Tay Forest District

South Rannoch

Forest 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:	South Rannoch
Nearest town, village or locality:	Kinloch Rannoch
OS Grid reference:	NN 590 550
Local Authority district/unitary Authority:	Perth & Kinross Council

Areas for approval

	Conifer	Broadleaf
Clear felling	236HA	0HA
Restocking	131HA	105HA

- 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 consultation and scoping has been carried out with all relevant stakeholders over the content of the 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 and, where it has not been possible to fully address their concerns, we have reminded them of the opportunity to make further comment during the public consultation process.

7. i underta	ike to obtain any permissions necessary	ioi the implementation of the approved Flan.
Signed	Forest District Manager	Signed Conservator
District		Conservancy
Date	······	Date of Approval

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Summary of Proposals:

- Expand areas of native woodland through PAWS restoration and, natural regeneration
- Maximise thinning potential within woodland blocks, including suitable areas of broadleaves
- Improve riparian zones through management interventions which will enhance bio-diversity
- Maintain landscape quality

Introduction:

1.1 Setting and context

South Rannoch is located on the southern edge of Loch Rannoch in Highland Perthshire. The forest which covers 3543ha, falls within the Glen Lyon and Loch Rannoch National Scenic Area (NSA) and incorporates the majority of the Blackwood of Rannoch Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). Adding to the forest's environmental importance is its adjacency to Loch Rannoch which is part of the River Tay SAC.

The Blackwood of Rannoch Caledonian Forest Reserve, which forms the north-western quadrant of the forest is represented in the forest plan as Natural Reserve/Minimum Intervention and owing to its environmental sensitivities is covered under a separate management plan with Scottish Natural Heritage.

Outwith the Blackwood, South Rannoch is composed mainly of trees planted from the 1940s to the present day, with the majority being planted between 1961 and 1970. However, there is a large component of 1950's planting on the eastern part of the forest.

1.2 History of plan

This plan is an early review of the 2008 Forest Plan which was set to run until 2018 and has been necessitated to address issues relating to Plantations on Ancient Woodland Sites (PAWS), woodland / bog establishment and reducing landscape impact.

1.3 Planning Context

The management of the Forestry Commission Scotland's national forest estate is guided by Scottish Forestry Strategy (SFS) 2006, which sets out seven key themes:-

- Climate change
- Timber
- Business development
- Community development
- Access & Health
- Environmental quality
- Biodiversity

Table 1. Relevant issues under the SFS and Tay Forest District Key Themes

SFS Key Themes	Relevant issues identified for South Rannoch FP
Climate Change	Opportunities for contributing towards national targets for renewable energy via woodfuel. Carbon sequestration levels increased by extending the area of low impact silvicultural systems Thinning where possible to counter the advance of Dothistroma Needle Blight.
Timber	Continue to grow quality timber sustainably using a variety of species to achieve this objective.
Business Development	Through tourism, timber harvesting, woodland establishment, maintenance and appropriate renewable energy projects. Consider landscape value with regard to woodlands and tourism.
Community Development	Encourage communities who wish to become more involved in the management of, or outputs from, their local forest
Access & Health	Maintain formal access routes and actively encourage public use of these facilitates through signage and offsite advertising. Retain informal access routes as a local feature.
Environmental Quality	Continue to work with local archaeologists and Historic Scotland to protect the ancient monuments in our care. Strictly follow the Forest & Water Guidelines to ensure water quality is not compromised.
Biodiversity	Continue to expand the area of native woodland and open bog land through the removal of introduced conifers as part of scheduled operations. Work with SNH to protect designated sites and enhance the condition of local habitats through careful management.

Table 2. Initial brief and objectives for developing management proposals

Brief	Objectives
Climate change	 where soil stability and rooting depth will not currently allow extended rotations, shorter cycles can be used to supply woodfuel market utilise resilient species most suited to the site conditions (like Sitka spruce, Scots pine and birch) to provide insurance for the future
Maintain production of quality timber	 continue programme of thinning and clearfell which takes coupe shape, scale and sequence into account restock according to good silvicultural practice that is driven by species selection principles manage suitable broadleaved woodland for potential future timber sales
Maintain and enhance existing natural habitats	 maintain areas of native shrubs and mixed grassland corridors along the electricity wayleave routes to promote key species such as pearl bordered fritillary remove LP and SS adjacent to Blackwood in order to promote native pinewood expansion protect designated sites and protected species according to agreed guidelines extend locally and nationally important habitats as opportunity arises through forest operations
Preserve historic features	protect all known features which include six unscheduled ancient monuments by recording on district constraints data base and following recommended guidelines
Access and health Landscape	 maintain infrastructure of footpaths and associated features for general use by the public South Rannoch is a significant part of the Loch Rannoch
Landocape	& Glen Lyon National Scenic Area requiring careful landscape design input for felling, restocking and infrastructure projects

2.0 Analysis of previous plan

The previous Forest Plan (FP) was approved in July 2007 and set a template for long term management covering a range of objectives which span commercial, landscape and biological interests.

Given the early review of the plan, not all time-bound actions in terms of felling and restocking have been achieved. As a consequence, during the 2015 to 2025 review all coupes were re-assessed in terms of appropriate felling years and restocking prescriptions.

A significant output from the previous plan is the removal of introduced conifer species from areas with good potential for restoration to native pinewood and also recognises the the influence of new neighbouring native pinewoods.

3.0 Background Description

3.1 Physical site factors

3.1.1 Geology Soils and landform

South Rannoch is situated on the northern flanks of the Glen Lyon where mountains rise to over 1000m above sea level. The forest sits within a glaciated valley running West to East with Loch Rannoch forming a dominant feature in a landscape which is predominantly mountain and moorland.

Parent material covering South Rannoch is composed mainly of moine, feldspar and granulite with localised intrusions of porphyrite and porphyre. There is a dominance of glacial till over the area which has resulted in poor sandy, course and loamy soils forming the majority of soil. Pockets of better soils are found over the intrusions of porphyrite and porphyre where podzolised brown earths form an alternative to podzols, peaty gleys, flushed gleys and deep peat which dominate over most of the forest.

3.1.2 Water

A number of private water supplies arise within the forest, including the supply for the campsite. These include small springs and large burns prone to spate. These burns are a major feature of the forest and flow through steep sided gullies. However, in recent years there has been an increased use of boreholes by neighbours seeking to secure a more consistent water supply.

When forest operations are carried out, the latest version of UKFS Guidelines Forest and Water will be strictly adhered to. Timber extraction will normally avoid crossing the 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 will be planted to provide dappled shade. Any herbicide treatment will follow the procedure specified in Forestry Commission Field Book 8 "The Use of Herbicides in the Forest".

3.1.3 Climate

There is a westerly climate in Rannoch which conspires to give a cool and wet local climate. Average temperatures range from -15°c to 28°c and average annual rainfall of 1700mm, on average there are 40 days per year of snowfall with low to moderate accumulations. Late spring frosts are common.

Exposure is significant with a DAMS range of 16-19 covering the majority of the area.

3.2 Biodiversity and environmental designations

There are a number of key environmental designations affecting South Rannoch which include:

The Blackwood of Rannoch is a Special Area of Conservation (SAC)) and a Site of Special Scientific Interest (SSSI)

The River Tay SAC

The Loch Rannoch and Glen Lyon National Scenic Area (NSA)

In terms of mitigation measures for protected species, there will be strict adherence to the following guidance during the application this forest plan outputs;

Forest operations & wildlife in Scottish forests; Guidance Note 31 (2006)

Forest operations & birds in Scottish forests; Guidance Note 32 (2006)

Forest operations & Red Squirrels; Guidance Note 33 (2006)

Forest operations & European protected species; Guidance Note 34

Bat Habitat use in Forestry Commission Guidance Note 35a

Forest operations & great crested newt Scotland; Guidance Note 35b

Forest operations & otters in Scotland, Forestry Commission Guidance Note 35c

Forest operations & wildcats in Scotland; Guidance Note 35d

Forest & Water Guidelines; 5th edition (2011)

Forest operations & badger setts; Practice guide 9

In recognition of the two SAC sites which border South Rannoch, a Habitats Regulations Appraisal Appropriate Assessment will be produced by Perth & Argyll Conservancy prior to approval and will be appended to the design plan.

South Rannoch FDP area sits within the catchment of the River Tay SAC and is adjacent to the Blackwood of Rannoch SAC and as such protection and enhancement of these designated sites is recognised as a high priority. The protection of the environment is considered at 3 different levels of planning within Tay Forest District with the emphasis changing at each level. All operations that can influence water are undertaken with reference to the latest UKFSGuidelines for Forests and Water (FWG) currently in their 5th edition and supporting guidance as listed above in Section 3.2.

District strategic plan – Considers issues across the district at a strategic level and highlights broader principals and direction for management. Mostly looking for positive enhancements through design changes

Forest Design Plan (shortly to become Land Management Plan) – covers a forest block or cluster of blocks in more detail and seeks regulatory approval for proposals over a 10 year period. Will seek to address specific issues and embed design changes.

Work plan – details the working methods for an individual coupe or piece of work. Mainly focused on protective measures.

Specific actions:

Protection and enhancement of the water environment are achieved in a number ways:

- Longer term design changes to enhance the water environment for example introducing greater buffering of watercourses with native woodland. This is a strategy that is being used at South Rannoch with the restocking proposals being set out on the future habitats map.
- Enhance water quality by altering details of forest design to help provide the ecological requirements set out in table 3.1 of the FWG an example at South Rannoch would be removal of non native conifers from the riparian zone during planned felling and restocking operations.
- Protection via application of the Forests and Water Guidelines (Currently 5th edition but any subsequent revisions will be adopted). FWG will be applied to all forest operations at South Rannoch including felling, restocking, roads and woodland creation. Where contractors are used adherence to the guidelines forms a contractual obligation. Our adherence to this best practice is also independently audited via UKWAS certification.
- Protection of adjacent designated sites will be achieved through the acurate capture of data in the South Rannoch forest plan and the transfer of key information into work plans in preparation for delivery on the ground. The forest district will always adopt the precautionary approach through undertaking walk over surveys, clearly defining work zones, applying close onsite supervision and recording any pertinent points.

FWG provide a comprehensive framework to cover all aspects of the operations proposed in the South Rannoch FDP. A number of the guidelines have been enshrined as legally binding GBRs but taken in their entirety the FWG provide a level of protection to the water environment substantially above legal requirements.

3.3 The existing forest

3.3.1 Age structure, species and yield class

Species	Age distribution	Yield Class
DF	1949 - 1968	8 - 18
EL	1955 - 2003	4 - 12
GF	1950 - 1968	12 - 16
HL	1955 - 1984	4 - 10
JL	1950 - 2009	4 - 14
LP	1950 - 2007	4 - 12
NF	1959 - 1960	12 - 22
NS	1949 - 2003	6 – 14
SP	1900 - 2010	4 - 14
SS	1950 - 2012	2 – 22
WH	1957 - 1960	14 - 16

3.3.2 Access

There are a number of access points into South Rannoch - the main points being located off the Kinloch Rannoch to Bridge of Gaur unclassified public road where forest entrances are located at Alt Druidhe, Kilvrecht and Carie.

An extensive network of formal and informal paths cross the forest with the main concentrations focused around Kilvrecht Campsite and Dall Estate. The Glen Lyon Right of Way also runs through the forest.

Limited shared access exists with Finnart Estate on the forest's western boundary and Barracks Estate for sporting purposes. In the case of Finnart, shared padlocks are used on access gates in order to prevent un-authorised vehicle movements.

3.3.3 LISS potential

Within South Rannoch, there is a large area in the eastern section of the forest designated under the previous plan as Low Impact Silvicultural Systems (LISS), see Management Map in plan Appendix.

The main LISS species is Scots pine with an age range between P1950 and P1960 which has been subject, in the case of most coupes, to one or more thinning cycles. A number of LISS species mixtures with similar age classes to the above also exist which include European (EL) & Japanese larch (JL), Sitka (SS) & Norway spruce (NS) and lodgepole pine (LP).

In terms of continued LISS potential, the prospects are good through using mixtures which already exist - like SS and SP with spruce functioning as a cash crop to cover early thinning costs. The existence of spruce regeneration is challenging in terms of native woodland restoration and, in practical terms, may remain a component given levels of regeneration and demands on resources.

Most areas of LISS will be managed using a group shelterwood system. Given the age of the pine crops this plan period will mainly focus on thinning although group fells of up to 2ha will be undertaken to promote regeneration where opportunities are identified..

3.4 Landscape and land use

3.4.1 Landscape character and value

The landscape character for the general area is described in the 1999 Scottish Natural Heritage (SNH) Tayside Landscape Character Assessment as a "large scale landscape with expansive lochs and large enclosing mountains". On account of the areas geology there are extensive corridor views which include woodland at low elevation and transition from low pasture to heather dominated upland.

There are many sides to the character of the forest - from low lying lochside to high level hillside, giving a range of experiences from a sense of exposure and perspective to very intimate settings in closely spaced forest. There are ever changing light conditions, brought about by the weather and woodland cover, which conspire to give a sense of discovery and wildness as visibility and colouration change through and outwith the forest.

The forest is a key component of the National Scenic Area which highlights its visual importance in both the local and wider landscape sense.

3.4.2 Visibility

The forest is most clearly viewed from the north shore of Loch Rannoch where there are a number of private houses and the B846 (which runs between Kinloch Rannoch and Bridge of Ericht). Views of the forest from Kinloch Rannoch and the MacDonald Hotel complex are generally distant and to a degree hidden by landform.

In general terms, there are no major population centres in the immediate area, but there are a scatter of properties along the northern edge of the forest, including clusters at Carie and Dall.

3.4.3 Neighbouring land use

Surrounding land use primarily consists of upland grazing for agriculture and deer stalking by large private estates. A number of private properties are located on the periphery of Forestry Commission land which are either occupied or let for holiday makers - tourism is a major part of the local economy. Generation of hydro-electricity is also a major local land use, with Loch Rannoch featuring as a key component in the generation process.

3.5 Social factors

3.5.1 Recreation

Within South Rannoch there are a number of formal and informal paths which cross the forest and are used regularly by local people and visitors to the area. There is also a seasonal Forestry Commission campsite at Kilvrecht which has a capacity for 90 pitches placed within an attractive woodland setting.

The forest periodically hosts events such as the Scottish Six Day Trial which annually passes through the forest on route to technical sections outwith Tay Forest District. In 2010 a national orienteering event was held in the forest with the campsite at Kilvrecht being used as an event hub for organisers and participants.

The Blackwood of Rannoch is a draw for wildlife tourists, students, individuals and conservation organisations. Such visitors do not constitute large numbers but tend to occur year round and often include other parts of South Rannoch in their itinerary.

3.5.2 Community

The nearest population centre to South Rannoch is the village of Kinloch Rannoch where a number of facilities are present, including a hall used for a wide range of events including public meetings. Along the northern forest edge facing Loch Rannoch are a scattering of privately owned cottages of which some are permanently occupied and others used as holiday cottages.

At the former school at Dall, there are a number of former staff houses, some of which are now rented by Dall Estate and others are privately owned. A number of Dall residents have a long association with the area and take an active interest in local matters and over the years have engaged well with local staff.

The Forestry Commission is a member of the Loch Rannoch Conservation Association (LRCA), which functions as a constituted body of riparian owners with a remit to undertake environmental/livelihood projects and address local issues such as lochside wild camping.

3.5.3 Heritage

The archaeological sites within the forest boundary are mainly associated with medieval or later agricultural land use (shielings, a township, a farmstead, an old road). All historic sites will be managed in line with UKFS Forests and historic environment guidelines (2011 or subsequent). There are at least at least nine sites within the forest plus a further five possible bloomeries studied in the late 1960s/early 70s by W G Aitken. In March 2015 an archaeological survey was undertaken to inform the Carie Hydro Scheme. This included the investigation of a shieling at the site NN620754 Once the report for this work becomes available it will be incorporated into FE records.

3.6 Statutory requirements and key external policies

SSSI and SAC: - The Blackwood of Rannoch is a SAC which extends to the west of the forest as a SSSI. The forest also borders Loch Rannoch which forms part of the River Tay SAC.

(condition of SAC is evaluated by monitoring on FC and neighbouring land)

The River Tay Special Area of Conservation (SAC) including the Allt na Boghair, Allt Camphouran and Dall Burn.

National Scenic Area: - the whole of the forest lies within the Loch Rannoch and Glen Lyon National Scenic Area.

South Rannoch is one of the Red Squirrel Stronghold woodlands in partnership with Saving Scotland's Red Squirrels.

Within the South Rannoch plan area there are a number of schedule 1 species including Blackgrouse, Osprey, Hen Harrier, Otter and Fresh Water Pearl Mussel. Using the guidelines stated in this section, protection measures will be incorporated into individual forest operation work plans following the directions of Tay Forest District's Environment team.

4.0 Analysis and Concept -

4.1 Analysis of constraints and opportunities

Factor	Opportunity	Constraint	Concept Development
Continuous cover forestry	Potential to expand areas of CCF and promote further natural regeneration for both conifer and broadleaf species.	Areas of steep ground place limitations on thinning activities. Regeneration of Sitka spruce and lodgepole pine which impede transition to native woodland	Maximise use of hill climbing harvesters on suitable sites as an alternative to cable crane.
Black grouse population	Protect and expand population through increase in suitable habitat where possible	Due to climate change, national black grouse populations are in a period of decline. However, at present, this is not the case for Perthshire – although vigilance must be maintained.	Monitor population, mark fences, time operations to avoid breeding season and safeguard lek sites.
Sporadic and group windthrow occurrences	Opportunity to review coupe design and increase levels of deadwood.	Re-sequencing of design plan to target significant areas of windblow. Costs involved with 'chasing' windblow and effect of removal on remaining crop.	Survey extent of windthrow and where possible include within scheduled harvesting operations. Clear windthrow and establish windfirm boundary within new or existing coupe. Retain dead timber in areas that will give the greatest biodiversity benefit.
Nutrient deficient	Increased use of pine – providing	Future loss of high volume species which	Treat checked spruce areas. Use ESC techniques to

	I	I	I
areas on spruce restock areas	"nursing" benefits and enhancing habitat/landscape value.	could impact of market supply. Expense incurred with treating heather areas.	recognise these sites at time of restocking and include more pine – both in mixture and pure (Scots pine) – and reduce fallow period.
Blackwood	Encourage the expansion of native woodland around this important site. Protect Blackwood from adjacent introduced conifer seed sources.	Further reduction in species of maximum productive potential (such as SS and DF).	Clear fell introduced conifer coups adjacent to the Blackwood and retstock with native species. Or Convert adjacent coupes to LISS, felling the introduced conifer species preferentially. This allows operations to increase the conservation value of the woodland while remaining economic.
Dothistroma needle blight	Reduce area of lodgepole pine and thin Scots pine areas.	Need to use more resistant provenances of lodgepole pine in nursing mixtures and market constraints in achieving thinning programme.	Monitor and map extent of disease distribution and feed data into operational plans relating to restocking in order to reduce risk.
Landscape	Continue to apply landscape sensitive management interventions through assessing/modelling future impacts before actioning operations.	Negative visual impact from poorly designed forest felling coupes in landscape sensitive areas.	Create internal and external forest boundaries which complement local and wider landscape. Ensure that consultation with landscape architect is made in all aspects of forest design prior to submission of forest plan for approval.
Regeneration and PAWS	Areas designated under PAWS layer which either require thinning or subsequent interventions.	Crop has grown beyond being thinned due to height, stability and no previous thinning. Steep or difficult ground in certain coupes limits harvesting options to cable crane extraction	Include PAWS areas in annual harvesting programme. Attempt to use LISS to manage these areas as woodland that is being gradually restored to a native habitat. May need to support some operations in order to achieve this biodiversity benefit.

		which is not financially viable.	
Dominance of acid soils in micro catchment areas	Removal of conifer crops which are effected by windblow and restock with species more appropriate for acid sensitive sites.	Acidification of fresh water brought through excess levels of sulphur and nitrogen entering water systems a result of washout from harvesting sites.	Harvesting operations follow the decision making process highlighted in the Forest & Water Guidelines (forth edition) where "felled area in any 3 year period is<20% of catchment". The harvesting coupes in question are within this 20% ruling on account of area within individual catchments. Other factors such as windblow,open area and sequencing further contribute towards reducing pollutant infiltration. Ensure that operators follow the Forest & Water Guidelines and that appropriate coupe sequencing is applied.
Micro hydro project at Carie	Utilising sustainable natural resources to generate electricity.	Environmental impact of the project and its associated infrastructure on the immediate and wider landscape.	Develop a proposal suitable for operating in this area.

4.2 Concepts of the plan

Native woodland restocking at Camphougran

Continuation of native woodland expansion through PAWS restoration

Visitor zone improvement at key locations which include Kilvrecht Campsite and Carie forest works

Phased removal of introduced conifers through thinning of sites favourable for native species such as Scots pine for future commercial and biodiversity benefit

Forest operations do not adversely impact on the local and wider landscape in terms contrasting significantly with the adjacent environment

5.0 Management Proposals

5.1 Forest stand management

5.1.1 Clear felling

Outwith LISS areas, clear felling follows conventional regimes over a 45 to 70 year rotation subject to yield class, location and species. As a rule, stands of viable Scots Pine are retained within felling coupes to provide structural and visual diversity and to act as a future seed source.

The sequence for felling is shown in the Forest Plan's Management Map which graphically shows the sequence, shape and designation of all the forests coupes covered not just in the current but also future plans. It is planned to remove the Sitka spruce and lodgepole pine relatively quickly in the south-west of the forest (Camghouran flats) – reflecting the ongoing significant impacts of windblow and snowbreak and the potential for native woodland linkage in the wider landscape and bog restoration.

			Felling	Restock	
Coupe	Fell Phase	Volume	Ha	area	Restock
16706		28765	75.5	73.2	MB30%, SP 20%,50% open
16921		12760	59.9	40.3	SS 60%, LP10%, 30% open
16215		11534	26.7	21.5	SP 70%, MB 20%, 10% open
16440		13184	46.1	19.8	SP 60%, SS 20%, 20% open
16035		7554	27.9	25.4	SP 50%, MB 20% MC 20%,10% open

Phase 1 Phase 2

Thinning	2014 - 2024	31745	551 ha
volume			

In terms of harvesting, work is split between standing sales, long term contracts and direct production covering thinning and clearfell. The South Rannoch plan area is well served by agreed timber haulage routes to markets which include the Perthshire Timber Company (Dunkeld), Tullis Russell (Glenrothes), James Jones, BSW (Boat of Garten) and Norboard (Stirling).

Access to South Rannochs main forest access at Carie is via an agreed timber transport route.

Adjacency

For the main production focused part of South Rannoch, felling has been scheduled to avoid adjacency issues in line with UKFS general forestry practice point 15. Adjacent coupes will not be felled until restocking has reached an average height of 2m. Any proposal to schedule felling outwith this rule will be discussed with FCS before taking matters further.

At the western end of the forest (known as Camghouran flats – **Map 3**) we are persuing a policy of open habitat / native woodland restoration. The proposed felling of the current conifer crop involves a sequence of coupes which will be felled before adjacent regeneration has occurred. This is considered appropriate based on the move to native woodland which does not need future crop separation. The area is also not highly visible in the landscape.

5.1.2 Thinning

As a general theme South Rannoch is managed as an irregular shelterwood with some localised variations with a variety of age classes, species and canopy structure. There is a presumption to thin whether possible although this has not always been possible due to terrain which can be steep, rocky or very wet in places.

A common thinning scenario is under thinned Scots pine interspersed with individual or small groups of medium to large diameter Sitka spruce dominating the crop. Recent thinning programmes starting from 2010 have involved managing these two components differently – sequentially removing groups of spruce and thinning the pine. The income generated from the spruce also helps with the viability of the thinning operation.

Under this Forest Plan, Scots pine will remain the primary tree species within South Rannoch (including PAWS areas) and thinning operations will reflect this status. Owing to individual coupe dynamics brought through age, species mixture and location will entail a varied thinning prescription which will be determined at Work Plan level. However as a general principal, crown thinning towards future frame trees should be applied to create a more stable structure and ensure deep crowns to enhance potential for natural regeneration.

To protect the water environment during thinning and clearfell operations, strict adherence to the Forest and Water Guidelines 5th edition (2011) will be maintained. Further more, pre-operations checks will be undertaken by Tay Forest District's Environment & Heritage team who through the Work Plan system give practical advise to harvesting delivery teams on individual coupes.

5.1.3 Internal Landscape

In areas such as forest entrances, paths, carparks, campsites and other recreation features. The practise of Visitor Zone Management will be applied as part of scheduled thinning operations. This practice requires additional trees and scrub to be removed from public areas to enable greater visibility within the forest environment to create a more diverse and welcoming experience for visitors.

5.1.4 LISS

Within South Rannoch, LISS is practiced mainly in coupes running along the shoreline of Loch Rannoch with the long term objective of conversion to predominately native woodland. Currently LISS practise entails thinning towards final frame trees and using non – native conifer as a cash crop by either removing dominant trees or undertaking small group felling.

The presence of spruce regeneration across the forest block presents both a current and future problem for conversion to native stands where pine and birch are the desired species. However, harvesting this regeneration may continue to make some operations economically viable.

In addressing this issue there are a number of solutions;

- Systematically remove regeneration as a specific operation
- Regeneration of all sizes is removed as part of planned thinning or clear felling operations
- Spruce and lodgepole pine regeneration is accepted as part of the forest matrix and managed as a cash crop to supplement thinning.

5.2 Future habitats and species

The most significant habitat in South Rannoch is native woodland, dominated by W18 pine woodland but there are some areas of wet woodland and upland birch woodland. Expansion of all of these areas will be of considerable importance locally and nationally. Expansion is most likely in the western sections of South Rannoch and in the areas subject to PAWS restoration.

There is some upland heath but if this gradually fills with regeneration of native woodland an evaluation of the relative importance of these habitats would be made in order to decide on a management approach; at present gradual native woodland regeneration would be preferential.

Although there have been no recent sightings of capercaillie in South Rannoch (a previously popular wood for the species) continued management of the Scots pine areas under the same caper "friendly" methods will promote long-term environmental benefit.

South Rannoch is one of Scotland's red squirrel strongholds (Saving Scotland's Red Squirrels) and is therefore of national importance. The woodland received this designation because it has a robust population of red squirrels, reasonable quality red squirrel habitat (relatively poor for grey squirrel) and is currently isolated from grey squirrels.

Conservation of this important species (one of the 6 FCS key species) within the forest is accounted for within the current management proposals. However, this designation is also likely to have a much wider influence on how forests in the wider landscape are managed. There will be extensive surveillance of the grey squirrel population in Highland Perthshire followed by targeted and effective trapping in order to prevent incursion into this area.

5.3 Restructuring

In terms of restructuring, the most significant change to the forest structure will be the increase in native woodland brought through restocking, natural regeneration and PAWS restoration in coupes previously stocked with lodgepole pine, Sitka and Norway spruce. The proposal for areas of LISS will also ensure that the age structure of the forest continues to become more diverse over time.

5.4 Future management

In addition to scheduled forest operations at South Rannoch, the control of deer will be a key factor in realising the aspirations of this plan given the scale of native broadleave establishment. This will require a sustained effort by in-house and possibly contract controllers to counter internal and external grazing pressure over a significant period of time as an alternative to internal fencing.

Management of Sitka spruce, and to a lesser extent lodgepole pine, regeneration will become an ever increasing feature across South Rannoch's designated areas (PAWS, LISS) which will require a variety of approaches. For trees of commercial value, removal through thinning is an obvious approach and a welcome injection of income. In the case of smaller regeneration leaving trees to self thin or mechanical removal are options to be considered and should be taken on a case by case basis.

Plant Health

All forests in Tay FD are regularly monitored for known tree pests and diseases with support available to identify the causes of any problems. Future managaement will respond to problems as they arise and in line with policies agreed at the time.

Current known threats include DNB, p.ramorum and Chalara with the forest currently containing a mix of pines, larches and a small ash component (recorded under MB). During the 2014 DNB extensive survey of South Rannoch, there were no recording of DNB infection in the Blackwood or in the wider South Rannoch area. Further surveys will be implemented in 2015 to maintain an accurate assessment of DNB progression.

Natural regeneration monitoring

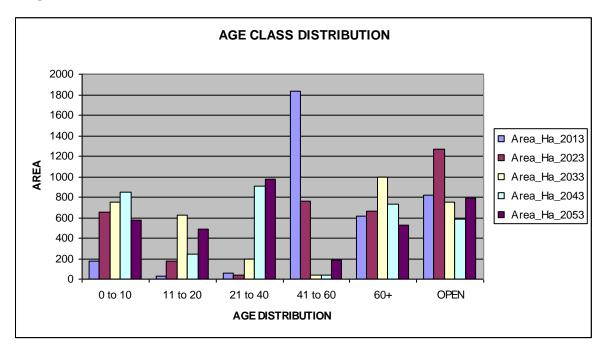
Given the high reliance on natural regeneration (assisted by deer control, some ground disturbance and direct seeding) to restock large sections of Camghouran flats, a monitoring regime will be established to determine how successful this approach is in practise. Regeneration areas will be inspected during the FDP mid-term review and during the plans 10 year review with the expectation that stocking density will be an average of 500 stems per hectare on drier soils with continuing recruitment at the end of the plan period. Following review supplementary planting will be considered in order to achieve required stocking densities or introduce desirable native species. Areas of bog habitat will be monitored by the district environment team

5.5 Species tables

MC		71	2%	89	3%	93	3%
NB		224	6%	258	7%	283	8%
NS		43	1%	40	1%	37	1%
LP		352	10%	241	7%	105	3%
DF		38	1%	34	1%	31	1%
SP		1210	34%	1188	34%	1189	34%
SS		663	19%	526	15%	449	13%
Ope	า	942	27%	1167	33%	1356	38%
Speci	es	Ha 2014	%	Ha 2024	%	Ha 2034	

Natural Reserve - SP	682	19%	682	19%	682	19%
Minimum Intrevention - SP,Bi,						
MC	327	9%	327	9%	327	9%

5.6 Age structure



5.7 Management of open land

Open ground in South Rannoch is relatively diverse (upland heath, bogs and riparian unplanted or cleared zones). The heath is primarily found on the Droilleachan Ridge, which is a good example of heathland that is neither heavily grazed nor intensively managed by muirburn. There is an area of eroding peat hags that are gradually re-vegetating; these will also benefit from a continuation of the current management.

It is likely that regeneration of trees on this high ground will be very gradual and as such is not a threat to the continued ecological value of this area. If, or when, regeneration of trees becomes significant it may be necessary to make a judgement regarding the ecological and landscape value of this habitat compared to the existing heath and then manage the ridge accordingly (the need for this decision process is anticipated to be considerably beyond the timescale of this plan).

There will be a general increase in the amount of open space through some clearfell without restocking. These areas are generally along the upper margins of the forest for landscape reasons, water courses or associated with boggy ground (and deep peat). It is predicted that these areas will not be completely open but will gradually be colonised by native tree species (including some planting). This intricate mosaic of open (often wet) ground and native woodland will considerably influence the broad connectivity and expansion of the primary conservation interest of the wider landscape - native woodland. This will also result in significant habitat expansion for FCS key species, notably black grouse (and, theoretically, capercaillie).

5.8 PAWS restoration

There is a significant area of PAWS in South Rannoch and because of the considerable benefit to biodiversity related to native woodland expansion, the conversion of these areas to native woodland is very important

A substantial proportion of the PAWS will be managed as productive conifer woodland using Scots pine as the primary species. There is also scope to use birch (downy on poorer soils and silver elsewhere) as a productive component of native woodland in this area.

Although clear felling some areas of non-native conifer around the Blackwood is proposed, it is likely that the larger areas of PAWS will be managed using a LISS approach, particularly to the east and north around Carie. This approach will mean that some key areas are re-established with native woodland as a re-stocking objective but most parts will follow a gradual shift towards native species.

There will be a significant amount of non-native conifer regeneration, particularly Sitka spruce, which will need to be managed in one of two ways. In key areas we will intervene to remove this regeneration when it is young and relatively easily accomplished. In less sensitive areas we will harvest this regeneration during thinning operations. This will help to compensate for the potential financial loss of these operations. Also, by favouring the native woodland species, the composition of the woodland will gradually change the proportion of these trees until they are dominant.

5.9 Deer management

The forest of South Rannoch extends to some 3536ha together with the Black Wood of Rannoch (SSSI, SAC, Caledonian Forest Reserve). The predominant deer species is red with a minority of roe. In addition to this sika deer are expanding their range on the periphery of the design plan area from the west. The forests are enclosed with a mix of stock on the lower margins and deer fence to the upper margins. Very high open range densities exist on the western and southern boundary.

The overall aim 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. All wider deer management issues will be discussed at deer management group level.

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

There are a number of factors which individually or collectively can be considered critical to the success of this plan:

- The western end of South Rannoch sits within an acid sensitive zone which entails a restriction on the size of coupes which can be felled in any given felling phase.
- With an increasing emphasis on restocking with species susceptible to deer browsing like birch and scots pine, the control of South Rannoch's internal deer population will be critical. The same concern applies equally to natural regeneration in PAWS zones where there is an enhanced risk to crop damage and deer control is either restricted or not possible on safety grounds.
- In terms of plant health, dothistroma needle blight presents a major threat to stands of Scots and lodge pole pine requiring regular monitoring and preparation of contingencies in case of a breakout. Currently, the level of risk in South Rannoch is low with no infected samples having been collected as of 2013. To avert the spread of this disease, there are counter measures in place such as restrictions in planting, raising staff & contractor awareness and on-going research. In late 2012 as part of the national survey for ash die-back, a survey of ash in South Rannoch was carried out but no infected examples were found.

Appendix I: Forest Design Plan Scoping and Consultation Record

Statutory Consultee	Date contacted	Date response received	Issue raised	Forest District Response
Scottish Natural Heritage		10 th April 2014	The River Tay SAC is not confined to Loch Rannoch, but includes several small streams including the Allt na Bogair and the lower reaches of the Dall and Camghouran Burns. The designated parts of these are outside of Forestry Commission ownership but may of course be affected by work within this plan and will need to be considered in the Habitats Regulations Appraisal (HRA) of the Plan. The Blackwood of Rannoch SAC is identified but it is recognised in the plan as a separate stand-alone plan exists for the SSSI/SAC. It is worth highlighting however that the land east of the Dall Burn is within the Blackwood of Rannoch SAC. It is not clear within the plan that this is appreciated. We will provide any further advice on any HRA you think might	A Habitats Regulations Appraisal with be submitted in relation to work which might impact on the River Tay SAC. References to Breadalbane NSA & ESA have been removed as suggested.

		be needed in this area of work. There are some inconsistencies in naming within the plan and about the different designations applying and some errors. The Breadalbane Environmentally Sensitive Area (ESA) currently has no status or relevance to the plan and is confused with the landscape designation National Scenic Area (NSA). References to the ESA should probably be removed.	
Historic Scotland	10 th April 2014	Records have been checked and can confirm that there are no historic environment assets of national importance within the forest area, anf therefore Historic Scotland has no locus in the determination of this proposal.	Points noted and Perth & Kinross archaeology service will be contacted to determine the potential impact on any unscheduled archaeology.
Perth & Kinross Council Andy Brown Tel 01738 477241	4 th April 2014	The C450 South Loch Rannoch is a consultation route for the purposes of timber transport and consultation should be made at least one month before any timber haulage operations are to commence.	The route is an agreed route as far as the main forest exist. Further west adjacent to the Blackwood SSSI it is a consultation route and the council will be contacted at least 1 month prior to any haulage. Map included in

			the plan.
Scottish Environment Protection Agency	16 th April 2014	For all development of this type, we ask that the UK Forest Standard and related Guidelines are adhered to.	All forest operations will adhere to UK Forest Standard requirements
RSPB	17 th April 2014	Welcomes the expansion of native woodland through PAWS restoration. We welcome the proposal to reduce deer densities to less than 10/100ha.	Points noted.
		No further comments to make.	
Perth & Kinross Council Richard Brough Greenspace Policy Officer	22 nd March 2014	In relation to public access there is a need to fully respect the statutory right of responsible access provided by the Land Reform (Scotland) Act 2003 and explained in the Scottish Outdoor Access Code. All established paths & routes must be taken into account within any forest works. There should be an intention to maintain public access during works using signage to warn users of the nature of works.	Referance to footpaths will be removed from the plan text. The importance of maintaining public access will be transferred inti operational work plans to ensure that delivery teams are aware of their resoncibilities under the Land Reform (Scotland) Act 2003 and explained in the Scottish Outdoor Access Code.
		Forestry can severely damage paths and there may be a need to reinstate path	

			surfaces.	
Technical Scoping meeting	23 rd August 2012	23 rd August 2012	PAWS	
John Barrow			The group looked at three	
SNH			examples of PAWS	
			restoration, one in mixed thinnings, a spruce clearfell	
Victor Clements			with pine retention and a	
Scottish Native Woods			restored broadleave site at	
Mr B Anderson			Carie.	
RSPB				
			A recommended approach	
Mr B Meikle			was to undertake thinning of	
Scottish Environmental			introduced species over a	
Protection Agency			period of cycles in order to	
			maintain woodland integrity	
Mr M Jamieson			and preserve ground flora	
Kindrogan Field Centre			where present. The group were not in favour of	
			were not in favour of removing introduced conifers	
Mr A Barbour			in one operation on account	
Woodland Manger			of removing future timber	
			revenue and disrupting	
Unable to attend			woodland dynamics through	
Chris Stark			small and large scale	
Forestry Commission			exposure.	
i oreatry commission			Woodland restoration	
			It was agreed by the group	

	·		
Unable to attend		that native woodland	
		restoration was the	
		appropriate course of action	
		for the most westerly section	
		at Camghouran currently	
		being felled. The forest bog	
		classification currently given	
		to the area is more suited to	
		the wetter ground further	
		east which is still under tree	
		cover.	
		The feeling of the group was	
		that planting on the drier	
		knolls would be beneficial and	
		could be achieved through	
		seed broadcasting if done	
		promptly after clearfell.	
		Desirable species for the	
		knolls were SP, Birch, Aspen,	
		Rowan which could be	
		established also by planting	
		without the need for internal	
		fencing provided current	
		levels of deer control are	
		maintained.	

Public scoping meeting held at Kinloch Rannoch Hall	26 th March 2013	26 th March 2013	Key points raised at the meeting were, Increase level of native species Maintain formal and informal path network Level of timber traffic and feliiing proposasls within new plan Pockets of unsightly windblown trees in key recreation areas	
Consultation response PKHT via conservancy		25 March 2015	Section 3.5.3: PKHER holds records for at least 9 sites plus a further 5 possible bloomeries (from W G Aitken's studies of the 1960s/70s (they wonder if this is what you mean by the "recent" research)). They've investigated a shieling at approx. NN 620 754 – no report yet but they would like any relevant info to be fed into the LMP. Is there scope for improved management of archaeo sites within wood – interpretation of sites for visitors?	Text and records updated to reference UKFS guidelines and incorporate all of the sites held in the PKHT system. We are unable to commit to further interpretation for visitors at this time.

Strengthen "important features within the forest & will be respected as such" to include how this will be done	
Note in the LMP that any unrecorded archaeological sites uncovered during forest operations can be reported to PKHT for verification	

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 – whichever 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 in native broadleaves and open/bog restoration	Greater than 5.0ha in areas of medium to high sensitivity

Appendix III. Design Plan Brief

FOREST 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 South Rannoch

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 within p1980 – p2002 pine

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 habitat 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.

Safeguard Blackwood as a pinewood reserve of national and international significance.

FDP key features

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

SSSI and SAC: - The Blackwood of Rannoch is a SAC and extends to the west of the forest as a SSSI. The forest also borders Loch Rannoch which forms part of the River Tay SAC.

(condition of SAC is evaluated by monitoring on FC and neighbouring land)

LANDSCAPE

National Scenic Area: - the whole forest lies within the Loch Rannoch & Glen Lyon National Scenic Area.

CONSERVATION AND HERITAGE

Ancient woodland: - The main feature is the Blackwood of Rannoch, which is one of the most important remnant Caledonian pinewoods. This is managed under a separate and comprehensive management plan with SNH. There are sizeable pockets of native woodland throughout the forest. All the planted Scots pine is of Rannoch origin, so there is no threat to the genetic integrity of the Black Wood.

Red Squirrel: - the forest is a Red Squirrel Stronghold woodland.

Black Grouse: - the areas of open moorland to the west and south of the forest provide good habitat for Black Grouse.

Otters: - these are found throughout the area affected by the plan, and have been recorded along the rivers Tummel and Guar and within Loch Rannoch.

Capercaillie: - were found in the Blackwood of Rannoch, although a significant decrease in their numbers has been recorded over the past 10 years.

Fish/artic char: - water courses are used for spawning ground.

Archaeological sites: - There are 6 unscheduled ancient monument sites in the forest. These include shielings, homesteads, a kiln and a relatively modern sheep fank. Evidence has come to light on a series of bloomeries within the forest However, their exact location is not known.

The pace of PAWS conversion is a point for consideration and the emergence of spruce regeneration an added issue.

RECREATION

The right of way to Glen Lyon crosses through the forest. As well as this facility there are 3 formal walks on the Carie walks system, several picnic areas and Kilvrecht campsite.

The Scottish 6-day trials come through the forest in May each year.

Area is periodically used for orienteering events using Kilvrecht as a focal point.

Informal walking routes through the Blackwood, visitor zones are marked on plan maps

TIMBER PRODUCTION

Good quality timber is on the lower slopes while growth rates in the upper elevations are also good but these tail off at high elevations. The major areas of checked Sitka spruce are planted on inappropriate sites and some of the lodgepole pine areas are now suffering from snow break and windthrow. Much of the East of the forest and the lower slopes has been, or will be, thinned; however, some sizeable areas will be left unthinned due to the risk of windthrow.

Removal of spruce pockets during thinning is viewed as a means of providing an added financial incentive to what otherwise is a low return operation. Looking to the long term, thinned pine will increase in terms of volume to make a more appealing venture.

Access to the markets is via the A9 by means of single track roads.

WATER

A number of private water supplies arise within the forest, including the supply for the campsite. These include small springs and large burns prone to spate. These burns are a major feature of the forest and flow through steep sided gullies.

There has been some question over water quality for some water supplies, resulting in high levels of filtration to be required.

The new Water Frameworks Directive will also need to be carefully considered before any forest operations are carried out. At the time of writing this, the impact this will have is still unclear.

SERVICES

There is only one electricity wayleave. This runs parallel with the public road, which runs along the south shore of Loch Rannoch

Proposed micro-hydro scheme is in the early stages of scoping.

Appendix iv Scoping

In terms of scoping for this design plan, a drop in meeting was arranged on the 26th of March 2013 at Kinloch Rannoch Village Hall. Using the forest district data base and the knowledge of local staff, invitations where sent to a broad range of individuals to comment on forest plan proposals presented by Tay Forest District staff. The meeting collected a range of general comments which were summarised into the points stated in Appendix 1 of this Forest Plan.

A technical scoping meeting was also held in August 2012 to focus on the management of native woodland restoration, continuous cover and general aspects of the forest plan proposals, this group was composed of representatives from Scottish Natural Heritage, Scottish Environment Protection Agency, Royal Society for the Protection of Birds and the Forest Authority who were not able to attend on that occasion.