Forestry Commission Scotland
Coimisean na Coillteararachd Alba

Planning

Cowal and Trossachs Forest District

Land Management Plan

# Strathlachlan

Cowal and Trossachs Forest District

# STRATHLACHLAN

## Land Management Plan

Approval date:

Plan Reference No:

Plan Approval Date:

Plan Expiry Date:

## CSM 6 Appendix 1b

### FOREST ENTERPRISE - Application for Land Management Plan Approvals in Scotland

**Forest Enterprise - Property**

| | |
|---|---|
| Forest District: | Cowal & Trossachs |
| Woodland or property name: | Strathlachlan |
| Nearest town, village or locality: | Strachur |
| OS Grid reference: | NS028950 |
| Local Authority district/unitary Authority: | Argyll and Bute Council |

**Areas for approval**

| | Conifer | Broadleaf |
|---|---|---|
| Clear felling | 205.1ha | <1.0ha |
| Selective felling | | |
| Restocking | 149.3ha | 108.3ha |
| New planting (complete appendix 4) | | |

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

2. I apply for an opinion under the terms of the Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999 for roads, tracks and quarries as detailed in my application.

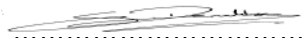
3. I confirm that the initial scoping of the plan was carried out with FC staff on 5th December 2014.

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

5. I confirm that the scoping, carried out and documented in the Consultation Record attached, incorporated those stakeholders which the FC 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  ……. Signed……

Forest District Manager Conservator

District …Cowal & Trossachs FD Conservancy……

Date 21st February 2017 **Date of Approval**…….

**Date approval ends** ……..

# Environmental Impact Assessment

Scheme No 032/03/19

# Determination Enquiry Form

**Complete this form to find out if you need consent, from the Forestry Commission (under the EIA Regulations 1999), to carry out your proposed work.**

## Section 1

Please tick the box to indicate the type of work you are proposing to carry out. Give the area in hectares and where appropriate the percentage of conifers and broadleaves.

Proposed work: Afforestation ☐ ha BL% Con%

Deforestation ☐ ha BL% Con%

Forest roads ☒ 5.3 ha

Forest quarry ☐ ha

Location and district: Cowal and Trossachs Forest District

**Please attach map(s) showing the boundary of the proposed work and also give details of the operations.**

## Section 2

**Property details**

Property name: Strathlachlan

Grid Ref: *(eg AB 123/789)* NS028950

Local authority: Argyll and Bute Council

Nearest town: Strachur

## Section 3

**Applicant's category:** *(please put a cross in one box)*

| | | | |
|---|---|---|---|
| PE Personal occupier | ☐ | PU Public ownership | ☒ |
| BU Business occupier | ☐ | OT Other | ☐ |
| VO Voluntary organisation | ☐ | CT Crofting tenant | ☐ |

## Section 4

**Applicant's type:** *(please put a cross in one box)*

LS Lessee ☐ TE Tenant ☐ OW Owner ☒ TR Trust ☐

## Section 5

**Your agent or woodland manager's details**

Title (Mr, Mrs, Ms, etc): Initials: Surname:

Organisation:

Address:

Postcode:

Tel: Mobile:

Fax: E-mail:

Is this the address for correspondence? ☐ YES ☐ NO

Forestry Commission

## Section 6

### Applicant's details

Title (Mr, Mrs, Ms, etc): Mr Initials: J Surname: Hair

Organisation: Forestry Commission Scotland

Position (eg partner, director etc) Planning Manager

Address: Cowal and Trossachs Forest District

Aberfoyle

Stirlingshire Postcode: FK8 3UX

Tel: 0300 067 6600 Mobile:

Fax: E-mail: john.hair@forestry.gsi.gov.uk

Is this the address for correspondence? [X] YES [ ] NO

## Section 7

**Sensitive Areas: Give the area of the proposal that is covered by any of the following designations:**

| Sensitive Area as listed in "Schedule 2" of the 1999 EIA Regulations | | Area (ha) |
|---|---|---|
| a. | Sites of Special Scientific Interest (SSSI) or Proposed Sites of Special Scientific Interest (PSSSI) | 0.00 |
| b. | SSSI's with a Nature Conservation Order (Section 29 of the Wildlife and Countryside Act 1981) | 0.00 |
| c. | National Park (NP) | 0.00 |
| d. | The Broads | 0.00 |
| e. | World Heritage Site | 0.00 |
| f. | Scheduled Ancient Monument (SAM) | 0.00 |
| g. | Area of Outstanding Natural Beauty (AONB) | 0.00 |
| h. | "Natura 2000" site - *(European network of special areas of conservation and special protection areas under the Wild Birds Directive)* | 0.00 |

Forestry Commission

 FCCS057

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# Summary of Proposals

The Strathlachlan Land Management Plan (LMP) draws on the key themes of the Scottish Forestry Strategy (SFS) (2006), Forest Enterprise Scotland's Strategic Directions and Cowal & Trossachs Forest District's Strategic Plan. Several objectives, for example native woodland restoration are in line with the Argyll and Bute Local Biodiversity Action Plan. The area covers approximately 1869ha divided into three discrete units.

The objectives of the new plan, which were developed following internal and external consultation, are summarised below and emphasise the key principals of establishing and maintaining a diverse, resilient forest capable of delivering a wide range of ecosystem services into the future.

1. Continue to manage the forest for timber production. Clearfelling, before onset of windblow, and replanting will be the predominant management technique.

2. Opportunities will be sought to thin stands and also establish continuous cover systems, where appropriate.

3. At restocking Ecological Site Classification (ESC) principles, will be used to guide choice and diversify species structure. Up to date guidance on the effects of climate change will be taken into account. Sitka spruce will remain the dominant species at higher elevations and will only be preferred at lower elevations, where site conditions are less than favourable to allow alternative species.

4. A diverse age structure will be maintained in order to provide visual diversity and help maintain resilience.

5. Priority ancient woodland sites will be restored, enhanced and maintained.

6. A forest habitat network (FHN) will be established and managed for conservation and landscape interest.

7. The area of productive broadleaves will be increased, in line with Scottish Government policy. Ancient woodland and parts of the FHN will be managed productively if appropriate.

8. Seek to maintain visual diversity in the forest landscape using judicious species choice, especially at lower elevations, and open space. Coupe shapes will be planned to soften their visual impact, especially in landscape sensitive zones.

9. There are several known features of archaeological interest which will be given appropriate protection. Record and protect any new discoveries made during operations.

10. Continue the programme of control of non-native invasive species initially targeted to areas of ancient woodland.

11. Enhance and protect habitats, including open ground, for priority species of conservation interest.

12. Establish appropriate deer management infrastructure to allow early natural regeneration and protect planted trees.

13. Protect water supplies, water courses and manage riparian zones, to maintain and improve water quality, increase biodiversity and mitigate against erosion and flooding. Follow all forest and water guidelines during forest operations.

# 1.0 Introduction:

## 1.1 Setting and context

The Strathlachlan Land Management Plan area lies to the south west of the village of Strachur in Argyll. The plan area is orientated south west – north east, parallel to Loch Fyne, which is the effective north western boundary, the other boundaries are less well defined (Figure 1.1). The block lies close to Loch Lomond and The Trossachs National Park and Argyll Forest Park. It is split into three units, divided in the north by the line of the A866 and in the south by private ground at Lephinmore. The setting is one of ridges and glens with moderately steep slopes with a mix of mainly commercial woodland and poor hill grazing. The area is valued for its landscape and gardens and the A866 is a key route to South Cowal and ferries to the Isle of Bute and Kintyre.

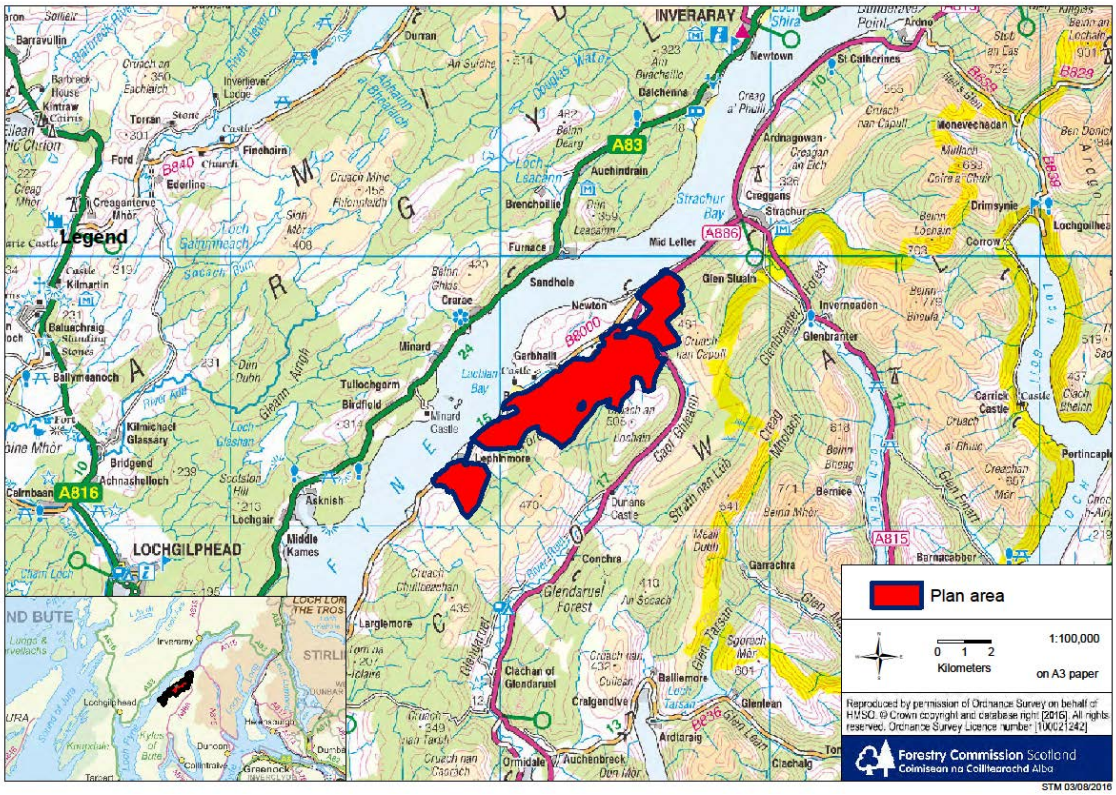


Figure 1.1 Strathlachlan: location

## 1.2 History of the plan

This is the third forest plan for Strathlachlan, the first and second plans having been submitted and approved in 1999 and 2004 respectively. The plan covers an area of 1869ha and continues a general aspiration to maintain production whilst improving the environmental and landscape features. Although there are areas of semi natural ancient woodland, dating back to at least 1750, the first commercial conifer planting took place in the late 1940s to early 1950s. Only relatively small areas of these first rotation stands remain and much of the forest is now on second and third rotations. A number of different species were planted in the first rotation with greater reliance on Sitka spruce in the second. The first two plans introduced a programme of restructuring aiming to achieve a diverse and resilient forest.

# 2.0 Analysis of previous plan

## 2.1 Aims of previous plan and achievements

The objectives of the previous plan were described in terms of four distinct zones: Forest Habitat Network (FHN), landscape sensitive zone, clearfell zone and open hill. The overall objective of the FHN is to improve habitat and provide links between habitat types - it incorporates semi-natural ancient woodland, riparian zones and open ground. Key ambitions are to remove non-native conifer and enhance or restore semi natural woodland. The clearfell zone is the area where commercial timber production is concentrated. Economic benefit is a key driver but social, environmental and landscape factors are also to be taken into account. There is an aspiration to diversify tree species where feasible. The open hill zone is largely that area above the commercial treeline the overall aspiration for which is steady improvement in habitat and diversity. The landscape sensitive zone overlaps the other three and emphasises the need for careful design. Other factors considered in the plan are protection and improvement of habitat for species of conservation concern (such as black grouse and red squirrel), protection of archaeological features and increased opportunity for access for informal recreation.

The previous plan envisaged a programme of phased felling and restocking designed to achieve the above objectives. Most of the work has been achieved, with occasional minor modification to coupe boundaries for mainly practical reasons. There have been delays to felling in the Lephinmore block, largely due to conservation reasons, but this has not compromised the overall aims of the plan. Some older stands have also been retained for

conservation reasons. In 2011/12 severe storms caused extensive windblow, particularly in the main block. Most of this has now been cleared with agreement from Forestry Commission Scotland. Restocking has been in line with the plan though in recent years there have been restrictions on the planting of larch due to risk from Ramorum disease. In places there is extensive natural regeneration helping to create diversity of habitat.

In terms of infrastructure the forest road through the main block has been completed. No other roads have been built but a number of temporary tracks have been used to help facilitate management.

## 2.2 How previous plan relates to today's objectives

The broad objectives of the previous plan are relevant to the new land management plan. Sustainable timber production remains a key objective, concentrating on Sitka spruce. In the new plan potential climate change is taken into account and, where site conditions and future climate are believed to be favourable, alternative species will be considered. There is now more emphasis on productive broadleaved production and opportunities will be sought to establish suitable stands, either through planting or natural regeneration. Using native species will also meet or complement objectives for enhancement and restoration of native woodlands. The principles and objectives of the FHN remain key to the plan, with added emphasis on management of open ground and diversification of habitat. Managing sensitively for both conservation and landscape remains a key element of the new plan.

The zones map illustrates the relative importance of the main objectives throughout the area, though there is a degree of overlap.

# 3.0 Background information

## 3.1 Physical site factors

### 3.1.1 Geology Soils and Landform

The Land Management Plan area lies to the north of the Highland Boundary Fault and is underlain by older metamorphic rocks derived from sandstones and finer grained sedimentary rocks. These rocks are hard, break down only slowly and provide a relatively poor nutrient source. There is a limited amount of superficial deposits of glacial or fluvio-glacial origin, largely derived from the solid geology. The older rocks have a south west to north east alignment and this is crossed at right angles by narrow strips of fine

grained basic igneous rocks associated with more recent volcanic activity centred on Mull. The latter add little to the parent material of the soils.

Topography is largely dictated by the underlying geology and the area is dominated by a largely north west facing slope. Slope steepness varies and there are frequent low hillocks and benches; the many deeply incised burns add complexity. Elevation ranges from 5m at Lephinmore to 420m in the north of in the main block.

Much of the plan area is covered by Forestry Commission soil maps at a scale of 1:10000. The remainder is covered in less detail by the James Hutton Institute 1:250000 survey. The surveys indicate the dominance of peaty gleys, unflushed peats and iron pan soils, even to quite low elevation. Areas of surface water gley are shown at lower levels and brown earths are found on the steeper slopes. Field observations confirm this general association, with perhaps less of a distinction between peaty and surface water gleys. Unflushed peat with poor nutrient status dominates flatter areas merging to flushed peats, deep peaty gley and iron pan soils where the slope steepens. On steeper slopes, at all elevations, shallow soils and rock outcrops are frequent. These soil types suggest water regimes towards the wetter end of the spectrum and poor to very poor soil nutrient regimes.

Table 3.1 summarises the nutrient and moisture regimes of the main soil types. The brown earths are likely to be towards the poorer end of the nutrient spectrum, only flushed surface water gleys are likely to be medium in terms of nutrient status. Moisture availability is unlikely to be a limiting factor in the plan area.

| Soil type | Soil moisture | Soil nutrient |
|---|---|---|
| Brown earth | Slightly dry to moist | Poor to medium |
| Upland brown earth | Fresh to moist | Poor |
| Intergrade | Moist | Poor to very poor |
| Iron pan soil | Very moist | Very poor |
| Surface water gley | Very moist to wet | Poor to medium |
| Peaty gley | Wet to very wet | Very poor to poor |
| Flushed peat | Very wet | Poor to medium |
| Unflushed peat | Very wet | Very poor |

Table 3.1 Strathlachlan: important soil properties

### 3.1.2 Water

The burns in the plan area drain into Loch Fyne, which is a sea loch. They are steep and deeply incised, particularly on the lower slopes. Sub-surface flow seems to be an important feature of the steeper slopes and surface water can appear in flatter areas. There are several private water supplies.

### 3.1.3 Climate

Using the measures of warmth and wetness defined in the Ecological Site Classification (ESC, see Forestry Commission Bulletin 124) the Strathlachlan LMP area is categorized as warm and moist at lower elevations, becoming cool and wet above about 150m. Average annual rainfall ranges from approximately 1800mm by Loch Fyne to 2300mm at the highest elevations. About 60% falls during the winter months. There is a very narrow strip along the northwestern boundary that is classed as sheltered. However the area becomes increasingly exposed as elevation increases, particularly above about 150m and above 200m there are significant areas classed as highly exposed.

### 3.1.4 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 (Figure 3.1). 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 (Figure 3.1).

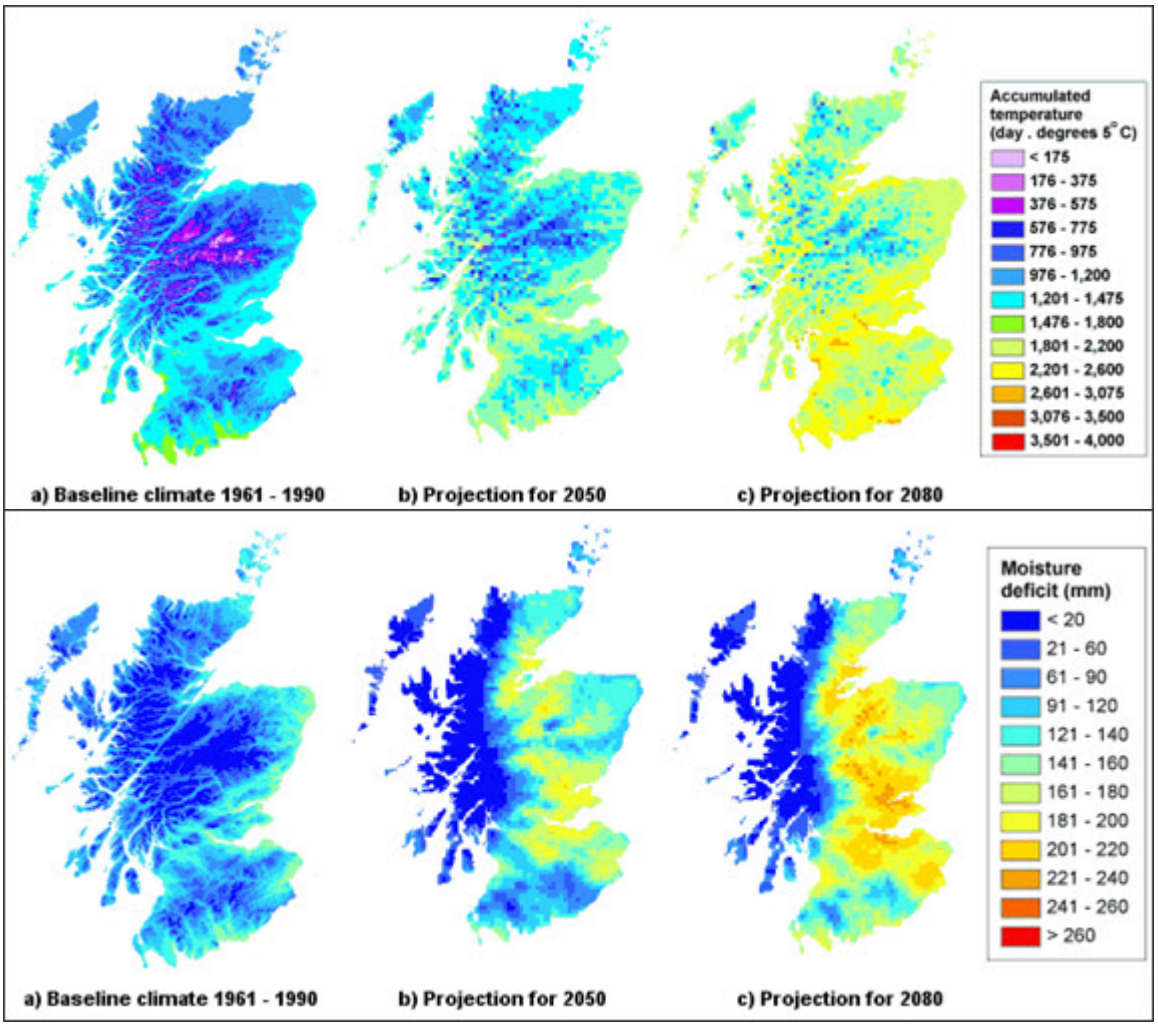


Figure 3.1 Predicted future warmth (top) and moisture deficit (bottom) – high emissions scenario

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 Strathlachlan area suggest an increase in accumulated temperature of almost 50% by 2050, compared to baseline 1960 – 1990 data, and about 60% by 2080. Relative increase is even greater at higher elevations and all parts of the forest are predicted to be classed as warm. 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. Where exposure is a limiting factor, at present, it seems likely to remain so.

## 3.2 Biodiversity and environmental designations

Strathlachlan Forest Block provides a diverse network of native woodland habitats, productive conifer and open hill. There is a good age range of productive woodland, which provides nesting areas for a variety of raptors, mammals and small birds. Linking corridors of native woodlands support an extensive range of bryophytes and lichens as well as many herbaceous food-plants for butterflies and other insects. They are also home to a number of bird and animal species such as redstart, owls, sparrowhawks, buzzards and squirrels. At higher elevations there are wide swathes of open ground which offer ideal hunting ground for golden eagle and habitat for red and black grouse among other species.

Golden eagle and black grouse are among several priority species that occur in the forest block. White tailed sea-eagles have also recently attempted to nest. Red squirrels are widespread and pine marten has increased in numbers in recent years. There are also numerous colonies of wood ant (*Formica lugubris*) in the Lephinmore block with several more in the southern part of the main block. Several of the burns support salmonid spawning grounds in their lower reaches.

There are extensive areas of semi natural ancient woodland on the lower slopes and along some of the larger burns. Oak, ash, birch and wet woodland species are important components of these woods. There are degraded areas of upland heath at higher elevations and extensive areas of blanket bog. In addition to the various water courses there is a small lochan in the main block which is home to several breeding birds.

## 3.3 The existing forest

### 3.3.1 Species, age structure and yield class

A total of 17 species are currently present in the forest though most of these make up only a tiny percentage of the overall total. Table 3.2 summarises species distribution into major groups. Sitka spruce is the dominant species making up just over 50% of the plan area and over 70% of the woodland area. Larch is the next most abundant species but makes up less than 7% of the woodland area and Norway spruce accounts for only 4.5%. There are small areas of Scots and lodgepole pine, which make up about 6% of the woodland area between them; all other conifers make up less than 2%. Mixed broadleaves includes a small percentage of beech and sycamore but the majority of this category is birch. Open ground has been excluded from table 3.2.

| Species | Area ha | Area % |
|---|---|---|
| **Sitka spruce** | 989.6 | 71.9 |
| **Larch** | 93.7 | 6.8 |
| **Lodgepole pine** | 42.9 | 3.1 |
| **Scots pine** | 35.4 | 2.6 |
| **Other conifer** | 76.6 | 5.6 |
| **Native broadleaf** | 121.4 | 8.8 |
| **Other broadleaf** | 16.8 | 1.2 |
| | **1376.4** | **100.0** |

Table 3.2 Species diversity, Strathlachlan, 2017

| Age Class | Area ha | Area % |
|---|---|---|
| **0-10** | 245.2 | 17.9 |
| **11-20** | 268.6 | 19.5 |
| **21-40** | 359.5 | 26.1 |
| **41-60** | 209.7 | 15.2 |
| **60+** | 293.4 | 21.3 |
| | **1376.4** | 100 |

Table 3.3 Age diversity, Strathlachlan, 2017

Table 3.3 gives figures for age class distribution for the woodland area. There is currently a gap in the 41 – 60 class, perhaps a reflection of historic and more recent windblow clearance. Of the 60+ class, 246ha (about 80%) were planted in the ten year period between 1946 and 1955. The remainder are mainly broadleaved trees in the remnant ancient woodland.

Yield class, (productivity) is measured as maximum mean annual volume increment ($m^3yr^{-1}ha^{-1}$) and is generally moderate in Strathlachlan. For Sitka spruce yield classes of 16 – 20, even higher in places, can be achieved on better sites, but growth at higher elevations is much reduced. At all elevations there are frequent areas of very slow growing trees due to waterlogging. Other conifers grow well at lower elevations on better sites. Performance of both Scots and lodgepole pine is variable dependent on site conditions. There is limited data for existing broadleaved species.

### 3.3.2 Access

There is road access into all the forest blocks from public roads. The Leanach block is accessed from the A886 and the internal forest roads allow access to all coupes. A forest road runs through the main block and this too can be accessed from the A886. The first 500m of this is through private forestry ground and the main exit in the south is at Barnacarry on to the B8000. The B8000 is a severely restricted route and the preference is to haul all timber from the main block north to the A886. There are additional access points at Garbhallt, which is used only for light vehicles, and into the isolated section at Feorline. The Lephinmore block also has access off the B8000 and timber from here has to be carried a short distance along the B8000 before being taken along the haul road through the main block. New forest roads will be required to access several coupes in the main block.

ATV tracks have been constructed in several coupes to aid management operations, however these are not regarded as permanent features.

### 3.3.3 Potential for continuous cover forestry

Continuous cover forestry (CCF) systems work best where there are deep, well drained soils in relatively sheltered situations. Due to the climatic conditions, particularly exposure, in Strathlachlan the best potential for CCF will generally be found where there are brown earth soils below about 150m elevation. Access due to topography further limits potential. In addition, timely and consistent thinning is a key success factor and on some, otherwise suitable sites, application of CCF techniques will be best delayed until the next rotation. There is scope for establishing permanent native woodland for landscape, environment and amenity.

### 3.3.4 Current and potential markets

Although timber prices fluctuate, there is continued demand for softwood timber of all dimensions and it is expected that there will continue to be a ready market for spruce. Future markets for hardwood and other conifer species are uncertain but expectations are that these will develop over time; in particular the demand for biomass for the woodfuel market is expected to grow.

## 3.4 Landscape and landuse

### 3.4.1 Visibility, landscape character and value

Strathlachlan lies just to the southwest of Loch Lomond and The Trossachs National Park and, though it is outside any designated areas, the landscape has much of value. In particular the wooded slopes, with tongues of broadleaved trees snaking up the incised burns, provide a fine backdrop to the east shore of Loch Fyne. The woodlands are visible from several viewpoints along the west shore of the loch and more detail becomes apparent from the adjacent public roads.

### 3.4.2 Neighbouring land use

The surrounding area is dominated by commercial forestry and rough grazing on low quality hill ground. There is some better grazing at lower elevations. Loch Fyne is a popular tourist destination and there is a caravan park and self-catering accommodation on Castle Lachlan Estate.

In 2016 a hydropower scheme was constructed, by the owners of Castle Lachlan, with an abstraction point on the Strathlachlan River between the main forest block and Leanachan. The water pipe follows the Strathlachlan River to the generating house which is located inside the LMP area at Feorline (grid reference NS042970).

## 3.5 Social factors

### 3.5.1 Recreation

There are no formal recreation facilities in the plan area. The forest provides a local resource for wider access opportunities particularly from the forest road networks, Castle Lachlan caravan park and access points on the shore of Loch Fyne. The woodland is part of an important tourism landscape backdrop viewed from the A886 and B8000 and from the villages and roads on the west shore of Loch Fyne. West coast tourism and associated wildlife

viewing continue to be a valuable part of the visitor offer within this area. Maintenance of the largescale landscape value of the plan area is important.

### 3.5.2 Community

The local community at Strachur use and value the woodland for local access, rural employment and a landscape character within which they live, travel and work. The community has a strong sense of place and history associated with the wider area. Road haulage on the single track public road along Loch Fyne is constrained being locally important for tourism and private dwelling access.

### 3.5.3 Heritage

Known heritage features are shown on the conservation map. These include a well close to Lachlan Bay; several platforms cut into a hillside at Barnacarry and a field system with associated features at Feorline, which may extend south west towards Garbhallt. There are the remains of a small township at Eas Sarachan in the Leanach block. In addition there is a record of a standing stone at the summit of Cnoc Mor but this has not been substantiated. There are also several designated sites in the immediate neighbourhood of the LMP area and other undesignated sites. The latter include a cup and ring marked stone near the public road at Lephinmore.

## 3.6 Statutory requirements and key external policies

The key policy documents influencing the LMP are the UK Woodland Assurance Standard, the UK Forestry Standard (3rd Edition) and the Scottish Forestry Strategy.

# 4.0 Analysis and Concept

The analysis and concept map summarises the main issues and aspirations for the LMP area.

## 4.1 Analysis

- Relatively even aged commercial conifers are dominated by Sitka spruce, increasingly at risk of wind damage and with limited ecological and visual diversity.
- Climate and soil conditions deteriorate quickly above about 175m.
- Extensive areas of open ground provide valuable range for birds of prey, breeding habitat for red grouse and potential black grouse habitat on woodland margins.
- Some poor quality stands of Sitka spruce, on wet and very wet ground at higher elevations, of limited commercial value. Occasional Sitka spruce natural regeneration.
- Woodlands are visually prominent from west shore of Loch Fyne.
- Extensive areas of semi natural ancient woodland of variable quality, some of which has been converted to conifer plantation.
- Red squirrels are prevalent throughout the woodlands.
- Presence of bird species attracting high levels of protection.
- Colonies of protected wood ants in several areas.
- Steep ground, deeply incised burns and complex topography create difficult harvesting conditions on lower slopes.
- Invasive non-native species, particularly rhododendron and western hemlock, are problematic throughout the plan area.
- Several non-designated heritage features.
- Several burns are used for private water supplies.

## 4.2 Concepts of the plan

The main objectives of the plan will be to maintain timber production whilst diversifying species and age structure and improving ecological and visual diversity. In addition protection of important mammal, bird and insect species and their habitats will be a priority.

- Establish a coupe structure that will progressively increase the age and species diversity whilst minimising the risk of future wind damage.
- Investigate options for species diversification for commercial, conservation and landscape objectives.
- Retain open ground habitat and manage existing spruce stands and woodland margins to benefit wildlife and visual amenity. Restrict spread of Sitka spruce within acceptable tolerances.
- Establish a long-term plan to restore or enhance ancient semi-natural woodlands.
- Establish management regimes to protect important mammal, bird and insect species.
- Assess site conditions prior to harvesting, taking into account topography.
- Monitor and assess spread of invasive species and establish a management programme.
- Follow guidelines on heritage features and protect known features through appropriate management.
- Protect private water supplies and follow Forest and Water Guidelines during all operations.

# 5.0 Land Management Plan Proposals

## 5.1 Management

Management will be guided by the key objectives of the plan. Broad objectives are illustrated in the management zones map though it should be stressed that there will be overlap between zones. The main management technique will be clearfelling and re-planting.

Coupes for which approval to fell is being sought are shown in the management map. All harvesting operations will be carried out in accordance with the UK Forestry Standard Guidelines, Forests and Water Guidelines (5th edition).

The coupes have been planned in such a way as to remove the most extensive windblown areas as early as possible. Although account has been taken of landscape, size and shape have been largely dictated by existing crop boundaries and topography. Most of the block can be worked by harvester/forwarder, however, topography, in particular the alignment of deeply incised burns, restricts machine access and operation in places. This has resulted in some relatively large and intricately shaped coupes at lower elevations. Landscape impact is offset by the screening effect of broadleaved trees at close distances and the overall landscape scale and distance when viewed from the west shore of Loch Fyne. Timing of felling has been set to avoid adjacency issues, where possible, and create a diverse age structure in the future. Some coupes, particularly late phase coupes, may have to be revised in future plans if conditions dictate. Final choice of harvesting method will be determined at work planning stage and take into account both cost of felling and landscape considerations.

Most of the Lephinmore block has been designated as long term retention for conservation reasons. The presence of priority bird species and rare ant species require a careful approach to felling and restocking in the short to medium term. Coupe shapes have been delineated, however, and the status of priority species will be monitored and management options reviewed over the lifetime of the plan. If advised that some felling can go ahead approval will be sought through plan amendment.

Where stands have been very slow growing, or failed, because of site conditions they may be retained in the short to medium term. Alternatively where there is a possibility of restoring the ground to valuable open habitat trees may be felled to re-cycle.

### 5.1.1 Thinning

Some stands have been thinned in the past but there have been no recent thinning operations. Where site conditions and exposure appear favourable younger stands that are approaching 10m -15m in height will be considered for first thinning. We intend to thin a mature oak stand at Garbhallt during the period of the plan. The objective of this operation is to benefit both the ecological status of the woodland and improve timber quality in the remaining trees. Thinning will be relatively light and only equipment appropriate to the site will be used. A more detailed prescription will be developed before the operation commences and the Environment team will be closely involved in this.

### 5.1.2 Potential for Continuous Cover Forestry

The climatic and site conditions, in particular a combination of exposure and poorly drained soils, restricts the potential for continuous cover forestry (CCF). Where broadleaved stands, in particular, have been designated as long term retentions they may be managed using CCF principles in the future. Suitability of younger conifer stands to be managed under CCF principles will be assessed as they develop.

## 5.2 Future habitats and species

The future habitats map shows the restocking proposals of the plan. Timber objectives will be met by continuing to use Sitka spruce but opportunities will also be taken to increase the percentage of other productive conifers and broadleaved species. These opportunities are largely limited to the area below the main forest road and even here, soil conditions and resource limitations mean that Sitka spruce will remain the main species of choice.

Productive broadleaves will be concentrated where access allows the more intense management required for these species. Ancient semi-natural woodland may be managed productively but only native species will be used. On the very best sites, broadleaved species will be established by planting and appropriate protection put in place. Elsewhere establishment will be by natural regeneration.

At higher elevations the species of choice will remain Sitka spruce. Species such as Norway spruce will also be planted where conditions allow and adequate protection can be given from browsing animals. On poorer sites the use of Lodgepole pine as a nurse species will be considered. More detailed proposals will be developed following clearfelling and at workplan stage when site conditions can be better assessed. Where there is extensive deep peat the latest guidance on restocking such sites will be followed.

Buffers along larger burns and between individual restock coupes will provide an opportunity for the extension of open space and/or native woodland. The preferred method of tree establishment in these areas will be natural regeneration but small scale planting will be considered as an option in certain areas. Work will, in part, be determined by available resources and more detailed assessment of options will take place following clearfelling. It is expected that there will be Sitka spruce natural regeneration in some of the buffers between restock coupes. An adaptive approach to management will be taken in these circumstances and the amount of Sitka, or other species, that is accepted will be determined on a site by site basis (see section 5.7). This approach will also be adopted in managing open hill ground.

## 5.3 Restructuring

The felling programme continues the process of restructuring the forest, which has been developed in previous plans. This process has partially been disrupted by the extent of recent wind damage. Coupe size is relatively large for the size of the woodland but as discussed above this is largely dictated by ground conditions and location of remaining wind damaged trees. Adjacency issues have been avoided as far as possible and future stability will be achieved by replanting Sitka spruce and other species in discrete stands with wide buffers between them. The tree line will also be lowered in places and further diversity achieved by using a limited number of alternative species to Sitka spruce.

## 5.4 Future management

Table 5.1 indicates net felling area and volume figures for the plan area. These values are approximate and coupes will be surveyed to provide more precise figures prior to felling.

| Phase | Area (ha) | Volume ($m^3$) |
|---|---|---|
| **1** | 138.9 | 53550 |
| **2** | 66.2 | 28200 |
| | 205.1 | 81750 |

Table 5.1 Proposed felling

Table 5.2 summarises the establishment proposals for the plan area. The figures include approximately 66.5ha of previously felled ground that has not yet been restocked, accounting for the difference between area felled and restocked.

| | Mixed broadleaves | Mixed conifer | Open | Totals |
|---|---|---|---|---|
| Phase 1 | 53.1 | 97.0 | 10.5 | 160.6 |
| Phase 2 | 55.2 | 52.2 | 30.9 | 138.3 |
| Totals | 108.3 | 149.2 | 41.4 | 298.9 |

Table 5.2 Proposed establishment

Where production is the key objective conifers will be planted at densities of about 2700 stems per hectare and broadleaves in the region of 3500. Target densities for native woodland regeneration will vary depending on site objectives.

Regeneration will be monitored at mid-term review and at re-submission of the plan and future management requirements evaluated based on the results of this. Open areas will be allowed up to 20% tree cover. Sitka spruce regeneration will be kept within acceptable tolerance limits on both open ground and in areas designated for broadleaved woodland.

## 5.5 Species tables

Table 5.3 and Figure 5.1 indicate the change in relative species composition between 2017 and 2047. This shows a significant reduction in the amount of Sitka spruce relative to other species over the 30 year period. The amount of larch reduces (a response to the threat from Phytophthora ramorum), but there is a small increase in lodgepole pine. The latter species will be used as a nurse for Sitka on some restock sites. There is also an increase in other conifers the most frequently used of which will be Norway spruce. The amount of native broadleaves is expected to increase significantly and there is a modest increase in non-native species.

| Species | 2017 | 2027 | 2037 | 2047 |
|---|---|---|---|---|
| **Sitka spruce** | 71.9 | 61.5 | 54.5 | 49.7 |
| **Larch** | 6.8 | 4.9 | 4.5 | 3.3 |
| **Scots pine** | 2.6 | 1.8 | 1.9 | 1.9 |
| **Lodgepole pine** | 3.1 | 3.0 | 3.1 | 4.8 |
| **Other conifer** | 5.6 | 7.9 | 10.4 | 10.5 |
| **Native broadleaf** | 8.8 | 18.2 | 22.5 | 26.3 |
| **Other broadleaf** | 1.2 | 2.7 | 3.1 | 3.5 |
| | 100.0 | 100.0 | 100.0 | 100.0 |

Table 5.3 Change in species diversity over time in Strathlachlan (percent planted area)

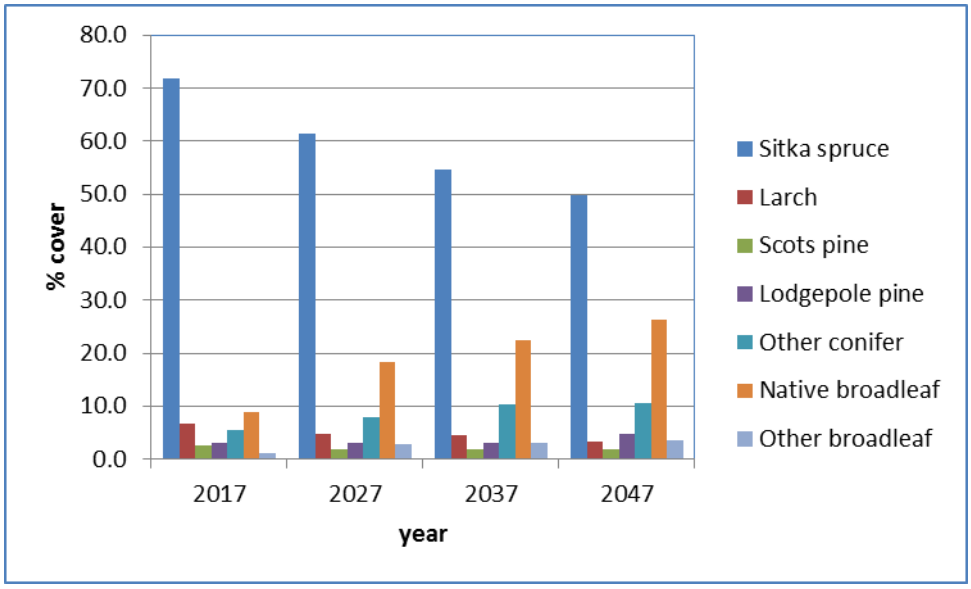


Figure 5.1 Change in species diversity over time in Strathlachlan (percent planted area)

## 5.6 Age structure

Table 5.4 and Figure 5.2 show the change in relative age structure between 2017 and 2047. These figures indicate that it will take some time to achieve a balanced age structure. There is an early fall in older age classes which will not be fully compensated for till after 2047.

| Age Class | 2017 | 2027 | 2037 | 2047 |
|---|---|---|---|---|
| **0-10** | 17.9 | 18.4 | 14.5 | 20.0 |
| **11-20** | 19.5 | 18.2 | 16.2 | 10.6 |
| **21-40** | 26.1 | 27.2 | 36.4 | 36.2 |
| **41-60** | 15.2 | 22.1 | 14.3 | 16.1 |
| **60+** | 21.3 | 14.1 | 18.6 | 17.1 |
| | 100.0 | 100.0 | 100.0 | 100.0 |

Table 5.4 Age structure in Strathlachlan (percent of forested area)

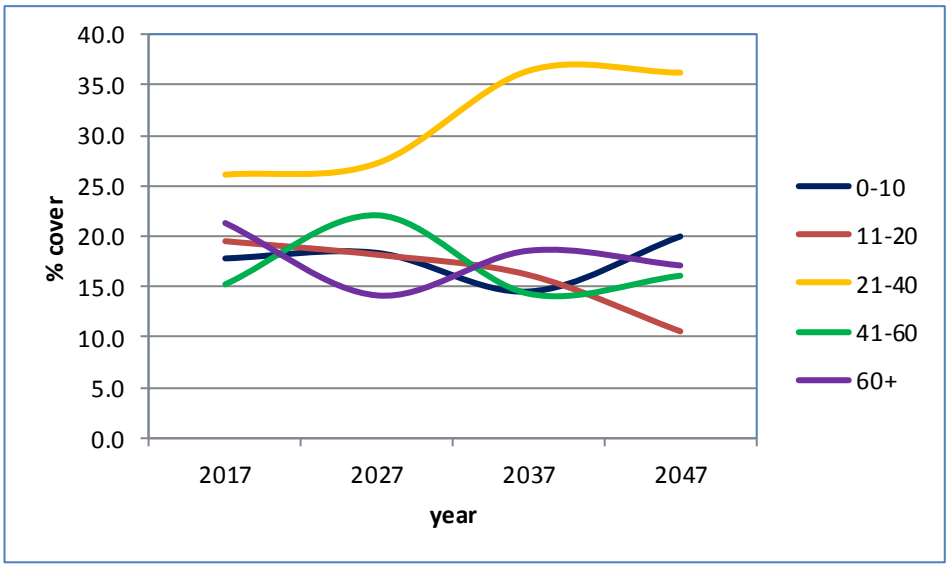


Figure 5.2 Age structure in Strathlachlan (percent forested area)

## 5.7 Management of open land

| | 2017 | 2027 | 2037 | 2047 |
|---|---|---|---|---|
| **Forest** | 73.6 | 73.9 | 72.2 | 70.4 |
| **Open** | 26.4 | 26.1 | 27.8 | 29.6 |

Table 5.5 Relative area of open ground and forest (%).

Table 5.5 summarises the relative distribution of open ground to forest in 10 year intervals between 2017 and 2047. The figures include transient open space, where felled coupes have not yet been restocked; areas designated “successional” have been divided between open space and native natural regeneration. In addition natural regeneration will be accepted in designated open areas, as long as canopy cover does not exceed 20%. Some of the open space is taken up by the roadline and a buffer zone around this will be kept clear of dense tree growth. Permanent wayleaves make up a moderate percentage of the area and these will be managed in association with the relevant utility company. Open land is also incorporated into most of the restocking coupes though this is not identified specifically in the plan.

## 5.8 Deer management

Successful establishment of broadleaves and softer conifers will require deer control in order to keep browsing to a minimum. The preferred approach is to manage background deer numbers through culling, bringing numbers down to a sustainable population where browsing damage is at an acceptable level. Fencing may be considered as an option on some sites, for example where shooting is precluded on health and safety grounds. An added benefit of reducing deer numbers will be the improvement of open ground habitats.

## 5.9 Access

Three new roads will be required to access first and second phase coupes; these are shown on the roads map. A number of ramps will also be required to enable harvesting machinery to access felling coupes. The precise location of these will be determined during operational planning but the expectation is that there will be one ramp for approximately 100m of coupe/road interface. Ramps will be approximately 3m wide and generally up to about 15m long; they will not be treated as permanent features. In

addition almost 15km of ATV tracks will be required to facilitate silvicultural operations and deer management on coupes to be restocked. These tracks will be approximately 2m wide and there will be a minimum amount of disturbance when they are being constructed. They will not be treated as permanent features and will be allowed to grass over once restocking is complete. Indicative positions of the tracks are shown in the roads and tracks map. Final position will be within ± 100m of the indicated positions and the nominal area amounts to just less than 3.0ha. An EIA determination form for roads and tracks is to be found at the front of this document. A written request can be found in appendix V and a summary in Appendix VI.

Base material for road maintenance and construction will be obtained from quarries within the plan area and these are indicated on the roads and tracks map. Additional surfacing material will be brought from the nearby Glendaruel quarry.

The roads and tracks map also indicates access points and haulage routes in and out of the woodlands, with approximate volumes. All timber from the main block will be carried north through the forest to exit on the A866. Leanach has a separate access and there are no plans to fell or thin in the Lephinmore section. A new bellmouth will be constructed at Garbhallt and the small amount of timber from thinning referred to in section 5.1.1 taken about 250m south along the B8000 to the existing entrance. From there it will be taken though the forest to the A866.

# Appendix I: Land Management Plan Consultation Record

| Consultee | Date contacted | Date response received | Issue raised | Forest District Response |
|---|---|---|---|---|
| Forestry Commission Scotland | 09/10/15 | No response received | | |
| Loch Lomond and The Trossachs National Park | 09/10/15 | No response received | | |
| SEPA | 09/10/15 | 14/10/15 | No specific comment – refer to online guidance. | Forest and Water Guidelines will be followed. |
| SSE | 09/10/15 | no response | | |
| RSPB | 09/10/15 | 23/10/15 | Recommend development of specific management plan for nesting raptors. Recommend consultation with RSPB, Argyll Raptor Study Group and local FCS staff regarding design. Encourage appropriate management and expansion of ancient woodland and recommend FES seek guidance on this. Request that management is sympathetic to improving habitat for black grouse and that neighbouring land owners are consulted. | FES work closely with various outside groups and will plan and manage sensitive sites in accordance with general and specific recommendations. Opportunities will be sought to enhance and expand native woodland. |

| | | | | |
|---|---|---|---|---|
| Strachur District Community Council | 09/10/15 | 28/10/15 | Consider B8000 unsuitable for timber traffic and use should be minimised.<br>Co-ordinate with neighbouring landowners with respect to timber transport.<br>Consider impact of operations on water run-off.<br>Request for consultation on development of forest trails. | Where possible timber traffic will avoid using minor roads and take into account local traffic management plans.<br><br>Latest guidelines will be followed during forest operations.<br>FES has no formal plans to develop forest trails but are prepared to discuss with local communities any aspirations they might have. |
| Mountaineering Council of Scotland | 09/10/15 | 23/10/15 | No issues raised | |
| Scottish Water | 09/10/15 | 02/11/15 | No water abstraction sources in plan area.<br>Consult with Scottish Water if working close to known assets. | Will follow Forest and Water guidelines, protect public water supply and consult if working near known assets. |
| Argyll Fisheries Trust | 29/10/15 | No direct response to consultation received | | FES staff held discussions with AFG in October 2015 regarding management in and around Strathlachlan. |
| Lephinmore West Estate | 09/10/15 | No Response received | | |
| Lephinmore East Estate | 09/10/15 | No response received | | |
| Dunans Estate | 09/10/15 | No response received | | |

| | | | | |
|---|---|---|---|---|
| Castle Lachlan | 09/10/15 | No response received | | |
| West of Scotland Archaeological Service | 09/10/15 | No response received | | |
| Argyll and Bute Council | 09/10/15 | 13-10-15 | Acknowledged invitation to comment but no issues raised. | |
| Scottish Wildland Group | 09/10/15 | No response received | | |
| SNH | 09/10/15 | 20/10/15 | Management should provide measures to enhance habitat for raptors, black grouse and protected mammal species.<br>Disturbance to these species should be minimised.<br>Protect and expand native woodland and aim to eradicate non-native invasive species.<br>Establish appropriate deer management. | See response to RSPB<br><br>A deer management plan will be in place during the lifetime of the LMP. |
| CONFOR | 09/10/15 | No response received | | |

# Appendix II. Scoping Record

**Strathlachlan Land Management Plan**

**Record of scoping exercise carried out by email in February 2015**

A number of stakeholders were contacted by email in March 2015 and the responses received are summarised in Appendix I.

**NB: All forests managed by FCS 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. Callander FDP will incorporate the various requirements of UKWAS within its proposals.**

# Appendix III. Land Management Plan Brief

**This forest plan will follow the general approach of the previous plan. Reference will be made to the District strategy and other documents such as the A&B LBAP**

**The key principal is to establish and maintain a diverse, resilient forest capable of delivering a wide range of ecosystem services into the future.**

**Objectives:**

Continue to manage the forest for timber production. Clearfelling, before onset of windblow, and replanting will be the predominant management technique.

Opportunities will be sought to thin stands and also establish continuous cover systems, where appropriate.

At restocking ESC principles, will be used to guide choice and diversify species structure. Up to date guidance on the effects of climate change will be taken into account. Sitka spruce will remain the dominant species at higher elevations and will only be preferred at lower elevations, where site conditions are less than favourable to allow alternative species.

A diverse age structure will be maintained in order to provide visual diversity and help maintain resilience.

Priority ancient woodland sites will be restored, enhanced and maintained.

A forest habitat network (FHN) will be established and managed for conservation and landscape interest.

The area of productive broadleaves will be increased, in line with Scottish Government policy. Ancient woodland and parts of the FHN will be managed productively if appropriate.

Seek to maintain visual diversity in the forest landscape using judicious species choice, especially at lower elevations, and open space. Coupe shapes will be planned to soften their visual impact, especially in landscape sensitive zones.

There are several known features of archaeological interest which will be given appropriate protection. We will record and protect any new discoveries made during operations.

Continue the programme of control of non-native invasive species initially targeted to areas of ancient woodland.

Enhance and protect habitats, including open ground, for priority species of conservation interest.

Establish appropriate deer management infrastructure to allow early natural regeneration and protect planted stock.

Protect water supplies, water courses and manage riparian zones, to maintain and improve water quality, increase biodiversity and mitigate against erosion and flooding. Follow all forest and water guidelines during forest operations.

Continue to maintain and manage the short loop track accessing the area of ancient woodland.

# Appendix IV: Tolerance Table.

| | Adjustment to felling coupe boundaries | Timing of restocking | Change to species (including boundaries) | Windthrow response | Changes to road lines |
|---|---|---|---|---|---|
| FC Approval not normally required | Up to 1ha or 10% of coupe - whichever is less | For productive species, up to 3 planting seasons after felling<br>Up to 10 planting seasons for natural regeneration | Change within species group i.e. diverse conifers; broadleaves; Sitka spruce.<br>Non native conifers in native woodland areas and designated open space up to 400 stems/ha.<br><20% increase in area of Sitka spruce | Up to 2ha as a single unit with >50%windblow | |
| Approval by exchange of letters and map | 1ha to 5ha or 20% of coupe - whichever is less | For productive species, 3 – 5 years after felling | >20% increase in area of Sitka spruce | 2ha to 20ha as a single unit with >50% windblow | Additional felling of trees not agreed in plan<br>Departures of >60m in either direction from centre line of road |
| Approval by formal plan amendment | > 5ha or 10% of coupe | For productive species, over 5 planting seasons after felling | Change from specified native species<br>Change between species groups | >20ha as a single unit | As above, depending on sensitivity |

# Appendix V. EIA Determination request

**Strathlachlan LMP –roads, tracks and ramps**

This is a request for an EIA determination for works covering construction of roads, tracks and ramps in Strathlachlan LMP area. The request covers proposals for the full ten year period of the plan which will offer some flexibility with the work programme without the necessity of having to re-submit a determination. Any work to be carried out in the second half of the plan period will be preceded by a new EIA determination request.

Approximately 3100m of new roads and 14.9km of tracks will be required to access harvesting sites and to facilitate harvesting, silvicultural and deer management operations. In addition up to 30 ramps will be required to allow harvester/forwarder access into coupes that are to be felled during the design plan period.

An initial survey of proposed roadlines has been carried out and their positions are shown on the roads and tracks map. A more detailed assessment of the route will be made prior to construction and a tolerance of ± 60m adhered to. The footprint of roads will be approximately 7m and the nominal area amounts to 2.17ha. Several roads will require to be upgraded prior to operations, however the nominal footprint of the road will not be increased. All work will be carried out in accordance with standards set out in the most up to date guidelines.

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

Indicative positions of the tracks are shown on the roads and tracks map and final positions will be within ± 100m of these. The actual line will be planned to minimise landscape impact and ground disturbance, reflecting existing topography, avoiding steep gradients where possible and avoiding sensitive habitats. ATV tracks will be approximately 2m wide and the nominal area amounts to 2.98ha.

Ramps will be approximately 3m wide and up to about 15m long. The nominal area is approximately 0.15ha. They will not be treated as permanent features and will be removed following operations. The final number and location of the ramps will be

determined at the time of operations but we believe one ramp per 100m of road/coupe interface will be sufficient.

An EIA determination request form is to be found at the front of this document and a summary of proposed works in Appendix VI. A revised EIA determination will be sought if any specific sensitive issues are encountered before construction.

| | | |
|---|---|---|
| 1 | Landscape | There are no major landscape issues with either tracks or ramps. Several coupes are visible from the west shore of Loch Fyne but views are distant and tracks are unlikely to feature significantly. |
| 2 | Watercourses | All work will conform to the 5th edition of the UK Forestry Standard Guidelines “Forests and Water”. |
| 3 | Archaeology | There are no known archaeological features in any of the coupes. Care will be taken to avoid damage to any new features discovered during operations. |
| 4 | Biodiversity | Work carried out will be sensitive to permanent and temporary features of conservation value (e.g. spawning frogs and toads in roadside drains). |
| 5 | Access | There are no major access issues. |
| 6 | Recreation | Construction will not impact on the informal use of existing roads and tracks. |
| 7 | Material | ATV tracks will use material from on site. Material suitable for roads ramps will be sourced from local FES quarries. |

# Appendix VI. EIA Determination summary - forest roads and tracks

| Coupe | Length (m) | Area (ha.) | Purpose | Landscape | Water quality | Archaeology | Biodiversity | Access | Recreation | Material |
|---|---|---|---|---|---|---|---|---|---|---|
| 05039 | 1375 | 0.96 | access for harvesting | no issues | standard protection measures | no known issues | no significant issues | from forest road | n/a | nearest FES quarry |
| 05044 | 768 | 0.54 | access for harvesting | no issues | standard protection measures | no known issues | no significant issues | from forest road | n/a | nearest FES quarry |
| 05059 | 930 | 0.65 | access for harvesting | visible from A866 | standard protection measures | no known issues | no significant issues | from forest road | n/a | nearest FES quarry |
| 05019 | 718 | 0.14 | crop establishment and deer management | no issues | standard protection measures | close to known site of settlement | no significant issues | from forest road | will not impact on informal use | to be found on site |
| 05021 | 1155 | 0.23 | crop establishment and deer management | no issues | standard protection measures | no known issues | no significant issues | from forest road | n/a | to be found on site |
| 05036 | 2181 | 0.44 | crop establishment and deer management | visible from Feorline | standard protection measures | no known issues | no significant issues | from forest road | n/a | to be found on site |
| 05039 | 1586 | 0.32 | crop establishment and deer management | no issues | standard protection measures | no known issues | no significant issues | from forest road | n/a | to be found on site |
| 05040 | 1370 | 0.27 | crop establishment and deer management | no issues | standard protection measures | no known issues | no significant issues | from forest road | n/a | to be found on site |
| 05044 | 1280 | 0.26 | crop establishment and deer management | no issues | standard protection measures | no known issues | no significant issues | from forest road | n/a | to be found on site |
| 05046 | 1758 | 0.35 | crop establishment and deer management | no issues | standard protection measures | no known issues | no significant issues | from forest road | n/a | to be found on site |
| 05052 | 1991 | 0.40 | crop establishment and deer management | not visible from Furnace | standard protection measures | no known issues | no significant issues | from forest road | n/a | to be found on site |
| 05059 | 1190 | 0.24 | crop establishment and deer management | visible from A866 | standard protection measures | no known issues | no significant issues | from forest road | n/a | to be found on site |
| 05073 | 1663 | 0.33 | crop establishment and deer management | visible from Furnace | standard protection measures | no known issues | no significant issues | from forest road | n/a | to be found on site |