West Region

BEALACH

Land Management Plan

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

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

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Contents

Summary of Proposals

1.0 Legal and regulatory requirements
- 1.1 Summary of planned operations
- 1.2 Proposed felling operations 2019-28
- 1.3 Proposed thinning
- 1.4 Proposed restocking in 2019-28
- 1.5 Woodland creation
- 1.6 Access and roads 2019 – 28
- 1.7 Tolerance table

2.0 EIA screening options
- 2.1 Quarries
- 2.2 Proposed roads
- 2.3 Proposed woodland creation

3.0 Critical success factors

4.0 Introduction
- 4.1 Setting and context
- 4.2 History of the forest

5.0 Analysis of the previous plan

6.0 Background information
- 6.1 Physical site factors
  - 6.1.1 Geology Soils and landform
  - 6.1.2 Water
  - 6.1.3 Climate
- 6.2 Biodiversity and environmental designations
- 6.3 The existing forest:
  - 6.3.1 Age structure, species and yield class
  - 6.3.2 Access
  - 6.3.3 LISS potential
  - 6.3.4 Current and potential markets
- 6.4 Landscape and landuse
  - 6.4.1 Landscape character and value
  - 6.4.2 Visibility
  - 6.4.3 Neighbouring land use
- 6.5 Social factors
  - 6.5.1 Recreation
  - 6.5.2 Community
  - 6.5.3 Heritage
- 6.6 Statutory requirements and key external policies

7.0 Management objectives

8.0 Analysis and concept
- 8.1 Analysis
- 8.2 Concept of the plan

9.0 Land Management Plan Proposals
- 9.1 Management vision
- 9.2 Future habitats and species
- 9.3 Restructuring
  - 9.3.1 Larch
  - 9.3.2 Management of vulnerable catchment
- 9.4 Future management
- 9.5 Felling of trees in exceptional circumstances
- 9.6 Species tables
- 9.7 Age structure
- 9.8 PAWS restoration
- 9.9 Woodland expansion
- 9.10 Management of open land within the forest
- 9.11 Management of hill ground
- 9.12 Deer management
- 9.13 Access

Support documents: Maps
- Map 1 Bealach location map
- Map 2a Analysis map
- Map 2b Concept map
- Map 3 Current species
- Map 4a Bealach felling programme
- Map 4b Bealach felling first 10 years
- Map 5 Bealach thinning map
- Map 6 Bealach haulage routes
- Map 7a Bealach Restock - main species
- Map 7b Bealach Restock - pure and mixed stands
- Map 7c Bealach Restock – 1st 10 years
- Map 8 Bealach location & sites – EIA screening
- Map 9a Woodland expansion – showing existing species
- Map 9b Woodland expansion – showing future restock
- Map 10 New planting proposal
- Map 11a Bealach road construction programme
- Map 11b Bealach roads – 1st 10 years
- Map 12 Bealach access routes
- Map 13 Climate model
- Map 14 Conservation features and habitats
- Map 15 Current Yield Class distribution
- Map 16 Land capability for forestry
- Map 17 Catchment at risk of acidification
- Map 18 Bealach – larch in the felling programme
- Map 19 Minimum intervention, ASNW & riparian
- Map 20 Strategic deer fence

Appendices:

I) Woodland types
II) Coupe details for clear fell and establishment – first 10 years
III) Programme of work 2019-28
IV) Species suitability
V) Consultation record
VI) Abbreviations used in the plan
VII) Deer Management Plan

Summary of Proposals

Bealach Forest is part of the Scottish Forest Estate, managed by Forestry and Land Scotland.

The Bealach Land Management Plan (LMP) area covers 1874 ha of primarily conifer forest and open hill, located between Duror and Appin and stretching from the coastal margin of Loch Linnhe at the A828, to an elevation of 640 metres on the slopes of Fraochaidh.

The forest is accessed from the A828, via a route shared with Bealach House, as well as the access and wayleaves for a hydro-electric scheme at Lochan Blar Nan Lochan. Much of the forest lies within the secluded Salachan Glen, which is visible only from the hilltops and in a limited way from Cuil Bay. Visibility from the A828 is limited and non-existent from the nearest settlement in Duror.

Sitka spruce is the predominant species, with oak/hazel/birch woodland along the riparian areas and birch on upper slopes and extending beyond the forest boundary on higher ground. The forested area was mainly planted in the 1970s, with smaller areas of 1980s, 90's and more recent planting, and modest areas of native broadleaved woodland, primarily located along the Salachan burn, in gullies and on hill sides. Limited harvesting has been undertaken to date but new forest roads have been constructed to facilitate felling and restocking, with further roads planned to link with the existing road from the southern margin of Duror forest in the north and from the main forest road along the glen floor, to access coupes in the south.

The strategy outlined in the last LMP focused on reducing the proportion of conifers, diversifying conifer species and increasing the proportion of broadleaves and open ground – with a net decrease in ground under forestry. Thinking on this has revised, in part to fulfil changing policies and priorities, although timber production remains the main objective.

The strategy now is to maintain tree cover within the forested area, as well as raising the tree line in places by accepting natural regeneration of native broadleaves further up the hill. Proposed is a modest increase, over time, in the proportion of Sitka spruce and other conifer species but also an increase in broadleaf trees, mainly through natural regeneration in riparian zones, along rides and forest edges. Areas previously identified for Long Term Retention will now be harvested during the felling cycle. Instead, areas of poor growth identified in both northern and southern sections of the forest have been identified for development as mixed successional conifer / broadleaved woodland. These areas will either be left un-felled and any natural regeneration of broadleaves or conifers accepted to supplement existing growth, or they will be felled and successional woodland allowed to develop naturally by accepting natural regeneration and regrowth of broadleaves and conifers.

The plan presents felling and replanting proposals for the first ten years (2019 to 2028) in detail. The first ten years are important because this relates to the parts of the plan that seeks approval for specific forestry operations. These are set out in sections 2 and 10.4. The following ten years (post 2029) and beyond are also considered in the plan to indicate a direction of travel and to provide context.

Objectives

- Maximise returns from conifers and productive broadleaves, where growing conditions support this
- Maintain and expand conifer woodland by restocking felled areas to the timber line where appropriate, focusing to the east and north of the burn and by planting adjacent open ground where feasible, avoiding areas of natural or cultural heritage interest
- Protect the vulnerable catchment area in the eastern section of forest north of the burn by creating buffer zones to keep conifers well back from gullies and burns and managing operations to minimise felling impacts on the riparian zone
- Simplify conifer felling and restocking cycles; optimise road construction cost/benefit and for better fit in landscape
- Conservation management of existing Ancient Semi-Natural Woodland / Plantations on Ancient Woodland Sites (ASNW / PAWS) and expansion of native woodland in riparian zones and across hill, to link existing PAWS/AWS areas
- Strengthen riparian broadleaved woodland by planting and encouraging natural regeneration of native broadleaves; managing for productive broadleaved woodland where possible
- Maintain existing habitat for Chequered skipper butterfly and identified areas of priority open habitat throughout the LMP area - through maintenance of grass sward and open broadleaved canopy
- Maintain access for existing recreational uses

Summary of management proposals

Felling proposals in the first 20 years of the plan are summarised below:

Felling phase	Area (ha)	% forest area (not incl. OL)
Phase 1 2019-23	56.09	4.7
Phase 2 2024 - 28	142.95	11.9
Phase 3 2029 - 33	97	8.1
Phase 4 2033 - 37	83	6.9

Increasing the areas felled and restocked each year will help to achieve restructuring sooner and harvesting closer to the optimum MAI.

Change in species composition:

Species composition will change over time and an increase in the proportion of land under forestry (both conifers and broadleaves) is anticipated. Over the next ten - twenty years, broadleaf cover will increase by about 119 ha. This includes 37.64 ha broadleaves planted in felled areas (including in mixture with conifers) and 4.76 ha of new planted broadleaves on open ground. Natural regeneration of broadleaves includes successional development in riparian areas and on hill slopes. Sitka spruce cover will increase by 42 ha and larch will reduce by 22 ha, while the area of other conifers will increase by 11 ha. These changes are reflected in a 128 ha reduction in open / successional areas within the forest as a reduction in deer pressures allows native broadleaved woodland to develop naturally, as well as some limited planting of broadleaved species in areas that were previously open ground. The total forest extent increases by 23 ha as native broadleaved woodland expands across the hill to the natural tree line.

Two large areas have been identified as successional in the longer term but have been allocated to a felling period. The decision, on whether to fell and leave as successional development or to allow existing poor conifer growth and naturally regenerated broadleaves and conifers to continue to grow and develop, will be made closer to the planned felling date.

Opportunities to plant mixed conifers on the glen floor and the more sheltered lower slopes will be pursued on appropriate soils but open broadleaved woodland habitat will be encouraged in riparian zones throughout the forest, through natural regeneration with supplementary planting where required. ASNW will be expanded and PAWS restored through restocking of native woodland.

New roads will be extended to enable timber extraction; in the northern section of forest, timber will be hauled through Duror. The improved road network will facilitate recreational activity and visitor access from Duror, the nearest settlement.
Increased deer management is proposed in the first 10 years of this LMP, to help protect young naturally regenerated and planted trees and reduce pressure on ground vegetation, improving structural and species diversity. Vegetation diversity on the open hill may also improve following increased deer culling. ATV tracks will be upgraded and maintained and an old track south of the Salachan burn will eventually be reinstated to facilitated deer control through new planting in the riparian zone. The planned extension of the roads network as coupes are harvested will also make deer control easier.

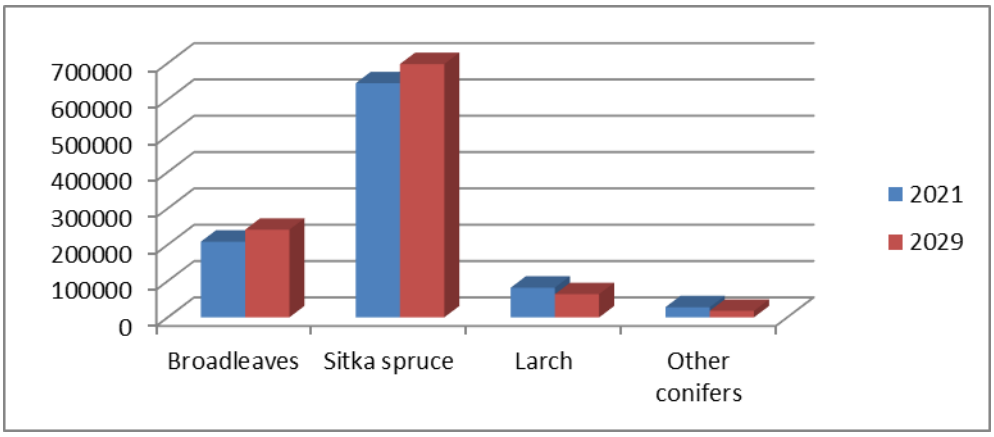
Change in species composition over the next ten years:

Changes in species	**2019 Area (ha)**	**2019 % forest area excl. open hill**	**2029 Area (ha)**	**2029 % forest area excl. open hill**
Broadleaves	124.55	10.4	244	20
Sitka spruce	584.88	48.7	627	51
Larch	86.62	7.2	65	5
Other conifers	27.94	2.3	39	3
Forest open land/ successional	376.01	31.3	248*	20
TOTAL FORESTED	1200		1223	
Open Hill	674		651	
GRAND TOTAL	1874		1874	

*Includes 8.5 ha managed open land within the forest, additional to roads/rides. The remainder of the area is successional, failed, felled and waiting for restock or wind blow.

Sitka spruce remains the most prominent species by a significant degree, although the proportion of broadleaves increases. Larch numbers will decrease as the felling programme progresses and larch is not replaced.

Change in species by number of trees in first 10 years:



Operations planned for the period 2019 – 2028 include the following activities:

Planned Operations	**2019 – 2029 plan period**
Felling	199 ha
Thinning	11.07 ha
Restock – planting*	190.97 ha
Restock – natural regeneration	2.3 ha
New woodland planting	4.76 ha
New woodland – natural regeneration**	28.8 ha
Existing broadleaved natural regeneration strengthened in riparian areas	88.5 ha
Existing broadleaved natural regeneration strengthened on hill slopes	42.7 ha
Road construction	7 km

* *Includes areas felled in previous periods & not yet planted*

** *Includes new woodland on open ground within forest and on hill slopes*

***Restock figures are net of open ground*

During the development of this plan we have consulted with local communities and stakeholders. For further information about the planning process, contact:

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1.0 Legal and regulatory requirements

1.1 Summary of planned operations

Operations planned for the period 2019 – 2029 include:

Planned Operations	**2019 – 2029 plan period**	**% of original forested area**
Felling	199 ha	16.6
Thinning	11.07 ha	0.9
Restock (planting)*	190.97 ha	16
Restock (natural regeneration)	2.3 ha	0.2
New woodland planting	4.76 ha	0.4
New woodland – natural regeneration**	28.8 ha	2.4
Road construction	7 km	

* *Includes areas felled in previous periods & not yet planted*

** *Includes new woodland on open ground within forest and on hill slopes*

*** *Restock figures are net of open ground*

1.2 Proposed felling operations 2019-28

It is proposed that almost 5% of the forested area will be felled between 2019 and 2023, with the area of felling increasing to almost 12% during 2024 – 2029.

The indicative yield is shown below:

Operation	Area	Indicative Yield (Vol m^3)	% Forest Area
Clearfell phase 1 2019-2023	56.09	26186	5
Clearfell phase 2 2024-2029	142.95	72487	12

Change in age structure over the first 10 - 12 years:

Age Class	Area ha @ 2018/19	% of stocked area	Area ha @ 2031	% of stocked area
Open	382	32	244	20
60+ Mature Forest	10	1	73	6
41-60 yrs Mature Forest	655	54	511	42
21-40 yrs Thicket	124	10	39	3
11-20 yrs Scrub/ early thicket	4	<1	37	3
0-10 yrs Establishment	30	2	317	26

NB: Changes in open ground and early establishment includes natural regeneration and successional development of native broadleaves.

1.3 Proposed thinning

Coupe 45705 (11.07 ha) will be thinned during the first 10 years of the plan. This coupe currently contains Sitka spruce (net 3.54 ha), a small amount of larch (net 0.05 ha) and broadleaves – predominantly birch (net 4.59 ha) and the proposal is to remove the spruce/larch and thin the birch to produce productive stands.

Elsewhere, consideration will be given to future respacing and thinning of second rotation planting (and some of the natural regeneration) of conifers and broadleaves in the glen and along more sheltered slopes, where risk of wind blow is lower.

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 MAI, or YC, per year) may be applied where thinning has been delayed, larger tree sizes are being sought or as part of a LISS prescription. In all cases work plans will define the detailed thinning prescription before work is carried out and operations will be monitored by checking pre and post thinning basal areas for the key crop components.

1.4 Proposed restocking in 2019-28

Restock	Area ha Planted	Area ha nat.regen.	Total area restocked	% Total Restocked Area
Mixed conifers	2.45		2.45	1.3
Broadleaves - restock of felled areas	26.79	2.3	29.09	15.05
Sitka Spruce	132.15		132.15	68.38
Mixed conifers/broadleaves	29.57		29.57	15.3
Total	190.96	2.3	193.26	

** Restock figures include areas that were previously felled but not yet restocked*

*** Restock figures are net of open ground*

1.5 Woodland creation

Expansion of tree cover within the woodland and at the forest edge

Stock	Area ha planted	Area ha nat.regen.	Total area stocked	% Total stocked area
Broadleaves - new woodland/ woodland expansion	4.76	28.8	33.56	100

Changes to species composition over the first 10 years (2019-2028) following restocking:

Changes in species	2019 Area (ha)	2019 % forest area excl. open hill	2029 Area (ha)	2029 % forest area excl. open hill
Broadleaves	124.55	10.4	244	20
Sitka spruce	584.88	48.7	627	51
Larch	86.62	7.2	65	5
Other conifers	27.94	2.3	39	3
Forest open land/ successional	376.01	31.3	248	20
TOTAL FORESTED	1200		1223	
Open Hill	674		651	
GRAND TOTAL	1874		1874	

1.6 Access and roads 2019-28

Proposed new roads are presented in Appendix 3 (Programme of Work) and Maps 11a & b.
Road requirements to enable access for harvesting in the forest north of the Salachan Burn have been clearly identified. Routes and road lengths in the southern section of the forest are less clearly defined as this will partly depend on whether the large area identified as successional will be felled or the existing stands left to develop. But road construction requirements here would be post 2029 and a decision will be taken nearer to the proposed (potential) felling period; this will depend on cost – benefit analysis at the time.

All roads will be constructed to the design standards set out in the current version of the Timber Transport Forum Guidelines.

To facilitate the deer management required to ensure establishment of broadleaves and soft conifers and a more diverse vegetation structure in the forest and on the open hill, almost 20km ATV tracks will be maintained or upgraded.

1.7 Tolerance table

	Adjustment to felling coupe boundaries	Timing of restocking	Changes to species	Wind blow clearance	Changes to road lines
Scottish Forestry Approval not normally required (record and notify SF)	10% of coupe size	Up to 5 planting seasons after felling (allowing for fallow periods for Hylobius)	Change within species group E.g. Scots pine to birch, Non-native conifers e.g Sitka spruce to Douglas fir, Non-native to native species (allowing for changes to facilitate Ancient Woodland policy)		Departures of up to 60m from the centre of the roadline
Approval by exchange of emails and maps	10-15% of coupe size	5 years +	Change of coupe objective likely to be consistent with current policy (e.g. from productive to open, open to native species).	Up to 5 ha	Departures of greater than 60m from the centre of the roadline
Approval by formal plan amendment may be required	> 15% of coupe size		Major change of objective likely to be contrary to policy, E.g. native to non-native species, open to non-native	More than 5 ha	As above, depending on sensitivity

2.0 EIA screening options

See Map 8 - EIA determinations.

2.1 Quarries

The existing quarry is no longer suitable for blasting. Instead, material for road construction will be sourced from Glenachulish and/or Barcaldine.

2.2 Proposed roads

Road construction proposed during 2019 – 2028 (see Maps 11 a & b):

Roads linking from Duror Forest

The major section of road linking from Duror forest to the north is already constructed.

A further section (section 3, approximately 1,512m) moving south-east towards the large gulley, is required to access coupes on the lower slopes north of the burn. The road crosses several gullies, including open ground at the top of a broad gulley. It will follow the contours and will form the boundary between felling coupes with widely separated fell years, which will reduce impact. 3D visualisation demonstrates that views of the road within the forest are limited to the upper slopes to the south. The road will not be visible from the public road or nearby settlements.

Section 2 (approximately 1,770m) is required to access coupe 45678 and will facilitate access to various coupes containing larch.

A further 2,100m (section 4) is needed to access coupe 45685 - this will cross a riparian area that extends from/is adjacent to, an ASNW/PAWS and contains oak/birch. The road will enable access to various coupes containing larch.

Extension of road BH12 from north east to north- west, towards the large gulley

A 604m stretch of new road (section 1) will extend the existing road into coupes 45693, 45694 and 45703 in the NE section of forest. Following contours, the road will pass through a vulnerable catchment at risk of acidification and crosses several small gullies. The road line forms a coupe boundary and will not be visible from out-with the forest, apart from on high slopes on nearby hills.

New road in SW part of the forest block, accessing coupes 45713 and 45714

Approximately 620m new road (section 5) is required to access coupes that are not scheduled to be felled until later in the programme but they contain large areas of larch, so access for harvesting needs to be established in case of a SPHN.

There are no site designations.

2.3 Proposed woodland creation

Should Lurignish Farm come back in hand, then proposals for planting new woodland to the West / South-West of the forest will be developed, to include broadleaved woodland that will link with existing PAWS/ASNW at Bealach, as well as conifer planting. Any planting in this area would be part of a much larger project that will cover the whole of the upland area linking with the Appin forest. A separate, but linked, Land Management Plan will be prepared following a survey to determine the current extent of tree cover and the acceptable degree of woodland expansion. Any expansion would be designed to protect open ground habitat for Golden Eagle and other raptors and would require an EIA determination.

Native broadleaved woodland will be extended northwards from the riparian zone in coupe 45719 at Achvlair, through natural regeneration, although some enhancement planting of locally native species will be considered, if necessary. The aim is to strengthen and expand the ASNW and nearby PAWS areas. Key species to be planted, if this is required, include oak, birch, hazel and alder. The area around the ruined buildings and other key archaeological features will be left as open ground, as will the species- rich wet flushes to the east of the coupe and the narrow riparian zone. There is potential to plant productive broadleaves in 4.76 ha of this field north of the ruined buildings but this will require an EIA determination. (See Map 10 – New planting proposal).

Extension of the tree line in coupe 45739 closer to the natural tree line, by allowing and encouraging natural regeneration of native broadleaved species through deer management / control, will expand the cover of open- canopied broadleaved woodland within the SPA. This is likely to lead to an increase in prey populations so should benefit Golden Eagles and other predator species, provided sufficient open ground is retained. This woodland expansion may require an EIA. (See Maps 9a and b – Woodland expansion).

3.0 Critical success factors

The following critical success factors have been identified, as failure to achieve them will make implementation of all other objectives impossible:

3.1 The construction of approximately 9.5 km of forest roads (about 7 km between 2019 and 2028) is essential to implement the planned programme of phased felling of clearfell coupes, selective felling of conifers from PAWS/ASNW and thinning of potentially productive broadleaved stands

3.2 Adequate control of browsing:

3.2.1 Deer control will be essential for the establishment of broadleaved and soft conifer species within the prescribed timescale and to protect key habitats

3.2.2 Careful timing of planting will be required, to minimise risk of Hylobius damage

3.3 The phased felling of commercial conifers in 199.04 ha over the first 10 years is required, to restock commercial conifers; restore native woodland on PAWS sites

and develop open broadleaved habitat in riparian areas, including felling conifers in approximately 14 ha of PAWS

3.4 The establishment of windfirm edges during felling will be key to reducing wind blow risk and damage

4.0 Introduction

This plan is the first revision of the original Bealach Forest Design Plan (FDP). The purpose of this Land Management Plan (LMP) is to describe management objectives and prescriptions for the forest over the period 2019 – 2028 in detail, and in more general terms for the following twenty years, to fulfil the requirements of the UK Woodland Assurance Scheme (UKWAS) and meeting UK Forest Standards (UKFS).

The management of Forestry and Land Scotland's Forest Estate is guided by the Scottish Forestry Strategy (SFS), which sets out six key themes:

- Healthy; achieving good environmental and silvicultural condition in a changing climate
- Productive; providing sustainable economic benefits from the land
- Treasured; as a multi-purpose resource that sustains livelihoods, improves quality of life, and offers involvement and enjoyment
- Accessible; local woodlands and national treasures which are well promoted, welcoming and open for all
- Cared For; working with nature and respecting landscapes, natural and cultural heritage
- Good Value; exemplary, effective and efficient delivery of public benefits.

Forestry and Land Scotland, West Region, will apply an approach based on a strategic assessment of national and regional priorities, ensuring continuity through the planning framework.

Key Directions	**Relevant issues identified for Bealach LMP**
Healthy	• We will consider the potential for thinning 2nd rotation crops and the stands of birch/ mixed broadleaves, for production, with a focus on the glen floor and more sheltered lower slopes • There is no opportunity in the current rotation for conifer LISS/CCF due to windthrow risk, current age structure and difficult terrain • We will maintain tree cover by restocking with optimum / minimum fallow, continuous cover of broadleaves and management of PAWS. We will balance fallow length with the need to control weed growth. Adjacency issues may impact on length of fallow, coupe size and felling schedules • Ground preparation techniques will minimise carbon losses • Soil and attribute surveys have been completed and will inform management decisions • Wherever possible, we will improve wind resistance by encouraging green edges on roads, rides and breaks, reinforcing riparian broadleaves to create natural breaks and environmental benefits. There are no steep / high risk areas • We will continue to monitor for encroachment of Rhododendron ponticum from neighbouring ground and remove this immediately • We will monitor the woodlands for significant tree pathogens such as Phytophthora ramorum, Hylobius spp. and Chalara

	fraxinea • We will strive to manage deer to fulfil our land management aspirations. We will work with Deer Management Groups and adjacent landowners to maintain good relations and ensure that views and objectives are taken into account • The forest management of Bealach will contribute towards achieving the objectives of The Argyll and Lochaber Area Management Plan (the River Basin Management Plan - RBMP) by:- 1. Addressing any local water body deteriorations within the plan area, paying particular attention to the area of catchment at risk from acidification - removing conifers from the riparian zone and expanding native broadleaved riparian woodland 2. Designing new proposals so that they will not result in deterioration of any water body status by creating open broadleaved habitat in riparian zones • By ensuring that forest activities are managed in such a way as to ensure they do not cause pollution
Productive	• Softwood timber production will continue to be a core objective • We will manage broadleaves for woodfuel and small roundwood, focusing on existing birch and mixed broadleaved stands between the road and burn and any areas of new planting, where access permits and where it is compatible with conservation priorities • We will consider the potential to enhance the broadleaved woodland in 45705, with low impact management for productive broadleaves • Broadleaves may offer longer term opportunities to contribute to local economic activity, encouraging value adding and job creation by encouraging small scale local markets such as wood turning and furniture making. Continuing forest management will help to secure / support long term downstream jobs • Local economic diversity will be encouraged by: ○ Considering proposals for any run-of-river hydro-electric developments, which supplement the existing hydro-scheme; ○ Maintaining productive relationships with the existing B&B business; ○ Giving consideration to requests / proposals from the community and local SMEs; ○ Constructing new forest roads where needed; facilitating a separate access route for other users at the forest entrance and by maintaining access to the open hill, which will attract more recreational users • We will support the Scottish Government's woodland expansion policy by encouraging natural regeneration of native woodland in the upper margins and in riparian zones and by planting new conifer and broadleaved woodland in open ground where appropriate, including linking the woodland with the Glen Creran and Appin LMP area.

	Previous plans to pull back the tree line from high ground will be reconsidered.
Treasured	• Links with Duror / Kentallen, and Appin Community Councils will be maintained and any requests to engage local communities in using and managing the woodland will be considered • Any requests from local communities or SMEs will be given serious consideration • Opportunities for volunteering, or for encouraging a more diverse range of people to use the forest, are limited due to the commercial nature of the forest but the oak/hazel wood and riparian and other native woodland areas will be managed for amenity and wildlife • Archaeological remains will be protected • Access to cave networks will be maintained
Accessible	• The forest is open to all, within the framework of the Scottish Outdoor Access Code and we will continue to promote best practice in relation to access • Construction of forest roads will improve access through the forest and linking to Duror
Cared for	• Conifers have been cleared from some PAWS/AWS sites. Any conifer regeneration will be removed and conifers felled in the remaining PAWS sites • Broadleaf habitat will be expanded to link native woodland and integrate with other habitats • Managing the grazing impact of deer will facilitate natural regeneration of broadleaves; protect planted broadleaves and soft conifers; improve biodiversity and promote restoration and maintenance of priority open habitats • Birch and mixed broadleaved stands between the forest road and burn; in riparian zones and coupe margins and on hillsides will be strengthened • Open habitats will be maintained in good ecological condition. Open habitat surveys have been completed and identified priority habitats will be protected from planting. A clear rationale for planting open ground will be agreed • Specific action plans for Chequered Skipper butterfly will be agreed • Road development in the northern section of the forest will be planned and designed to protect vulnerable and priority habitats and to limit damage in riparian zones and when crossing gullies • Archaeological features will be protected, particularly ruined buildings, remnants of dykes and remains of the kiln structure on the open ground / field at Achvlair. Open ground will be maintained around archaeological remains
Good Value	• A sustainable yield of timber will be made available to a range of local and national customers wherever possible • Venison produced from deer management activities is sold to national game dealers for both the domestic and export market

4.1 Setting and context

The Bealach LMP area covers 1874 ha of primarily conifer forest and open hill, located between Duror and Appin. It is part of a much larger contiguous land area under Forestry and Land Scotland management. Bealach is bounded by the Duror Land Management Plan (LMP) area to the North; the Glen Creran/Appin LMP to the East and South West; Glen Stockdale in private ownership to the South and Achara in private ownership to the North West. The forest stretches from the coastal margin at the A828, to an elevation of 640 metres; conditions vary from the sheltered Glen Salachan to the exposed, sub alpine conditions of Fraochaidh. A narrow strip up the side of the Salachan burn to the open ground at Achvlair is also under private ownership. The forest is accessed from the A828, via a route shared with Bealach House. A hydro-electric scheme has been developed at Lochan Blar Nan Lochan and the access track and wayleaves for this are serviced through the forest, from the A828.

The forested area is approximately 1200 ha of 1970s, 1980s and 1990s planting, with approximately 66 ha of PAWS and AWS - primarily oak/hazel/birch woodland located along the Salachan burn, with birch woodland on hill sides and mixed broadleaves in other riparian zones. Some forest roads have been constructed, with more planned in the next few years, which has facilitated the commencement of the felling and restocking programme. But the current even-aged structure presents challenges for restructuring as most of the coupes become ready for felling at the same time.

4.2 History of the forest

Historical maps indicate presence of both woodland and habitation in Salachan Glen over many years; in fact, "Salachan" is derived from the Gaelic term for Willow. The Timothy Pont map of 1583 indicates presence of trees and the Roy Military Survey map 1747 shows trees south of the Salachan Burn. The Timothy Pont map also shows some buildings roughly north of the river, these are not shown on Roy's military map but Bartholomew's maps of 1903 and 1912 again show buildings at Achvlair. Remnants of upland oak and birch woodland in the main riparian zone of Salachan burn and along gullies are an indication the ancient woodland that once covered a more extensive area.

Most of the current forest was planted in the 1970's, with some coupes planted in the 1980's and 90's. Much of the existing semi-natural woodland along riparian zones has been retained, although conifers have been planted close to the burn in some places.

5.0 Analysis of the previous plan

The strategy outlined in the last LMP focused on reducing the proportion of conifers, diversifying conifer species and increasing the proportion of broadleaves and open ground – with a net decrease in ground under forestry.

The objectives outlined in the previous plan were not SMART and lacked detail:

- Managing or Regenerating Forests or Woodland - Multi benefit forestry

  Sustainable, multi-benefit forestry would be achieved by restructuring over a 50 year period, not restocking the less productive and inaccessible areas; diversifying species composition and age structure, resulting in an improved balance between conservation, landscape and commercial interests.

- Producing Wood and Marketable Timber

  While the plan proposed to reduce the area of commercial forest by 37% due to increases in open and broadleaf areas, there was a commitment to produce a sustainable 7000 m^3 of timber per annum in the next rotation.

- Landscape Enhancement

  Retaining areas of distinctive landform and leaving others open after felling.
  Conserving and strengthening broadleaved woodland with shapes, species and densities reflecting landform irregularities.
  Retaining and enhancing the landscape pattern.
  Co-ordinated management of coupes in Duror, with the adjacent coupes in Bealach - to provide continuity.

- Maintaining and Creating Wildlife Habitats
  Conifers were to be removed from all Ancient Woodland sites except in coupe 45737, which is a long- term retention and where potential for restoration is low.
  The existing Oakwoods would be enhanced through active management, including thinning.
  The regeneration exclosure in 45747 would be maintained, with management of regenerated broadleaves through respacing and thinning.
  Bealach forest was identified as priority woodland for Red Squirrels, with a strategic aim to have forest able to sustain a Red population and be less attractive for Grey Squirrels. Hence, no large seeded broadleaved trees would be planted.
  The plan broadly meets the objectives of the Glen Salachan Upland Oakwoods Habitat Action Plan.

  During the original plan period, the target was completion of felling 61 ha with restocking conifers 28 ha, broadleaves 7 ha and open land 25 ha.

  All coupes planned for harvesting during the plan period have been felled. Some additional coupes were felled for various reasons i.e. due to wind blow, to accommodate road lines and for the access and penstock tracks to the Lochan Blar Hydro Scheme.

New forest roads have been constructed to facilitate harvesting and restocking, with further roads planned to link coupes in the North West part of the forest with Duror forest - the southern margin of Duror forest is contiguous with the North- Western margin of Bealach.

Although the restructuring programme is underway, the bulk of the restructuring is still to do and will be undertaken as harvesting progresses. Conifers have yet to be removed from several areas of PAWS and parts of the riparian zone. The fence built previously around the exclosure in coupe 45747 is no longer functional and sheep and deer graze throughout this area.

There is an opportunity to revisit the restructuring plans in light of policy changes – to restock felled coupes with conifers where appropriate; to strengthen the broadleaved woodland in the riparian zone and existing areas of natural regeneration on the hill; increase coupe sizes slightly and encourage expansion of the treeline through native woodland regeneration on higher ground, subject to determination of impact on SPA habitats. There is also potential for new planting on some of the open ground on lower slopes. But it will still be sensible to avoid replanting where conifers are in check on poorer ground; the issue will be whether it will be economically viable to harvest them or whether to leave them and allow natural regeneration to create mixed stands with a gradual progression to broadleaved woodland.

6.0 Background information

6.1 Physical site factors

6.1.1 Geology Soils and landform

The predominant landforms are the secluded glen, with rounded rocky knolls and lower slopes, rising to open moor with an irregular, amorphous landform interspersed by upland lochs.

The geology is superficially, moundy glacial deposits (diamicton, sand and gravel) over a more complex bedrock comprising bands of quartzites, pelites and semipelites, phyllites and limestone formations, metamudstone and slate.

Soils are highly variable across the forest block, reflecting changing geology, landform and the number of watercourses and valley complexes. Peaty surface water gleys predominate across much of the area, with some upland brown earths in the western section; podzols and podzolic surface water gleys; ranker complexes on some of the higher ground; ironpans and Molinia type bogs scattered throughout and small areas of Calluna dominated bog on higher ground to the south.

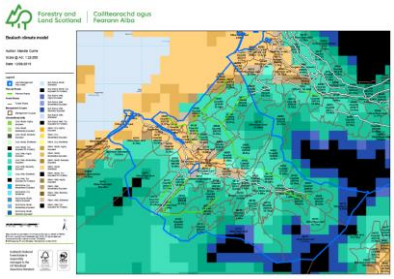
6.1.2 Water

The Salachan burn runs through the forest, along the glen floor and has previously been identified as a spawning site for Salmonids. A number of smaller burns feed into the larger river.
One domestic water supply and a reserve public supply are located within the glen, close to Bealach House. A public water pipeline and a BT line run west from Bealach on the low side of the road.
The penstock for the Blar Lochan Hydro scheme runs from the South, through the South Westerly part of the forest, to a power house close to the Salachan

Burn. Water abstracted for the hydro scheme is returned to Salachan burn, approximately 2.5 km away from the abstraction point.

6.1.3 Climate

The climate is mild, wet and windy, with average annual temperatures around 8 – 9 C and precipitation above 1800 mm per year. Although snow is less prevalent than eastern and central Scotland, the region is subject to rain bearing South Westerly winds. Humidity levels are high throughout the year, rarely sinking below 70% relative humidity. The wet conditions contribute to soil leaching and development of gleys and bogs where soils are insufficiently free- draining. Rainfall conditions should be taken into account when planning and executing harvesting operations to avoid run-off to the Salachan burn and its tributaries. See Map 13 (Climate Model) for details of local climate conditions.



Wind exposure across the forest measured using the DAMS score is 12 – 16 throughout most of block but this varies from < 10 along parts of the riparian zone and 10-12 near the coast and along the bottom of the glen, to 12-14 on the more sheltered lower slopes and 16 – 20 on higher slopes / high tops. Windblow risk is high on upper slopes and while much of the glen floor is relatively sheltered from prevailing South Westerlies, storms from westerly or easterly directions could potentially create devastating wind blow on lower slopes or even in the glen itself – the actual wind blow risk in these areas is unknown. Timing and sequencing of felling operations will be planned to protect tree stability and minimise wind blow.

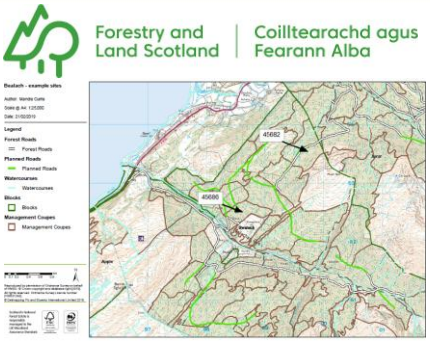
Temperatures also vary widely across the forest, from the warm, moist, sheltered parts of the glen; warm, wet or cool, wet and moderately exposed lower slopes – to cool, wet, highly exposed upper slopes. The map illustrates these variations, and demonstrates also, the higher degree of exposure closer to the coastal margin, where trees are more exposed to salt laden winds. Species choices are limited, although greater diversity can be achieved in a few places on more sheltered lower slopes, on better soils. Appendix 4 demonstrates species suitability related to site conditions across the forest.

Example: Ecological Site Classification (ESC) site data for coupe on lower slopes:

Coupe	AT	CT	DAMS	MD	SMR	SNR
45686	1284	4	12	101	2 (Wet)	2 (Poor)

Example: ESC site data for coupe on upper slopes:

AT = Accumulated Temperature; CT = Continentality; MD = Moisture deficit
DAMS = Detailed aspect method of scoring (measure of exposure)



6.2 Biodiversity and environmental designations

There are no statutory designations covering the forested area, although there are significant areas of PAWS/ASNW, mainly concentrated in the riparian zones along the Salachan Burn and minor tributaries, and on hill sides. Chequered Skipper butterflies, which is a FLS priority species, have been noted in an area of open broadleaved woodland and unimproved grassland south of the forest road, which should be protected and linked to broadleaved woodland in the riparian zone through creation of corridors where possible. Map 14 shows key conservation features and habitats.

Several UKBAP priority open habitats, mainly upland heathland, calcareous grassland and wet flushes, are located throughout the LMP (although covering a limited area and mainly focused on the open ground in the South West). Black and Red grouse can be found on the open ground within the LMP area; these are not currently affected by forestry operations, but any new planting or regeneration would need to avoid loss or degradation of their habitat. A number of breeding sites for Pine marten and other species have been noted in the forest and any operations should aim to protect these.

Bealach forest was identified by Scottish Natural Heritage as priority woodland for Red Squirrel, mainly as a strategic reserve to encourage Red Squirrel and discourage the spread of Grey Squirrel, but there is no evidence of Red Squirrel in the woodland. The 2006 to 2016 LMP included objectives to create suitable woodland habitat for Red Squirrel but there is no evidence currently, that planting large seeded broadleaf species in this forest will create any risk from Grey Squirrels.

The overall environmental status of Salachan burn was assessed in 2008 by SEPA as Moderate with Medium confidence, with overall ecological status of Moderate and overall chemical status of pass, with the objective to achieve good status by 2021. Planting of conifer species in the riparian zone was identified as a factor contributing to the "Moderate" status, and the catchment in the North-Eastern part of the forest, north of the Salachan Burn, is identified as vulnerable to acidification. Improvement of the riparian zone and wetland habitats by 31/12/2020 is required to meet the objective of achieving good ecological status by 2021. Agreed action is to remove conifers from riparian and wetland areas and allow appropriate broadleaf riparian woodland to develop. To date, felling in this zone has been undertaken as per the previous plan; conifer restock will be kept well back from water courses and gullies and open broadleaved canopy will be allowed to develop in riparian areas.

Most of the open ground to the North and East of the LMP area is covered by the Glen Etive and Glen Fyne SPA but this designation does not extend into the forested areas. However, much of the forest lies within the range of key raptor species. Forest management should take account of the need to provide suitable habitat throughout the forest to encourage prey species, including maintenance of open areas; leaving ridges and knolls exposed following harvesting and restocking and

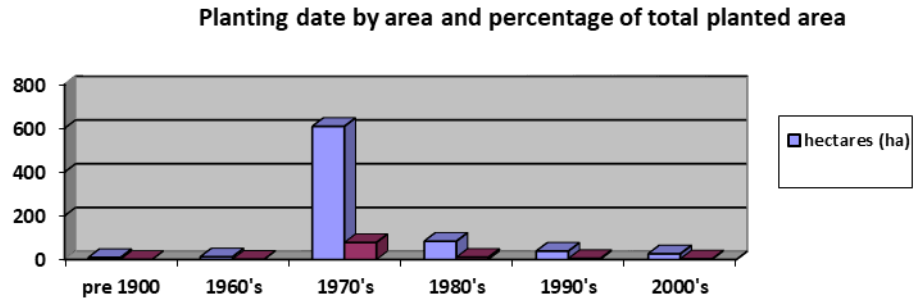
encouraging a diverse grass sward. Dense swards of Nardus/Molinia grassland will be improved by planting or natural regeneration of native broadleaved species. Any woodland expansion by extending the tree line with native woodland will be managed to create an open canopy structure with plenty of open ground.

6.3 The existing forest:

6.3.1 Age structure, species and yield class

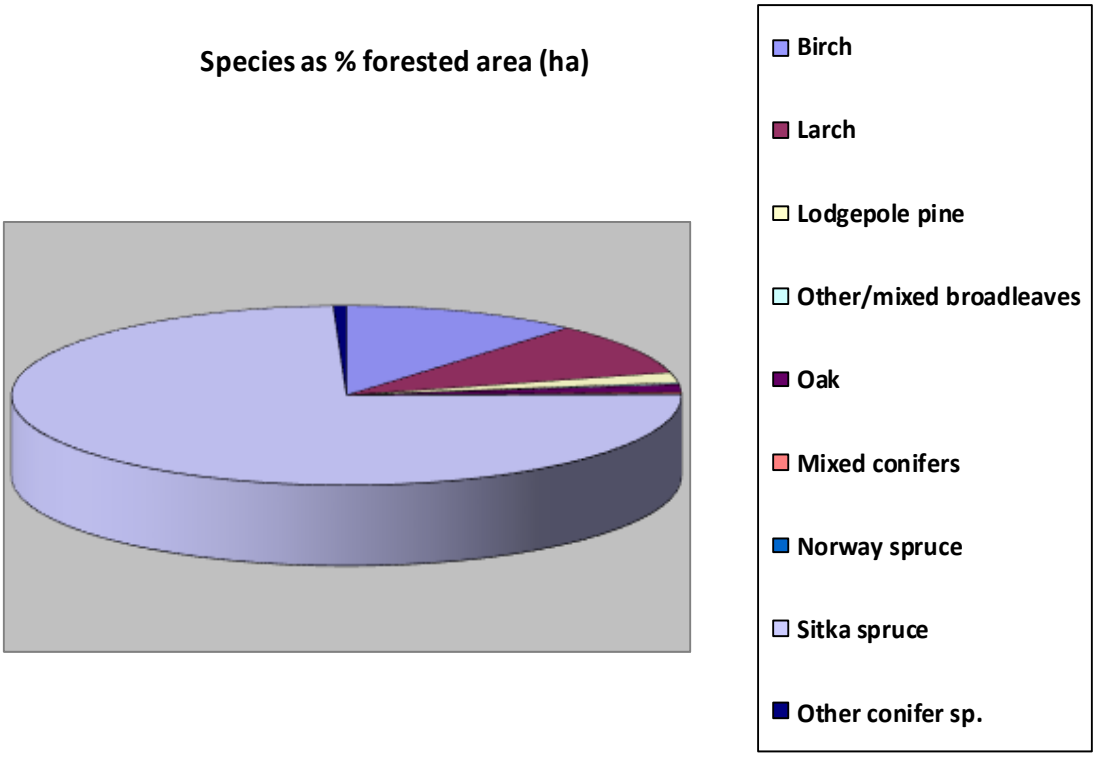
Currently, the total area under active management is 1874 ha and of this, 766 ha is high forest, with 957 ha managed as open ground and 76 ha as temporary open ground (areas that have failed, been felled, or suffered wind blow). Consideration will be given to identifying and maintaining open ground to optimise both environmental benefits and forest production capacity.

More than 78% of the forest was planted in the 1970's, with approximately 11% planted in the 1980's and much smaller areas in the following two decades. This even age structure presents significant challenges, in restructuring the forest to maintain sustainable production levels and a healthy forest environment. Vulnerability to wind blow is unknown but could potentially be significant, at least for coupes on the higher slopes, where DAMS scores are 16/17.



The pre 1900 figures comprise small areas of oak, some of which were historically wooded as well as a small area of new planting in the 1900's and 2nd rotation planting in 2017.

The species structure creates similar challenges in terms of lack of diversity: Sitka spruce is the dominant species covering around 75% of the forest area, as demonstrated below. The market for Sitka spruce is strong for both logs and small round wood and is likely to continue for this versatile species. However, in the future the limited species diversity may reduce potential markets that can be accessed, as well as potentially lowering the resilience of the forest to pests, diseases and other environmental factors.



The presence of larch species and risk of Phytophthora infection also provides challenges, due to the need to exclude larch from future restocking/planting (which will constrain species choice and limit diversity) and the potential early removal from existing stands if infection occurs, which would necessitate work programme amendments and bringing some works forward. Roads and tracks will be planned and scheduled to facilitate access in the event of early extractions.

Yield Class is variable across the forest, with generally higher Yield Classes in the Northern section, particularly to the North-East but the high degree of variability reflects soil heterogeneity and varying site conditions and species.

Yield Classes across the forest block are presented in Map 15 (Current Yield Class Distribution).

Site conditions, primarily soils (nutrient status and moisture content) and degree of exposure impact on the tree species that are suitable for timber production. The Ecological Site Classification indicates that across much of the site, the range of species suitable for timber is limited. Soil conditions are variable across the forest block, but with slightly better soils just north of the burn in the North-Western section of forest and around some of the watercourses elsewhere, on the lower slopes and the more sheltered glen floor. See Appendix 4 for details.

Soil surveys have been undertaken at Bealach and the better soils are often where there are broadleaved trees. There is potential to utilise the reputation of birch trees as a soil improver, to grow either in mixed stands with Sitka or in pure stands within mixed sub-compartments, to improve soil conditions longer term.

Land capability for forestry has been determined (data from James Hutton Institute) – see Map 16. According to this model, land to the West and South-East

are unsuitable for growing trees. Most of this ground is open hill but part of the area in the North-West supports stands that are growing fairly well, although this is variable.

6.3.2 Access

There is lack of access for harvesting and extraction in the northern section of forest, so there is a significant requirement for new roads and related infrastructure. The large, wide gulley in the north – eastern section of forest is effectively impassable and forms part of the vulnerable catchment at risk of acidification. Extraction will be via Duror for coupes to the North and West. For coupes east of the gulley, a new section of road will extend from the existing forest road and haulage will be along the main forest road to the A828. (Map 6).
A further new road, required to access coupes 45713 and 45714, will be services via the main forest road to the A828.

There are no strategic timber transport routes through the forest.

6.3.3 LISS potential

There is no opportunity in the current rotation for conifer LISS/CCF due to windthrow risk, current age structure and difficult terrain. However, tree cover will be maintained by restocking with optimum / minimum fallow, continuous cover of broadleaves, particularly in riparian zones, and management of PAWS. Consideration will be given to the potential for thinning 2nd rotation crops and the stands of birch/ mixed broadleaves, for production, with a focus on the glen floor and more sheltered lower slopes. The stands of broadleaves / conifers between the road and burn in coupe 45705 will be thinned following conifer removal.

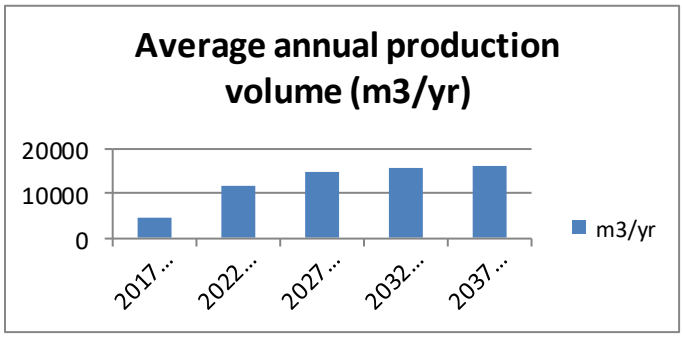
6.3.4 Current and potential markets

Bealach produces conifer sawlogs and small roundwood for local markets including the large sawmill at Kilmallie, with Sitka spruce as the dominant species. Conifer sawlogs will continue to be the main product from the forest but the challenge will be to achieve continuity of supply during restructuring of the even aged stands, the majority of which are now 40 – 50+ years old, and ongoing, to supply an even flow of timber that maintains its economic potential into the future.

The felling plan in the existing LMP has scheduled to fell, an average of 8 ha annually over the next three years, rising to 25 ha annually between 2032 and 2036. This would produce a forecasted volume of 4403 m^3 per year between 2018 and 2021, increasing sharply, to 11,851 m^3 produced each year between 2022 and 2026 and rising to 15,912 m^3 / year in 2037 – 2041.

It may be necessary to bring forward some production in order to optimise the potential of the more productive coupes and to even-out production volumes, also bearing in mind the objective to achieve a more diverse age, species and spatial structure. Under the current Land Management Plan felling schedule, conifers harvested in the 2037-2041 felling period will be 63 years old. This may be acceptable in coupes with lower yield classes and sub optimal growing conditions where trees will take longer to reach their potential, but felling schedules will be reviewed to achieve the optimum rotation age.

There will be a presumption to maintain optimum production levels in the longer term, subject to addressing some of the environmental issues highlighted and understanding the reasons for the areas of poor conifer growth.



Estimated average annual volume production (m^3 /year overbark standing) across all conifer species – existing plan

There will be a presumption to maintain optimum production levels in the longer term, subject to addressing some of the environmental issues highlighted and understanding the reasons for the areas of poor conifer growth.

If thinned correctly, the stands of birch and mixed broadleaves could produce small roundwood and there is potential for future woodfuel production and possibly, for supply to local niche markets, such as wood turning, on a small scale.

Consideration needs to be given to the potential for growing productive broadleaves, as well as the choice of conifer species, to improve structural and species diversity while maintaining productivity.

Marketed venison provides a relatively small income, derived from deer culled in the forest. Red deer numbers are currently high, with a population increase over the past three years due to migration from neighbouring land. A deer culling programme combined with strategic deer management in the catchment to the South/East, in partnership with the Deer Management Group, aims to reduce deer numbers within the forest to below 10 per sq km within the next two years. Income from venison is expected to peak and then reduce and plateau, as deer numbers are maintained at sustainable levels, moving forward.

6.4 Landscape and land use

6.4.1 Landscape character and value

The Scottish Natural Heritage Landscape Character Assessment describes the area as a "Craggy Upland". The key characteristics are:

- Upland moor with an irregular, amorphous landform
- Rounded rocky knolls and upland lochs
- Open moor with conifer plantations along glens and extending onto moors, camouflaging the landscape
- Oak-birch woodland within the shelter of lower slopes and within glens

The pressures and sensitivities are listed as:

- Landform features such as rocky knolls and historic features such as archaeological sites are sensitive to pressures from forestry and changes in land management

- Native oak/birch woodlands within glens and on lower coastal slopes are sensitive to changes in land use and expansion of infrastructure
- Coastal development and forestry constitute the major forces for landscape change

6.4.2 Visibility

Most of the forest is within the secluded Salachan Glen, can only be seen from the hill tops and is not visible from the road or from any settlements, apart from parts of the face to the North - West, which are visible from Cuil Bay.

6.4.3 Neighbouring land use

There are no settlements situated close to Bealach; the nearest significant settlement is the village of Duror, which lies several miles north of the forest. The only near neighbours are Bealach House, which is operated as a B&B; the Highland Titles – owned woodland close to the forest entrance at the western boundary, and the neighbouring Lurignish farm.

The land adjoining Bealach forest to the North, East and South are National Forest Estate. To the North, Bealach is contiguous with Duror forest and forestry operations at the boundary between the two forest blocks will be co-ordinated. The ground adjoining the LMP area to the South West, and a small area of open land within the forest area, are part of an agricultural tenancy but the land is owned by Forest Enterprise Scotland as part of the National Forest Estate. The farmhouse is located further south of the LMP area and is accessed from the A828.

6.5 Social factors

6.5.1 Recreation

The forest is open to all, within the framework of the Scottish Outdoor Access Code, and we will continue to promote best practice in relation to access. Currently, recreational use of the forest is mainly limited to walkers, ramblers, cavers and occasional fishing in the loch and burn for most of the year. A recognised footpath, which is not a core path, connects Glen Stockdale to the A828. A Sustrans cycle route runs alongside the A828 and the plan is that it will run close to the lower part of the forest road where it joins the A828.

The ongoing programme of road and track construction will support tourism, by facilitating improved access to Froachaidh and links to Duror village through Duror forest.

Several caves and potholes are located within the LMP area, in coupes 45712 and 45723, including the deepest pothole in Scotland, the Cave of the Skulls. The majority of people visiting the caves walk in from the forest road entrance. Access to these sites will be maintained and protected during forestry operations but the approach will be low key, with no signage or markers to the caves.

Part of the Scottish Six Day Motorcycle Trials takes place in Bealach, the route of which is agreed beforehand with FLS. This event only runs for one day a year in Bealach and takes place in spring. Impacts on timing of forestry operations and on wildlife and key habitats will be considered.

6.5.2 Community

The nearest settlement to Bealach is the village of Duror, which lies about 5 km North- West of the forest and links to Bealach via Duror forest as well as the main trunk road. The planned construction of forest roads will create more opportunities for Duror residents to access the forest. Communities in the area are represented by Duror and Kentallen Community Council to the north and Appin Community Council to the south.

6.5.3 Heritage

A walkover archaeological survey conducted in 2005 identified several remains of interest at Achvlair in coupe 45719, including ruined buildings, sheilings and a corn kiln. There also appears to be evidence of old field patterns here.

6.6 Statutory requirements and key external policies

Special Protection Area (SPA)

The forest lies adjacent to the Glen Etive and Glen Fyne SPA for Golden Eagles. Although none of the forested land lies within the SPA, the designation does cover the open ground and hills at the East and North-Easterly boundaries and much of the forest lies potentially within the range area used by Golden Eagles. Management of open ground and suitable habitat within the forest and at its boundaries will be undertaken to improve habitat conditions and comply with SPA Conservation Objectives.

River Basin Management

Salachan burn and its tributaries form part of the Appin Coastal catchment area, defined within the Argyll and Lochaber Area Management Plan, through the River Basin Management Plan process under the Water Framework Directive. The overall status of surface water (including Salachan Burn) in this catchment area is Moderate, although part of the land to the north east is identified as a catchment at risk, which is vulnerable to acidification and other impacts of intensive forestry (see Map 17: Catchment at Risk). This area covers a relatively small part of the forest block but to minimise negative impacts, it is important that no more than 20% of the catchment should be felled in any three year period.

This Moderate status is indicated as a result of intensive forestry and cultivation/ planting of conifers to the bank, with improvement to the condition of the riparian zone and / or wetland habitats expected by 31/12/2020, to achieve good status by 2021. The UK Forestry Standard identifies that forest management should contribute towards achieving the objectives of the RBMP to protect and improve the water environment, and ensure that forestry pressures on the aquatic environment are addressed.

7.0 Management objectives

The Objectives outlined in the Brief have been revised during development of the Plan and are incorporated within the following Management Objectives:

Objective 1: Ensure that the forest continues to contribute to regional timber production targets

The key objective at Bealach will be to maximise returns from conifers and productive broadleaves (where growing conditions support this) and while also protecting features of high natural and cultural heritage value and riparian zones.

There are opportunities to maintain and increase production by restocking felled areas to the timber line where appropriate but focusing on the areas of higher yield class to the East and North of the burn and planting adjacent open ground where feasible, avoiding areas of natural or cultural heritage interest. There are limited opportunities to manage broadleaves between the road and burn for small scale timber and firewood production.

Objective 2: Create well landscaped long- term felling coupes that are scaled appropriately for the landscape and are productive and economically cost effective to manage.

Felling and restocking cycles will be simplified and average coupe sizes will increase slightly, with larger coupes on upper slopes and hillsides that benefit from the cohesion brought by landscape-scale management. On lower slopes and along the glen floor, coupes will be much smaller but size will vary to accommodate natural features and management needs. Existing roads, rides and natural features will be used to create wind-firm margins. Particularly on the northern, south facing lower slopes, coupe margins will be defined by the many gullies and burns that dissect the catchment in an N-S direction.

The vulnerable catchment in the NE section of forest north of the burn will be protected by creating buffer zones to keep conifers well back from gullies and burns and managing operations to minimise felling impacts on the riparian zone

Access is an issue and the required new roads will not extend all the way through the northern section due to a large gully that is effectively impassable. In the southern part of the forest, the extent of road construction and harvesting will depend on the feasibility of the works. Road construction needs to optimise cost/benefits and achieve a better fit in the landscape, so a decision will be taken nearer the time and will depend on costs and market conditions.

Recreational access will be maintained, and improved by road construction that will open up areas of forest and improve links through from Duror and the A828 to Froachaich and other hill tops.

Soils on sheltered lower slopes in the North and East could support mixed conifers but elsewhere, Sitka spruce will predominate. Where soils are particularly poor, Sitka will be planted with adjacent stands of birch to improve soil condition in the longer term.

Objective 3: Enhance forest diversity by diversifying age structure and species; strengthening the broadleaf component; protecting and enhancing other priority habitats and linking open space within the forest to the open hill
Broadleaved woodland will be expanded in riparian zones by encouraging natural regeneration of native broadleaves, with supplementary planting where required, to create approximately 50% canopy cover along watercourses. The felling programme and slightly increased coupe sizes will achieve a more varied age structure while maintaining sustainable production of timber and other products. Where possible, productive broadleaved woodland will be managed for timber.

Existing habitat for Chequered skipper butterfly and identified areas of priority open habitat throughout the LMP area will be managed- through maintenance of grass sward and open broadleaved canopy. New planting in the field at Achvlair will be kept back from the wet flush in the eastern part of the field, which will be kept open.

Objective 4: Enhance and expand native woodland in ASNWS/PAWS zones through removal of non-native conifers and encouraging natural regeneration of locally native species.
Conservation management of existing ASNW / PAWS woodland will include removal of non- native conifers and promotion of natural regeneration through minimising deer impact. There are opportunities to expand the existing native woodland in riparian zones and across hill, to link PAWS/ASNW areas.

Objective 5: Maintain and extend the current level of tree cover by maintaining and restructuring the existing conifer tree line; expanding native woodland upwards on hill slopes through natural regeneration; by limited new planting and by allowing successional development of trees along rides, glades and areas where planted conifers are in check.
Felled areas will be restocked to the existing timber line where appropriate, focusing to the East and North of the burn but areas of very poor growth will not be replanted. Upper margins will be restructured to produce a more natural tree line, including accepting natural regeneration where this occurs. The field at Achvlair (coupe 45719) will be planted, avoiding areas of natural or cultural heritage interest such as the farm building and archaeological remains and areas of wet flushes.

8.0 Analysis and Concept

8.1 Analysis

The Analysis map is presented in the Appendices (Map 2a).

Objective	Opportunities	Constraints	Concept
Ensure that the forest continues to contribute to regional timber production targets	Forest is well suited to commercial timber production, with significant areas with high good yield class. Some opportunities to diversify production with planting mixture of conifer and broadleaved species on lower slopes. Modest opportunity to grow productive broadleaf stands and to manage existing broadleaves (particularly in 457605) for timber. Targeting production on areas where growth rates are higher and access is easier can increase economic performance even if overall area of conifers is reduced. Diversifying species will increase resilience. Potential to plant broadleaves in the upper part of the field at Achvlair, in the northern section of the forest.	Exposure and soil conditions on upper slopes limit the species suitability. Wind blow hazard has not been tested here but there is likely to be high risk of wind blow on upper slopes, which will impact on coupe shapes and the need to find wind firm margins. Current coupe sizes are too small to be practical and much of the area lacks sufficient breaks to define coupe boundaries effectively Similar aged forest across large areas may limit coupe options and consistency of production. Diverse conifers and broadleaves produce less timber / wood products and allowing successional growth will produce uncertain quality and quantity. Damage from deer, Hylobius and other pests may limit the success of restocking. There are significant areas of checked conifer growth,	Sitka spruce will remain the most appropriate species, delivering a high value product on short rotation across much of the LMP area. Diverse conifers and broadleaves on lower slopes, together with native broadleaves in riparian zones, have potential to deliver diversity of productive output. Plant productive conifers in the upper part of the field at Achvlair. Deer management should focus on areas where potential productivity is highest. Active, early management of successional growth will improve quality of product and diversity in forest structure. Timber production should focus on areas of better growth.

		interspersed with birch trees. Growth in these areas is variable but mainly poor in these areas	
Create well landscaped long-term felling coupes that are scaled appropriately for the landscape and are productive and economically cost effective to manage.	Enclosed glen contrasting with upper slopes provide opportunities to create viable felling coupes that fit well with landscape scale. Secluded nature of glen and lack of visibility from main road and local settlements, so landscape impacts of felling programme will be minimised. Modest opportunity to manage productive broadleaves under CCF. Birch and other broadleaves between road and burn are ready to thin now to produce small roundwood and firewood. Access for recreational use will be improved by the road network that will be constructed for harvesting and restocking operations	Conifer CCF options are very limited in the current crop due to potential wind blow risk; lack of thinning and crop type. There is limited opportunity to create productive broadleaved stands through respacing and thinning. The large number of gullies, including the wide gully in the northern part of the forest, limits the shape and scale of coupes north of the Salachan burn. Risk of wind blow also influences the shape and scale of felling coupes to achieve viable margins. There are stands of larch in the western section and forming a strip along the western boundary, which may be most visible from Cuil Bay. Access to these may be a problem if felling needs to be brought forward in the event of a	Design coupes that are larger on the upper slopes and smaller along the more sheltered glen floor and along lower slopes, where landform is more complex and opportunities for crop diversity more likely. Develop a long term plan for the redesign of upper margins of the forest to reflect landform, through managing natural regeneration of native broadleaves. Develop a thinning plan for planted broadleaves to develop diversity in productive output. Future restocking should include buffer zones and natural regeneration of native broadleaves encouraged in riparian zones. Routes for road construction will be determined by topography and will avoid a gully on the northern side of the river that is too large to

		SPHN. Part of the northern eastern section of forest lies in a catchment identified by SEPA as at risk due to morphological pressures and potential acidification from conifers.	cross
Enhance forest diversity by diversifying age structure and species; strengthening the broadleaf component; protecting and enhancing other priority habitats and linking open space within the forest to the open hill	A balanced felling and restocking programme can produce a more varied age structure in the longer term. Sheltered glen floor and lower slopes suitable for growing other conifer species, where soils can support them, which will increase diversity. Modest area suitable for new planting Existing broadleaves along the extensive network of riparian zone and smaller gullies can be strengthened through promotion of natural regeneration and supplementary planting where necessary. Road construction for harvesting programme will increase access opportunities, particularly from Duror. Existing open and successional	Conifers are even aged and approaching maturity, presenting challenges for creating diverse structure. Soil type and exposure conditions limit the species suitable for timber production other than parts of the more sheltered glen and lower slopes. Increasing proportion of broadleaves will reduce productive capacity so it will be important to target conifer production in the north and east of the burn where trees are growing well. Maintaining an appropriate amount of open space and balancing this with areas of successional growth will require ongoing monitoring. Planted soft conifers and broadleaves will be vulnerable	Focus mixed conifers and productive broadleaves in sheltered glen and lower slopes, where soil conditions are suitable. Group restock of species sensitive to deer browsing into areas where deer control can be targeted. Create larger felling coupes where appropriate to achieve a more varied age structure as soon as possible and to facilitate deer control and make restock areas less sensitive to deer damage. Keep new planting and restocking well back from priority habitats and riparian zones. Operations must be compliant with Forest and Water Guidelines, specifically • removing conifers and encouraging broadleaved

	areas can be strengthened to link to open hill and existing broadleaved habitat. Open broadleaved woodland / grassland habitat can be managed for Chequered Skipper butterflies in identified areas and expanded downhill towards the burn, linking with riparian areas. Areas of UKBAP Priority Habitats found throughout the forest must be maintained	to deer pressure. The vulnerable catchment area in the north-eastern section of forest, north of the burn, must be managed to reduce acidification impacts of growing conifers and exceeding critical load at harvesting and restocking.	woodland in riparian zones to achieve 50% dappled shade; • maintaining a buffer zone at least 20m wide around larger watercourses and 1m around streams/ gullies less than 1m wide • removing brash from buffer zones, streams and trenches • avoiding felling more than 20% of vulnerable catchment area in a three year period to avoid nitrate induced acidification
Enhance and expand native woodland in ASNW/PAWS and riparian zones through removal of non-native conifers and encouraging natural regeneration of locally native species.	Space available to expand native broadleaves in riparian zones and on upper slopes, including above the current timber line. In particular, to encourage natural regeneration of oak/hazel/birch woodland northwards from the riparian zone in the field in coupe 45719. This would improve hunting habitat for raptor prey species as the field is currently dominated by a dense grass sward Existing natural regeneration	Access for removal of non-native conifers in some ASNW areas will be constrained and determined by the road construction programme. Natural regeneration will be impacted on by deer grazing/browsing so will depend on an effective deer management programme. Riparian woodland should be actively managed to produce conditions of dappled shade.	Prioritise access for non-native removal in key areas of PAWS and consider fell to recycle where appropriate. Monitor deer pressure to ensure that deer management is sufficient to protect natural regeneration. Monitor regeneration in PAWS areas and enhance with planting where necessary.

	of broadleaves doing well. Road construction for harvesting programme will facilitate removal of non-native trees from ASNW/PAWS.		
Maintain and extend the current level of tree cover	Existing native woodland regeneration on upper slopes indicate potential to expand native woodland uphill beyond existing tree line and improve margin shapes. Existing natural regeneration along riparian zones cam be strengthened. Where conifer growth is acceptable on upper slopes and forest margins, restock with same to maintain extent of tree cover. The fairly large areas of poorer growth could be left unfelled to develop naturally as successional areas, or could be felled then left to restock through natural regeneration.	Extending the tree line through natural regeneration of native species may impact on the SPA designation and may require EIA determination. Natural regeneration should be balanced by the need to maintain open ground. The success of natural regeneration may be limited by grazing/browsing pressure. Restocking upper margins will depend on accessibility for harvesting and cost/benefit. Harvesting areas of poor growth will depend on accessibility and cost/benefit of road construction.	Deer management to promote natural regeneration on upper slopes and linking areas of existing native woodland. Beyond the existing tree line, this may be subject to EIA. Restock all felled areas apart from those identified as open ground, which will be maintained as open and poor growth areas identified as successional, where natural regeneration will be allowed to develop.

8.2 Concepts of the plan

The concept map is presented in the Appendices (Map 2b).

Effort will be focused on growing conifers where they are currently doing well – on lower slopes and areas North / East of the Salachan burn. But felling within the vulnerable catchment area will protect riparian zones; conifer planting will be kept well back from watercourses and gullies and broadleaved woodland encouraged instead, to create buffer zones.

Two significant areas of poorer growth Sitka spruce in the northern and southern sections have been identified as potentially successional. It may not be economically advantageous to harvest these areas, particularly where road construction is required. Trees in these zones could be left to grow on, accepting the natural regeneration of birch and other broadleaf species that is already progressing. However, the scale of each area could represent significant future timber volume so a decision will be made at the time of harvesting of adjacent coupes. If they are harvested, these areas will not be planted but instead will be left to regenerate naturally

9.0 Land Management Plan Proposals

9.1 Management vision

The prime focus at Bealach will continue to be timber production, while protecting and expanding native broadleaves (in riparian and on upper slopes) and other priority habitats. Lack of visibility from outwith the forest and low recreational use mean that felling programmes can be bolder, creating larger coupes and sequencing to accommodate road construction programmes, within the framework of good landscape and visual amenity.

The native broadleaved riparian woodland will be expanded through natural regeneration, with limited planting of locally native species where necessary; linking PAWS/ASNW with other areas of remnant native woodland through corridors of open broadleaf habitat. Suitable habitat for Chequered Skipper butterflies will also be extended by planting native broadleaves (and natural regeneration) in the adjacent coupe (45711) below the road, to link to riparian woodland.

Elsewhere, the focus will be on commercial conifer plantations producing sawlog timber for local and distant markets, with higher quality timber production focused on the more accessible and better- quality ground to the North and East of the Salachan burn. Within this area to the East, the catchment is sensitive to acidification and morphological pressures from conifer species, so conifers will be kept back a distance from gullies to create a buffer zone of 20 m from the larger burns/gullies and 10 m from streams/gullies < 1 m wide. All operations will be planned to protect the catchment and water environment, as described earlier. To help slow the spread of Phytophthora, larch will be removed during clearfell harvesting operations and from accessible adjacent coupes where this would not create wind blow problems. Some roads will be completed early to facilitate larch removal in the event of a Statutory Plant Health Notice.

Where conifers are in check due to site conditions, the plan is to allow the less accessible stands to grow on and eventually regenerate naturally but to harvest the more accessible stands and not replant these. Instead, natural regeneration of broadleaved and conifer species will be allowed in these areas, which will be managed eventually for timber production if growth rates and quality are acceptable, or for natural heritage interest if not. A transition period of mixed broadleaves and conifers may give way to primarily broadleaves in some areas and conifers in others. The slow growth, sparse tree cover and many open areas provide good hunting habitat for raptors and other priority species. These areas will be left to develop naturally.

9.2 Future habitats and species

Sitka spruce will continue to be the predominant commercial species, with moderate proportions of Norway spruce and mixed conifers where soil conditions allow. Species options to achieve optimal growth for timber production are limited by site conditions, so species diversity will be primarily achieved through restocking identified areas with broadleaved species; management of broadleaves in riparian zones and by planting other conifer species and mixtures of conifers and broadleaves in identified coupes in the glen floor and on lower slopes, where soil conditions are favourable and there is lower risk of wind blow. Birch will be planted with Sitka spruce in areas indicated on the map to increase diversity and improve soil conditions.

Riparian zones will be stocked by natural regeneration and supplementary planting with oak, birch and hazel and smaller proportions of alder, willow, rowan and other site- suitable native broadleaves. Natural regeneration of native broadleaf species will be encouraged along buffer zones, linking existing ASNW/PAWS areas and above the existing timber line, including hawthorn, rose and other shrub species where ground conditions allow, to create a more diverse and multi layered woodland structure, leaving at least 20% open ground. The aim will be to maintain 50% canopy in the larger riparian zones.

Coupes that are identified in the current plan as Long Term Retention will be felled as per the felling schedule, as there is no current management requirement for their retention. In ASNW areas, conifers will be removed and any remaining native broadleaves retained. Instead, the inaccessible areas of in-check conifers will be managed as Minimum Intervention and allowed to regenerate naturally (with native broadleaves as well as some conifers). The more accessible areas of in-check conifers will be felled and natural regeneration of broadleaves encouraged, but these stands will be managed in future through respacing and thinning to produce small roundwood or woodfuel product. See Maps 7a - c (Restocking programme).

9.3 Restructuring

Restructuring will be achieved by creation of different age classes through felling and restocking and by improved species diversity, focusing mainly on riparian and other broadleaved woodland habitat.

Respacing and eventual thinning of stands of broadleaves between the road and burn to the West, together with removal of conifer species, as well as

management of broadleaf regeneration in the more accessible areas of in-check conifers, will create a mosaic of denser canopy with understorey and open areas that will develop over time.

Harvesting will concentrate first on stands that are most ready for felling and are most easily accessible, working deeper into the forest as roads continue to be constructed and access improved. Areas where growth is slower and trees have not reached their optimum size will be felled at later stages. Access issues mean that some ready-to-fell stands will be harvested beyond their optimum rotation period but this will also be necessary to create greater age diversity in the future forest. Comprehensive restructuring won't be possible during this rotation – several production cycles will be required before full restructuring is complete. 199 ha of forest will be felled and replanted during the 10 year lifespan of this plan.

We will balance fallow length with the need to control weed growth and manage to minimize Hylobius impacts. Adjacency issues may impact on length of fallow, coupe size and felling schedules.

9.3.1 Larch

Larch exists throughout the forest, but in the North and Western sections there are larger larch stands or stands where larch comprises a higher percentage of the crop, as indicated in Map 3. Map 18 shows coupes containing larch components throughout forest; the existing and planned roads and the felling programme.

Approximately 25% of the larch will be removed in the first 10 years of the Plan (see Maps 4b & 18) but the remainder will be harvested over the course of the felling programme. Presence of larch is too extensive to bring forward felling of these coupes while avoiding adjacency and most coupes have fairly small areas/volumes of larch. Road construction costs are the key constraint and it would not be cost effective to pre-emptively fell those areas. In the event of a Statutory Plant Health Notice, larch will be felled in compliance, with extraction where access roads are completed or alternatively, felled to recycle. In the western section north of the road, forwarder tracks can be used to remove felled timber to the existing road but in the South-Western section, a new road will be required.

Larch is extensive in coupes 45713 and 45714, planted in the 1970s, but growth is variable and it is not cost effective to bring forward the felling of these coupes instead of felling other coupes to the North and East that will achieve MAI earlier. Approximately 600 m of road, plus forwarder tracks, need to be constructed to access these coupes. The road line will be surveyed fully at an early stage to ensure that road construction and timber extraction can be brought forward early if needed.

9.3.2 Management of vulnerable catchment area

The area to the North East of the forest, north of Salachan Burn, is identified as a vulnerable catchment at risk from acidification impacts (see Map 17).
In line with the Forestry Commission's Forestry and Water Guidelines, existing broadleaved woodland will be maintained and expanded along the riparian zone, with additional emphasis on protecting the existing Ancient Woodland and restoring PAWS sites.

Non-native conifers will be removed from riparian areas and gullies during coupe felling; any left will be taken when the adjacent coupe is felled. Natural regeneration of native broadleaves will be encouraged and supplemented with planting of site appropriate native broadleaved species where required, to speed up revegetation and reduce nitrate leaching. Restocking in riparian zones will leave open areas and vary stocking densities to create a contrast in light and shaded areas along the watercourse, with 50% dappled shade. Occasional conifer trees may be retained on stream sides if necessary where there is no existing broadleaved canopy, to create some shade. A mixture of native broadleaves will be encouraged but alder will managed, so that it comprises no more than 10% of the trees in this catchment area, to minimise potential impacts arising from the higher rates of nitrogen fixation and release associated with this species.

Riparian zones are marked on the maps and these will create substantial areas of open broadleaved canopy along streams and gullies. But as a minimum, along all riparian areas, conifers will be kept clear of a buffer zone of at least 20 m from the burn and large gullies and 10 m from smaller gullies and streams that are less than 1 m wide. Areas of conifer clearance will be extended beyond buffer widths to incorporate steep sided slopes, boggy source areas and flushes.

Harvesting operations will be planned to, and delivered in compliance with, the UK Forest Standard, to protect water courses, the riparian zone and vulnerable catchment area.

Phasing and timing of felling in riparian zones will be managed to promote ecological recovery of watercourses, which include small streams and gullies, as well as the larger Salachan Burn. Felling coupe sizes and felling schedule will be managed to avoid felling more than 20% of the vulnerable catchment area per three -year period.

9.4 Future management

The proposed felling programme (see Map 4a) aims to harvest timber to optimise MAI, while maintaining continuity of supply and completing the restructuring within a reasonable timeframe.

Felling coupes and areas (ha) to be felled in the first 10 years:

Coupe	Fell period	Coupe Area	Felled Area (net)
45697	2019 - 23	18.68	15.12
45708	2019 - 23	21.00	19.27
45729	2019 - 23	16.41	9.71
	Total P 1	**56.09**	**44.1**
45678	2024-28	22.38	19.12
45682	2024-28	31.83	24.59
45685	2024-28	18.44	15.72
45691	2024-28	23.44	19.77
45693	2024-28	40.40	32.26
45701	2024-28	1.96	1.58
45704	2024-28	3.48	2.12
45725	2024-28	1.02	1.02
	Total P2	**142.95**	**116.18**

Detail of areas to be felled in the first 10 years:

Felling phase	Coupe	Coupe Area (ha)	Key species to be felled
Phase 1 (2019 – 2023)	45697	18.68	Sitka spruce (99%)
	45708	21.00	Sitka spruce (26%), Noble fir (19%), Japanese larch (41%)
	45729	16.41	Sitka spruce (65%), Japanese larch (22%)
Phase 2 (2024 – 2028)	45678	22.38	Sitka spruce (33%), Lodgepole pine (33%), Japanese larch (34%)
	45682	31.83	Sitka spruce (83%)
	45685	18.44	Sitka spruce (88%)
	45691	23.44	Sitka spruce (99%)
	45693	40.40	Sitka spruce (99%)
	45701	1.96	Sitka spruce (60%), Birch (30%)
	45704	3.48	Sitka spruce (64%), Norway spruce (19%)
	45725	1.02	Japanese larch (50%), Birch (50%)

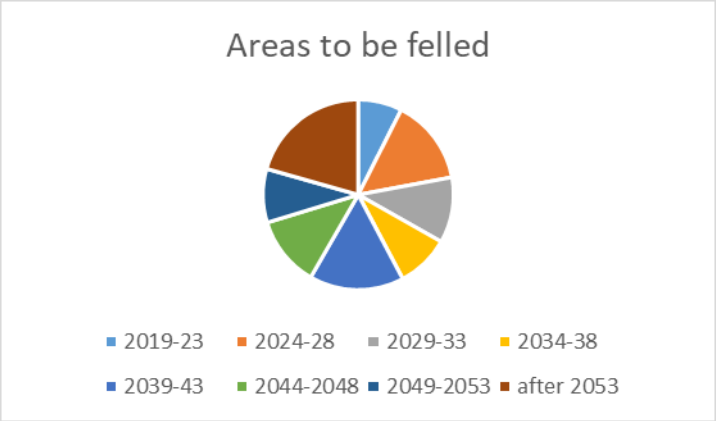
Summary – net size of area (ha) to be felled for each species, in the first 10 years:

Species	Area (ha)
Sitka spruce	119.29
Japanese larch	23.71
Lodgepole pine	6.64
Noble fir	0.32
Norway spruce	0.37
Birch/ mixed broadleaves	7.76

See maps 4a and b for detail of felling coupes.

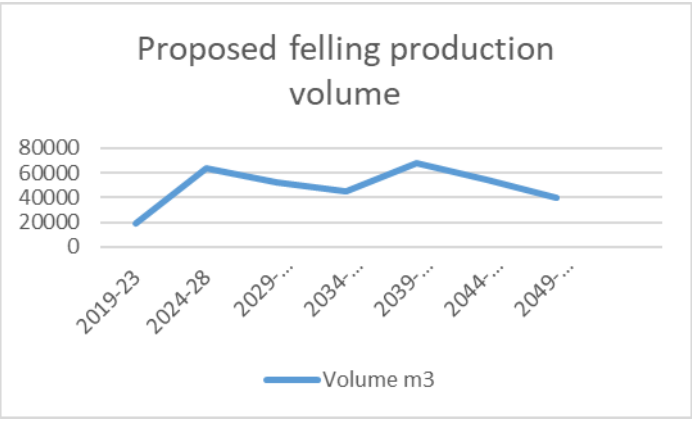
Larger areas will be felled in 2024-28 and 2039-43, which will result in corresponding increases in timber volume in these years. A significant area and volume remain to be felled after 2053, although this includes 31 ha planted since 2008.

Proportion of forest area to be felled each period over 50+ years:

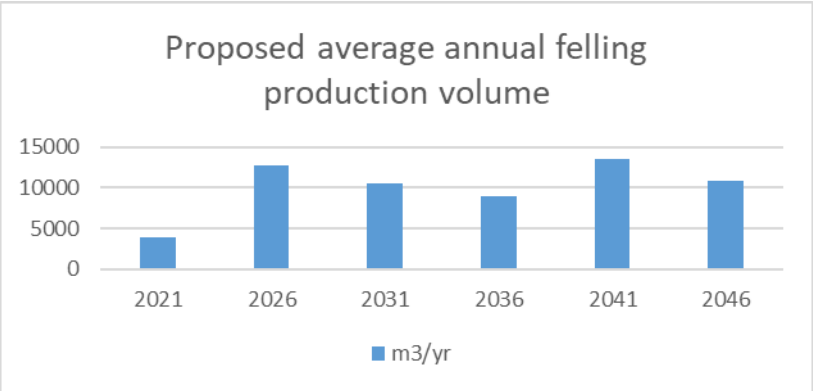


Felling programmes will include removal of conifer species along riparian zones and in PAWS areas but elsewhere, a mixture of broadleaves and conifers will be allowed to develop in successional areas, with the expectation that broadleaves may dominate eventually in places where growing conditions are less favourable for conifers.

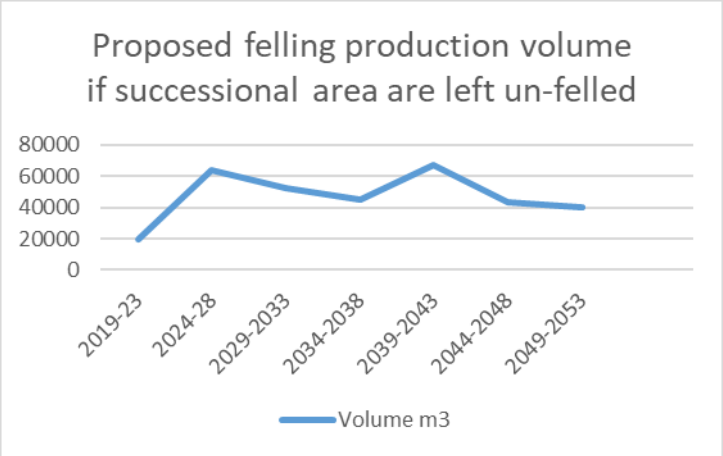
9.4.1 Production:
Harvesting volumes will increase significantly after 2019-23, which is already scheduled, and are expected to vary over the following 30 years to accommodate the required restructuring, balanced with the need to achieve as much continuity of production as possible. An indication of expected volume production per five -year period is given below:



The proposed schedule will result in an average annual harvesting volume that varies between 9000 and 13,500 m^3/year.



The coupes that have been identified in section 9.2 as potentially successional are scheduled to be felled during 2044-48, but they will only be harvested if market conditions and costs are favourable. If cost/benefits are not favourable, then these areas will be left to develop through successional phases. If this happens then potential production volume during 2044-48 would be reduced by 10,323 m^3. In this case, the changes in production volume over time would look like this:



9.4.2. Thinning

Conifers will be removed from coupe 45705, which currently comprises mixed stands of Sitka spruce and birch, with a small quantity of larch, planted in the 1960's and 1990's, together with trees that have naturally regenerated. Broadleaved trees will be respaced where required, and a thinning regime introduced, to favour birch for productive output.

Broadleaved stands will be thinned at or below the level of marginal thinning intensity (removing no more than 70% of the MAI, or YC, per year) selecting the best individual trees to favour but a more detailed thinning prescription is defined in the work programme in Appendix 3 and will be confirmed before work is carried out. Operations will be monitored by checking pre and post thinning basal areas for the key crop components. During the first 10 years, thinning will produce an estimated 2,263 m^3 of timber. Most of this volume (approx. 2,121 m^3) will come from removal of Sitka, with 106 m^3 from birch thinnings.

9.4.3 Tree Health

As well as ensuring conditions for good tree health by monitoring for tree diseases and acting where necessary, replanting programmes will be supported by monitoring Hylobius populations to identify optimum length of fallow period; this may also influence final species choices. Deer numbers will also be monitored and controlled to minimise browsing pressure.

9.5 Felling of Trees in Exceptional Circumstances

Forestry and Land Scotland will normally seek to map and identify all planned tree felling in advance through the LMP process.

However, there are some circumstances requiring small scale tree felling where this may not be possible and where it may be impractical to apply for a separate felling permission due to the risks or impacts of delaying the felling.

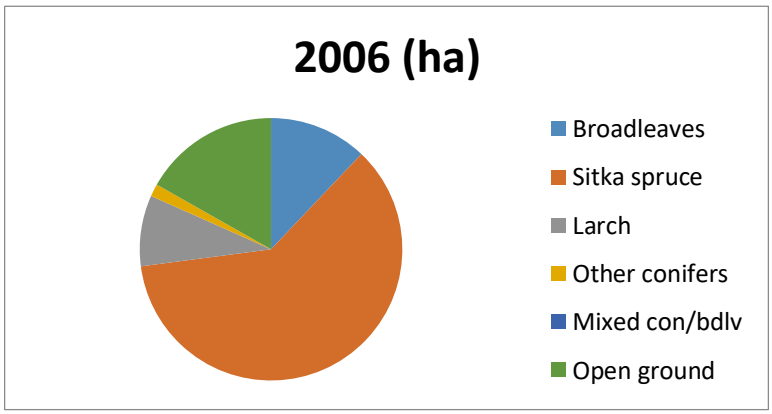
Felling permission is therefore sought for the LMP approval period to cover the following circumstances:

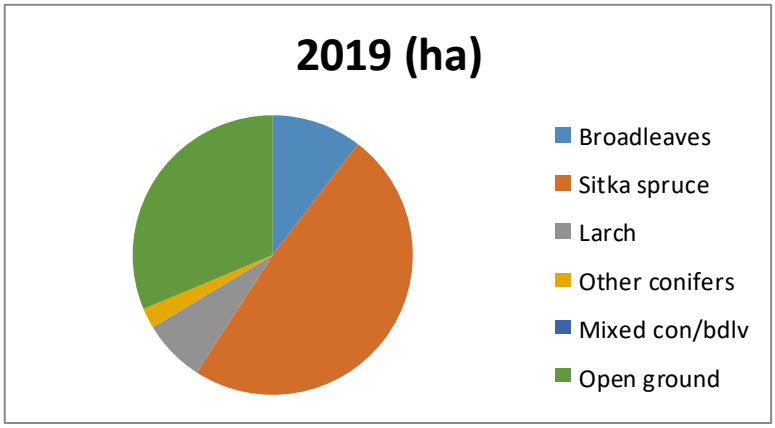
Individual trees, rows of trees or small groups of trees that are impacting on important infrastructure (as defined below*), either because they are now encroaching on or have been destabilised or made unsafe by wind, physical damage, or impeded drainage.

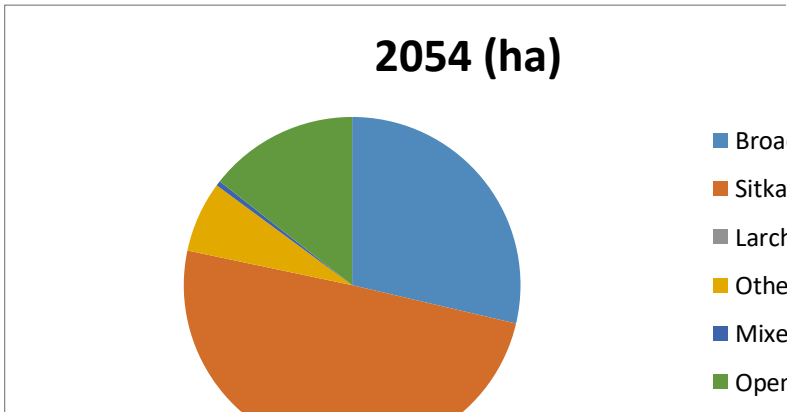
**Infrastructure includes forest roads, footpaths, access (vehicle, cycle, horse walking) routes, buildings, utilities and services, and drains.*
The maximum volume of felling in exceptional circumstances covered by this approval is 40 cubic metres per Land Management Plan per calendar year.
A record of the volume felled in this way will be maintained and will be considered during the five year Land Management Plan review.

9.6 Species tables

Species changes over time – excluding open hill ground:







The graph above and table below shows species changes from the start of the previous plan period, to the current status and longer term, beyond 2054. Proposed is a modest decrease in Sitka Spruce compared to 2006, with a proportionately higher increase in mixed conifers and mixed conifers/broadleaves, although overall hectarage for these species is relatively small. There will be an overall 9% decrease in forest open land over the next thirty years (376 ha reducing to 341 ha, with a much larger decrease of 52% in the longer term). This is balanced by a significant increase in area covered primarily in broadleaves (89% over the next 30 years and 190% in the much longer term). The changes are largely accounted for by areas of broadleaf natural regeneration that will be allowed and encouraged along riparian areas and rides, which previously would have been designated as open ground.

For example, more than 128 ha of land in riparian zones will be allowed to develop into broadleaved woodland through natural regeneration, but retaining a minimum of 20% of open ground in these zones and 50% open canopy along the main Salachan burn and larger gullies. There will also be a gradual progression of native broadleaved natural regeneration (primarily birch) up the hill, eventually extending across upper slopes above the current tree line. The amount of both open ground and native woodland will depend on the option chosen for the potential

successional areas and whether or not these will be felled then left to regenerate naturally, or left un-felled as mixed conifer/broadleaved successional. Changes in proportion of open ground are also accounted for by areas felled and waiting for restocking as well as successional areas that won't yet have developed.

Changes in species	2006 Area (ha)	2006 % Total Forest	2019 Area (ha)	2019 % Total Forest	2054 Area (ha) Prev. LMP	2054 % Prev. LMP	After 2054 Area (ha) New LMP	After 2054 % New LMP
Broadleaves	141	12	124.55	10.42	236	22	362	29
Sitka spruce	710	61	584.88	48.7	446	41	627	52
Larch	102	9	86.62	7.2	23	2	0	0
Other conifers	18	2	27.94	2.3	51	5	86	7
Mixed Conifers/ broadlvs	0	0	0	0	0	0	6	0.5
Forest open land	196	17	376.01	31.3	341	31	182	14
TOTAL FORESTED	1166	100	1200	100	1096	100	1263	100
Open Hill	707		674		777		610	
GRAND TOTAL	1874		1874		1874		1874	

9.7 Age structure

Current structure – planting dates:

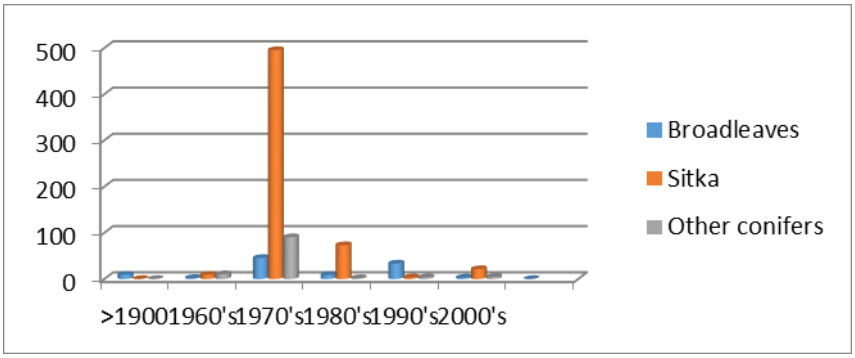


Figure 1 Planting profile - areas (ha) planted

As outlined earlier, most of the forest was planted in the 1970's and comprises Sitka spruce, with small proportions of broadleaves and other conifers. Restructuring will create a more varied age structure, with harvesting and replanting over the next forty years; the establishment of natural regeneration, through both managed and successional areas and the retention of mature broadleaves in riparian zones. The largest area of planted broadleaves will be planted between 2020 and 2024.

Future structure – planting and natural regeneration areas (ha):

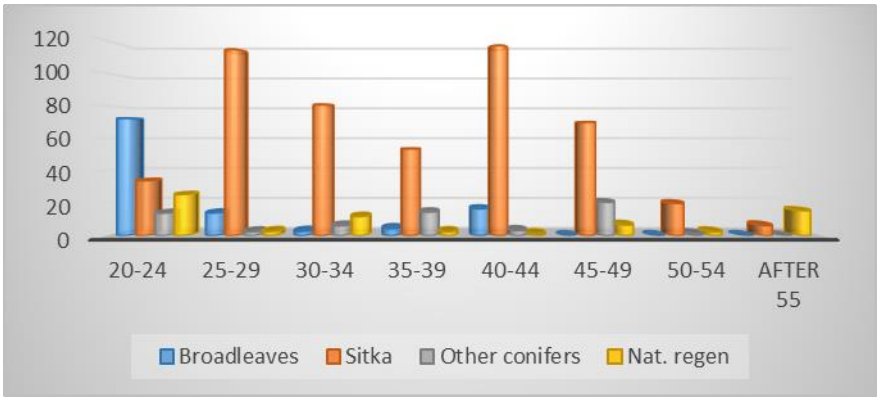


Figure 2 Time profile of proposed areas (ha) to be planted and established (natural regeneration)

9.8 PAWS restoration

The major part of the ASNW and PAWS zone is being managed but conifers remain in significant areas of PAWS. These conifers will be clear felled and natural regeneration of native broadleaves encouraged, with supplementary planting where necessary. Moving forward, PAWS/ASNW areas will be managed as a discrete entity, clearly defined from adjacent coupes but management will be co-ordinated to ensure the retention of wildlife corridors and links to other semi-natural habitats. For example, broadleaved woodland will be planted to link the area zoned for Chequered Skipper butterfly habitat with the riparian woodland and ASNW/PAWS areas. Maps 14 & 19 identify ASNW, PAWS and riparian woodland.

Much of the ASNW/PAWS and minimum intervention areas cover riparian zones, but the forest has many other burns and gullies running into the Salachan burn (river), some of which have conifers planted right up the edge. In the North-Eastern section of forest, the catchment at risk will be managed to encourage the establishment of native broadleaves with at least 20% open canopy, to protect water quality and provide optimum habitat for invertebrates and fish.

Map 14 shows the areas of ASNW/PAWS and areas of minimum intervention, where the priority will be to maintain cover of native broadleaved species through natural regeneration and successional processes, once any non- native conifers are removed.

Conifer removal will only be required in the margins of the largest areas of riparian habitats running north and south from the burn (in coupes 45720 and 45726). The main part of these coupes will be under minimum intervention.

9.9 Woodland expansion

Modest expansion of the forested area will be achieved through both planting and natural regeneration. Development of native broadleaved woodland along the steep riparian gullies in the northern part of the forest and expansion of riparian

woodland into the open field at Achvlair (45719) will be achieved through encouraging natural regeneration of native broadleaved species. The upper part of the field will be planted with mixed broadleaves for productive woodland.

Further expansion of the existing birch woodland on the hill in the south eastern section of the forest (coupe 45739) will also be achieved by encouraging natural regeneration, primarily through deer control, with the aim of increasing canopy cover and only a modest expansion further up the hill.

9.10 Management of open land within the forest

The area of open/successional land within the forest area will eventually be 182 ha but with the aim of maintaining at least 8.5 ha that are truly open ground, excluding roads/rides. The open broadleaved canopy habitat required for Chequered Skipper butterfly will be maintained and expanded. Open ground linking to the hills will also be maintained but an open canopy structure of native woodland regeneration will be encouraged in some places above the timber line, as described previously. At least 610 ha of hill within the LMP area will be maintained as open hill ground in the longer term (651 ha over the next 10 years). This zone will be monitored and managed where necessary to protect and maintain the SPA habitat in favourable condition.

Identified areas where in-check conifers are left to grow on as minimum intervention will be managed to maintain at least 40% open ground. Where in-check conifers are felled, natural regeneration of native broadleaves will be allowed and encouraged; also allowing for 40% open ground.

9.11 Management of hill ground

Management of hill ground will take into account the requirement to maintain favourable habitat for protected species, including raptors.
Where it is appropriate, and in compliance of all obligations under natural heritage designations, further woodland expansion will be considered, including natural regeneration of native broadleaves and planting of conifer and broadleaved trees. A separate exercise will be undertaken to investigate the feasibility of woodland expansion on the Scottish Forest Estate ground to the south; its potential scope, opportunity and constraints.

9.12 Deer management

Deer will be managed to minimise damage from browsing and its impact on growth of planted and naturally regenerated trees. Management operations will be determined by evidence of deer damage, collected via regular monitoring of deer presence and grazing impacts.

Deer management at Bealach is planned and implemented with the Blackmount Deer Management Group, of which FLS is a member, and includes deer control within a strategic deer fence. Deer control is necessary to protect growing trees, maintain biodiversity and reduce environmental degradation. A targeted approach is preferred rather than fencing individual blocks, taking into account environmental and access issues, shared costs, benefits and budgetary constraints.

A Deer Management Plan for Bealach and the surrounding area is provided in Appendix 6.

9.13 Access

Approximately 9.5 km roads will be constructed (approx. 7 km during 2019-28) and 20 km ranger tracks will be upgraded, improved or maintained during the life of this plan.

Most of the road construction in the northern part of the forest, north of the Salachan burn, will be completed by 2029, enabling harvesting and facilitating removal of larch if required.

New roads in the southern section of forest will be completed by 2039, with the 620 m road into coupes 45713 and 45714 completed earlier. A firm decision on routes will be taken following a detailed Civil Engineering survey and will be partly dependant on whether the areas identified with poorer growth are felled or left as successional, along with the natural regeneration of broadleaves and conifers that is already occurring.

In the longer term, other low key ATV track extensions (approx. 850 m) will be considered to facilitate the management of restock sites and improve access for deer extraction, which will improve the effectiveness of deer control.

Appendix I: Woodland Types Present in the LMP Area

Prescription	Species	Establishment	Density	Management Objectives
Conifer plantation	SS; also NS, LP, RC	Planting	> 2500 stems / ha	Timber production
Productive broadleaves	BI	Thinning existing stands Planting new woodland	Thinning to 800 – 1000 stems / ha (younger trees) and 400 – 500 stems / ha (older trees) Planting > 2500 stems / ha	Small roundwood and firewood production
Native broadleaves	BI, OK, ROW, WL, HAZ, WCH	Natural regeneration	100 – 500 stems / ha	Environmental, amenity
Riparian woodland	OK, BI, HAZ, WL, CAR,	Natural regeneration	100 – 500 stems / ha	Environmental, amenity
Successional woodland	MC, MB	Natural regeneration from planted or regenerated trees	100 – 1000 stems /ha	Environmental, amenity, small roundwood and firewood production

Appendix II: Coupe details for clearfell and establishment for the first 10 years

Clearfell

Coupe	SS	Larch	LP	NS	Other conifers	BI	Oak	Other BL	Open/ Successional	Total
45697	15.00	-	-	-	0.23	-	-	-	3.37	18.68
45708	4.57	8.61	-	-	4.42	1.79	-	-	1.61	21
45729	7.34	2.17	-	-	-	1.23	-	-	5.67	16.41
45678	6.13	6.37	6.64	-	-	-	-	-	3.26	22.38
45682	19.69	3.55	-	-	-	-	-	1.48	7.11	31.83
45685	12.85	2.4	-	-	-	0.03	0.49	-	2.67	18.44
45691	18.79	-	-	-	-	1.26	0.01	-	3.38	23.44
45693	32.69	0.10	-	-	-	-	-	0.06	7.54	40.4
45701	1.18	-	-	-	-	-	-	0.52	0.26	1.96
45704	1.05	-	-	0.37	0.32	-	-	0.38	1.25	3.48
45725	-	0.51	-	-	-	0.51	-	-	0	1.02

Restock

Coupe	SS	Larch	mixed Con	BI	Mixed BL planted	Mixed BL nat. regen.	Mixed Con/BL	Open/ Successional	Total
45697	17.93	-	-	-	-	0.75	-	0	18.68
45708	-	-	-	-	5.5	1.56	13.94	0	21
45729	16.41	-	-	-	-		-	0	16.41
45678	13.29	-	-	-	9.1		-	0	22.38
45682	25.95	-	-	-	-		5.88		31.83
45685	7.61	-	2.45	-	1.74		5.37	1.27	18.44
45691	18.52	-	-	-	-	-	-	4.92	23.44

45693	32.44	-	-	-	-	-	4.38	3.58	40.4
45701	-	-	-	-	1.96		-	0	1.96
45739b						9.2*		13.8	23.00
45711					5.42	3.07		0	8.49
45719					4.76	5.81**		4.31	14.88

** Expansion into open or successional ground, which includes some existing native broadleaved tree cover. Total coupe area is 65.75 ha; 42.75 ha of which supports open canopy native birch woodland and scattered trees*
***Expansion into open ground formerly used for agriculture (livestock grazing, rough pasture)*

Notes on coupe work schedule

Coupe	Notes
45697	Primarily SS plantation with scattered broadleaves, mainly BI, along riparian zones. To be restocked with SS with natural regeneration of mixed broadleaves along riparian zones. Consider potential to improve forest edge for Black Grouse by allowing/ encouraging expansion of the existing natural regeneration at the margin.
45708	Stands of SS, JL and NF; part of the area has already suffered wind blow. Oak and other broadleaves along margins and riparian zones should be retained and the large riparian area to the west of the coupe should be protected during felling and restocking operations. Pine marten resting place in riparian area should also be avoided. Restock with mixed broadleaves in the northern section of coupe close to the road by planting and natural regeneration and with planting mixed conifers and broadleaves in the remainder of the coupe. Consider potential to improve forest edge habitat for Black Grouse by reducing restocking density at the margin with the open hill and allowing some natural regeneration, to create a gradation of dense to open canopy to open hill.
45729	Coupe is mainly SS, with some JL and has suffered some wind blow previously. Coupe is bounded by open broadleaved habitat to east and west of the coupe, which should be protected during operations. Broadleaves should be retained at coupe margins and the roadside where possible. Restock with SS.
45678	Coupe runs along NW edge of the forest block and includes linear stands of JL at the margin. The rest of the coupe is stocked with SS and LP. Following clear felling, restock with SS, including MB along margins and tracks. Be aware of Pine Marten activity within coupe.
45682	Coupe in northern section of forest containing SS and some JL, on variable soil types and YC but generally better growth than in other parts of the block. Coupe is bisected by the new road running south from Duror forest, so coupe is accessible. Restock primarily with SS and small areas of SS/BI mixes on poorer soils, planted in groups rather than intimate mixtures.
45685	Complex geology and soils with variable growing conditions but relatively sheltered lower slopes. Mainly SS with some JL plus OK and BI. Retain OK, BI and any other native broadleaves where possible and restock with SS and MC. Plant OK, BI, HAZ and other locally native broadleaves in area close to the ASNW and PAWS in the riparian corridor.

45691	SS plantation with small areas of OK and BI. Coupe is bounded by open canopy broadleaved riparian woodland in two sides – west and south – so operations should avoid buffer zone, retain broadleaved trees and protect watercourses. Retain OK, BI and other broadleaves, particularly on coupe margins, when felling the SS and avoid Pine Marten resting place that lies on western coupe margin, close to riparian area.
45693	Large coupe in northern section of forest with generally better YC but wind blow risk in untested. Western boundary of coupe is bounded by large gulley and coupe lies in vulnerable catchment at risk of acidification, so operations must protect riparian zone, keep well back from, and protect, gulley and other smaller watercourses. Existing SS and JL to be restocked mainly with SS, plus small area of mixed SS/BI on poorer soils and locally native MB along riparian zones, including the many small watercourses that cross the coupe.
45701	Small coupe in riparian zone along main Salachan burn. SS to be restocked with MB in open canopy structure with 50% open space, or 50% canopy cover at maturity. Protect watercourse and riparian zone during operations, which must comply with Forestry and Water Guidelines and all UKWAS requirements. Avoid disturbance to otter holt in eastern part of coupe, just north of Salachan burn.
45704	Small coupe in main Salachan Burn riparian zone. SS with some NS and NF; identified as LTR in previous plan. Conifers to be felled and restocked with locally native MB by natural regeneration and supplementary planting where required (target for establishment is 2031). Open broadleaved canopy exists across part of coupe, which should be retained when felling conifers. Aim to achieve 50% open canopy at restocking.
45725	Small stand of JL and BI surrounded by open canopy broadleaved stands in adjacent coupes. JL to be felled, BL retained as much as possible and restocked with native MB by natural regeneration. Target restock date for natural regeneration is 2031; opening up a relatively small area within existing broadleaved woodland may increase vulnerability to deer browsing and will require careful deer management.
45739	A large part of the total coupe area of 65.75 ha already supports naturally regenerating birch woodland, from open canopied woodland in places to scattered trees in others. The proposal is to allow and encourage natural regeneration of native species further up the hill, particularly focusing on gullies, to link the areas of existing native woodland and to create a mosaic of open canopy birch woodland and open heathland. Regeneration will be achieved by deer management, reducing grazing pressure.

Appendix III

Program of work – 2019 – 2028
(Species in brackets cover < 20% of the area)

Coupe	Period	Fell Species	Objective	Restocking Species	Objective	Notes
Fell and Restock						
45697	1 (2019-23)	SS (NF)	Clear fell conifers, retaining any native BL along gullies /riparian zone. Protect watercourses during harvesting operations.	SS (BI)	Plant with SS, leaving a buffer of at least 10 m around smaller watercourses/gullies, allowing natural regeneration of BL along riparian/gullies, leaving at least 20% open canopy in riparian.	
45708	1 (2019-23)	JL, SS (BI, NF, WH)	Clear fell conifers, retaining native BL along riparian zone	MB / MC (BL, OK)	Plant with MB in northern section of coupe close to road and MB/MC in southern section (60% MC/40% MB). Allow natural regeneration of native BL along riparian zone to create open canopy, with 50% shade. Supplementary planting of native BL if regeneration is sparse, favouring OK.	

45729	1 (2019-23)	SS, JL (BI)	Clear fell conifers, retaining BI and other BL at margins where possible and minimise disruption at margins with adjacent coupes 45723 (Chequered skipper habitat) and 45726 (open canopy native broadleaved woodland).	SS	Plant with SS and allow natural regeneration of native BL at coupe margins / boundary with broadleaved woodland habitat in 45723 and 45726.	
45678	2 (2024 - 28)	JL, LP, SS	Clear fell conifers, retaining BL along rides and coupe margins where possible.	SS, BI, (MB)	Plant with SS throughout coupe apart from strip of BI on western margin, which will be planted at 2 m spacings.	
45682	2 (2024 - 28)	SS (JL)	Clear fell conifers, retaining any BL along road side where practical.	SS, BI	Plant SS throughout coupe, with small mixed stands of SS and BI (60% SS/ 40% BI) as indicated on the map, where soils are poorer, with the aim of improving soil conditions. SS and BI to be planted in groups rather than intimate mixtures.	
45685	2 (2024 - 28)	SS (JL, BI, OK)	Clear fell conifers, retaining BL,	SS; Native BL (OK, HAZ, BI,	SS throughout eastern section of coupe and SS mixed with stands of BI	

			especially OK. JL may need to be felled early in the event of a SPHN	CAR, ROW, WL); MC (NF, NS, LP, RC) in area close to riparian	(70% SS / 30% BI) in the western section. Plant native BL, mainly OK, HAZ, BI, CAR, ROW along riparian zone, accepting natural regeneration of locally native BL where this occurs. Further increase diversity by planting a narrow area of MC adjacent to riparian area, where more fertile soils and improved shelter provide suitable growing conditions to support a wider range of species.	
45691	2 (2024 - 28)	SS (OK, BI)	Clear fell the SS, retaining BL, especially the OK, BI and other native BL close to the gulley/riparian zone. Protect riparian zone during harvesting operations. Remove any conifers growing in riparian areas, including PAWS in adjacent coupe 45720. In this	SS; native BL including OK, BI, HAZ, ROW, CAR, WL)	Coupe is dissected by various small watercourses running NE to SW. Plant SS throughout coupe keeping well back from the watercourses /gullies, leaving a buffer of at least 20 m. Allow natural regeneration of site native species, along all watercourses, but especially the larger riparian area at the western margin of the coupe. Plant with native	

			area, fell to recycle individual trees where extraction would cause damage to riparian area.		BL if regeneration fails. Maintain 50% canopy cover in the larger riparian area at the western zone (45691b and 45720a).	
45693	2 (2024 - 28)	SS (JL)	Clear fell conifers, retaining any BL along riparian zone. Coupe is in vulnerable catchment at risk of acidification, so particular care should be taken to minimise soil disturbance during extraction and time works to avoid extremes weather conditions – run-off during wet weather and soil shrinkage during very dry weather. Protect watercourse during operations. Remove any conifers from riparian areas.	SS; native BL (BI, HAZ, WL, ROW, HAW) natural regeneration along riparian	Most of coupe to be planted with pure stands of SS apart from 4.38 ha where soils are poorer, which will be planted with 70% SS and 30% BI. Also, the large riparian zone at the western margin, and smaller gullies that run NE to SW in the eastern section of the coupe. Conifers should be kept well back from these areas with a buffer of at least 20 m in the larger riparian area to the west and 10 for the smaller gullies to the east. Allow natural regeneration of native BL in these areas, retaining at least 50% open space in the large riparian area and 20% open ground along the smaller watercourses. If natural regeneration in the larger riparian zone	

					is sparse then enrichment plant with BI, WL, HAZ, ROW, OK.	
45701	2 (2024 - 28)	SS	Clear fell conifers, retaining any BL. Protect riparian area during operations.	Native MB – including BI, HAZ, WL, HAW, WCH, OK.	Plant mixed BL, retaining 20% open space throughout coupe and average of 50% open canopy along watercourses.	
45704	2 (2024 - 28)	SS (NF, NS)	Clear fell conifers, retaining any BL where possible, for conversion to open MB woodland.	MB – including BI, HAZ, WCH, OK.	Monitor natural regeneration. If unlikely to establish through NR by 2031, plant MB, retaining 40-50% open ground and maintaining 50% canopy cover along riparian areas.	
45725	2 (2024 - 28)	BI, JL	Clear fell small stand of JL, retaining BL where possible and minimising disruption to surrounding open BL woodland and riparian area/gulley.	Native BL – including BI, WL, CAR	Allow felled area to regenerate naturally with native BL. Deer control to protect regenerating broadleaved trees.	
Restock only						
45711	1 (2019-23)	MB (BI, HA, RO, OK)	Previously felled coupe. Restock in 2020/21 by planting mixed BL, 50% BI and 30% with a range of other locally native BL; leave up to 20% open ground.			
Thin						
Coupe	Period	Species	Objectives			Notes
45705	2019 -	SS, BI,	Coupe contains a mixture of BI and SS planted in 1965 and			

	2023	MB	the 1990's. Fell and extract SS, JL and any other conifers. Thin BI to maintain 50% live crown length throughout the rotation, to maintain maximum diameter growth. Younger trees (11-14 m stand height) should be thinned to 800- 1000 +/- 100 stems per ha, maintaining 50% crown length. Second thin of younger trees expected when they are approx. 20 m stand height. Older trees (18 – 20 m stand height) – crown thin to favour dominant trees leaving 400 – 500 stems / ha. Promote other species during thinning to diversify species mix.	
New planting				
Coupe	Period	Species	Objectives	
45719	2021	BI, OK, MB	New planting of native BL, 60% BI, 20% OK, 20% MB in 4.76 ha at top of field. Avoid planting area (4.31 ha) around ruined buildings and archaeological features, and near small burn to East of coupe. Natural regeneration of native BL in lower section of field (5.81 ha), expanding trees north from burn (see Environmental, below). Enrichment plant with locally native species if natural regeneration is too sparse.	
Environmental				
Coupe	Period	Objectives		
45723	2019-28	Maintain open canopy broadleaved woodland habitat for Chequered skipper butterflies – remove any non-native regeneration or dense canopy; control deer to reduce deer browsing.		
45739	2019-28	Encourage natural regeneration of native broadleaves; reduce browsing pressure by controlling deer numbers.		
45720	2019-28	Successional – riparian woodland; remove any conifers during operations when clear felling 45693 and 45691.		
45708, 45697 & 45729	2019-23	Remove conifers from riparian area when clear felling coupe. Retain broadleaves in riparian and at coupe margins.		
45685	2024-28	Remove conifers from riparian area when clear felling coupe. Retain broadleaves in riparian and at coupe margins.		

45718 & 45719	2019-28	Deer control to promote natural regeneration of native broadleaves within 45718 and northwards into 45719. Monitor regeneration and supplement with planting of locally native broadleaved species if necessary. Remove regenerating trees from around wet flush and the archaeological remains to retain open area, as indicated on map.	
45725	2019-28	Deer control to promote natural regeneration of native broadleaves throughout coupe. Felling existing larch stand will in middle of open broadleaved woodland will create conditions that are attractive to deer.	
Roads			
Coupe	Period	Objectives	
45678	2024 - 2028	Approx. 1.7 km new road required to access felling coupe 45678, which will also improve access to coupes 45681 and 45680 which contain larch and will assist if felling needs to be brought forward felling in the event of a SPHN.	
45685	2024 - 2028	A further 2.1 km new road (approx.) required to access felling coupe 45685, which will also enable access to adjacent coupes in event of an SPHN. Steep slopes will require several switchbacks and a longer stretch of road, which out of necessity will cross the gulley and cut through riparian woodland. Care required to minimise impact on watercourse and Salachan burn into which it feeds.	
45691	2024 - 2028	Approx. 1.5 km new road required to access coupe, which needs to cross gulley. Care required to protect watercourse and riparian area. Road will cross open ground at top of gulley – need to minimise landscape impact.	
45693	2024- 2028	Approx. 604 m new road required to access coupe. Route passes through a vulnerable catchment at risk of acidification and crosses several small gullies.	
45713 & 45714	2024- 2028	Approx. 620m road required to access these coupes, which are not scheduled for harvesting in the next felling programme (i.e. between 2019 and 2028) but which contain large areas of larch and may need to be felled early in the event of a SPHN.	

Appendix IV

Species suitability in two coupes, as representative examples of the range potential across the forest (*NB only species that are suitable or marginal are listed):*

Coupe	Suitable species	Suit (Ecol)	Suit (Timber)	Yield	Limiting factor
45686 (lower slopes)	Corsican pine	S	M	7	SMR
	Lodgepole pine	VS	VS	12	SNR
	Macedonian pine	S	S	8	SMR
	Scots pine	M	M	4	SMR
	Norway spruce	S	S	12	SMR
	Serbian spruce	M	M	11	SMR
	Sitka spruce	S	S	19	SMR
	Sitka spruce (Imp)	S	S	21	SMR
	Western Red Cedar	S	S	16	SNR
	Coast redwood	S	M	12	SNR
	Lawson's cypress	S	S	13	SMR
	Downy birch	VS	VS	7	SMR
	Norway maple	M	M	4	SMR
	Pedunculate oak	M	N	2	SMR
	Aspen	S	S	7	SNR
	Common Alder	S	S	7	SNR
	Red Alder	VS	VS	10	SNR
	Grey alder	VS	VS	10	SMR
	Italian alder	S	M	5	AT5
	Cider gum	S	S	17	SMR
	Hornbeam	M	M	3	SMR
	White willow	M	M	3	SNR
45682 (higher slopes)	Lodgepole pine	S	M	7	MD
	Macedonian pine	M	M	6	MD
	Scots pine	M	U	4	SMR
	Norway spruce	M	M	8	DAMS
	Sitka spruce	S	S	15	SMR
	Sitka spruce (imp)	S	S	16	SMR
	Western red cedar	M	U	6	DAMS
	Coast redwood	M	U	5	DAMS
	Downy birch	S	S	4	DAMS
	Pedunculate oak	M	U	1	SMR
	Aspen	S	M	6	DAMS
	Common alder	M	U	3	DAMS
	Red alder	S	M	6	DAMS
	Grey alder	S	M	4	MD
	Cider gum	M	U	6	DAMS
	White willow	M	U	2	SNR

VS = Very Suitable; S = Suitable; M = Marginal; U = Unsuitable
AT5 = Accumulated Temperature (day degrees above 5 C); MD = Moisture Deficit;
SMR = Soil Moisture Regime; SNR = Soil Nutrient Regime; DAMS = Detailed Aspect Method of Scoring (measure of exposure)

Appendix V Consultation record

Consultee type	Consultee	Date contributed	Reply received	Issue	FES response
Community Council	Charles Fotheringham (Appin Community Council)	11/05/18		Raised concerns that the Bealach Land Management Plan does not include comprehensive deer fencing. In the absence of a proper deer fence around new plantings, a large number of deer will be absorbed by the forestry and then shot. Plan includes proposals to re-establish a natural treeline and these trees will not properly be protected if there is no deer fence. Required clarification about "strategic" fencing and where deer fences would be erected.	We manage the National Forest Estate to deliver a range of environmental, social and economic benefits. As well as protecting growing trees destined for timber, we also need to reduce the negative biodiversity impact of deer grazing and browsing on semi-natural habitats e.g. native woodland, mountain, moorland, grasslands, wetlands etc. and on designated sites. At Bealach, this includes the Special Protection Area, where high deer grazing and browsing levels can potentially degrade the features upon which the area has been designated. Our deer management is in line with Government policy and outlined in Forest Enterprise Scotland's strategy, Deer Management on Scotland's National Forest Estate. Forest Enterprise Scotland (FES) have adopted a partnership approach to landscape-scale deer management,

					working with Deer Management Groups. Where possible, we set management strategies at a landscape scale to determine how best to integrate management objectives and maximise benefit delivery. Our management is also in accordance with the UK Woodland Assurance Scheme which requires that appropriate wildlife management and control shall be used in preference to fencing. Therefore, culling is generally our preferred approach. In situations where fencing is an appropriate part of a co-ordinated and integrated deer management plan, deployment will be across wider areas, in partnership with Deer Management Groups, rather than fencing individual forest blocks. Their use must be targeted for maximum effect, taking into account environmental and access issues, shared costs, benefits and budgetary constraints. There are no plans to include a separate deer fence at Bealach and

					deer culling will be the preferred means of control.
Internal scoping	Operations, Environment, Planning and Programming teams - FES	09/02/18		<u>New planting</u> Open field at Achvlair – expansion of oak/hazel/birch woodland up the hill may require fencing if upper portion of field is retained as agricultural. Planting of upper portion with productive broadleaves or conifers would require a change from agricultural use and an EIA determination. Area would require deer fencing until deer numbers are reduced significantly. <u>Tree line</u> Agreed that we should maintain the current tree line (conifers) apart from areas where planting has failed /not doing well and allow / encourage expansion of tree line with native woodland (primarily birch) to create expansion of tree line with natural edge - conifer stands with birch transition zone to open hill.	

				<u>Harvesting /Restocking</u> The presumption is to maintain the present area of productive conifers apart from areas where there are different objectives e.g. higher conservation priorities such as PAWS or riparian areas. Strengthen broadleaves in riparian zones, gullies and on roadsides where appropriate. Look at areas in N and S where conifer growth is poor and sparse. Thin broadleaves - between road and burn and remove conifer invasion. Review LTRs - current coupes identified for LTR are not appropriate. Consider reinstating old track along riparian zone (indicated on OS map) to enable deer control below road. This track is machine built – hard standing. <u>Conservation</u> Maintain open ground / open broadleaved habitat for Chequered skipper – where identified close to road.	

				Consider management of open ground vs expansion of birch woodland above current tree line – maintain habitat for eagles, grouse etc.	
Statutory	SNH	May 2018		Advised that LMP Brief was out to consultation but no comments received. Informal advice about native woodland expansion and in principle, no major issues highlighted.	
Statutory	SEPA	May 2018		Advised that LMP Brief was out to consultation but no comments received.	

Appendix VI

Abbreviations used in the plan

Abbreviation	**Meaning**
FLS	Forestry and Land Scotland
LMP	Land Management Plan
ASNW	Ancient Semi-Natural Woodland
PAWS	Plantation on Ancient Woodland Site
ATV	All Terrain Vehicle
Ha	Hectare
MAI	Mean Annual Increment (Average annual growth a tree of stand of trees has experienced to a specific age)
YC	Yield Class (Index of potential productivity of even-aged stands of trees. Measured in units of cubic metres per hectare per year)
LISS	Low Impact Silvicultural System
CCF	Continuous Cover Forestry
EIA	Environmental Impact Assessment
UKWAS	UK Woodland Assurance Standard
UKFS	UK Forestry Standard
RBMP	River Basin Management Plan
UKBAP	UK Biodiversity Action Plan
SEPA	Scottish Environmental Protection Agency
DAMS	Detailed Aspect Method of Scoring (A modelled windiness score used to calculate the probability of damaging winds occurring)
SPA	Special Protection Area
SPHN	Statutory Plant Health Notice
Species	SS = Sitka Spruce NS = Norway Spruce HL = Hybrid Larch JL = Japanese Larch EL = European Larch XL = Larch NF = Noble Fir RC = Western Red Cedar WH = Western Hemlock LP = Lodgepole Pine MCP = Macedonian Pine MC = Mixed Conifers AR = Alder CAR = Common Alder BI – Birch (downy/silver) HAZ = Hazel OK = Oak (robur/petreae ROW = Rowan

	HAW = Hawthorn WCH = Wild Cherry / Gean GWL = Goat Willow XWL = Other Willows MB = Mixed Broadleaves

Appendix VII

BEALACH DEER MANAGEMENT PLAN

Description

Bealach forest comprises commercial conifer plantation with native broadleaved woodland in riparian zones and on some hill sides, including areas of Ancient Semi-Natural Woodland (ASNW) and Plantations on Ancient Woodland Sites (PAWS). The forest lies adjacent to a designated site: the Glen Etive and Glen Fyne SPA; currently, none of the forested area lies within the SPA but if the existing native woodland develops on the hill side then this will touch the margin of the SPA.

Deer control in Bealach is managed as part of Blackmount Deer Management Group and the forest is within a strategic deer fence running from Glen Coe to Glen Creran. Location and siting of the deer fence is shown in Map 20. Migration of Red deer from neighbouring sporting estates is a potential issue if the strategic fence does not remain deer proof.

Deer species

Red and Roe Deer are common, Sika Deer are present in low density.

Population densities

Red deer populations have increased over the last three years, with in-migration from surrounding land; numbers are currently high. Roe deer are at low density.

Annual Cull figures have increased from 83 deer culled in 2016/17, to 193 deer in 2017/18.

Deer migrate freely within the strategic deer fence between Glen Coe and Glen Creran. Density was reported as generally medium on neighbouring land but in 2015, a SNH count reported 227 Red deer on neighbouring land West of Bealach. The total Blackmount DMG count in 2015 was 7969 Red deer.

Browsing levels and tree establishment issues

In recent years, soft conifer and broadleaved species have suffered high browsing levels, especially in the first years of establishment and this will continue or intensify if deer numbers are not reduced.

No formal surveys have been undertaken within the forest but surveys undertaken on the nearest neighbouring land recorded 28% leader browsing in year one (2015) and 27% leader browsing in year one (2016).

The neighbouring farm at Invernahyle has reduced sheep numbers and Red deer are now hefting on to land that historically, was grazed by sheep.

Action

Deer control
A period of intense culling activity is required within Bealach to reduce the current population. Species to be culled: Red, Roe and Sika deer, with a target of achieving population numbers of 10 deer per km/sq.
Deer control is currently by FLS staff; this will continue with contract support from 2019 / 20.

Fencing
The strategic deer fence between Glen Coe and Glen Creran should be maintained and must remain deer proof.

The existing stock fence should also be maintained.

Deer Management Protection Zones (Open Space/Glades/Corridors)

Open space / glades are vital to aid deer control; successional tree growth will be managed where necessary to retain required open space.

Access tracks are essential for deer control and carcass extraction. Approximately 6 km of access tracks will be maintained, and improved where required, and access routes to the open hill will be kept clear.