

Tannylaggie Land Management Plan 2016-26

Galloway Forest District

TANNYLAGGIE

Land Management Plan

Approval date:

Plan Reference No: FDP

Plan Approval Date: 01 September 2016

Plan Expiry Date: 31 August 2026

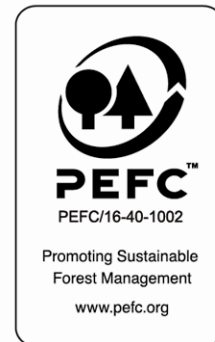
Tannylaggie Land Management Plan 2016-26

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.



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Tannylaggie Land Management Plan 2016-26

CSM 6 Appendix 1

FOREST ENTERPRISE – Application for Forest Design Plan Approvals Forest Enterprise – Property

Forest District:	GALLOWAY FD
Woodland or property name:	TANNYLAGGIE
Nearest town, village or locality:	NEWTON STEWART
OS Grid reference:	NX280670
Local Authority district/unitary Authority	DUMFRIES & GALLOWAY

1. I apply for Forest Design Plan approval*~~/amendment approval*~~ for the property described above and in the enclosed Forest Design Plan.
2. I confirm that the scoping, carried out and documented in the Consultation Record attached, incorporated those stakeholders which the FC agreed must be included. Where it has not been possible to resolve specific issues associated with the plan to the satisfaction of consultees, this is highlighted in the Consultation Record.
3. I confirm that the proposals contained in this plan comply with the UK Forestry Standard.
4. I undertake to obtain any permissions necessary for the implementation of the approved Plan.

Signed
Forest District Manager

Signed
Conservator

District **GALLOWAY FD**.....

Conservancy

Date

Date of Approval:

Date approval ends:

*delete as appropriate

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EIA Determination form if required

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- viii) Assessment of felling and restock proposals within catchments at risk or failing
- ix) The UK Forestry Standard, Forestry Commission Guidelines and the UK Woodland Assurance Scheme (UKWAS)

Summary of Proposals:

The main management objectives in this medium scale plan focus on Peatland Restoration (centred around the Kilquhockadale Flow hydrological unit), Water quality (within the R Bladnoch catchment) and sustainable Timber production sympathetic to the significant demands of landscape and recreation.

1.0 Introduction:

1.1 Setting and context

Part of Galloway Forest District that is based in Newton Stewart, Tannylaggie is a clearly identifiable, medium scale, linear plantation totalling some 2188.0ha located around 15.0km west of Newton Stewart.

Despite its mass, the block does not constitute a dominant feature lying as it does in a relatively flat landscape with limited distant external views. Views of the plantation frontage tend to be restricted to those from the minor county roads in the area; the C3w road to Glen Luce that cuts through the south end of the block and the unclassified U111 and U165 roads from Knowe to Derry and from Dirnow to High Eldrig that access other properties in and around the plan area.

The block adjoins FES plantation (Penninghame and Kilgallioch) and private forestry to the east and north, and borders extensive areas of open hill ground and poor agricultural grazing land to the west and south.

An integral part of the Galloway Forest Park the block also lies within the larger Western Southern Uplands Environmental Sensitive Area (ESA).

This plan is a revised submission of an earlier plan approved in 2005.

1.2 History of plan

The Tannylaggie Land Management Plan area comprises two areas of differing character (Three Lochs and Tannylaggie) that were initially separate forest plans but were subsequently amalgamated in 2000 to create a medium scale plan area that physically connects a series of moss and wetland areas and also better captures significant sections of the R Bladnoch SAC / SSSI catchment.

From the early acquisition in 1952 the plan area has been acquired piecemeal over many years right through until 1991. The majority of the block was planted during the 1970s but afforestation began as early as 1954 and continued right through until 1996 when restocking then began (see table below).

Although some small retention of the 1950s plantings still exists, most of it has been harvested and restocked. Current felling is, and has been, focussed on the fairly extensive 1970s plantations.

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This medium scale plan stands comfortably as a single design plan unit for water catchment and large scale open habitats management considerations.

Acquisition date	Deed No	Title	Seller
May 1952	248	Fell of Loch Ronald Farm	Lord David Stuart
Sept 1953	300	Balminnoch (pt)	Lord David Stuart
April 1962	719	Polbae & Tannylaggie	Mr HOJ Carter Jonas and others
Nov 1962	745	Kilquhockadale	Mr & Mrs RT Oxley
Nov 1969	986	Mochrum Estate (pt)	Miss Flora Stuart
Mar 1971	1044	Balminnoch exch.	Sir Robert J Formby Burrows
Dec 1971	1074	Mark of Loch Ronald	HJ Glover
Fen 1972	1082	Polbae No 2 Tannylaggie	Maj.Gen. DG Moore & KN Rankin
Dec 1974	1151	Urrall & Kilquhockadale	Caledonian Insurance As. Trust
Mar 1975	1164	Drumnabrennan exch.	Mr RAE Herbert
Oct 1976	1223	Fell of Loch Ronald exch.	Sir RJF Burrows
Jan 1977	1231	Urrall & Kilquhockadale	RT Oxley
Sept 1978	1291	Mark of Loch Ronald exch.	Robert M McConnell
May 1982	1393	Mochrum Boundary Adj.	Miss Flora Stuart
Oct 1989	1477	Kilquhockadale	Exec. Of John Wallace
Jan 1991	1495	Urrall	Mr JR Haddon

2.0 Analysis of previous plan

2.1 Analysis from previous plan

Objectives from the previous plan were as follows:

Objectives	Assessment of Objectives during plan period
Commercial softwood timber production in forest core. Diversify age structure and species composition of the block through restructuring and generally reduce coupe size to benefit habitat and visual diversity (particularly along public roads).	Clearfelling and restock has taken place as per the previous plan approval leading to increased species diversity and age structure.
Improve overall quality water catchments and riparian zones especially along targeted significant watercourses. Monitor and improve water quality as per Guidelines.	Much of the felling and restock during the previous plan period has focussed around the Polbae Burn, Water of Tarff and the Black Burn and has led to expansion of open space and BL restock within these riparian zones.
Improve recreational, historical and archaeological value of area.	Discreet areas of conifer plantation have been removed around some minor heritage features and replaced with open space / broadleaf restock to improve heritage value of block.
Create internal road network to service this block with links to neighbouring private sector blocks to reduce timber haulage impact on county roads.	Roads construction and maintenance has taken place as per previous plan approval and FCS amendment. Accessing coupes around the Loch Ronald, Black Burn and Drumgorth areas, the latter also facilitating access for the private sector, the FES network links to the wider STTF roads partnership network.

Whilst these approved plan objectives were generally met, they have over the interim period become slightly outdated. Key objectives for the plan (see table below) are now more directly related to the revised brief in Appendix V.

Themes and objectives.	Priority
Productive; Promote sustainable timber supply through revised felling / thinning plans and restocking plans. Implement modest scale road building / road maintenance programme required to service proposed operations coupes. Increase broadleaf woodland creation particularly native species for	high

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<p>biodiversity. Create a more diverse age structure for the forest.</p>	
<p>Healthy; Increase area of peatland restoration within block. Increase area of mature woodland and species diversity for habitat enhancement. Expand area covered by and develop Low Impact Silviculture systems to south of block.</p>	high
<p>Treasured; Maintain favourable status of internal and adjacent designated sites; Blood Moss SSSI, R Bladnoch and Kirkcowan Flow SACs. Restore and expand peatlands, broadleaf areas and network habitats for wildlife species.</p>	high
<p>Cared for; Whilst block is not visually prominent continue to contribute to Scotland's landscape through the management of local views from around the Three Lochs caravan park A712, enhance the external large scale landscape and internal design through the management of major flow blanket bog areas, revised species choice, open space and coupe shape. Protect water, soil and air through management of watercourses and private water supplies in keeping with SEPA guidance, UKWAS standards and Forest and Water guidelines to maintain and improve water quality within R Bladnoch catchment and to improve feeding and spawning conditions for fish. Maintain and enhance plan area for priority species such as Red Squirrel. Manage heritage features according to FES Archaeological guidelines.</p>	high
<p>Accessible; Retain / improve access and views, through localised intensive management regimes, to provide an enjoyable woodland experience around the Three Lochs campsite area and SUW corridor (core path 432 circles L Heron using both FES and private land).</p>	medium

3.0 Background Description

3.1 Physical site factors

3.1.1 Geology Soils and landform

The underlying solid geology is composed of sedimentary greywackes and shales of the Silurian and Ordovician period. A band of Black Shale with Glenkiln fossils runs below Tannylaggie Flow and to the north of Urrall Fell. An igneous intrusion of Porphyrite is to be found on Urrall Fell.

The block lies on a moorland plateau stretching from the A714 at Corwar to Port William on the Solway that is characterised by extensive deep peat areas interspersed with numerous lochs, lochans and wetland areas and occasional hilly outcrops and drumlins. Generally the poor soils types that inevitably dominate the plan area, deep peats, gleys and peaty gleys are flushed however are even poorer where they are raised. A fairly intimate mixture of brown earth and ironpan soils and peaty gleys restricted to the valley bottoms and drumlin hills are also present.

The James Hutton Institute "Land Capability for Forestry" classification (previously Macaulay Institute) for this extremely wet low lying area is a mixture of F5 and F6, land with limited flexibility and very limited flexibility for growth and management of tree crops, classifications amply demonstrated by the narrow existing choice of commercial conifer species and the inherent high windthrow risk.

The plan area generally lies in a basin with elevation ranging from 120-184m and with the only significant landforms being Fell Hill (153m) and Urrall Fell (184m).

3.1.2 Water

The Tannylaggie land management plan area lies squarely in the catchment of the R Bladnoch. The R Bladnoch is designated SAC for Atlantic salmon and Salmon habitat but historically the catchment has been quite heavily forested with issues such as watercourse over shading, surface water acidification, siltation risks and drainage and riparian management of particular concern. The plan area is drained to the west by the Tarf Water, to the east by the Black Burn and to the north by the Polbae Burn all of which ultimately flow into the R Bladnoch. Other significant watercourses in the plan area include the Dargoal Burn and Pultayan Burn.

Site management and generally water catchment management is a key environmental consideration throughout the plan area and particularly within the designated area. The district regularly consults with both SEPA and Galloway Fisheries Trust and participates in a regular ongoing water sampling exercise of the Bladnoch catchment that continues to inform and fine tune management practice in the block.

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With regard to River Basin Management Plan considerations the R Bladnoch is currently classified as “moderate”. Potential pressures on the watercourse are morphological alterations from forest operations, production of non-renewable electricity and diffuse source pollution. There are a number of forest management measures that the district will take to promote the biological recovery of acidified watercourses. Along with the accelerated clearance of shade casting stands and the expansion of native riparian woodland in treeless areas we also aim to comply with best practice and minimise sediment release from any forest operations with efforts made to create wider aquatic and riparian zones to provide long term protection against disturbance from future forestry operations and loss of light from canopy closure (a minimum of 50m for the main watercourses the Tarf Water, Black Burn and Polbae Burn and a minimum of 10m on the other significant burns mentioned above).

There is no forest canopy cover over 300m in the plan area.

FES has considered flood risk of peak flows at the exit of the site and also further down stream and there are no known issues. It is appreciated that new planting with associated operations of draining and ploughing can give rise to a very slight increase in peak flow (up to 20% at site scale) but the small scale of our additional planting and the well designed and significant sized buffers will minimise this effect. The significance of the potential increase in peak flow will reduce as more water joins from other tributaries and the peak flow is diluted. Clearly if whole water catchments were being proposed for planting this would require greater examination and consideration.

There are several private dwellings within or close to the block; details of all known private water supplies are held in a District GIS layer (see constraints map).

All work undertaken will comply with the Forests and Water Guidelines (Fifth Edition) although in this sensitive acidified catchment riparian buffer zones should be significantly enhanced.

3.1.3 Climate

The south west of Scotland has a predominantly mild windy oceanic climate influenced by the Gulf Stream. Annual rainfall in this block falls mainly during the winter months October to February and, compared to the district range of 1000 – 2000mm, ranges from 1600mm to 1800mm on this lower lying ground. Guidance on Climate Change suggests that the District can expect an increased frequency of extreme weather events with the climate remaining wet and mild. Whilst there may be little impact on this DP block with regard to primary species choice (mainly conifer) there may be future threats to wildlife habitats. The development and maintenance of open Habitat networks will be important.

3.2 Biodiversity and environmental designations

The R Bladnoch SAC and Blood Moss SSSI are both found to the north of the plan area with Kirkcowan Flow SAC adjacent to the western margin of the plan area.

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The R Bladnoch and Kirkcowan Flow SAC sites are designated for Atlantic salmon and Blanket bog respectively.

Blood Moss SSSI is designated for its raised bog, one of the best examples of remnant blanket bog in Wigtownshire. A management plan, agreed by SNH, to sustain the bog flora and retain water on the site is in place. Previous drain blocking, chemical killing of conifers and conifer mulching techniques to establish a buffer around the SSSI have taken place over the years with varying degrees of success. Whilst there is little evidence of conifer natural regeneration on Blood Moss itself, there is a dense cover on some of the treated buffer areas that is in the process of being removed.

Any reduction of conifer crop in the vicinity of these designated sites replaced by open space or broadleaf planting would reduce the potential seed source for conifer natural regeneration and make a significant contribution to both overall biodiversity and the favourable status of their designation.

Water quality is a significant environmental factor in the plan area with the R Bladnoch Dee identified as being of national importance for Atlantic salmon and other breeding salmonid populations and there is little doubt that overall the catchment remains quite sensitive. To date some conifer removal intervention has already taken place where forest encroachment onto watercourses has occurred, work that will benefit other aquatic species such as Brown trout and European Eel (UKBAP species) and will be further supplemented by planned creation of additional aquatic and riparian zones improvements, generally in excess of basic guidelines identified in Forest and Water guidelines 5th edition. There is little Native Woodland present, only small areas such as Knockbrake Wood and Loch Ronald Wood located to the south of the plan area. Often associated with riparian and aquatic habitat these fragments are priority focal areas for the expansion of native broadleaf woodland.

3.2.1 FCS Biodiversity Programme key species

A number of upland LBAP priority bird species are associated with the open ground within and surrounding the design plan. Wide ranging raptors such as Hen Harrier, known to have roosted within the block, will benefit from the planned creation of additional open ground corridors.

The block is adjacent to Black Grouse core lek areas and the species was no doubt present throughout the block prior to canopy closure. The plan area is still considered to be an important opportunity to provide habitat to support the species. Creating habitat links through the plantation to the open moorland edge utilising scattered native broadleaf species such as Birch, Hawthorn, Alder, Willow, Aspen and Rowan and increased amounts of open ground will favour the species.

Red Squirrel is present at low densities throughout although the block is not considered to be a "Red Squirrel Stronghold site" (a small suite of sites designated by the Scottish Government where Red Squirrel can be helped to survive). A relative lack of connectivity to surrounding broadleaf woodland and

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the low proportion of existing large seeded broadleaf suggests that currently the block is less vulnerable to Grey Squirrel colonisation and can be managed to ensure that it remains advantageous towards Red squirrel. Our overall commitment to conifer plantation albeit reduced in area by proposed Peatland Restoration and a planned increase in species diversity, particularly areas of Scots Pine, other minor conifer species such as Norway Spruce and small seeded Broadleaf restock reflect this.

3.2.2 Scottish Biodiversity List Species

Otters have large territorial areas and wide areas of adjacent and connecting land to water bodies and existing riparian habitats are regularly used by them for foraging and movement between river systems. There are known Otter records close to the plan area at Tannylaggie bridge and Beoch Burn. Positive riparian zone management measures, often exceeding basic water guidelines, such as an increase in small seeded BL cover coupled with our aim to keep sections of stream banks permanently vegetated and persisting throughout subsequent rotations will increase both the availability and connectivity of suitable breeding and feeding habitat for both of these species. Galloway FD Environment staff now also prepares brush piles along water courses, specifically providing excellent cover for rearing, resting and breeding otters. The main benefits for FES is that providing these features greatly reduces the likelihood that otters will create resting places or breeding sites within commercial forest stands and the brush piles are also likely to be used by a wide range of animal species and provide valuable deadwood habitat.

Pine Martens favour similar forest habitats as Red Squirrels and have been recorded south of the block near the A75(T). Recent increases in sightings and scat observations suggest that they may be re-colonising former territories. Water voles have used the block. Whilst large sections of the plan habitat remain suitable for their recolonization, numbers are increasingly scarce. Bats occur throughout the area however little is known about their use of plantation forest. A series of bat boxes in the area and the maintenance of a matrix of woodland cover and open space should benefit all Bat species.

3.3 The existing forest

3.3.1 Age structure, species and yield class

Species / Yield class

Almost one quarter of the area of this plan is currently classified as open ground most of which comprises open hill and clear felled ground. The detailed treatment of open areas is covered under section 5.2 Future Habitats and Species.

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Species diversity in the plantation area is currently quite poor. On the poorer site types pure spruce and spruce / pine mixtures dominate the block and account for around 84% of the plantation area. Restricted to the more fertile site types broadleaf (almost 6%) and the minor conifer species Scots Pine, Larch and other conifers (around 10%) account for the remainder of the plantation area. Around 20% of our current broadleaf area (15.1ha) has been identified as Native or nearly Native Woodland under the Native Woodland Survey Scotland project. These areas will provide a focus for further native woodland expansion. In the immediate short term species diversity in the plan area will be further compromised with most if not all of the larch component scheduled for removal because of district wide spread of *P ramorum* infection. The situation should improve over the period of the plan as restocking of the larch areas utilises non spruce species from our agreed alternatives species list.

Yield class is variable across the block with spruce crops ranging from YC16 down to poorer YC4 crops on the deeper peat areas. Options available include conversion of the poorer spruce crops on the peat land areas to peat land edge woodland or full bog restoration to permanent open peatland.

Species in 2016	Total area (ha)	Total area %	Total plantation area %
Sitka spruce	1229.5	56.3	74.0
Norway spruce	7.0	0.1	0.4
Larch spp.	115.4	5.3	6.9
LP (Other Pine)	156.0	7.1	9.5
Scots Pine	25.6	1.2	1.5
Douglas Fir	27.2	1.3	1.6
Other conifers	9.0	0.4	0.5
Broadleaf	93.9	4.3	5.6
Open space (includes felled areas & open water)	523.9	24.0	-
Total	2187.5	100.0	100.0

Age Structure

Restructuring remains an objective given that almost half of the plan area still comprises either pole stage or mature forest and provides limited structural biodiversity benefit. Initially Design Plan approved clearfelling to the south of the block markedly improved the forest structure however planned felling over and above areas already felled for *P ramorum*, and as yet not restocked, will compromise restructuring through a transitional increase in open space throughout the plan area.

The revised clearfell programme, with a minimum of 7yr age gaps or a 2m height differential maintained between fell coupes, will improve the spatial appearance and structure of the block over the plan period. Some of these coupes will be

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quickly restocked to deliver an improved age structure and others particularly some of the second rotation crops can potentially be converted from clearfell to Low Impact Silvicultural System (LISS) management. These factors and extended crop rotation lengths should provide longer term improvements in structure through a more even spread of age classes throughout the block and greater areas of old high forest.

Age of trees	Growth stage	Percentage of class at given year	
		2016	2046
0 - 10	Establishment	13.0%	8.8%
11 - 20	Thicket	12.8%	11.1%
21 - 40	Pole stage	26.4%	29.7%
41 - 60	Maturing high forest	22.2%	8.0%
61 +	Old high forest	1.6%	4.6%
	Open space / felled areas	24.0%	37.8%
Total		100.0%	100.0%

3.3.2 Access

The block is currently accessible for timber haulage using the existing relatively modest forest road network. All timber haulage exits the block to the south along the C3w Glen Luce road or north along either the B7027 or more likely via the internal forest road network onto the A714 at Arnimean. On the Dumfries and Galloway Timber Transport Group Agreed Routes Map west for Timber Haulage the A714 Newton Stewart to Girvan road is classified as an "agreed route" with the B7027 and C3w minor roads classified as "consultation routes". The use of this strategic internal forest road network along with links through to other private sector plantation forest roads will significantly reduce the impact of timber haulage on the public road network. Additional light vehicle access is available along the minor county roads currently excluded for timber transport. Road upgrade of the existing forest road network and supplementary new road construction to facilitate access to some virgin first rotation crops will be required during the period of this plan approval. Around 70% of the planned roads programme for the block is scheduled for construction during the plan approval period, with two thirds of the work carried out in the first phase (see table below).

Although out with the period of the plan, negotiated agreed access may be required through neighbouring private plantation land to facilitate harvesting and haulage of some FES coupes to the far north of the block.

Period of Proposed Construction	Proposed length for construction
2016 to 2020	2835m
2021 to 2025	1800m

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2026 and beyond	1730m
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There are three active quarries in the plan area, two to the north and one to the south that will provide stone material for forest road upgrade and new construction to service the planned timber harvest. All of the quarries are small scale, lie within the block core and are relatively inconspicuous with limited landscape impact. To avoid diffuse pollution arising from rainfall derived leaching, appropriate soakaways are in place. All quarries are identified in the suite of DP maps along with proposed / planned forest roads for the plan period and beyond.

District policy is to target Irish pipe bridges for removal as they are known barriers to fish migration however there are no such bridges identified in the Tannylaggie DP area.

3.3.3 LISS potential

The majority of the plan area has low to moderate DAMS scores (Detailed Aspect Method of Scoring) of 17 or less with only a few areas, generally focused on the deep peats, showing scores higher than 17. In reality however opportunities for a significant expansion of LISS areas are generally constrained by the poor, boggy site types and restricted to the areas to the south of the plan area around the Three Lochs that have already been identified for thinning and LISS management (Low Impact Silvicultural System). LISS is defined as "Use of silvicultural system whereby the forest canopy is maintained at one or more levels without clearfell of areas over 2.0ha". Second rotation crops will potentially provide opportunities for future LISS expansion.

3.4 Landscape and land use

3.4.1 Landscape character and value

Lying in a relatively flat landscape with only limited distant external views afforded by a network of minor county roads that surround it, the block does not constitute a dominant feature in the landscape. Whilst parts of the block are more visible in near and mid-distant views, particularly the area around the Three Lochs, up until now much of the Tannylaggie block has been less than visible with only restricted internal views available from the forest road network. Recent restructuring in the northern core of the block has dramatically opened up many new internal views.

The 1998 Dumfries and Galloway landscape assessment categorises the area occupied by the Tannylaggie block as type 17 "Plateau with forest" where "land cover is typified by extensive conifer plantation of even age, colour and texture as yet little modified by redesign", and where "forests show an exposed and remote character with a lack of elevation to create dark landscapes".

The main landscape issues for consideration in this landscape type are

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- adding diversity to the landscape in subsequent rotations
- loss of plateau moorland through forest expansion
- potential wind power development given the landscape sensitivity

In developing this plan design the following key landscape specifics have been addressed:

“Forest restructuring for spatial, age, species and wildlife diversity should be progressed and should seek to expose and preserve cultural features” and “Gentle landform and large scale relief will require large scale design responses”; whilst the relatively large scale relief will allow for some larger scale felling coupe design in the plan hinterlands, the principal landscape concerns remain enhancing the limited topographical diversity through the greater use of interconnected patterns of open space and the restocking of alternative species with a greater future reliance on broadleaf and minor conifer species such as Scots Pine. All known heritage features will be buffered in areas of open space.

3.4.2 Neighbouring landuse

The block adjoins private plantation to the west and southeast and other FES plantation to the northeast (Penninghame LMP).

The remaining surrounding land is generally dominated by open hill agricultural farm land or designated status open ground sites (Kirkcowan Flow).

Several farm and domestic properties are located around the periphery of the block and the Three Lochs caravan park borders the plan to the south.

3.5 Social factors

3.5.1 Visitor Zone Recreation

The Tannylaggie block is not considered a high Recreation priority for the district and contains little in the way of FES recreation facilities.

To the south of the block FES plantation does however provide a backdrop to the Three Lochs (Black Loch, Loch Heron and Loch Ronald) that in turn supports commercial recreation in the form of the fairly popular and developing Three Lochs caravan park. Facilities currently associated with the caravan park include a short informal trails network that partially uses the FES estate and fishing access and other water based activities that use the actual lochs resource. Additionally the long distance Southern Upland Way footpath skirts the block at its northern most edge.

Recreational demands around these facilities will impact greatly on our management choice. To improve the internal and external views associated with them, specific Visitor Zone treatments will be developed for each site potentially involving bespoke thinning regimes, mature tree retentions where possible and the creation of additional open space and increased species diversity.

The principal facilities are listed in the table below.

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Facility	Concept / Opportunity	Constraint	Plan Development
Southern Upland Way (SUW) long distance route	Improve general experience of walkers along FES sections of route Reduce impact of clearfell operations	SUW currently uses unclassified county road	Enhance / maintain immediate surrounds to long distance route through conversion of existing primary conifer to either BL woodland and open space or secondary conifer woodland to reduce impact of future harvesting operations
Three Lochs caravan park trails network	Site extensively used by Caravan park residents Improve general experience of walkers along FES sections of route	Financial pressures relating to facility expansion in non-core recreation areas Core path does not align with forest trail Caravan park expansion pressure on basic facilities	Enhance / maintain visitor zone areas through Long-term retentions, creation of BL woodland and use of Native species such as Scots Pine for a more natural and informal appearance and feeling

3.5.2 Community

As previously stated there are several domestic and farm properties associated with the block that have an interest in the plan area however there are no readily identifiable local communities present.

Kirkcowan Community Council were involved in our initial scoping exercise and are in receipt of the latest version of our local Strategic Plan.

3.5.3 Heritage

Following *FES Historic Environment Planning Guidance*, this Forest Design Plan describes and considers the conservation and management of the historic environment. The FDP includes details of all relevant scheduled monuments, listed buildings, designed landscapes and the most significant undesignated features.

Designated historic environment features are recorded in the Designated Historic Assets Register (maintained by the FCS Archaeologist). Scheduled monuments and listed buildings are managed within the Forest District Monument Management Plan and Condition Surveys respectively. FCS also maintains a programme of detailed measured survey of our most significant sites in order to

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enhance the national historic environment record and inform conservation management.

Whilst there are no Scheduled Monuments or Category A listed buildings present in the plan area, other archaeological heritage features, settlement remains and sheep pens are present and listed in Appendix III.

All significant features will be protected and managed following the *Forestry and Archaeology Guidelines* (2011), the FCS policy document *Scotland's Woodlands and the Historic Environment* (2008) and the supporting *FES Historic Environment Planning Guidelines* (available from the FCS Archaeologist).

Known heritage features are marked on workplans before the start of forestry operations. Machine operators are fully briefed on their responsibilities prior to all sites being worked. The known record is based on features recorded on the 1st edition OS Map (1850).

Felling coupes, access roads and fence lines will be surveyed prior to any work being undertaken to ensure that upstanding historic environment features can be marked and avoided. Historic environment features, including drystone dykes, coming to light during forest operations will be surveyed, recorded, mapped and monitored for inclusion in future versions of the Design Plan and to demonstrate Forestry Commission Scotland compliance with the UK Forestry Standard.

At planting and restocking historic features will be removed from ground disturbing operations with opportunities to enhance the setting of important sites considered on a case-by-case basis (such as the views to and from a significant designated site).

Any recent archaeological surveys that have been undertaken on behalf of FCS have been incorporated into the Forester GIS Heritage Module geodatabase - and any new archaeological surveys required (in unimproved upland areas for example, or areas within which the archaeological record is unusually rich) are undertaken to the standards laid out in *FES Historic Environment Planning Guidelines*. This will ensure that undiscovered historic environment features are mapped and recorded prior to forestry establishment and management operations - and will ensure the continued comprehensive protection of the known archaeological resource.

3.5.4 Forest Renewables and Utilities

At this time there are no renewable developments planned for the Tannylaggie LMP unit however the possibility remains that the area could be subject to future windfarm applications. Currently there are two windfarms, at various stages in their development planned for private ground bordering the plan area. The plans are listed in the table below;

Glenchamber Windfarm	Site located a few kilometres to the west of the plan area, developer RES.
Gass Windfarm	Site again located to the immediate west of the plan area at Tarf Bridge, developer WilloWind.

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Forestry Commission Scotland (FCS) is working to develop the wind and hydropower potential of the land and forests that we manage for the Scottish Ministers. Our aim is to ensure that the potential of the National Forest Estate is developed and managed in ways that

- contribute to the Scottish Government's renewable energy target
- maximise financial returns from the National Forest Estate
- secure benefits for local communities and
- achieve a reasonable and sustainable balance with other FCS objectives

3.6 Statutory requirements and key external policies

The legal status of the land is purchased.

4.0 Analysis and Concept

4.1 Analysis of constraints and opportunities

The following table sets out the site factors that are deemed significant in influencing the long-term management of the forest block.

Factor	Opportunity	Constraint	Concept Development
Biodiversity	Peatland restoration and connections to other external designated sites / hydrological units	Extended restoration period as resources permit Fragmented nature and quality of remnant peatland Permanence of surrounding conifer seed sources	Identify focal priority areas for potential peatland restoration that have areas of deep peat, are generally flat and wet and have remnant bog species on site Create sanitised zone buffer that will be less likely to seed onto designated site
Biodiversity	Enhance Blood Moss SSSI site	Timber production Permanence of surrounding conifer seed sources	Create broadleaf wet woodland area linkage to other designated sites / open habitats Create sanitised zone buffer that will be less likely to seed onto designated site Undertake peat depth survey and consider extending bog restoration area
Biodiversity	Enhance Black Grouse habitat	Low level resident population	Increase BL restock, targeted on Black Grouse locations, for additional species diversity and food / shelter source Identify localised boggy areas as open space
Biodiversity	Enhance Red Squirrel habitat	Potential Grey squirrel incursion from neighbouring broadleaf areas	Increase second and subsequent rotation crop areas under NS & SP Increase small seeded BL restock to benefit species
Environmental	Enhance water	Conifer monoculture	Enhance riparian zones

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Quality	quality within the R Bladnoch catchment Enhance connectivity of aquatic areas to other habitat networks	planted close to watercourses	through increased open space / BL restock Identify core connecting corridors that link internal open space and aquatic / riparian areas to woodland fringe and/or open hill top ground Increase species diversity (BL and minor conifer) Reduce average coupe size where appropriate
Environmental Quality	Enhance views of block from minor county roads	Moderate to low levels of existing species diversity Harsh plantation edges	Improve species diversity through additional use of alternative minor conifer species and broadleaf Enhance / soften plantation boundaries and create more natural and welcoming woodland edges Where possible reduce coupe size and extend rotation lengths in highly visible coupes and along roadsides
Environmental Quality	Increase area managed under Low Impact Silvicultural Systems	Site type constraints Lack of appropriate mature conifer crop	Increase area managed under LISS (south of plan area) Extend rotation lengths throughout plan area
Timber	Provide planned sustainable timber supply	Poor site types Increased creation / enhancement of conservation habitats	As far as possible (given increased BL restock and potential peatland restoration) maintain conifer restock programme Smooth timber production programme removing year spikes
Access and Health	Enhance access and enable local communities and visitors to enjoy	Low levels of existing formal recreation within block confined to extreme north and	Enhance current formal recreation through trails development and bespoke silvicultural

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	woodland	south	treatments within Recreation Visitor zones
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4.2 Concept development

The concept forms the broad framework for the detailed design and is presented graphically in map 4: Analysis and Concept. Several themes, often overlapping, are outlined as follows:

Commercial conifer zone / Core timber production

Much of the plantation block will continue to be managed as commercial crop to meet the district programme commitments, a programme minimally compromised by some premature P ramorum felling of Larch.

There are areas of better site types to the south of the plan area that may provide opportunities, through additional LISS areas, to create smaller clearfell coupe sizes, extend the rotation length of some conifer crops and increase overall species diversity.

Designated sites

Part of the Bladnoch SAC and Blood Moss SSSI are found within the plan area and Kirkcowan Flow SAC lies immediately adjacent to the west of the plan area. The existence of these designated sites will be taken into account when considering areas of bog restoration and the creation of open space buffers on their margins will contribute towards the maintenance of their favourable status.

R Bladnoch system riparian zone

Several watercourses, the Black Burn, Dargoal Burn, Pultayan Burn and Tarf Water run north south through much of the plan area eventually draining into the R Bladnoch. Water quality issues within the catchment, potential for peatland restoration and the creation of a significant habitat network centred on this riparian corridor are critical success factors in the plan.

The plan intention is to fully open up the riparian corridor going beyond the basic proposals of the legal drivers and voluntary codes i.e. the UK Forestry Standard (UKFS) the Forest and Water Guidelines (FWG) and the UK Woodland Assurance Standard (UKWAS) and in some cases such as the lower lying areas to the north of where the Dargoal Burn meets the Polbae Burn opportunities also exist for the creation and expansion of wet broadleaf woodland using locally rare Aspen.

Peatlands restoration zone

Apart from the Blood Moss site several, fragmented areas of deep peat blanket bog can be found throughout the plan area. Peat depth surveys around the Black Lochs of Kilquhockadale in the central core of the plan and in the parts of the surrounding conifer plantation suggest a far more extensive layer of deep peat exists that has potential for either full restoration or the establishment of Peatland Edge Woodland.

Residentials

There are several residential and agricultural properties within and on the edges of the design plan area (Balminnoch Cottages, Three Lochs campsite, Dirnow, Kilquhockadale, Urral, Tannielaggie and Fell of Loch Ronald).

Opportunities exist to better integrate farm fields and open ground with our plantation and provide farm friendly woodland that could protect water supplies

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and even provide additional grazing or animal shelter. Improving visual and species diversity around these areas is an additional objective for the plan.

Minor roadside Recreation corridors

Parts of the block are highly visible and present a series of attractive views from the minor road to Glenluce to the south and some less interesting ones from from the unclassified road and Southern Upland Way to the north.

Long term aims are to develop and improve the views through increased species diversity both broadleaf and minor conifer, better coupe design and better sight lines into the plantation. Area specific Visitor zone treatments will be developed for these corridors involving bespoke thinning regimes, mature tree retentions where possible and the creation of additional open space and species diversity.

Powerline corridors

A small number of visible, angular lower voltage powerlines cross the plan but do not dominate the landscape.

Our planned use of open space and broadleaf restock around their boundary edges should ameliorate / soften their impact and appearance in the landscape.

5.0 Management Proposals

5.1 Forest stand management

The Tannylaggie plan has been designed in accordance with sound silvicultural and environmental principles within the framework outlined by the UK Forestry Standard, the UK Woodland Assurance Standard and the Galloway FD Strategic Plan.

The accompanying Management map provides details of our coupe management proposals and the following table summarises the average annual felling and thinning volumes (m3ob) expected for the next 10years (plan period):

Fell period	Thinning / LISS	Clearfell	Total
2016	2508	61165	63673
2017-2021	1021	35429	36450
2022-2026	1517	18091	19608
2027-2031	1589	11018	12607
2032-2036	1664	6546	8210

The programme has to an extent been smoothed to provide a regular and sustainable supply of timber yet remains open to amendment should circumstance change.

5.1.1 Clear felling

Given the terrain and prevalent site types most of the plan area (around 76%) will be managed under a clearfell management type using conventional harvester and forwarder working. To the south of the plan area there is however limited scope for a targeted expansion of the area managed under Low Impact Silvicultural Systems (LISS), particularly in the second rotation crops.

A number of coupes scheduled for clearfell during the 10yr period of the plan contribute to the district programme. Details of the 14 coupes (605.1ha and around 27.5% of the plan by area) are identified in Appendix IV.

For landscape and biodiversity considerations efforts have been made to extend the felling period between coupes to over 7yrs, to marry coupe shape better to landform and where possible reduce the overall average size of clearfell coupes and increase the area of plantation under LISS.

The following table confirms that as per paragraph 3.4.2 in the UK Woodland Assurance Standard (second edition), with the exception of the first fell period 2016-2020, no more than 25% of the plan area is due to be felled in any five year period within this plan approval period. The area felled in the first period is heavily impacted by the peatland restoration project yet still only marginally exceeds the threshold, representing some 25.59% of the total area.

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All proposed operations sites will be surveyed prior to work taking place to identify the presence of species such as Red Squirrel, Otter or Badger that may require specific management treatments i.e. locating dreys or avoiding breeding seasons.

5yr Fell period	Area felled (ha)	Area felled as % of total plantation area
2016-2020	560.2	25.59
2017-2021	424.2	19.41
2018-2022	424.2	19.41
2019-2023	245.4	11.22
2020-2024	267.1	12.21
2021-2025	70.8	3.24
2022-2026	161.7	7.39
2023-2027	201.3	9.20
2024-2028	211.2	9.65
2025-2029	189.5	8.86

It is of course important to manage forestry activities in acid sensitive water catchments and there are three catchments covering this LMP area that have been identified as either "at risk" or "failing". Surprisingly the catchment central to the LMP area that includes the Black Lochs of Kilquhockadale, the Black Burn and Pultayan Burn, and where much of our proposed peatland restoration will be targeted, is neither at risk or failing. Calculations involving proposed felling and restocking for the catchments have been prepared and are included at Appendix VIII.

All three of the catchments satisfy the felled area threshold but two of the three fail to meet that of closed canopy forest > 15yrs needing to be less than 30% of the catchment in 15 years time. Whilst there is little recent water chemistry data available for the two catchments not meeting the restocking threshold, the district has been involved in regular water sampling / data collection in the catchment that meets both of the thresholds, number 271 based on the Polbae Burn. Until we have access to more recent data from the failing catchments the district will commit to

- not to restock any areas felled during the period of this plan
- the collection of water samples on identified watercourses within the failing catchments and
- depending on future critical load calculations prepare revised restocking proposals through FCS amendment

In extensively (>50%) forested catchments like those covering the Tannylaggie LMP area additional measures will be more closely considered, for conservation and biodiversity benefit, to reduce the impact of forestry such as

- the conversion of conifer stands to broadleaf
- extending the felling period between coupes and

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- reducing overall coupe size

5.1.2 Thinning

Thinning has been constrained by site type and restricted to the lower lying, better sites to the south of the block around the lochs. Opportunities to expand the overall thinnable area of the block and ultimately increase the woodland area managed under less intensive management systems than clearfell are therefore limited to second rotation crops. Carried out on a 7-10yr cycle in accordance with our local policy, crops will generally be thinned to realise amenity, biodiversity and landscape objectives with the benefits of improved timber quality mainly restricted to the second rotation first thin crops.

5.1.3 LISS, Long-term Retention and Natural Reserve

Around 205.0ha (just over 9%), is planned for managed under Low Impact Silvicultural Systems (LISS). As LISS can contribute to the protection and improvement of soil quality, water quality and biodiversity through reducing soil erosion and the creation of suspended solids in water, additional areas where site types are better, will be targeted for LISS development.

Group Shelterwood systems will be the preferred system and should, through regular crown thinning and occasional small-scale clearfells of <2ha (perhaps centred on windthrow), provide areas for either natural regeneration or targeted restock of small seeded native tree and shrub species and contribute towards greater spatial diversity.

Group Shelterwood generally encompasses:

- progressive thinning
- clearance of windthrow patches
- small-scale felling patches of 0.5ha up to 2.0ha to stimulate restructuring and promote regeneration of target tree species. Where there is no evidence of natural regen 5 years after felling, then these areas will be restocked.

If there is a management requirement for any coupe greater than 2.0ha to be felled then that prescription will be initially agreed with the FCS as per the Tolerance Table in Appendix II.

A further 7% of the plan area has been identified as Natural Reserve, Minimum Intervention or Long Term Retention.

Natural Reserves are predominantly wooded, permanently identified locations of high wildlife interest or potential that is solely managed for high conservation or biodiversity value.

Minimum intervention has management with no systematic felling or restocking although operations such as fencing, control of exotics and pests, safety work and trail maintenance are permitted. As there are sufficient selected Natural Reserves of higher biodiversity value throughout the district, in this block broadleaf areas and isolated conifer blocks provide a focus for Minimum Intervention management.

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Under Long-term Retention trees are retained for environmental benefit significantly beyond the age or size generally adopted.

5.2 Future habitats and species

The accompanying Future Habitats and Species map provides detail of our proposed restock species and habitats for Tannylaggie LMP (see Habitats and Species map).

5.2.1 Open land (open space)

Currently open ground comprises around one quarter of the plan area and is itemised in the table shown below.

Open ground type	Area (ha)
Open ground and streamside	287.2
Felled area	208.5
Open water	1.0
Unplanted	22.9
Quarries	4.2
Deer glades	0.5
Archaeology	0.4
	524.7

In this relatively low lying block most of the open space is associated with the numerous riparian systems and aquatic zones, there is little open hilltop. Over time the area of open space markedly increases as we reduce the impact on our blanket bog areas through restored peatland open ground or low density stocking Peatland Edge Woodland replacing conifer plantation. The open ground area includes a felled area component whose contribution to the total figure will fluctuate as some felled coupes are restocked and other new coupes are felled.

5.2.2 Riparian zones / aquatic zones / wetland zones (open space / woodland)

The still water bodies of Loch Ronald, Black Loch and Loch Heron to the south of the plan area are virtually encompassed by FES plantation and yet remain important oases for recreation activities and fish and wild fowl species. Significant buffer zones are proposed for around the lochs to remove excessive shading by conifer crop and additionally; substantive links to the Tarff Water riparian zone to the west and to other external agricultural and recreational open space will generally contribute to the creation of larger scale habitat networks. Increased riparian buffer zones by upwards of 10m, comprising native BL planting and open space, are proposed for watercourses >0.5m wide within the block. Within the SAC area riparian zones will be extended by up to 50m to assist in improving water quality, protecting soils and benefitting species that use

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the habitat riparian buffer zones. Small areas of open space have previously been identified around Urral Loch, around Blood Moss and around the Black Lochs of Kilquhockadale, wetland features associated with Kilquhockadale Flow SSSI. The plan looks to reinforce these valuable peatland habitat fragments by both connecting them and linking them to designated sites or adjacent riparian systems through the creation of additional areas of broadleaf and open ground. To complement this planned riparian zone management and to aid water quality improvement, roadside drainage management and the continued monitoring and management control of conifer natural regeneration in the riparian zone are critical factors.

At a more detailed level where we are looking to better promote other natural features such as rock crags and wet hollow areas such as those along the Black Burn, increased open space and additional species diversity will persist.

5.2.3 Blood Moss SSSI / potential for Peatland restoration / Peatland Edge Woodland (open space)

Blood Moss SSSI, designated for its raised bog, lies to the north of the plan area. An agreed management plan is in place and the site is in "Favourable Maintained" status". Felling work carried out over recent years has extended the open ground area around Blood Moss to reduce seed rain onto the moss and increase the area of peat in open ground. The area is re-wetting well with considerable areas recolonising with *Sphagnum spp.* Re-wetting the site should discourage conifer regeneration however, if required, it will be removed on a 5 yearly cycle. Further work is planned to assess the extent of deep peat around the moss and undertake additional felling, extraction and drain blocking to restore the natural bog habitat around the SSSI.

The UK Forestry Standard and the Scottish Government's policy on Control of Woodland Removal presumes that sites will be restocked following clearfell. The UK Forestry Standard also requires managers to minimise soil disturbance, particularly on organic (peaty) soils with a general requirement to consider the potential impacts of soil disturbance when planning operations involving cultivation, harvesting, drainage and road construction. Since the FC Forests and Peatland Habitats Guidelines Note was published in 2000, the importance of trees in mitigating climate change has become more important with supplementary guidance produced to support the original note. This additional guidance, FC Scotland practice guide "Deciding future management options for afforested deep peatland", offers a decision making framework based on the likely carbon storage or release from different management options on deep peats.

In the Tannylaggie LMP large areas of blanket bog were planted in the 1970s which, under modern guidance, would not now be considered. With their enormous potential for restoration to open bog habitat these areas offer a significant environmental opportunity, if funding is available, to deliver successful peatland restoration. Extensive surveys have been carried out to identify the flattest and wettest areas of deep peat with good levels of remnant bog

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vegetation (especially sphagnum) with poorly growing or blown conifer crops. The surveys identified large areas of coupes 20014, 20017 and 20036 that are ideal for bog restoration with the additional benefit of being adjacent to and linked with a SSSI / SAC (Kirkcowan Flow) and within the catchment of and likely to benefit a SAC (R Bladnoch).

As a result of the surveys and following the recent guidance we plan to “Initiate further lowland raised bog and intermediate bog restoration work on other plantation sites which are ecologically suitable for restoration”

The following table summarises the information we have used to arrive at this decision;

Coupe	Objective	Benefits / positive factors	Implementation
• Priority sites for habitat restoration			
Coupes 20014, 20017 & 20036	<ul style="list-style-type: none"> • Restore to open peatland • There is strong evidence of relict bog vegetation and deep peat from peat depth survey • Waterlogged peat has resulted in extensive windblow • Site restoration will likely improve the condition of the associated designated habitat to the west (Kirkcowan Flow SAC) 	<ul style="list-style-type: none"> • Conserve existing bog vegetation • Reduce risk of transpiration and lowering of water table by conifers to adjacent SSSIs • Potentially increase area of SAC Kirkcowan flow • meets UKWAS UKBAP priority habitats requirements • lessen conifer plantation impact on the water subcatchments of the Black Burn, Pultayan Burn and Dergoal Burn (R Bladnoch SAC feeder streams and currently catchments at risk) • Enhance large scale landscape of bog areas within the three major flows in the plan area (Ink Moss, Tannylaggie Flow and centrally Kilquhockadale Flow) out through 	<ul style="list-style-type: none"> • Clearfell coupes 20014, 20017 and 20036 with no planned restock (removing as much timber as possible from site in planned fashion see appendix VII) • Block drains with wet peat to speed up re-wetting of bog surface, sphagnum growth and restore water table to reduce invasion of conifer regeneration • Monitor occurrence of conifer regeneration at 5yr intervals and assess impact on resulting habitat • Remove regeneration where appropriate by tree pulling and cutting

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		other FES land and on to a series of adjacent mosses such as Kirkcowan Flow SSSI and SAC on adjacent private ground	
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See appendix VII for further detail on Peatland Restoration Methodology. Some peatland sites that are not suitable for complete restoration will be targeted for the creation of Peatland Edge Woodland. These sites will typically be minimum cultivation sites of low density native woodland native planting comprising 50% tree cover and 50% open ground and will provide a gradation from the surrounding high forest commercial crop to the restoration areas and enhanced habitat for Black Grouse and other moorland bird species. Any natural regeneration will be closely monitored, assessed as to its suitability and if the density of woodland cover is unacceptably low then restocking would take place, with Aspen the favoured species to minimise any potential for natural regeneration on the restored sites, or if conifer regeneration is too dense then removed as resources permit.

Typical of this area of Galloway, the areas of deep peat are constrained behind glacial moraines where soils change to mineral. These wet edges are ideal for the creation of Peat Edge Woodland. Where these wet edges coincide with stream sides, Aspen will be used as a component of the native woodland to further buffer the acidic nature of the soil.

5.2.4 Quarries (open space)

There are several quarries in the plan area two of which, Tannylaggie Shiel Hill and Ink Moss, are active quarries that are important in maintaining civil engineering projects in the area. All quarries are identified on the features map and will remain as permanent open space during the period of this plan. Future quarrying, including some boundary expansion will inevitably be required to continue to provide a ready source of stone material for forest road construction and maintenance in the surrounding area.

In two distinct parts, Tannylaggie Shiel Hill quarry sits to the north of the block and Ink Moss and the smaller Knockbrake quarries lie to the south near the Three Lochs area. None of the quarries are externally visible.

Any significant quarry development proposals outwith agreed tolerances will be submitted to FCS for approval prior to work taking place (see Tolerance table Appendix II).

5.2.5 Deadwood / Veteran trees

Although there are no PAWS or Ancient Semi Natural Woodland sites, there are several significant, established broadleaf / mixed conifer areas throughout the block (Balminnoch Wood, Knockbrake Wood and Loch Ronald Wood) that have

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been identified for non clearfell management. Standing deadwood in these areas is at a premium however their deadwood and associated woodland ground flora will be protected and retained at time of conifer removal to provide focal points for future BL expansion (see local District BL policy document) and in time, as the broadleaf component of the block increases, provide a long term source of deadwood.

Dedicated areas for deadwood creation will also rely on identifying around 1% of the conifer plantation as Natural Reserve (from which no timber will be removed) as per our current District Deadwood Management policy. Conifer deadwood will be achieved in this plan mainly through the retention of windthrow and other identified areas of poorly growing conifer.

5.2.6 Plantation woodland

Sitka spruce either pure crop or in mixture with Lodgepole Pine will continue to be the main timber species in the commercial conifer dominant areas however, where site conditions are favourable or where landscape considerations prevail then other conifer species including DF, NS and SP will be preferred. Our current policy not to restock Larch (driven by our current and potential future Phytophthora infections) will in all probability result in a virtually Larch free forest. This potential loss of habitat benefit to important species such as Red Squirrel bequeathed by larch free woodland will be offset to a certain extent through the planned restocking of these other minor conifer species and significant areas of additional native small seeded broadleaf.

The following table presents the details of our proposed species restock over the approval period of the plan. It reflects an initial reduction in the area of Larch and Sitka spruce woodland that is primarily compensated for by an expansion of broadleaf woodland and open space but also, for additional species diversity, modest area increases to some of the minor conifer species.

Species	Area (ha) in 2026	Total Area %	Plant. Area %	Area (ha) in 2046	Total Area %	Plant. Area %
Sitka spruce	913.3	41.8	68.9	921.3	42.2	67.4
Norway spruce	10.8	0.5	0.8	10.4	0.5	0.8
Larch spp.	98.8	4.5	7.5	71.0	3.2	5.2
LP (other pine)	92.0	4.2	6.9	97.2	4.4	7.1
Scots Pine	28.2	1.3	2.1	26.5	1.2	1.9
Douglas Fir	28.0	1.3	2.1	37.5	1.7	2.7
Other Conifers	9.6	0.4	0.7	21.5	1.0	1.6
Broadleaf	145.3	6.6	11.0	182.3	8.3	13.3
Open Space	861.5	39.4	-	819.8	37.5	-
Total	2187.5	100.0	100.0	2187.5	100.0	100.0

Local place names such as Derry (oakwoods), Polbae (stream of the birches) and Tannylaggie (little marshy hollow) suggest that previously there was a substantial broadleaf element to the landscape. Away from the restored areas

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both of these species, especially small seeded Birch, along with Willow should potentially figure in our planned increase in broadleaf cover from around 4% in 2015 to just over 6% by the end of the plan period and should both enhance the landscape and provide improved woodland habitat to protect soils and improve water quality. Target stocking density for this mainly non-commercial broadleaf will be a minimum of 1600 stems per hectare (2.5m spacing) with restocking taking place should the figure not be reached. Target stocking density for conifer will be a minimum of 2500 stems per hectare.

Post clearfelling there will be no conifer restocking within at least 10m of main watercourses (and a minimum of 50m along the R Bladnoch SAC area) with the riparian zones also benefitting from targeted areas of additional broadleaf planting. Significant natural regeneration of conifers within these riparian zones will be managed as resources allow avoiding the loss of proposed buffer zone. Where species selection differs markedly from the design plan proposals, detailed restock plans will be submitted to FCS for approval prior to work taking place (see Appendix II Tolerance table).

5.3 Restructuring

Whilst felling and restock operations over previous plan periods has resulted in gradual but significant changes to the spatial appearance and structure of the landscape to the south of the block, restructuring throughout the remainder of the block remains an objective.

Our revised felling plans proposing longer rotation ages and more extensive areas of mature conifer species such as Douglas Fir and increased areas of broadleaf and permanent open space should in the long term provide additional habitat diversity for conservation and increased structural and landscape benefits for the block. The proposed larger scale conversion of conifer plantation to open ground bog restoration and Peatland Edge Woodland should also contribute towards greater permanent structural benefits.

5.4 PAWS restoration

There are no PAWS or Ancient Semi Natural Woodland sites within the LMP unit.

5.5 Deer management

Recent estimated Deer Population survey work suggested an overall woodland density of 10.2 deer per 100.0ha across the Forest District. Figures fluctuate across design plans but do give a strong indication of culling requirements in order to deliver Forest Enterprise Scotland's National Deer Management Strategic objectives that include <10% impact on all commercial crops.

With significant numbers of both Roe deer and Red deer present in the Tannylaggie plan area significant resources will be deployed in an effort to reduce the overall background population over the next 5yrs in order to deliver restocking targets.

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Restocking of premature felled areas such as Phytophthora infested larch will provide additional challenges to the District's deer team with the small and often hidden individual coupes difficult to protect from negative deer impacts. Current deer management in the Tannylaggie block is carried out by FES Wildlife Rangers with assistance from contract rangers and a single Deer Management permission. Cull requirements and available resource will be reviewed on an annual basis in order to remain proactive towards protecting vulnerable areas of the design plan area.

Several new ATV tracks will be implemented along restocked coupes adjacent to open hill areas or along the larger riparian zones. These tracks are extremely important from both a Health and Safety and operational perspective. ATV tracks provide a safe walking platform for deer management staff during stalking operations which may be during daytime or dusk/darkness. The tracks also allow more straight forward and safer carcass extraction via ATV when required. ATV tracks must be given careful consideration regarding their absolute need and location.

When required, they will be constructed to one of two designated standards.

- Tracks along riparian zones will involve minimal ground disturbance work.
- Those not following riparian zones will involve removing topsoil and levelling the surface with a drain on the top side and will be a maximum of 2m wide.

No trees will be planted within 5m of the track centre.

Temporary quad bike tracks will also be formed with minimum ground disturbance. They will generally follow old unplanted rides, with levelling to negotiate side slopes and be spaced at approximately 400m intervals. There will be no unplanted margin around these temporary tracks and they will subsequently be subsumed into the plantation as tree canopy closes. Forests and Water guidelines (Fifth edition) will be adhered to during their construction and crossing points will be piped.

Deer glades, typically up to 1.0ha in size, are not shown on the suite of design plan maps. Precise locations will be identified and inserted at time of restocking when Ranger staff has had the opportunity to fully assess site conditions post clear fell taking into account the location and protection of vulnerable tree species.

5.6 Pathogens, Diseases and Invasive Non-native species

Dothistroma Needle Blight (DNB) has been identified on Corsican and Scots Pine crops in the district, although at present is only causing mortality in CP.

Although there is little evidence of DNB within the Tannylaggie LMP area the pathogen has been identified in adjacent FES plantation and its wider presence in the block cannot be ruled out. Given the impact on structural and species diversity of the block by the recent *Phytophthora* infection Scots Pine will play an

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important element in planned restock so future DNB surveys may increase in intensity.

Hylobius, the Pine weevil, can cause extensive damage to young conifer crop and is found throughout the district. As part of the districts chemical minimisation strategy, the *Hylobius* Management Support System (HMSS) is used to measure *Hylobius* numbers on clearfell sites. Using billet traps virtually all of the districts conifer restock areas are assessed. Weevil numbers are recorded and used along with other site data to determine the optimum time for site restocking. This more flexible fallow period between felling and re-stocking may result in restocking not taking place within two years of felling. (Appendix II Tolerance Table).

Phytophthora ramorum infection has been confirmed on Larch throughout the district. Although not a major component by area in the Tannylaggie LMP, Larch crop is nevertheless quite prominent appearing on many of the more elevated areas of the plan as a visual contrast to the dull green spruce matrix. Future restocking in the block will not now include larch with other minor conifer (as per our FCS agreed species replacement table that does not include Sitka spruce) and broadleaf woodland increasingly contributing more towards the species diversity of the block.

Invasive non-native species (INNS) impact the geology of an area directly and are recognised as a significant risk to water environments. There are no records of *Rhododendron ponticum* Japanese Knotweed, Giant Hogweed and Himalayan Balsam in the block.

5.7 Waste on site (including felling to recycle)

Generally there are no plans to carry out chipping, mulching or spreading of forest waste over the plan area for ecological site improvement. Prior to any such work taking place, advice from partner organisations would be sought and detailed plans submitted to FCS for approval.

As part of the operations within the agreed management plan however some felling to recycle is planned in response to naturally occurring conifer regeneration around the margins of the Blood Moss SSSI site. Felling to recycle may potentially take place to prevent conifer colonisation of riparian buffers and other bog restoration sites.

5.8 Habitats Regulations Appraisal sites

The following Special Area of Conservation (SAC) sites either border or cut through parts of the plan area:

R Bladnoch

Kirkcowan Flow; one of the best examples of an area of basin and blanket bog habitat within Wigtownshire the site nevertheless is in unfavourable condition through over grazing.

When a plan or project affects a Natura site the requirements of the conservation (Natural Habits etc) Regulations 1994 as amended (the "Habitats Regulations")

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apply and Habitats Regulations Appraisals (HRA) are required. Where necessary the appraisals include an appropriate assessment step, required when forestry operations are likely to have a significant effect on that site.

See appendix VI for Habitats Regulations Appraisals for both sites.

5.9 Tolerances

Tolerance thresholds for design plan amendments are as per our Tolerance Table (based on CSM6 Appendix 3 and subsequent to local agreement with FCS South Scotland staff) and the *P ramorum* working tolerance table for Larch found in Appendix II

5.10 Critical Success Factors

- Maintain favourable status of Blood Moss and adjacent Kirkcowan Flow SSSIs
- Identification of potential areas for Peatland restoration
- Enhancement of the R Bladnoch riparian corridor
- Construction of proposed new roads

5.11 Amendments

To be logged on amendment form

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Appendix I: Land Management Plan Consultation Record

Statutory Consultee	Date contacted	Date response received	Issue raised	Forest District Response
SEPA: John Gorman; Newton Stewart office	27 February 2015	30 March 2015	<ul style="list-style-type: none"> • Identifies unique nature of position of plan in relation to SAC R Bladnoch • Supports proposals to increase open space, creation of Native BL habitat networks and enhanced riparian zones • Note compliance with FWG5 for roads and quarries construction and general forest operations • SEPA guidance on Forest Waste and Private Water supplies 	<ul style="list-style-type: none"> • Noted see LMP text sections 3.1.2, 5.2.2, 5.2.4, 5.7 & appendix VII
SNH Newton Stewart office: Jonathan Hudson	27 February 2015	23 March 2015	<ul style="list-style-type: none"> • Notes on protected species • Appraisal of natural habitat impacts 	<ul style="list-style-type: none"> • Noted see LMP text sections 3.2.1, 5.8 & appendix VI
RSPB Crossmichael: Julia Gallagher	27 February 2015	13 March 2015	<ul style="list-style-type: none"> • Welcome objectives for peatland restoration through bog management aligned with FCS Deep Peat policy • Welcome objectives to increase Native BL along riparian zones • Support objectives to 	<ul style="list-style-type: none"> • Noted see LMP text sections 3.2.1, 3.3.1, 5.2.2, 5.2.3 & appendix VII

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			maintain open habitats to enhance habitat for Black Grouse	
Historic Scotland: Chloe Porter	27 February 2015	10 March 2015	<ul style="list-style-type: none"> No designated features identified in the DP area 	<ul style="list-style-type: none"> Noted see LMP section 3.5.3
Mr Low; Mark of Loch Ronald	27 February 2015	05 March 2015	<ul style="list-style-type: none"> Windfarm development on adjacent private land concerns Commercial development of Caravan park 	<ul style="list-style-type: none"> Noted see LMP sections 3.5.1 & 3.5.4
FCS South Scotland Conservancy: Dumfries office	27 February 2015	No comment received	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
Dumfries & Galloway Regional Council: Simon Fieldhouse	27 February 2015	No comment received	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
Galloway Fisheries Trust: Jamie Ribbens	27 February 2015	No comment received	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
Rosemary Green; IUCN Otter Specialist Group	27 February 2015	No comment received	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
Jamie Farquhar (by email)	27 February 2015	No comment received	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
Saving Scotland's Red Squirrels: Heinz Traut	27 February 2015	No comment received	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
Visit Scotland: Paula McDonald	27 February 2015	No comment received	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
Kirkcowan Community Council	27 February 2015	No comment received	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
Scottish Woodlands: A Menarry	27 February 2015	No comment received	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">

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Other neighbours	27 February 2015	No comment received	•	•
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Appendix II: Tolerance Tables

	Adjustment to felling period	Adjustment to felling coupe boundaries	Timing of restocking	Change to species	Change to roadlines	Designed open space
FC Approval not normally required	Fell date can be moved within 5yr period where separation or other constraints are met.	1.0ha or 10% of coupe area - whichever is less.	At year 3 after felling. Restocking within 2yrs +/- of year 3.	Change within species group e.g. evergreen conifers; broadleaf.		Location of temporary open space e.g. Deer glades if still within overall Open space design. Increase by 0.5ha or 5% of area - whichever is less
Approval by exchange of letters and map		1.0ha to 5ha or 10% of coupe area - whichever is less			Additional felling of trees not agreed in plan. Departures of >60m in either direction from centre line of road.	Increase of 0.5 to 2ha or 10% - whichever is less. Any reduction in open space.
Approval by formal plan amendment may be required	Felling delayed into second or later 5yr period. Advance felling into current or 2 nd 5yr period.	>5ha or 10% of coupe area	If timing of restocking is outwith the period above.	Change from specified native species. Change between species groups.	As above depending on sensitivity.	More than 2ha or 10%. Any reduction in open space in sensitive areas. Colonisation of open space agreed as

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						critical.
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Notes

- Felling sequence must not compromise UKFS e.g. Adjacency. At mid term review detail of felling progress and impact will be reviewed against UKFS.
- Where windblow occurs, FCS should be informed of extent prior to clearance and consulted on clearance of standing trees.
- Tolerances subject to an overriding maximum of 20% open ground.
- Within the text of the Forest Design Plan it must clearly state how the plan will address the issue of adjacency with a statement to the effect that:
- **EITHER Any adjacency issues will be dealt with through delay restocking, ie a coupe will not be restocked until all surrounding crops are at least 2m tall**
- **OR Any adjacency issues will be dealt with through delay felling, ie a coupe will not be felled until all surrounding crops are at least 2m tall.**

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TABLE OF WORKING TOLERANCES SPECIFIC TO LARCH WITH THE INFECTED ZONE

	Adjustment to felling period *	Adjustment to felling coupe boundaries	Timing of restocking	Changes to Species	Changes to road lines
FC Approval normally not required	Fell date for all larch can be moved and also directly associated other species	Larch areas can be treated as approved coupes. Other conifers directly associated with larch being felled, may also be removed up to an equivalent of 20% of the area occupied by the larch or 5 ha, whichever is greater	To be undertaken within the overall plan approval period	Replacement as per the agreed restock plan, but where this is not specified or is larch this may be replaced with either another diverse conifer (not SS) or Broadleaves.	
Approval normally by exchange of letters and map. In some circumstances Approval by formal plan amendment may be required		Removal of areas of other species in excess of the limits identified above.	Restocking proposals outwith the plan approval period	Restocking proposals for other species which do not meet the tolerances identified above.	New roadlines or tracks directly necessary to allow the extraction of Larch material

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Appendix III: Ground Truthed Heritage sites

Polbae Burn	No	NX267727		Unroofed structure Maintain in area of open space.
Blair Hill	No	NX275725		Field system, structure, walls Maintain in area of open space.
Meadow Hill	No	NX270721		Building Maintain in area of open space.
Dirneark	No	NX269707		Enclosure Maintain in area of open space.
Drumacarie	No	NX278711		Field system(single field) Maintain in area of open space.
Sheil Hill	No	NX282712		Field system(two fields); centred on live quarry, nothing identified Site record maintained. Permanent quarry open space
Sheil Hill	No	NX286713		Field system(single field) centred on quarry, nothing identified Site record maintained. Permanent quarry open space
Rigmay	No	NX280704		Field system(single field); ploughed, planted in the past and recently harvested the site is of minimal value. Boundary features allocated 5m buffers from restock, machinery crossings utilised existing breaks in feature. Maintain in area of open space
Big Gorracher	No	NX289705		Field system(single field) Maintain in area of open space
Chapman's Craig	No	NX293704		Field system(single field) Maintain in area of open space

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Mean Hill	No	NX289691		Field system Maintain in area of open space
Barnsladie	No	NX289684		Small field system Maintain in area of open space
Stane Fauld	No	NX274683		Enclosure, structure Maintain in area of open space
Drumalloch	Yes	NX275666	22.07.15	Farmstead, field system; discernible compartmented ruins (with corrugated shed) to west edge of good condition (some windthrow damage to north west) stone dyke with entrance to south west. Maintain in area of open space
Drumalloch	Yes	NX279666	22.07.15	Field system(single field); possible low level dyke remains under mature NF retention Maintain in area of open space
Drumalloch	No	NX280663		Field system(two fields); single field dyke (identified during 2009 felling) is in very poor condition(a low line of stones for much of its length) Maintain in area of open space
Sheep pen	Yes	NX272656		Sheep pen (five sections and a deal of corrugated iron sheets) attached to north side of field wall Maintain in area of open space
Tarf Water	No	NX268660		Field system and sheep pen Maintain in area of open space
Knowes o' the Rue	No	NX259655		Two conjoined fields with sheep pen Maintain in area of open space
Sheep pen	No	NX259645		Sheep pens Maintain in area of open space
Tarf Water	No	NX254638		Structure, wall Maintain in area of open space
Wood Hill	No	NX264637		Building ruins and associated lime kiln Maintain in area of open space

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Loch Ronald	No	NX264637		Possible castle Maintain in area of open space
Mains of Loch Ronald	Yes	NX272632		Extensive farmstead and enclosure ruins; in substantive open space with good access to forest road Maintain in area of open space
Knock Roger	No	NX266631		Field system (single field) Maintain in area of open space
Barwhil	No	NX269630		Field system, structure Maintain in area of open space
Crotteagh Hill	No	NX268635		Field system (single field) Maintain in area of open space
Fell of Loch Ronald cairn	No	NX273636		Cairn Maintain in area of open space
Fell Hill cairn	Yes	NX284652		Cairn Maintain in area of open space
Fell Hill	No	NX280651		Clearance cairns Maintain in area of open space
Fell Hill	No	NX280648		Cairn (possible) Maintain in area of open space
Fell Hill	No	NX283651		Clearance cairns Maintain in area of open space
Knockalanny	No	NX282645		Farmstead, field system Maintain in area of open space
Fell Hill	No	NX283651		Clearance cairns Maintain in area of open space
Knockbrake	No	NX277649		Field system Maintain in area of open space
Knockbrake	No	NX277646		Farmstead Maintain in area of open space
Knockbrake Wood	No	NX274648		Farmstead (possible) Maintain in area of open space

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Appendix IV: Coupe details for clearfell and establishment

Clearfell

Coupe	SS	NS	Larch	SP	LP	Other con.	BL	Open space	Total
20002	22.3	-	-	-	6.4	-	-	6.2	34.9
20011	26.3	-	-	0.2	9.3	-	-	4.5	40.3
20014	72.2	-	-	-	6.5	-	-	6.0	84.7
20017	89.0	-	-	-	2.8	-	-	5.8	97.6
20018	48.1	-	-	-	6.8	-	-	7.5	62.4
20019	62.6	-	2.3	1.3	-	-	-	1.3	67.5
20022	24.2	-	1.4	0.2	-	-	-	1.4	27.2
20026	39.4	-	4.8	1.0	-	-	-	2.2	47.4
20029	22.9	1.3	0.7	-	-	-	-	1.6	26.5
20031	40.9	4.7	3.0	0.2	0.1	-	0.8	1.3	51.0
20035	13.1	-	1.4	-	3.9	-	-	0.3	18.7
20036	77.9	-	-	-	1.5	-	-	7.2	86.6
20039	50.6	-	2.3	-	1.3	-	-	4.5	58.7
20069	15.6	-	-	-	14.1	-	-	3.9	33.6
total	605.1	6.0	15.9	2.9	52.7	0.0	0.8	53.7	737.1

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Restock

Coupe	SS	NS	Larch	SP	LP	Other con.	BL	Open space	Total
20002	8.0	-	-	-	-	-	11.1	15.8	34.9
20011	25.9	-	-	-	11.0	-	-	3.4	40.3
20014	-	-	-	-	-	-	6.0	78.7	84.7
20017	-	-	-	-	-	-	8.2	89.4	97.6
20018	-	-	-	4.8	-	-	29.3	28.3	62.4
20019	54.9	-	-	-	-	-	6.8	5.8	67.5
20022	23.0	-	-	0.3	-	-	1.1	2.8	27.2
20026	28.3	-	-	-	12.7	-	2.9	3.5	47.4
20029	11.4	3.8	-	-	-	-	8.1	3.2	26.5
20031	28.0	5.5	-	0.5	-	-	11.2	5.8	51.0
20035	-	-	-	-	3.4	1.5	11.6	2.2	18.7
20036	-	-	-	-	-	-	17.5	69.1	86.6
20039	17.9	-	-	-	-	1.0	30.3	9.5	58.7
20069	14.4	-	-	-	14.4	-	-	4.8	33.6
total	211.8	9.3	0.0	5.6	41.5	2.5	144.1	322.3	737.1

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Notes on coupe work schedule

20002	Small conifer SS area, otherwise mainly broadleaf and open space focussed around Polbae Burn and Dargoal Burn riparian zones
20011	Mainly SS or SS/LP with small area of open space around quarries
20014	Mainly Peatland restoration site with narrow Peatland Edge Woodland buffer established to west between deep peat area and Kirkcowan Flow SSSI
20017	Mainly Peatland restoration site with narrow Peatland Edge Woodland buffer established to west between deep peat area and Kirkcowan Flow SSSI
20018	Southern extent of Peatland restoration with additional Peatland Edge Woodland and SP on crag area adjacent to and within Black Burn riparian zone
20019	Mainly SS with additional BL and open space targeted to Pultayan Burn riparian zone
20022	SS with areas of SP, broadleaf and open space targeted to Pultayan Burn riparian zone
20026	SS or SS/LP with open space and broadleaf targeted along county road and agricultural land boundary
20029	Mainly SS and NS with BL and open space along block boundary, powerline and forest road
20031	Mainly SS with open space and broadleaf targeted along forest road access to private holdings, county road to south and Tarf Water riparian zone to west
20035	Mainly broadleaf adjacent to county road and recreation corridor with additional smaller areas of LP and mixed conifer
20036	Mainly Peatland restoration site with Peatland Edge Woodland buffer established to west, between deep peat area and Kirkcowan Flow SSSI and to the east on a drumlin site
20039	Some SS with significant areas of broadleaf linking the Three Lochs aquatic area with the Tarff Water riparian zone
20069	SS/LP with open space concentrated around minor watercourse riparian area

Appendix V. Tannylaggie Land Management Plan Brief

The main management objectives in this medium scale plan focus on Peatland Restoration (central Kilquhockadale Flow hydrological unit), Water quality (R Bladnoch catchment) and Timber production.

The block lies around 15.0km west of Newton Stewart, Dumfries and Galloway.

Key Strategic Directions from Role of Scotland's National Estate	Local District Strategic Plan Priorities	Actions / Prescriptions
<p>Healthy: good environmental and silvicultural condition in a changing climate</p>	<ul style="list-style-type: none"> • Commitment to high quality silviculture and increased use of alternatives to clearfell • Stewardship of carbon resources locked in Estate's trees and soils • Adapt to climate change and make woodlands more resilient to pressure • Deal with invasive species that threaten habitats and biodiversity 	<ul style="list-style-type: none"> • <i>Increase</i> area of woodland managed under LISS particularly highly visible areas around Black Loch & Loch Heron and along county road to Glenluce • <i>Implement</i> National deep peat restocking / restoration policy and increase the overall area of peatland restoration within the district (Kilquhockadale Flow / Blood Moss area) • <i>Improve</i> resilience through use of Alternatives to clearfell and smaller coupe size • <i>Increase</i> area of broadleaf woodland and establish / maintain a permanent woodland infrastructure along riparian zones (Polbae Burn) • <i>Increase</i> use of natural regeneration in our restocking • <i>Control</i> invasive species as per FES guidelines (specifically <i>R. ponticum</i>) • <i>Manage</i> watercourses within DP unit in keeping with UKWAS standards and Forest and Water guidelines to maintain and improve water quality within R Bladnoch catchment
<p>Productive: provide sustainable economic benefits from the land</p>	<ul style="list-style-type: none"> • Contribute to local economy by maintaining core timber production • Expand area of productive broadleaf and diversify timber markets • Provide work in rural areas 	<ul style="list-style-type: none"> • <i>Meet</i> production forecast commitment through revised felling plan • <i>Increase</i> area of productive broadleaf (use of Aspen in specific subcatchment areas e.g. Dargoal Burn) • <i>Implement</i> road maintenance programme required to service harvesting operations

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<p>Treasured: a multi-purpose resource that sustains livelihoods, improves quality of life and offers involvement and enjoyment</p>	<ul style="list-style-type: none"> • Involve and engage with local people / encourage partnership working • Creation of unique special places • Place for research and development 	<ul style="list-style-type: none"> • <i>Continue</i> to work with local community (drop-in meetings and other) to ensure access and facilities are fit for purpose • In consultation with SNH <i>manage</i> Blood Moss SSSI, the R Bladnoch and the adjacent Kirkcowan Flow SACs according to agreed management plans to maintain / achieve favourable status • <i>Continue</i> long term partnership working with SEPA, GFT and Marine Scotland to monitor water chemistry in the upper reaches of the R Bladnoch catchment
<p>Accessible: woodland that welcome and are open for all</p>	<ul style="list-style-type: none"> • Improve access and enhance existing or invest in new facilities • Use for health benefits and outdoor learning 	<ul style="list-style-type: none"> • <i>Retain</i> and improve access and views to existing informal / formal walking networks (area adjacent to Three Lochs campsite area & section of SUW long distance route) and <i>provide</i> a varied and enjoyable woodland experience for visitors and local communities
<p>Cared for: working with landscape and the natural and cultural heritage</p>	<ul style="list-style-type: none"> • Increase area of broadleaf cover • Landscape • Maintain open habitats in good ecological condition • Safeguard heritage features 	<ul style="list-style-type: none"> • <i>Increase</i> area of native BL throughout plan area for added biodiversity, targeting a permanent BL woodland infrastructure along riparian zones • Block is not visually prominent, only viewed in near to mid view from the countyroad corridors, SUW and the Three Lochs campsite area; maintain and enhance local landscape through additional species diversity, open space integrated management and revised coupe shapes to better suit landform • Maintain and enhance large scale landscape through management of blanket bog areas within the three major flows in the plan area (Ink Moss, Tannylaggie Flow and the central Kilquhockadale Flow) out onto the series of mosses comprising the adjacent Kirkcowan Flow SSSI and SAC • Although not a core site, maintain and enhance area for Red Squirrel (priority species) • R Bladnoch SAC is important for breeding Atlantic Salmon; manage watercourses and private water supplies within DP unit in keeping with UKWAS standards and Forest and Water guidelines to maintain and improve water quality within the R Bladnoch catchment (particularly River Tarff, Dargoal Burn and Polbae Burn)

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		<ul style="list-style-type: none"> • Manage minor heritage features as per FES guidelines • <i>Maintain</i> lek and nesting areas for Black Grouse <i>and enhance</i> habitat through creation of woodland fringe • <i>Manage</i> minor heritage features as per FES guidelines
Good value	<ul style="list-style-type: none"> • Seek diverse range of income streams • Reduce carbon emissions from business activities 	<ul style="list-style-type: none"> • <i>Continue</i> to offer deer leases over plan area

Appendix VI: Habitats Regulations Appraisals

R Bladnoch SAC

Qualifying Interests	
Common Name	Scientific Name
Atlantic Salmon	Salmo salar

The **conservation objectives** for the **R Bladnoch SAC** are to avoid deterioration of the habitats or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and significantly contributes to achieving favourable conservation status for the qualifying species ensuring that the following are maintained in the long term

- distribution of the species within the site
- distribution and extent of habitats supporting the species
- structure, function and supporting processes of habitats.
- no significant disturbance of typical species of the habitat.

The **potential impacts** and **controls of impacts** of operations associated with Tannylaggie land management plan on the R Bladnoch Natura site are as follows;

Potential Impact.	Control of Impact
<p>Commercial forestry coupes adjoin the SAC. Future forestry operations (felling and extraction of timber and restocking operations) have the potential to impact on the water quality of the SAC and its tributaries that in turn impact on the habitat that supports the qualifying species.</p> <p>Additionally forest encroachment and tree canopy capture and deposition of acidic atmospheric pollutants contribute to water course acidification.</p>	<ul style="list-style-type: none"> • There will be no forest operations or traffic within the SAC area. • All trees in coupes adjacent to the SAC will be felled away from the SAC area and brash concentrated in trackways off the SAC site. • Creation of a permanent broadleaf and open space riparian buffer along all watercourses in the plan area between the SAC and the commercial forest (ideally wider than those specified in Forests and Water guidelines) • Close adherence to Forest & Water Guidelines (pre-felling workplan process identifies appropriate safeguards prior to operations start)

Kirkcowan Flow SAC

Qualifying Interests	
Common Name	Scientific Name
Notable for blanket bog and depressions on peat substrates	Blanket bog and depressions on Peat substrates.

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The **conservation management objectives for Kirkcowan Flow SAC** are to:

- to avoid deterioration of the natural habitats and the habitats of species, as well as disturbance of the species, for which the areas have been designated
- protect the site and maintain and, where necessary, enhance its features of special interest through maintaining the extent of the bog habitats and by maintaining a high water table through maintaining current water levels

The **potential impacts** and **controls of impacts** of operations associated with Tannylaggie land management plan on the SAC sites are as follows;

Potential Impact.	Control of Impact
<p>Forest operations. Commercial forestry coupes adjoin the SAC. Future forestry operations (felling and extraction of timber, restocking operations, fencing and culling of deer) have the potential to impact the peat / bog habitats through site disturbance such as brash encroachment, pollution and siltation.</p>	<ul style="list-style-type: none"> • There will be no forest operations or traffic within the SAC area. • All trees in coupes adjacent to the SAC will be felled away from the SAC area and brash concentrated in trackways off the SAC site. • Close adherence to Forest & Water Guidelines (pre-felling workplan process identifies appropriate safeguards prior to operations start) • Creation of a permanent broadleaf and open space buffer zone between the SAC and the commercial forest
<p>Regeneration of trees. Natural regeneration of commercial conifer species (and other trees) onto SAC site.</p>	<ul style="list-style-type: none"> • SAC site (and buffer) will be monitored with any areas of regeneration mapped and removed from the SAC site.

Conclusions.

With the mitigation condition identified in place, the proposed Forest Operations identified within the Tannylaggie land management plan could proceed without having an adverse effect on the integrity of these SAC sites.

The design plan text and supporting documents set out a range of work that should enhance the wider biodiversity of the SAC sites and buffer areas.

Appendix VII: Tannylaggie Peatland Restoration Methodology

Background

The significance of bog habitats in Tannylaggie (the little marshy hollow) was established during the compilation of the Strategy for Lowland Raised Bog and Intermediate Bogs on the NFE in Scotland.

The Black Lochs of Kilquhockadale have lost much of their mire fauna but there is evidence of surviving high value bog habitat vegetation on many of the compartment rides and other significant unplanted areas. The Black Lochs area and the surrounding low lying ground is patently the sump for the hydrological unit that includes to the west Kirkcowan Flow SAC and possibly to the north Blood Moss SSSI. Much of the site also contains poorly growing, low yield class mixed conifer crop.

Following the interrogation of various datasets and detailed discussion with partnership groups (SNH, SEPA and Galloway Fisheries Trust) a peat depth survey was undertaken for part of the plan area around the lochs area and other linkages to surrounding low lying ground.

The site is largely flat and remains wet despite forestry drainage. Most of the site showed peat depths in excess of 2 metres, occasionally rising to over 7m in depth.

Objective

The main management objective is to restore a significant area of forested land to active bog with peat forming vegetation. This will be achieved through the removal of conifer timber and the retention of as much water on site as possible, stabilisation of the hydrological unit and the sustenance and enhancement of any bog vegetation present.

Methodology

A bog restoration management plan will be created before work commences. This will set out the main features and history of the site and map the impacts of forestry operations on the bog especially drainage.

Around 2000m of forest road construction is required to access the planned coupes to facilitate the early felling and extraction of conifer timber. The operations will be planned and carried out to fell and extract the trees parallel to the forestry drains so that the drains are left clear. The drains will then be blocked at regular intervals using wet peat to assist in raising the water table, re-wetting the site, promoting the growth of bog species (especially sphagnum) and help prevent tree regeneration.

Following completion of the above works, the site will be monitored. Conifer natural regeneration will be removed on a 5 year cycle.

Appendix VIII: Assessment of felling and restock proposals within catchments at risk and failing

Tannylaggie 271 catchment at risk / failing catchment

The total area of this water catchment centred on the Polbae Burn to the north of the Tannylaggie LMP area is 1184.0ha. It is made up of 514.1ha* of FES land and 669.9ha of open ground (Kirkcowan Flow SSSI) to the west and additional private sector plantation to the north. See below for base catchment area detail as at 01 March 2016.

Open ground area (FES land)	250.0ha
Plantation area (FES land)	264.1ha
Total catchment area (FES land)	514.1ha*
20% of catchment (FES land)	102.8ha
30% of catchment (FES land)	154.2ha

The felled area within the catchment in any 3 year period needs to be less than 20% of the catchment. The table below based on the planned coupe felling programme confirms that this is the case.

5yr Fell period	Currently proposed felled areas (ha)	Proposed fell area as % of catchment area
2016-18	19.0	3.7%
2017-19	0.0	0.0%
2018-20	53.2	10.3%
2019-21	53.2	10.3%
2020-22	53.2	10.3%
2021-23	0.0	0.0%
2022-24	0.0	0.0%
2023-25	0.0	0.0%
2024-26	25.9	5.0%
2025-27	25.9	5.0%

The area of closed canopy conifer forest (age > 15years) needs to be less than 30% of catchment in 15 years' time i.e. 154.2ha. The table below confirms that this is the case.

In the table the proposed fell area for the next 15yrs within the catchment is subtracted from the current plantation area in the catchment to give a notional area of 121.8ha of plantation within the catchment over 15yrs age (assumes that felled areas

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will be restocked within 2-3yrs of felling subject to planned restock and Hylobius Management Support System).

Current plantation area within catchment	264.1ha
Proposed felled area between 2016 -2030 (15yrs)	142.3ha
Notional plantation area in 15yrs time > 15yrs age	121.8ha

Tannylaggie 321 catchment at risk / failing catchment

To the south of the Tannylaggie LMP, centred on the lower Tarf Water and Lannygore Burns area and straddling the A75(T), the total area of this water catchment is 5021.0ha. Only 762.0ha* of the catchment is FES land, the remainder falls mainly on low lying agricultural open ground and additional private sector plantation to the south east. See below for base catchment area detail as at 01 March 2016.

Open ground area (FES land)	106.1ha
Plantation area (FES land)	655.9ha
Total catchment area (FES land)	762.0ha*
20% of catchment (FES land)	152.4ha
30% of catchment (FES land)	228.6ha

The felled area within the catchment in any 3 year period needs to be less than 20% of the catchment. The table below based on the planned coupe felling programme confirms that this is virtually the case with 20.0% threshold only marginally exceeded during the 2021 to 2022 period.

5yr Fell period	Currently proposed felled areas (ha)	Proposed fell area as % of catchment area
2016-18	93.0	12.2%
2017-19	93.0	12.2%
2018-20	46.0	6.0%
2019-21	107.0	14.0%
2020-22	155.9	20.5%
2021-23	155.9	20.5%
2022-24	48.8	6.4%

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2023-25	0.5	0.0%
2024-26	89.7	11.8%
2025-27	150.8	19.8%

The area of closed canopy conifer forest (age > 15years) needs to be less than 30% of catchment in 15 years' time i.e. 228.6ha. The table below confirms that this is **NOT** the case, the figure is around 31.9%.

In the table the proposed fell area for the next 15yrs within the catchment is subtracted from the current plantation area in the catchment to give a notional area of 243.2ha of plantation within the catchment over 15yrs age (assumes that felled areas will be restocked within 2-3yrs of felling subject to planned restock and Hylobius Management Support System).

Current plantation area within catchment	655.9ha
Proposed felled area between 2016 -2030 (15yrs)	412.7ha
Notional plantation area in 15yrs time > 15yrs age	243.2ha

Tannylaggie 192 catchment at risk / failing catchment

The total area of this water catchment centred on the Tarf Water impacting the south of the Tannylaggie LMP area is 4271.2ha. It is made up of 855.2ha* of FES land and 3416.0ha of mainly private sector plantation and open ground to the west. See below for base catchment area detail as at 01 March 2016.

Open ground area (FES land)	349.0ha
Plantation area (FES land)	506.2ha
Total catchment area (FES land)	855.2ha*
20% of catchment (FES land)	171.0ha
30% of catchment (FES land)	256.5ha

The felled area within the catchment in any 3 year period needs to be less than 20% of the catchment. The table below based on the planned coupe felling programme confirms that this is the case.

5yr Fell period	Currently proposed	Proposed fell area as % of
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	felled areas (ha)	catchment area
2016-18	104.0	12.2%
2017-19	27.4	3.2%
2018-20	27.4	3.2%
2019-21	0.0	0.0%
2020-22	0.0	0.0%
2021-23	0.0	0.0%
2022-24	21.8	2.5%
2023-25	21.8	2.5%
2024-26	30.0	3.5%
2025-27	8.2	1.0%

The area of closed canopy conifer forest (age > 15years) needs to be less than 30% of catchment in 15 years' time i.e. 256.5ha. The table below confirms that this is **NOT** the case, the figure is around 35.2%.

In the table the proposed fell area for the next 15yrs within the catchment is subtracted from the current plantation area in the catchment to give a notional area of 301.3ha of plantation within the catchment over 15yrs age (assumes that felled areas will be restocked within 2-3yrs of felling subject to planned restock and Hylobius Management Support System).

Current plantation area within catchment	506.2ha
Proposed felled area between 2016 -2030 (15yrs)	204.9ha
Notional plantation area in 15yrs time > 15yrs age	301.3ha

Appendix IX: The UK Forestry Standard, Forestry Commission Guidelines and the UK Woodland Assurance Scheme (UKWAS)

All of the operations in Tannylaggie plantation will be carried out in accordance with the UK Forestry Standard and its supporting publications. In particular the following documents are relevant:

- Forests and Water Guidelines (5th edition pending)
- Forest and Nature Conservation Guidelines
- Forest and Archaeology Guidelines
- Forest and Soil Guidelines
- Forest Practice Guide - Forest Design Planning
- Galloway FD Deadwood Management Policy
- Galloway FD Deer Management Strategy Plan

In line with Forest Enterprise policy, Galloway FD has undergone a management audit that is part of the process leading to certification under UKWAS. Membership of the scheme indicates that the District's forests and management practices have been found to be sustainable both in terms of silviculture and environmental impact. Membership of the scheme is conditional on periodic audit and consistent attainment of audit standards.

The Tannylaggie Land Management Plan will be included in this audit process.