Glen Creran Land Management Plan - Appendices

Appendix I. Glen Creran LMP Brief 3

Appendix II. Analysis of Previous Plan 19

Appendix III. Background Information 20

3.1 Physical Site Factors 20

Geology, Soils and Landform 20

Water 20

Climate 20

3.2 The Existing Forest 21

Age Structure, Species and Yield Class 21

3.3 Neighbouring Land Use 22

3.4 Landscape 22

Landscape Guidelines 23

Landscape Designations 23

3.5 Environmental Designations 23

SSSI/SAC/SPA 23

Archaeology / Scheduled and Unscheduled Monuments 24

3.6 Habitats 24

3.7 Species 24

3.8 Biodiversity 24

3.9 Social Factors 25

Recreation and Community 25

Appendix IV. LMP Consultation Record 26

Appendix V. Deer Management Plan 43

Appendix VI. Provenance Guidance Chart 46

Appendix VII. Abbreviations Used in the Plan 47

Appendix VIII. Coupe Prescriptions 49

Appendix IX. Productive Forestry – Species Selection 58

Appendix IX. Glen Creran SSSI Management Plan 61

Maps

Map 1 - Glen Creran location map
Map 2 a - Creran upper glen concept map
Map 2 b - Creran lower glen concept map
Map 3 a - Glen Creran Management map upper zone
Map 3 b - Glen Creran Management map lower zone
Map 3 c - Creran phase 1 & 2 felling
Map 4 a - Glen Creran North thinning map
Map 4 b - Glen Creran South thinning map
Map 5 a - Creran N future habitats & species map
Map 5 b - Creran N phase 1 & 2 restock
Map 5 c - Creran S future habitats & species map
Map 5 d - Creran S phase 1 & 2 restock
Map 6 a - Glen Creran planned roads
Map 6 b - Creran – location of BLs along planned roadline
Map 6 c - Creran access provision
Map 6 d - Creran upper spur planned road
Map 6 e - Creran lower spur planned road
Map 7 a - Creran S current recreation provision
Map 7 b - Creran S proposed new recreation provision
Map 8 a - Creran N Conservation & heritage
Map 8 b - Creran S Conservation & heritage
Map 9 - Creran S water
Map 10 a - Creran upper glen – analysis map
Map 10 b - Creran lower glen – analysis map
Map 10 c - Creran landform analysis
Map 11 - Creran planting years
Map 12 a - Creran N current species
Map 12 b - Creran S current species
Map 13 – Creran current yield classes

Appendix I - Land Management Plan Brief

Land Management Plan Brief - Glen Creran, West Region

Date: 20/11/19

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Description

Glen Creran forest lies about 21 km NE of Oban and is accessed from the public car park at Elleric, towards the end of the minor public road that runs along the glen. The Land Management Plan (LMP) area covers 2,482 ha of forest and open land that extends from sea level to 760 metres, with conditions varying from sheltered glens to exposed hillsides and sub alpine conditions at the highest elevations.

Creran comprises two distinctive zones: the upper part of the forest supports productive conifer plantation while the lower part is native broadleaved woodland, mainly Ancient Semi-Natural Woodland (ASNW) designated as the Glen Creran Woods SSSI and SAC. The commercial conifer planting is predominantly Sitka spruce with some larch, Scots pine and other conifer species, planted in the 1960's, with small areas of 1970's planting.

The southern margin of the native woodland zone, in the lower glen, lies adjacent to the Glasdrum National Nature Reserve. The forest is bounded by Scotland's National Forest and Land holdings of Duror and Bealach to the West and Brecklet to the North - the open hill is contiguous between these blocks, with private estates neighbouring to the East, South and North-West.

The forested area covers 1,185 ha, comprising currently, 697 ha conifers (72% of the current tree cover) and 269 ha broadleaves (28% of the current tree cover). The open ground extends to 1,365 ha, the majority of which is hill ground.

There are two areas of SSSI/SAC in the lower zone, separated by commercial conifer coupes. The coupe on the lower ground here has been felled and deer fenced and is regenerating naturally with native species but the coupes on the upper slopes await felling.

Social Factors

Creran forest lies at the upper end of Glen Creran, the lower part of which has ribbon settlements of individual houses and farms along its length - but the nearest village settlements are Appin, approximately 7 km to the West and Barcaldine 8 km to the SW. The land to the East of the forest is a shooting estate. One private house lies in a plot within the FLS land holding.

The public car park at Elleric, which lies in the native woodland part of the forest, is well used by visitors who use the trails through the native woodland, by hillwalkers for the Munros and by some of the walkers using the Public Right of Way to Glenachulish.

Environmental Factors

Most of the open ground adjacent to the Glen Creran LMP area is covered by the Glen Etive and Glen Fyne SPA but this designation does not extend into the forested zones. However, the potential impact on the SPA would need to be assessed if the woodland is expanded above the current tree line.
The Ben Nevis and Glen Coe National Scenic Area touches the open land at the northern end of the forest.
The Loch Etive Mountains Wild Land Area lies East and NE of the forest and extends slightly into the open land in the NE part of the block.
Glen Creran Woods SSSI and SAC extends over most of lower Glen Creran, including much of the lower section of the Creran forest block. The Glasdrum National Nature Reserve is adjacent to the southern boundary of the forest block.

The River Creran runs along the eastern boundary of Creran forest and drains into Loch Creran, which is a marine SAC and a designated shellfish area. Salmonids spawn in the river and other main watercourses. Loch Creran, the Firth of Lorn and Loch Linnhe are potentially vulnerable sea lochs, which can be affected by forestry activities.

Overall, environmental condition of Loch Creran and the Firth of Lorn are Good, with high scorings on physical condition and freedom from invasive species. While the condition of River Creran dropped from Good to Moderate between 2014 and 2017 – for pre HMWB (Heavily Modified Water Body) status, physico-chemical, biological, fish ecology conditions and presence of barriers to fish migration – its overall condition is currently Good. The condition of the shellfish water protected area in Loch Creran was fair in 2014 and is still not at target objective. A number of private water supplies are drawn from Creran forest.

The Scottish Natural Heritage Landscape Character Assessment describes the Landscape Character type in Glen Creran as “Upland Glens – Argyll”. Key characteristics are:

- Flat glen floor of narrow, linear mountain glens with a sharp break of slope at glen sides

- Long ribbon lochs in lower glen; glacial moraine creates uneven landform with small, rounded lochs on floor of upper glen
- Mudflats and winding creeks at loch heads and at the mouth of the glen
- Meandering river, fringed with groups of trees, contrasts with rectangular pastures drained by straight ditches
- Small blocks of woodland and some conifer plantations
- Linear settlements strung out along lanes at the foot of the steep side slopes
- Castles and estates are important local landmarks.

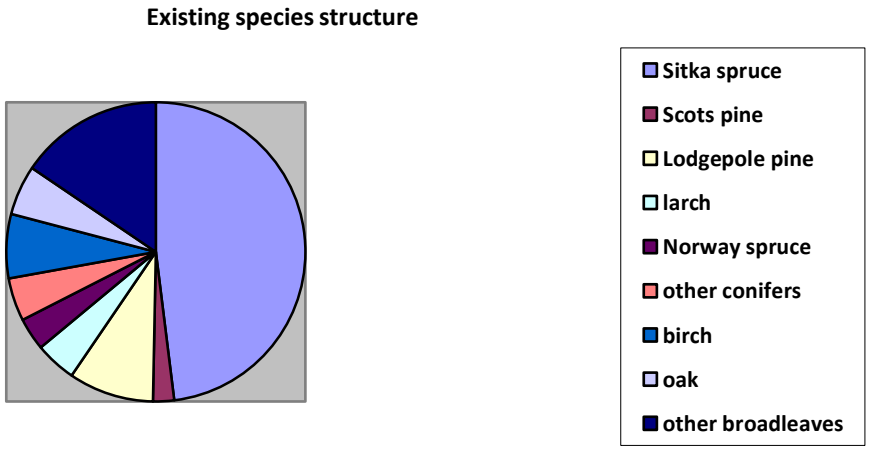
The specific landscape guidelines include plantations remaining small in scale, not obscuring distinctive landforms and maintaining rivers as focal points. However, this is not entirely applicable to Creran, given that it is a large forest and the upper glen is quite a broad, open landscape from the perspective within the glen.

The conifer forest is located nearer the head of the glen and is much less visible than the native forest lower down. Visibility of slopes planted with conifers is very limited from locations outwith the forest, other than from surrounding high ridges.

Priority species include Chequered skipper and Pearl bordered fritillary butterflies; Red squirrels, Golden eagles; Pine martens; lichen assemblages. There is one scheduled and 21 unscheduled ancient monuments in the LMP area.
Rhododendron ponticum has infested the native woodland area and isolated bushes are even found in the Coires and higher ground. A partnership project has been successful in removing most of the bushes but an ongoing programme to remove regeneration and new growth is underway.

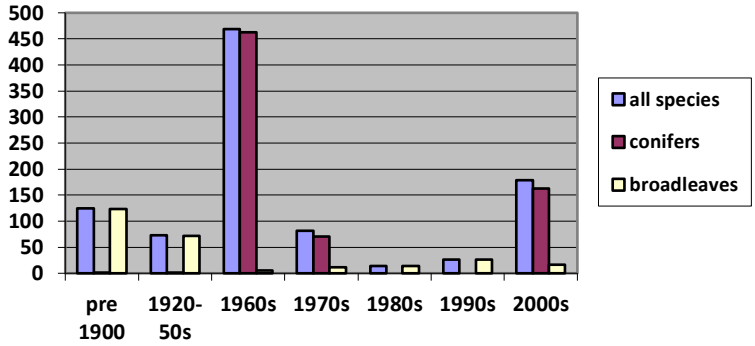
Economic Factors

Of the forested ground, 697 ha is under commercial conifers and 269 ha of broadleaves, with a further 58 ha of felled, failed or windblow, some of which is designated for restock, under the current LMP.



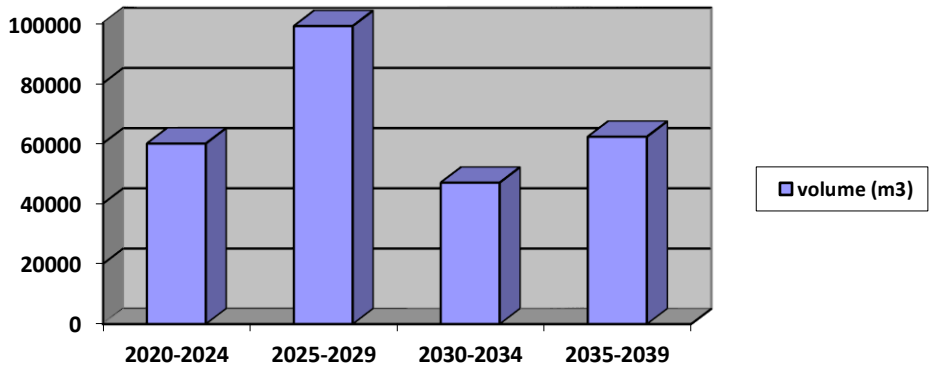
Tree cover in the upper zone is dominated by Sitka spruce, with broadleaves mainly in the lower, native woodland, zone. For the commercial crop, a challenge will be to increase diversity to improve resilience, while maximising productivity. There is 45 ha of larch, which is vulnerable to Phytopthora ramorum and plans to harvest these at the earliest opportunity will be reviewed.

The forest is even-aged, with around 49% planted in the 1960's and further significant planting in the 2000's; the pre 1900 trees are broadleaves. A relatively large area is at, or close to, economic maturity.



Area of tree cover per planting / establishment period

This relatively poor age diversity impacts both the flow of timber from the forest over time and on the structural and visual diversity of the forest. The 20 year production forecast, based on the existing LMP felling programme, predicts production volume spiking during 2025 –2029 then dropping - felling, on average, 21 ha annually for the next five years, rising to around 30 ha per year between 2025 and 2029.



Total conifer volume production (m^3) per felling period over the next 20 years

Many of the coupes to be harvested later in the felling programme will be past their optimum rotation age at felling. Some restructuring of coupe sizes and felling sequences may be required, to optimise production of the most promising coupes and even-out production, while bearing in mind the need to diversify age, species and spatial structure. Tree growth is quite variable across the forest, reflecting differences in soils and other growing conditions, so there may be opportunities to delay felling of some coupes beyond the normal rotation age. Restocking of the worst affected areas will be reviewed, to avoid the wettest and poorest soils conditions. Windblow has not been too great a problem to date, so the slower growing areas may be sufficiently stable to enable some retention to older age classes. Problems with deer incursion has resulted in patchy growth in some areas, which will impact on production volumes from the coupes in question. This needs to be taken into account when designing felling sequences and the problem addressed for subsequent restocking.

In the upper glen, there will be a presumption to maintain optimum production levels in the longer term, subject to maintaining suitable buffers around riparian zones and addressing the issue of whether to maintain or reduce current conifer tree lines - and potential expansion of broadleaf cover. Consideration will be given to growing productive broadleaves, as well as maximising alternative conifer species, to improve structural and species diversity, while maintaining productivity.

A 0.5 MW Hydroelectric scheme has gained approval for development on the Allt Eilidh burn in the NW section of the Creran forest; developed by Renewables First for Osprey Energy. The scheme will be serviced within the forest but the route and siting of infrastructure will have only limited impact on the future felling programme.

The lower section of forest will be managed as native broadleaved woodland and the aim is to maintain the SSSI / SAC in favourable condition.

The recreational trails attract people into the forest and indications are that numbers will increase, the popularity of the area reflecting the growing visitor numbers in North Argyll and Lochaber. Recreation provision will be maintained and improved where possible.
A reduction of deer browsing pressure will be required, to protect broadleaves and softer conifer species and improve the diversity and quality of open ground habitats. FLS participates in the Deer Management Group and seeks to reduce deer numbers combined with use of deer fencing that facilitates management at the landscape scale.

Achieving National Priorities Locally

The management of Scotland's National Forests and Land is guided by Scotland's Forestry Strategy 2019 – 2029 and the organisation's Corporate Plan and is informed by strategies on a range of topics, including land use, economy, climate change, biodiversity and the historic environment.

Scotland's Forestry Strategy sets out a 50 year vision:

"In 2070, Scotland will have more forests and woodland, sustainably managed and better integrated with other land uses. These will provide a more resilient adaptable resource with greater natural capital value that supports a strong economy, a thriving environment and healthy and flourishing communities."

To support the 50 year vision, the Scottish Government has identified three objectives to deliver over the next 10 years:

- Increase the contribution of forests and woodland to Scotland's sustainable and inclusive economic growth
- Improve the resilience of Scotland's forests and woodland and increase their contribution to a healthy and high quality environment

- Increase the use of Scotland's forest and woodland resources to enable more people to improve their health, wellbeing and life chances

This Land Management Plan will help deliver on these objectives, in line with FLS corporate outcomes, to ensure clear linkages through the planning framework and implementation of national and regional priorities.

The brief is also guided by the National Spatial Overview, which has identified the broad focus of effort and investment challenges for this area.
Key contributions that Glen Creran forest makes to our Priorities, Aims and Objectives are:

- Ecosystem services and additional public benefits – scenic quality and visitor attractions contribute to tourism income; sustainable timber production
- Other national commitments – PAWS restoration; rhododendron control; habitat management for chequered skipper butterfly; dealing with the potential impact of *P ramorum* on larch
- Contribution to financial sustainability – range of softwood; hydro schemes

The focus of effort and investment challenges for Glen Creran forest include:

- Improving age and species diversity to achieve sustainable timber production in the longer term
- Native / broadleaved woodland management to develop markets and maximise productive capacity from broadleaved woodlands
- Expanding native woodland to the natural tree line, where feasible
- Protecting restocking and improving open habitats through deer management / control
- Managing ASNW, designated sites and priority open habitat in favourable condition
- Management of riparian areas to protect watercourses and develop open canopied riparian broadleaved woodland
- Planning and delivering an efficient road construction programme to help optimise the harvesting programme
- Control of invasive non- native species

Critical Success Factors

Deer control will be the main critical success factor for restocking by planting or natural regeneration of both commercial and native woodland. The approach taken will be deer culling (working with the Deer Management Group) combined with the strategic deer fence and limited use of internal exclosure fences where appropriate. Close collaboration with neighbours and other partners will be crucial to successful deer management.

Where deer are adequately controlled, natural regeneration will need to be managed timeously, to achieve the desired species in all crops and to remove non-native species from the native woodland areas.

The continued control of invasive species, particularly Rhododendron, is required to protect the native woodland and commercial crops.

Access is also key – the timing of road construction to access felling coupes needs to synchronise with production requirements and this will determine the harvesting and restocking programmes.

LMP Objectives

- Maximise the returns from the current productive stands through coupe and access design and timing of harvesting
- Optimise production potential by focusing future conifer production on the most suitable areas, concentrating on the upper glen and reviewing options on steep and marginal ground
- Manage deer populations, to allow the successful establishment of planted and naturally regenerating trees and to maintain priority open ground habitats in favourable condition
- Manage recreation access by maintaining a network of trails and the Right of Way to Glenachulish; creating provision to the Fairy Bridge
- Increase the resilience of the forest to climate change and pests and disease through design and species choice
- Manage and expand the native woodland habitat, focussing on the lower glen and above the current tree line
- Manage riparian areas to protect watercourses and develop open canopied broadleaved woodland along larger watercourses
- Protect and enhance the designated sites and features.

Key Issues Identified for the LMP

(see maps 10 a & b – analysis and 2 a & b - concept)

Corporate plan outcomes and priorities	Key Corporate Actions	LMP priorities
Outcome: "FLS supports sustainable rural economy by managing the national forests and land in a way that encourages business growth, development opportunities, jobs and investments." Priority: Provide sustainable economic benefits from the national forests and land	➢ Ensure a sustainable balance between the resilience and productivity of the national forests and land ➢ Provide a sustainable supply of timber ➢ Implement the national restocking strategy ➢ Support Scottish tourism and the visitor economy through provision of visitor attractions ➢ Work to release value from rural development opportunities for reinvestment in the national forests and land ➢ Support commercial activity on the national forest estate which help to sustain rural communities	• Softwood timber production will continue to be a core objective but effort will be focused on areas where soil, topography, shelter and other environmental conditions will achieve the best growth and where cost effective infrastructure can support the necessary harvesting and forest management activities • Coupe size / shapes, felling sequences and restocking will be reviewed to better balance priorities of visual amenity; sustainable volume production; optimised costs/income; environmental benefits and resilience • We will review areas of steep ground to identify optimal restocking in these areas that balances economic benefit with safety and environment / landscape issues. Conifers will be restocked to the existing viable timber line where site, safety and environmental/landscape conditions are suitable • We will consider opportunities to create and manage productive broadleaved woodland for firewood and small roundwood, using low impact management,

Corporate plan outcomes and priorities	Key Corporate Actions	LMP priorities

		where access permits and where it is compatible with conservation priorities
		
		• 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:
		  ○ Supporting planned hydro-electric developments;
		  ○ Maintaining productive relationships with neighbouring landowners and businesses;
		  ○ Giving consideration to requests / proposals from the community and local SMEs;
		  ○ Maintaining and expanding existing path networks, improving car park facilities and signage and by maintaining access to the open hill and the Right of Way to Glenachulish
		
		• 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 (avoiding open ground priority habitats), A separate plan for open

Corporate plan outcomes and priorities	Key Corporate Actions	LMP priorities
		habitats will complement this work. Previous plans to pull back the existing tree line from high ground will be reconsidered • We will review the felling schedule in the coupes between the areas of SSSI and SAC to rationalise harvesting access and maximise native woodland restoration plans in the context of sustainable volume production from the forest as a whole • We will review the existing plans for new roads, with the aim of minimising new road construction where possible
Outcome: "Scotland's national forests and land are looked after; Biodiversity is protected and enhanced More environmental services are provided to people" Priority:	➢ Manage the forests and land to further the conservation and enhancement of biodiversity ➢ Collaborate with partners on integrated landscape-scale approaches to habitat management and restoration ➢ Protect and enhance priority species ➢ Contribute to renewable energy targets ➢ Supporting forest research ➢ Manage the historic environment assets	• We will consolidate and protect the SSSI areas by continuing to remove conifers; bringing forward felling of the conifer coupes between the SSSIs and restocking them with native broadleaves and by creating a buffer area of alternative conifers and broadleaves between the SSSIs and the Sitka spruce plantation to the north. Broadleaves and soft conifer planting will require deer fencing • We will consider the potential for thinning 2nd rotation crops for production, with a focus on the glen floor and more sheltered lower slopes, as well as opportunities for growing productive broadleaves under continuous cover forestry • We will maintain tree cover by restocking with optimum / minimum fallow, continuous cover of broadleaves and

Corporate plan outcomes and priorities	Key Corporate Actions	LMP priorities
Ensure forests and woodland are sustainably managed – by woodland expansion, increasing adaptability and resilience, and enhancing environmental benefits provided by forests and woodland	➢ Work with neighbouring landowners to control non-native invasive species, e.g. Rhododendron ➢ Improve the resilience of forests and land to impacts of climate change and tree health threats e.g. Phytophthora ramorum ➢ Contribute to Scotland's national woodland creation targets	management of ASNW/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 • Where there are areas of poor conifer growth, we will consider options for developing native woodland where site conditions are unsuitable for commercial woodland • We will review areas for Long Term Retention to improve diversity and ensure that older age classes are represented in the forests. A proportion of trees will be maintained to provide dead wood habitat, where this will have environmental benefit • Ground preparation techniques will seek to protect the soil and soil carbon at the same time as achieving rapid re-establishment of woodland cover • 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 • We will continue the programme of Rhododendron ponticum control and will monitor for encroachment of Rhododendron from neighbouring ground and remove this as soon as possible

Corporate plan outcomes and priorities	Key Corporate Actions	LMP priorities
		• 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 Creran will contribute towards achieving the objectives of The River Basin Management Plan (RBMP) by:- ○ Addressing any local water body deteriorations within the plan area - removing conifers from the riparian zone and expanding native broadleaved riparian woodland ○ 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 • Open habitats will be maintained in good ecological condition. A clear rationale for planting open ground will be agreed

Corporate plan outcomes and priorities	Key Corporate Actions	LMP priorities
		• Conifers will be removed from riparian zones and growth of broadleaves encouraged in key areas, maintaining at least 50 % open ground along watercourses • We will investigate options to restore the water feature and areas of peat in coupe 44515 • Roads and tracks will be planned to facilitate management of ASNW/PAWS as well as commercial coupes • Archaeological remains will be protected
Outcome: "Everyone can visit and enjoy Scotland's national forest and land to connect with nature, have fun, benefit their health and wellbeing and have the opportunity to engage in our community decision making	➢ Maintain walking and biking trails, for everyone to enjoy and gain health and other benefits ➢ Engage communities in decisions on management of forest and land ➢ Help facilitate local communities make use of the forest to benefit their communities	• The forests are open to all, within the framework of the Scottish Outdoor Access Code and we will continue to promote best practice in relation to access • Car parking provision will be expanded and the existing Elleric car park will be maintained • Access to the Fairy Bridge will be developed and access routes to the open hill maintained and signed, including the Right of Way • We will continue to work with hydro developers at Creran to help and encourage them to provide community benefit from the schemes

Corporate plan outcomes and priorities	Key Corporate Actions	LMP priorities
Priority: Engage more people and communities in the use and management of forests and woodlands.		• Links with Appin Community Council will be maintained and any requests to engage local communities and organisations in using and managing the woodland will be given serious consideration • Opportunities for volunteering, or for encouraging a more diverse range of people to use the forest, will be considered, focusing most on the native woodland areas
Outcome: "FLS is a supportive, safe and inclusive organisation…." Priority: Sustain a safe working environment for people working in, and using our forests and promote healthier lifestyles	• Ensure health and safety of forestry workers and users underpin all forest planning and operations	• Safety considerations will inform decisions on restocking coupes on steep ground
Outcome:	• Meet statutory duties as an executive agency • Maintain UKWAS certification	• The LMP will be tested against UKFS and UKWAS to ensure compliance with these Standards.

Corporate plan outcomes and priorities	Key Corporate Actions	LMP priorities
"FLS is recognised as a high performing, efficient and effective, financially sustainable organisation that continues to transform and adapt." Priority: Deliver best value in the effective and efficient delivery of public service	• Align with Scottish Government targets on carbon emissions, waste, water and chemical use • Working collaboratively, openly and responsibly with partners and others to improve the management of forest estate Enable and deliver continuous improvement	• Stakeholders will be consulted on key amendments to planned forest management • We will participate in partnership projects, such as the landscape control of invasive species • We will maintain productive dialogue with neighbours and key stakeholders

Stakeholders and Consultation

Scottish Forestry

Nature Scot (SNH)

SEPA

Argyll and Bute Council

Appin Community Council

Confor

Argyll and the Isles Coast and Countryside Trust

Appin Historical Society

Appin Community Development Trust

Mountaineering Scotland
Ramblers Association
Scottish Rights of Way Society
VisitScotland
Argyll Fisheries Trust
Argyll District Salmon Fishery Board
RSPB
Butterfly Conservation Trust
Neighbouring landowners

Appendix II: Analysis of Previous Plan

The previous Forest Design Plan covering the LMP area ran from 05/01/2009 to 04/01/2019. The objectives were not SMART and were fairly general.

Objectives	Achievements/Changes	Relevance to the plan revision
➢ Timber production ➢ Build broadleaved habitat networks ➢ Increase diversity ➢ Match species to site conditions ➢ Create recreation opportunities ➢ Increase conservation value ➢ Protect archaeology ➢ Protect water quality	Operations undertaken in the past 10 years have worked towards achieving these objectives: producing timber; starting to fell the conifers between the SSSI areas; improving riparian areas through felling conifers and including open ground / broadleaved riparian buffer, and restocking with mixed species. Visitor numbers have increased but high recreation maintenance costs and safety concerns have precipitated a review and the closing of trails where bridges are in a poor state of repair or have failed. Most coupes have been felled and restocked as per the LMP apart from 44528 and 44506, which have been felled but not yet restocked. 44597 has not yet been felled but was subject to amendment, which has changed coupe shape and size, also affecting 44525 and 44128. Coupes in the SE part of the upper zone have been sold to the neighbouring landowner. A breach in the new march fence allowed ingress of deer. High deer pressure has caused restock to be in check and necessitated significant beating-up multiple times. This has resulted in adjacency issues for several coupes (e.g. 44505 and 44506).	Continue to strengthen open broadleaved habitat along riparian zones. Complete felling of conifers between the SSSI areas and restocking with site native species; removing non -native restock (W. Hemlock, Beech, Sitka etc.) from these areas. Grow productive broadleaves where feasible. Revise management coupes to improve structural and age diversity and restock with a variety of species, including soft conifers and broadleaves where appropriate. Restock to existing timber lines but pulling back commercial species from areas of poorer ground, leaving these areas to develop as successional or restock them with site appropriate native species. Reduce deer browsing pressure and focus deer control on protecting restock areas.

Appendix III: Background Information

Physical site factors

Geology Soils and landform

The underlying geology surrounding Creran comprise Dalriadan bedrock with limestone exposures that result in base-rich soils, notable in the southern zone of the forest block and the adjacent Glasdrum NNR. The hard Dalriadan rock formations consist of Cambrian granite, late Silurian and early Devonian igneous rocks and sedimentary schists. The entire area is overlain with glacial deposits, resulting in the development of areas of fertile soil. The lower forest zone in Creran has a mosaic of upland brown earths, podzols and typical ironpans, changing to peaty surface gleys with tussocky molinia and calluna bogs in the upper spur of the upper (northern) zone.

Water

The River Creran runs along the E / SE boundary of the forest block and drains into Loch Creran, which is a designated marine SAC. The River Creran supports salmonids; its environmental condition has reduced previously, for reasons unknown, but is now Good. In the upper forest zone, the river is fed by the Allt Eilidh burn and a number of other smaller watercourses that drain into the burn or directly into the river.

The Allt a' Muilin burn also runs into the River Creran, SW of the Elleric Car park; the potential for high peak flow and associated flood risk here has been identified. See map 9 for details.

The waterbodies in the ASNW areas in the lower forest zone are associated with important lichen and bryophyte assemblages that are notified features for the SSSI designation and therefore must be protected.

A small waterbody in coupe 44130 was previously dammed to create a reservoir, which was subsequently breached. The remains of the earth dam are still in evidence. The area that was previously under water remains wet and is fed, and drained, by a number of small watercourses and drains.

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 related podzolisation) and development of gleys and bogs where soils are insufficiently free- draining.

Climate projections point to a warmer climate with lower summer rainfall and higher winter rainfall, which can potentially, support a wider range of species in future.

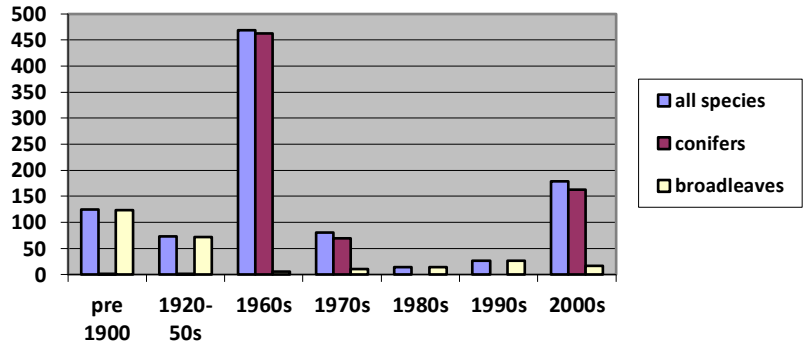
DAMS scores are fairly low along the Glen floor but these increase on higher slopes and are high particularly, in the upper zone. Wind throw has been relatively limited to date but the risk is unknown

as to when mature standards start to be opened up during felling. It is likely that DAMS scores will increase in future as climate change brings windier weather and increased frequency of storm events.

The existing forest

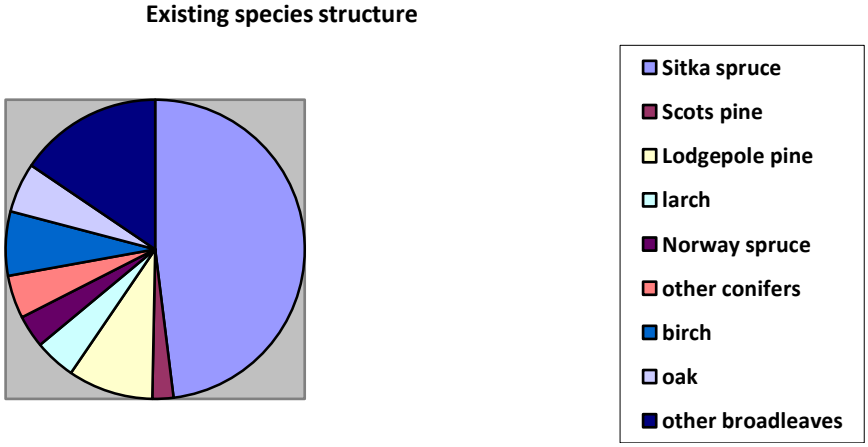
Age structure, species and yield class

The forest is even-aged, with around 49% planted in the 1960's and further significant planting in the 2000's; the pre 1900 trees are broadleaves. A relatively large area is at, or close to, economic maturity. Map 11 shows planting years.



Area of tree cover per planting / establishment period

Of the forested ground, 697 ha is under commercial conifers and 269 ha of broadleaves, with a further 58 ha of felled, failed or windblow, some of which is designated for restock, under the current LMP. Maps 12 a & b show current species.



Tree cover in the upper zone is dominated by Sitka spruce, with broadleaves mainly in the lower, native woodland, zone. For the commercial crop, a challenge will be to increase diversity to improve resilience, while maximising productivity. There is 45 ha of larch, which is vulnerable to Phytopthora ramorum and plans to harvest these at the earliest opportunity will be reviewed, to ensure continuity of timber supply and improved age diversity and so that the trees can be felled quickly in the event of a SPHN.

Tree growth is quite variable across the forest, reflecting differences in soils and other growing conditions. Yield Class is similarly variable, also reflecting different tree species growing in different parts of the forest (see Map 13).

The lower zone is predominated by YC < 6 reflecting the broadleaved stands but where coupes in this zone are under conifers, YC reach 20 – 24, indicating the better growing conditions in this area. Some of the lower slopes in the upper zone support similarly high yield classes but elsewhere, YC are highly variable and are low to moderate on higher, more exposed slopes, with YC < 6 in these areas.

Neighbouring Land Use

The Glen Ure Estate neighbours the Creran FLS land to the E and SE. Historically, this has been managed as a sporting estate but very recently, their policy has changed to focus more on environmental objectives. The majority of the rest of the Creran forest boundaries join other FLS land, apart from short boundary lengths to the North and West that march with private land, managed for livestock and sporting game.

A 0.5 MW Hydroelectric scheme is being developed on the Allt Eilidh burn in the NW section of the Creran forest by Renewables First, for Osprey Energy. The scheme will be serviced within the forest but the route and siting of infrastructure will have only limited impact on the future felling programme.

The lower forest zone will be managed as native broadleaved woodland, linking and expanding on the ASNW areas and aiming to maintain the SSSI / SAC in favourable condition.

The recreational trails attract people into the forest and indications are that visitor numbers will increase; the popularity of the area reflecting the growing visitor numbers in North Argyll and Lochaber. Recreation provision will be maintained and improved where possible.

Landscape

Landscape character assessment

The Scottish Natural Heritage Landscape Character Assessment describes the Landscape Character type in Glen Creran as “Upland Glens – Argyll”.

Key Characteristics

- Flat glen floor of narrow, linear mountain glens with a sharp break of slope at glen sides
- Long ribbon lochs in lower glen; glacial moraine creates uneven landform with small, rounded lochs on floor of upper glen
- Mudflats and winding creeks at loch heads and at the mouth of the glen
- Meandering river, fringed with groups of trees, contrasts with rectangular pastures drained by straight ditches
- Small blocks of woodland and some conifer plantations
- Linear settlements strung out along lanes at the foot of the steep side slopes
- Castles and estates are important local landmarks.

Landscape descriptions
Rugged mountains underlain by intrusive igneous rocks of granite and Steep Ridges and Mountains by Dalradian rocks of the Southern Highland Group. The flat floor of the Upland Glen is an alluvial plain, formed from the layers of silty deposits washed down from the surrounding mountains. Glen Creran is along a fault line and contains a long ribbon loch, which takes up much of the length of the glen.

The domestic scale and farmland character of the glen is in contrast to the surrounding mountains and ridges and there is a sharp break in slope along the outer margins of the floodplain, with linear settlements along the roads that hug steep valley slopes. In the lower glen, flat floodplains are drained by straight ditches, patchworks of fields with hedgerows and stone walls on the more undulating slopes, with small blocks of woodland and conifer forests at a similar scale to the fields, which interrupt the pattern of farmland. Hedgerow trees form straight lines across the glen, creating layered views. The meandering river towards the centre of the floodplain is fringed with groups of trees, damp meadows and patches of scrubby woodland, with a gradual transition from pasture to mud and shingle.

Settlements are generally partially hidden by mature oak trees, which have been planted along the lanes and have thrived in the sheltered conditions. There are sand and gravel quarries, and electrical sub stations with their overhead wires, which have local visual impact.
Many of the glens have fine castles and estates. Their influence has created a wooded parkland character, with groups of specimen trees adding scenic impact and creating dramatic framed views.

Landscape Guidelines

The specific landscape guidelines include plantations remaining small in scale, not obscuring distinctive landforms and maintaining rivers as focal points. However, this is not entirely applicable to Creran, given that it is a large forest and the upper glen is quite a broad, open landscape from the perspective within the glen.

The conifer forest is located nearer the head of the glen and is much less visible than the native forest lower down. Visibility of slopes planted with conifers is very limited from locations outwith the forest, other than from surrounding high ridges.

Landscape designations

The Ben Nevis and Glen Coe National Scenic Area touches the open land at the northern end of the forest. The Loch Etive Mountains Wild Land Area lies East and NE of the forest and extends slightly into the open land in the NE part of the block.

Environmental designations

Special Site of Scientific Interest (SSSI), SAC, SPA

Most of the open ground adjacent to the Glen Creran LMP area is covered by the Glen Etive and Glen Fyne SPA but this designation does not extend into the forested zones. However, the potential impact on the SPA would need to be assessed if the woodland is expanded above the current tree line.

Glen Creran Woods SSSI and SAC extends over most of lower Glen Creran, including much of the lower section of the Creran forest block (the lower forest zone). The Glasdrum National Nature Reserve lies adjacent to the southern boundary of the forest block.

The River Creran runs along the eastern boundary of Creran forest and drains into Loch Creran, which is a marine SAC and a designated shellfish area. Salmonids spawn in the river and other main watercourses. Loch Creran, the Firth of Lorn and Loch Linnhe are potentially vulnerable sea lochs, which can be affected by forestry activities.

Archaeology: Scheduled Monuments / Unscheduled

There is one Scheduled Monument (a cairn) in the upper forest zone at Salachail (460 m NE of the house, NN059513). A variety of unscheduled archaeological features are present, including evidence of buildings, townships and sheepfolds; copper mines; footbridges; stone dyke; slate seat; standing stone and evidence of at least 17 charcoal burning platforms. See maps 8 a & b for details).

Habitats

The western acidic oak woodland and mixed woodland on base rich soils associated with rocky slopes are key habitats in the lower zone that are protected by SSSI and SAC designations.

The SAC data form for the site notes Tilio-Acerion forests (Ash, Wych elm and lime) of slopes, screes and ravines for which the area is considered to support a significant presence. Old sessile oak woods with Ilex and Blechnum in the British Isles for which this is considered to be one of the best areas in the United Kingdom.

A range of other important habitats are found in the forest and on the open hill, including humid and marshy grasslands, mesophile grassland, bogs, marshes, water fringed fens, inland water bodies, pool systems, heath scrub, calcareous grassland, basic flush, springs, bog pools, blanket bog, tall herb ledges, flushed wet heath.

Species

A number of protected and priority species can be found in the forest or its vicinity, including otters, bats, Red squirrel, Pine marten, Golden eagles, Pearl bordered fritillary, Chequered skipper.

Open priority habitats support white beak sedge, juniper, dwarf willow, alpine meadow rue, globeflower, alpine bearberry, stone bramble, melancholy thistle, mountain sorrel, purple mountain saxifrage, Scottish asphodel, alpine saw – wort, moss campion.

Biodiversity

The open hill and native broadleaved woodland support a fairly diverse mosaic of habitats and related biodiversity, contrasting with the fairly even aged conifer stands in the forest upper zone.

Priorities to maintain and improve biodiversity will include:

- Scrub and bracken control in ASNW areas to create suitable conditions for butterflies
- Control of invasive species in the broadleaved woodland and on the open hill

- Monitoring priority open habitats and where necessary, controlling tree regeneration or grazing to favour priority habitats
- Restoring peatland areas through drainage management
- Removal of conifers and development of open canopied broadleaved woodland in riparian corridors
- Felling conifers in area between ASNW / SSSI and restocking with native broadleaved woodland
- Protecting important bryophyte and lichen assemblages during harvesting and other operations
- Improving species, age and structural diversity in the conifer plantation as early as possible

Social factors

Recreation & Community

The nearest settlements of any scale are in Appin and Barcaldine but there is a small ribbon settlement of scattered dwellings along the minor road that runs through the lower glen, up to the Elleric car park. A single private dwelling is located in the FLS forest at Salachail and is accessed via the forest road. There are scattered domestic and estate buildings on the adjacent Glen Ure Estate.

The Glen Creran community are involved in a partnership with FLS and Argyll and Bute Council to control invasive species, notably Rhododendron, in the native woodland.

The entrance to formal waymarked trails (Pine Marten trail) leading from the Elleric car park is currently closed due to a bridge failure but a new route will be installed allowing direct access to the Fairy Bridge and resumption of access to the rest of the trail.

A waymarked Public Right of Way to Ballachulish accesses the hillside through the forest upper zone and will be maintained.

The site is part of the last clansman trail, which covers all the sites linked to the Appin murder in 1752 and includes an interpretation panel but not a signposted route.

Glen Creran is increasingly popular with visitors who go for woodland walks or access the Public Right of Way or the nearby hills and many websites and brochures include Glen Creran woodland in their information on places of interest. The aim will be to maintain trails and car parking that can accommodate a predicted increase in visitor numbers but not to promote the forest externally to visitors.

A number of private water supplies are drawn from the native woodland areas in the lower forest zone and FLS have a duty of care to protect these supplies. Visitor numbers are increasing in the area generally but there is growing interest particularly, in the Fairy Bridge. Many visitors are now accessing the Bridge via informal paths to the South of the Elleric car park, often parking on the road side or on private land and blocking driveways. The proposed new trail route to the Fairy Bridge, together with an additional small car park, will help to draw visitors away from water supply intakes. There are opportunities also for FLS to work with residents to help further protect and improve existing water supplies.

Appendix IV: Land Management Plan Consultation Record

Consultation on the Brief was undertaken in December 2019 and January 2020. The Brief was made available for download from the FLS website with hard copies posted to anyone who requested it. A public notice was placed in the Oban Times (OT) w/c 16th December 2019 and statutory consultees contacted by email and letter. A drop – in consultation event for the Creran and Appin LMPs and the North Argyll Strategic Plan was held in Appin Village Hall on 10th January 2020, advertised locally, directly to statutory consultees and in the OT.

Statutory Consultee	**Date contacted**	**Date response received**	**Issue raised**	**Forestry and Land Scotland Response**
Scottish Forestry (Highland and P & A Conservancies)	05/12/19		Verbal comment received – potential adjacency issue along riparian area in upper zone.	Coupe felling schedule slightly amended to minimise potential adjacency issue.
SEPA Planning Officer Planning Service	09/12/19	29/01/20	Recognise that some of the historic planting in the glen is on steep slopes that may be a challenge when harvesting. Compliance with The UKFS Forest and Water Guidelines should mitigate pollution risks but specific recommendations: a) Introducing a wider riparian buffer strip along stretches of watercourses that may be affected by upslope high risk forestry works. b) Detailed surface water management planning for each coupe to ensure they are designed with no pathways connecting to a watercourse and have adequate vegetated filtration to catch fine sediment. c) Disconnecting historic drains from	All operations will comply with The UKFS Forest and Water Guidelines. Riparian buffer zones will be introduced around watercourses and natural regeneration of broadleaved woodland encouraged along riparian corridors on all but the smallest watercourses, to create open canopy structure with at least 50% open ground. Direct discharge into watercourses will be avoided. Harvesting will be timed to avoid periods of heavy rainfall and to minimise run-off and sedimentation risks.

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
			watercourses to prevent any direct discharges into the watercourses. d) Using phasing in individual coupes (especially those adjacent to a watercourse), so that no one area is fully exposed all at once. e) Avoid felling in coupes directly adjacent to watercourses during periods of heavy rainfall or snowmelt. f) Consideration of the fact that the River Creran is currently downgraded under the Water Framework Directive however the cause is unknown at present. The proposals within the Forest Plan should help improve the catchment but it is important to minimise any risks of sedimentation entering the river.	
SNH (South Highlands and Argyll & Outer Hebrides area offices)	05/12/19	Message receipt received 05/12/19		
Appin Community Council	05/12/19	10/01/20	Comments received by verbal briefing during consultation event (see relevant section below).	
	09/12/19	21/01/20	Glen Creran residents' representative:	See response below

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
Glen Creran residents (near neighbours)			Comments at consultation event: requested a statement from Visitor Services that we will work with the community to improve protecting the water supplies up at the fairy bridge area	
			Glen Creran residents' representative: Thank you for circulating the Planning briefs and associated documents for North Argyll forests and the Creran and Appin land holdings. As a community we greatly appreciate the opportunity to engage with the FLS planning process. The recent consultation event was also very useful, allowing us to see all of the maps more easily and talk together about the proposals. I am writing now with comments on the **Creran LMP Brief** in particular. As residents of the Glen our small community works together on issues relating to local land management and the FLS land holding provides a major backdrop for our lives, health and wellbeing. We are keen to work with FLS to improve and sustain the quality of our local woodlands and input to the development proposals which will have a significant impact on the daily lives of us all.	Sent 03/02/2020 by email. Thank you for your comments on the Creran Land Management Plan (LMP) Brief; my apologies for the delay in responding fully. I note the importance of the FLS landholding to the community living within the Glen and appreciate your willingness to work with FLS to help improve and sustain the quality of the woodlands in our care. In response to your specific comments: **Timber extraction** The responsibility for the public road lies with Argyll and Bute Council. However, the public road through Glen Creran is a Timber Transport Consultation Route, which requires either ourselves or our customers, to consult with Argyll and Bute Council roads engineers on the management of haulage along it prior to

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
			The context for my comments lies in three of the key proposals set out in the Strategic Plan: 1. Projected levels of timber extraction 2. Proposed development of visitor access 3. Management of the lower glen woodland There is no objection in principle to any of these proposals; it is, however, important that the planning and delivery of activities is done in close consultation and engagement with local residents to ensure that their wellbeing and quality of life is not adversely affected. The local community can also potentially assist and support FLS in its objectives to improve the conservation status of local forest resources and to use these resources as a platform for stimulating local training, employment and economic development. **Timber Extraction** The Creran LMP Brief provides figures for projected volumes of timber extraction from the upper glen (P4). These projections show that extraction volumes will continue at around, or periodically above their present level throughout the whole of the planning period and indeed beyond. The impact of	commencing any operations. The Council will also be consulted as part of the LMP process and will have an opportunity to feed in comments about the road. We will ensure that the consultation is proactive and that all operations are managed in a way that minimises the impact to both the road itself and to other road users. The proposals may also be discussed by the Argyll Timber Transport Group, if required. **Access for visitors** Although FLS have an overall objective to increase visits to our sites, this is delivered in the context of local issues and circumstances. We are aware that the route through to Glen Creran is popular and that the site appears to be starting to attract the wider tourist market, therefore we are not planning to promote the site beyond the FLS website and the North Argyll leaflet, although I note that you intend to promote it through Appin's community website. Given the general rise in tourism in Scotland, our ability to control access is limited, particularly within the legal

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
			timber lorries, together with the haulage of huge items of equipment associated with the felling and extraction of timber and the maintenance and creation of forest roads is already having a severe impact on the glen's public road and adjacent property. The glen road is not designed to carry these heavy loads. Many years ago the road was widened a little and the edges strengthened in preparation for the first FCS harvesting programme; however, it remains just a narrow country lane that has been tarmacked over. In many places the road surface is simply disintegrating as a consequence of both the increased volume of traffic and significantly higher load factors than was ever envisaged. Potholes occur on a regular basis and in some parts the road is visibly slipping into the verge. The passing places are too small for today's traffic and in very poor repair whilst at our own property the pressure from forestry related traffic at the bend is causing the road edge and culvert to collapse, along with our stone boundary wall. Our wall is also frequently hit and stones dislodged by the larger transporters.	requirements of the Scottish Outdoor Access Code. With this in mind, we do need to accommodate existing and anticipated visitors through provision of adequate facilities, as far as is practicable. The current plan is to remove the "Pine Marten Bridge", however we do not want to lose public access to the site so a new section of path (an old extraction route) is being considered to join the existing Pine Marten trail, thus avoiding the river crossing. This would allow FLS to manage the site in a more sustainable way, as the long term costs of maintaining and ultimately replacing bridges in every location is not practical. We know from visitor data that the Fairy Bridge is considerably more engaging than the forest walk on its own and our view is that the unique selling point of this site should be the Fairy Bridge. We intend to improve access to the Fairy Bridge from the existing Pine Marten trail, then encourage visitors to return via

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
			It is essential that the road should be substantially improved, not only to cater for future increases in timber volumes, but to repair the damage and inadequacies that exist at present. **Access for Visitors** The proposals to attract more visitors to the glen will place additional pressure on the road system. Many of these visitors are unused to country lanes and find it difficult to back into passing places at the best of times. When faced with a large timber lorry and needing to back into a small passing place with indistinct edges, a soft verge and in some places huge potholes both visitors and locals alike find the process stressful, frustrating and, in some cases, resulting in the car being damaged. Improvements to the road should also include expansion and upgrading of the passing places. Various proposals are made for the development of visitor access and facilities in the glen. These are summarised in the table on P12 of the draft Plan: Car parking provision will be expanded and the existing Elleric car park will be maintained	that same route rather than down the side of the gorge. We will look at signposting hill access and any Rights of Way, however the focus of our Visitor Services team is on our core offer of formal facilities as promoted on our website. Visitors utilising Rights of Way and accessing open hill country are more self-sufficient and looking for a greater wild or adventurous experience. These routes are also widely promoted elsewhere and in ways that are more suitable for attracting the type of visitor looking for this kind of experience. However, we will seek to ensure that these routes remain free of obstacles such as windblow, where they pass through FLS forests. The new car park proposed will service the new section of path to access the Fairy Bridge and the link with the Pine Marten trail. The existing Elleric car park will be retained for use by people accessing the long distance walking routes and mountain tops.

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
			Access to the Fairy Bridge will be developed and access routes to the open hill maintained and signed, including the Right of Way In November I met with FLS staff (Joanne Maclean and Sarah Hunt) to discuss issues relating to the circular Pine Martin / Millennium walk which is currently closed due to problems with the pedestrian bridge. Last year many visitors were disappointed that they couldn't use this trail and we (Appin Community Development Trust) are keen to get it reinstated so that it can be publicised on the "visiting Appin" section of our community website (www.appin.scot). We would be keen to have confirmation that the existing bridge will be repaired / replaced in the near future – there is no reference to this in the LMP. This walking route works so well for visitors to the glen as there is good parking space at Elleric and the route itself is suitable for a wide range of abilities. In a subsequent meeting with all Coilleveneach residents (6 households) Sarah explained plans to create an additional car park and visitor access route on an old extraction track as a means of providing access to the circular walk for maintenance vehicles and also for visitors	Please note that we have not set our budget for the coming financial year and therefore all the proposed visitor access developments are currently concept. **Private water supplies** FLS would not be able to invest in upgrading or improving the private water supplies as this is the responsibility of residents. However, we do need to ensure that we do not do anything that will have a detrimental effect on the current supply and we will continue to consult with local residents on these plans as they progress, with this in mind. **Management of the lower glen woodlands** We would be happy to discuss how the community might be involved in the management of the lower glen woodlands, in the context of the existing SSSI / SAC designations and the concomitant obligations. We do not have any specific views on how this might best be achieved but further discussions can be promoted through the Land

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
			pending repair of the bridge. I note that this proposal isn't currently included in the LMP. We also discussed at length the proposal to create a new formal access route to the "Fairy Bridge" linking to the top of the existing circular walk. We have explained our concerns that the proposed route crosses the water supply system for the Pentleugh property and also brings visitors close to the water supply system for the Coilleveneach complex. Both water supply systems are very fragile and the Coilleveneach system includes a dam that is extremely vulnerable to interest and interference from dogs and people. We request that any project to create and signpost an access route to the Fairy Bridge, in whatever direction, should include actions to protect and improve the two private water supplies and their infrastructure. We have also requested that visitor access should be focussed on the Fairy Bridge and not extend further down the hill, both to protect the water supply and also to discourage visitors from parking in the passing layby at Coilleveneach. **Management of the lower Glen woodlands**	Management Plan process as well as with our Visitor Services team. As you have indicated, you have already had initial discussions on the new trail proposals with members of our Visitor Services team, who will bring forward more detailed proposals to discuss with you in due course. There will also be an opportunity then, for you to provide any more detailed information on private water supplies in the Glen and to agree a liaison process for any future works that might impact on these supplies. Also, to discuss any initial thoughts on ways in which the community might further engage with the management of the lower Glen woodlands. In the meantime, the draft LMP should be ready for discussion in approximately two months and we would be happy to meet residents then, to discuss the plan and ongoing liaison arrangements. I hope that my response has answered your queries and concerns. There will be further opportunities to contribute, through the LMP consultation and then on the final version that will be placed on the public register.

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
			The objective of continuous improvement to the lower glen woodlands for conservation purposes is very welcome and sits well with the expressed desire for community engagement. The community is already working with FLS on rhododendron removal in the glen and it would be useful to discuss with FLS what other opportunities might exist. Such opportunities might include both/either volunteer activities and/or the establishment of woodland management activities as a community business. In conclusion, the expressed commitment to community engagement is very welcome and it would be helpful to know how this might best be achieved in practice. The protection, maintenance and improvement of both road infrastructure and water supplies are key issues for the Glen Creran community and an explicit commitment by FLS to these outcomes is requested. An ongoing programme of monitoring the number and impact of visitors within the Glen would also be helpful to inform long term management.	
Appin Historical Society	09/12/19			
Appin Community Development Trust	09/12/19	09/12/19	We have been looking at these over the last few days, as they were circulated through the	

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
			Community Council. So far these plans seem to be very thorough and well done.	
Comments drawn on map (Consultation event held in Appin Hall 10/01/2020)	10/01/20	10/01/20	Glen Creran – request to develop / maintain bike / walking track to connect with track that goes down to Glencoe Visitor centre Creran – smaller chequered skip butterfly? Seen on lochside opposite Glasdrum	Access to ROW to Ballachulish will be maintained but no plans to develop a new trail to Glencoe. Potential issues would be created by a biking track – potential damage to priority open habitats created by increased bike access. Management for butterflies developed with advice from Butterfly Conservation Trust
Verbal and written comments Consultation event held in Appin Hall on 10/01/2020)	10/01/20	10/01/20	Positive comments from several people regarding proposals to expand native woodland further up the hill – for all forest blocks in the area. Positive comments about proposals to link the SSSI native woodlands by removing the conifers from between and above the SSSI areas Requests to keep the ROW open over the watershed Comments on the need to maintain Rhododendron control program and remove all Rhode bushes that regenerate. Comments on level of deer pressure and need for deer control	Access to ROW from the forest will be maintained. Rhododendron control programme is ongoing; works are scheduled in FLS work programmes and regrowth is being removed. A separate Deer Management Plan is prepared and will underpin the LMP. The objective is to reduce and maintain deer pressure to levels that enable young planted trees and natural regeneration to establish successfully. Deer control will be undertaken in both conifer plantations in the upper forest zone and in the native woodland in the lower zone.

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
Highland Council	05/12/19			
Argyll and Bute Council	05/12/19			
Confor	05/12/19			
SSE (for West Region)	18/12/19			
Mountaineering Scotland	05/12/19	08/02/20	Comments submitted on the N Argyll Strategic Plan (which includes Creran) but some of these are also relevant to the Glen Creran LMP: Our interests lie with access through the Forest blocks to the open high ground, and the landscape implications of restocking and other management on the National Scenic Area and Wild land Area. We support your intention to "maintain walking and biking trails, for everyone to enjoy and gain health and other benefits". Access through forest blocks can often be confusing as forest roads and tracks can bend and turn away from preferred walking destinations beyond the forest.	The access through the forest to the ROW to Ballachulish will be maintained and if necessary, signposting will be improved. Natural regeneration of native broadleaves along gullies and above the existing timber line, where it occurs, will result in open structured woodland with scattered trees to the natural tree line and are unlikely to block any significant views. There are no plans to extend conifer plantation outwith the existing forested area in Glen Creran. Deer management is integral to achieving all FLS's objectives in Glen Creran and will be essential for timber production, protection and expansion of native woodland and protection of priority habitats. Deer culling is the preferred method of control and use of deer

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
			Your LMP Priorities states “maintain and where necessary/possible, improve access to long distance routes, including routes to access Munros…”. We agree that maintaining clear paths to the popular hilltops and crags will be of benefit to hillwalkers and climbers. Another topic of importance to hillwalkers and climbers within the Strategic Plan is the intention for “extending woodland cover to the natural tree line by natural colonisation and expanding commercially productive woodland, where feasible”, coupled with “control deer grazing and browsing pressure, to improve open habitats and protect restocking”. Many of our members welcome more tree cover on the hills, but there is also a significant percentage who appreciate the open views from hillsides and are concerned that woodland plantation would obstruct these wide and long views. Encouraging more natural regeneration, especially within the National Scenic Area, would allow trees to grow naturally where they can,	fencing is limited to circumstances where this would provide significant benefit. In Glen Creran, deer fencing may be considered in future, around the three Coires (Coire Chaluim, Coire Mulrooney and Coire Sheileach) to promote natural regeneration of native broadleaves between and above the existing ASNW – designated as SSSI/SAC. This will only be considered if there is evidence that deer culling will be insufficient to reduce browsing pressure to viable levels. A Business Case will be presented prior to any decision making. An EIA determination would also be required. Any deer fences would incorporate pass gates at key points as appropriate, following input from MS and other stakeholders.

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
			and may result in a more open, scattered appearance rather than the straight rows and blocks of plantation. This would allow woodland cover to reach a natural treeline and preserve views through the trees. This of course depends very much on the impact of herbivores like sheep and deer and the means to control their impact. We are of the opinion that the landscape and biodiversity would benefit from limiting the number of deer per square kilometre to allow for natural tree and shrub regeneration. This also has climate mitigation benefits through carbon storage and sequestration in the landscape. Our preference would be to manage this through deer culling rather than the use of lengths of deer fencing. Where deer fences are deemed essential, we would expect pass gates to be installed at key points of informal access to the more open hill.	
Ramblers Association	05/12/19			

Statutory Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
ScotWays	05/12/19	14/01/20	Scotways undergoing transition so not in a position to comment on the Brief but intend to comment of the draft LMP.	
VisitScotland	05/12/19			
RSPB Conservation Officer – Argyll, Arran and Ardnamurchan	05/12/19	14/04/20	Unable to comment on Brief but will provide comment on draft LMP.	
Argyll and Isles Coast and Countryside Trust	05/12/19			
Lochaber DSFB	05/12/19			
Argyll DSFB	05/12/19			
Argyll Fisheries Trust	05/12/19			
Butterfly Conservation Trust (H&I branch)	09/12/19			
Glen Ure Estate	09/12/19			

An online public consultation on the draft LMP commenced on 11th November and is ongoing. The draft LMP summary document, maps and a narrated presentation are available on the FLS website, with instructions on how to provide feedback. A link to the documents was sent to statutory stakeholders and individuals who had attended the public scoping event and had expressed an interest in being kept informed.

Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
Confor	11/11/20	12/11/20	Without any local knowledge, it's impossible for me to make any detailed comments on the plans, other than admiring the substantial amount of work that has gone into your presentation of future proposals. Having said that these forests do contain large areas of productive conifer – witness your map of yield classes at Creran. The plans appear to predict a significant decrease in the area of spruce crop. Can we be assured that the loss of this ground of commercially attractive species is compensated by at least equal – preferably increased production potential of the remaining area of future spruces? I would be interested in the reaction from local timber processors such as BSW to this. I also note the attention in the plans to the need for deer control in the area, and the qualified hesitancy to revert to deer fencing. But I trust that however expensive such fencing is, this will not become an obstacle to successful re-establishment of productive species in these forests.	I note your concerns about the proposed decrease in area of spruce crop at Creran. The aim is to continue to produce a sustainable timber supply while protecting environmental, landscape and heritage features. The main decrease in area under spruce is in coupes that lie between two areas of SSSI/SAC, designated for the upland oak woodland and mixed woodland on base rich soils associated with rocky slopes – and their associated features. Here, the intention has long been to revert to native woodland, to consolidate and protect the designated sites (which are important nationally and internationally) while also growing productive broadleaves across part of the area. There are other sites in Creran where the growing conditions are very poor and Yield Classes achieved have been low, which may not be restocked with commercial conifers following harvesting. However, where conditions are suitable, the aim is to retain the existing timber line, whereas the previous LMP brought the timber line further down the hill. In line with current policy, alternative conifers will be grown where appropriate, to diversify the species composition and increase resilience but Sitka spruce will continue to be the main species grown.

Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
				The intention is to take an overview of the management of all the geographically linked FLS land in North Argyll where there are common issues and linkages – such as contiguous areas of open land and deer management across a common area. Production will be viewed across the suite of sites, maximising production where conditions are suitable and pulling back from areas where growing conditions are very poor, where commercial timber production is not cost effective or safe, or where environmental or landscape issues require a different approach. A Strategic Plan is in preparation for this entire area, which will be underpinned by an Open Habitat Management Plan and a Deer Management Plan. While not requiring formal approval, the Strategic Plan will go out to consultation once complete. In terms of deer fencing, this will be used where it is considered to be the best option in order to meet the objectives for the land in question and a Business Case will be prepared accordingly. It is therefore not possible to make an unqualified statement in

Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
				any LMP about deer fencing until a Business Case has been prepared and considered.

Glen Creran - Land Management Plan 2021 - 2031

Appendix V: Deer Management Plan

Deer Management Plan: North Argyll Forests Strategic Plan Area

Introduction

This Deer Management Plan (DMP) outlines the deer management issues and priorities for Scotland's National Forests and Land in North Argyll, managed by Forestry and Land Scotland. The DMP underpins the Strategic Plan for the area and the individual Land Management Plans for each forest block: Glen Creran, Appin, Bealach, Duror, Lagnaha, Glenachulish and Brecklet.

The Blackmount Deer Management Group (DMG) covers all these forests apart from Appin. No specific issues are identified within the DMG at present.

Description

The FLS land holding in North Argyll comprises six forest blocks - Glen Creran, Appin, Bealach, Duror (with Lagnaha) Ballachulish and Brecklet covering 9,760 hectares. The land includes hills (two of them Munros), five glens draining into coastal waters of significant importance, many with international designations, and a range of habitats including sub- alpine plant communities; montane scrub; blanket bog; wet flushes, springs and lochs; rivers; conifer plantations and native broadleaved woodland.

The individual forests are linked by large extents of open land as well as the road (A828) which is the main arterial route through the area. The forested areas in Bealach and Duror are contiguous and projected woodland expansion may eventually lead to native woodland habitat linking directly through from Appin to Bealach. Duror and Glenachulish forests link through a strip of land in the coastal fringe as well as through the open ground at Lagnaha.

The area is covered by a large number of international and UK designations, associated with both large land expanses and with specific sites. The Glen Etive and Glen Fyne SPA (important for Golden eagles) is common to all forests apart from Appin, as this covers virtually all of the open ground that links the forests, most of which is in the NFL estate. Deer browsing can potentially impact habitat management across this area. Other geographically large-scale designations are the Ben Nevis and Glencoe National Scenic Area (NSA), which includes Brecklet, Glenachulish and part of Creran forests; the Lynn of Lorn NSA, the NE boundary of which is adjacent to Appin forest and the Loch Etive Mountains Wild Land, which includes part of the hill ground above the Creran forest. Within these, various priority habitats and features may potentially affected by forestry operations.

Some designated sites may be particularly impacted by deer browsing and deer management. Glen Creran supports Ancient Semi- Natural Woodland (ASNW) – acidic oak woodland and mixed deciduous woodland on base rich soils associated with slopes – designated as SSSI / SAC (approx. 444.28 ha). The Glen Creran SSSI designated features are lichen assemblages (in unfavourable condition); bryophyte assemblage (favourable condition); Pearl bordered fritillary and Chequered skipper butterflies and upland oak woodland (all in unfavourable condition but recovering). Natura site designated features that are not covered by the SSSI designation are mixed woodland on base rich

soils associated with rocky slopes (unfavourable condition) and otter (favourable condition). Deer browsing is a main limiting factor affecting successful establishment of natural regeneration or supplementary planting of native trees. The SSSI Management Plan notes the need for deer culling and if necessary, deer fencing, to control browsing pressure.

The River Creran runs through Glen Creran forest and feeds into Loch Creran, which is designated as a marine SAC. The health of the river and its tributaries are dependent on development of open canopy riparian broadleaved woodland.

Glasdrum National Nature Reserve (NNR) is 168 ha of western acidic oak woodland adjacent to Glen Creran forest SSSI/SAC.

Glencoe NNR (5625 ha) and Carnach Wood biological SSSI (84 ha) lie adjacent to Brecklet in the North of the strategic plan area.

The FLS land supports significant areas of Plantations on Ancient Woodland Sites (PAWS) which FLS has a policy nationally to restore 85% to native woodland. Successful deer management is integral to this restoration activity. Glenachulish supports the largest area of PAWS (approximately 301 ha) and around 22 ha of semi-natural woodland, some of which is ASNW. Appin supports about 183 ha of PAWS, as well as more than 40 ha of native woodland, most of which is thought to be ancient in origin. There is around 100 ha of PAWS in Duror, as well as more than 34 ha of semi-natural woodland in the recently acquired agricultural ground at Lagnaha, which shows potential for woodland expansion as the grazing and browsing pressure is reduced.

Deer Populations

Red and Roe Deer are common, Sika Deer are present in low density. Population numbers have increased in recent years, caused by in-migration from neighbouring landholdings but this movement appears to have reduced and the population is now decreasing annually. However, currently Red Deer are still at a high density, while Roe deer are at lower density.

Annual Cull: 2016/17 = 230 Red, 42 Roe; 2017/18 = 543 Red, 75 Roe; 2018/19= 308 Red, 33 Roe Deer.

Deer density is generally high on neighbouring land; the 2015 SNH count shows 227 Red Deer on neighbouring land West of Glen Creran. The total Blackmount DMG count was 7969 Red Deer.

Glen Creran, Appin, Bealach, Duror, Balachullish and Brecklet LMP areas are within the strategic Deer Fence that runs from Glen Coe to Glen Creran; deer migrate freely within this fence.

Deer Impacts

The last available (2016) herbivore impact survey results for nearest neighbours show 78% soft conifer/broadleaves damage and 15% Sitka spruce damage. Challenges have been experienced in establishing natural regeneration and planted soft conifers and broadleaves, due to high browsing in year one.

Current Challenges

Migration of Red deer from neighbouring sporting estates can be problematic if the strategic fence is not deer proof.

Issues have arisen in recent years in Glen Creran, with a breach in the deer fence that allowed deer incursion into the forest and this led to high browsing pressure and failure of restocked coupes. A section of deer fence was rerouted due to disposal of coupes on the East side of the forest, where the original fence line no longer formed the march with the neighbouring ground. There was subsequent breach of the new fence during road construction on the neighbouring land. The fence has now been repaired and effort can focus on reducing deer numbers within Glen Creran forest.

There are concerns about potential movement of deer into the forest across the River Creran, South of the end of the deer fence, with potential impacts to the designated ASNW areas but movement is also possible in from the West. Successful reduction of deer impacts is dependent on deer management across the whole DMG area but within the FLS land holding, particular focus is required on areas where young trees are establishing. Culling effort will be informed by herbivore impact assessments.

Invernahyle and Lurignish farms have reduced sheep numbers and Red deer are now hefting on to land that historically was grazed by sheep. Intense culling effort is reducing the current deer population but this will take time to reduce density overall.

Management Objectives and Targets

The aim is to maintain deer browsing pressure to levels that allow successful establishment of young trees (planted and natural regeneration) including soft conifers and broadleaved species.

Priorities currently, are to maintain existing stock and deer fencing and to use contract culling to support the deer control undertaken direct by the FLS wildlife ranger team.

Individual Business Cases will be made for additional deer fencing, to promote new woodland creation and to protect young restock in Creran, Appin and Duror. This will be done on a case by case basis where culling alone proves insufficient.

Red, Roe and Sika deer will be targeted.

Objectives:

- Maintain deer numbers under 10 deer per square km across the whole strategic plan area
- Within each forest block, achieve establishment of young naturally regenerated or planted trees that are not checked by deer or livestock browsing
- Maintain the strategic Glen Coe to Glen Creran fence in a deer proof condition
- Create and maintain open space and glades in the forests to aid deer control
- Retain, repair and improve existing ATV/ATC tracks on restock sites - retain and maintain approx. 6000 m of essential tracks to enable carcass extraction
- Complete Herbivore Impact Assessments to inform deer control and management
- Investigate and clarify the need for a deer fence around the three Coires in Glen Creran, to inform the development of a Business Case for deer fencing to help promote native woodland expansion in the area
- Monitor natural regeneration and young tree growth in Appin forest, to inform the development of a Business Case for deer fencing if this is required

Appendix VI: Provenance guidance chart

Species	Guidance
SS	Improved QSS standard throughout Alaska (ASS) provenance may be considered (if available) for its slower growing properties in specific locations. i.e Short Rotation Forestry (SRF) in Windfarm renewables developments.
VPSS	Limited use in best locations
SP	High rainfall type specified as standard. W20
NSP	From the nearest appropriate zone near CFR areas
LP	Only ALP being used in mixture with SS on poorer sites
DF	Seed stand or coastal origin
ESF	Czech or central European
NF	Registered seed stands
GF	Scottish registered seed stands
WH	Registered seed stands with low fluting
WRC	Scottish seed stands
NS	Seed stands, Eastern European or Harz
JCR	Northern Japanese range
NBL	Region of Provenance 10, Native Seed Zone 106
XC	PSSB will advise on any other minor species
Notes: PSSB can provide the most up to date guidance on provenance selection including advice on best suited seed stands. Virtually all seed supplied by PSSB comes from registered seed stands and is based on geographic area compatibility. Use of VPSS has declined as seed orchard QSS improves and this also has a wider genetic base for resilience purposes.	

Appendix VII: Abbreviations used in the plan

Abbreviation	Meaning
ASNW	Ancient Semi-Natural Woodland
ATV	All Terrain Vehicle
CCF	Continuous Cover Forestry
DAMS	Detailed Aspect Method of Scoring (A modelled windiness score used to calculate the probability of damaging winds occurring)
ESC	Ecological site classification (based on soil and climate information, aids tree species choice)
EIA	Environmental Impact Assessment
FSC	Forest Stewardship Council
FLS	Forestry and Land Scotland
Ha	Hectare
LISS	Low Impact Silvicultural System
LMP	Land Management Plan
MAI	Mean Annual Increment (Average annual growth a tree of stand of trees has experienced to a specific age)
MI	Minimum intervention (minimum level of management)
NR	Natural Reserve
NSA	National Scenic Area
PAWS	Plantation on Ancient Woodland Site
PEFC	Programme for the endorsement of forest certification
RBMP	River Basin Management Plan
SAC	Special Area of Conservation (habitats)
SEPA	Scottish Environmental Protection Agency
SF	Scottish Forestry
SSSI	Site of Special Scientific Interest
SPA	Special Protection Area (birds)
SPHN	Statutory Plant Health Notice
UKBAP	UK Biodiversity Action Plan
UKFS	UK Forestry Standard
UKWAS	UK Woodland Assurance Standard
YC	Yield Class (Index of potential productivity of even-aged stands of trees. Measured in units of cubic metres per hectare per year)

Species Abbreviations
AR = Alder
ASP = Aspen
BI = Birch (downy/silver)
CAR = Common Alder
DF = Douglas Fir
EL = European Larch
HAW = Hawthorn
GF= Grand Fir
GWL = Goat Willow
HAZ = Hazel
HL = Hybrid Larch

Species Abbreviations
JL = Japanese Larch LP = Lodgepole Pine MB = Mixed Broadleaves SS = Sitka Spruce MC = Mixed Conifers MCP = Macedonian Pine NBL = native broadleaves (including SP where suitable for conservation) NF = Noble Fir NS = Norway Spruce OK = Oak (robur/petreae) RC = Western Red Cedar ROW = Rowan SP = Scots Pine SS = Sitka spruce WCH = Wild Cherry / Gean WH = Western Hemlock XL = Larch XWL = Other Willows

Appendix VIII: Coupe prescriptions

Felling and Restocking:

Coupe No.	Total Area (Ha)	Felling date	Restock date	Next thinning date	Prescription
44150	40.67	2021/22	2024/25		Clear fell for restoration to native BLs. Leave BL trees where possible and do not fell mature BLs. Protect watercourses during felling, use silt traps and avoid any drainage direct into watercourses. Coupe to be checked by Environment Team before felling to identify any important features to protect and provide any detailed prescriptions required. Particular attention to avoid disturbance to any lichens and bryophytes. Restock will be natural regeneration, seeded from the neighbouring oak/ birch native woodland in the SSSI area with supplementary planting considered if necessary, using site native species (1,100 stems/ha at 5 years). Further away from the SSSI area, plant with site native species using local seed sources (1,100 stems / ha at 5 years). Hot plant, as soon after felling as possible to minimise weed growth. Avoid mounding and minimise ground disturbance. Native planting near watercourses should aim to achieve 50% canopy cover in the riparian zone.
44152	34.48	2021/22	2024/25		Leave broadleaved trees standing wherever possible, especially along riparian zones. Protect watercourses during felling, use silt traps and avoid any drainage direct into watercourses. Ensure that the strip of larch hanging above coupe 44154 is felled at the same time. Restock with mixtures of SS, NF and LP with some MC on lower slopes and SS/BI on higher slopes (see restock coupes for detail). Leave buffers along watercourses – allow natural regeneration of BLs in riparian areas, to achieve open canopy (50% canopy cover). Two small areas (< 1 ha each) between gullies to be planted with 100% MB.
44153	37.28	2021/22	2024/25		Above road: Clear fell to leave broadleaved trees where possible. Protect watercourses during felling, use silt traps and avoid any drainage direct into watercourses. Restock with SS apart from an area in the northern part of the coupe that is showing poorer growth, to be planted with SS:BI 40:40 with 20% open ground. Wide buffers (variable, 15 – 60 m) along riparian zones

Coupe No.	Total Area (Ha)	Felling date	Restock date	Next thinning date	Prescription
					and natural regeneration of BLS to be encouraged (BI, ROW, SCI/XWL) with 40 – 50% open space along watercourse. Below road: Clear fell to open up riparian zone, leaving any broadleaved trees where possible. Protect watercourses during felling, use silt traps and avoid any drainage direct into watercourses. Restock by planting broadleaves along watercourses – 60% planted/ 40% open ground in the western section (3.49 ha), with 50% planted / 50% open in the upper area in the eastern section (4.32 ha) of the coupe, aiming for 50% canopy cover along the watercourse itself. Two stands of conifers – 60% SS / 40% LP in the northern section (2.24 ha) and 80% SS / 20% BI in the southern section (1.97 ha). BI to be planted in clumps at least 30 m diameter within the SS planting.
44145	78.32	2027/28	2029/30		Clear fell for restoration to native BLs. Leave BL trees where possible, especially mature trees, but remove non-natives (SY, BE). Protect watercourses during felling, use silt traps and avoid any drainage direct into watercourses. Coupe to be checked by Environment Team before felling to identify any important features to protect and provide any detailed prescriptions required. Particular attention to avoid disturbance to bryophytes and lichens. Lower slopes to be planted with productive MB, predominantly OK, with BI, HAZ, HOl and other site – native species at 1600 to 3100 stem / ha spacings, with the aim to grow some timber. Planting along riparian zones to achieve no more than 50% canopy cover. Upper slopes to be restocked primarily with BI, with a mix of other site native minor species – with areas of planting and natural regeneration. Planted areas to be stocked at 1600 stems / ha, rising to 1100 stems per ha on higher slopes, leaving up to 40% open ground to create a mosaic of planted and open areas. Species planted should be site native grown from local seed sources.
44159	31.99	2027/28	2029/30		Leave broadleaved trees where possible, especially along watercourses. Protect watercourses during felling, use silt traps and avoid any drainage direct into watercourses. The scheduled monument (cairn, grid ref: NN059513) extends into the bottom part of the coupe, close to the lower road and about 460m East of the private house. This has been partially damaged by previous road construction and forestry works and care should be taken to avoid any further damage. Environment team to check the feature and ensure that

Coupe No.	Total Area (Ha)	Felling date	Restock date	Next thinning date	Prescription
					it is clearly marked with tape prior to any work commencing, then to oversee during works. Harvesting and restocking activity should similarly avoid the old stone dyke (unscheduled) at NN058511 although any trees interfering with the feature should be carefully removed (Environment team to prescribe). Restocking by planting should leave 10 m buffers around the heritage features and variable buffers along watercourses (10 m for watercourses > 1m wide and 5 m for channels < 1 m wide). Stands above the upper road to be planted with SS / BLS (80:10 with 10% open ground) and MC / BLS (80:10), with BLS planted in discrete groups, minimum 30 m diameter. BLS can be planted in riparian zones to create maximum 50% canopy cover. Most northern section of coupe above upper road to be planted with a %50:50 intimate mix of SS:BI. The section between the two roads will be planted with stands of MC:BLS (80:10) and a larger area of 100% SS, planted at 2500 stems /ha.
44136	73.2	2027/28	2029/30		Coupe has areas of very poor growth and windblow. Several watercourses converge and there are various areas of very wet ground but previous ingress by deer may also account for some of the check in growth. Leave broadleaved trees where possible. Protect watercourses during felling, use silt traps and avoid any drainage direct into watercourses. There is a sheepfold in the SW part of the coupe – protect during harvesting. Extreme SW of the coupe extends into a conservation impact zone (potential nest site) so check with Environment team prior to felling during breeding season (Feb – Aug). Planned restocking is planting mainly SS, with some BI, other site suitable BLS (ROW, HAW, ASP and AR in wetter areas) and BLS natural regeneration in poorer areas. But a decision to be made once the site has been harvested and true extent of ground conditions can be assessed. If necessary, part of the coupe may be left to develop as successional woodland.
44103	34.74	2027/28	2029/30		Clear fell, leaving broadleaved trees where possible. Protect watercourses during felling, use silt traps and avoid any drainage direct into watercourses. Restock with SS and SS/ MC mixture with SS/BI on higher slopes, with NR BL along watercourses (20/30 m wide minimum). SS and SS/MC mixtures planted at 2,500 stems / ha. SS/BI 50:50 intimate mixture planted at 2,500 stems / ha. SS/BI 60:30 mixture planted with BI in discrete groups (minimum 30 m diameter), with SS planted at 2,500 stems / ha and BI planted at 1,600 stems / ha. BLS NR along riparian zones to achieve 1,100 stems / ha variable spacing, with 50% canopy cover along margins of watercourses.
44110	20.22		2023		Previously felled and not yet restocked. Plant 100% SS above the road and 80% SS: 20% BI mix below road, with BI in discrete groups, minimum 30 m diameter, towards stand margins

Coupe No.	Total Area (Ha)	Felling date	Restock date	Next thinning date	Prescription
					and close to open ground and watercourses. SS at 2500 stems/ ha and BI at 1600 stems / ha (1100 stems / ha near watercourse). Planting to leave a buffer of minimum 10 m width along watercourses with a channel 1- 2 m wide and 5 m for watercourses < 1m.
44115	16.95		2022		Previously felled and not yet restocked. Plant with 80% SS and 20% LP. Plant native MB in riparian zone along Allt Eilidh (60% BLS, 40% open ground) to create open canopy riparian broadleaved woodland. Leave an unplanted buffer along other watercourses (20 m for channels > 2 m wide, 10 m for channels 1 -2 m wide and 5 m for channels < 1 m wide).
44132	21.09		2022		Previously felled and not yet restocked. Plant pure SS and mixtures of SS, NS, SP, BI, MB, MC in discrete groups at 2,500 stems / ha. Promote NR on main riparian zones to achieve 50% canopy cover. Leave variable width unplanted buffers (10 – 40 m) along other watercourses, to develop as successional but removing any conifer regeneration that occurs within 10 m of the smaller watercourses and within 20 m of the River Creran.
44160	9.4		2024/25		Coupe felled for hydro development. To be restocked at same time / together with coupe 44152. A 5m corridor above the penstock will be left unplanted, with BLs planted in the riparian zone and between the penstock and the burn. Several smaller watercourses join the Allt Eilidh burn in this coupe so most of the coupe will be planted with 70% BLs, leaving 30% open ground, apart from about 2 ha in the northern part of the coupe, which will be planted with 100% SS.
44142 – subcpt 1810G	0.38	2020/21	2023		Subcompartment containing 100% HL to be felled when rest of coupe is thinned in 2020/21, followed by restocking with native BL at 1600 stems / ha.
44143 – subcpt 1810G	0.4	2020/21	2023		Subcompartment containing 100% HL to be felled when adjacent coupe 44142 is thinned / rest of subcompartment 1810G is felled in 2020/21, followed by restocking with native BL at 1600 stems / ha.

Thinning:

Coupe No.	Total Area (Ha)	Felling date	Restock date	Next thinning date	
44144	26.67			2028/28	Remove non – natives, including SS, WH and BE by 21/22 at the latest. Continue to weed out any non-native regeneration. Assess trees every 5 – 10 years with a visual inspection of stand to determine suitability for thinning. Expect first thin in 2027/28 (age 15 years) or at 11-14 m stand height, to produce 800 – 1000 +/- 100 stems per ha, maintaining 50% crown length to maximise diameter growth. Favour OK, AH (where healthy) and BI and select the best stems for production. 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 native species where possible during thinning to diversify species mix. Where gaps occur, promote natural regeneration or enrichment planting of native species to maintain species diversity; if necessary, enlarge gaps through irregular thinning.
44142	6.62			2020/21	Manage as irregular shelterwood with first thin as soon as possible (by end of 2021 at the latest). Remove all HL in first thin. Thin on an initial 5 year cycle, to favour best stems but try to retain as many stems of minor species as possible. Retain all SOK.
44139	16.92			2030/31	Manage as irregular shelterwood, thinning from age 15 – 20 years, depending on stand height achieved (10 – 12 m / 20 – 30 m3 / ha basal area). Favour best stems but retain aspen in the stands. If possible, remove JL from adjacent stand 44146 (LTR) at the same time.
44109	14.39			2025/26	Manage as irregular shelterwood, first thin 2025/26. Remove any HL by end 2021. First thin at 20 years; line thin on an initial 5 year cycle. Retain minor species during thinning where possible
44101	15.38			2024/25	Line thinning, commencing at g 15- 20 years (earlier date if stand height achieved); removing larch at thinning and retaining any BL.
44114 44112 44108 44105 44131 44133	30.26 12.33 16.82 24.82 15.7 16.79			2029/30	Assess for thinning every five years and target removal of any larch during the plan period. First thin at 15 years if stand height achieved, otherwise leave until 20 years. Intermediate line thin on an initial 5 year cycle, but with a harder thin on coupe margins. Aim to retain sub-dominant or minor species, where possible, to maintain species mix. Retain BLs along watercourses and ride / track edges. For co-dominant mixtures, aim to retain both species in the stand for as long as possible, managing in groups if necessary.

Environmental:

Coupe	Period	Prescription
44106, 44595, 44593, 44591 44585, 44592, 44575, 44579, 44581	2021-2031	Management as per SSSI Management Plan to protect designated features – including otter, western acidic oak woodland, mixed woodland on base-rich soils associated with rocky slopes, lichen assemblages, bryophyte assemblages, Chequered skipper and Pearl bordered fritillary. Rhododendron control, including bushes that have seeded into areas outwith the SSSI – on upper slopes and in the Coires. Targeted thinning of dense regeneration to favour lichen assemblages. Limited scrub clearance and bracken whipping to create conditions favourable for Chequered skipper and Pearl bordered fritillary butterflies. Deer control to protect young growing trees.
44585	2021-2031	Small sub-compartment (0.7 ha) containing Beech dating from 1850. Monitor for seeding into the native woodland and remove seedlings / young trees if necessary.
44106	202 - 2031	Small sub-compartment (2.44 ha) containing mature Sycamore (approx. 0.88 ha) and Grand fir (approx. 0.1 ha established 1959. Monitor for seeding into native woodland and remove seedlings / young trees is necessary. Consider gradual removal of these specimens when other forest management works are underway in the coupe.
44138, 44160, 44115, 44132, 44135, 44136, 44153	2021-2031	Management of riparian areas during clear felling, restocking and thinning operations. Protect watercourses during felling / thinning; avoid drainage directly into watercourses / use silt traps and avoid work in extremely wet weather. Retain BL in riparian zones during clear fell. Avoid restocking conifers in riparian zones, leaving 20 m unplanted along River Creran and any sections of Allt Eilidh or other watercourses that are > 2 m wide. 10 m buffer for watercourses 1- 2 m and 5 m for < 1 m. Riparian native BL woodland – planted at up to 1100 stems / ha where specified, otherwise natural regeneration – to achieve an overall canopy cover of 40-50%. Remove any regeneration of conifer species.
44130	2032/33	Peatland restoration: Survey and block side drains to increase water table, leaving main watercourse untouched Remove conifer regeneration where it occurs Once coupe to East is felled (44157 - 2032/33) plant with alder, willow and other site appropriate native BLs leaving 40% open ground. Allow natural regeneration of native BL along margin to create a fringe of scrub woodland, transitioning to open peatland habitat. Allow natural regeneration of BLs on ridges, where peat is thinner and along the riparian zone on thinner, sandier soils.

Heritage:

Coupe	Period	Prescription
44159	2021-2030	Scheduled monument – 12.5 m diameter; at least 16 kerb stones around perimeter, largest 1.1 X 0.5 m. N. and S. sides damaged by forestry track and drainage work. Protect feature from any further damage – mark area with posts and identify on any work plans.
44106, 44585, 44591, 44145, 44143, 44142, 44140, 44159, 44139, 44135, 44136, 44102, 44599, 44115, 44130, 44109, 44107	2021-2030	Undesignated archaeological features – see map. Identify and protect during forestry operations.

Roads:

Coupe	Period	Prescription
44122, 44124, 44157, 44152	2021/22 and 2022/23	Road in two sections – GC1 Creag Fhada (1.24 km) and GC1 PR Glen Creran final phase PR (0.64 km) – required to access felling coupe 44152 and allowing access to fell larch in adjacent coupes in the event of a SPHN. Road crosses complex gulley, multiple watercourses in coupe 44122. Care required to protect watercourse and riparian zone.

Coupe	Period	Prescription
44151, 44150, 44145	2022/23 and 2024/25	0.99 km road (2022/23) and 1.29 km (2024/25) to be constructed, to access felling coupes: 44150 to be harvested in 2022/23 and 44145 in 2027/28. Roadline crosses multiple watercourses and care must be taken to protect watercourses and riparian zones during construction. Large gulley crossing required in coupe 44145. Road line passes through SSSI / SAC in coupe 44150, designated features include lichen and bryophyte assemblages. The coupe contains mature conifers, but the road should be micro-sited to avoid any remnant BLs, any features supporting significant lichen / bryophytes and where possible, any remnant areas of ground vegetation associated with the qualifying woodland types. Environment team to survey and advise prior to construction.

Tree Health:

Coupe	Period	Prescription
44136, 44134, 44156, 44152, 44160, 44157, 44124, 44155, 44153, 44111, 44107, 44103, 44104, 44501, 44159, 44101, 44142, 44143, 44150,	2021-2030	These coupes contain larch and will be checked regularly for signs of disease. Coupe 44160 – felled in 2020 under an amendment for an Hydro scheme development but should be checked to ensure that all larch trees were removed during felling. Coupes 44136, 44152, 44158, 44103, 44159, 44150 and 44145 are due to be felled during the lifetime of this LMP (phases 1 and 2) – harvesting would be brought forward in the event of a SPHN or evidence of P. ramorum. Coupe 44144 contains young larch trees (ca 2012) within the restock that should be removed at the earliest opportunity. Coupe 44101 contains larch trees planted in 2009 – sub-compartment 1803A (8.41 ha) with 15% JL (1.26 ha) and 85% SS (7.15 ha). The sub-compartment can be accessed from the forest road. Consideration should be given to taking the larch out now if possible. Adjacent coupes 44142 and 44143 will be managed under irregular shelterwood but between them contain 0.78 ha HL planted in 2001 (sub-compartment 1810G). This is a discrete sub-compartment containing 100% HL. Coupe 44142 will be thinned in 2020/21, at which time HL should be removed and the area restocked with MB. First thinning intervention for coupe 44143 is scheduled for 2034/35 but HL should be removed in 2020/21 at the same time as thinning coupe 44142 and area restocked with MB. Sub-compartment 1810G is easily accessible from the forest road.

Coupe	Period	Prescription
44144, 44145		
44106, 44595, 44585, 44592, 44145	2021-2030	These coupes contain ash trees. Monitor trees annually for signs of ash die-back disease (Chalara). Retain dead and dying trees where possible but remove badly affected trees close to paths, roads and other sites where they may present a hazard.

Coupes containing larch

Coupe	Planting date	Scheduled felling date	Coupe	Planting date	Scheduled felling date
44144	2012		44136	1967, 1968	2027/28
44150	1963, 1969	2022/23	44134	1967	2037/38
44159	1968	2027/28	44156	1967	2032/33
44101	2009	2055/56	44104	1968	2037/38
44501	1968	2046/47	44103	1963	2027/28
44145	1970	2027/28	44152	1966	2022/23
44143	2001	2098/99	44160	1966	2019/20
44142	2001	2099	44107	1963, 1964, 1966	2032/33
44157	1966	2032/33	44124	1966	2052/53
44155	1965	2042/43	44158	1965	2027/28
44111	1965	2037/38			

Appendix IX: Productive Forestry: Species Selection

Soil Group	Soil Types Relevant to IRS FD	Characteristics	Species Prescription for Commercial Restocking
1	Brown Earths	Soils with typically good aeration and drainage throughout the profile and well-incorporated organic matter. These soils range from very rich to poor and usually allow deep rooting. Likely vegetation to be encountered includes broad leaved grasses, (e.g. Yorkshire fog, Bent), bracken, bramble, foxgloves, violets and a diverse range of herbs.	Douglas Fir on Poor (must be without heather) to Rich fertility with Moist to Dry soil moisture. Desirable intimate or group mixture; European Larch*, Norway Spruce or Western Red Cedar. Generally in sheltered areas with sufficient rainfall Sitka or Norway Spruce on Poor to Medium fertility with Wet to Fresh soil moisture. Desirable intimate or group mixture; each other or European/Hybrid Larch Scot's Pine in Podzolised areas on Poor to Medium fertility with Moist to Dry soil moisture. Desirable intimate or group mixture; Japanese/Hybrid or European Larch* European Larch on Medium to Rich fertility with moist to Moderately Dry soil moisture. Desirable intimate or group mixture; Scot's Pine or Douglas Fir Japanese/Hybrid Larch* on Poor to Medium fertility with Very Moist to Fresh moisture. Desirable intimate or group mixture; Scot's Pine Sycamore on Medium to Rich fertility with Moist to Fresh soil moisture. Desirable intimate mixture: Ash† or European Larch* Where improved climatic conditions allow: Sessile Oak on Medium to Rich fertility with Moist to Slightly Dry soil moisture. Pedunculate Oak (Local seed source if possible) on Medium to Rich with Very Moist to Fresh soil moisture. Desirable intimate/group or blocky mixtures include; Norway Spruce, European Larch*, Western Red Cedar, Silver Birch or Ash Silver Birch on Poor to Medium with Very Moist to Fresh soil moisture. Desirable intimate or group mixture: Oak or Scot's Pine *Ash on Rich fertility with moist to Fresh soil moisture and less acidic sites. Mix in groups with; Sycamore, Oak or Beech
3	Podzols	Develop on unfertile acid soils with high rainfall where nutrients are flushed into the lower horizons of the soil profile. Very poor fertility. Induration or an impenetrable pan will prevent good drainage, resulting in a need to break this impediment with suitable cultivation that will allow freer draining and greater rooting depth. Vegetation common to these soils are ericaceous plants, grasses including Wavy hair, Matt and Purple moor grass. Light bracken and feather mosses may also be present.	Scot's Pine with Moist to Dry soil moisture. Desirable mixture; intimate mixture with Hybrid Larch* Sitka Spruce with Wet to Moist soil moisture. Mix with; Lodgepole Pine in wetter areas or Japanese/Hybrid Larch* Japanese/Hybrid Larch* with Very Moist to Fresh soil moisture Where improved climatic conditions allow: Sessile Oak (not on 3m) with Moist to Fresh soil moisture. Desirable mixture; Hybrid Larch, Scot's Pine or limited Norway Spruce
4	Ironpans	Develop on free draining acid soils with high rainfall. The transfer of aluminium and iron in solution down through the soil profile develops an ironpan that is impervious to water and root penetration. Breaking of the ironpan is desirable, so as to allow drainage of the site and a potential increase in soil rooting volume and nutrient availability. Vegetation and fertility is similar to that of Podzols above	Scot's Pine with Moist to Dry soil moisture. Desirable mixture; Japanese/Hybrid Larch Japanese/Hybrid Larch* with Very Moist to Fresh soil moisture. Desirable mixture; Scot's Pine Lodgepole Pine in elevated areas with Wet to Fresh soil moisture Sitka or Norway Spruce (4 & 4b) with Wet to Fresh soil moisture. Desirable intimate or group mixture; Lodgepole Pine in wetter areas or Japanese/Hybrid Larch or Scot's Pine. Sycamore (4b only) with Moist to Fresh soil moisture. Consider intimate mixture with Japanese/Hybrid Larch* Cultivation that includes amelioration of the ironpan will be considered.
5	Groundwater Gleys	Dominant vegetation is commonly Tufted hair grass, Willows and herbs. Occurring where a shallow water table causes waterlogging and therefore subject to compaction and poorly oxygenated. The soil is permeable but is affected by a fluctuating ground-water table. Moderate nutrient availability.	These areas are generally presumed to be open or riparian zones.. Where rooting depth is adequate: Sitka or Norway Spruce on Medium to Rich fertility with Very Wet to Moist soil moisture. Consider adding blocks of Downy Birch and Alder Intimate mix of Downy Birch and Common Alder on Poor fertility with Very Wet to Moist soil moisture

6	Peaty Gleys	Very Poor to Rich nutritional availability, these soils are indicated by Purple moor grass, Calluna and Cross-leaved heath, with sphagnum prevalent in the North and West. High winter water table can be expected and good drainage will be required to achieve best results.	Sitka Spruce on Poor to Medium fertility with Wet to Fresh moisture. Experience in IRS FD suggests this crop will rarely establish as a pure stand without fertiliser input. Intimate mix with Lodgepole Pine in wetter and poorer areas or with Japanese/Hybrid Larch* in more Pozolised areas. Consider adding blocks of Downy Birch Downy Birch on Poor to Medium fertility with Very Moist to Fresh soil moisture
7	Surface Water Gleys	Differing from groundwater gleys in that waterlogging is caused not by a high water table, but by lateral surface-water movement through the soil profile developing a seasonally fluctuating water table. Resulting anaerobic conditions will restrict rooting. Indicative vegetation includes Tussock grass and Creeping Buttercup. Again poor to moderate nutritional availability can be expected. Drainage will be required along with micro site cultivation such as mounding.	Sitka or Norway Spruce on Medium fertility with Wet to Fresh soil moisture. Desirable mixture; each other, Japanese/Hybrid Larch* or with Lodgepole Pine in wetter poorer areas Where improved climatic conditions allow: Pedunculate Oak on 7b Medium to Rich fertility with Moist to Fresh soil moisture. Desirable group or blocky mixture; Norway Spruce
8	Flushed Basin Bogs	Rushes are prevalent. A shallower peat type, nutrient rich and containing some mineral grains. Peat is black in colour.	Please note that there is a presumption against planting areas of deep peats where reasonable productive growth rates are not achievable due to intact hydrology and/or challenging climate. Forestry Commission Scotland is currently forming a policy for dealing with these soil types. Forest Enterprise Scotland will issue Guidance once a policy is in place. It may be considered that more fertile, flushed peats and areas of deeper peat where hydrology has been ireverisbly compromised will remain suitable for restocking. Where areas of deeper peat are encountered in intimate mosaic with more favourable soils Sitka Spruce (QSS) will be favoured in a mixture with Lodgepole Pine of disease resistant provenance or hybrid larch. On these more nutritionally challenged sites a proportion (up to 20%) of soil improving species such as birch will be considered.
9	Molinia Bogs	Often existing on hillsides where flushing is more pronounced. Moderate nutrition available.	
10	Unflushed Flat or Raised Bogs	Sphagnum Moss dominated bogs, formed as peat levels rose to form a dome, reliant on precipitation for moisture and nutrients. Mineral grains are absent and the peat is reddish-brown and tends to be deeper.	
11	Unflushed Blanket Bogs	Calluna, cotton-grass, deer grass bogs including the hill peats located on upland plateaux and hillsides deeply dissected by burns.	
14	Eroded Bogs	Very poor nutritional status characterised by bog asphodel, deer grass, bog cotton etc. Can be dominated by either deep and frequent eroded areas (haggs) or frequent pools of standing water (flows). Very deep peat.	
15	Littoral Soils	Formed on coastal sands and shingles, such as the dunes found at Morrich More near Tain. The category is split into shingle (15s), dunes (15d) and then sands with varying water table depths (15e,w,g,i). These sands can be distinguished by various levels of mottling. Coastal grasses and heathland plants predominate.	Corsican cannot be considered due to the current DNB moratorium on planting therefore Scot's Pine either pure or in intimate, group or blocky mixture with Birch. Downy/Silver Birch depending on climate

NB – These prescriptions must be adopted within the local context set out in the main body of this Forest Design Plan. Climate, (along with soils) must be included as **the** determining factor in final species selection.

- Planting will generally become a mosaic of the species recommended above and will include areas of non-productive open ground and broadleaf riparian zones. Species choide will be dictated by local conditions and agreed after site visits by management staff.
- No commercial forestry type likely to be suitable on sites wetter than SMR "Very Moist" and vegetation indicating SNR <4.5
- Origin for SS is QSS. However where conditions are sub-alpine then ASS is preferred
- Mixed stands mean that each species occupies at least 20% of the canopy. Blocky areas should aim to cover the area that 3-4 mature trees would cover. Mixtures may need management to favour one or more species. Intimate mixtures of broadleaves with Sitka Spruce or Scot's Pine will normally result in the conifer's dominating overtime so planitng in blocks is often the better option.
- * Due to plant health restrictions there will be no planting of Larch species, Ash or Lodge pole pine (with the exemption of Alskan provenance Lodge pole pine)

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Appendix X: Glen Creran SSSI Management Plan

See separate document – Signed Glen Creran Woods Management Plan