Tay Forest District

Keillour & Murray's Hill

Forest Design Plan

Approval date: ***

Plan Reference No: ****

Plan Approval Date: *****

Plan Expiry Date:

CSM 6 Appendix 1b

FOREST ENTERPRISE - Application for Forest Design Plan Approvals in Scotland

Forest Enterprise - Property

Forest District:	TAY FOREST DISTRICT
Woodland or property name:	Keillour
Nearest town, village or locality:	Methven
OS Grid reference:	NN955 258
Local Authority district/unitary Authority:	Perth & Kinross Council

Areas for approval

	Conifer	Broadleaf
Clear felling	56.4	0
Selective felling		
Restocking	44.9	6

1. I apply for Forest Design Plan approval~~*/amendment approval~~* for the property described above and in the enclosed Forest Design Plan.

2. * I apply for an opinion under the terms of the Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999 for afforestation* /deforestation*/ ~~roads*/ quarries~~* as detailed in my application.

3. I confirm that the initial scoping of the plan was carried out with FC staff on ☐

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 agreement has been reached with all of the stakeholders over the content of the design plan and that there are no outstanding issues to be addressed. Copies of consultee endorsements of the plan are attached.

7. I undertake to obtain any permissions necessary for the implementation of the approved Plan.

Signed ..... Signed.....
Forest District Manager Conservator

District ..... Conservancy.....

Date ..... **Date of Approval**.....

Date approval ends:.....

Contents

5.0 Forest Design Plan Proposals

Support documents: Maps

- Location map
- Context map
- Features map
- Analysis and concept map(s)
- Management map
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- Future habitats and management

Appendices:

i) Consultation record
ii) Tolerance table
iii) FP brief

Summary of Proposals:

Timber production

The primary objective for Keillour is timber production on account of good conifer growth rates and proximity to transport routes and markets. There will a more targeted approach to forest thinnings by placing unsuitable coupes into non-thin regimes where access, drainage and exposure constraints are present. The remaining coupes including broadleaves will remain under either LISS or thinning to final crop in order to maximise timber value.

Conservation & heritage

Despite the apparent demise of the local capercaillie population there is still benefit to be had from maintaining the current network of habitats and species present in Keillour and Murray's Hill. This will be achieved by following FC Guidance on habitats and also through appropriate timing of operations and ensuring that there is operator awareness of any issues or features present in the works area.

Heritage features will be maintained and protected following FC Practice Guide "Identifying the historic environment in Scotland's forests and woodlands" (2010) and again ensuring operator awareness during any forest works.

Recreation

Informal recreation will continue within the forest areas with walkers, riders and permitted husky dog teams using the existing forest road network and the continued lease of Loch Horn to the local angling club.

Landscape

On account of the low visibility of the forest from major conurbations and road networks, the forests presence in the landscape will remain largely unchanged during the period of this plan.

1.0 Introduction:

1.1 Setting and context

The forest blocks of Murray's Hill and Keillour, which consists of two blocks (Gorthy to the southwest and Bellour to the northeast) are situated on a low ridge within Glen Almond and south of the river Almond. It is planned that Murry's Hill will be placed on the Forestry Commission disposal list during 2013 and consequently may be removed from the National Forest Estate during the life of this forest plan.

The majority of Keillour is composed of Sitka spruce which in general terms performs well with good growth rates being displayed. There are however other species including beech, oak and mature Scots pine which diversify the visual and structural values of the forest - as well as from a biodiversity perspective.

In terms of crop age distribution, this ranges between planting years 1870 and 2011 with a yield class distribution from 2 to 20. There is a history of thinning at Keillour, although this is perhaps not as widespread as it should have been as there are examples of unthinned stands of varying age.

The forest previously provided part of the range for the local capercaillie population with active lekking sites being recorded until 2000. However population, numbers have significantly dwindled to nil sightings by 2012. There is also a range of more common woodland bird species, with moorland species such as curlew being present on younger restock sites.

1.2 History of plan

The previous plan for Keillour was approved in April 2004 and identified timber production and conservation as the main management priorities. This was based on the good growth rates and access and the presence of Capercaillie. There were no applications to Forestry Commission Scotland for design plan amendments during the plans ten year period which is set to expire in 2014.

2.0 Analysis of previous plan

2.1 Analysis from previous plan

Under the previous forest plan adherence was kept to the prescribed felling sequence with phase two (2007 – 2011) clearfelling being completed as per the allotted timeframe. In terms of thinning, it could be argued that a higher level of thinning should have been applied through out the forest in terms of first and subsequent interventions, but much of the forest is on gleyed soils which are very wet, creating a significant risk of ground damage and silt run-off.

A current major restriction to management which was not highlighted in the key features and issues map was the fragility of Keillour's forest roads. These are constructed of locally won, but low strength, roadstone and become easily waterlogged and suffer from rapid vegetation encroachment.

3.0 Background Description

3.1 Physical site factors

3.1.1 Geology Soils and landform

The land here is gently rolling, with the highest points in the forest not exceeding 250m. The soils are predominantly surface water gleys with some areas of peaty gleys.

Underlying geology is Old Red Sandstone.

3.1.2 Water

There is one known, well marked private water supply which arises near Loch Horn. Loch Horn is let to a local angling club and there are various Burns running through the forest, some of which are spawning grounds for Brown Trout.

Part of Keillour falls within the catchment area for the Methven reservoir which is also used by a local angling club.

3.1.3 Climate

Rainfall in Keillour and Murray's Hill ranges from 423-557mm (summer to winter). The climate is cool and wet.

3.1.4 Services

There is one major overhead powerline which runs through the western edge of Bellour

3.2 Biodiversity and environmental designations

No environmental designations are present within the forests. Some of the burns on site do provide spawning grounds for brown trout and ultimately these burns flow into the River Tay SAC (although the forest is not within the SAC itself). Certain moorland species such as hare and curlew can be found on young restock sites and more common woodland species are also present on the site. Previously there were capercaillie in the forest, although there have been no recent sightings. The site is on the interface between red and grey squirrels so monitoring is carried out. Invasive non-native species such as rhododendron and shallon have been managed, and monitoring will be carried out to ensure they do not encroach again. There are two areas of spaghnum bog in the south of Murray's Hill which will be retained and not planted on.

3.3 The existing forest

3.3.1 Age structure, species and yield class

There have been recorded plantings at Keillour since the late 1800's when the forest was part of the lands belonging to nearby Keillour Castle. Large scale planting occurred between the 1940's to 1960's and has reduced in scale subsequently.

Keillour age structure, species, yield class and wind throw hazard classification

Species	Planting Year	Yield Class	Area(Ha.)	Wind hazard
SS	2004	12	5.85	4
SS	1998	14	12.88	4
SS	1997	18	7.66	4
SS	1993	16	12.93	4
SS	1991	14	30.5	4
SS	1989	14	53.05	4
SS	1988	14	76.33	4
SS	1980	18	3.53	4
SS	1976	0	11.83	4
SS	1975	14	1.66	4
SS	1974	14	5.36	4
SS	1973	16	8.5	4
SS	1969	18	0.26	4
SS	1968	18	6.84	4
SS	1966	14	2.4	5
SS	1964	8	2	4
SS	1956	10	5.53	5
SS	1950	10	4.34	5
SS	1949	16	5.92	4
SS	1948	10	5.33	4
SS	1947	16	9.06	4
SS	1940	12	1.48	5
SP	2004	8	0.71	3
SP	1997	8	0.75	4
SP	1956	10	1.75	5
SP	1949	8	5.69	4
SP	1948	8	4.41	4
SP	1947	8	0.95	4
SP	1940	6	0.27	5

Keillour age structure, species, yield class and wind throw hazard classification

Species	Planting Year	Yield Class	Area(Ha.)	Wind hazard
NS	2004	12	0.8	3
NS	1973	14	0.64	4
NS	1969	20	3.56	5
NS	1968	14	1.05	4
NS	1958	10	0.33	4
NS	1952	16	2.15	5
NS	1950	16	1.02	5
NS	1949	18	2.82	5
NS	1947	12	0.87	4
NS	1942	6	0.82	4
NS	1922	8	1	4
NF	1958	16	1.84	4
MC	1997	0	0.75	4
MC	1989	0	0.81	4
MC	1940	0	1.64	4
JL	1952	8	2.38	4
JL	1947	8	0.16	4
HL	1962	8	0.61	4
HL	1922	8	0.33	4
DF	1948	12	0.55	4

Species	Planting Year	Yield Class	Area(Ha.)	Wind hazard
MB	1997	2	0.61	4
BI	1994	2	0.81	4
MB	1994	0	11.33	4
MB	1991	0	1.01	4
MB	1989	0	1.62	4
BI	1988	2	2.88	4
MB	1988	2	5.53	4
MB	1956	0	0.06	4
BE	1955	8	0.77	4
BI	1952	8	0.59	4
BE	1952	8	1.35	4
MB	1952	2	0.32	4
MB	1950	0	0.35	4
BI	1950	0	0.45	4
MB	1949	0	4.51	4
BI	1945	6	1.37	4
XB	1949	0	0.56	4
MB	1940	0	0.91	4
BI	1940	0	0.45	4
BE	1922	6	2.26	4
OK	1870	4	1.55	4

The dominant species at Murray's Hill is Sitka Spruce planted between 1951 and 2004. Recently, emphasis has moved more towards native species on account of the heathy site conditions rather than competing objectives.

Murray's Hill age structure, species, yield class and wind throw hazard classification

Species	Planting Year	Yield Class	Area(Ha.)	Wind hazard
SS	2004	16	10.79	3
SS	2000	14	3.13	4
SS	1995	14	2.05	3
SS	1989	14	10.76	4
SS	1963	8	1.66	4
SS	1962	0	1.64	4
SS	1952	8	0.77	4
SS	1951	8	0.29	4
SP	2004	10	1.8	3
SP	1963	6	4.75	4
SP	1959	6	1.37	4
SP	1957	8	0.78	4
SP	1952	8	1.07	4
NS	1959	6	2.26	4
NS	1957	10	0.78	4
NS	1952	8	0.25	4
NS	1951	8	1.94	4
LP	1963	6	5.9	4
LP	1952	6	1.15	4
JL	1959	6	0.21	4
JL	1952	8	1.05	4
EL	2004	10	1.8	3
EL	2000	8	2.09	4
Bl	2011	8	7.79	4

3.3.2 Access

The main access points into Keillour, Keillour Gorthly and Murray's Hill are off minor roads accessible from either the A85 or the B8063. There is a good network of forest roads in Keillour and Murray's Hill, although the condition of them is generally very poor due to encroaching vegetation and waterlogging in some areas. The main routes used for hauling timber will be maintained to deal with these issues.

There are no official footpaths through the forest, but forest tracks are used by recreational users, including the local angling club.

3.3.3 LISS potential

There is limited potential for LISS to be implemented in Keillour with four areas having been suggested for Continuous Cover Forestry at present which include SP, SS, NS and JL. These areas will also provide biodiversity benefits in the form of potential raptor nesting sites.

3.4 Landscape and land use

3.4.1 Landscape character and value

There are no particular noted landscape features which affect either of the forests. The surrounding landscape is dominated by agriculture, interspersed with forested areas, often in geometric shapes with hard edges.

As the terrain is only gently rolling, forest blocks can appear quite harsh in comparison to flatter fields adjacent to them, although views of the forests are generally only obtained relatively close to the forest edges.

3.4.2 Visibility

Only small glimpses of the forest are had from the A85, minor roads closer to the forest provide greater visibility with one running along the entire Western side of Murray's Hill and others passing close to other parts of the forest boundaries.

3.4.3 Neighbouring landuse

Keillour and Murray's Hill are predominantly surrounded by agricultural land, with some scattered blocks of forest. There is also a block of privately owned forest which separates Murray's Hill from Gorthy.

3.5 Social factors

3.5.1 Recreation

The forests of Keillour and Murray's Hill are predominantly used by locals for dog walking, angling, some horse riding and also the more specialist use of husky training.

3.5.2 Community

There are various scattered dwellings near the forests, with the nearest large settlement being Crieff. The forest is used by the local community for recreation, as detailed above.

3.5.2 Heritage

There are no scheduled monuments within Keillour or Murray's Hill, although there are some unscheduled monuments present, including two brick lined pits near Loch Horn. The forests do not contain any areas of ancient woodland, although there are Eastern sections recorded as long established plantations, partly due to the history of woodland management, including early field testing of introduced conifers, by the Keillour Castle Estate. However none of those original conifer field trials survive today.

3.6 Statutory requirements and key external policies

There are no statutory requirements on Keillour or Murray's Hill, although the burns within the forests do flow into the River Tay SAC.

4.0 Analysis and Concept

4.1 Analysis of constraints and opportunities

Factor	Opportunity	Constraint	Concept Development
Forest roads in poor condition, including areas of waterlogging	Restoration of roads during plan period to allow better access	Quantity of roads needing attention means work will be costly to undertake	Target key routes where roads maintenance can be applied to facilitate timber operations within plan period
Windthrow and pressure on forest roads	Opt for non-thin zones where issues with soils and roads exist Improve biodiversity and internal views as well as drying out forest road surface	Not so practical in Keillour or Murray's Hill due to access and forest layout Reduction in small round wood through not thinning	Reduction in road pressures will increase longevity of roads Identify non thin areas and sequence as clearfell coupes Remove roadside trees in adjacent coupes during scheduled operations
Silvicultural of broadleaved woodland	Broadleaves by Loch Horn have the potential to produce quality timber for niche marketing	Area contains sporadic conifers which should be removed to focus on broadleaves	Remove conifer, thin broadleaves and high prune selected trees to produce future quality timber
Riparian zone modification	Increase and improve riparian zones throughout the forests, including broadleaves in appropriate quantities	Some riparian features close to forest roads which require an increased management awareness	Increase riparian zones to benefit biodiversity through increased habitat
Limited quantities of deadwood	Increasing the quantity of deadwood present	Quantities are not measured so difficult to judge the right amount	Increasing deadwood presence in areas where it will have most benefit – near burns; in areas of long term retention etc, improves biodiversity of the site

4.2 Concepts of the plan

From the issues identified in analysis of Keillour & Murray's Hill, see enclosed maps. The following concepts for the plan review have been identified and summarised below;

Rationalise and expand felling coupes within Gorthy in order to accommodate non-thin regimes and reduce damage to forest roads

Improve forest roads through removing encroaching tree cover which is effecting drainage and restricting internal forest views

Bring stands of broadleaved woodland under management in order to improve timber quality and encourage regeneration

Re-position riparian zone in Gorthy in order to avoid future access conflicts

Sequence coupes which have gone beyond thinning potential into clearfell areas observing adjacency protocols

Undertake visitor zone management at main public access points into the Keillour blocks

5.0 Management Proposals

5.1 Forest stand management

5.1.1 Clear felling

The sequence for clearfelling is depicted in the enclosed Management Map which shows an evolving matrix of coupes scheduled for felling on account of crop age and increasing levels of windthrow.
With a combination of late thinning, water logged soils, poor forest roads and potential for windblow in many coupes. The counter measure to this is to introduce non-thin prescriptions which will reduce volume returns at clearfell but hopefully bring greater crop stability.

5.1.2 Thinning

As acknowledged in section 2.1, there has not been a consistent approach to thinning within Keillour. Factors include the strength of the road system which has created numerous historical problems during forest operations and the levels of site damage.

Under this forest plan, the number of thinning coupes has been restricted to areas where access is generally good, there has been a previous thinning history, soils are suitable and there will be long term silvicultural benefit.

5.1.3 LISS

There are LISS designated areas in both conifer and broadleaf coupes which follow differing prescriptions. In the mature broadleaves where beech and sycamore are the dominant species a group shelterwood system will be applied. Within conifer stands where more diverse age classes are present, an irregular shelterwood regime would be appropriate.

5.2 Future habitats and species

The proposed mix of conifer species and age classes will maintain current levels of biodiversity and provide foraging habitat that is more suitable for red squirrels (than grey squirrels).

Increasing deadwood will have a long-term benefit to biodiversity.

The bog in Murray's hill could be improved (and possibly expanded) by blocking the drain (cutting).

Continued use of LISS in primarily Norway spruce, pine and broadleaved areas will help to maintain a stable woodland habitat.

5.3 Restructuring

Under the proposed plan, there will be no significant change to the structure of the forest in terms of species and age distribution.

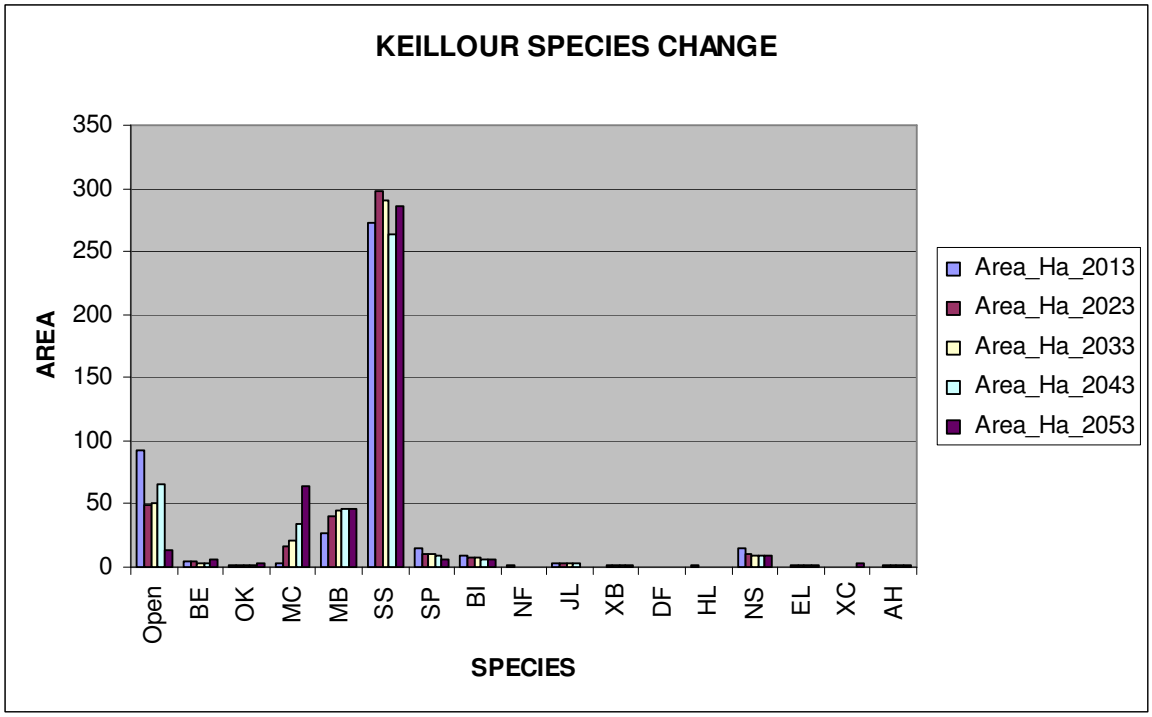
5.4 Future management

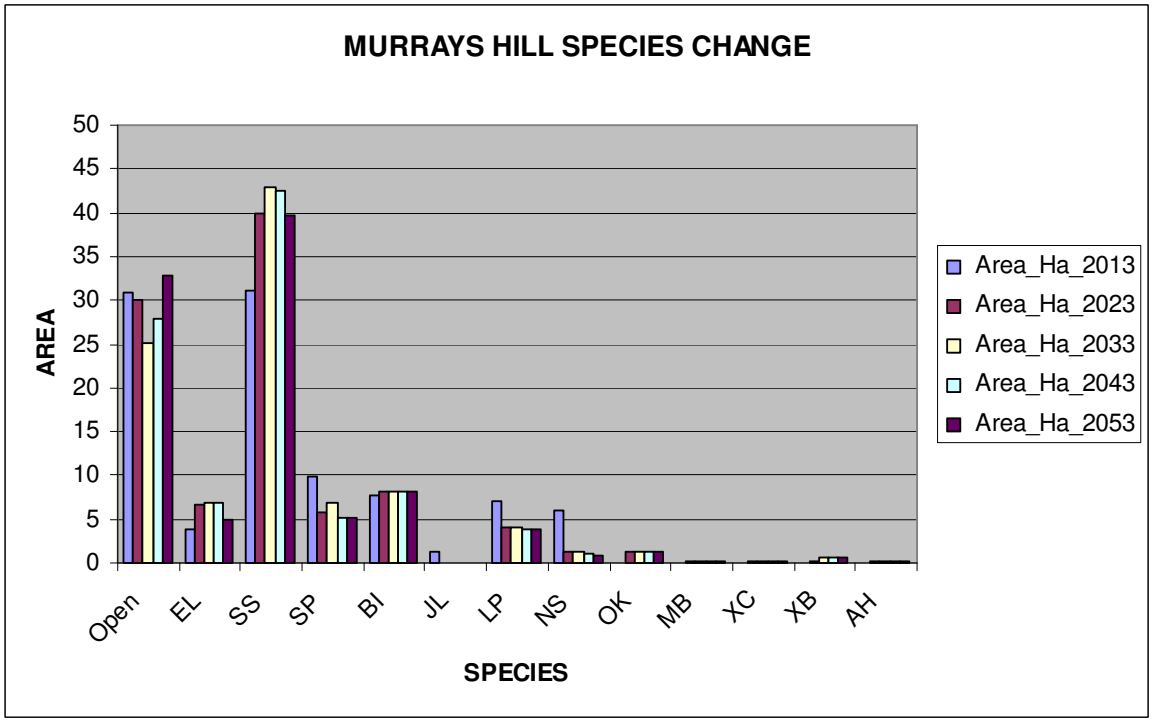
Reduction of thinning coupes at Keillour will entail a lower intensity of operational management in coupes where a non-thin clearfell regime is in place which will have the effect of reducing pressure on forest roads and countering windblow.

An important operation linked to forest roads with be the removal of roadside trees at opportune times to create a 15–20m zone on coupe edges to allow exposure to direct sunlight and improve sight lines.

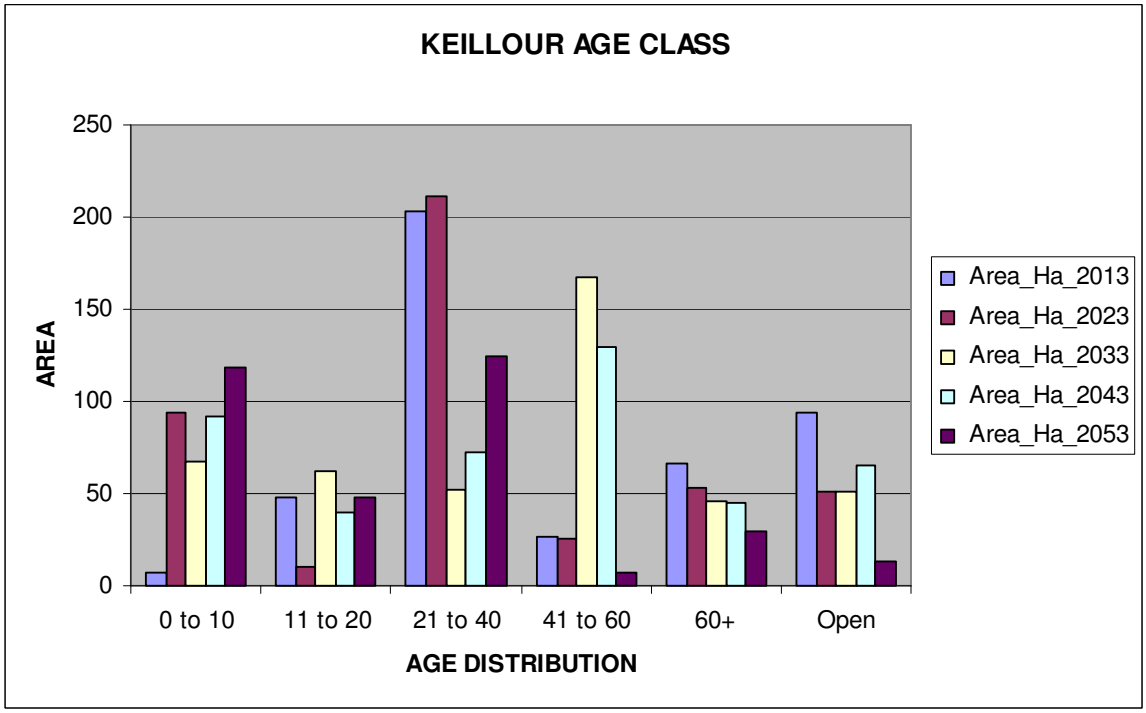
Within coupes where there is a significant component of broadleaves , there is a strong silvicultural requirement for thinning to improve crop quality and encourage natural regeneration.

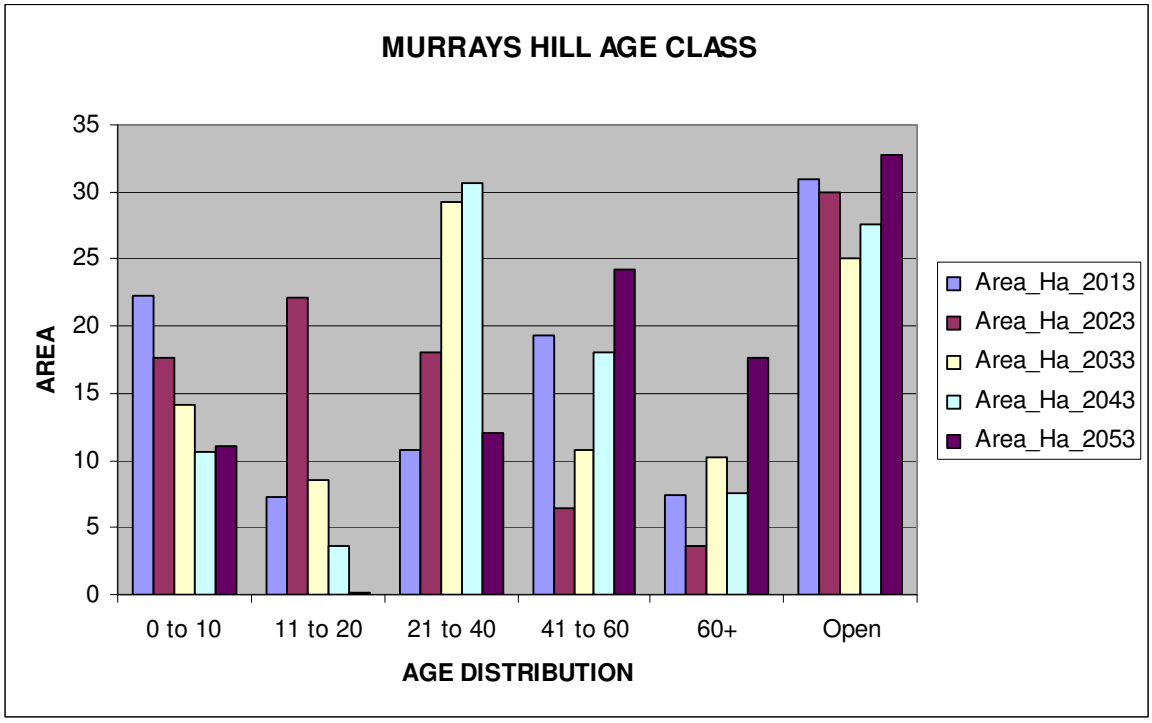
5.5 Species tables





5.6 Age structure





5.7 Management of open land

The areas of bog in the south of Murray's Hill are to be retained and possibly improved by drain blocking.

5.8 PAWS restoration

There are no areas of PAWS on the site.

5.9 Deer management

The forests of Keillour (Gorthy, Bellour and Murray's Hill) amount to some 543ha. The predominant species is roe, with red deer expanding their range on the periphery of the design plan area from the west. Both woods are surrounded by rolling agricultural land and mixed woods. Much of this land is also used for mixed sporting interests and with only stock fences, there is medium to high migration of deer across boundaries. A deer management culling lease is used to control the deer in the woods with the current annual cull being around 60 roe and 5 red.

The overall plan will be to continue to monitor deer populations and trends by dung counts and culls to reduce densities to less than 10/100ha. In addition, we will monitor impact of deer on young restocking, areas of natural regeneration and important habitats. There is no Deer Management Group in the area but close collaboration exists between FCS and local land-owners.

The Forest District maintains a Forest Deer Management Strategy for all its forest blocks as a mechanism for identifying deer management issues at both strategic and operational level. Feeding into the strategy is captured data from cull records, boundary fence condition, browsing impacts, and estimated deer population figures within forest blocks and on neighbouring land. This information is collected by local staff and external bodies to give a holistic view of deer dynamics effecting individual forest blocks.

5.10 Critical success factors

The most significant success factor for forest management at Keillour is to re-instate the forest road network so that is fully fit for purpose and can withstand regular passage of haulage vehicles. Linked to achieving this goal is the phased removal of tree cover close to roadside edges and preventing surfaces from drying out through shading out sunlight. The creation of larger roadside margins will also give space for safe stacking of timber and the passage of harvesting machinery which will take further pressure off road surfaces. It will also create a more attractive internal landscape.

Within coupes scheduled for thinning, there willbe a commitment to deliver a consistent work programme of work to improve stand quality and resistance to windblow.

Appendix I: Forest Design Plan Consultation Record

Statutory Consultee	Date contacted	Date response received	Issue raised	Forest District Response

Appendix II: Tolerance Table

	Adjustment to felling coupe boundaries	Timing of restocking	Change to species	Windthrow response
FC Approval not normally required	0.5ha or 5% of coupe – which ever is less	Variation of less than 2 planting seasons from standard restock year, 4 years post-felling	Change within species group, e.g. conifers:native broadleaves	Up to 1.0ha
Approval by exchange of letters and map	0.5ha to 2.0ha or 10% of coupe – which ever is first		Greater than 15% species change	1.0ha to 5.0ha – if mainly windblown trees between 5.0ha to 10ha in areas of low sensitivity
Approval by formal plan amendment	Greater than 2.0ha or 10% of coupe	Variation of greater than 2 planting seasons from standard restock year, 4 years post-felling	Increased native woodland component. Increase native broadleaves and open/bog restoration	Greater than 5.0ha in areas of medium to high sensitivity

Appendix III. Design Plan Brief

Keillour & Murray's Hill Forest Design Plan Brief

Statement of intent

The purpose of this forest design plan (FDP) review is to produce a sustainable ten year plan which takes into account the biological, commercial, visual and community factors which relate to Keillour & Murray's Hill.

This FDP review will meet the criteria of the 2006 Scottish Forestry Strategy (SFS) and act as a working document for managers and as a point of reference for internal & external stakeholders on current and future interventions.

Under the SFS there are seven key objectives:

Theme 1 Climate change
Theme 2 Timber
Theme 3 Business development
Theme 4 Community development
Theme 5 Access & Health
Theme 6 Environment quality
Theme 7 Biodiversity

Themes in the context of the FDP review

Theme 1 Climate change

Opportunities for contributing towards national targets for renewable energy via woodfuel and increased carbon sequestration by extending low impact silvicultural systems such as continuous cover forestry.

Counter the advance of dothistroma needle blight through surveying.

Theme 2 Timber

Continue to grow quality timber by applying good silvicultural practice and matching compatible species to restock sites. Seek to supply a range of products to local and national markets with the objective of maximising returns.

Theme 3 Business development

Provide the opportunity for local business to compete in supplying a range of forest management services.
Maintain a high commitment to protecting landscape value and maintaining quality recreation facilities for visitors.

Theme 4 Community development

Actively seek to determine community views through engagement in the FDP review process

Theme 5 Access & Health

Engage public awareness of recreational facilities through a range of media designed to welcome the public into the forest.

Maintain and update where required all recreation facilities in order to meet customer demand.

Theme 6 Environment quality

Maintain fabric of landscape by thinning and continuous cover forestry where possible and limiting the scale of clearfell coupes.

Protect known archaeological features through the recording of sites and embedding good operational practice.

A diverse range of habitats and species are found through the forest which characterise a healthy environment typical for its location.

Theme 7 Biodiversity

Management interventions complement natural energy flow by encouraging a varied range of species to exist by using a number of approaches.

FDP key features

STATUTORY DESIGNATIONS (e.g. SSSI, SAM, etc.)

None.

LANDSCAPE

In this gently rolling landscape only small sections of the forest are seen at any one time. From the busy A85 most of the forest is obscured and only seen in small sections. There are closer views from the minor public roads closer to the forest and from the scatter of neighbouring properties in this rural location.

CONSERVATION AND HERITAGE

The forest is important for capercaillie, although numbers have declined in recent years – in line with the national trend. The forests are too small to support a viable population although they form a key part of the range and important lek sites. There is also a range of more common woodland species, with moorland species (such as curlew and hare) present on the younger restocking areas

There are no ancient woodlands sites, although the eastern sections are recorded as being long-established plantations. This reflects the long history of woodland management on Keillour Castle Estate, including the field testing of new introduced conifers. Sadly, none of these original plantings have survived.

There are some unscheduled ancient monuments, including the recent discovery of two brick lined pits near Loch Horn.

No longer an important site for capper, part of thin red line for red squirrel

RECREATION

Low recreation use

There is a moderate usage by walkers, usually exercising their dogs and some more specialist use e.g. husky training. Loch Horn is let to a local angling club and is regularly used.

TIMBER PRODUCTION

The sites are capable of producing high yields of spruce close to the markets. The downside is that the predominately gleyed soils make the crops vulnerable to windthrow.

WATER

There is one known private water supply that arises within the forest and this is well marked. Loch Horn and Methven Reservoir (both man-made) are also important because of their use by local angling clubs. Loch Horn has recently had a new spillway constructed to upgrade to deal with a 1-in-150 year flood event, following advice from our Inspecting Engineer. Some of the watercourses arising in the forest are spawning burns for brown trout.

Stress forest water guidelines – siltation is a major consideration

SERVICES

There is one major powerline that cuts through Bellour.

Under ground cable by Gorthy, services to private house?

Strategic points from previous plan and previous consultees

Category	Relative value	Comments
Landscape	LOW	Not highly visible in the landscape.
Conservation/heritage	MODERATE	Mainly because of the RED SQUIRREL population.
Recreation	LOW	A small core of regular dog walkers and anglers.
Timber Production	HIGH	Good growth rates and good access, tempered by wet soils.