

Drynachan Land Management Plan 2015-2025

Lochaber Forest District

Drynachan Forest

Land Management Plan

Approval date: ***

Plan Reference No: *****

Plan Approval Date: *****

Plan Expiry Date: *****

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

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



The mark of
responsible forestry



Drynachan Land Management Plan 2015-2025



Drynachan Land Management Plan 2015-2025

Lochaber Forest District
FOREST ENTERPRISE
Application for Land Management Plan Approvals
Forest Enterprise – South Laggan

Forest District:	Lochaber FD
Property name:	Drynachan
Reference Number:	
Nearest town, village or locality:	Invergarry
OS Grid reference:	NH310020
Local Authority:	Highland Council
Plan Area	785 Ha
Conifer Felling	33Ha
LISS	64.7 Ha
Broadleaved Felling	0

1. I apply for Land Management Plan (LMP) approval for the property described above and in the enclosed Land Management Plan.
2. I apply for an opinion under the terms of the Environmental Impact Assessment (Forestry Scotland) Regulations 1999 for road construction ~~Afforestation/Deforestation~~ as detailed in my application.
3. I confirm that the initial scoping of the plan was carried out with FCS staff during March and April 2015.
4. I confirm that the proposals contained in this plan comply with the UK Forestry Standard.
5. I confirm that the scoping, carried out and documented in the Consultation Record attached, incorporated those stakeholders which the FC agreed must be included.
6. I confirm that consultation and scoping has been carried out with all relevant stakeholders over the content of the land management plan. Consideration of all of the issues raised by stakeholders has been included in the process of plan preparation and the outcome recorded on the attached consultation record. I confirm that we have informed all stakeholders about the extent to which we have been able to address their concerns. We have

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reminded them of the opportunity to make further comment during the public consultation process.

7. I undertake to obtain any permission necessary for the implementation of the approved plan.

Signed.....
Forest District Manager

Signed.....
Conservator

Date.....

Date.....

Date of Approval.....

Date Approval Ends.....

Plan Reference no.

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Request For Determination Under The E.I.A. (Forestry) (Scotland) Regulations 1999	
Operation	New road construction- in SW of forest
Location	Drynachan LMP Ref: 030/519/236
Grid Reference	NH306012
Is The Location Of The Proposed Works Within A "Sensitive Area", As Defined In The Regulations? If So, What Type Of Sensitive Area?	No
If Operation Is Afforestation, Deforestation or Forest Quarries, What Area Is Involved?	N/A
If Operation Is Forest Roads, Tracks, or Paths, What Is Specification And What Length And Width is Involved?	Standard Forest road 1400m x 3.4m Roadside ditches 2m either side This equates to c1.4ha of woodland lost. To access cpts 7227 and 7210 Roads will be constructed following best practice in TTF (2014) on 'The design and use of the structural pavement of unsealed roads', SEPA General binding rules and the UK Forest Standard.
Is The Proposed Operation Immediately Adjacent To An Area Of The Same Project Type Which Has Been Completed Since 06/09/1999? If So, Give Details.	Yes spur off a road which was either upgrading of an old track or a new road c2005
Proposed Timing	2015 – 2025
State Any Perceived Impact On The Following	
Archaeology	No known archaeological sites on the route. Will advise operators to be vigilant
Conservation	No known conservation sites. A survey of the route will be undertaken prior to construction to ensure no protected species.
Landscape	Road is within standing crop – purpose is to allow thinning of the Scots pine stand to allow potential for LISS (Low impact sivicultural

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	system) in future.
Water	Minor burn crossing required which will follow GBR and Forest and Water Guidelines
Recreation/Access	Existing forest road is used for informal recreation. The new road will allow and extension of the walk albeit a there and back route.
People	The road will allow thinning of the Scots pine stand and maintain the potential for LISS in the future. This will provide a more permanent backdrop to the village.
Other Information	
Signed	Signed
Forest District Manager	Conservator
Date	Date
Approval Date	Approval Ends

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Summary of Proposals

Table 1: How the Land Management Plan (LMP) contributes to the six aspirations under the Strategic Direction for Scotland’s National Forest Estate

Six Aspirations	Relevant issues identified for Drynachan Forest LMP
 <p>Healthy <i>achieving good environmental and silvicultural condition in a changing climate</i></p>	<p>The LMP is the ideal tool to consider the strategic enhancement of the environmental and silvicultural condition of the forest area.</p> <p>The plan proposals will seek to maintain & enhance species diversity, and to utilise mixtures as appropriate to increase resilience in the face of existing & potential disease, pest & climate impacts.</p> <p>Under the next ten years of the plan, an expansion of the areas managed under a low impact silvicultural system (LISS) will focus on suitable sites where crop and site conditions enable this approach to be adopted. In the longer term the management of crops via interventions earlier in their life cycle should lead to a gradual expansion of the area managed under LISS.</p> <p>Active deer management across the forest has been a priority, and a continuation of active deer management, in consultation with neighbours, has a number of positive silvicultural and environmental implications for the site. Deer management is an essential tool to increase both the area managed under LISS and to achieve an expansion of the native woodland area.</p> <p>The impact of feral pigs on the forest & neighbours will be monitored and control measures implemented in line with national & district policy as this develops.</p> <p>Rhododendron control remains an on-going priority and will play a key role within the native woodland and LISS areas.</p>



Productive
providing sustainable economic benefits from the land

The forest is home to a wide range of species including red squirrel & black grouse. These species are dependent on a healthy and functional ecosystem.

The Drynachan Forest area contributes a significant volume of timber on an on-going basis to a wide range of large scale timber users, many of whom are locally based. The forest road network & links to the public road network enables efficient harvesting to take place.

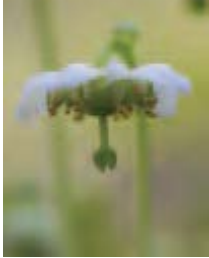
The lower slopes of the site are suitable for timber production from a range of species, with Sitka Spruce, Scots Pine, Norway Spruce & Douglas Fir being the most appropriate species.

The species options on the upper slopes are constrained by poor drainage, thin soils, pockets of deep peat and exposure. Here Sitka Spruce would be the key productive species, with Lodgepole Pine having a role as a nurse crop. Areas of unproductive deeper peat will be returned to open ground/upland birch habitat.

The expanded broadleaved area also offers the opportunity to contribute to production via woodfuel and some log material. The road network established to harvest the first rotation conifers represents an asset that would facilitate the utilisation of the hardwood areas. Appropriate silvicultural management within the hardwood areas could contribute positively to biodiversity.

High quality venison & pork produced as a by product of deer/pig management contributes to the non wood production of the forest, with the venison production in particular creating downstream economic benefits.

The forest landscape viewed from major tourist routes and the Great Glen Way enhances the



Treasured

as a multi-purpose resource that sustains livelihoods, improves quality of life, and offers involvement and enjoyment



Accessible

local woodlands and national treasures that are well promoted, welcoming & open for all

recreational experience and contributes to the generation of income for local businesses.

The roadside & village landscape along the A82, A87 & proximity of Invergarry village will be enhanced for residents & visitors alike by restructuring using LISS, with an emphasis on the retention of specimen trees within a broadleaved matrix.

The variant of the Great Glen Way and forest road network provide a recreational resource for Invergarry.

The forest landscape enhances the recreational experience for users of the main Great Glen Way & boat traffic on Loch Oich.

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Cared for
working with nature and respecting landscapes, natural and cultural heritage



Good Value
exemplary, effective and efficient delivery of public benefits

Actions to restore plantation on ancient woodland sites (PAWS) under the past Design Plan have already created significant new areas of native woodland, and it is proposed to continue this process under the new LMP.

The maintenance of a multi-purpose forest provides suitable habitat for a range of species including red squirrel and black grouse, and the LMP provides the structure to maintain the habitat for these species. The operational management of the site minimises adverse interactions between operations and these species.

Archaeological features have been identified within the forest and steps taken to protect these features and enhance their setting.

The forest is well suited to timber production with good access to markets.

The site makes a significant landscape contribution to major tourist road, foot & cycle routes.

1.0 Introduction

1.1 Setting and context

Drynachan Forest extends over an area of 785Ha and lies on the western shore of Loch Oich immediately to the North of Invergarry in the Great Glen. The forest stretches from 32m to 200m above sea level. See Map M1.

1.2 History of the forest

Drynachan Forest is subject to an existing Forest Design Plan & extensions: Forest Enterprise Reference Number 030/519/236, signed in April 2002.

Much of the lower slopes comprise both ancient woodland sites and long established plantation areas with the upper slopes formerly grazed by livestock & deer.

The lower slopes with better drainage, higher fertility & shelter offer better growing conditions for a wide range of tree species and this together with the older plantings in this area have resulted in a good scattering of specimen mixed conifers along the roadside. Natural regeneration of mixed broadleaves is also strong across these areas, which again reflects both the history of the site & physical site conditions.

The bulk of the conifers on the lower slopes were established around 1960. This age class has been broken down by felling/restock operations during both the 1990's and the 2000's.

The establishment on the upper hill took place in 1989 with the focus on the only suitable commercial species, these being Sitka Spruce & Lodgepole Pine. Restructuring of these areas has not yet begun due to the lower growth rates.

2.0 Analysis of previous plan

2.1 Aims of previous plan and achievements

The Forest Design Plan (2002) had the following general objectives: landscape improvement, timber production, native woodland expansion, stable long term structure & recreation enhancement/maintenance.

The more specific management priorities for the previous plan were identified as:

- Producing wood and marketable timber.
- Restructuring to restore PAWS areas and maintain productive areas.
- Establish road infrastructure to support management.
- Enhance the internal landscape from the Great Glen cycle route (variant).
- Enhance the roadside environment and the landscape setting of Invergarry.
- Protect water supply quality.
- Conserve archaeology.

The implementation of the previous plan has had many positive impacts including:

- Restructuring of the 1960 crop to diversify age class, this has included the successful establishment of softer conifer species without deer fencing.
- Maintenance of species diversity.
- Restoration of PAWS area. Mixed broadleaf natural regeneration is extensive.
- Creation of forest road network.
- Improvement of the recreational experience along the Great Glen cycle route (variant).
- Maintenance of specimen trees.
- Maintenance of water supply quality.
- Conservation of archaeology and enhancing the setting of features.
- Extensive Rhododendron control has been implemented and is ongoing.

Potential problems created by plan implementation include:

- A strict interpretation of ASNW historical map boundaries during restocking has resulted in elements of species distribution (conifer/broadleaves) having adverse landscape impacts.
- Small areas of some retentions conflict with landscape scale and may have stability issues.

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- 1960 conifer crop fragments on the eastern margin along the Great Glen Cycle route (variant) are isolated and difficult to access and manage.
- Some of the current standing crop within the restructured areas have a ragged appearance that has been exacerbated by some wind blow.

2.2 How previous plan relates to today's objectives

Consequences for current revision:

- The multi-purpose objectives of the original plans remain very relevant ten years on. The main changes relate to the external environment, with climate change and associated issues being major drivers. Increasing forest resilience to both disease and economic storms are now important considerations, and the value of productive forestry in mitigating climate change is generally accepted. With woodland expansion targets proving challenging, maintaining or increasing production from established forests is an important strategic economic and environmental consideration.
- The management of the isolated mature conifer pockets along the Great Glen Way is problematic, and this is further exacerbated by the powerline wayleave and limited access points along the A87/A82.
- Continued review of PAWS sites are likely to identify and consolidate further establishment of native broadleaves using natural regeneration where possible.
- The opportunities for 'continuous cover' management need to be reviewed, with potential to expand the area of continuous cover management both within the 1960's crop and within the younger crop element.
- In terms of species diversity the desire to expand the species range is compromised by the number of key species with an uncertain role in future forest restructuring. Ash, larch and pine are all important species on this site that are potentially very vulnerable to disease. On this site pine species are particularly vulnerable to Dothistroma needle blight (DNB) with level 3 (high) impact of the infection on the plateau). Intimate crop mixtures may increase resilience of forest cover and productive capacity.
- Increasing productivity in following rotations and maintaining a critical mass of productive forest area are important strategic considerations.
- Increasing economic diversity in forest industries, by marketing a wider range of forest products to a wider range of end users, increases resilience.
- The importance of transport links and power infrastructure are now important considerations within Land Management Plans. While slope stability is not a particular issue here, mature tree crops in storm conditions may impact adversely on both road links and power lines. This consideration

needs to be balanced against the desire to retain specimen trees for a range of very valid aesthetic/landscape/cultural/ecological reasons.

- The Land Management Plan approach seeks to take neighbouring land uses into consideration to a greater extent than the traditional Forest Design Plan approach. In this plan the agricultural and sporting enterprises on adjacent ground are largely unaffected by forest operations and activity. Feral pigs have colonised private & state forest areas in Glen Garry following their escape from collections on privately owned land. The management & control of this species has yet to be finalised, and a more developed approach to this issue may be applied at plan review.

3.0 Background information

3.1 Physical site factors

3.1.1 Geology Soils and landform

The geology is granitic gneiss. The resulting soils range from upland brown earths to peaty gleys & podzols, with pockets of peat on the areas where drainage is impeded; rankers are also a feature of the plateau area.

3.1.2 Water

There are a number of private water supplies within the forest (See Map 2: Key Features). The River Garry to the south supports salmon & sea trout populations.

All water bodies, within and surrounding the forest, are at good ecological status under the Water Framework Directive, and maintenance of this situation is a plan priority.

The establishment of more extensive broadleaved areas may also contribute to improved water yield for private water supplies.

There are no areas potentially vulnerable to flooding (SEPA) downstream of Drynachan forest under the Flood Act.

There are two shallow lochans within the forest. Lochan Doire Cadha has extensive areas of open ground around both it and associated burns, and this reflects the deeper peat and low productivity of this area. This has positive ecological and water quality implications.

Lochan na Curra also has extensive open ground around its shores, but there may be potential to expand the open ground areas by converting areas of checked crops on deeper peat to open ground.

The upper forest area planted in 1989 occupies a plateau like area with some pockets of deeper peat and areas of very shallow soils over bedrock. The forest cover on these areas will have significant impacts on hydrology, but given the age and growth rates of this area, then the detailed management of this area and any potential localised deforestation would best be considered at plan review.

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When felling and restocking are carried out, the Forest and Water Guidelines (2011, fifth edition) will be strictly adhered to. Timber extraction will normally avoid crossing burns or main drains, but, where necessary, each crossing point will be piped or bridged. Branches will be kept out of watercourses and trees will generally be felled away from the watercourses. When restocking, planting will normally be kept back from the watercourses, although broadleaves may be planted or regenerated to provide dappled shade and retain forest humidity.

All felling and restocking will comply with the Controlled Activities Regulations (CAR) 2011 General Binding Rules with respect to appropriate buffer strips between new planting and the watercourses and waterbodies.

3.1.3 Climate

The forest falls within the warm and moist climate zone along the glen floor grading to cool and wet on the upper parts of the forest.

The forest is reasonably sheltered, particularly on the mid to lower slopes. See map M5.

Snowfall can be high and sustained.

Management on the lower slopes is fairly unconstrained by climate, although the impacts of snow on operations and crown damage (particularly Scots pine) can be significant.

The climate change predictions for the west of Scotland under a high emissions scenario are for a rise in accumulated temperature and maintenance or rise in summer rainfall. There is also likely to be an increase in extreme rain and wind events.

NB These predictions carry a considerable level of uncertainty at a regional level and local conditions need to be taken into account when considering impacts at a forest level.

3.2 Biodiversity and environmental designations

The extent and location of the statutory designations affecting the forest are shown on Map M2.

There are no designated sites within the forest, although Loch Lundie lying 400m to the west of the forest is a Special Protection Area (SPA).

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There is a black grouse lek to the north of the forest and black grouse make some use of the woodland edge in the upper forest area. There will be scope to enhance the forest edge for black grouse in the next rotation and this will be considered in detail at the next plan revision.

Wood ants are found on the lower slopes especially in south facing rides with some shading. Red squirrels are currently using the more mature woodland closer to the village.

Rhododendron is the only invasive non-native species (INNS) recorded in the forest, and this is the subject of an ongoing control programme, with good progress made to date.

The control of INNS on a landscape scale in collaboration with neighbours has merit for biodiversity generally and designated sites specifically.

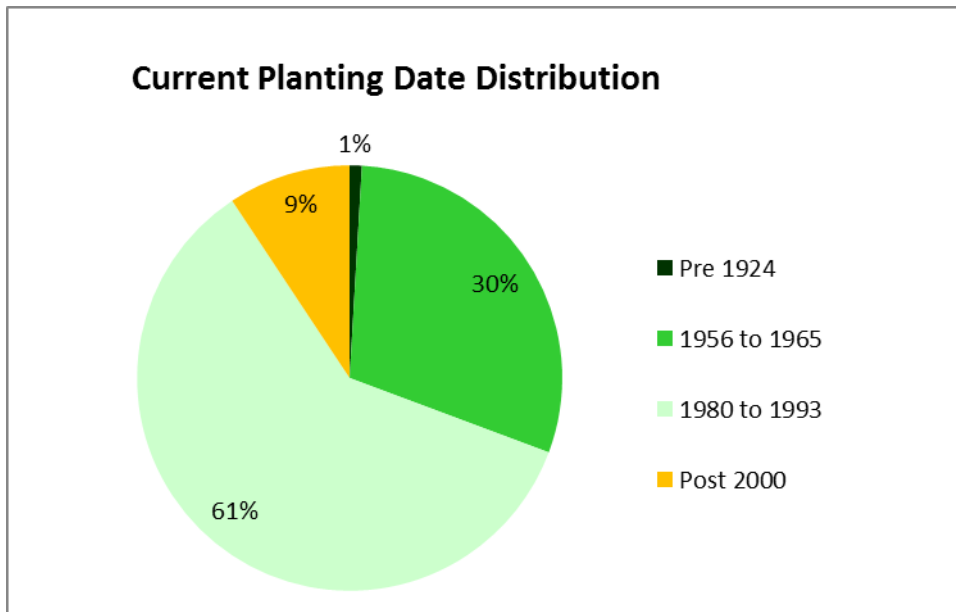
The process of restoring PAWS areas has been facilitated by effective deer control, good local seed sources and soil/mycorrhiza/seed bank factors. The PAWS areas have been assessed for potential for restoration based on the amount of woodland remnant flora present. See Map M11.

The retention of specimen exotic conifers contributes to biodiversity and landscape, but these specimen trees may act as seed sources for the regeneration of exotic conifers within PAWS restoration areas. A balance needs to be struck between these factors and needs to consider the practicality of eliminating non-native tree seed sources in the locality. Beech is prevalent along the loch side and plays a key landscape role, again many of the considerations relating to exotic conifers and PAWS apply to beech on this site.

3.3 The existing forest

3.3.1 Age structure, species and yield class

See Maps M3 and M4.



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Species group @ 2015	Area Ha	%	Species group @ 2035		%	% Change
Larch	35.5	5%	Larch	22.2	3%	-2%
Lodgepole Pine	329.9	42%	LP	314.2	40%	-2%
Mixed Broadleaf	20.9	3%	MB	40.7	5%	3%
Mixed Conifer	37.0	5%	MC	28.4	4%	-1%
		0%	MIX	6.8	1%	1%
Open Ground	173.2	21%	OG	178.4	22%	1%
Scots Pine	122.1	16%	SP	126.3	16%	1%
Sitka spruce	66.1	8%	SS	67.3	9%	0%
Total	784.5	100%		784.5	100%	0%

Table 1: Proposed changes in species composition over plan period.

Species	GYC Range
Mix Broadleaf	4
Douglas fir	16 to 20
Larch	4 to 14
Lodgepole pine	4 to 12
Norway spruce	8 to 22
Scots pine	4 to 12
Sitka spruce	4 to 24

Table 2: Indicative General Yield Class Range (GYC)

3.3.2 Access

Following implementation of proposals under the previous FDP, the forest is now well roaded and served with a quarry providing good stone. Further road extensions will be required as the harvesting programme extends into un-roaded areas.

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The road network represents a long term investment in infrastructure that in conjunction with the productive potential of the site gives a comparative economic advantage for timber production that benefits the local and national economy. A good road network also reduces the potential for harvesting operations to adversely affect soil structure and water quality.

General management, disease monitoring and deer control are all facilitated by the network of haul roads and ATV tracks.

The forest road network provides a path network for both cyclist and walkers, with fine viewpoints across the surrounding land.

Although there are areas of steep ground that limit the harvesting method and consequent coupe shape, much of the area has gentle slopes with low roughness and good ground bearing capacity.

Areas of deeper peat within the upper plateau area may present some challenges and brash mat construction in these areas may well reduce realisable timber yields.

The strip of woodland running along the public road has very poor access due to the following factors:

- Powerline wayleave
- Limited access points onto public road.
- Slope
- Public access along core path/Great Glen Way
- Proximity of housing
- Variable patchy nature of tree cover
- Lack of connectivity with road network due to past harvesting operations.

3.3.3 Low Impact Silvicultural System (LISS)

The previous plan recognised areas with potential for LISS, but management of these areas wasn't progressed under the previous plan, although extensions to the road network to enable this were undertaken.

There are 3 main reasons for trying to adopt LISS as the management approach: maintaining forest cover behind the village if possible, maintaining the diversity of trees along the A82 and to retain the Scots pine

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areas by opening up the stands and increase airflow. See Maps M5 and M6 for DAMS and slope in relation to potential LISS areas.

Harvesting operations under LISS tend to be associated with higher costs. Timber prices have a key bearing on whether LISS is economically viable, and the plan may need to be reviewed should timber price declines prove to be sustained.

A major consideration within Drynachan is that areas of crop are marginal for LISS management primarily due to the age of the crop. This has two impacts on the feasibility of LISS management: -

- a. stability issues arising from thinning in crops with a poor height to girth ratio and
- b. the ability of the crop to respond positively to the increased light levels associated with thinning, which is a function of the crown to stem ratio and species.

3.4 Landscape and land use

3.4.1 Landscape character and value

The forest landscape is again defined by the split between the lower “broad forested strath” & the upper plateau within the “rocky moorland” Landscape character type (Scottish Natural Heritage (SNH)). The upper plateau is a rolling large scale landscape with lochans providing a visual focus. The gentle rolling terrain is dominated by the dramatic mountain vistas to the south in Glengarry Forest.

The lower slopes in contrast form a very different landscape element with a much more intimate visual experience that is defined by the lochs of the Great Glen, farmland on the Glen floor and forested steeper slopes.

The forest also plays a key role in the landscape transition between the more upland Glen Garry and the gentler Great Glen.

The woodland cover on the lower slopes is mixed in nature with many specimen mixed conifers reflecting an earlier estate landscape design. Beech is a feature of the area and emphasises the gentler lowland element of the landscape along these transport corridors.

The specimen conifers & mature beech & oak along the A87 & A82 define the roadside landscape and bring winter colour and visual diversity. In

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In addition these trees provide a landscape backdrop to Invergarry village and enhance the views from both options of the Great Glen Cycle route.

The linkage between the narrow diverse mixed landscape along the roads and the lower slopes is poor in places and the past felling has highlighted the contrast between these two elements. A wider application of LISS and expanded broadleaf areas along burns may have a role to play in providing better landscape continuity.

Some landscape enhancements can be made during the next 20 years of the LMP, but many other elements will require a longer time frame to address.

The main landscape elements that will require remedial action include:

- PAWS restoration boundaries at odds with landform in compartments (compts) 7201 & 7202.
- Isolated & out of scale conifer retentions along the Great Glen Cycle Route (variant) (compts 7201, 7204, 7208).
- Unstable mixed mature conifers creating a confused landscape impact on the ridge in compt 7201.
- The scale of the potential felling coupe in compt 7207.
- Powerline wayleaves
- The impact of the forest margin when viewed from the west in compts 7210 & 7227 (currently screened by mature foreground conifers).

The strong natural regeneration potential across the lower slopes of the forest will help to mitigate many of the current landscape issues over time and will build in more forest resilience.

3.4.2 Visibility

The lower slopes of the forest are highly visible from the A87 & A82 as well as the Great Glen Cycle route along the east shore of Loch Oich.

The visual impacts are both medium scale views from these routes and close up intimate views where they pass through the forest.

The upper plateau area has more limited visual impacts, with views from distant Munros (mountains over 3000ft in height) having some significance.

3.4.3 Neighbouring land use

The main neighbouring land uses are forestry and deer stalking, although some farming takes place along the Glen floor. The linkage and interactions with neighbouring land uses is low, with few obvious options for integration.

Effective deer control within the forest has facilitated good natural regeneration of mixed broadleaves and mixed conifers across the lower slopes as well as the establishment of planted softer conifers & broadleaves without deer fencing. This provides landscape, access and ecological benefits.

The control of Rhododendron is an ongoing priority within the forest. Control on neighbouring land would clearly secure longer term benefit from this expenditure.

Feral pig have colonised the forest and surrounding areas following escapes from private collections. This has created issues for FCS, residents and local farmers. The best way to manage this issue has yet to be determined, but ongoing consultation with SNH and affected neighbours to deal with this mutual problem on a national level is required. Wild boar were previously an integral element of the Highland forest ecosystem and while the specific problems for individuals shouldn't be underestimated, from an ecological and forest management perspective the impact of feral pigs may not be entirely negative.

3.5 Social factors

3.5.1 Recreation

The woodland is used for informal recreation, by local people and visitors to the area.

The A87 & A82 are also key tourist routes and the forest contributes positively to the visitor experience of a large number of passers-by.

The upgraded Great Glen Cycle route on the east shore of Loch Oich provides more sustained views of the forest with the specimen tree element again having positive impacts.

The Public Right of Way (PROW) that runs across the forest from Invergarry to Loch Lundie is only lightly used, and there is scope for greater use of this route to facilitate a circular route of moderate distance. Much of the route

on the lower slopes has a hard base and forms part of the network of ranger paths.

3.5.2 Community

The village of Invergarry is an active community with strong links to traditional land uses including forestry.

The maintenance and enhancement of access, control of rhododendron and maintaining a pleasant setting for the village are all considered priorities for the community.

The issue of feral pig releases on private land affects FCS, the Community & neighbouring land managers. The effective management of this new land use factor is currently under review and will require cooperation between all parties.

3.5.3 Heritage

There are a limited number of unscheduled archaeological features on the lower slopes and the setting and protection of these elements has been taken into account under the previous plan. The success of natural regeneration across the lower slopes may create problems for some of these sites, and site monitoring is important to assess whether clearance of regeneration is required.

The specimen trees on the lower slopes also form a living part of the heritage of the area, and the PROW reflects past, more intensive, land use.

3.6 Statutory requirements and key external policies

There are no statutory designations on site, and all water bodies have been recorded as being of good status.

The forest lies mainly within an area defined as policy category A 'Suitable for all types of woodland which respect local circumstances and meet current FCS design criteria and guidelines', within the Highland Council Forest and Woodland Strategy.

Proposals to increase the amount of designed open space must take into account the Scottish Government Control of Woodland Removal Policy.

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The latest advice concerning tree disease impacts, appropriate tree species for restocking and biosecurity protocols will all be utilised within the planning and operational procedures.

4.0 Analysis and Concept

4.1 Analysis

Map M7: 'Landscape Analysis', section 3 above and Table 4 below illustrate the factors, which through consultation and review, have significantly influenced the design and long term vision for the forest.

The main issues addressed by the plan are:

- **Timber production:** Increasing opportunities to maintain the commercial high quality timber output while increasing the diversification of timber producing species. The lower slopes offer the more scope for alternative productive conifer species. The upper forest area is suitable is more limited with SS and LP likely to be the main species for softwood timber. Opportunities for productive broadleaves within the PAWS restoration areas will be considered at the time of restocking once the site conditions can be assessed.
- **Forest health:** DNB is present in the forest and existing stands of pine will need to be monitored. Thinning of Scots pine stands will help to reduce the impact of the disease.
- **LISS:** The area of forest managed as continuous cover has been reviewed, to reflect site potential. New areas which are appropriate for LISS have been identified. Increasing the area of forest managed as continuous cover, to underpin timber production, forest sustainability, biodiversity and recreation interests. The real potential for an expansion of LISS will be realised as the younger restocks reach thinning age.
- **Biodiversity:** Expanding the area of broadleaves associated with PAWS and watercourses, and maintaining and enhancing broadleaves along watercourses where they contribute to the riparian habitat. Improving the forest age diversity to enhance the habitat to benefit a range of species including black grouse. Opportunities for the expansion of the Dubh locahn and mire habitat in the upper forest and modification of the forest edge will be considered in detail at the next plan revision when the crops are closer to felling age. Alternative (to Sitka spruce) conifers will benefit red squirrels.
- **Landscape:** Restructuring to address crop landscape issues (3.4.1), build on the existing landscape strengths, in particular the specimen tree element, and encourage the longer term recruitment of this landscape element.
- **Recreation:** Forest restructuring offers a more diverse internal forest landscape, and enhances views from paths outwith the forest. Potential for greater use of PROW.

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- **Deer and grazing damage:** Effective deer control is fundamental to achieving the LMP objectives. Continuation of active deer management to avoid, where possible, the need to deer fence sensitive crops. A good road network, ATV tracks, permanent open ground and a matrix of felling coupes can all facilitate effective control.
- **Protection of water quality:** Continuation of past management to maintain water quality both in the wider environment and specifically for private water supplies.
- **Feral pigs:** Implement policy as this becomes defined and applicable to forest management.
- **Resilience:** Retain the resilience of transport links and power supply. Increase the resilience of the forest ecosystem and productive capacity of the forest by increasing species diversity and expand the use of intimate mixtures, particularly in relation to pine areas.

4.2 Concepts of the plan

Map 8: 'Design Concept' and Table 4 below illustrate how the issues identified in analysis have been taken into account in relation to the forest plan management proposals.

- Provide phased and well balanced felling proposals which will maintain a diverse age and species structure.
- Establish felling coupes which reflect landscape scale, ranging in scale from small scale coupes along the lower forest margin floor to larger coupes along the upper margins of the forest.
- Replace less productive species and species which will not thrive in the face of climatic change with a range of timber producing species which will improve the quality of timber production. Alternative conifers suitable climatically for Drynachan include Douglas fir.
- Maintain and where possible extend the percentage of LISS within the forest and increase the opportunities for expanding continuous cover forest systems in the future, through careful choice of restocking options on accessible dry ground in sheltered locations.
- Replace conifers with native woodland on areas identified as PAWS, but reconcile this with landscape considerations. Consider opportunities for establishing productive broadleaves where this is compatible with conservation interests. Establish native riparian woodland along watercourses through planting or regeneration.
- Deal with specific landscape issues as the plan develops.

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- Dubh lochan and mire habitat to be considered in detail at next plan revision when the crop will be closer to felling age.
- Similarly the treatment of the edges adjacent to the moorland for black grouse will be considered in the next plan revision.
- Explore ways to manage the areas of isolated mixed conifer along the Great Glen Cycle route (variant) in a cost effective way.
- Take into account views from access routes, and increase woodland diversity along access routes, to enhance the informal recreation experience. In particular enhance internal views in the vicinity of the village and along the public road. Retain and manage the specimen tree element and facilitate recruitment of replacements.

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Table 4: Analysis of opportunities, constraints and concept

Factor	Opportunity	Constraint	Concept
Alternative conifer species	Diversify the productive conifer element within the forest.	<p>Climate suitability – the lower slopes of the forest are the warmer and slightly drier areas which are suitable for a greater variety of species.</p> <p>There is a lack of detailed soil information which will need to be checked prior to restocking to finalise the species choice.</p> <p>Disease impacts on pine and larch.</p> <p>WH is not a preferred species at present due to its invasive nature and will not be established close to native woodland.</p>	<p>Suitable species for the lower slopes – SP, DF, GF, WRC, Japanese red cedar (JRC), NS, Wellingtonia (WSQ), Pinus strobus (WEP) (?).</p> <p>Higher up the slope the choice is more limited – SS, LP, (WH), NS (drier sites), NF.</p> <p>Larch will not be planted in the first 10 yrs of the plan.</p> <p>Provenance selection for the pine disease resistance along with thinning of the stands.</p> <p>GF and NF will only be planted in small stands for diversity as the timber is lower grade. JRC, WSQ and WEP will also be more limited but worth trying.</p>

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Factor	Opportunity	Constraint	Concept
Resilience to climate change	Diversify species and age structure of the forest and improve connections	Challenge of increased storm events and impact of disease on species choices. Early thinnings necessary for improved future stability are often uneconomic.	Establishment of riparian corridors to provide habitat links. Use of alternative species – see above.
Adverse landscape impacts	Opportunity to address these issues building on the intrinsic strengths of the woodland/current management including: potential for a wide species range, good deer control, good natural regeneration, specimen trees, a good road network.	Access is problematic in key areas along the main path route through the forest adjacent to the public roads. Isolated blocks, powerlines and restricted access onto the A87/A82 all constrain management and increase operational costs. Many of the landscape enhancements will require action over a long time period.	Use LISS to maintain forest continuity. In the younger crop in compt 7207 retain the significant MB element at felling to reduce landscape impacts. Fell unstable crop elements with high visual impacts. Thin margins of crop in compts 7210 & 7227 to create varying densities and a diverse edge. Retain and recruit specimen trees
Conservation interests	Increase native woodland species on PAWS when felling has taken place on identified sites. Expand area of BI/SP in upper forest as appropriate. Protect and enhance the	The mapped extent of the ASNW areas may conflict with landform, and accuracy may be questionable. SP may be constrained by DNB. No felling will take place	Significant PAWS have been converted; identify areas requiring further intervention to secure the native woodland elements. Enhance the landscape fit of these areas. Manage the PAWS areas to

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	dubh lochan and mire area	in the upper forest area during the first 10 yrs of the plan.	retain remnant woodland flora interest where felling is not due in the plan period. Establish appropriate levels of broadleaves along the watercourses, and intimate mix of BI/SP in key locations. Review the mires etc at the next plan revision.
Forest used for recreation	Potential to diversify age and species diversity, and to open up and retain views as part of forest management. LISS can be used to maintain recreational interest and increase sustainable forest management.	Recreation usage all year, coupled with difficult access for forest management in key areas.	Aim to diversify the forest with species which can be used for timber production as well as adding visual diversity. Utilise MB areas for productive use where access is feasible.
Deer	Joint working with neighbours. Build on current effective deer control to maintain low deer numbers.	Recreational use may constrain deer control. Neighbours objective may conflict with forest management.	Continue good proactive management and respond to damage levels in sensitive restock sites.

5.0 Forest Design Plan Proposals

Felling Phases	Area Ha	%
Phase 1 (2016 - 2020)	3.6	0%
Phase 2 (2021 - 2025)	29.3	4%
Phase 3 (2026 - 2030)	27.9	4%
Phase 4 (2031 - 2035)	38.4	5%
Phase 5 (2036 - 2040)	100.8	13%
Phase 6 (2041 - 2045)	45.0	6%
Phase 7 (2046 - 2050)	110.5	14%
After 2051	101.4	13%
LISS	112.5	14%
Long Term Retention	41.8	5%
Open Ground	173.2	22%
Total	784.5	100%

Table 5: Felling phase proportions across the plan period.

5.1 Clear felling

See Map M9 Management map - felling and the 3D visualisations.

The options for clear fell coupes in terms of number and design are restricted by current crops and past felling.

This has resulted in gaps in the felling phases, but this could be ameliorated by the timing of operations within the LISS areas to provide a more continuous timber output.

On the upper plateau area, where there is the younger crop and slower growth, larger scale coupes are appropriate. While felling phases have been suggested for this area, a more pragmatic approach would be to review this zone at plan review in light of growth rates & disease impacts.

5.2 Thinning

Most of the thinning activity will be focussed within the proposed conifer LISS areas. While climatically the site lends itself to a significant area of active silvicultural management, rough ground conditions restrict machine access in some otherwise suitable crops. The weakness of timber markets in the past has also limited the areas that have been thinned. Future timber prices will have a bearing on LISS feasibility. See Map M9 Management map for areas of proposed LISS which will require thinning interventions.

Thinning in standing crops needs to consider stability issues and the prospects of the crop responding positively to the opportunities presented by thinning. Typically a third of tree height needs to be live crown to enable the tree to take advantage of increased post thinning light levels, although this generalisation varies with species and site. Crown thinning offers some scope to maintain stand stability in crops where thinning has been delayed.

Future restocks and young pole stage crops should be actively assessed for thinning potential as the plan progresses. Future timber revenues relative to harvesting costs are important considerations, and an expansion of the LISS area over second rotations is a possibility.

Early thinning of Scots pine stands is a recognised way of reducing the impacts of DNB, and while it can be a cost burden in the short term, the longer term costs associated with senescing pole stage pine stands are potentially higher. Some 2nd rotation conifer crops on PAWS sites also need to be thinned early to reduce the impact of the evergreen conifers on any remnant features. Some targeted halo thinning to release the remnant mature broadleaves in coupes where clearfelling is not due this rotation. See Map M11.

5.3 Low Impact Silvicultural System (LISS)

See Map M9 Management map for areas of proposed LISS. Irregular shelterwood is the most appropriate LISS across most of the larger areas of SP & NS, with irregular shelterwood & selections systems being more appropriate for small scale intimate working along the path, public road and village environs where tree species and structure are already diverse (See appendix III).

In places along the path where access is severely constrained felling without extraction may be the only option. Cooperation with SSE, the Highland

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Council roads dept. and Transport Scotland (A82) is vital in relation to the management of the area located along the Great Glen Way & the public road.

5.4 Future habitats and species

See Map M10 Future Forest Restocking and the 3D visualisations.

Drynachan offers opportunity to increase the diversity of productive conifer and productive broadleaf, particularly on the lower slopes. The main alternative conifer species will be DF, NS and SP with some more limited planting of GF, NF, JCR and Wellingtonia. The final layout will depend on obtaining soil information after felling.

Establishment of native broadleaves at closer spacing will be considered on the PAWS sites where these are accessible for future management .

Management of birch for woodfuel will also be considered as a future option to retain some productive on the poorer sites.

The establishment of native woodland on the PAWS will enhance biodiversity. On the lower slopes oak/hazel woodland is the principal native woodland type with some of the areas higher up the slope more suited to pine/birch woodland. ASNW areas will be linked by riparian zones where possible. The riparian zones should be enriched with the removal of the riverside spruce, and the increased light and planting of native broadleaves should create greater diversity.

Continuous cover will help maintain the populations of species which benefit from a stable habitat, including red squirrels.

The proposal to create matrices of both Scots pine/Sitka spruce (SP/SS) & Scots pine/birch (SP/Bi) to increase forest resilience may also provide biodiversity and landscape enhancement.

The areas identified for native broadleaves have the potential to produce productive timber and woodfuel.

5.5 Management of open land

Many of the upland areas with potential for bog restoration contain checked crops with a functional ground flora and hydrology, and this should facilitate

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the limited restoration targets envisaged as the upper plateau area comes into active harvesting management. (See appendix III)

Deer management is the main practical tool for managing the open hill areas, and the internal open ground, and the correct balance between habitat degrade from overgrazing and the uncontrolled expansion of woodland cover on the open hill needs to be reached. In particular increasing deer numbers on the open hill would be associated with adverse impacts on native broadleaf establishment within the PAWS areas.

The strength of mixed regeneration across much of the forest on the lower slopes would suggest that the most pragmatic approach is to accept this unless it has adverse impacts on key features such as public access routes or archaeology.

The powerline wayleaves could be enhanced both visually and ecologically by the establishment of juniper.

5.6 Deer/Feral pig management

A continuation of current active deer management is essential to achieve the plan aims.

Any deer fences, internal or march will be assessed for black grouse strike risk and marked where they present a risk to the local population.

The management of feral pig populations will be informed by national policy in consultation with SNH & local communities.

5.7 Access

The proposed new roads shown on the management map are based on a detailed desk assessment which should allow for construction within the agreed tolerances. Only the road to the SW to cpts 7210 and 7227 is planned for the period of the plan. Once the EIA requirements have been satisfied a prior notification will be submitted to the Highland Council. Roads will be constructed following best practice in TTF (2014) on 'The design and use of the structural pavement of unsealed roads', SEPA General binding rules and the UK Forest Standard.

5.8 Critical success factors

LISS – Many of the areas identified as appropriate for continuous cover are close to the end of the thinning window in terms of stability in an un-thinned crop. Having identified areas appropriate for continuous cover, in terms of gradient, soil type and species, it is essential that a thinning programme is implemented within a fairly short time frame if LISS is to be a viable option. This may require thinning to be undertaken even if markets are depressed, however should the economic constraints prove insurmountable, then these areas should be reviewed with an eye to clearfelling at next plan review.

PAWS restoration – Resources need to be available for the ongoing management of the PAWS areas to protect the remnants until full restoration is achieved, for the ongoing remove non-native regeneration and where necessary to supplement the nat regen of native species.

Specimen Tree Management – The management of specimen trees requires an arboriculture approach focussing on individual trees and potential recruitment. Recruitment is particularly important where felling of over mature specimens is required due to potential damage to housing, road or power linkages. There are currently a good range of species and age classes available on site for recruitment as specimen trees, but the long term nature of this management requires a consistent and sensitive approach that needs to be integrated with more traditional large scale forest management approaches.

Pathside management – Maintaining a pleasant path environment is very problematic given the access constraints for harvesting and extraction. Early interventions may be more cost effective than later interventions. A pragmatic approach may, however, be to maintain the paths functionality in the short term and revisit the whole issue of full restructuring as the adjacent younger restocks become mature.

Deer control - it is vital that deer are prevented from damaging restocking, including broadleaves on the PAWS, by culling. Continued good deer control is essential.

Climate Resilience – Selection of crops for LISS that are able to retain some stability is an important consideration. Many of the areas on the lower slopes have a low DAMS score and good rooting depth, but in some cases crop characteristics are marginal for thinning due to lack of past thinning.

Retaining a wide species range can limit the scale of impacts from climate change, while potentially making it more likely that some element of the forest may be adversely affected.

Disease/Pest Resilience – Monitoring of disease impacts is vital, particularly in relation to pine species & DNB. Active management and thinning of Scots pine stands can play an active role in reducing the impact of DNB. A wide species range and intimate crop mixtures can reduce the scale of disease impacts.

Infrastructure Resilience – Collaborative working with SSE, the Highland Council and Transport Scotland in relation to powerline and road resilience issues is essential, and this process should seek to bring considerations of the multi-purpose benefits of forestry into resilience planning; particularly in relation to landscape, aesthetics & amenity.