
Ardochy Land Management Plan 2016-2026

Lochaber Forest District

ARDOCHY

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



Ardochy Land Management Plan 2016-2026

Application for Forest Design Plan Approvals

Forest Enterprise Scotland

Forest District:	Lochaber FD
Property name:	Ardochy Forest
Nearest town, village or locality:	Invergarry
OS Grid reference:	NH23880313
Local Authority:	Highland Council
Plan Area	260ha
Conifer Felling	60.72ha
Broadleaved Felling	0

1. I apply for Forest Land Management Plan approval for the property described above and in the enclosed Land Management Plan.
2. I apply for an opinion under the terms of the Environmental Impact Assessment (Forestry Scotland) Regulations 1999 for roads as detailed in my application.
3. I confirm that the initial scoping of the plan was carried out with FC staff on 11th February 2016
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 design 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 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.

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Signed.....
Forest District Manager

Signed.....
Conservator

Date.....

Date.....

Date of Approval.....

Date Approval Ends.....

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Request For Determination Under The E.I.A (Forestry) (Scotland) Regulations 1999	
Operation	New road construction
Location	Ardochy LMP Ref : 030 /519 /212
Grid Reference	GRNH1419703344
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 X3.4m Roadside ditches 2m either side. This equates to c1.4ha of woodland lost. to access cpts
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.	Roads will be constructed following best practice in TFF (2014) on 'The design and use of the structural pavement of unsealed roads SEPA and general binding rules and the UK Forest Standard.
Proposed Timing	2017-2018
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 route will be undertaken prior to construction to ensure no protected species.
Landscape	Roading will be screened within the forest, sympathetically constructed and with no significant impact on the wider landscape.
Water	Burn crossing at Allt Dubh will require bridge and other minor crossings which will follow GBR and Forest and Water Guidelines. Minor burn crossings required which will follow GBR and Forest and Water Guidelines

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Recreation / Access	The new road will allow informal access
People	No impact on neighbours
Other Information	
Signed	
Forest District Manager	Date
Signed	Date
Conservator	
Land Mgt Plan approval date	
Land Mgt Plan approval ends	
EIA determination valid for 5 years	EIA approval ends

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This plan is the first revision of the original Ardochy Forest Design Plan (FDP). The purpose of this plan is to describe management objectives and prescriptions for the forest over the period 2016 – 2026 in detail, and in more general terms, for the following twenty years to fulfil the requirements of the UK Woodland Assurance Standard (UKWAS).

Summary of Proposals

- Felling of 60.72 ha of commercial conifer timber over the next ten years. This requires major road infrastructure in the upper portion of the forest
- Emphasis on restocking the lower slopes and better soils with commercial conifer including Sitka Spruce , Norway Spruce and planting Scots Pine on heathery knolls to link the species over wider forest
- Restructure of the forest margins on the loch side and with sympathetic consideration to the A87 road corridor
- An emphasis to increase and enhance the native woodland element throughout the forest
- Retention of Scots Pine to maintain seed source and protect Red Squirrel habitat
- Maintenance and enhancement of butterfly habitat
- Explore potential to better utilise wayleave edges and corridors by considering low structure species to become established.
- There will be no new planting over the next 10 years

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1.0 Introduction:

1.1 Setting and context

Ardochy Forest is situated on the northern shore of Loch Garry and 9 km north of the small village of Invergarry. The woodland consists of some 260 ha including open ground reaching from the Kinlochourn road on the northern shore of the Loch and across the A87 Skye trunk road to a maximum elevation of approximately 200 metres.

The woodland also extends from beyond Ardochy House on Loch Garry to the deer grid on the A87 and to the junction of the Kinlochourn road with the eastern boundary being the watercourse known as the Allt Daingean. The forest is deer fenced for much of its boundary, however, there are degraded sections throughout rendering it ineffective and the forest is dissected on its upper margins by the A87 Public Highway. From here a number of viewpoints allow visibility into the interior and loch side margins of the forest, however, it is from the surrounding hills and opposite shore of Glengarry Forest that visibility of Ardochy is most prominent.

1.2 History of the forest

Ardochy is subject to an existing Forest Design Plan Reference number 030 / 519 / 212 which was signed on 25 /04 /2005 and is due to expire on 24 /04/2015 and it has been extended to 31/3/2017.

The land was acquired by the Forestry Commission in the 1947 and was planted with commercial conifers from then through to the present day. The forest bounds an SPA and SSSI and is in the process of restructure with a proportion of rotational age timber now harvested. The general character of this forest is one of commercial conifers, predominately Sitka spruce with Norway spruce and larch as a secondary timber crop. There are PAWS and ASNW designations to parts of the forest with significant broadleaf components and internally Ardochy contains small stands of naturalised Scots Pine, planted in the 1890's and offering the potential of seed trees to the aid of natural regeneration. There are elements of policy woodlands and tree collections along with archaeological evidence of past human habitation and these add cultural landscape values to the woodland.

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1.3 Planning Context

The Strategic Directions for the National Forest Estate provide the planning framework for the Lochaber Strategic Plan which in turn guides the development of this LMP. The 6 strategic directions for the NFE are set out below and a more detailed review of Ardochy in the light of these directions is given in the Brief appendix.

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

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2.0 Analysis of previous plan

2.1 Aims of previous plan and achievements

The management objectives of the previous plan were identified as: -

- Producing wood and marketable timber – High Priority
 - Managing and regenerating forests or woodland – High Priority
 - Recreation – Low Priority
 - Water Quality –High priority
 - Landscape enhancement – High Priority
 - Maintaining and creating habitats- Medium Priority
 - Providing Employment –Medium Priority
 - Conserving Archaeological features – Medium Priority
- **Producing wood and marketing timber**
Felling programme complete with coupes harvested between 2005-2013 and accounting for 25% of the area of commercial crop and yielding c.22, 300m³
 - **Managing or regenerating forests and woodlands**
Previous plan has improved diversification in the upper portion of the forest and establishment of 16ha of protected commercial broadleaves on PAWS (plantations on ancient woodland sites) designation contributes to long term restoration targets
 - **Enhancing the landscape**
Previous plan mentioned reshaping the upper margins with no mention of LISS (low impact silvicultural systems) as an alternative. The plan did acknowledge open ground and the possibility of natural regeneration of native species in this area. Improvements to the eastern march have been achieved through diversification of species and felling has taken a large coupe from the lower portion of the forest which has left a poor quality landscape in that part of the forest.

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- **Maintaining and creating new wildlife habitats**

Fencing to protect productive broadleaf component has created secure growing area aids protection to natural regeneration along the riparian edge on east march of forest where cattle grazing on lower mixed woodland has enhanced butterfly habitat. The retention of Scots Pine on felled coupes will also benefit the Red Squirrel population and provide future seed source. The previous plan identified ASNW (ancient semi-natural woodland sites) and PAWS sites and there has been limited establishment of native species in this area with one coupe of productive broadleaves planted in 2014 subsequently becoming infected with *Chalara fraxina* resulting in a statutory plant health notice (SPHN) being served. Red squirrel numbers were recorded as low and the location of a badger sett recorded.

- **Providing public recreation**

Recreation has played a minor role within the plan an emphasis being on Daingean historical site and informal access for visitors. There has been creation of access to public and provision of small car park at Daingean archaeological site and a walk around the township which is maintained by volunteers. There is no other official public recreation infrastructure.

- **Conserving archaeological features**

Recorded features have been conserved during forest operations

- **Wayleave constraints**

Ardochy has considerable wayleave margins and presented challenges to the felling programme with overhead power line (OHPL) shutdowns required during harvesting operations.

- **Other /Regulatory Designations**

Black Grouse lek was noted adjacent to the forest, although outside the boundaries and unplanted ground below the powerlines designated a Butterfly Action Plan area. There is an SPA designation bordering Loch Garry which is part of the wider West Inverness-shire lochs initiative. The forest also lies within the Glengarry Upland Oakwood Management Plan.

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2.2 How previous plan relates to today's objectives

The previous plan forms the base line for the current reappraisal contributing to the redesign and restructure of the forest and this is in part still driven by existing constraints. Many policies of the original plan are valid today and still influence the future management of Ardochy and the continued aim to allow the forest to sit comfortably within the context of a large woodland area of mixed ownership. The main difference is the national change in policy on PAWS restoration which makes this now a high priority for the wood.

In today's LMP we continue with applying those objectives through design and by the continued, careful clear fell of rotational age Conifer crops over the next 10 years. The subsequent restocking will be diversified by using a range of appropriate species and with an increasing emphasis on conservation and biodiversity. We will continue with the gradual reduction of commercial conifers, restoration of PAWS, retention of open space and existing habitats, while increasing native and commercial broadleaves components of the forest.

Consequences for current revision –

- Redesign of the upper margins needs to be continued into the next plan with further opportunities for reshaping forthcoming in future felling and restocking
- Continued review of PAWS sites are likely to identify and consolidate further restocking of native broadleaves.
- The habitat plan was reasonably limited and this requires action to incorporate and action on LISS objectives in the lower loch side fringes and a review of wayleave edges around the powerlines.

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3.0 Background information

3.1 Physical site factors

3.1.1 Geology, Soils and landform

The underlying parent geology is one of Morainic Drift composed of silty or sandy till commonly interbedded with varying proportions of gravel, sand and silt.

The soils in the lower aspect are primarily Upland Brown Earths (1u) , Podzolic Brown Earths (1z) ,with the upper forest likely to have an element of Deep Peat and a typical peaty surface- water gley (5) and Brown ground – water Gley (5b). Within that matrix there are localised variants due to the complexity of the landform and underlying geology. The soils information is only available at a low resolution and will need to be confirmed before restocking but is suitable for growing productive timber crops, particularly on the lower slopes.

The landform is defined by regular and gently undulating hills which sweep down to the loch-side and with notable riparian features that lend to steeper, rockier sections at their margins and which bound the forest to the east and west. There is a notable softening of the landform around the loch side margins where the expanse of water becomes the focal point in the surrounding and wider landscape.

3.1.2 Water

The natural fall of the landscape lends to the various water courses draining south and into loch Garry which is part of the West Inverness-Shire lochs SSSI. The catchment is large including a manmade area of water that is extensive in body and which is part governed by hydro dams which utilise the loch to produce power. Drainage from the main forest is characterised by a number of water courses sometimes steep and which run down from the upper margins, through the forest before emptying into the loch. Amongst the multiple water supplies running through the forest to Loch Garry the most westerly is used by Marine Harvest to supply their fishery. Other supplies taken from the forest are utilised as supplies for private households.

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The fishing in Loch Garry comes under the Ness District Fishery Board category 3 fisheries with the FD having a board rep to represent these interests. The forest management objectives will contribute towards achieving the objectives of the River Basin management Plan (RBMP) by addressing any local water body deteriorations within the LMP area. The management proposals will also reflect practice that will not result in the deterioration in any water body status by ensuring that forest management does not cause pollution.

Water body or protected area ID	Water body or water dependent protected area name	Type	Classification and pressures which plan could address
1000190	Loch Garry	Heavily Modified Water Body	Good ecological potential

Area of proposed felling in each catchment over next ten years -

Ardochy Forest = 60.72 Ha

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3.1.3 Water and the River Basin Management Plan (RBMP)

The riparian features of Ardochy Forest all drain southward and into the freshwater and hydro dammed Loch Garry. There are three main riparian features which bound both the Western and Eastern marches of the forest with Allt a'Bhiora running through both the upper and lower portions before terminating in Loch Garry. There are unidentified private water supplies relating to at least two properties bounding the lower section of woodland at Ardochy House.

For the waterbody Loch Garry SEPA have set the overall Environmental objectives for the first, second and third RBMP cycle as

Year	2008	2015	2021	2027
	Good ecological potential	Good	Good	Good

The forest management of Ardochy will contribute towards achieving the objectives of **The River Basin Management Plan** (RBMP) by: -

1. Addressing any local water body deteriorations within the plan area.
2. By designing new proposals so that they will not result in deterioration in any water body status
3. By ensuring that forest activities are managed in such a way as to ensure they do not cause pollution.

To this effect all operations will comply with the Forests & Water Guidelines section of UKFS.

The Water Body Data Sheets from the RBMP confirms that there are no water bodies within or adjacent to the plan area which are currently at less than good ecological status / potential and this standard should be maintained and enhanced if possible. Sustained forest management is essential to ensure the supply of good quality fresh water, provide protection from natural hazards such as flooding or soil erosion and to protect the needs of aquatic species.

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3.1.4 Climate

The general climate is mild, wet and windy and mean annual temperatures in this area are around 7.9°C. Snow is less prevalent than in eastern central Scotland with this region exposed to rain and South / South Westerly winds. The climate is mild, wet and windy and the mean annual precipitation of 1,415mm. Wind exposure across the forest is measured using the DAMS score. Ardochy is considered sheltered and this low score offers thinning potential for future crop management. However, winds can be gusty in this area and early and regular thinning intervention is recommended.

While Ardochy is generally accessible all year round, both thinning and felling programmes need to take into account rainfall levels which may cause significant run off and possible land slip on unstable slopes. In addition, parts of the glen are exposed directly to western winds, which are likely to have an effect on ensuring the stability of continuous cover and planning the timing and sequence of felling proposals.

3.2 Biodiversity and Environmental designations

The area sits within a wider habitat network of forests that contain elements of ancient semi-natural woodlands, veteran trees, old policy woodland remnants and natural regeneration which offers a varied species mix of broadleaved trees.

3.2.1 Woodland

Ardochy sits within a good native woodland habitat network and contains significant areas of PAWS extending to 86 hectares. It is also a prominent site in the landscape with a major tourist route cutting through the forest. The forest is accessible and has extensive ASNW on the upper middle and lower loch side portions. A component of commercial broadleaves is established on the eastern march of the forest and is growing well, protected by a fence. There is sound rationale to increasing this native woodland matrix by increased planting of commercial broadleaves in suitable sites throughout the forest. This is evidenced in the success of an already established commercial broadleaved crop. By continuing this establishment and expansion into PAWS sites we improve biodiversity, forest resilience and contribute toward restructuring targets.

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The diversification of species offers a potential future crop for the local timber industry and on PAWS sites with a limited choice of fast growing commercial conifer species.

The retention of Scots pine groups is to be continued during commercial conifer felling operations and future establishment will also consider Scots pine as a potential restock species with red squirrel present in small numbers

The woodland rides and open glades are important butterflies breeding in the open sunny glades and less dense areas of the forest, especially around the lochside. There are wood ants in the forest and retention of open grown Scots Pine will benefit this species where they are present. There is an ongoing cattle grazing regime in these areas where carefully management by the Forestry Commission keeps these important features open.

(See Appendix III: Richard Thompson ecological notes)

3.2.2 Open Ground

The topography above the forest consists of rolling open ground and largely hides the forest edge which contours with the landscape. There is a significant area of open ground around the clearance remains at Daingean, in the upper section of forest, managed by cattle grazing the sward in the summer months. A mix of deer glades and unplanted restock are interspersed throughout the forest and which are supplemented by the wayleaves around the powerline constraints which run east – west the length of the lower coupes contribute to create a substantial area of open space within the forest.

3.2.3 Mire/Fen

There are areas of Upland flush fen and swamp identified around the Daingean archaeological site. This is recorded as covering 40% of that area with associated open water, grassland and woodland. In addition to that there is a record of additional small sites throughout the forest and close to the road at NH2150291. Any roadside and drain, culvert management in the forest needs to be undertaken with care to avoid changes to the water flow onto these areas. The District will manage these sites adhering to the UK Forest Standards for water management during operational activity.

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3.2.4 Red Squirrel / LISS Area

The Red squirrel is present in low numbers in Ardochy Forest and with that population to east around the Tomdoun access, adjacent to the area identified as suitable for LISS. While it is anticipated that the area of LISS with its less radical impact on the habitat will benefit the squirrels, it is important that the clear felling of neighbouring coupes does not isolate the LISS areas and retention of Scots Pine and other seed bearing conifers elsewhere in the forest is desirable.

3.2.5 Invasive Non Native Species (INNS)

Lochaber FD will continue to monitor for INNS within its boundaries and to deal with these species in the recommended manner.

3.2.6 Statutory requirements and key external policies

Statutory Designations -

There are no SSSI within Ardochy Forest there are, however, adjacent designations and issues of note.

- West Inverness-shire Lochs Special Protected Area (SPA) and SSSI which includes Loch Garry

Water quality in the Loch is good and continued control of run off and water management during operations will be maintained

Black Grouse Lek – Neighbouring Estate

Lekking of black grouse is precluded within the block due to the crop structures. With increasing woodland edge and open space the local populations of black grouse may well re-establish within the forest boundary although more likely to focus on younger open hill plantings to west out with the NFE.

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Loch

The fishing in Loch Garry comes under the Ness District Fishery Board category 3 fisheries with the FD having a board rep to represent these interests

3.3 The existing forest

3.3.1 Age structure, species and yield class

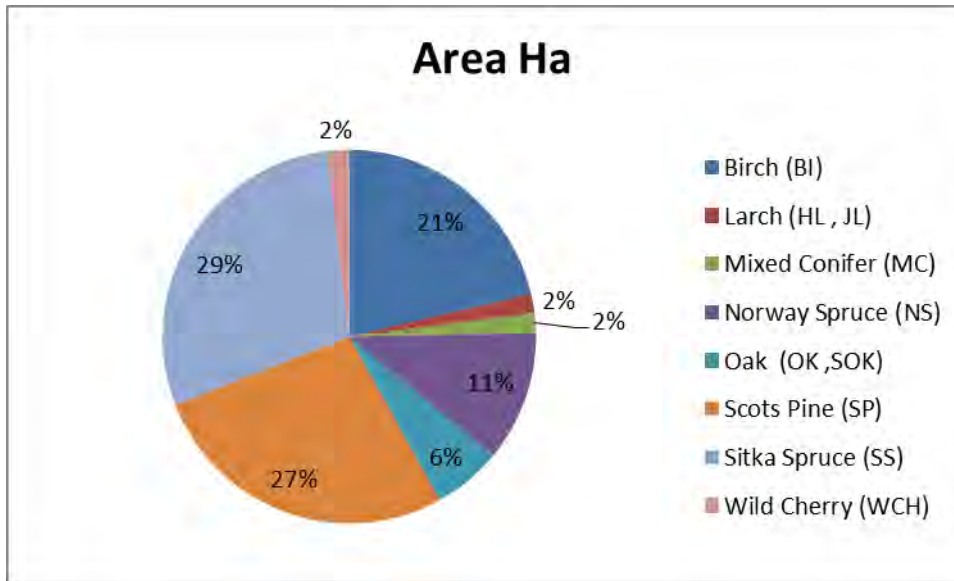
The general character remains one of commercial conifer predominately Sitka spruce with Norway spruce as a secondary timber crop. The forest is currently in the process of restructure with a proportion now harvested. The remaining rotational crop is concentrated above the trunk road and on a higher elevation to around 200m and appears to be relatively wind firm with notable stands of naturalised Scots Pine. There is a PAWS designation in the forest with significant components and which contain a wide range of broadleaf species especially in the lower portion of the forest adjacent to Loch Garry.

Yield Class in the upper component of the forest where the bulk of rotational timber remains, ranges from 6-8 and up to 10-12. There are two components of 14-16 of Sitka Spruce identified in this upper standing crop (PY50) and on younger stands (2002) which is established around Daingean.

The lower component has been largely felled with remaining stands of Sitka spruce with again a yield class of 6-8 and 10-12

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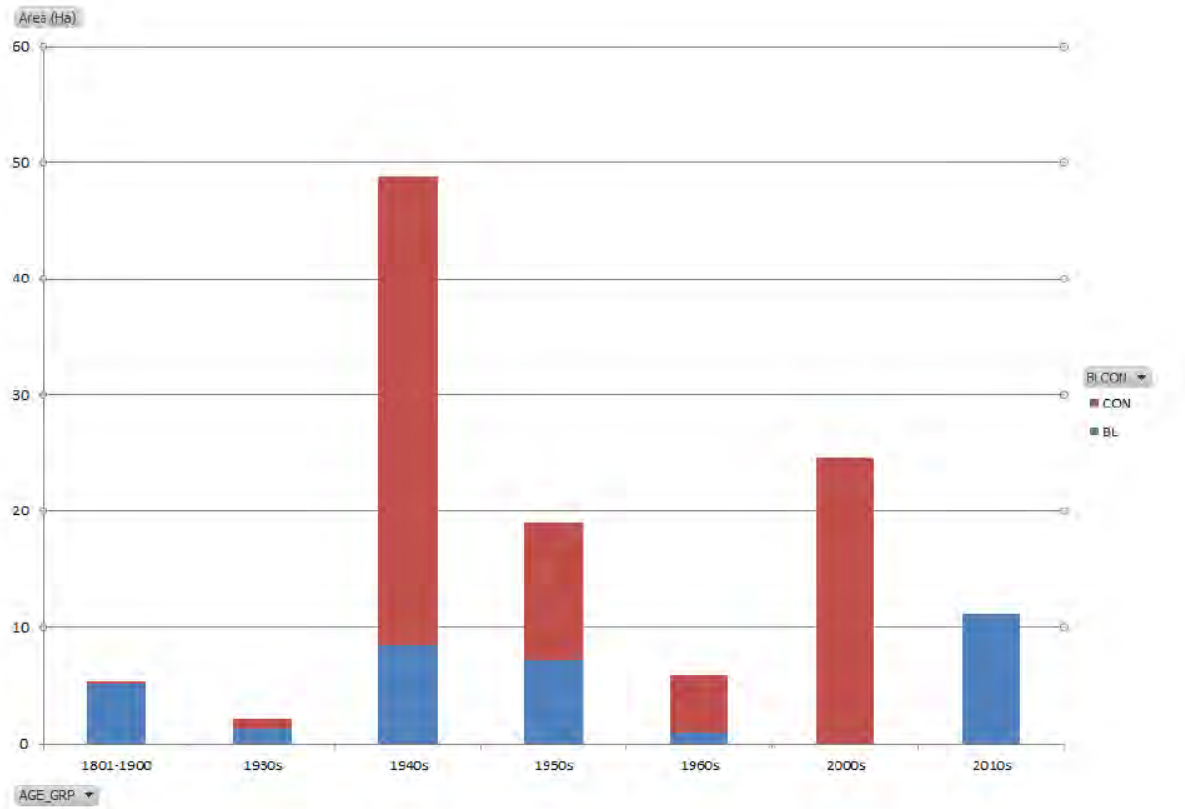
Species



Species	Area Ha	%
Birch (BI)	24.9	21.0
Larch (HL, JL)	1.9	1.6
Mixed Conifer (MC)	2.0	1.7
Norway Spruce (NS)	13.2	11.0
Oak (OK, SOK)	6.9	6.0
Scots Pine (SP)	31.6	27.0
Sitka Spruce (SS)	33.8	29.0
Wild Cherry (WCH)	2.3	2.0
Total	116.6	100%

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Current Age Structure



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3.3.2 Access / Roads

The present road network in the upper margin of the forest is insufficient to access all of the programmed clearfell coupes in that area. New road infrastructure will be required to access the upper coupes and harvest the standing crop.

Heavy vehicle access to the forest already exists from the A87 and to the upper portion of the forest at GR22160294 (AD4). This will be extended in an Easterly direction to access the phase 1 coupes and where 1 km of new road and a timber transfer point will be constructed at GRNH1419703344.

A further 1.7 km of newly constructed road will be constructed and routed in a westerly direction to access the phase 2 coupes in the upper section of Ardochy forest.

In the lower section of the forest there is existing heavy vehicle access situated at GR24060291 (AD1) and the road here requires no upgrade at present being sufficient for future restock and felling operation access.

3.3.3 LISS potential

The forest has been traditionally managed under the clear fell and restocks system with commercial conifer the predominant species. There are however opportunities to utilise LISS within Ardochy forest. Clear fell will remain the principle operational method of harvesting over the next ten years and that will initiate landscape change. The potential to introduce LISS systems exists most notably within the lower section of the forest, bounded by OHPL lines and the Kinlochhourn minor road, and then extending from that roads junction, to the open ground of Ardochy House which marches with Forest Estate to the West. This narrow strip of woodland contains mixed hardwoods of varying age class interspersed with mixed conifer. It is classified as non ASNW with veteran trees and is under a Butterfly Action Plan. The restoration of this area, in close proximity to the Loch side, by the removing of conifers and selective thinning would improve and increase the quality of the semi natural woodland of Ardochy forest. This proposed improvement has been identified as beneficial to butterflies and common scoter in particular.

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3.3.4 Current and Potential Markets

There is a strong demand for the forest products and timber production forms an important component to the local economy. There are accessible sawmills in Fort William where spruce is in high demand and further to the north east where small round wood and bio fuel are easily transported by road via the A82 and A86. A limited local demand currently exists for niche products, firewood and quality hardwoods. There is a potential in future to expand the market in hardwood species and offer viable volumes of quality produce to the local and wider markets.

3.4 Landscape and Land Use

3.4.1 Landscape character and value

The forest of Ardochy is situated at the head of Glengarry and sits amongst gentle sloping hills that reach down to Loch Garry which drains west in a narrowing profile of steep hills to the sea loch of Hourn. The forest forms a significant tract to the network of woodlands which run east to west below the sprawling lower slopes of Meall Dubh to the north with its windfarms breaking the skyline above the forests upper margins.

Key Characteristics /Landscape Description: - Scottish Natural Heritage, Publication Number 97, Lochaber Landscape Character Assessment 1998 describes the Ardochy LMP area as follows.

Broad Forested Strath– Broad low lying strath with rolling relief and sculptural glacial landforms with simple , large scale mosaic of forested ridges , rolling pastures and heather moorland dominated by commercial forestry but with long distance views from surrounding hills over and framed by steep sided glens. The areas at the mouth of Glen Garry having been scoured by ice flows creating more subdued terrain compared to the surrounding relief – low smooth ridges and broad drumlins within a rolling landform between the high sides. In the Great Glen sediments from subsequent ice dammed lake left fertile soils that now support densely afforested and farmed landscapes. The Broad Forested Strath is identified as a particular mix of land superimposed on gently undulating landform and comprises gentle sloping hills which are mostly found alongside wide glaciated valleys. Their character derives less from geology than from glacial action which has hewn a distinctive profile from the original,

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higher hills. The ridges which are quite low lying at 600 to 700m may be recognised by their smooth undulating topography. They often occur as a transition into Rugged Mastiff.

The presence of dolerite and basalt dykes, formed by igneous intrusions gives rise to indistinct parallel ridges along some slopes.

On the flat plateaux of the smooth moorland ridges, retention of rain water has led to the accumulation of peat, and the surfaces are riven with exposed peat 'hags'. The rounded hills support swathes of heather moorland which form a purple drape over the hills during the summer. The heather is often interspersed with a rough grass sward and on lower slopes small blocks of pasture are often associated with stone dykes and fences.

Scrubby trees such as rowan and birch follow the burns and gullies which cut through the grain of the ridges and disrupt the smooth landform. Thicker growths of oak and birch wood occupy some lower slopes and loch edges.

The smooth and open rolling land form is better reflected by large blocks of woodland rather than small isolated stands; the edges may be softened and naturalised through deciduous planting up gullies and utilizing natural diversity in the land form.

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3.4.2 Visibility

The forest is most visible from across the loch and from Glengarry forest, which has minor public road at Greenfields and low visitor numbers. From all other aspects, accepting the loch itself and surrounding mountain/hill tops Ardochy is not the most visible of forests. It is, however, situated in the heart of a relatively scenic landscape where mixed woodlands make up a good proportion of the land use matrix. The key aspects which need to be taken account of in the plan is the external appearance of the forest from Glen Garry and surrounding summits, also from local roads (viewpoint 4) and from the loch / shoreline. There is an important viewpoint just off the A87 corridor and which overlooks in part the lower forest which is also privately owned.

The majority of visitors pass through Ardochy on the A87 corridor with the wider landscape offering spectacular views into Glengarry and the surrounding mountains. The corridor of the A87 dissecting the LMP area is an important tourist route and we recognise the need to maintain a sympathetic balance and structural integrity to our woodland here.

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Viewpoint 1- Looking North from NH2324601791 the shores of Loch Garry to Ardochy Forest.



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Viewpoint 2 – Looking North East on the Tomdoun road corridor NH2340602867



Unsympathetic straight edges along the roadside corridor margins of the forest have been identified as a priority along with internal wayleave edges. These margins reduce the landscape value of the area both when viewed within the FDP area but also distant views from outside the boundary. Clear felling to redesign the roadside margins will create a new forest edge sympathetic to this landscape and views from the adjacent nationally important landscape.

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Viewpoint 3 – Ardochy Forest from Loch Garry NH NH2324601791



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3.4.3 Neighbouring land use

The main neighbouring land use is one of forestry with private commercial forestry dominating and a significant component of semi natural broadleaf woodland in the overall wider landscape structure. There are potential opportunities to work with neighbours in future with protection requirements and intentions for forest boundaries an obvious area of mutual interest. The age variance compared to neighbouring conifer crops does not offer opportunity for collaborative working on harvesting and roading operations at present. In future the forest district may find as yet unidentified opportunities for collaborative working and resources sharing as neighbouring LMPs are offered for consultation.

Deer stalking is carried out by neighbouring estates and the forest district is represented on the local management group. This offers a discussion forum to address any implications to deer movements and influenced by future protection measures.

The water quality of the loch is good and Loch Garry is covered by a loch SSSI designation. There is fish farming activity in the Loch and holiday /letting properties on the forest boundaries that draw their water from within the forest boundaries.

Sheep and cattle farming is undertaken by external neighbours and concentrated to the east march of the forest. The topography and a boundary fence reduce the threat of browsing by domestic animals to a very low likelihood.

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3.5 Social factors

3.5.1 Recreation

The woodland is used for informal recreation by both locals and tourists with visitor numbers low. The formal recreation interest internally is the Daingean Township which offers a small car park and interpretative walk round the remains. The main visitor interaction is a lay off the A87 and at a viewpoint just off the public highway at its highest point. This affords iconic views down the length of Loch Garry and is on private ground overlooking the Forest Estate. Visitor numbers are unknown. However, through traffic is significant and is likely to grow in line with Highland wide trends.

3.5.2 Community

The local communities at Invergarry and outlying properties along the Loch side are represented through continued liaison with the Invergarry Community Council. In the past there has been local community involvement in Daingean the clearance township which sits on the edge of the forest and above the A87 highway. We will continue to liaise and offer opportunities for comment and inclusion to local people in respect of Ardochy Forest through these mechanisms.

3.5.3 Heritage

Within the LMP there are notable archaeological remains at Daingean Township previously hidden in the forest and other features within the forest which include cairns ditches, banks and the remains of houses, farmsteads all remnants from the clearances and previous agricultural land use of this area. There is also a wider cultural landscape that includes elements of past policy woodlands and tree collections. Where there are particular specimen trees attempts will be made to retain these where possible and to plant new specimens to reference this cultural legacy where appropriate. We will continue to undertake sound site planning during operations to protect any of these known sites and any sites yet to be discovered.

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4.0 Analysis and Concept

4.1 Analysis

Analysis and Landscape Character maps illustrate the factors which, through our consultation and review, have significantly influenced the design and long term vision for the forest. Ardochy is a sheltered forest and the main influence on future management will be a restructuring process which will result in a reduction of commercial conifers and increase in native woodland and open space.

The main issues addressed by the plan are:

Timber Production – Conifer production will remain the primary objective in relation to site timber targets, retaining Sitka spruce as the primary species and to ensure future supplies of softwood to the local timber industry.

LISS - There are opportunities to utilise LISS as a management tool within Ardochy forest and primarily in close proximity to the Loch side. A removal of conifers and selective thinning using LISS in suitable stands would provide a sound rationale for improving and increasing the quality of the semi natural woodland element of the Ardochy forest.

PAWS - In the areas defined as PAWS the management will be to enhance the environmental value by the conversion from commercial conifer to native species with restoration the principle management target.

Biodiversity – Open space and wayleave corridors provide opportunity to enhance biodiversity by diversifying species in these areas. A continuation of grazing cattle in meadows is important for the grazing project (Highland Cattle) and for maintaining the sward in favour of butterflies and common scoter in the loch side habitat.

Native Species - Expanding the area of broadleaves associated with PAWS and watercourses, maintaining and enhancing broadleaves along watercourses where they contribute to bryophyte habitat. There is also the potential to expand native woodlands throughout the forest and further link the existing ASNW and old policy woodland habitat network.

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Recreation – The visitor numbers to this forest are low and access informal with the only formal visitor zone at Daingean. We will continue to consult with local interest groups on decisions which impact on these sites.

Roads

Over the next 10 years it is anticipated that 1.7 km of new forest road will be constructed within the LMP area. The construction of roads will comply with all relevant guidance in line with Appendix 1 of Forestry Practice Guidance: Forest Design Planning.

Deer, Feral Pigs and grazing damage

Deer impacts are constrained by effective deer control enabled by the abundant open space and a good road network. Feral pigs are present in the area and will be managed when encountered.

4.2 Concepts and development of the plan

The concept plan illustrates how the issues identified in analysis have taken into account in relation to the forest plan management proposals.

- Felling proposals for Ardochy account for the need to provide phased and well balanced programme of clear fell which will maintain a diverse age and species structure. Conifer production will remain the core objective and with the potential to establish productive broadleaves and influence links to existing natural and native broadleaves throughout the forest to provide this variety.
- The productive nature of the current crops of Norway spruce and Sitka spruce indicate that these primary conifer species will continue to do well and should form the core component of future commercial restock. The first rotation crop achieved expected volumes and standing crop displays a wind firm character. Conifer forest resilience will be strengthened by the establishment of Scots pine primarily on PAWS sites which offer commercial opportunity and contribute to longer term restoration targets. Douglas fir will offer further species diversity and resilience. To be established as part of an intimate mix on sheltered heather free aspects.

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- Native species cover will be extended and improved through selective thinning of existing stands and by establishing further commercial broadleaves coupes. Primary species for restock for commercial hardwoods will be sycamore, silver birch and sessile oak. At present there is a presumption not to establish Sycamore near to PAWS restoration sites – that could change with the issues with ash. Further improvement to existing cover can be achieved through management intervention to natural regeneration. By thinning and implementation of LISS to the existing hardwood cover in Ardochy forest and by retaining Scots Pine during felling operations we can extend the percentage of continuous cover within the forest and improve the wider species habitat network.
- Much of the upper margins of the forest are already sympathetic to the surrounding landform. The areas where improvement can be achieved are primarily around the powerline constraint and the road corridors, loch side fringes and close to adjacent properties. Here existing habitat can benefit by introduction of linking species which will improve the internal margins of the constraint corridors. A sympathetic influence to design to the form of these edges has been offered within the plan and proposes scalloping and species structure diversity allied to pulling planted areas back from roads and houses.
- The establishing of smaller felling coupes is proposed in the LMP as a tool to better reflect landscape scale and no coupes over 17.92ha are proposed.
- Retention of Scots Pine throughout the PAWS designation and establishment of productive broadleaves through regeneration and enrichment is current management practice within Ardochy forest. A continuation of this forms a critical component of the restructuring process through further establishment and retention of these species.
- Establishment of native riparian woodland along the watercourses has been established around the east march of the forest at Allt Daingean. As part of the restock this establishment will be further enhanced by the planting of mixed hardwoods along riparian edges and by creating unplanted buffers to allow natural regeneration.

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- The open aspect to existing access routes and forest trails will be maintained to enhance the informal recreation experience. The proposal to enhance external viewpoints around road corridors and below the A87 will be addressed by a more intimate species mix in the vicinity of these zones.
- There are small areas of mire habitat within the forest boundary which will be incorporated into other areas of open space where possible.
- Deer populations will continue to be controlled to a level that will allow for the natural regeneration of native woodlands
- Informal access will continue to be encouraged to the forest despite the low visitor numbers. Existing recreation routes around Daingean Township will continue to be reviewed in liaison with local community interests.

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5.0 Land Management Plan Proposals

5.0 Felling Phases

Felling Phases	Area Ha
Phase 1 2016-26	27.30
Phase 2 2026-36	33.42
Phase 3 2036-46	17.92
Phase 4 2046-56	LISS

5.1 Clear Felling

The forest is undergoing restructure and a proportion of wind firm rotational age mixed conifer crop has yet to be harvested. This is largely concentrated in the upper portion of the forest where variant incremental growth is evident in the crop structure and in relation to species planted. The standing crop is partially situated on PAWS with impacts on restock proposals. There is at present limited roading and access to this upper section of the forest which combined with topography restricts options and approach to the future felling programme.

The upper section of the forest, where the crop is wind firm the coupe shapes offer flexibility and options to harvest in relation to infrastructure and availability of future resources. The remaining standing crop on the lower section presents no difficulty once the approved road infrastructure is in place.

The proposed felling phases and coupe shapes offer a pragmatic approach to future harvesting and with LISS input can provide a continuous timber output with some variation in product available.

- Phased road building programme will influence felling sequence and drive the restructuring programme.

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- Rotational age conifer crop is wind firm and offers flexible coupe shape design and felling sequence proposals
- Coupe shapes allow opportunity to review harvesting proposals in relation to future circumstances and available resources.
- Felling phases ensures restructuring minimises disturbance to environmental and recreational considerations.
- Opportunity to achieve PAWS restoration targets through phased felling programme.

5.2 Thinning

There has been no thinning activity during the restructuring process to date largely driven by cost and economic weakness of timber markets in the past. The thinning proposals within this LMP relate to the LISS coupe identified to benefit from intervention.

Given the age of the standing crop thinning prospects are limited although retention of and future intervention in the stands of Scots Pine would be beneficial in improving structure and should be carried out within the next 10 years.

A potential exists to produce small quantities of niche product by targeted halo thinning of isolated and important broadleaved species present in the forest. This will also benefit the restructuring process and should be undertaken within the next decade using LISS methods.

Future restock and young crop do, however, offer opportunities for thinning in the future and should be actively assessed for thinning potential as the plan progresses. The future values of product harvested from these sites relative to cost are important considerations. Thinning of existing and future planted crop will improve the quality of commercial conifer and broadleaves which make up the future crop in Ardochy forest. The management through thinning of these diverse species also offers increased resilience.

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5.3 LISS

There is good matrix of irregular shelter wood, old policy woodlands and native broadleaves throughout the forest which offer alternative harvesting opportunities and through using low impact silvicultural systems (LISS). This is especially true of the coupe in phase 1 that borders the lochside where a matrix of largely broadleaved species provides an opportunity to enhance biodiversity and aesthetic appearance. An introduction of small scale, intimate working systems here offers both hardwood and conifer product to the market while improving the irregular shelter wood that borders the Tomdoun road and Loch Garry.

5.4 Wayleaves

Opportunities to utilise the considerable wayleaves within the forest should be considered. A reduction of future liability and reducing their visual impact is also desirable. The establishment and encouragement of low structure species spread into wayleave edges should be considered at OHPL corridors, around neighbouring properties and road corridors. This requires confirmation by SSE and confirmation of their preference and cost implications.

We can improve the aesthetic values of the landscape around neighbour properties and the public highways. This can be achieved by using LISS as a management tool with a species specific mix that offers low apical height with ground cover. Species such as hazel and blackthorn are amongst those offering low apical height and environmental value. The introduction and future management of these species should be encouraged.

5.5 Future habitats and species

(See map M11 restocking and V1, V2 Future species and habitats and 3D visualisation)

Ardochy forest already contains diversity with a strong thread of broadleaved species and conifer species present

There is a proportion of rotational age conifer still to be harvested in Ardochy forest and consists of Sitka spruce, Norway spruce and Scots pine. This is largely concentrated on the upper slopes above the A87 road corridor. The harvesting of this forms an important aspect to the restructuring programme and influences the rational

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for future restocking and management proposals. We will retain Scots pine where possible during harvesting operations and restock with an effort to increase resilience by species diversification in planted commercial crop composing both conifer and broadleaved species.

The core conifer species will be Sitka spruce, Norway spruce, Scots pine and Douglas fir and will require soil analysis to determine final layout.

Broadleaved species form a strong component to this forest. The lower lochside slopes support a proportion of mature broadleaved and remnant policy woodland species along with natural regeneration of birch and scrub. To the east of the upper section of forest there is a fenced coupe of commercial broadleaves planted in 2014 the main component species is birch replacing Chalara infected ash.

The riparian zones of the forest also provide existing diversity adding to this matrix of species. The re-establishment of native woodlands on the designated PAWS sites is required and will have an impact on restock and species choices reducing the area available for fast growing commercial conifer.

On PAWS sites the main species of restock will be Scots pine supplemented by birch which will require protection resources to ensure establishment. A further coupe of commercial broadleaves will be established to the west of Ardochy House and will consist of Sessile oak, sycamore and Silver birch. This will be protected by fencing.

The increase in species diversity after harvesting and through restocking will increase forest resilience. Continuous cover will help to encourage the population of red squirrel, wood ants and other species which benefit from a stable habitat. The overall structure of the forest matrix will improve through this process by linking isolated habitats, increasing biodiversity while improving the visual overview of the forest.

The careful management of the mire/fen habitat will continue to maintain where practical and enhance the forest environment and increase the diversity of species.

The expansion of native woodland and sward management through cattle grazing will create a mosaic with the heather moorland outside the forest and provide improved habitat for black grouse and raptor species.

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5.6 Management of Open Land

There is a notable percentage of open land within the forest in part created by powerline wayleaves, road corridors, deer lawns and the archaeological site around Daingean. This also contains the only significant mire/fen within the Ardochy forest. These areas will continue to be maintained and managed as open space within the forest boundary.

The management of open ground using highland cattle as a grazing tool has been ongoing for several years and is beneficial to the grass sward through careful monitoring and control of the herd. The benefit to butterflies is recognised through the Butterfly Action Plan designation on the lower slopes of the forest around Loch Garry.

There are also notable areas of unplanted ground, influenced by past restock practices which it is envisaged that after assessment could be restocked. This in part will be rebalanced by a drawing back of stocked ground from the road corridor around the A87 and on the forest fence marches.

5.7 Deer Management

Deer management is another practical tool for managing and careful balance between habitat degradation from overgrazing and uncontrolled expansion of woodland cover into these open spaces needs to be achieved. This is especially associated with adverse effects on native broadleaf establishment through unprotected regeneration and restocks being overgrazed. Effective management of the resident roe and red deer population has produced mixed results over the period of the last plan. While red and roe are the primary species, sika deer are also present in small numbers. The main objective is to keep deer populations to a level that will allow for the regeneration of native woodlands. The FES work in conjunction with neighbours on this control and are represented on the local Deer Management Group. The need to fence restocked commercial broadleaves is necessary given the ineffectiveness of the boundary fences that originally enclosed the forest and are now in a state of disrepair. A more detailed review of the fencing option is needed to see if replacing the strategic deer fence is a more cost effective option. This will need to be in conjunction with neighbouring landowners who have shared march fence liabilities.

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5.7b Feral Pigs

The FES will actively manage the feral pig population as it is encountered and this policy will be informed by national policy in consultation with Scottish Government, SNH, local stakeholders and communities

5.8 Biodiversity

Consideration will be given to the expansion and retention of native woodland throughout the forest to further enhance the existing mosaic of tree cover in the wider landscape. The commercial conifers crop will be felled and managed in phases under a careful clear fell system and harvesting rotational age conifer crops over the next 10 years. The subsequent restocking will be diversified by using a range of appropriate species and with a greater emphasis on biodiversity. Retention of existing Scots pine and riparian species, within these rotational age crops will secure the habitat linkage through to eventual PAWS restoration.

5.9 PAWS Restoration

Through the continuation of a system of phased clear fell coupes, there will be a gradual transformation of designated PAWS areas back to broadleaved woodland by a process of natural regeneration using existing native woodland as a seed source.

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6.0 Critical success factors

Access / Infrastructure

The lack of roading in the upper section of Ardochy is the main challenge to a successful implementation of this LMP. The positioning of the rotational crop in the forests upper reaches allied to limited egress to the NFE from the public highway A87 will be critical to the progression of the phased felling sequences and harvesting of the crop

Restocking

Successful establishment of alternative conifers and an intimate species mix offers increased resilience. The effect of this will be to further diversify the forest species composition within Ardochy offering a higher resilience to potential future disease and a continued contribution to the management targets of eventual restoration.

PAWS – The successful establishment of a commercial native species crop on PAWS sites, with lower ecological potential, will be followed up with further restoration. The progress already made toward this target through past management choices has been

achieved by the enhanced protection of native broadleaved species and by controlling deer numbers. The Scots pine retentions and intimate mix within the restock proposals and LISS interventions around the lochside stands will further progress this priority. The protection of riparian zones, establishment of commercial broadleaves and potential to introduce further diversity through low structure species around constraints has the potential to underpin further restoration of these sites.

LISS – A target of this LMP is to improve species resilience, biodiversity, habitat and canopy structure through intervention in established semi-natural broadleaved stands. The chance to improve stem quality and utilise niche products using LISS is there to be developed. This opportunity is dependent on resources, management intervention and appropriate timings.

There is a wider non-commercial benefit to wildlife such as red squirrel, butterflies and common scoter. This would be a positive development within Ardochy Forest, bordering an SPA and SSSI on Loch Garry and contributing to the longer term aspiration of restoration. Further to this the aesthetic improvement to the lochside road corridor through these actions should be considered within the context of the wider landscape.

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Deer /Feral Pig Control – It is vital that current control measures are maintained and implemented to prevent deer and feral pigs from damaging restock, natural regeneration and vegetation within the forest boundaries.

Wayleave Margins – The considerable OHPL wayleave margins running through the forest create areas of unproductive and dead ground. A reassessment of these margins in collaboration with SSE should seek to identify potential to introduce through restock, low structure / scrub species requiring no intervention as tree cover.

Disease / Pest Resilience – Monitoring of disease in relation to pine species and Dothistroma Needle Blight (DNB) infection is vital. A diverse species range and intimate crop mixtures can reduce the scale of future disease impacts.

Infrastructure Resilience - Close working relationships with SSE, Highland Council and Transport Scotland in relation to powerline and road side operations is essential.