunications. The Finglas Reservoir is a drinking water supply and a tunnel connects it to Loch Katrine. Associated with these water bodies are extensive drinking water protected areas. A water main and other Scottish Water assets are located on the southern boundary of the plan area. In addition to Scottish Water facilities there are a number of private water supplies. These facilities are shown on the Utilities Map, M11.

## 7.6 Social factors

### 7.6.1 Recreation

The Trossachs are a nationally, and even internationally, important area for tourism and the Achray LMP area is perhaps the most important recreation site in Central Region. A wide range of facilities are on offer, from the 5 star rated Lodge Visitor Centre to numerous formal and informal trails and paths. Visitors and their requirements are critical to the success of the Achray LMP and operational planning will take account of this as a high priority. The main recreation features are shown on Map M13.

The Lodge acts as hub for a range of activities and includes a popular café with spectacular views over the Achray Face. Also found on site is Go Ape, whose Tree Top Challenge is centred on some of the oldest stands of trees in the forest. There are trails from The Lodge to suit all abilities and it is also possible to access the more remote parts of the forest. In general access is granted under the Scottish Outdoor Access Code and there are numerous informal trails and

paths in addition to the more formal offer. Only the latter are maintained by FLS Visitor Services. Two long distance paths go through the forest as does part of the National Cycle Network 7. For those travelling by car the Duke's Pass is an iconic and popular route and gives access to the Three Lochs Forest Drive, which takes visitors through the heart of a working forest. The wider road network is available for exploration by all and cycling interest has increased in recent years. Carparks are available at the Lodge, on the Forest Drive, and several forest entrances. Those by Loch Achray are extremely popular and allow access to hill paths to the summits of Ben Venue and Ben A'an. The Ben A'an car park has recently been expanded to help cater for the large increase in the number of people climbing the hill. Two of the car parks, Braeval and Leannach are also part of FLS's stay the night scheme for camper vans. A camping management zone operates from March to October around the Forest Drive and Loch Achray. Within these zones permit areas, including a large camping area by Loch Achray, are managed by the Loch Lomond and The Troassachs National Park. Toilet facilities are available at two locations along the Forest Drive.

### 7.6.2 Community

The plan area falls within boundaries of three Community Councils. Strathard covers the largest area, including the southern part of the Forest Drive and to the west of Duke's Pass. To the north of Loch Drunkie and the Achray Hotel is Trossachs CC and a small area at Braeval/Stonefield is part of Port of Menteith CC. All have been consulted during plan development and key issues and concerns have been discussed. Local stakeholders are also consulted on a regular basis by a number of FLS functions, particularly visitor services and involved in development of various projects.

### 7.6.3 Heritage

Just over 50 heritage features have been recorded in or closely associated with the LMP area. These are shown on the conservation and heritage map, M12. Many are remains of shielings and farmsteads or other buildings indicative of past use and settlement. They include The Lodge Visitor Centre building, a listed building with a distinctive three wing radial plan. The largest feature is the Aberfoyle slate quarry, now disused, and associated tramways. Some designations remain uncertain and 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	FLS Response
Loch Lomond and The Trossachs National Park	Involved in early meetings in 2019 and several discussions since.		<p>NP support, and encourage the use of CCF techniques.</p> <p>NP are happy to see native woodland expansion into suitable areas and with restocking with native broadleaves, in general.</p> <p>Spread of non-native conifer and rhododendron onto open habitat and potentially threatening designated sites is a concern. There is potential to collaborate with neighbours and NP.</p> <p>Consider that use of mixtures will enhance bio-diversity.</p> <p>There is potential for peatland restoration in several places.</p>	<p>FLS will review CCF designations, especially in light of threat from P. ramorum to larch on Achray Face. CCF will continue to be used where feasible.</p> <p>FLS will increase the percentage of native broadleaves during the plan period. The potential for woodland expansion is recognised but no firm proposals will be considered in this plan.</p> <p>FLS will implement a programme of non-native control, prioritising sensitive sites. Collaborative effort can be considered.</p> <p>FLS will look at a range of restocking options including the use of mixtures to improve diversity and growth.</p> <p>Although there are no detailed proposals FLS will continue to examine the possibility of peat restoration throughout the Region.</p>
Nature Scot	04.06.21	21.06.21	<p>Several protected sites of national and international importance within plan area. It is important to consider the impact of proposals on these sites.</p> <p>Habitat Regulations apply to the Trossachs Woods and River Teith SACs and NatureScot believe the LMP is likely to have a significant effect on both.</p> <p>Surveys for European Protected Species (EPS) should be carried out prior to felling activity commencing. NB survey data is valid for only a two year period.</p> <p>Recognise significant intervention on deer population but suggest deer numbers may still be too high to achieve successful natural regeneration.</p> <p>A deer management plan is required to support the LMP.</p> <p>Management of goats should also be taken into account.</p>	<p>Location of designated sites will be shown in the plan and high levels of protection afforded to these. Relevant guidelines will be followed and referred to in the plan.</p> <p>If required HRA will be carried out.</p> <p>Surveys will be carried out as part of operational planning.</p> <p>Methods of protection will be reviewed during plan development and referred to in the proposals.</p> <p>Deer management will be referred to in the LMP.</p> <p>Management of goats will be referred to in the plan.</p>



Scottish Water	04.06.21	11.06.21	<p>Plan area falls within a Drinking Water Protected Area (DWPA). Request that FLS notify SW prior to any operation taking place within the plan area. Notify SW, without delay, of any incident, during operations, that might affect SW.</p> <p>Follow Forests and Water Guidelines and in addition take into account Guidance on Forestry Activities Near SW Assets, and develop site specific risk assessment and mitigation measures.</p> <p>There are Scottish Water assets in the plan area, in particular an aqueduct from Glen Finglas to Loch Katrine and multiple assets in the Aberfoyle area. All assets potentially affected by activity should be identified. SW personnel may be able to offer advice on site.</p> <p>SW's processes, standards and policies dealing with asset conflicts must be complied with.</p> <p>Asset conflicts have been identified and early contact should be made with HAUC Diversions Team via the Development Services portal: <a href="https://swastroprodweb.azurewebsites.net/home/default">https://swastroprodweb.azurewebsites.net/home/default</a>. All detailed design proposals relating to protection of SW assets should be submitted to the HAUC for review.</p> <p>SW have produced a list of precautions for activities adjacent to SW assets. Site specific risk assessments and mitigation measures are required to be implemented. No works should take place adjacent to SW assets without prior written acceptance.</p> <p>Proposals will be required to comply with Sewers for Scotland and Water for Scotland 4<sup>th</sup> Editions.</p>	<p>DWPA will be mapped and referred to in plan.</p> <p>SW will be notified prior to any operations and incidents will be reported.</p> <p>Guidelines will be followed and site specific assessments and measures developed at operational planning stage.</p> <p>Known SW assets will be identified on a map and referred to in the plan. Advice will be sought prior to operations.</p> <p>FLS will consult with SW prior to operations and comply with required standards.</p> <p>Contact will be made with HAUC early in work planning stage.</p> <p>No works will take place, adjacent to SW assets, without written consent of SW.</p> <p>Operations will comply with Sewers for Scotland and Water for Scotland 4<sup>th</sup> Editions.</p>
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SEPA	04.06.21	08.06.21	<p>Point out that UKFS is currently under review and consider restocking proposals are weighted too heavily towards conifer as opposed to broadleaves. Suggest FLS review this.</p> <p>Plan should refer to compliance with good forestry practice for all activities, reference being made to Forestry and Water Scotland Know the Rules version 2. Imperative that all contractors follow this guidance.</p> <p>Leaving plastic based guards in the landscape constitutes improper waste disposal. Where tree guards are used there must be a removal plan in place for after the trees have become established.</p> <p>Focus in any woodland creation scheme should be to use low risk intrusive techniques to minimise soil and carbon losses.</p> <p>Great care must be taken when working in the vicinity of private water supplies to protect water quality. Source areas and water transfer pipework must be afforded maximum protection. Where source areas are extensive or boundaries unknown buffer distances should be treated as a minimum.</p> <p>New forest tracks must avoid areas of shallow and deep peat.</p>	<p>The proportion of planted area occupied by broadleaves at the end of the plan period is estimated to be 25% to 30%, well above current UKFS guidelines.</p> <p>All operations will be carried out to the standards set out in UKFS. Contractors are expected to work to these standards.</p> <p>Where necessary a guard removal plan will be put in place.</p> <p>There are no specific plans for woodland creation. Ground preparation described in the plan is for restocking felled sites.</p> <p>Protection of drinking water supplies is referred to in the plan and will be communicated at operational planning stage.</p> <p>Construction of tracks will follow relevant guidance.</p>
Strathard Community Council	03.06.21	01.07.21 et seq	FLS worked with community representatives during development of the plan and a summary of this engagement can be found in Appendix III	
Trossachs Community Council	26.07.21	27.07.21	<p>No issues regarding professional woodland management.</p> <p>Consider objectives too vague and weighted towards forest management rather than taking a holistic approach that includes forest, open land, environment and visitor management.</p>	<p>Although requiring a certain level of detail LMPs remain strategic documents outlining key aspirations and seeking approval for operations that require permission. As far as is possible plans take account of a wide range of issues and present solutions as an integrated whole.</p> <p>Detailed operational plans are developed in a separate stage.</p>
Port of Menteith Community Council	03.06.21		No response received	
Malling Estate	14.06.21	23.06.21	Primary concern is to maintain access into Malling Forest and to liaise ahead of operations to minimise impacts on activities.	FLS will liaise with Malling regarding the access into Malling Forest and any future operations.
Invertrossachs Estate	04.06.21		No response received	

Loch Achray Hotel	04.06.21	15.06.21	No comments and happy to be guided by FLS.	Keep hotel management informed of operations in the vicinity of Achray Hotel.
Tigh Mor Trossachs	04.06.21		No response received	
Mountaineering Scotland	04.06.21	11.06.21	<p>Main interest lies in access to climbing routes and open high ground and impact of forest operations on landscape.</p> <p>Appreciate maintenance of routes to main walking destinations i.e Ben Venue and Ben A'an. Prefer to see tall conifer kept back from routes and use of native broadleaf species.</p> <p>Would appreciate maintenance of informal access to popular rock climbing locations.</p> <p>Provision and maintenance of parking areas would be useful.</p> <p>Support the intention to modify treelines and aspiration to expand native woodland, preferring to see natural regeneration to accomplish this through control of deer population.</p>	<p>Reference will be made to management of trails in the plan. Restocking proposals are outlined in the plan and the zones around trails will be managed to provide a diversity of experience.</p> <p>Presence of popular climbing locations is noted but maintenance of access cannot be guaranteed.</p> <p>There are a number of FLS car parks in the plan area.</p> <p>Woodland expansion is a longer term aspiration and formal approval for woodland expansion is not being sought at the present time. Native woodland restoration is likely to be achieved through a mix of planting and natural regeneration.</p>
Woodland Trust	04.06.21		No response received	
WoSAS	04.06.21	30.06.21	Unable to provide comment at the present time but advised to be aware that there may be archaeological issues in the plan area.	FLS will refer to their own data sets and in house advice regarding heritage during plan revision and known sites will be afforded protection during operations.
CONFOR	04.06.21		No response received	

RSPB	04.06.21	25.06.21	<p>Rich and varied upland habitat is key for the success of black grouse – supportive of aspiration to provide more subtle transformation from forest to open ground. Opportunities can be explored as part of The Great Trossachs Forest Project.</p> <p>Trossachs SAC is described as unfavourable, declining – supportive of action to tackle INNS.</p> <p>Supportive of action to expand native woodland.</p> <p>Supportive of action to remove Sitka spruce from open and native woodland habitat.</p> <p>Much of plan area falls within the geographical remit of the draft Strathard Framework – consistency of approach is important.</p> <p>Commitments to restock large areas with native woodland are welcome.</p> <p>Achray has potential to complement TGTF and targeted herbivore management to help secure natural regeneration and woodland expansion is supported.</p>	<p>General aspirations will be outlined in plan. FLS will continue to work with partners on the detail of TGTF.</p> <p>SAC and SSSI management will be referred to in the plan.</p> <p>Woodland expansion is largely aspirational at the present time but reference will be made to potential opportunities in the plan.</p> <p>Objectives will be consistent with the Strathard Framework.</p> <p>FLS are committed to restoring large areas of plantation on ancient woodland sites.</p> <p>The plan will outline proposals for deer management.</p>
Butterfly Conservation	04.06.21		No response received	
Transport Scotland	04.06.21	15.06.21	<p>No specific comment regarding the LMP in general.</p> <p>Ask that TS be contacted if, at any time, FLS operations might add 5% traffic volume to existing levels on any trunk road.</p>	TS will be contacted if increase in traffic volumes onto trunk road system might exceed 5%.
Raptor study group	04.06.21		No response received	
Scottish Wild Land Group	04.06.21		No response received	
Sustrans	04.06.21		No response received	
Stirling Council (Roads)	04.06.21		No response received	
SSE	04.06.21		No response received	
Scottish Power	04.06.21		No response received	

BSBI plant recorders	04.06.21	09.09.21	<p>Note of concern regarding spread of Piri piri burr, particularly in the vicinity of The Lodge and associated trails and roads.</p> <p>Spoil heaps at Lime Craig Quarry are botanically rich; recent work to remove conifer regeneration will benefit this and ought to be continued as and when necessary.</p> <p>The area between FLS Aberfoyle Office and Aberfoyle Golf Course has a relatively rich flora and fauna including four priority habitats, several rare plant species and three rare spiders. Sensitive management advised.</p> <p>Protected bat cave at the slate quarry; parsley fern grows on spoil heaps; request not to remove all spoil.</p> <p>List of rare plant species supplied.</p>	<p>Presence of piri piri burr will be noted in the plan.</p> <p>Quarry will be managed in line with plan agreed with NS.</p> <p>It is proposed to manage this area for conservation benefit.</p> <p>Presence of bats is noted; not all spoil will be removed from quarry.</p>
Forth District Salmon Fisheries Board	04.06.21	04.06.21	<p>A number of burns and lochs within the LMP area are associated with the River Teith SAC, would like to see a firm commitment to good forestry practice and enhancement of riparian zones for the benefit of the SAC where opportunities arise.</p> <p>Lack of commitment to protection of or enhancement of rivers impacted by forestry, in the draft objectives is seen as a missed opportunity.</p> <p>Would like to see commitment to protection of protected species which occur in the plan area.</p>	<p>FLS are committed to UKFS standards and Forest and Water Guidelines will be adhered to. Riparian areas are incorporated into the forest habitat network with consequent environmental benefits.</p> <p>Objectives revised to indicate commitment to management of forest habitat networks structured on riparian zones.</p> <p>Text will emphasise commitment to protection of priority species and habitats.</p>
Friends of Loch Lomond and The Trossachs	04.06.21	07.06.21	<p>Asked for maps showing extent of area covered by management plan.</p>	<p>Link to web site with maps sent.</p>
Go Ape Aberfoyle	04.06.21		<p>No response received</p>	
Dounans Centre	04.06.21		<p>No response received</p>	
Gravelfoyle	04.06.21		<p>No response received</p>	
Gene Maxwell (grazier)	04.06.21	04.06.21	<p>Acknowledgement only</p>	
Achray Farm	04.06.21		<p>No response received</p>	

Aberfoyle Golf Club	04.06.21	28.06.21	<p>Ensure roadside drains are fit for purpose and maintained to reduce/negated overflow on to Golf Club land.</p> <p>Road maintenance should avoid damage to boundary walls and Golf Club land. Installation of culverts draining onto Golf Club land should be discussed with Club prior to any work being carried out.</p> <p>Protection of Golf Club water storage system during operations.</p> <p>Request consultation prior to any operations that might affect health and safety of members of/visitors to the Golf Club.</p> <p>There is uncertainty around a lease area indicated in FLS database – can this be confirmed.</p> <p>Could a map of land ownership be provided to Golf Club.</p>	<p>Met with Club Secretary on 28<sup>th</sup> June to look at and discuss issues.</p> <p>Road maintenance be included in text. Golf Club to be consulted on any proposals that might impact their property.</p> <p>Forest and Water Guidelines will be followed and necessary protection afforded to water supply.</p> <p>Health and safety is a priority concern and Golf Club will be consulted prior to any operations that might impact on club members/visitors.</p> <p>Details of lease to be forwarded to club secretary.</p> <p>FLS to provide up to date land registration map.</p>
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# Appendix II: Scoping record and design brief

## Achray Land Management Plan

Scoping was carried out by email and a number of stakeholders contacted in June 2021. In addition the Loch Lomond and Trossachs national Park were directly involved in early discussions on plan objectives and other discussions as the plan developed.

A summary of responses is given in Appendix I

An internal meeting was held on 30<sup>th</sup> April 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.

- Progress the restructuring process started in the previous plan aiming to diversify both species and age. Include coupes already incorporated into the Regional felling programme.
- Fell a proportion of larch during the plan period to mitigate against the risk of Ramorum disease in line with FLS policy. Develop a programme that treats the Achray Face and Achray North sensitively, minimising, as far as possible, the visual impact of clearfelling, and seeking opportunities to maintain visual and species diversity at restocking.
- Continue to provide a high level of visitor services, centred on The Lodge, The Three Lochs Forest Drive and Duke's Pass, balancing visual and environmental diversity and recreation facilities with the operations necessary for a working forest.
- Maintain a high level of timber production using a range of management techniques and restocking with Sitka spruce where this is clearly the most suitable species for the purpose. Use alternative species where site conditions are favourable and there will be no significant loss of production.
- Review status of stands designated as Continuous Cover Forestry (CCF), and incorporate these into the clearfell fell programme if CCF management is no longer considered feasible or does not meet site objectives.
- Protect and enhance SACs and SSSIs and other existing native woodland and priority habitats. Restore ancient woodland sites when non-native species are clearfelled.



Remove invasive natural regeneration, including Sitka spruce and western hemlock from priority sites.

- Examine longer term opportunities for modification of commercial treeline and expansion of native woodland onto open ground whilst retaining the element of wildness associated with the higher hillsides and crags.

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. Achray LMP will incorporate the various requirements of UKWAS within its proposals.

## Appendix III: Strathard Community Engagement

Four meetings were arranged to discuss the Achray LMP with Community representatives between 1<sup>st</sup> July 2021 and 30<sup>th</sup> September 2021. There was also some email correspondence. Key issues discussed are listed below:

There was discussion regarding the opportunities and constraints of Continuous Cover Forestry techniques, particularly with respect to impacts on heavily used visitor areas, operational constraints and future habitats *FLS will review extent of CCF and modify designations where appropriate. In particular the threat of Phytophthora ramorum to larch will be taken into account when examining options for management of the Achray Face. It was agreed that establishing small clearfell coupes on the Face, in order to remove larch in a controlled fashion was preferable to more widespread felling in the event of infection.*

Retention and maintenance of existing trail network seen as desirable and, for example an aspiration to re-instate Duke's Trail. Large network of frequently used informal trails. *FLS frequently review trail networks. There might be scope to work with community regarding future development of trail network.*

Impact of herbivores on designated habitats. *FLS are working towards reducing impacts of grazing in designated sites and other areas.*

Promoting the Slate Quarry as a heritage feature is an aspiration. *There are no immediate plans to take this idea forward.*

Some concerns raised over the lack of diversity in even some native stands; could the amount of Sitka spruce be reduced and is there scope for planting more Scot's pine? *FLS are committed to improving diversity in the woodlands they manage. Sitka spruce will remain an important commercial species in the plan area but there will be a significant increase in alternative conifers in the future. In addition there are large areas of plantation on ancient woodland sites and these will be restored as conifer are felled. Scots pine will be included in the suite of species considered for planting.*

Desire to see removal of Sitka spruce and western hemlock natural regeneration, especially from more sensitive and designated sites. *FLS will manage non-native regeneration in sensitive sites and look at priorities for removal elsewhere.*

Also desire to see control of other non-native species such as piri piri burr. *FLS recognise presence of piri piri burr and may seek to control this species if necessary.*

Instability on steep slopes and risk of flooding were raised as concerns. *FLS will take account of these risks prior to operations commencing.*

Concerns raised over management of health and safety in popular visitor sites and the need for early consultation prior to operations. *FLS set a high standard on health and safety and detailed operational planning will take this into account.*



## Appendix IV: Summary of operations

Coupe	Fell Year	Phase	Gross Area	Felling Species	Felling Net Area	Establishment Species	P/NR	Year	Area ha
21027	n/a	n/a	7.3	n/a	n/a	NMB	P	2024	5.9
						OPN			1.4
21028	n/a	n/a	18.3	n/a	n/a	SS	P	2024	9.7
						SP	P	2024	5.6
						MC	P	2024	2.2
						NMB	NR	2027	0.4
						OPN			0.4
21034	n/a	n/a	27.8	n/a	n/a	SS	P	2025	12.6
						LP	P	2025	4.2
						NMB	P/NR	2028	5.4
						OPN			5.6
21052	n/a	n/a	10.9	n/a	n/a	MC	P	2024	6.9
						NMB	P/NR	2027	2.2
						OPN			1.8
21087	n/a	n/a	3.6	n/a	n/a	NMB	NR	2027	3.2
						OPN			0.4
21104	n/a	n/a	0.4	n/a	n/a	NMB	NR	2027	0.3
						OPN			0.1
21196	n/a	n/a	10.7	n/a	n/a	MC	P	2024	5.3
						SS	P	2024	3.2
						NMB	P	2024	1.1
						OPN			1.1
21216	n/a	n/a	1.5	n/a	n/a	NMB	P	2024	0.8
						OPN			0.7

Coupe	Fell Year	Phase	Gross Area	Felling Species	Felling Net Area	Establishment Species	P/NR	Year	Area ha
21263	n/a	n/a	10.8	n/a	n/a	MC	P	2025	3.2
						SS	P	2025	1.9
						MB	P	2025	0.7
						NMB	P/NR	2028	2.2
						OPN			2.8
21272	n/a	n/a	3	n/a	n/a	MC	P	2024	1.1
						SS	P	2024	0.5
						MB	P	2024	0.8
						NMB	P	2024	0.9
						OPN			0.5
22110	n/a	n/a	6.7	n/a	n/a	SP	P	2025	3.3
						NMB	P/NR	2028	2.0
						OPN			1.4
22114	n/a	n/a	3.7	n/a	n/a	SP	P	2025	1.6
						NMB	P/NR	2028	1.4
						OPN			0.7
21012	2023	1	5.4	Larch	0.2	MC	P	2025	4.3
				SS	2.1	NMB	NR	2028	0.6
				NS	3.1	OPN			0.5
21063	2023	1	13.3	SS	9.2	MC	P	2025	4.4
				NS	1.1	SS	P	2025	2.6
				SP	0.4	NMB	P/NR	2028	5.5
				MB	1	OPN			0.8
21091	2023	1	7.0	SS	4.7	MC	P	2025	4.2
				MC	0.1	SS	P	2025	1.4
						MB	P	2025	0.7
						NMB	P	2025	0.7

Coupe	Fell Year	Phase	Gross Area	Felling Species	Felling Net Area	Establishment Species	P/NR	Year	Area ha
21184	2023	1	10.4	Larch	6.5	MC	P	2025	2.7
				SS	1.0	SS	P	2025	1.4
				MC	1.2	MB	P	2025	2.0
				MB	0.9	NMB	P/NR	2028	3.4
						OPN			0.9
21198	2023	1	8.1	SS	5.0	MC	P	2025	2.6
				MC	0.8	SS	P	2025	0.9
				BI	0.9	MB	P	2025	0.5
						NMB	P/NR	2028	3.4
						OPN			0.7
21274	2023	1	5.3	SS	3.0	MC	P	2025	1.9
				Larch	0.3	SS	P	2025	0.9
				NS	0.5	MB	P	2025	1.4
						NMB	P/NR	2028	0.5
						OPN			0.6
21219	2023	1	0.7	SS	0.5	NMB	P/NR	2028	0.6
				MB	0.2	OPN			0.1
21304	2023	1	7.9	SS	7.9	MC	P	2025	2.8
						SS	P	2025	1.7
						MB	P	2025	0.6
						NMB	P/NR	2028	1.1
						OPN			1.7
21004	2024	1	8.1	SS	0.3	MC	P	2026	1.7
				Larch	4.3	NMB	P/NR	2029	4.4
				WH	1.5	OPN			2.0

Coupe	Fell Year	Phase	Gross Area	Felling Species	Felling Net Area	Establishment Species	P/NR	Year	Area ha
				MB	0.2				
21108	2024	1	10.3	SS	3.2	NMB	P/NR	2029	7.2
				NS	1.6	OPN			3.1
				Larch	3.8				
				MB	0.3				
21152	2024	1	1.4	SS	0.1	MC	P	2026	0.2
				JL	1.3	NMB	P/NR	2029	0.8
						OPN			0.4
21030	2025	1	23.3	SS	11.7	NMB	P	2027	14.0
				JL	2.6	NMB	NR	2030	4.7
				NS	2.5	OPN			4.6
				SP	1.6				
21253	2025	1	5.3	SS	1.6	MC	P	2027	0.5
				Larch	3.6	NMB	P	2027	3.7
						OPN			1.1
21264	2025	1	7.1	SS	0.6	MC	P	2027	3.4
				Larch	4.9	NMB	NR	2030	0.2
				MC	0.6	OPN			3.5
				MB	0.4				
21271	2025	1	10.6	SS	3.8	MC	P	2027	6.4
				Larch	4.6	SS	P	2027	1.1
				MC	0.9	NMB	P	2027	2.1
						OPN			1.0
21362	2025	1	6.5	SS	1.7	MC	P	2027	2.7
				Larch	0.9	SS	P	2027	0.5
				NS	0.7	MB	P	2027	0.9

Coupe	Fell Year	Phase	Gross Area	Felling Species	Felling Net Area	Establishment Species	P/NR	Year	Area ha
				SP	2.0	NMB	NR	2030	0.8
				WH	2.5	OPN			1.6
22005	2025	1	23.0	SS	7.7	SP	P	2027	2.3
				Larch	5.0	NMB	P/NR	2030	16.1
				NS	3.7	OPN			4.6
				LP	2.1				
22009	2025	1	19.3	SS	2.1	NMB	P/NR	2030	12.0
				Larch	7.1	SP	P	2027	3.5
				NS	4.6	OPN			3.8
				MC	0.8				
				MB	1.0				
21042	2026	1	11.4	SS	6.3	MC	P	2029	7.0
				Larch	3.6	NMB	P/NR	2032	2.8
				LP	1.6	OPN			1.6
21206	2026	1	3.3	Larch	2.7	MC	P	2028	1.5
				MC	0.7	SS	P	2028	0.2
						MB	P	2028	0.5
						NMB	NR	2031	0.7
						OPN			0.4
21049	2028	2	28.4	SS	14.0	NMB	P	2030	19.1
				Larch	9.3	OPN			9.3
				MC	2.1				
21112	2028	2	8.8	Larch	1.5	MC	P	2030	5.8
				SS	2.8	NMB	NR	2033	1.8



Coupe	Fell Year	Phase	Gross Area	Felling Species	Felling Net Area	Establishment Species	P/NR	Year	Area ha
				NS	3.5	OPN			1.2
21127	2028	2	5.6	SS	2.7	MC	P	2031	1.4
				Larch	0.4	SS	P	2031	1.9
				LP	0.9	LP	P	2031	0.4
				SP	0.2	MB	P	2031	0.3
						NMB	NR	2033	0.8
						OPN			0.8
21038	2028	2	15.4	SS	9.3	MC	P	2031	7.7
				Larch	1.5	SS	P	2031	4.6
				MC	1.4	MB	P	2031	1.6
				SP	1.0	OPN			1.5
21259	2028	2	13.4	SS	0.7	MC	P	2030	7.9
				Larch	3.0	SS	P	2030	1.5
				NS	2.2	MB	P	2030	2.7
				SP	4.1	OPN			1.3
21015	2029	2	9.0	SS	0.3	MC	P	2031	2.9
				Larch	6.6	SS	P	2031	1.7
				SP	0.9	SP	P	2031	1.0
						NMB	P/NR	2034	2.1
						OPN			1.3
21114	2029	2	12.4	SS	5.0	NMB	P/NR	2034	8.8
				Larch	5.5	OPN			3.6
				NS	0.3				
21163	2029	2	5.4	SS	0.6	MC	P	2031	3.4
				Larch	2.8	SP	P	2031	0.3
				MC	0.3	NMB	P	2031	1.3

Coupe	Fell Year	Phase	Gross Area	Felling Species	Felling Net Area	Establishment Species	P/NR	Year	Area ha
						OPN			0.4
21197	2029	2	11.2	SS	3.3	MC	P	2031	4.2
				Larch	4.8	SS	P	2031	1.4
				NS	0.3	NMB	P/NR	2034	5.1
				MB	1.3	OPN			0.5
21461	2029	2	7.4	SS	1.1	MC	P	2031	2.6
				Larch	3.8	SS	P	2031	0.5
				SP	1.1	MB	P	2031	0.9
				MC	0.7	NMB	P	2031	2.6
						OPN			0.8
21011	2030	2	11.4	SS	1.1	MC	P	2032	5.2
				Larch	3.4	SS	P	2032	3.1
				MC	2.5	NMB	P/NR	2035	1.8
						OPN			1.3
21048	2030	2	8.7	SS	3.3	MC	P	2032	3.8
				Larch	0.6	NMB	P/NR	2035	3.1
				NS	2.9	OPN			1.8
				MC	1.0				
21098	2030	2	2.8	SS	0.2	MC	P	2032	1.9
				Larch	1.7	NMB	NR	2032	0.9
				NS	0.2				
21106	2030	2	10.0	SS	1.6	NMB	P/NR	2035	7.0
				Larch	3.0	OPN			3.0
				MC	0.4				
				MB	1.4				

Coupe	Fell Year	Phase	Gross Area	Felling Species	Felling Net Area	Establishment Species	P/NR	Year	Area ha
21166	2030	2	5.5	Larch	2.6	MC	P	2032	2.7
				MC	2.0	SS	P	2032	0.5
				MB	0.5	MB	P	2032	0.9
						NMB	NR	2035	0.5
						OPN			0.9
21250	2030	2	4.3	SS	0.5	MC	P	2031	0.4
				Larch	2.6	NMB	P	2031	3.0
				NS	0.6	OPN			0.9
				MB	0.6				
22011	2030	2	17.3	SS	4.8	NMB	P	2032	12.1
				Larch	4.4	SP	P	2032	1.7
				NS	6.3	OPN			3.5
				MC	1.5				
22021	2030	2	3.4	SS	0.6	NMB	P	2032	2.4
				Larch	0.9	SP	P	2032	0.3
				MC	1.7	OPN			0.7
21019	2031	2	17.8	SS	4.6	MC	P	2033	4.8
				Larch	8.0	SS	P	2033	3.2
				MC	0.7	NMB	P/NR	2036	7.6
				MB	0.5	OPN			2.2
21148	2031	2	4.5	SS	1.6	MC	P	2033	2.0
				Larch	0.6	SS	P	2033	1.1
				MC	0.4	MB	P	2033	0.4
						NMB	NR	2036	0.5

Coupe	Fell Year	Phase	Gross Area	Felling Species	Felling Net Area	Establishment Species	P/NR	Year	Area ha
						OPN			0.5
21269	2031	2	5.4	Larch	2.1	MC	P	2033	2.5
				SP	2.2	SS	P	2033	0.4
				MC	0.8	MB	P	2033	0.8
						NMB	NR	2036	0.8
						OPN			0.9
<b>clearfell</b>			<b>395.8</b>		<b>336.3</b>			<b>SS</b>	<b>58.5</b>
<b>restock</b>			<b>108.1</b>		<b>na</b>			<b>MC</b>	<b>126.3</b>
<b>gross</b>			<b>503.9</b>	<b>net</b>	<b>336.3</b>			<b>SP</b>	<b>19.6</b>
								<b>LP</b>	<b>4.6</b>
								<b>MB</b>	<b>15.7</b>
								<b>NMB</b>	<b>192.9</b>
								<b>Open</b>	<b>86.3</b>
								<b>gross</b>	<b>503.9</b>
								<b>conifer</b>	<b>209.0</b>
								<b>broadleaf</b>	<b>208.6</b>
								<b>planted</b>	<b>346.9</b>
								<b>nat regen</b>	<b>70.7</b>



# Appendix V: Forestry projects requiring a screening opinion request

## V.i Proposed deforestation

If proposals, outlined in the plan, for peat restoration amount to deforestation a full assessment will be made and a screening opinion request submitted.

## V.ii Proposed afforestation

There are no afforestation proposals.

## V.iii Proposed forest roads, tracks and other facilities

This section describes works covering construction of, roads, tracks, ramps and other facilities in Achray LMP area. It is included to give an indication of the number of facilities required to successfully deliver the plan. Proposals for roads and tracks are shown on Map M10.

A screening opinion for facilities will be requested as and when required during the plan period.

Coupe 21049, which contains a significant proportion of larch and a new road will be required to allow to access by machinery and timber lorries. The total length is about 1050m with a width of 7m; the nominal area is 0.74ha. The proposed road will be constructed to the standard FLS Class A road specification and in line with the principles described in the SNH guidance on Constructed Tracks in the Scottish Uplands. Construction will also conform to the Forest and Water Guidelines (Fifth Edition). Roads will have a waterbound surface (not tarmac), with one layby at about 500m intervals and with a turning point at the end.

The first part of the roadline is partially visible from Duke's Pass but, although it climbs quite high, it is eventually hidden from all angles by the landform. The line has been selected to follow the site topography and to minimise cut and fill. Impact will be further reduced by ensuring batter angles and any disturbed ground are left in a condition that will promote early natural vegetation regeneration. In addition, because it passes through a recently restocked site it will be largely hidden in a relatively short period of time; groups of native trees will be planted to provide extra screening at appropriate points. The location of turning points and laybys will be carefully selected to minimise disturbance and the batter angle of any cut required in construction. Where possible laybys and turning points will be positioned on the downhill side of the new roads. Also, where possible, top soil stripped from the roadline will be stored to be used for landscaping after construction.

A proportion of the materials required to construct roads may be sourced from within the excavation corridor the remainder will come from the closest available FLS quarry.

During the plan period a large proportion of the road network will need maintenance or upgrade. None of this work will necessitate alteration to the footprint of the road and so will not require an EIA determination.

It is estimated that about 1220m of forwarder extraction track will be required, to access the lower and western section of coupe 21049 and coupe 21048. The longer track through coupe 21049 is initially hidden by the land form and at lower elevations is largely obscured from the public road by the steep slopes and surrounding trees. There are distant views from the south and west but the line will not be prominent in these. Construction will be kept to a minimum, but where it is required material will be sourced either from the line of the track or the nearest FLS quarry. The surface of extraction tracks will be protected with a layer of branches and tops. Forwarder tracks will be approximately 4m to 5m wide with a nominal area of about 0.61ha. When no longer needed for extraction the width will be narrowed to 2.5m and both track and batters will be allowed to revegetate. Early restocking of 21049 will effectively hide the track in a short period of time. There are no issues with the track for 21048. If, at time of operational planning it is decided that additional tracks are required a separate determination request will be submitted.

The total length of ATV tracks will be approximately 23750m and they will be about 2m wide; the nominal area amounts to 4.75ha. 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 roads and tracks are shown on the roads and tracks map (M10) 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. Some tracks will be visible from prominent viewpoints such as Ben A'an and Ben Venue when first constructed. However as they age they will blend into the landscape and, eventually, will also be masked by tree cover.

Up to 250 ramps may be needed to facilitate access for machinery into clearfell and thinning coupes. These will be approximately 3m wide and up to about 15m long. The total nominal area is approximately 1.13ha. They will not be treated as permanent features and will be either allowed to re-vegetate or removed following operations. The final number and location of the ramps will be determined at the time of operations but one ramp per 100m to 150m of road/coupe interface is believed to sufficient.

## V.iv Quarries

There is only one active quarry within the plan area (map M10). Stone is also taken from material lying in the old slate quarry to the west of the Duke's Pass. In a review of stone requirements for the plan area it was proposed that the active quarry be expanded and a new one established close to the new road in coupe 21034. Detailed proposals are still being developed and a screening request will be submitted when these have been finalised.

## V.v Summary of forestry projects requiring screening opinion

Coupe	Length (m)	Area (ha.)	Purpose	Landscape	Water quality	Archaeology	Biodiversity	Access	Recreation	Material
21011	824	0.17	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
21012	438	0.09	crop establishment and deer management	visible from Ben Aa'n see text	standard protection measures	no known issues	no significant issues	from forest road	n/a	to be found on site
21015	379	0.08	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
21019	982	0.20	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
21028	1072	0.21	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
21030	1331	0.27	crop establishment and deer	visible from Ben Aa'n see text	standard protection measures	no known issues	no significant issues	from forest road	n/a	to be found on site
21034	1232	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



Coupe	Length (m)	Area (ha.)	Purpose	Landscape	Water quality	Archaeology	Biodiversity	Access	Recreation	Material
21038	1207	0.24	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
21042	646	0.13	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
21048	73	0.04	facilitation of harvesting	visible from Duke's Pass see text	standard protection measures	crosses slate quarry tramway; avoid unnecessary damage	no significant issues	from forest road	n/a	to be found on site
21048	513	0.10	crop establishment and deer management	visible from Duke's Pass see text	standard protection measures	no known issues	no significant issues	from forwarder track	n/a	to be found on site
21049	1050	0.74	access to second phase fell coupe	visible from Duke's Pass see text	standard protection measures	no known issues	no significant issues	from forest road	n/a	from nearest FLS quarry
21049	1139	0.57	facilitation of harvesting	might be seen from distant viewpoints;	standard protection measures	no known issues	no significant issues	from new forest road	n/a	to be found on site
21049	429	0.09	crop establishment and deer management	mostly hidden or seen only from distance	standard protection measures	no known issues	no significant issues	from forwarder track	n/a	to be found on site
21052	781	0.16	crop establishment and deer management	visible from Duke's Pass see text	standard protection measures	crosses slate quarry tramway; avoid unnecessary damage	no significant issues	from forest road	n/a	to be found on site

Coupe	Length (m)	Area (ha.)	Purpose	Landscape	Water quality	Archaeology	Biodiversity	Access	Recreation	Material
21063	667	0.13	crop establishment and deer management	visible from Ben Aa'n see text	standard protection measures	no known issues	no significant issues	from forest road	n/a	to be found on site
21091	465	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
21106	844	0.17	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
21108	638	0.13	crop establishment and deer management	visible from Ben A'an see text	standard protection measures	no known issues	no significant issues	from forest road	n/a	to be found on site
21112	566	0.11	crop establishment and deer management	visible from Ben Aa'n see text	standard protection measures	no known issues	no significant issues	from forest road	n/a	to be found on site
21114	903	0.18	crop establishment and deer management	visible from Ben A'an see text	standard protection measures	no known issues	no significant issues	from forest road	n/a	to be found on site
21163	370	0.07	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
21166	334	0.07	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

Coupe	Length (m)	Area (ha.)	Purpose	Landscape	Water quality	Archaeology	Biodiversity	Access	Recreation	Material
21184	439	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
21196	680	0.14	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
21197	398	0.08	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
21198	410	0.082	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
21206	323	0.07	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
21250	439	0.09	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
21253	375	0.08	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
21259	674	0.14	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

Coupe	Length (m)	Area (ha.)	Purpose	Landscape	Water quality	Archaeology	Biodiversity	Access	Recreation	Material
21271	612	0.12	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
21304	446	0.09	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
21362	553	0.11	crop establishment and deer management	visible from A81 see text	standard protection measures	no known issues	no significant issues	from forest road,	n/a	to be found on site
21461	478	0.10	crop establishment and deer management	visible from A81 see text	standard protection measures	no known issues	no significant issues	from forest road,	n/a	to be found on site
22005	1318	0.26	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
22009	647	0.13	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
22011	813	0.16	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
22114	510	0.10	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

## Appendix VI: Mitigation of impacts on designated sites

There are several designated sites in or close to the plan area which might be impacted by forest operations; These are shown on map M12 Conservation and Heritage.

FLS will adhere to UKFS guidelines during all operations and work closely with the relevant organisation when working in proximity to sensitive sites, for example NatureScot, SEPA and Scottish Water. Prior to operations we will consult with such organisations to discuss, in detail, any mitigation required to avoid impact on features of concern and ensure that these are implemented during operations.

With regard to Trossachs SAC (Woodland features |) the following specific measures will be taken:

- All trees will be felled away from SAC to reduce chances of damage
- Any trees that are leaning towards the SAC will be winched in by either hand or machine
- Any debris from felling (branches etc) will be lifted out of the SAC and back onto FLS felling coupe
- There will be no machine access or chainsaw operator access in the SAC
- At restocking a buffer of native woodland will be established adjacent to the SAC.

With regard to the River Teith SAC and associated SSSIs (mostly water based features) the following specific measures will be taken.

- Consult with NatureScot about entering SSSI areas and agree protection methods (licences to enter this SSSI have been applied for previously)
- Avoid winter working wherever possible
- No working in heavy rain conditions, especially in yellow/amber/red weather warning (this includes haulage on forest roads that effect SAC area)
- Silt catch points to be installed prior to operations commencing. This will include silt netting and sump traps that lead into already existing drainage networks.
- All vehicles accessing and on site will have full pollution control kits
- Pollution control plans to be issued to all operators on site before work starts
- All operations will follow Forest and Water guidelines.
- Consultation with SEPA will take place before work starts
- Crossing of water courses that lead into SAC will be avoided but when this is not possible robust log bridges will be constructed with regular monitoring taking place over their condition
- No machine access within 10m of all water course to prevent ground damage