Galloway Forest District

# BENNAN

## Land Management Plan

Approval date:

Plan Reference No: FDP

Plan Approval Date: 01 February 2018

Plan Expiry Date: 31 January 2028

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

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


The mark of responsible forestry

# CSM 6 Appendix 1
# FOREST ENTERPRISE – Application for Forest Design Plan Approvals
# Forest Enterprise – Property

| | |
|---|---|
| Forest District: | GALLOWAY FD |
| Woodland or property name: | BENNAN |
| Nearest town, village or locality: | NEW GALLOWAY |
| OS Grid reference: | NX598744 |
| 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 ……..…… Signed ……
Forest District Manager Conservator

District **GALLOWAY FD**…… Conservancy ……

Date **……**…… **Date of Approval:** ……

**Date approval ends:** ……

*delete as appropriate

# Bennan Land Management Plan 2018-28

EIA Determination form if required

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# Summary of Proposals:

The main management objectives are sustainable timber production sympathetic to the significant demands of biodiversity (Red Squirrel Stronghold site, Black Grouse and Nightjar habitats and adjacent SSSI), Environmental Quality (water quality issues) and Access (Raiders Road recreation facilities).

# 1.0 Introduction:

## 1.1 Setting and context

Part of Galloway Forest District that is based in Newton Stewart, Bennan is a blocky, large scale plantation totalling some 5634.0ha that is located around 9.0km west of New Galloway. To the immediate south and west the block adjoins FES plantation; the Round Fell and Fleet Basin land management plan areas. It is bounded by the A712 Newton Stewart to New Galloway road (Queens Way) to the north and the minor New Galloway to Laurieston road to the east. The block is highly visible in the near and mid distance view from both of these roads and internally along the Raiders Road forest drive. The block contains significant tracts of open hill ground and agricultural land.
An integral part of the Galloway Forest Park the block also lies within the larger Western Southern Uplands Environmentally Sensitive Area (ESA).
This plan is a revised submission of an earlier forest design plan approved in 2005.

## 1.2 History of plan

The plan area was acquired in several lots starting in 1921 through to the mid 1950s (see table below).

| **Acquisition date** | **Deed No** | **Title** | **Seller** |
|---|---|---|---|
| April 1921 | 9580 | Bennan Farm (Airds (pt)) | Sir A J Henniker-Hughan |
| Dec 1937 | 9586 | Kenmure II (part) | John S M Gordon |
| Aug 1938 | 9808 | Craignell & Clatteringshaws | Galloway Water Power Co. |
| Nov 1938 | 22619 | Craigshinnie | J Gardiner |
| July 1940 | 9589 | Orchars Farm (part) | Mrs Murray-Usher |
| Nov 1954 | 9595 | Cally Estate-Cullendoch | Elizabeth E Murray-Usher |

Afforestation began in 1924. Progressive felling has accounted for almost all of the older crops with the extensive 1970s plantations now providing for our current felling programme.

Initially two separate design plan units that were merged at their first resubmission to contain the entirety of the Black Dee valley hydrological unit, the plan now stands comfortably as a single land management plan unit for biodiversity, recreation, agriculture and landscape considerations.

# 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 |
|---|---|
| Maintain commercial softwood timber production in forest core and diversify the age structure and species composition of the block. | Clearfelling and restock has continued as per previous plan period approval with noticeable view benefits to both the forest drive and A712 corridor.<br>Plan wide restructuring has been somewhat compromised by extensive *P ramorum* and windthrow felling to the west of the plan area |
| Provide a variety of views along the forest drive | Overall the area of Broadleaf and SP in the plan has marginally increased.<br>Planned and additional felling resulting from the extensive P ramorum infestation has created many alternative views from the forest drive and provided opportunity for increased species diversity and larger scale habitat network creation. |
| Link open hills to valleys, lochs and watercourses to improve use of open space for visual and conservation purposes. | Areas of conifer plantation have been removed along the R Dee riparian corridor and replaced with open space and broadleaf planting.<br>Other felling has begun to impact on the existing open hill areas. |

Whilst these plan objectives have generally been 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 (see Appendix V).

| **Themes and objectives.** | **Priority** |
|---|---|
| Productive;<br>Meet/promote sustainable timber production forecast commitment through revised felling / thinning plans (modified to accommodate *P ramorum* infestation) and restocking plans<br>Implement modest scale road building / road maintenance programme required to service proposed operations coupes<br>Increase broadleaf woodland creation (including productive broadleaf), particularly native species for biodiversity<br>Integrate and manage plantation associated with Laggan o' Dee tenancy | high |
| Healthy; | high |

| | |
|---|---|
| Protect water, soil and air through agreed management plans for SSSI sites and follow UKWAS standards and Forest and Water guidelines to improve water quality within R Dee catchment to improve feeding and spawning conditions for fish<br>Increase area of mature woodland and species diversity for habitat enhancement (consider impact of *P Ramorum* within block and the future design of a Larch free forest)<br>Expand area covered by and develop Low Impact Silviculture sytems in block | |
| Treasured;<br>Maintain favourable status of Clatteringshaws dam quarry and adjacent Laughenghie and Airie Hills and Kenmure Holms SSSIs<br>Improve / enhance key visitor zone surroundings to Raiders Road forest drive and Otter Pool through species diversity and open space<br>Restore and expand peatlands, broadleaf areas and network habitats for wildlife species | high |
| Cared for;<br>Block is visually prominent; contribute to Scotland's landscape through the management and enhancement of external views from A712 and the A762 and the internal views along the Raiders Road through revised species choice, open space creation and coupe shape<br>Restore PAWS woodland sites and establish new native BL woodland throughout plan area and establish larger scale habitat networks<br>Maintain and enhance plan habitats for priority species such as Red Squirrel and Black Grouse and other nationally important species such as Nightjar<br>Manage all heritage features according to FES Archaeological guidelines | high |
| Accessible;<br>Improve access and provide an enjoyable woodland experience through localised intensive management regimes, improved signage and core facilities (Clatteringshaws VC / Otter Pool / Raiders Road / artworks) and a maintained road network | high |
| Good Value;<br>Maintain tourism based partnership activity in block. | medium |

# 3.0 Background Information

## 3.1 Physical site factors

### 3.1.1 Geology Soils and landform

The underlying parent rock is mostly igneous, being Granite of the Lower Old Red Sandstone era and part of the larger Cairnsmore of Fleet Granites. A metamorphic aureole lies to the north merging with the Ordivician and Silurian sedimentary rocks.

The overall topography is gently undulating with distant views creating a medium scale landscape. Altitude ranges from 80m up to 493m. The central and dominant massive lying to the north is the Black Craig of Dee at 493m with the lower Gormael and Shaw Hills to the south, Benniguinea to the west and Cairn Edward to the east. Evidence of glacial deposition and erosion is all around extensively modifying the area to produce an undulating landscape of moraines and drumlins. On some of the steeper faces such as Garry's Craig huge scree boulders litter the ground.

The combination of geology and glaciation has resulted in a range of very poor soil types with impeded drainage dominating the plan. The main soil types are peaty gleys, deep peats and smaller areas of peaty podzols.

Arable ground is minimal and generally limited to the drumlins where brown earth soils are found. The former land use was rough grazing.

The James Hutton Institute "Land Capability for Forestry" classification for the bulk of the area is F5 and F6 (land with limited and very limited flexibility for growth and management of tree crops). Poor stony site types and altitude result in an area with windthrow issues, difficult cultivation, limited species choices and a lack of thinning opportunities.

### 3.1.2 Water

The plan area lies within the Ken / Dee catchment and is mainly drained by the R Dee. The R Dee, flowing from Clatteringshaws Loch, a man made reservoir lying out with the plan area to the north, and its tributaries are important fish nursery and spawning areas. Other significant watercourses in the plan area include the Laggan Burn, Green Burn, White Burn, Glengainoch Burn and Knocknairling Burn. Surface water acidification, watercourse over shading, siltation risks and drainage and riparian management are particular concerns within the R Dee catchment that has historically been quite heavily forested; many of the burns are poor for fish ecology and moderate to failing for acid sensitive vertebrates. Potential pressures on the watercourse are morphological alterations from forest operations and diffuse source pollution. We aim to comply with best practice and minimise sediment release from any forest operations with efforts made to;

- Protect watercourses through drainage management

- 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 30m for the R Dee and a minimum of 20m on the other significant burns).

There are only a few water subcatchments in the plan area that have forest canopy cover over 300m. With our planned restructuring and reduction in future conifer restocking at elevation this figure is likely to drop further.
FES has considered flood risk of peak flows at the exit of the site and also further down stream and several burns within the plan area (Knocknairling Burn, Black Water of Dee and Glengainoch Burn) and Loch Ken to the east have been identified as areas for concern. 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 minimal scale of our additional planting, the proposed well designed and significant sized riparian buffers and the proposed increase in LISS coupes within the valley floor of the Black Water of Dee should 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 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). Information from this layer is provided to all contractors engaged in operations that impact on the supply source areas.
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 the block is generally above average for the district ranging from 1600 – 2000 and falls mainly during the winter months, October to February. Much of the block is exposed to the west to the prevailing Westerly winds with damaging gales likely during the early part of the year. Winters can be severe and a low cloud base is common.
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 habitat networks will be important.

## 3.2 Biodiversity and environmental designations

The following designated sites lie adjacent to or within the plan area:
Clatteringshaws Dam Quarry SSSI (within)
Kenmure Holms SSSI (adjacent)

Laughenghie and Airies Hills SSSI (part within)
SNH approved management plans are in place for all of these SSSIs that are on FES land. To the west, Clatteringshaws Dam Quarry SSSI is designated for geological features, to the south Laughenghie and Airies Hills SSSI is designated for breeding bird assemblages on unplanted moorland whilst Kenmure Holms SSSI, off the plan area to the north east is designated for invertebrates and Fen Meadow.
In early post glacial times the lower Dee valley slopes would have been covered with Oak, Birch and Pine woodland now however, much of the land cover is dominated by heather moorland, rough grassland and areas of exposed rock with only scattered fragments of Native Woodland remaining. Over an extended period of time this management plan area will greatly benefit from an expansion of native broadleaf woodland that would link our fragile internal PAWS and ASNW areas to more robust external and adjacent ASNW areas along the R Dee and R Ken valleys including the Water of Ken Woods SSSI designated Dunveoch Wood which is currently in unfavourable condition.
Water quality is a significant environmental factor in the plan area with the R Dee identified as being of local importance for breeding salmonid populations. Whilst Clatteringshaws Loch is classified as “high” in terms of its ANC there is little doubt that overall the catchment remains quite sensitive. Conifer removal to date has already actioned some forest encroachment onto watercourses issues, 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 5$^{th}$ edition.

### 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 Peregrine and Golden Eagle will benefit from the planned creation of open ground corridors linking the lower elevation valley sites to the open ground hill-tops.
The plan area is a nationally important Black Grouse site with large numbers present on the plan upper margins and is considered a core area for the species within the district. Enhancing the wetter brood rearing areas in the valley floor with scattered broadleaf planting, increasing the amount of open ground present in the block, creating and strengthening habitat linkages between valley floor and the moorland edge and establishing stands of native broadleaf species such as Birch, Hawthorn, Willow and Rowan for winter browsing adjacent to the woodland edge sites will directly benefit Black Grouse.
Red Squirrel (UKBAP priority species) is present throughout the block at moderate to low densities. Given the low levels of existing large seeded broadleaf and a lack of connectivity to surrounding broadleaf woodland the block is less vulnerable to Grey Squirrel colonisation. The LMP unit is therefore

recognised as priority woodland and one of a small suite of “Red Squirrel Stronghold Sites” designated by the Scottish Government where Red Squirrel can be helped to survive. Planned extended rotation areas of existing Norway Spruce and Scots Pine (currently only around 6.0% of the plantation area) and a continued commitment to conifer plantation with substantial increases to the area of Scots Pine and Norway Spruce and small seeded Broadleaf restock reflects this and ensures that the block will remain advantageous towards Red squirrel (reference Galloway FD Outline management plan for the Red Squirrel Stronghold).

### 3.2.2 Scottish Biodiversity List Species

Pine Martens favour similar forest habitats as Red Squirrels and have been recorded as present and breeding throughout the LMP area. Recent increases in sightings and scat observations along with more formal research suggest that the Bennan LMP supports higher than average numbers of this species within South Scotland.

Otters have large territorial areas. Consequently, 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. 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 brash 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 brash piles are also likely to be used by a wide range of animal species and provide valuable deadwood habitat.

Water voles have used the block. Whilst large sections of the plan habitat remain suitable for their recolonisation, numbers are scarce.

Little detail is known about Bat populations and their use of plantation forest however local research has taken (is taking) place suggesting that the plan area is important to significant populations of a variety of Bat species, with roosts recorded for Daubenton’s, Leisler’s and Soprano pipistrelle bats and large numbers of both Soprano and Common pipistrelle observed feeding during the summer months. 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.

Nightjar, a nationally rare and declining species that favours heathlands, moorlands, and recently felled conifer plantation, use the area. Historical survey work suggests an expansion in the number and range of churring males around their historic concentration in the eastern part of the block. Our general progress towards smaller clearfell coupe sizes and an extended fallow period for *Hylobius*

management policy will continue to provide a range of potential habitats for the species as will the matrix of planned small open areas adjacent to low density pine and Birch and other broadleaf restock adjacent to the existing core breeding area.

The design plan is also home to a variety of schedule 1 raptor species in locally, and occasionally nationally significant numbers with a range of woodland and open habitat species present. The management of permanent open space and creation of woodland fringe, along with continued and extended areas of LISS will ensure the habitats continue to support such a rich predatory avian population.

## 3.3 The existing forest

### 3.3.1 Age structure, species and yield class

Species / Yield class

A significant percentage of this plan is already classified as open space. Around 24% of the total plan area comprises wild open hilltop, some agricultural land, open water at Loch Stroan and other open ground as detailed in the table below with an additional 8% of transient felled ground.

| **Open ground type** | **Area (ha)** |
|---|---|
| Open hilltop | 1109.7 |
| Felled area | 448.9 |
| Agricultural land | 65.1 |
| Open water | 26.8 |
| Streamsides | 42.7 |
| Quarries | 8.1 |
| Deer glades | 17.7 |
| Car parks & Information | 2.9 |
| Unplantable | 96.6 |
| | **1818.5** |

During the period of this plan there will be a small increase in the area of open space as sections of plantation initially planted above the 300m contour are felled and not likely to be restocked in the second rotation and as planned woodland fringe creation replaces conifer plantation and impacts less on blanket bog areas. Detailed treatment of open areas is covered under section 5.2 Future Habitats and Species.

Current species diversity in the plantation area is relatively poor. Pure Sitka Spruce and Sitka Spruce / Pine mixtures dominate the poorer site types present in the block and account for 81% of the plantation area. Generally found in the more fertile riparian valley bottom sites throughout the block, the minor conifer species of Norway spruce, Scots Pine, Larch and other conifers (around 13%) and broadleaf (just under 6%) account for the remainder of the plantation area.

Only around 50.0ha (22.5%) of the broadleaf area has been identified as Native Woodland under the Native Woodland Survey Scotland project however these areas and areas identified as previously supporting Ancient Semi Natural Woodland will form focal points for further broadleaf expansion. Our planned additional Broadleaf restock and restock with non-spruce conifer alternatives to felled larch should also improve species diversity over the period of the plan. Species diversity may well be further compromised in the short term with some of the larch component scheduled for removal as a result of the P ramorum infection. This situation should however improve over the period of the plan as planned restocking will include non-spruce species alternatives to the larch.
Yield class is variable across the block with spruce crops ranging from the poorer YC 4 and 6 crops on deeper peat areas and at elevation up to the YC22 crops of the fertile valley slopes down to Loch Ken down. Options available include restocking with alternative conifer species better suited to the site such as Scots Pine or converting the poorer spruce crops on the peat land areas to peatland edge woodland or permanent open space.

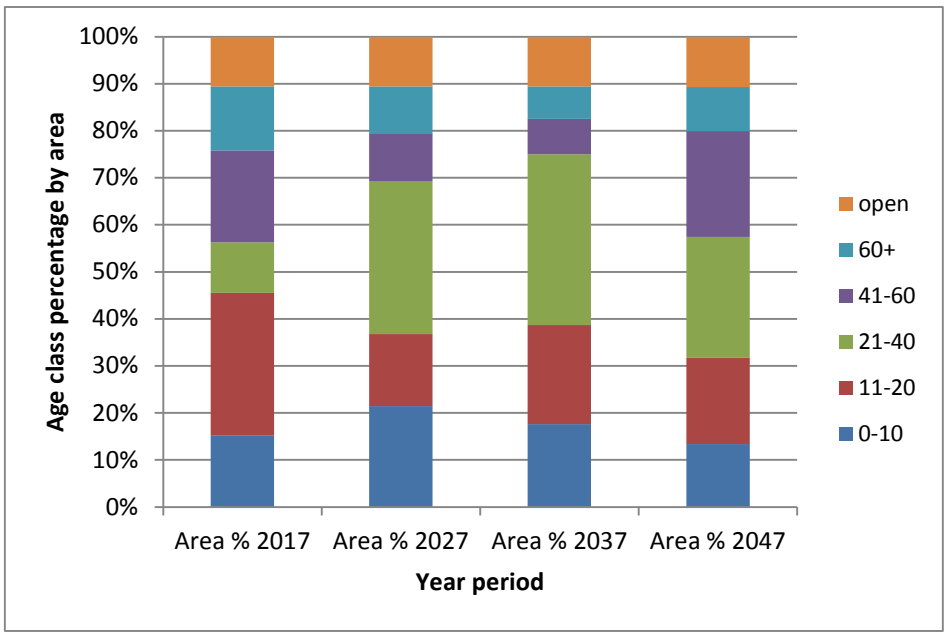
| **Species in 2017** | **Total area (ha)** | **Total area %** | **Plant. area %** |
|---|---|---|---|
| Sitka spruce | 2925.5 | 55.5 | 70.9 |
| Norway spruce | 182.5 | 3.0 | 4.5 |
| Larch spp. | 155.6 | 2.6 | 3.8 |
| LP (Other Pine) | 390.5 | 7.2 | 10.1 |
| Scots Pine | 101.4 | 1.8 | 2.6 |
| Douglas Fir | 64.4 | 1.2 | 1.7 |
| Other conifers | 22.5 | 0.4 | 0.6 |
| Broadleaf | 225.4 | 4.0 | 5.8 |
| Open space (includes open water) | 1369.6 | 24.3 | - |
| **Total** | **5634.0** | **100.0** | **-** |
| **Plantation Area** | **4264.4** | **-** | **100.0** |

Age Structure

As can be seen from the table and chart below there is already a measure of spatial diversity within the Bennan design plan with all stages of crop growth represented although currently the growing stock is slightly skewed in favour of non-cone bearing establishment and thicket crop (around 45.6% of the plan area).
The chart shows that over time our revised felling programme featuring extended rotation lengths (mainly Scot Pine and Norway spruce although all species will be considered), age gaps of 8-10yr or a 2m height differential maintained between felling coupes (with possibly, in the longer term, even wider age gaps in coupes immediately adjacent to Black Grouse areas or to favour the availability of coning crops) and the potential conversion of some second rotation crops from clearfell

to Low Impact Silvicultural System (LISS) management leads to longer term sustainable enhancements in the spatial appearance and structure of the block bequeathing an improved spread of age classes favouring cone bearing age crops over 20years in age.

| Age of trees | Growth stage | Percentage of class at given year | |
|---|---|---|---|
| | | 2017 | 2047 |
| 0 – 10 | Establishment | 15.2% | 13.3% |
| 11 – 20 | Thicket | 30.4% | 18.3% |
| 21 – 40 | Pole stage | 10.7% | 25.8% |
| 41 – 60 | Maturing high forest | 19.6% | 22.4% |
| 61 + | Old high forest | 13.6% | 9.4% |
| | Felled areas(transient open space) | 10.5% | 10.7% |
| **Total** | | **100.0%** | **100.0%** |




### 3.3.2 Access

With a fairly extensive forest road network, the block is relatively accessible for timber haulage. All timber haulage exits both east onto the A762 New Galloway to Laurieston road or west onto the A714 Newton Stewart to New Galloway road; both are classified as an “agreed route” on the Dumfries and Galloway Timber Transport Group Agreed Routes Map west for Timber Haulage.

A small length of 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. All of the

planned roads programme is scheduled for construction in the second approval phase (see table below).

| Period of Proposed Construction | Proposed length for construction |
|---|---|
| 2017 to 2021 | 0m |
| 2022 to 2026 | 1470m |
| Beyond 2023 | 0m |

Given the licencing thresholds and the modest scale of our proposed road construction work for this plan area, there is no requirement to apply for a SEPA Construction Site licence. All construction work will however comply with the general binding rules specified in the Water Environment (Controlled Activities) (Scotland) Regulations 2011.

Although there are several small, inconspicuous quarries within the plan area, to avoid the risk of using rock of unsuitable chemical content stone material for forest road upgrade and new construction to service the planned timber harvest will probably be sourced from the nearby major quarries at Garraries and Craignell. To avoid diffuse pollution arising from rainfall derived leaching, appropriate soakaways are in place in both quarries.

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 and other inappropriately designed structures for removal as they are known barriers to fish migration; there are no known such structures identified in the Bennan LMP area.

### 3.3.3 LISS potential

Most of the plan area has low to moderate DAMS scores (Detailed Aspect Method of Scoring) of 17 or less with only some open hill tops and associated plantation at elevation showing scores greater than 17.

Despite this the potential for significant expansion of LISS (Low Impact Silvicultural System) areas is still constrained by the poor, boggy site types. Whilst areas along the R Dee valley bottom have already been identified for thinning and LISS management, second rotation crops may well provide further opportunities for future LISS expansion.

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”.

## 3.4 Landscape and land use

### 3.4.1 Landscape character and value

Over the period of the previous plan, planned felling coupled with additional larch removal for the *P ramorum* infestation dramatically impacted on the internal

landscape of the block. With the A714 Queens Way virtually occupying the entire northern boundary and the Raiders Road forest drive running through the centre of the Land Management plan, specific areas of the block are highly visible in both near and mid-distant view. Much of the block is however markedly less visible, only really visible from surrounding hilltops and restrictive internal views from the forest road network.

The 1994 Dumfries and Galloway landscape assessment categorises the Bennan LMP area as a mixture of "Southern Uplands type with Forestry" where "large, smooth dome-shaped hills have large scale dark green plantations on slopes and over lower summits" and where future emphasis should be on "restructuring and improved design of forests" and "Foothills with Forestry" where typically there is a "dark green blanket of forest covering undulating foothills".

The main issues arising from the assessment over these two landscape character types are

- Forestry expansion and the loss of open ground and obscuring topographic interest
- the incremental loss of hill farm land to forestry
- modification of existing forests and landscape character enhancement through forest design
- threats to cultural features and wildland scenic areas through forestry planting
- potential wind power development given the landscape sensitivity

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

"Improved forest design should seek to reflect topographic diversity in open space patterns, species mix and coupe pattern"; whilst the relatively large scale relief of the plantation and open hill ground interface allows for some larger scale felling coupes, the principal landscape concerns remain the enhancing of topographical diversity through the use of interconnected patterns of open space linking open hill down into the lower basin areas and the use of alternative species with a greater future reliance on broadleaf and minor conifer species such as Norway Spruce, Scots Pine and Douglas Fir for restocking.

"Heather and semi natural woodland management in unforested areas should be supported"; there are areas of conifer plantation on blanket bog that may be marginal for economic woodland where a targeted reduction of plantation and the creation of native peatland edge woodland may be appropriate. A variety of habitat networks will be created linking the lower valleys to the slopes and hill summits often using existing scattered semi natural woodland.

"Forest restructuring should seek to expose and preserve cultural features" and "constituent features of agricultural areas and hill farming should be maintained as an essential feature of this forest dominated landscape"; all known heritage features will be buffered in an area of open space and whilst the area under agricultural land use will not be diminished, better design of the plantation

surrounding agricultural holdings such as Laggan o' Dee should enhance the tenancy area.

### 3.4.2 Neighbouring land use

The block is part of a conifer massif comprising other adjoining FES plantation to the north, west and south (Clatteringshaws, Round Fell and Fleet Basin LMPs respectively). The land to the east is a mixed lowland landscape with extensive areas of mixed broadleaf, open agricultural land or open water (Loch Ken) and the town of New Galloway lies to the east of the plan area.
An area of open rough agricultural land to the north has recently been acquired and afforested by the private sector.

## 3.5 Social factors

### 3.5.1 Visitor Zone Recreation

As well as supporting the Raiders Road forest drive and its associated Otter Pool car parking and toilet area, short sections of forest trail such as the Bennan viewpoint and a significant length of the Core Paths network (mainly along the forest road network); the Bennan DP area also provides a partial backdrop to the recreation facilities associated with the nearby Clatteringshaws Visitor Centre. Along with some minor outdoor recreation facilities including fishing access to Stroan Loch, all of these facilities are considered to be core recreation facilities for the district.
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 involving bespoke thinning regimes, mature tree retentions where possible and the creation of additional open space and species diversity.
Opportunities potentially exist to develop other key locations within the block and to expand the forest trail network linking these key locations and features
The existing principal facilities are listed in the table below.

| **Facility** | **Concept / Opportunity** | **Constraint** | **Plan Development** |
|---|---|---|---|
| Clatt'shaws Visitor Centre (not within plan area) | Enhance environs of VC<br>Enhance views from VC | Large scale felling for *P ramorum* (plant health)<br>Windthrow | Large scale landscape design of coupe shape and species diversity |
| Raiders Road Forest Drive | Enhance entrances to Raiders Road forest drive<br>Improve the | Lack of mature crop and extended timescale<br>Maintenance of long route length | Create/develop areas of cathedral mature conifer at drive entrances and other highlighted sections of forest drive |

| | | | |
|---|---|---|---|
| | general vehicle user experience along the forest drive<br>Reduce the impact of clearfell operations | Ongoing harvesting / forest operations and timber haulage | Construct stone dyke entrances to forest drive<br>Convert targeted conifer plantation to broadleaf woodland along route to reduce the impact of future harvesting operations<br>Enhance / maintain immediate surrounds of Forest Drive with additional conifer diversity, additional BL woodland and open space |
| Otter Pool parking & toilet area (key destination on forest drive) | Enhance appeal and uses of car park<br>Enhance environs of car park / toilet block<br>Enhance views from car park | Ability to maintain permanent views | Enhance / maintain immediate surrounds of car park area through thinning, species diversity (both conifer and BL woodland) and open space creation |
| Labyrinth (Art installation) | Enhance site surroundings and backdrop to Art installation | Large scale felling for *P ramorum* (plant health)of adjacent crop<br>Extended timescale to create and maintain a permanent visual backdrop for installation<br>Windthrow | Enhance immediate surrounds of Art installation through species diversity (both conifer and BL woodland) and open space creation<br>Convert targeted conifer plantation to broadleaf woodland to create permanent visual backdrop |

### 3.5.2 Community

Whilst New Galloway is located to the east and outside of the plan area and there are several residential and agricultural interests affecting the area (Darsalloch, Waukmill and Laggan o' Dee), there are no real local communities associated within the area.

A public drop-in meeting was held in New Galloway on Wednesday 29 October 2014 to provide a forum for neighbours, locals and other interested parties to discuss options for the plan.

The Royal Burgh of New Galloway 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 a programme of individual Monument Management Plans and Condition Surveys respectively. FCS also maintains a programme of detailed measured survey of our most significant sites in order to 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 Bennan LMP however the possibility remains that the area could be subject to future windfarm applications.

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

FCS are currently in consultation with Scottish Power Energy Networks (SPEN) regarding the Kendoon to Tongland 132Kv Reinforcement Project, an overhead powerline and tower construction project that given the developers preferred route will significantly impact on the visual landscape and conservation interests in the eastern section of the plantation block.

## 3.6 Statutory requirements and key external policies

The legal status of the land is purchased.

The Land Management Plan has been prepared to ensure that the Planning and Operations functions will comply with the following legislation and policies:

Biodiversity

- Conservation (Natural Habitats) Amendment (Scotland) Regulations 2007
- Nature Conservation (Scotland) Act 2004
- Wildlife and Natural Environment (Scotland) Act 2011
- Land Reform (Scotland) Act 2003
- Water Environment and Water Services (Scotland) Act 2003
- Water Environment (Controlled Activities) (Scotland) Regulations 2011
- UK Woodland Assurance Standard 2008
- UK Forestry Standard 2004

Climate Change

- United Nations Framework Convention on Climate Change
- Kyoto Protocol
- EC Directive 2003/87/EC
- Climate Change (Scotland) Act 2009

Historic Environment

- Ancient Monuments and Archaeological Areas Act 1979
- Treasure Trove Scotland
- UNESCO World Heritage Convention
- Planning (Listed Buildings and Conservation Areas)(Scotland) Act 1997
- European Convention on the Protection of the Archaeological Heritage Valetta 1992

Forests & People

- Control of Substances Hazardous to Health Regulations 2002
- Equality Act 2012
- Employers Liability (Compulsory Insurance) Act 1969
- Health and Safety at Work Act 1974
- Management of Health and Safety at Work Regulations 1999
- Occupier's Liability (Scotland) Act 1960
- Provision and Use of Work Equipment Regulations 1998
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995
- The Highways Act 1980

Soils

- Control of Pesticides Regulations 1986
- Waste Management Licensing Regulations 1994
- European Soil Charter

# 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 |
|---|---|---|---|
| Timber | Provide planned sustainable timber supply | Premature *P ramorum* larch felling<br>Creation / enhance conservation habitats<br>Recreation developments<br>Extended rotation lengths to facilitate conifer coning | Maintain conifer restock programme whilst increasing area of BL in subsequent rotations<br>Remove flow peaks from timber production<br>Increase area managed under LISS |
| Biodiversity | Enhance Red Squirrel habitat | Potential Grey squirrel incursion from neighbouring ASNW into Fleet Basin stronghold if large seeded species used | Increase crop area under NS & SP<br>Increase plantation area managed under LISS and extend crop rotation ages<br>Reduce coupe size where appropriate<br>Increase small seeded BL restock for species benefit |
| Biodiversity | Enhance Black Grouse habitat | Low level resident population<br>Moderate to low levels of existing species diversity | Increase BL restock for additional species diversity and food / shelter source in targeted Black Grouse locations<br>Identify localised boggy areas as open space |
| Biodiversity | Restore ASNW remnants and connect to other external ASNW habitat networks | Fragmented nature and poor quality of existing ASNW remnant<br>Extended restructure period<br>Potential Grey squirrel incursion into Fleet Basin stronghold if large seeded species used | Extend BL woodland / open space connectivity to riparian zones, internal / external open space and other external Native woodland areas<br>Increase small seeded BL restock for additional species diversity |

| | | | |
|---|---|---|---|
| Environmental Quality | Enhance views of block from A712 and minor county road | Rapid period of landscape change due to *P ramorum* infection<br>Moderate to low levels of existing species diversity<br>Harsh non welcoming plantation edges | Increase species diversity<br>Extend rotation lengths throughout (particularly highly visible coupes)<br>Smaller coupe size<br>LISS areas<br>Enhance / soften plantation boundaries to create more natural and welcoming woodland edges |
| Environmental Quality | Increase area managed under Low Impact Silvicultural Systems | Site type constraints<br>Lack of appropriate mature conifer crop | Increase plantation area managed under LISS<br>Extend rotation lengths throughout plan area<br>Increased use of Natural Regeneration for restock |
| Environmental Quality | Enhance water quality within the R Dee catchment | Conifer monoculture planted close to watercourses<br>Moderate / low levels of existing species diversity<br>Extended period of landscape change | Increase plantation area managed under LISS<br>Enhance riparian zones through increased open space / BL restock<br>Increase species diversity (BL and minor conifer) through restock / natural regeneration |
| Access and Health | Enhance access and enable communities to enjoy woodlands | | Maintain and enhance existing Core Paths network and other formal recreation through trail / facilities development<br>Provision of additional bespoke treatments within Recreation Visitor zones including increased open space and species diversity |

## 4.2 Concept development

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

Commercial conifer zone / Core timber production

Significant areas of upland spruce and mixed conifer plantation will continue to be managed commercially to meet the district programme commitments although this has been compromised by the some recent premature P ramorum felling of Larch. There is potential on the lower lying, better site types to extend rotation lengths in some conifer crops (through additional LISS areas), to create opportunities for smaller clearfell coupe size and to increase species diversity.

Red Squirrel Stronghold site

The LMP area is crucially important for Red Squirrel with the maintenance and enhancement of this type of habitat a priority for the species. Extending rotation lengths, retaining areas of mature cone bearing conifer and increasing overall species diversity throughout the block are all important considerations.

Nightjar area

Land to the east of the LMP area is important for Nightjar. Smaller coupe sizes, additional areas of LISS and increasing overall species diversity will provide priority habitat for the species.

Wet Woodland and Black Water of Dee riparian zone

The Black Water of Dee runs west / east through the plan area into Stroan Loch. Water quality issues within the catchment and the creation of a major habitat network centred on the development of this riparian corridor are critical success factors in 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).

Ancient Semi Natural Woodlands expansion zone

There are small, highly fragmented areas of ASNW remnant along the Black Water of Dee valley floor. Within the sites there is however on-site evidence of mature woodland and relict ground flora providing opportunities to restore and connect these areas over time through continued conifer removal and increased broadleaf species restock diversity to further enhance their expansion.

Highly visible recreation corridors (Forest Drive, A712 and A762)

The block is a core recreation area for the district. As well as the important drive past views into the block from the two county roads, a series of highly visible and attractive views, Archaeology sites and Artworks can also be experienced from the internal Forest drive road that runs through the block and parallel to the Black Water of Dee to access the recreation destination site, the Otter Pool. Long term aims are to maintain and further improve this significant site and identified views along the route by developing area specific Visitor Zone treatments involving bespoke thinning regimes, increased species diversity,

additional open areas and retentions of mature conifer where possible and better distant view sight lines.

Open hilltops zone

The summits of Gormal Hill, Shaw Hill, Fell of Fleet, Rig of Craig Gilbert, Hope Hill, Benbrack, Benniguinea and Black Craig of Dee are all prominent features in the local landscape that already provide a significant amount of permanent open space. Large scale coupes will be required on some of these hill tops to address landscape issues.

The creation of additional permanent open space or woodland fringe that will connect some of these open hilltops down through the forest matrix to the low lying areas of the Black Water of Dee valley and the A712 corridor is a plan objective.

Agricultural holdings / residentials

Agricultural land, in particular the Laggan o' Dee holding, is found at lower elevations. Opportunities exist to better integrate farm fields with our plantation and provide farm friendly woodland that could potentially provide additional grazing, animal shelter or protect water supplies.

There are other residential properties within and on the edges of the design plan area (Darsalloch and Waukmill). Improving visual and species diversity around these areas is an additional objective for the plan.

Designated sites

Laughengie and Airie Hills SSSI south of the Black Water of Dee and Water of Ken Woods SSSI east of the A762 both lie adjacent to the plan area.

The creation of open space buffers and native broadleaf woodland in FES woodland on the margins of these designated sites will contribute towards the maintenance of their favourable status.

# 5.0 Land Management Proposals

## 5.1 Forest stand management

The Bennan 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 |
|---|---|---|---|
| 2018-2021 | 7316 | 38200 | 45516 |
| 2022-2026 | 8251 | 23447 | 31698 |
| 2027-2031 | 8642 | 24268 | 32910 |
| 2032-2036 | 7015 | 25404 | 32419 |
| 2037-2041 | 5790 | 25610 | 31400 |

The programme has to an extent been smoothed to provide a regular and sustainable supply of timber.

### 5.1.1 Clear felling

Most of the plan area will be managed under a clearfell management type using conventional harvester and forwarder working (178 coupes averaging 22.5ha); there is however scope for a targeted expansion of the area managed under Low Impact Silvicultural Systems (LISS) in selected second rotation crops and along the Black Water of Dee valley.

| Management type | Area (ha) | Area % |
|---|---|---|
| Clearfell | 4014.4 | 71.3 |
| Group Shelterwood | 464.3 | 8.2 |
| Minimum Intervention | 134.4 | 2.4 |
| Natural Reserve | 57.8 | 1.0 |
| Long Term Retention | 164.3 | 2.9 |
| Open / other land | 798.8 | 14.2 |
| **Total** | 5634.0 | 100.0 |

A number of coupes are scheduled for clearfell during the 10yr period of the plan (31 coupes, 768.9ha and around 20% by area) and they substantially contribute to the district programme (see Appendix IV).

Within the plan area coupes range in size from 0.2ha areas of Long Term Retention up to 312.0ha of open hill ground. Overall average coupe size in the block is 19.7ha (278 coupes).
The following table confirms that, as per paragraph 3.4.2 in the UK Woodland Assurance Standard (fourth edition), no more than 25% of the plan area is due to be felled in any five year period within this plan approval period. Due to the large area of open hill area associated with the plan, we have used plantation area (3815.5ha) and the percentage is still not exceeded.

| 5yr Fell period | Area felled (ha) | Area felled as % of total plantation area |
|---|---|---|
| 2018-2022 | **489.6** | **12.8** |
| 2019-2023 | **351.6** | **9.2** |
| 2020-2024 | **257.5** | **6.7** |
| 2021-2025 | **284.0** | **7.4** |
| 2022-2026 | **253.8** | **6.7** |
| 2023-2027 | **210.1** | **5.5** |
| 2024-2028 | **253.7** | **6.7** |
| 2025-2029 | **316.6** | **8.3** |
| 2026-2030 | **411.3** | **10.8** |
| 2027-2031 | **270.4** | **7.1** |

Forestry is known to affect the acidification of water, principally due to the ability of forest canopies to capture sulphur and nitrogen pollutants from the atmosphere to a greater degree than shorter types of vegetation (Managing Forests in Acid Sensitive Catchments refers). As a result it is important to manage forestry activities within vulnerable areas to ensure acidification is not exacerbated and opportunities for improvement are realised.
Within this Land Management Plan area there are three catchments that have been identified as being either “at risk” or “failing”; catchment 601 covers almost all of the plan area while the other two catchments are little impacted on. Calculations have been prepared for 601 and are included at Appendix VII.
Planned operations within this primary catchment comfortably satisfy the felled area threshold but in this heavily forested catchment fail to meet that of closed canopy forest >15yrs needing to be less than 30% of the catchment in 15 years’ time. As there is a district commitment towards restocking our proposed felling areas in this catchment to maintain a future conifer cone crop for Red Squirrel and that there is little up to date water chemistry data available to us, until we have access to more recent water chemistry data we intend to:

- In discussion with SEPA commit to the collection of water samples on identified watercourses during the first phase of the plan and
- In response to the results of that sampling revise our current restocking proposals where appropriate through formal plan amendment

In extensively forested catchments like those present in the Bennan plan area, additional measures to reduce the impact of forestry will be more closely considered. For landscape, conservation and biodiversity considerations, particularly as a Red Squirrel Stronghold site, efforts have been made where possible

- to extend the felling period between coupes to over 7years
- to increase the area of plantation under LISS
- to reduce the overall size of the remaining clearfell coupes
- to marry coupe shape better to landform and
- where appropriate to consider the conversion of conifer stands to stands of small seeded broadleaf (in non-PAWS and ASNW sites)

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.

### 5.1.2 Thinning

Thinning areas in the Bennan block have been constrained by restrictive site types and are generally confined to the Black Water of Dee valley bottom and lower lying areas to the east and west of the block. We have already missed the thinning window opportunity for many of the other first rotation pole stage or maturing high forest areas so second rotation crops will mainly provide the potential to expand the overall thinnable area of the block. Recent efforts throughout the district to expand our thinning programme have met with various degrees of success, with windthrow often occurring.

Carried out on a 7-10yr cycle in accordance with our local policy, crops will generally be thinned to realise amenity and landscape objectives with the benefits of improved future timber quality only likely from the second rotation thinnings. Maximising the area of conifer crops that can be thinned will ultimately result in an increased woodland area managed under less intensive management systems than clearfell and potentially increase the food variety and availability capacity within the Red Squirrel Stronghold area.

### 5.1.3 LISS, Long-term Retention and Natural Reserve

Around 464.3ha (just over 8%) of the plan area is planned for management under Low Impact Silvicultural Systems (LISS). Areas of LISS can provide multiple benefits for the plan area contributing to the protection and improvement of soil quality, water quality and biodiversity through reducing soil erosion and the creation of suspended solids in water and even limiting flooding within the Dee catchment; additional areas within the LMP particularly the valley bottom where site types are better, will be targeted for LISS development. Developing these additional areas should also assist in managing the Red Squirrel stronghold's capacity (food variety and availability) rather than the population.

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

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 6% of the plan area has been identified as Natural Reserve, Minimum Intervention or Long Term Retention. Wherever possible the default position should be delayed felling and retention of Norway Spruce, Lodgepole Pine and Douglas Fir.

Natural Reserves are predominantly wooded, permanently identified locations of high wildlife interest or potential that are 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.

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 Bennan FDP (see Habitats and Species map).

### 5.2.1 Open hilltop / Woodland fringe

A feature of the design plan is to maintain and expand the area of open hilltop and create greater links between them and the lower elevation farmland and river valley ground. Modification of the upper planting margins and highlighting crag areas through broadleaf planting and increased open space to better complement landform will take place.

Targeted areas of Native woodland fringe, a transitional zone between the plantation and open hilltop will also be encouraged. Native woodland fringe is defined as 20-50% tree cover in a matrix of short vegetation. Always more than 50% (ideally 100%) of the tree species will be native. 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 or if too dense the conifer regeneration removed as resources allow. Woodland fringe has the potential to provide additional habitat for both Black Grouse and Nightjar with additional opportunities existing through grazing of the open hill to improve Black Grouse habitat.

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

The only significant still water bodies impacting on the plan are Stroan Loch to the east end of the forest drive and Loch Ken reservoir across the A762 that bounds the eastern edge of the plan area.

Loch Stroan is closely bounded by the Forest Drive to the north and east and the significant area of non FES open ground to the south that is the Laughenghie and Airies SSSI. As part of our objective to create larger habitat networks, additional open space buffer zones around the loch to reduce excessive shading by conifer crop with links to riparian zones and other external and internal open space are proposed.

Throughout the block other watercourses, >0.5m wide, will be subject to riparian buffer zones enhancement. Comprising native BL planting and open space to assist in improving water quality, protecting soils and benefitting species that use the habitat, riparian buffer zones will be extended. To complement this planned riparian zone management and to aid water quality improvement, the continued monitoring and management control of conifer natural regeneration in the riparian zone is critical.

Post clearfelling, there will be no conifer restocking within 20m (and on occasion up to 50m) within the main watercourse riparian zones. It is expected that some of the riparian zones, designed open ground and broadleaf areas will fill in with natural regeneration of both conifers and broadleaves. Monitoring levels of natural regeneration will be undertaken by stand-alone FES natural regeneration surveys and the FES sub-compartment database will be updated according to FES protocols.

At the 5 year mid plan review and at the submission of a new Land Management Plan at year 10, an assessment will be made of the extent of this natural regeneration and noted in the associated commentary. If natural regeneration of conifers has created a canopy cover of greater than 50% of the riparian buffer area and has a negative impact on the watercourse, designed open ground or areas of broadleaves, the Land Management Plan submission will specifically address this and identify any approaches to be taken. Any such approaches will be proposed after consultation with SEPA, the Galloway Fisheries Trust and agreed with FCS and based on supporting evidence which considers the potential impacts on acidification and the increased levels of shade and shelter on the watercourses or habitat and the technical feasibility of natural regeneration clearance.

| **Objective** | **Benefits / positive** | **Implementation** |
|---|---|---|

| | **factors** | |
|---|---|---|
| • Enhance aquatic / riparian zone | • Improve water quality through removal of conifer shading<br>• Protect soil through reduced impact of future operations<br>• Enhance / improve habitat for species that use the riparian zone | • Identify aquatic / riparian zone and commit towards no planned restock<br>• Monitor area for natural regeneration incursion<br>• Accept range of habitat options from 100% open space up to 100% broadleaf woodland (conifer woodland area element restricted to 50%)<br>• Where conifer woodland % exceeds 50% figure, canvas advice from appropriate stakeholders and, where technically feasible, remove when required to avoid buffer zone loss |

At a more detailed level where we are looking to better promote other natural features such as rock crags and wet hollows areas, increased open space and species diversity will persist.

Wet woodland is a high focus habitat of the Biosphere and there are areas of marsh /mire habitats and other localised wetland features associated with the R Dee valley system that have already been identified as areas of permanent open space or low density broadleaf planting that will remain unstocked. Other areas will be identified by future operations during the plan period. These sites will as far as possible remain unstocked as a benefit to invertebrates and bird life although, if water quality is not diminished, some natural regeneration of native species will be accepted.

### 5.2.3 Laggan o' Dee Grazing tenancy (open space)

Centred on the holding itself, the Laggan o' Dee grazings are nevertheless spread throughout the block.

Previously there was a management agreement in place for the grazings; it is not an agricultural holding within the meaning of the Agricultural Holdings Act, with the agreement requiring the tenant to manage the area and provide conservation benefits.

Currently the holding is now back in hand (FES management) and plans are being developed to not only retain the area under agriculture but also to deliver additional recreation and education benefits.

### 5.2.4 Quarries (open space)

As previously stated there are several small quarries in the plan area but none of them are expected to produce significant amounts of material for 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, may be required with any significant development proposals outwith agreed tolerances submitted to FCS for approval prior to work taking place (see Tolerance table Appendix II).

### 5.2.5 Deadwood / Veteran trees

Deadwood is generally at a premium within the plan area. Older trees and deadwood fragments may be found in the various PAWS areas however High Wood (Brough Wood) to the north, the principal area of established broadleaf, contains most of the standing deadwood and veteran trees within the plan area. As far as possible all significant broadleaf areas and their associated woodland ground flora will be retained at time of conifer clearfell to provide focal points for future BL expansion (see local District BL policy document) and as the broadleaf component of the block increases there will be the potential in time to provide a more comprehensive additional source of deadwood.

### 5.2.6 Plantation woodland (and Red Squirrel Stronghold proposals)

Whilst Sitka spruce will continue to be the main timber species in the commercial conifer dominant areas, restocking with Norway Spruce and Scots Pine will be increased over time for diversity of squirrel food supply where site conditions are favourable or where landscape considerations prevail. Our current policy not to restock Larch (driven by our current and potential future Phytopthora infections) may in all probability result in a virtually Larch free forest. This potential loss of habitat benefit to important species such as Black Grouse and Red Squirrel bequeathed by larch free woodland will be offset through additional planned restocking of other conifer species including SP, NS and small seeded native BL. The following table presents the details of our proposed species restock:

| **Species** | **Area (ha) in 2027** | **Plant. Area %** | **Area (ha) in 2047** | **Plant. Area %** |
|---|---|---|---|---|
| Sitka spruce | 3087.0 | 72.6 | 3003.7 | 71.4 |
| Norway spruce | 217.5 | 5.1 | 240.0 | 5.7 |
| Larch spp. | 140.7 | 3.3 | 126.3 | 3.0 |
| LP (other pine) | 341.1 | 8.1 | 270.5 | 6.4 |
| Scots Pine | 136.4 | 3.2 | 194.7 | 4.6 |
| Douglas Fir | 55.4 | 1.3 | 33.7 | 0.8 |
| Other Conifers | 12.8 | 0.3 | 75.8 | 1.8 |
| Broadleaf | 260.1 | 6.1 | 266.3 | 6.3 |
| Open Space | 1383.0 | - | 1423.0 | - |
| **Total** | **5634.0** | **-** | **5634.0** | **-** |
| **Plantation Area** | **4251.0** | **100.0** | **4251.0** | **100.0** |

As evidenced Sitka Spruce and Sitka Spruce / Pine mixtures continue to dominate the block. Whilst Sitka Spruce cover virtually flatlines, there is a slight reduction in plantation area for pure spruce crop and spruce mixtures with Lodgepole Pine accounting for around 78% in the future. Modest increases in the

minor conifer species of Norway spruce, Scots Pine, Larch and other conifers up to around 16% and broadleaf cover slightly over 6% compensate for this.
This genuine enhancement of species diversity in tandem with an improved age class range will provide a dependable food supply for Red Squirrel populations.
The planned increase in Native Broadleaf cover from less than 6% in 2017 to just over the figure by the end of the plan period will both enhance the landscape and provide improved woodland habitat to protect soils and improve water quality.
Target stocking density for the non commercial broadleaf will be around 1600stems per hectare (2.5m spacing) with restocking taking place should the figure not be reached.
The area of open space, that will inevitably always contain a significant component of transient felled ground, slightly increases over time and is focussed on the riparian zones and their linkages out onto the adjacent designated hilltop areas some of which may eventually develop into native woodland fringe.
Post clearfelling there will be no conifer restocking within at least 30m (and a minimum of 50m along the R Dee) of main watercourses with the riparian zones also benefitting from small areas of additional broadleaf planting
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

Block restructuring remains an objective. The planned, gradual changes in the spatial appearance and structure of the block carried out under the previous plan have subsequently been significantly compromised by emergency sanitation felling for Phytopthora ramorum resulting in some quite intrusive landscape changes. Revised felling plans with proposed increases to the rotation length of some mature conifer species such as Norway spruce and Scots Pine and additional areas of broadleaf restocking should provide not only future structural and landscape benefits for the block but also greater diversity of habitat for a range of priority species including an improved spread of age classes favouring cone bearing age crops over 20years in age for Red Squirrel.

## 5.4 ASNW / PAWS restoration

There are several small FES PAWS sites within the DP unit (see table below).

| Site | Objective | Benefits | Implementation |
|---|---|---|---|
| NX608772 Knocknairling Wood ASNW | • Maintain and enhance | • Maintained high quality riparian ASNW habitat will act as a reservoir for biodiversity that will spread into adjacent semi-natural habitats during forest restructuring. | • Monitor native tree regeneration to assess browsing impacts.<br>• Monitor non-native tree regeneration and INNS.<br>• Control non-native tree and INNS regeneration.<br>• Restore recently separated area of PAWS to buffer ASNW remnants. |
| NX608772 Knocknairling Wood PAWS | • Full site restoration | • Increased biodiversity<br>• Increased native broadleaf<br>• Creation of habitat network with existing ASNW's<br>• Secure remaining remnant ground flora | • Clearfell existing conifer from site<br>• Monitor native BL regeneration for extent and browsing pressure<br>• Restock fell areas adjacent to site with native broadleaf where required.<br>• Monitor conifer and INNS regeneration and remove as required.<br>• Manage the native BL restock linking this native woodland with adjacent High Wood ASNW. |
| NX625767 High Wood ASNW | • Maintain and enhance | • Maintained high quality ASNW habitat will act as a reservoir for biodiversity that will spread into adjacent semi-natural habitats during forest restructuring. | • Monitor native tree regeneration to assess browsing impacts.<br>• Monitor non-native tree regeneration and INNS.<br>• Control non-native tree and INNS regeneration. |
| NX603737 Tannoch Wood | • Maintain and enhance | • Maintained high quality ASNW habitat will act as a | • Remove or kill standing non-native conifer. |

| | | | |
|---|---|---|---|
| ASNW and adjacent Non-PAWS with veteran trees | ASNW.<br>• Full restoration of non-PAWS with veteran trees | reservoir for biodiversity that will spread into adjacent semi-natural habitats following restoration<br>• Increased biodiversity<br>• Increased native broadleaf<br>• Creation of habitat network with existing ASNW<br>• Secure remaining remnant ground flora | • Monitor native tree regeneration to assess browsing impacts.<br>• Monitor non-native tree regeneration and INNS.<br>• Control non-native tree and INNS regeneration.<br>• Thin or halo-thin selectively favouring remnant veteran oak, ash and hazel.<br>• Thin to improve light conditions for remnant AW ground flora. |
| NX617727 Upper Gairloch PAWS | • Full site restoration | • Secured remnant AW features.<br>• Increased biodiversity<br>• Increased native broadleaf | • Thin mature conifers under district thinning programme or halo-thin selectively favouring remnant veteran oak, and hazel<br>• Thin pole stage conifers under district thinning programme to improve light conditions for remnant AW ground flora.<br>• Monitor native tree regeneration to assess browsing impacts and species composition.<br>• Enrich as required<br>• Monitor non-native tree regeneration and INNS.<br>• Control non-native tree and INNS regeneration. |
| NX616724 Upper Gairloch 5 PAWS | • Enhance for Biodiversity | • Secured and improved minor conifer species<br>• Increased biodiversity and | • Manage under LISS, thin to improve stand quality and remove invasive conifer regeneration |

| | | | |
|---|---|---|---|
| | | stand structure<br>• Alternative food source for FCS priority species red squirrels | |

| | | | |
|---|---|---|---|
| NX626715 Nether Gairloch 1 PAWS | • Full site restoration | • Secured remnant AW features.<br>• Increased biodiversity<br>• Increased native broadleaf | • Remove invasive conifer regeneration<br>• Clearfell mature conifer stand<br>• Plant groups of SOK<br>• Monitor native BL regeneration to assess browsing impacts and species composition<br>• Enrich / restock as required<br>• Monitor non-native tree regeneration and INNS.<br>• Control non-native tree and INNS regeneration. |
| NX626713 Nether Gairloch 2 PAWS | • Enhance for Biodiversity | • Secured and improved minor conifer species<br>• Increased biodiversity and stand structure<br>• Alternative food source for FCS priority species red squirrels<br>• Retained favoured mature conifer habitat for FCS priority species red squirrel | • Manage under LISS, thin as per district thinning programme to improve NS cone bearing.<br>• Monitor non-native tree regeneration and INNS.<br>• Control INNS.<br>• Manage non-native tree regeneration as required for retention of NS stand. |
| NX643709 Clachrum PAWS | • Full site restoration | • Protects remnant AW features<br>• Increased biodiversity<br>• Increased native broadleaf | • Thin mature conifers under district thinning programme to improve light conditions for AW ground flora.<br>• Monitor native BL regeneration to assess browsing impacts and species composition<br>• Enrich / restock as required<br>• Monitor non-native tree regeneration and INNS.<br>• Control non-native |

| | | | |
|---|---|---|---|
| | | | tree and INNS regeneration. |

| | | | |
|---|---|---|---|
| NX652706 Airds Craig PAWS | • Full site restoration | • Increased biodiversity<br>• Increased native broadleaf<br>• Creation of habitat network with existing ASNW's | • Plant groups of SOK<br>• Monitor native BL regeneration to assess browsing impacts and species composition following recent clearfell<br>• Enrich / restock as required<br>• Monitor non-native tree regeneration and INNS.<br>• Control non-native tree and INNS regeneration. |
| NX654711 Garels Wood PAWS | • Full site restoration | • Creation of habitat network with existing ASNW's<br>• Increased biodiversity<br>• Increased native broadleaf | • Clearfell remaining conifer crop under district felling programme<br>• Monitor native BL regeneration to assess browsing impacts and species composition<br>• Enrich / restock as required<br>• Monitor non-native tree regeneration and INNS.<br>• Control non-native tree and INNS regeneration. |
| NX654719 Bennan PAWS | • Full site restoration | • Increased biodiversity<br>• Increased native broadleaf<br>• Creation of habitat network with existing ASNW's<br>• Improved landscape along Raiders Road entrance | • Clearfell remaining conifer crop under district felling programme<br>• Monitor native BL regeneration to assess browsing impacts and species composition<br>• Enrich / restock as required<br>• Monitor non-native tree regeneration and INNS.<br>• Control non-native tree and INNS regeneration. |

| | | | |
|---|---|---|---|
| NX647736 Bennan Suspected Non-PAWS | • Enhance for Landscape | • Secured and improved minor conifer species<br>• Increased biodiversity and stand structure<br>• Alternative food source for FCS priority species red squirrels<br>• Retained favoured mature conifer habitat for FCS priority species red squirrel | • Manage under LISS, thin as per district thinning programme to improve landscape quality along Loch Ken<br>• Improve cone production of favoured and high quality red squirrel food source NS and DF |

Restoration work has already begun on some of these PAWS and ASNW sites and will contribute towards achieving FES targets of restoring over 85% of PAWS sites on the National Forest Estate and, along with additional planned native broadleaf restock throughout the area, will not only link the PAWS fragments internally but also externally to designated upland oak woods on neighbouring land creating larger landscape scale habitat networks.

## 5.5 Deer management

Previous Deer Population survey work carried out suggests that across the Forest District an overall woodland density of 10.2 deer per 100.0ha prevails.
Figures fluctuate across design plans but give a strong indication of culling requirements needed to deliver Forest Enterprise Scotland's National Deer Management Strategic objectives including <10% impact on commercial crops.
With significant numbers of both Roe deer and Red deer present in the Bennan 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.
Restocking of premature felled areas such as Phytopthora 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 Bennan block is carried out by FES Wildlife Rangers with assistance from contract rangers and a single Deer Management permission (800.0ha). 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

Invasive non-native species (INNS) can impact directly on the geology of an area and are recognised as a significant risk to water environments potentially causing problems for communities who rely on rivers and lochs for their livelihoods. There are no records of Japanese Knotweed, Giant Hogweed and Himalayan Balsam in the block however *Rhododendron ponticum* is present in High Wood and there are records of American Signal Crayfish being present in the Knocknairling Burn that feeds Loch Ken. Signal Crayfish prey on young fish and their eggs, compete for food and habitat which can impact on the populations of native fish and their extensive burrows can destabilise banks causing erosion and collapse. No long term solution has yet been found to eradicate the species and until one is found, good bio security practice within this sub-catchment is the order of the day.
*Phytopthora ramorum* infection has been confirmed on Larch throughout the district. Infected areas were initially felled to comply with the requirements of a Statutory Plant Health Notice (SPHN) but are now treated under a “management zone” agreement. Although not a major component of the plan area growing stock, larch in the Bennan block has been particularly affected along the length of the Raiders Road with highly visible areas of mature and pole stage crop recently removed. In the foreseeable future, restocking in the block will avoid the use of larch with restock comprising other minor conifer (not Sitka spruce) and broadleaf woodland contributing more towards the species diversity of the block.

*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. Sanitary felling of Corsican Pine near to Stroan Loch has previously occurred and having been identified in adjacent forest design blocks, its wider presence in the block cannot be ruled out. Given the impact on structural and species diversity of the block by the recent *Phytopthora* infection Scots Pine will play an 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 both in this plan area and 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).
*Heterobasidion annosum* is not endemic in the block. Stump treatment with urea after felling will however be required in the areas of poorer site types.
There is no record of Ash dieback *Chalara fraxinea* present in the LMP area. FCS published a Chalara Action Plan for Scotland in 2013 that will be followed should an outbreak be discovered.
The block is actively monitored and trapped for Grey squirrel incursion.

## 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 however in response to the potential infection of *P ramorum* in immature larch crops, some small scale felling to recycle and chipping trials with the product removed from site for wood fuel may take place. Detailed plans will be submitted to FCS for approval prior to any work taking place.

## 5.8 Habitats Regulations Appraisal sites

The following Special Sites of Scientific Interest (SSSI) border the plan area:
Laughenghie and Airies Hills
Kenmure Holms SSSI
Clatteringshaws Dam Quarry
There are however no SAC sites impacted on by the plan area, a Habitats Regulations Appraisal is not therefore required.

## 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

- Maintenance and enhancement of plan area as Red Squirrel Stronghold site
- Development of the R Dee riparian corridor
- Persistence and enhancement of ASNW features
- Undertake water sampling scheme to establish up to date water chemistry data for LMP area with a view to continued restock
- Construction of proposed new roads

## 5.11 Amendments

To be logged on amendment form

# Appendix I: Land Management Plan Consultation Record

| Statutory Consultee | Date contacted | Date response received | Issue raised | Forest District Response |
|---|---|---|---|---|
| Neighbour: Peter Kelly | 15 December 2014 | Meeting 22 January 2015 | • Supportive of increased use of conifer and BL natural regeneration throughout block particularly around Laggan o' Dee tenancy<br>• Welcomed open hill top habitat management proposals for bird species under threat such as Red Grouse | • Noted |
| Historic Scotland: Martin Brann | 15 December 2014 | Email reply 19 January 2015 | • No designated sites within plan area<br>• Contact local authority archaeology service for minor sites in D&G Historic Environment Record | • Noted section 3.5.3<br>• Local authority consulted as part of design plan consultation process |
| RSPB Crossmichael: Julia Gallagher | 15 December 2014 | Email reply 13 January 2015 | • Welcome maintaining open hill top habitat for predator / prey bird species foraging<br>• Management for Nightjar should be a higher priority<br>• Support restoration and improved condition of ASNW sites | • Noted section 3.2 |
| SEPA: John Gorman; Newton Stewart office | 15 December 2014 | Letter reply 05 January 2015 | • Enhance water quality generally but with specific reference to Black Water of Dee tributaries (important fish nursery and spawning areas)<br>• Protect watercourses through drainage management and minimising pollution risk | • Noted sections 3.1.2, 3.3.2, 5.2.2 and 5.6 |

| | | | | |
|---|---|---|---|---|
| | | | • Risk of unsuitable rock quality / chemistry use in road construction and maintenance<br>• Management of natural regeneration<br>• Presence of American Signal Crayfish requires good management practice | |
| SNH Newton Stewart office: Stuart Graham | 15 December 2014 | No Comment received | • | • |
| FCS South Scotland Conservancy: Dumfries office | 15 December 2014 | No Comment received | • | • |
| Royal Burgh of New Galloway Community Council : Margaret Watson | 15 December 2014 | No Comment received | • | • |
| Dumfries & Galloway Regional Council: Simon Fieldhouse | 15 December 2014 | No Comment received | • | • |
| Dumfries & Galloway Regional Council: Richard Masters | 15 December 2014 | No Comment received | • | • |
| Galloway Fisheries Trust: Jamie Ribbens | 15 December 2014 | No Comment received | • | • |
| Rosemary Green;IUCN Otter Specialist Group | 15 December 2014 | No Comment received | • | • |
| Saving Scotland's Red Squirrels: Heinz Traut | 15 December 2014 | No Comment received | • | • |

| | | | | |
|---|---|---|---|---|
| Visit Scotland: Paula McDonald | 15 December 2014 | No Comment received | • | • |

| Consultee | Issues raised from LMP being on public register | Forest District Response to consultee | FCS consideration |
|---|---|---|---|
| **Dumfries & Galloway Council: Richard Masters; Access officer** | • **No objections raised**<br>• **Map showing extent of Core path network provided** | • **Email reply 11 May 2018**<br>• **Core path issue addressed in sections 3.5.1, 4.1 and Appendix V of LMP text** | • |
| **RSPB: Julia Gallagher; Conservation officer** | • **Mapped Nightjar area to be expanded in line with local expansion range of species**<br>• **Inclusion of Nightjar as a target species in LMP brief** | • **Email reply 11 May 2018**<br>• **Nightjar issues addressed in sections 2.1, 3.2.2 and 4.2 of LMP text**<br>• **Species diversity, habitat creation centred on area regularly used by species and planned Low Impact Silviculture System (LISS) coupes should also benefit species**<br>• **Local workplan system will provide opportunities for further enhanced proposals to benefit species** | • |
| **SEPA: Simon Watt; Senior Planning officer SW** | • **Generic response covering a raft of issues covering natural regeneration, flood risk, American Signal Crayfish and other non-native invasives, riparian** | • **Email reply 11 May 2018**<br>• **Issues addressed in sections 3.1.2, 3.3.2, 5.2.1, 5.6, 5.7 and Appendix VI of LMP text** | • |

| | | | |
|---|---|---|---|
| | **buffer zones, acid sensitive catchments, fell and plant and peatlands and wetlands** | | |
| **SNH: Francois Chazel; Operations officer Southern Scotland** | • **Advice only response, natural heritage interests of national importance on site will not be affected by the LMP proposal**<br>• **Greater emphasis to be placed on multiple benefits induced by Low Impact Silviculture Systems (LISS)**<br>• **Develop partnership opportunities** | • **Email reply 11 May 2018**<br>• **Benefits of LISS issues addressed in sections 3.1.2 & 5.1.3 of LMP text**<br>• **District has over time built up close working relationships with local fisheries trusts and other groups and will continue to develop these relationships in the future** | • |

# Appendix II: Tolerance Tables

| | Maps required (Y/N) | Adjustment to felling period* | Adjustment to felling coupe boundaries** | Timing of restocking | Change to restocking species | Change to roadlines | Designed open space ** *** | Windblow clearance **** |
|---|---|---|---|---|---|---|---|---|
| FC Approval not normally required | N | Fell date can be moved within 5yr period where separation or other constraints are met. | Up to 10% of coupe area | Up to 3 planting seasons after felling | Change within species group e.g. evergreen conifers or broadleaf. | | Increase by up to 5% of coupe area | |
| Approval by exchange of letters and map | Y | | Up to 15% of coupe area | Between 3 and 5 planting seasons after felling, subject to the wider forest and habitat structure not being significantly compromised | | Additional felling of trees not agreed in plan. Departures of >60m in either direction from centre line of road. | Increase by up to 10% of coupe area<br>Any reduction in open space of coupe area by restocking | Up to 5.0ha |
| Approval by formal plan amendment may be required | Y | Felling delayed into second or later 5yr period. Advance felling(phase 3 or beyond) into | More than 15% of coupe area | More than 5 planting seasons after felling, subject to the wider forest and habitat structure not being | Change from specified native species. Change between | As above depending on sensitivity. | In excess of 10% of coupe area<br>Colonisation of open space agreed as | More than 5.0ha |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | current or 2nd 5yr period. | | significantly compromised | species groups. | | critical. | |

**Notes**

- * Felling sequence must not compromise UKFS, in particular felling coupe adjacency
- ** No more than 1.0ha, without consultation with FCS, where the location is defined as “sensitive” within the Environmental Impact Assessment (Forestry)1999 Regulations (EIA)
- *** Tolerance subject to an overriding maximum 20% open space
- ****Where windblow occurs FCS should be informed of extent prior to clearance and consulted on where clearance of any standing trees is required
- Land Management Plan 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.**

**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.**<br><br>**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 |

# Appendix III: Ground Truthed Heritage sites

| SITE | PHOTO | GRID | COMMENT |
|---|---|---|---|
| Walled enclosure I (1of 3 similar enclosures west of Benniguinea) | No | NX550757 | Roughly square enclosure, possibly a plantation enclosure; within P2005 plantation. **Maintain in area of open space.** |
| Sheep pen | No | NX553763 | Sheepfold of 6 compartments; in fair condition, adjacent to agricultural field and currently in area of open space and scattered BL. **Maintain in area of open space.** |
| Walled enclosure II (1of 3 similar enclosures west of Benniguinea) | No | NX556758 | Roughly square enclosure, possibly a plantation enclosure; within P2005 plantation. **Maintain in area of open space.** |
| Walled enclosure III (1of 3 similar enclosures west of Benniguinea) | No | NX560760 | Part of a roughly square enclosure, possibly a plantation enclosure; poor condition within area of open space. **Maintain in area of open space.** |
| Carved boundary stone | No | NX567759 | Carved stone; on Benniguinea open hill top. **Maintain in area of open hill top.** |
| Nannie Walkers Was | No | NX558749 | Series of field system walls and sheep folds; various conditions in and through second rotation P1990s crop. **Maintain in area of open space.** |
| Sheep pens(Greenburn) | No | NX562743 | Ruins in P1952 plantation; possibly farmstead building remains. **Maintain in area of open space.** |
| Orchars field system | No | NX573734 | Series of field system enclosures; various conditions and currently within area of open space. **Maintain in area of open space.** |
| Sheepfold | No | NX572739 | Sheepfold of 6 compartments; in fair condition within area of P1953 plantation. |

| | | | |
|---|---|---|---|
| | | | **Maintain in area of open space.** |
| Craig Gilbert field system | No | NX581738 | Series of field system, enclosures and structures; various conditions partly on open ground to south of Craig Gilbert and partly within P1998 plantation.<br>**Maintain in area of open space.** |
| Cairn | No | NX592726 | Small cairn; adjacent to forest road in area of open space.<br>**Maintain in area of open space** |
| Craig Gilbert corn kiln | No | NX586739 | Corn kiln; adjacent to forest road in area of open space.<br>**Maintain in area of open space** |
| Tannoch settlement | No | NX603736 | Collection of unscheduled buildings and field system enclosures; occupied until the early 1900s, lying in mix of open ground and plantation of various age.<br>**Maintain in area of open space** |
| Gairloch settlement | No | NX573300 | Extensive sheepfolds and enclosures; in fair condition within area of open space.<br>**Maintain in area of open space.** |
| Upper Gairloch settlement | No | NX614728 | Farmstead and other structures and field system; various condition straddling open ground and plantation.<br>**Maintain in area of open space.** |
| Sheep pen | No | NX613431 | Sheepfold; in fair condition within plantation.<br>**Maintain in area of open space.** |
| Sheep pen | No | NX614721 | Two enclosures; in fair condition within P1964 plantation.<br>**Maintain in area of open space.** |
| Holmhead farmstead | No | NX616721 | Farmstead and enclosure; within P1999 plantation.<br>**Maintain in area of open space.** |
| Sheep pen | No | NX623712 | Sheepfold attached to north side of wall; in fair condition within open space.<br>**Maintain in area of open space.** |
| Cairn Edward cairn | No | NX628733 | Small cairn 2m high on Cairn Edward Hill said to have been built in 14th century.<br>**Maintain in area of open hill top.** |

| | | | |
|---|---|---|---|
| Cairn Edward well | No | NX634734 | Cairn Edward well (Chalybeate) lies slightly to east of old track in P2006 plantation.<br>**Maintain in area of open space.** |
| Milldown well | No | NX628739 | Well called Milldown well (Chalybeate spring) lies in P1951 plantation.<br>**Maintain in area of open space.** |
| Philip's Cairn | No | NX634737 | Small pile of stones marks spot where man called Philip was found dead; within P1951 plantation.<br>**Maintain in area of open space.** |
| Soldiers Memorial | No | NX644740 | WW1 memorial to local soldier.<br>**Maintain in area of open space.** |
| | | | |

# Appendix IV: Coupe details for clearfell and establishment

## Clearfell

| Coupe | SS | NS | Larch | SP | LP | Other con. | BL | Open space | Total |
|---|---|---|---|---|---|---|---|---|---|
| 60007 | 14.8 | - | - | - | - | - | - | 1.7 | 16.5 |
| 60014 | 39.2 | - | - | 4.5 | 1.5 | - | - | 0.5 | 45.7 |
| 60016 | 3.6 | - | 1.9 | - | - | - | - | - | 5.5 |
| 60019 | 35.0 | - | 1.2 | - | 1.5 | - | - | 10.0 | 47.7 |
| 60041 | 9.5 | - | 0.1 | 0.8 | - | - | - | - | 10.4 |
| 60043 | 7.3 | - | - | - | - | 3.0 | - | - | 10.3 |
| 60052 | 7.5 | - | - | - | - | 1.0 | 0.8 | - | 9.3 |
| 60090 | 4.0 | - | - | - | 1.0 | - | - | 2.6 | 7.6 |
| 60102 | 4.0 | - | 0.1 | - | 0.4 | - | - | 12.5 | 17.0 |
| 60129 | 7.0 | - | - | 4.1 | 2.8 | - | - | 0.7 | 14.6 |
| 60136 | 4.3 | 0.3 | - | - | 1.5 | 0.1 | - | 0.4 | 6.6 |
| 60140 | 23.0 | - | 1.7 | - | 8.8 | - | - | 0.7 | 34.2 |
| 60148 | 2.0 | 3.3 | - | - | - | - | - | 8.0 | 13.3 |
| 60149 | 44.4 | - | 0.5 | - | 19.7 | 0.8 | - | 1.0 | 66.4 |
| 60160 | 26.0 | - | - | - | 12.0 | - | - | 2.8 | 40.8 |
| 60179 | 2.9 | 1.0 | - | - | - | 7.0 | - | - | 10.9 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 60200 | 18.5 | - | - | 2.5 | 6.5 | - | - | 0.6 | 28.1 |
| 60206 | 6.4 | - | 0.9 | - | 5.6 | - | - | 3.8 | 16.7 |
| 60207 | 36.0 | - | - | - | 15.5 | - | - | 1.4 | 52.9 |
| 60219 | 1.5 | 3.2 | - | - | 1.5 | - | - | 7.1 | 13.3 |
| 60226 | 28.9 | - | - | - | 12.7 | - | - | 2.8 | 44.4 |
| 60227 | 16.0 | - | - | - | 10.0 | - | - | 0.8 | 26.8 |
| 60236 | 36.3 | - | - | - | 7.8 | - | - | 1.5 | 45.6 |
| 60246 | 6.3 | 0.8 | - | - | 1.4 | - | - | 5.1 | 13.6 |
| 60254 | 7.4 | 1.4 | 1.8 | 0.4 | - | - | - | 0.4 | 11.4 |
| 60255 | 14.0 | 1.0 | - | - | 12.2 | - | - | 1.3 | 28.5 |
| 60259 | 15.4 | - | - | - | 11.4 | - | - | 0.8 | 27.6 |
| 60266 | 1.5 | - | - | - | 0.4 | - | - | 0.1 | 2.0 |
| 60268 | 19.0 | - | 3.7 | - | 10.1 | 2.5 | - | 0.9 | 36.2 |
| 60270 | 29.3 | 3.5 | 2.7 | 1.1 | 13.5 | - | - | 2.8 | 52.9 |
| 60524 | 0.5 | 2.1 | 0.5 | - | - | 8.0 | - | 1.0 | 12.1 |
| total | **471.5** | **16.6** | **15.1** | **13.4** | **157.8** | **22.4** | **0.8** | **71.3** | **768.9** |

## Restock

| Coupe | SS | NS | Larch | SP | LP | Other con. | BL | Open space | Total |
|---|---|---|---|---|---|---|---|---|---|
| 60007 | 15.2 | - | - | - | - | - | - | 1.3 | 16.5 |
| 60014 | 21.4 | - | - | - | 21.4 | - | - | 2.9 | 45.7 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 60016 | - | 4.8 | - | - | - | - | - | 0.7 | 5.5 |
| 60019 | 33.2 | - | - | - | - | - | - | 14.5 | 47.7 |
| 60041 | 9.0 | - | - | 0.4 | - | - | - | 1.0 | 10.4 |
| 60043 | 7.3 | - | - | - | - | - | 2.5 | 0.5 | 10.3 |
| 60052 | 9.3 | - | - | - | - | - | - | - | 9.3 |
| 60090 | 7.2 | - | - | - | - | - | - | 0.4 | 7.6 |
| 60102 | - | 16.0 | - | - | - | - | - | 1.0 | 17.0 |
| 60129 | 12.8 | - | - | - | - | - | - | 1.8 | 14.6 |
| 60136 | - | 6.3 | - | - | - | - | - | 0.3 | 6.6 |
| 60140 | 13.7 | - | - | - | 13.7 | - | 2.0 | 4.8 | 34.2 |
| 60148 | 10.9 | - | - | - | - | - | 1.2 | 1.2 | 13.3 |
| 60149 | 54.8 | - | - | - | - | - | - | 11.6 | 66.4 |
| 60160 | 40.8 | - | - | - | - | - | - | - | 40.8 |
| 60179 | - | - | - | - | - | 5.4 | 5.5 | - | 10.9 |
| 60200 | 22.7 | - | - | - | - | - | 2.4 | 3.0 | 28.1 |
| 60206 | 11.0 | - | - | - | - | - | 3.1 | 2.6 | 16.7 |
| 60207 | 4.2 | - | - | 28.3 | 15.8 | - | 1.4 | 3.2 | 52.9 |
| 60219 | - | - | - | 13.3 | - | - | - | - | 13.3 |
| 60226 | 42.3 | - | - | - | - | - | 1.3 | 0.8 | 44.4 |
| 60227 | 18.3 | - | - | - | 3.5 | - | 2.0 | 3.0 | 26.8 |
| 60236 | 45.0 | - | - | - | - | - | - | 0.6 | 45.6 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 60246 | 12.9 | - | - | - | - | - | - | 0.7 | 13.6 |
| 60254 | 3.0 | 3.7 | - | - | 3.0 | - | 0.4 | 1.3 | 11.4 |
| 60255 | 11.3 | 0.7 | - | - | 11.3 | - | 1.2 | 4.0 | 28.5 |
| 60259 | 21.6 | - | - | - | - | - | 3.0 | 3.0 | 27.6 |
| 60266 | - | - | - | - | - | - | - | 2.0 | 2.0 |
| 60268 | 24.0 | 7.5 | - | - | - | - | 0.6 | 4.1 | 36.2 |
| 60270 | 22.6 | 4.5 | - | - | 22.6 | - | 0.7 | 2.5 | 52.9 |
| 60524 | 0.3 | 4.2 | 0.1 | - | - | - | 7.5 | - | 12.1 |
| total | **474.8** | **47.7** | **0.1** | **42.0** | **91.3** | **5.4** | **34.8** | **72.8** | **768.9** |

**Notes on coupe work schedule**

| | |
|---|---|
| 60007 | Core plantation; mainly SS with open space on coupe edges |
| 60014 | Core plantation coupe at elevation bounding Cairn Edward Hill open ground to west; mainly SS with open space on coupe edges and open ground boundary for landscaping |
| 60016 | Core plantation coupe visible from east side of Loch Ken; NS for RSSS species diversity and habitat connectivity with open space to forest road boundaries |
| 60019 | Core plantation coupe at elevation bounding Benbrack open ground to north; mainly SS with open space on coupe edges and open ground boundary for landscaping |
| 60041 | Coupe visible from east side of Loch Ken has Lowran Glen burn to east boundary; mainly SS with open space targeted to riparian zone |
| 60043 | Core plantation adjacent to east end of forest drive; mainly SS with DF for species diversity and open space on forest drive and coupe edges |
| 60052 | Coupe adjacent to east end of forest drive, highly visible from east; conversion to BL for amenity and biodiversity |
| 60090 | Core coupe part felled for *P ramorum*; mainly SS with open space on coupe edges |
| 60102 | Coupe highly visible from Clatteringshaws Loch side and Queens Way part felled for *P ramorum*; mainly NS with open space targeted to coupe edges |

| | |
|---|---|
| 60129 | Core coupe to east of Hope Hill; mainly SS with open space to coupe edge boundaries |
| 60136 | Visible coupe adjacent to forest drive; NS for RSSS species diversity |
| 60140 | Visible core plantation coupe above Darsalloch with open hill to south; mainly SS/LP mix with BL and open space for conservation benefits in Darsalloch Burn riparian / aquatic zone |
| 60148 | Part felled coupe(for *P ramorum*) highly visible from Queens Way; mainly SS with BL and open space targeted towards PAWS area and riparian / roadside edge |
| 60149 | Visible core plantation coupe above Darsalloch with open hill to south; mainly SS with open space to south |
| 60160 | Visible core plantation coupe above Darsalloch with open hill to west; pure SS restock |
| 60179 | Coupe visible from east on side of Loch Ken; conversion to BL / Mixed conifer for amenity and biodiversity |
| 60200 | Core production coupe bordering Green Burn to east; pure SS restock with open space and BL targeted to Green Burn riparian zone and coupe edges |
| 60206 | Core production coupe bordering Pullaugh Burn to west; SS/LP restock with open space and BL targeted to Pullaugh Burn and tributary riparian zone and coupe edges |
| 60207 | Core production coupe bordering Gormal Hill to east; SS, SP and LP restock (for species diversity)with open space and BL targeted to modest riparian zone and coupe edges |
| 60219 | Part felled coupe(for *P ramorum*) adjacent to Black Water of Dee; pure SP |
| 60226 | Core production coupe at altitude; pure SS restock with open space and BL targeted to riparian zone and coupe edges |
| 60227 | Core plantation; mainly SS or SS/LP with BL and open space for species diversity in Nick Burn riparian zone and forest road |
| 60236 | Core plantation coupe at elevation, immediately adjacent to Shaw Hill open hill ground to south; mainly SS with additional open space at elevation |
| 60246 | Part felled core plantation coupe(for *P ramorum*) adjacent to Black Water of Dee; mainly SS with open space targeted to riparian zone |
| 60254 | Core plantation, coupe lies adjacent to Pullaugh Burn to west; mainly SS/LP mix with NS, BL and open space for conservation benefits in riparian zone |
| 60255 | Core plantation, coupe lies adjacent to Pullaugh Burn to west and contains Loch Gower; mainly SS/LP mix with NS, BL and open space for conservation benefits in riparian / aquatic zones |

| | |
|---|---|
| 60259 | Core plantation; mainly SS with BL and open space for species diversity in Green Burn tributary riparian zones and forest road |
| 60266 | Fell with 50096, coupe at elevation and immediately adjacent to Shaw Hill open hill ground; open ground for landscaping |
| 60268 | Core plantation; mainly SS with NS for RSSS and BL and open space for species diversity in riparian zone |
| 60270 | Core plantation, coupe lies near open ground (Shaw Hill) to west; mainly SS/LP mix with NS and BL for conservation benefits in riparian zone |
| 60524 | Core plantation on PAWS; NS for RSSS out with PAWS, otherwise BL restoration of PAWS |

# Appendix V. Bennan Land Management Plan Brief

The main management objectives in this medium scale plan focus on core Timber production, Recreation (Raiders Road and Otter Pool facilities), the integration of Agricultural land, Conservation (priority species habitats) and large scale Landscape views (open space, water and species diversity).
The block lies around 9.0km west of New Galloway, Dumfries and Galloway

| Key Strategic Directions from Role of Scotland's National Estate | Local District Strategic Plan Priorities | Actions / Prescriptions |
|---|---|---|
| **Healthy:** good environmental and silvicultural condition in a changing climate | • Committed to high quality silviculture and increased use of alternatives to clearfell<br>• Stewardship of carbon resources in estate's trees and soils<br>• Adapt to climate change and make woodlands more resilient to pressure<br>• Deal with invasive species that threaten habitats and biodiversity | • *Increase* area of woodland managed under LISS particularly highly visible areas around along Raiders Road and adjacent to Queens Way A712 / A762 Laurieston to New Galloway road<br>• *Increase* area of broadleaf woodland and establish a wider range of conifer and broadleaf species diversity and use of natural regeneration in our restocking<br>• *Improve* resilience through use of Alternatives to clearfell and smaller coupe size<br>• Implement National deep peat restocking / restoration policy<br>• *Control* invasive species as per FES guidelines (specifically R. ponticum) |
| **Productive:** provide sustainable economic benefits from the land | • Contribute to local economy by maintaining core timber production<br>• Expand area of productive broadleaf and diversify timber markets<br>• Increase agricultural use of the estate<br>• Provide work in rural areas | • *Meet* production forecast commitment through revised felling /thinning plan (modify to accommodate extent of P ramorum infestation<br>• *Implement* road maintenance programme required to service harvesting operations<br>• *Increase* area of productive broadleaf<br>• Sympathetically *manage and develop* plantations surrounding and associated with farm tenancies(Laggan o' Dee) |
| **Treasured:** a multi-purpose resource that sustains | • Involve and engage with local people / encourage partnership | • *Improve and enhance* key visitor zone surrounds to Clatteringshaws VC and its associated viewcone through, increased species diversity and open space, |

| | | |
|---|---|---|
| livelihoods, improves quality of life and offers involvement and enjoyment | working<br>• Creation of unique special places<br>• Place for research and development | enhanced use of LISS and integrated management of open space within woodland<br>• In consultation with SNH *manage* Clatteringshaws dam quarry and adjacent Kenmure Holms and Laughenghie and Airies Hills SSSIs according to agreed SSSI management plans to maintain / achieve favourable status |
| **Accessible:** woodland that welcome and are open for all | • Improve access and enhance existing or invest in new facilities<br>• Use for health benefits and outdoor learning | • *Retain and improve* access and views to existing Core Paths, walking and cycle trail networks (Benniguinea viewpoint trail & SUSTRANS), core recreation facilities (Raiders Road, Otter Pool, Clatteringshaws VC, artworks) and *provide* a varied and enjoyable "must see" aspect of woodland experience and desitnation for visitors and local communities |
| **Cared for**: working with landscape and the natural and cultural heritage | • Improve / restore status and condition of Ancient Woodland sites<br>• Expand / enhance area of Native woodland<br>• Increase area of broadleaf cover<br>• Landscape<br>• Maintain open habitats in good ecological condition<br>• Priority species conservation (Black Grouse)<br>• Safeguard heritage features | • *Secure* remnants and *restore* PAWS woodland sites (mainly along Raiders Road)<br>• *Increase* area of native BL throughout plan area for added biodiversity benefits linking to internal and external ASNW sites(Birchhill Wood, area along Knocknairling Burn, unnamed sites ion eastern edge of Bennan Hill)<br>• Block is visually prominent from the A712 Queens Way and there are important internal views along the Raiders Road; *maintain and enhance* large scale landscape through enhanced use of LISS, additional species diversity, open space integrated management and revised coupe shapes to better suit landform<br>• Part of core Red Squirrel Stronghold Site (Fleet Basin); *maintain and enhance* area for Red Squirrel (priority species)<br>• *Maintain* lek and nesting areas for Black Grouse *and enhance* habitat through creation of woodland fringe<br>• *Maintain and enhance* Nightjar habitat areas<br>• *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 Dee catchment |

| | | |
|---|---|---|
| | | (Black Water of Dee)<br>• *Manage* minor heritage features as per FES guidelines |
| **Good value** | • Seek diverse range of income streams<br>• Reduce carbon emissions from business activities | • *Manage* nearby Visitor Centre in partnership with recreation and tourism related businesses |

**ACHIEVED BY PLAN**

HEALTHY

**Y** Committed to high quality silviculture and increasingly using alternatives to clearfell (LISS): significant area of LISS and other alternatives to clearfell in place particularly along Black Water of Dee valley

**Y** Committed to dealing with invasive species that threaten habitats and biodiversity: active *R.ponticum* control and monitoring of Grey Squirel and American Signal Crayfish is in place

**Y** Help the estate to adapt to climate change and become more resilient to pressure: targeted proactive control of *P ramorum* has been carried out throughout the block, increased species diversity is planned and an operational Deer management plan for the block is in place

PRODUCTIVE

**Y** Supply three million cubic metre of sustainable softwood nationally: design plan significantly contributes to the overall programme for the district

**Y / N** Manage at least one quarter of our expanding broadleaf woodlands to produce quality hardwood and fuelwood: modest increases in area of Broadleaf cover will focus on PAWS and ASNW restoration and is unlikely to be of a productive nature

**Y / N** Support Scottish Governments woodland expansion programme: block presents limited opportunities for woodland expansion

**Y** Plan to increase the agricultural use of the estate where this is consistent with environmental objectives: existing grazing tenancy presents the opportunity to act as a hub for the potential expansion of agricultural land use in the block

TREASURED

**Y / N** Committed to more unique special places across the estate and delivering benefits to a more diverse range of Scotland's people: block presents limited opportunities

**Y / N** Recognise the value of the Estate as a place for research and development of best practice: block has some potential for LISS development

**Y / N** Continue to use the Estate as a place for volunteering and gaining employment skills: currently there are limited opportunities within the block

ACCESSIBLE

**Y** Invest available resources into high quality facilities that encourage and help visitors experience and enjoy the outdoor experience: block presents significant opportunities for development of existing facilities (Otter's Pool, Raiders Road Forest Drive,artwork sites etc.)

**Y** Use estate for health benefits and outdoor learning: block is a popular and regularly used recreating area for both local area residents and a significant visitor demograph

CARED FOR

**Y** Restore 85%of areas on ASNW to native species: ongoing thinning and other identified work will significantly contribute towards district restoration targets
**Y** Increase BL tree cover from 8% woodland cover to 20%: block will only modestly contribute towards district's Broadleaf tree cover expansion targets
**Y / N** Committed to maintaining best open habitats in good ecological condition: block presents limited opportunities
**Y** Identify particularly vulnerable species for which the NFE is important and take specific conservation action (Black Grouse / Red Squirrel): felling programmes to sustain mature cone bearing habitat and enhance the block as a Red Squirrel Stronghold site and provide beneficial habitats for other priority species are in place
**Y** Safeguard archaeological sites through planning and management and recognise special places and features with local cultural meaning: there are important local archaeological heritage sites / features that will be managed accordingly

GOOD VALUE
**Y / N** Seek a range of income sources to underpin the cost of managing the Estate and look for ways to achieve best value in delivery of public benefits: block presents limited opportunities for income from sources other than timber
**Y** Work with partners to find new ways to harness our natural and cultural heritage and develop the estate's potential for tourism: continue to manage nearby Visitor Centre in partnership with recreation and tourism related businesses

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

**Bennan 601 catchment at risk / failing catchment**

See below for base catchment area detail as at 25 October 2017. The total area for this catchment that includes Black Water of Dee and Pullaugh Burn to Loch Ken is 2963.7ha. The failing catchment lies almost entirely within the Bennan LMP*.

| | |
|---|---|
| Open ground area (including open water) | 724.7ha |
| Plantation area | 2239.0ha |
| Total catchment area (within Bennan LMP) | 2963.7ha* |
| 20% of catchment | 592.7ha |
| 30% of catchment | 889.1ha |

In line with the UK Forestry Standard 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 entirely the case with no period exceeding 5.5% of the catchment.

| 3yr Fell period | Currently proposed felled areas (ha) | Proposed fell area as % of catchment area |
|---|---|---|
| 2018-20 | **163.1** | 5.5% |
| 2019-21 | **154.6** | 5.2% |
| 2020-22 | **96.4** | 3.3% |
| 2021-23 | **83.1** | 2.8% |
| 2022-24 | **40.8** | 1.4% |
| 2023-25 | **13.8** | 0.5% |
| 2024-26 | **94.5** | 3.2% |

| | | |
|---|---|---|
| 2025-27 | **94.5** | 3.2% |
| 2026-28 | **115.4** | 3.9% |
| 2027-29 | **73.5** | 2.5% |

The area of closed canopy conifer forest (age > 15years) needs to be less than 30% of catchment in 15 years' time i.e. 889.1ha. The table below confirms that under the current LMP proposals this is not achievable with the figure around 56.8%.
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 1684.8ha of plantation within the catchment over 15yrs age (assumes that felled areas will be restocked within 3yrs of felling subject to planned restock and Hylobius Management Support System).

| | |
|---|---|
| Current plantation area within catchment | 2239.0ha |
| Proposed felled area between 2018 -2032 (15yrs) | 554.2ha |
| Notional plantation area in 15yrs time > 15yrs age | **1684.8ha** |

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

All of the operations in Bennan 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 Bennan Land Management Plan will be included in this audit process.