Scottish Lowlands Forest District

Murdostoun & Mossband

Forest Design Plan

Approval date: 29th June 2015

Plan Reference No: 032/08/16

Plan Approval Date: 29th June 2015

Plan Expiry Date: 29th June 2025

FOREST ENTERPRISE - Application for Forest Design Plan Approvals in Scotland

CSM 6 Appendix 1b

Forest Enterprise - Property

Forest District:	Scottish Lowlands
Woodland or property name:	Murdostoun & Mossband
Nearest town, village or locality:	Shotts
OS Grid reference:	NS840604
Local Authority district/unitary Authority:	North Lanarkshire Council

Areas for approval

	Conifer	Broadleaf
Clear felling	97.16	2.50
Selective felling	6.76	
Restocking	19.25	
New planting (complete appendix 4)		

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

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

3. I confirm that the initial scoping of the plan was carried out with FC s 25/01/2013

4. I confirm that the proposals contained in this plan comply with the UK Forestry Standard.

5. I confirm that the scoping, carried out and documented in the Consultation Record attached, incorporated those stakeholders which the FC agreed must be included.

6. I confirm that consultation and scoping has been carried out with all relevant stakeholders over the content of the design plan. Consideration of all issues raised by stakeholders has been included in the process of plan preparation and the outcome recorded on the attached consultation record. I confirm that we have informed all stakeholders about the extent to which we have been able to address their concerns and, where it has not been possible to fully address their concerns, we have reminded them of the opportunity to make further comment during the public consultation process.

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

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

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

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

Date approval ends: .....

EIA Determination

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Mr Scott Gordon
Forestry Commission Scotland
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Conservator Keith Wishart

26th June 2014

Dear Mr Gordon,

Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999
Murdostoun and Mossband Forest Enterprise Design Plan

I refer to your application for our Opinion as to whether the work you are proposing within the Murdostoun and Mossband Forest Enterprise Design Plan will require our consent.

I can confirm that the work you propose will **not** require our consent.

In reaching this decision the following assumptions have been made:

- The detailed Forest Enterprise Design Plan will meet the requirements of the Scottish Government policy on the control of woodland removal and align with the current Forestry Commission Scotland guidance relating to peatland habitats.
- The detailed Forest Enterprise Design Plan will include a method statement explaining the methods that will be used to facilitate the restoration of the lowland raised bog.

This decision is valid for only five years from the date of this letter and shall cease to have effect beyond 26/06/2019. If you propose to carry out any of the work in your application beyond 26/06/2019 or propose any changes to the project details you must inform us beforehand and we will assess again whether you need our consent or not.

Yours sincerely

Tom Hobbs
Operations Manager

Protecting and expanding Scotland's forests and woodlands, and increasing their value to society and the environment
www.forestry.gov.uk/scotland

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Summary

Murdostoun and Mossband Forest Design Plan is a 10yr management plan for the two FES sites west of Shotts in North Lanarkshire. After 5 years the plan will be subject to review.

The forests are located on two separate Lowland Raised Bogs (LRB), both have been assessed as suitable for restoration. This plan details the current best practice for achieving restoration, and also details management of the remaining matrix of woodlands and open space.

The plan will deliver “Key Themes” of the Scottish Forest Strategy particularly Biodiversity and Environmental Quality; it shall also deliver towards the Scottish Government targets for Climate Change through Carbon Sequestration. See Appendix 3 Brief and Objectives.

1.0 Introduction:

1.1 Setting and context

Murdostoun Forest NS840604 is on a peatland unit in the upland plateau of the Tillan Burn. Mossband NS8603 contains an entire peatland unit and its surrounding fens. Two areas of bog adjacent to Murdostoun are identified by the Local Authority as Sites Important for Nature Conservation (SINCs), as is the whole of Mossband.

The remainder of the land surrounding Murdostoun is improved grazing for cattle and sheep, with a series of shelterbelts which were part of the Designed Landscape of the former Hartwood Castle. The land between the two forests is managed by James Hutton Institute.

South of Mossband is the policy woodland of the former Hartwoodhill Hospital, and there are other woods between Mossband and the town of Shotts to the east. Mossband and Murdostoun at the closest point are 400m apart. Total area is 196.3ha.

Map 1 Location & Context

1.2 History of the forest

Murdostoun has some broadleaf trees as hedgerows, pre-dating the phases of conifer planting in 1979, 1982, and 1985. The sites were planted with good intentions, when forestry policy was focussed on timber production and the biodiversity and carbon storage value of bogs was not fully understood or recognised.

Conifer growth is poor and patchy, and despite the age of the plantation and early attempts to drain the sites, much of the crop is small and uneconomic to harvest.

2.0 Analysis of previous plan

The previous plan does not include any operations, because at the time an assessment of all LRBs in the Forest District was being undertaken. This was incorporated into a wider study of the total FES resource, resulting in the FES Strategy for Lowland Raised Bogs 2012. During this process, the only actions taken by the FD were those agreed with SNH for specific designated sites, none of which are covered by this FDP. Also, the crops were not ready for harvesting, and so no felling and restocking was programmed.

3.0 Background information

3.1 Physical site factors

3.1.1 Geology, Soils and landform

Mossband and the majority of Murdostoun are within Scottish Middle Coal Measures Formation, overlain with Peat. On the western edge of Murdostoun is Passage Formation - Sedimentary Rock Cycles, Clackmannan Group Type. There is Scottish Lower Coal Measures Formation overlain with Devensian – Diamicton Till in the southeast corner extending northward as a tongue.

Murdostoun soils are mainly deep peat, with non-calcareous gley soils on the west/southwest edges. Peaty gley soil in the south-eastern half of the forest extends north as a tongue, almost to the northern boundary, and there is also a small area in the extreme NW edge. Mossband consists entirely of deep peat, with the typical dome shape of a LRB at its height at NS860602.

The landform is plateau farmland, and although the FDP area is the on the highest ground between Edinburgh and Glasgow, the rolling landscape means that the views are often limited. Beech hedgerows and other shelterbelts further enclose the views.

3.1.2 Water

The main watercourse is in Murdostoun; the Tillan Burn runs east to west along the extreme northwest boundary. Most of the drains run north towards Tillan Burn, which itself meets South Calder Water near Motherwell. The remaining area, and all Mossband with its main drain around the west and southern edges

of the dome, plus several side drains, all run north to south towards South Calder Water.

3.1.3 Climate

Murdostoun and Mossband fall within the Cool Wet Climatic zone. The accumulated temperature (day-degrees above 5.0C) is 1136 and 1169 respectively. Soil Moisture Regime is uniformly Wet. The Soil Nutrient Regime is medium to poor on the gley areas, and Very Poor on the deep peats forming the majority of the Plan area.

3.1.4 DAMS

Detailed Aspect Method Scoring (DAMS) is a measure of windiness of a site using the angle to the horizon in the eight compass points, weighted towards the prevailing wind direction. Scores range from 0-20: The higher the score the greater the exposure. DAMS on both sites are over 17, making them very exposed.

3.2 Biodiversity and environmental designations

3.2.1 Statutory Designations

There are no SSSI or other statutory biodiversity designations applying to the forest, nor to the surrounding area.

3.2.2 Local Nature Conservation Sites

LNCS are non-statutory sites of local importance for biodiversity and/or geodiversity features. Other terms include Wildlife Site (WS), Sites of Importance for Nature Conservation (SINC) and Regionally Important Geological / Geomorphological Sites (RIGS). The term Local Biodiversity Site (LBS) is used in the Lothians and includes WS and Scottish Wildlife Trust-identified sites

Two areas of unplanted bog adjacent to Murdostoun have SINC status, and the whole of Mossband is SINC. There are also some areas of LEPO adjacent to the boundaries of both sites with SINC status.

See Map 2 Key Features and Survey Information

3.2.3 Lowland Raised Bog

The main feature of both Mossband and Murdostoun is their Lowland Raised Bog. See also para 3.7

Lowland raised bog is a rare habitat with an estimated 28,000ha in Scotland (over 800 sites), of which only 2,500ha is in a near natural state[1].

North Lanarkshire has about 10% (c3724ha) of all lowland raised/intermediate bog cover in Scotland and 4.6% of all such cover in Great Britain. Since North Lanarkshire is c0.2% of the total land area of Great Britain, it contains a significant area of the remaining and best bog habitat in Scotland and UK[2].

Both sites have been assessed as suitable for restoration. See Appendix 4 for the reports. Also p26 of FES Strategy for LRB: "There will be a presumption against any restocking on sites which have been identified as suitable candidates for open habitat restoration on the basis of ecological advice."

Murdostoun & Mossband are both included in this Strategy: recommendation (5) "Initiate further lowland raised bog and intermediate bog restoration work on other plantation sites which are ecologically suitable for restoration", and their areas for restoration are noted as 99ha & 10ha respectively. See Table p30-31 of Strategy.

3.2.4 Ancient Woodland

Murdostoun has 4 separate areas of LEPO (Long Established Plantation Woodland) based on 1860 maps, one of which is SINC. Over half the area of Mossband is LEPO. There are also areas of LEPO adjacent to the boundaries of both sites.

The areas of LEPO composed of native species have been surveyed and results published as part of the Native Woodland Survey for Scotland. A selection of parameters is shown in the Table below; this shows that the native woodland LEPO are mainly composed of young trees, and of good quality (in conservation terms) Upland Birch or Wet Woodland. There are opportunities to link several areas, to each other, and to adjacent LEPO areas.

See Map 2 Key Features and Survey Information

[1] Strategy for Lowland Raised Bog and Intermediate Bog on the National Forest Estate in Scotland 2012-2022
[2] North Lanarkshire LBAP: Bogs Action Plan 2008

Table 1 Selected attributes of Native Woodland LEPO in/near Murdostoun and Mossband. Taken from published NWSS information, and Ancient Woodland maps.

*Woodland ID – **ref Map 2***	*Nativeness[3] %*	*Semi-naturalness[4] %*	*Herbivore Impact*	*Habitat*	*Maturity*	*Invasives*
Murdostoun						
1 LEPO	*90*	*100*	*Light-mod*	*Upland Birch*	*mixed*	*none*
2 LEPO	*95*	*100*	*Light-mod*	*Upland Birch*	*Mixed*	*None*
3 LEPO	*70*	*100*	*Light-mod*	*Upland Birch*	*Mixed*	*None*
4 LEPO	*65*	*100*	*Light-mod*	*Upland Birch*	*Mixed*	*None*
5 LEPO	*65*	*100*	*Light-mod*	*Upland Birch*	*Mixed*	*None*
Non-FC 6 LEPO	*65*	*100*	*Light-mod*	*Upland Birch*	*young*	*None*
Non-FC 9 LEPO	*70*	*100*	*Light-mod*	*Upland Birch*	*Mixed*	*None*
Non-FC 10	*80*	*100*	*Light-mod*	*Wet Woodland*	*Young*	*None*
Mossband						
7	*80*	*100*	*Light-mod*	*Upland Birch*	*Young*	*None*
Non-FC 8	*100*	*100*	*Light-mod*	*Wet Woodland*	*Young*	*None*
Non FC 11	*100*	*100*	*Light-mod*	*Lowland Mixed Deciduous*	*Young*	*None*

[3] % of canopy composed of site-native species

[4] % of canopy that has arisen naturally as opposed to being planted

3.2.5 Indicative Habitat Network

The Central Scotland Green Network IHN illustrates in map form, areas of theoretical connectivity of three different types of habitat, by overlaying dispersal zones over the existing areas of broadleaved woodland, wetland, and neutral grassland. In future, a model will be produced for heathland. The plan area is all within the hotspot zone for broadleaved woodland, and the IHN illustrates potential linkages in Murdostoun, particularly in the west. Mossband is zoned as existing broadleaved woodland habitat.

3.2.6 Species

3.2.6.1 Birds

A walkover survey April – November 2011 of Murdostoun and the farmland to the south as part of a developing bid to site a windfarm, noted 61spp including breeding curlew and oystercatcher on adjacent SINC bogs. None of the species recorded are of concern *and* reliant on woodlands. In fact, the converse is the case: bog restoration will benefit the species of conservation concern. See Table 2.

Table 2 Bird species recorded during field surveys, their conservation status, special legal protection and seasonal occurrence. (R=resident, B=breeding, W=winter, P=passage, O=occasional). Species are listed in approximate taxonomic order.

Common Name	Scientific Name	Conservation Status	WCA Schedule 1	Birds Directive Annex	Seasonal occurrence
Mute swan	*Cygnus olor*	GREEN		II(B)	R
Pink-footed goose	*Anser brachyrhynchus*	AMBER		II(B)	P, W
Greylag goose	*Anser anser*	AMBER	1	II(A), III(B)	R
Canada goose	*Branta canadensis*	NOT ASSESSED			O
Teal	*Anas crecca*	AMBER		II(A), III(B)	O
Mallard	*Anas platyrhynchos*	AMBER		II(A), III(A)	W
Red kite	*Milvus milvus*	AMBER	1	I	O
Sparrowhawk	*Accipiter nisus*	GREEN			R
Buzzard	*Buteo buteo*	GREEN			R
Kestrel	*Falco tinnunculus*	AMBER			R
Merlin	*Falco columbarius*	AMBER	1	I	O
Peregrine	*Falco peregrinus*	GREEN	1	I	O
Oystercatcher	*Haematopus ostralegus*	AMBER		II(B)	B
Golden plover	*Pluvialis apricaria*	AMBER		I, II(B)	P
Lapwing	*Vanellus vanellus*	RED		II(B)	W
Snipe	*Gallinago*	AMBER		II(A), III(B)	B

Common Name	Scientific Name	Conservation Status	WCA Schedule 1	Birds Directive Annex	Seasonal occurrence
	gallinago				
Curlew	*Numenius arquata*	AMBER		II(B)	P
Common gull	*Larus canus*	AMBER		II(B)	O
Herring gull	*Larus argentatus*	RED		II(B)	P, W
Stock dove	*Columba oenas*	AMBER		II(B)	W
Cuckoo	*Cuculus canorus*	RED			O
Barn owl	*Tyto alba*	AMBER	1		B
Tawny owl	*Strix aluco*	GREEN			B
Great spotted woodpecker	*Dendrocopos major*	GREEN			R
Magpie	*Pica pica*	GREEN		II(B)	R
Jay	*Garrulus glandarius*	GREEN		II(B)	R
Hooded crow	*Corvus corone cornix*	GREEN		II(B)	P
Raven	*Corvus corax*	GREEN			O
Goldcrest	*Regulus regulus*	GREEN			R
Blue tit	*Parus caeruleus*	GREEN			R
Great tit	*Parus major*	GREEN			R
Coal tit	*Parus ater*	GREEN			R
Skylark	*Alauda arvensis*	RED		II(B)	B, P
House martin	*Delichon urbica*	AMBER			B
Long-tailed tit	*Aegithalos caudatus*	GREEN			R
Chiffchaff	*Phylloscopus collybita*	GREEN			B
Starling	*Sturnus vulgaris*	RED		II(B)	R
Blackbird	*Turdus merula*	GREEN			R
Fieldfare	*Turdus pilaris*	RED	1	II(B)	W
Song thrush	*Turdus philomelos*	RED		II(B)	R
Redwing	*Turdus iliacus*	RED	1	II(B)	W
Robin	*Erithacus rubecula*	GREEN			R
Dunnock	*Prunella modularis*	AMBER			R
House sparrow	*Passer domesticus*	RED			B
Pied wagtail	*Motacilla alba*	GREEN			B
Meadow pipit	*Anthus pratensis*	AMBER			B
Chaffinch	*Fringilla coelebs*	GREEN			R
Greenfinch	*Carduelis chloris*	GREEN			B
Goldfinch	*Carduelis*	GREEN			R

Common Name	Scientific Name	Conservation Status	WCA Schedule 1	Birds Directive Annex	Seasonal occurrence
	carduelis				
Siskin	*Carduelis spinus*	GREEN			B
Lesser redpoll	*Carduelis cabaret*	RED			B, P
Crossbill	*Loxia curvirostra*	GREEN	1		O

Taken from the draft Ornithology chapter of the Environmental Statement for Hartwood Wind Farm. Data collected By Alba Ecology Ltd

3.2.6.2 Protected Species

Otters, bats, and badgers are the protected species relevant to Murdostoun and Mossband. Ecological surveys were carried out to identify breeding sites and habitats in most of Murdostoun, as part of a developing bid to site a windfarm. In addition, FCS staff have recorded sites and sightings over the years. Mitigation for protection of these species is detailed in section 5.7.5. Species locations are sensitive and exact location is not detailed in this plan.

3.2.6.3 Otters

Otter signs were found on the Tillan Burn; one old and desiccated spraint, and the other fresh. This indicates that probably one individual includes the Burn in its territory, and visits occasionally. The drains within the forest are mostly vegetated with sphagnum to the extent that no running water is apparent, and so it is unlikely that otters are using them except perhaps as summer foraging for amphibians.

3.2.6.4 Bats

Bats are known to be present in the area, from a survey in 2012 and casual observation. Mature broadleaved trees in the LEPO woodlands and boundary hedgerows were found to host mainly pipistrelle bats, and bat feeding forays were noted along edges of these habitats, and on the linear rides within the forest but not over the canopy or within in the plantation. Species recorded are soprano pipistrelle, and brown long-eared bat.

3.2.6.5 Badgers

Badger setts have been identified on site, and will be fully considered as part of operational planning. The setts are not shown in this Design Plan, as a precaution against disturbance.

3.2.6.6 Water Voles

Water voles were not found to be present in Murdostoun, but two areas of suitable habitat were noted on the north boundary. Any operations proposed in

this plan will only improve the habitat. During management activities, best practice will be followed in line with FC Forests and Water Guidelines.

3.2.6.7 Great Crested Newt

The ponds in Murdostoun have been assessed and were found to be unsuitable for GCN, and the species is considered unlikely to be present. A pond at Jersey, however, does hold suitable habitat, although no survey for them has taken place.

There are no suitable habitats within Mossband and the neighbouring Shotts Village Nature Park has a small network of ponds these have been surveyed by CSGNT and GCN were not present. North Lanakshire Council confimed a sighting some 5 km south of the site at Darngavel farm, south of the former Damside Opencast site. The closest recorded presence on the National Biodiversity Network Gateway is near Seafield in West Lothian.

3.2.6.8 Additional UKBAP Species

Other UKBAP species recorded in the plan area are:

- Song Thrush
- Lesser Redpoll
- Small pearl-bordered fritillary

3.3 Utilities:

3.3.1 OHPL

Two 33kV OHP lines run in parallel through Murdostoun. These are delineated by an unplanted wayleave. At Mossband, a low voltage wire crosses the legal access track where it leaves the county road in Shotts.

3.3.2 Gas

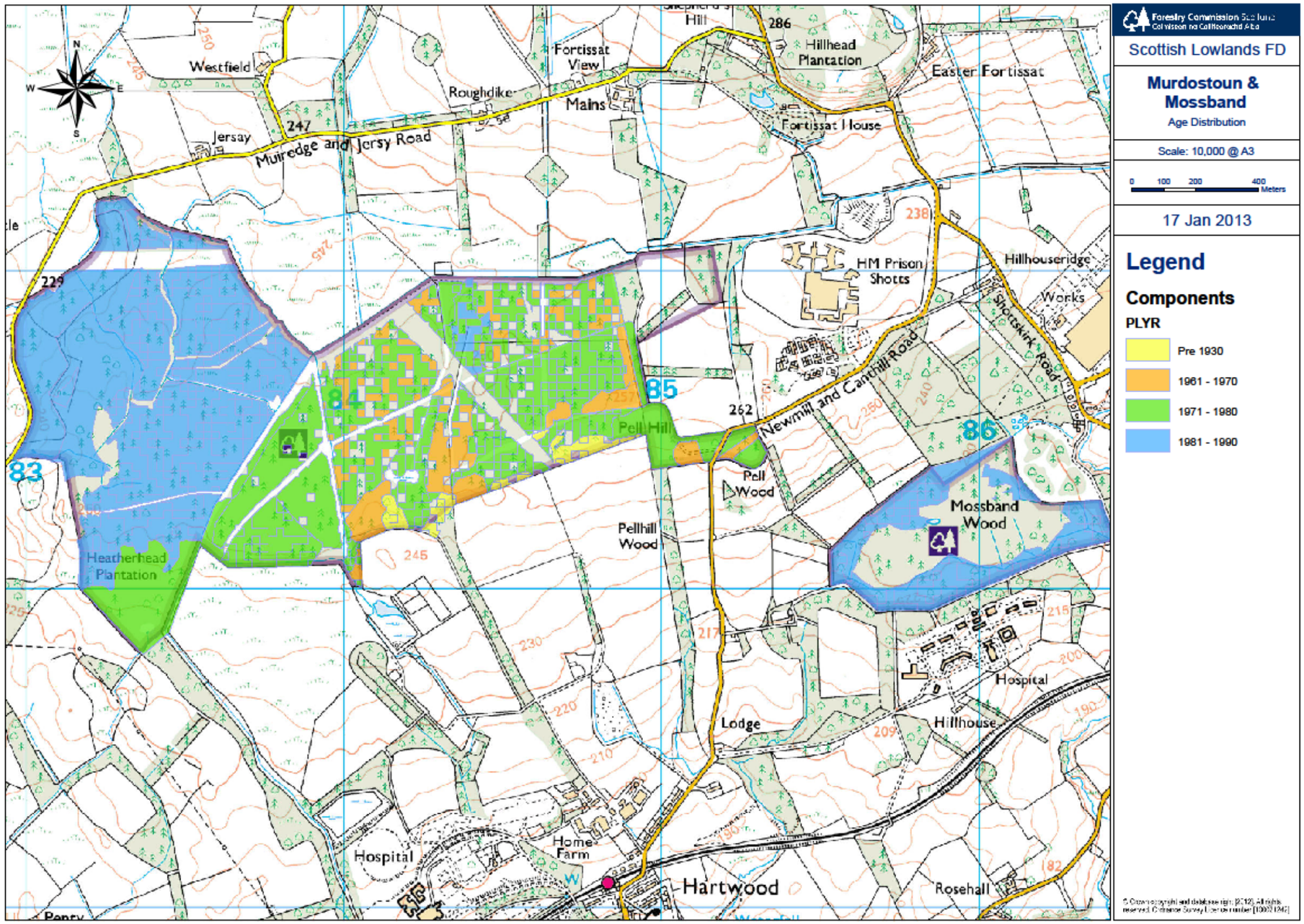
A gas pipe runs along the track on the south boundary of Mossband.

See Map 2 Key Features and Survey Information

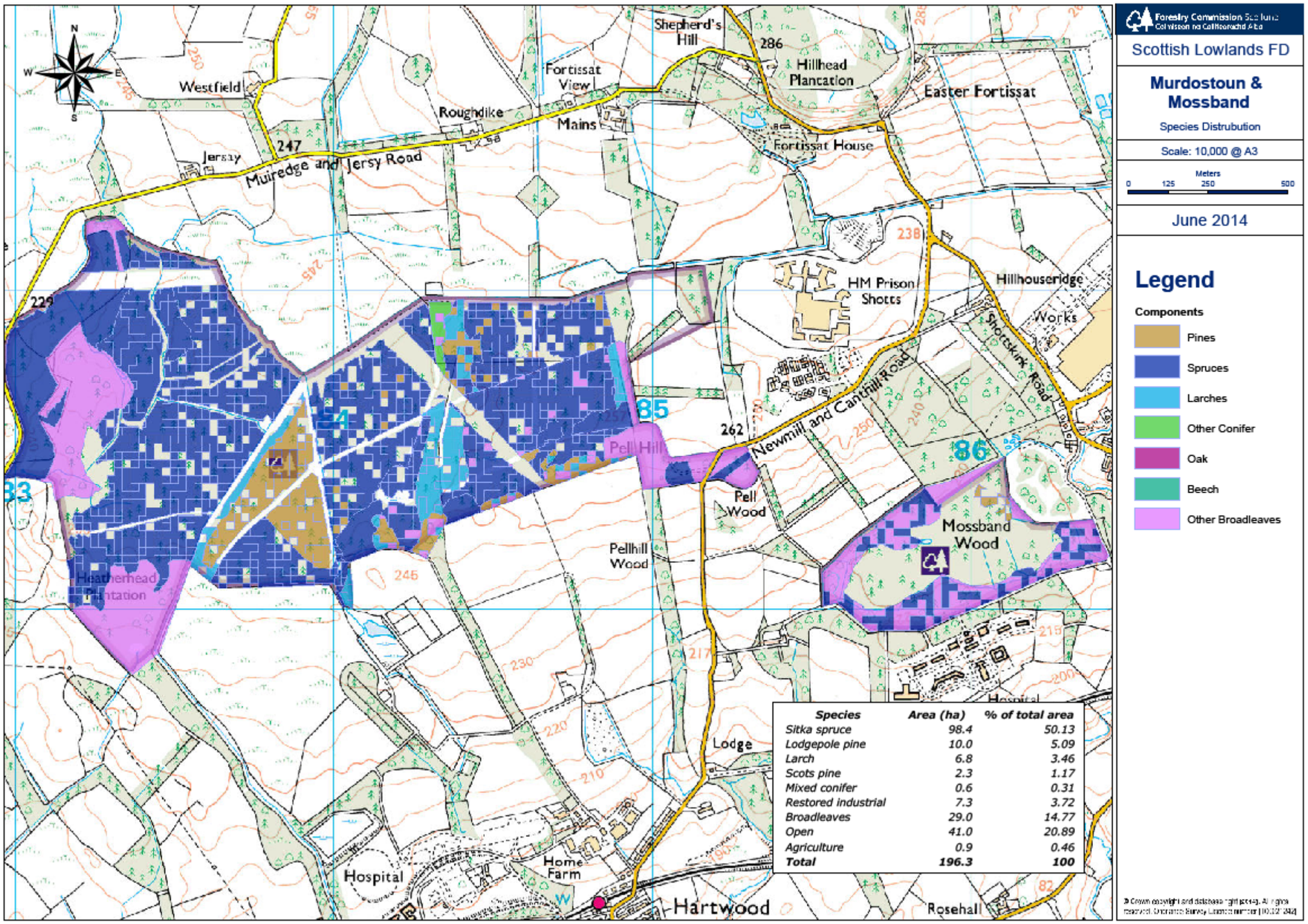
3.4 The existing forest:

3.4.1 Age structure, species and yield class

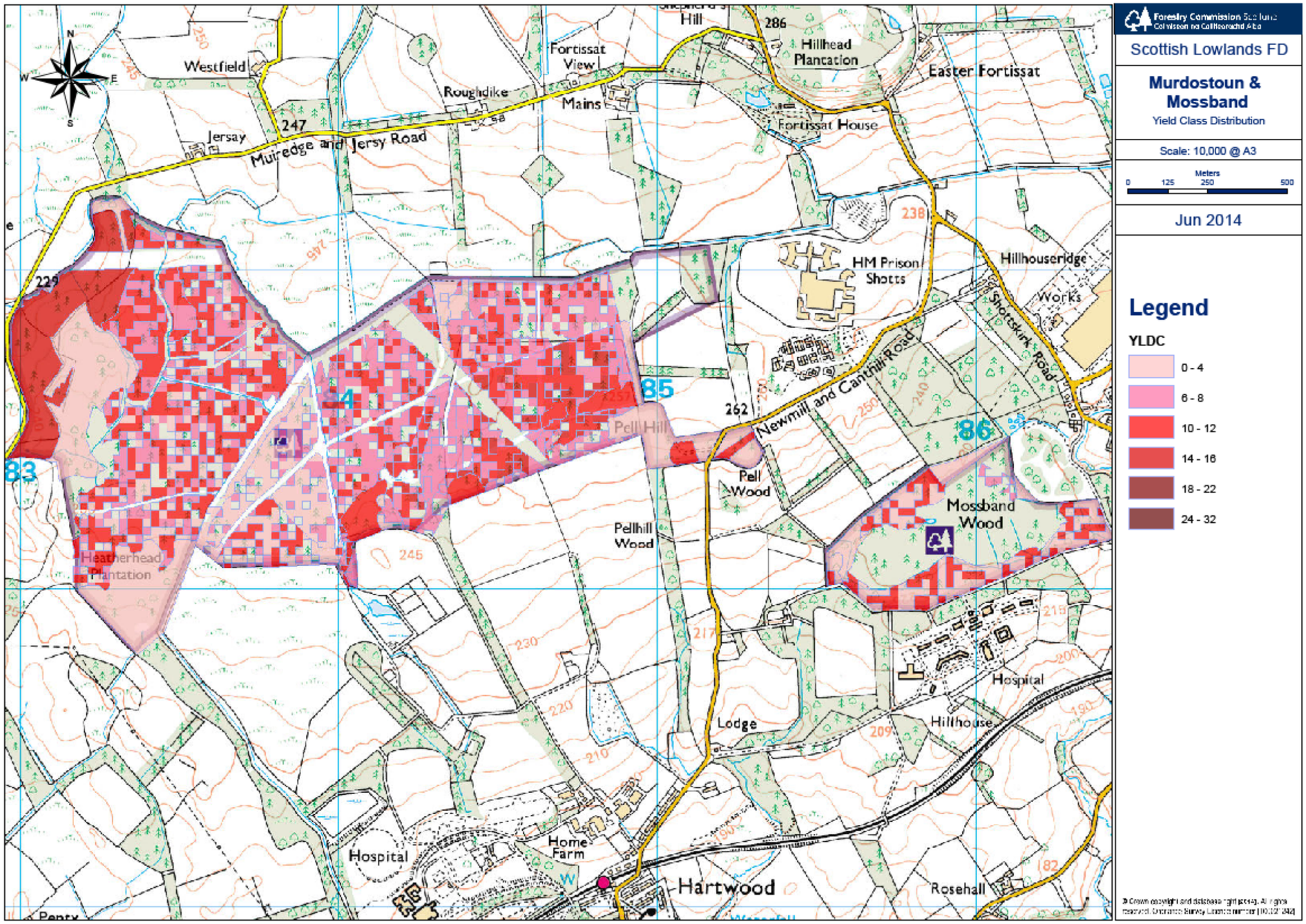
The Plan area was planted during the 1970s and early 1980s. The different planting years indicate how difficult it was to establish a forest on Murdostoun.



The majority of the forest area is Sitka spruce, with Lodgepole pine forming the majority of pine areas and downy birch making up the majority of other broadleaved areas. In the map below, the small blank squares in Murdostoun reflect the low stocking in the centre of the bog, and the species table below indicates that over 20% of total plan area is open space.



Yield Class is a measure of growth rate of a given tree species. It ranges from 0 (in check) to 16. The map below shows that despite the draining work and fertilising, tree growth has been poor on the bog.



3.4.2 Access

Access to the east end of Murdostoun is from the Newmill & Canthill road between Kirk of Shotts off the M8, and Allanton on the A71. There is also access to the west end from the minor Muiredge & Jersay road leading off the above. There is only one short section of forest road at the east end, and a short grass-covered track at the west end. Mossband is accessed from an unclassified public road (a track) along its south and west edge, and this is sufficient for future management.

3.4.3 LISS potential

The very wet and exposed conditions indicate a high likelihood of endemic windblow, but the native woodlands including much of the LEPO area, can be managed under LISS. Since the main objective for the plan area is biodiversity, the continuing supply of deadwood of varying ages caused by windblow, will add further 'value' to the sites.

3.5 Landscape and Landuse

3.5.1 Landscape character and value

In terms of the SNH Landscape Character Assessment, Murdostoun and Mossband straddle the boundary between Central Plateau Moorland to the north, and Central Plateau Farmlands to the south. Apart from the two areas of unplanted bog north and south of Murdostoun, the landscape is improved farmland with a series of shelterbelts, part of the Designed Landscape based around the old Hartwood castle. To the south of Mossband is the policy woodland of the former Hartwoodhill Hospital, and other areas of woodland to the east between Mossband and the town of Shotts.

3.5.2 Visibility

Due to the topography of the surrounding landscape and its network of shelter belts and hedgerows, Murdostoun and Mossband have limited visibility from the wider landscape, though the forest edges are clearly visible from the surrounding minor roads. The southern edge of Murdostoun, when viewed from some of the hills further south, forms part of the backdrop to the dramatic building of the old Hartwood Hospital. Any other key views are from surrounding farms and scattered dwellings.

3.5.3 Neighbouring Landuse

There are a number of private settlements and farms in the surrounding area, in addition to Shotts to the east and Hartwood to the south. The James Hutton Institute manages the farmland between the southern boundary of Murdostoun and Mossband, and there are two areas of good

quality bog adjacent to the north and south boundaries. Most of other surrounding land is predominately improved or semi-improved grazing with shelterbelts.

Map 2 Key Features and Survey Information

3.6 Social factors

3.6.1 Recreation

The two short sections of road at east and west edges of Murdostoun show signs of use by horse riders and dog walkers, who are also using the ridges of drier ground, and alongside some of the hedgerows. The very wet ground elsewhere, however, discourages public access. In Mossband, use is limited to the edges. To the south, east & west, Mossband is bounded by north Lanarkshire Councils Core path network routes 258 &257. Route 220 passes through north eastern edge of Murdostoun route 220. These routes connect to and form part of Right of way No. 34.

3.6.2 Community

Mossband is a WIAT site, albeit with poor direct access and infrastructure. Although the site is used very little for community purposes, the Beat Ranger has been involved with school and nursery activities in CSFT's Nature Park adjacent. An area at the east end of Murdostoun, just at the end of the forest road has been used, on a regular basis by Burnhouse School, Whitburn, to run Forest School for pupils with additional support needs.

3.6.3 Heritage

The small number of heritage features are all unscheduled sites, mostly within the LEPO areas, and consist of old quarry workings, estate boundaries, and in the west edge of Murdostoun, a few stone walls and beech hedgerows.

Map 2 Key Features and Survey Information.

3.7 Statutory requirements and key external policies

3.7.1 Lowland Raised Bog

The extent of loss of this habitat across Europe has meant that even degraded raised bog has been accorded a priority status on the European Habitats Directive (Annex 1) and active raised bogs are a Priority Habitat (Annex 1). This habitat type is a UK Biodiversity Action Plan Priority, and is subject to National and Local Habitat Action Plans.

3.7.2 Protected Species

European Protected Species are listed on the EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna (Habitats Directive) as species of European Community Interest and in need of strict protection. The Habitats Directive is transposed into domestic legislation by The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended 2004, 2007 and 2008)

4.0 Analysis and Concept

4.1 Analysis

Through survey work and research, constraints and opportunities have been identified and analysed to reach the proposals detailed in the plan. Details of the Analysis of constraints and opportunities are in the table below and on:

Map 3 Analysis and Concept

Factor	Opportunity	Constraint	Concept Development
Timber production	Plant productive broadleaves and/or conifers.	Presence of lowland raised bog, so concern about seed rain & hydrology impacts. Machine access limited and tree growth rates poor on majority of site.	Consider productive broadleaves on previously farmed land in W of Murdostoun.
Climate/soils	Site conditions offer opportunity to restore bog, and increase priority habitat woodland.	Limited tree species choice on wet, nutrient-poor soils Considerable area of deep peat not to be replanted.	Species selection made using ESC principles, subject to requirements for successful bog restoration.
Thinning	Through DAMS analysis identify any comparatively stable parts of the retained woodland area.	Exposed, wet site limits management options. Cost of extra roading for management.	Identify any suitable areas and include in FD thinning programme.
Biodiversity including Priority Habitats	Protect current functioning of LRB, and increase its capacity to function effectively. Protect and increase interest of LEPO, and link areas. Incorporate proposals of CSGN Integrated Habitat Network.	Expense & extent of continuing management required cannot be predicted reliably. Some of conifer-stocked LEPO area is also LRB, so conflicting objectives. Threat of seed rain on to LRB. Restoring LRB is higher priority.	Identify LRB restoration area, and include in FD programme. Prepare LRB management plan, to include drain blocking, removal of subsequent NR, and periodic monitoring. Retention of existing broadleaves, including mature (non-native) individuals in hedgerows; expansion using NVC-matched native trees and shrubs to link areas of LEPO. Include LEPO in FD AW Management Plan. Link areas of LEPO in W Murdostoun with NVC-matched woodland.
Hydrology	Bog restoration will retain water on site & contribute to reducing peak flows downstream.		Incorporate bog restoration, including drain blocking.

Factor	Opportunity	Constraint	Concept Development
	Water courses provide opportunity to increase habitat networks, using native broadleaves as part of habitat creation.	Bog restoration takes priority over other habitats.	Plant native woodland NVC types where appropriate to improve habitat networks.
Protected species	Improve habitat for protected species.	Mitigation to be employed during operations. Seasonal working under licence near badger setts.	Incorporate improvements through Work Plans
Landscape	Enhance views of edges of Murdostoun as seen from surrounding minor public roads. Also internal ridge, seen from Allanton, and from A71 when travelling west.	Large scale clearfell on bog will impact on views from the few houses to the north.	Any planting out-with the bog i.e. on edges will be sympathetic to landscape.
Recreation	Already regular informal use of the short roads and SE section of Murdostoun, and edges of Mossband.	Site conditions severely restrict informal access in the interiors of the two sites.	Partnership working with neighbours to develop options for improved access nearby. Any additional roading & conversion to native woodland will offer improved access for general public.
Community	Mossband is a WIAT site. Beat Ranger has been involved with school/nursery activities in CSFT's adjacent Nature Park.	Site conditions severely restrict access within the interiors of the two sites.	Partnership working with neighbours to develop options for improved access/involvement nearby, and volunteer work to restore LRB at Mossband.
Access by FC	Possible windfarm development will improve vehicle access.	High cost of roads in relation to low predicted timber income.	Identify route of additional forest roads/forwarder routes required for harvesting.

Factor	Opportunity	Constraint	Concept Development
Historical Features/Archaeology	Opportunity to protect and enhance archaeological sites as part of LEPO and native woodland management. Creation of open-space buffers around archaeology provides improved informal access, and added biodiversity within the LEPO woodland matrix.		Buffers used as recommended to enhance features and become part of habitat network and improve accessibility.
Utilities & Rides	Active bog-forming vegetation still flourishes in unplanted rides and wayleaves.	Ensure any restocking kept back to recommended wayleave distances.	Protect vegetation in wayleave and rides from machinery, and encourage its spread into felled areas by damming drains.

4.2 Concepts of the plan

The primary intention of the plan is to start the process of restoring a damaged but still high quality LRB, but at the same time to meet the other priorities in the brief (Appendix III): Climate Change, Timber, Community Development, Access & Health, Environmental Quality, and other Biodiversity.

The aim of the plan is for this area of the national forest estate to deliver:

- An increased area of functioning Lowland Raised Bog, which helps meet biodiversity and carbon sequestration targets.
- Limited broadleaf timber production, helping to meet carbon sequestration targets as well as timber supply.
- Enhancement of remaining LEPO, and additional areas of Native Woodland to help connect to wider woodland habitat networks
- A contribution to reducing peak flows downstream in Clyde catchment.
- Improved setting for the limited number of heritage features.
- Additional opportunities for recreation.
- Improve opportunities for the local community of Shotts, by developing volunteer work, and through increased partnership working with neighbours.

5.0 Forest Design Plan Proposals

5.1 Forest Stand Management

The plan has been designed in accordance with sound environmental principles, falling within the framework outlined by the UK Forestry Standard, the UK Woodland Assurance Scheme, FC Bulletin 124 Ecological Site Classification for Forestry, and the current FC edition of Forest and Water Guidelines.

Murdostoun plan predominately relates to LRB restoration; however the remaining areas of woodland are to be managed in accordance with the above and will require future treatments.

5.1.1 Clearfell

During the period of the plan, the phased tree removal on the LRB will begin. This woodland removal satisfies the Criteria of The Scottish

Government's Policy on The Control of Woodland Removal and will not require compensatory planting as it is "enhancing priority habitats and their connectivity". The only commercial coupes, in Murdostoun, will also be harvested.

Table of felling volumes

Coupe	Productive Clearfell		Unproductive (LRB Restoration Area)		Total Volume m³	Total Area Ha
	Vol m³	Area Ha	Vol m³	Area Ha		
Phase 1 Felling (2015 - 2019)						
78057	200.26	0.50			200.26	0.50
78953	3777.78	14.80			3777.78	14.80
78000	3168.75	10.41			3168.75	10.41
78068	179.51	1.46	418.90	3.14	598.41	4.60
78249			723.61	5.22	723.61	5.22
Phase 1 Totals	7326.30	27.17	5066.27	26.47	8468.81	35.53
Phase 2 Felling (2020 - 2024)						
78062			3923.76	18.11	3923.76	18.11
78053			7373.70	40.98	7373.70	40.98
78054			704.66	2.54	704.66	2.54
Phase 2 Totals	0.00	0.00	12002.12	61.63	12002.12	61.63

Clearance of the lowland raised bog area will require the clearance of areas identified as LEPO the vast majority of these areas are currently under commercial plantation and as such, the soils have been significantly altered by ground preparation and fertilisation and do not exhibit the flora that would normally be associated in an ancient woodland site.

5.1.2 Thinning & LISS

The high exposure severely limits opportunities for thinning and Low Impact Silvicultural Systems. Cleaning and low thinning 'to waste' will take place in the broadleaved woodland. The intention is to increase the deadwood content, and improve scope for broadleaf timber production in the few areas accessible for harvesting.

The Sitka spruce will be thinned from the LEPO surrounding Mossband LRB, leaving birch-dominated broadleaved woodland.

See Map 4 Felling & Thinning

5.2 Future habitats and species

Open Lowland Raised Bog habitat complemented with native woodland, are proposed. The intention is to convert the conifer woodland to native woodland on the western edge of Murdostoun, where traces of old farming are still evident. The other area of better soil in SE Murdostoun, which includes some LEPO, is to be felled and then grazed as part of the overall bog management. Although this latter area might seem suitable for restocking to conifer, the reasons for not doing so are

- To facilitate future grazing management of the LRB: the economics of scale
- To minimise effects on hydrology of the bog
- To reduce risk of damaging seed rain and consequent tree regeneration on the bog.

The expansion of native woodland by restocking will be matched to the soils and ground vegetation, using the guidelines in the Forestry Commissions Ecological Site Classification (ESC) Bulletin 124. This uses the climatic zone, soil moisture and soil nutrient to recommend the type of woodland most suited to the site.

Species are selected in accordance with ESC principle for both productive conifer and native woodland areas. Biosecurity, however, now has a major impact on species choice in all UK forests.

Map 5 Future Habitats & Management

5.3 Lowland Raised Bog Restoration Management Method

Although Murdostoun and Mossband peatland areas are not designated SSSIs, they will be managed in a similar way, as funds become available to begin clearance:

- Approx. 109ha of mainly spruce and pine are to be clearfelled or mulched.

- Herbicide application to be applied to broadleaf stumps, and any regrowth.

- Plan for drain blocking will be produced, specifying SNH current best practice and using experienced contractors. In the FES Strategy App4 p32, Mossband has ‘been shortlisted for surveys to prescribe management such as ditch blocking etc’

- The sites will be monitored, and tree regeneration removed, additional dams installed and/or grazing regime altered as required.

- Grazing will be considered for both areas of bog, and if feasible, the sites stock fenced and a grazing tenant secured at the appropriate grazing levels.

5.4 LEPO Management

The LEPO in Murdostoun will be managed as a natural reserve and at Mossband the LEPO will be managed under LISS to gradually restore to native woodland. While areas of LEPO will be lost to the lowland raised bog restoration, restocking areas out with the bounds of the bog will endeavour where possible to connect the isolated areas of LEPO and generally expand where possible the areas of broadleaves with appropriate NVC species. Areas of LEPO loss are as follows:

- Mossband 8.0ha
- Murdostoun 4.1ha

The areas of LEPO overlap with lowland raised bog are shown on Map 2 - Key Features

All other broadleaved elements of these blocks will be managed towards native woodland removing non-native species under minimum intervention or low impact silviculture throughout the period of the plan.

5.5 Protected Species

The plan aims to improve habitat for protected species. The native woodland expansion will have no negative impact on existing protected species, as they are mostly in the areas of LEPO and within buffered riparian edges or watercourses. The woodland removal and drain blocking on the bogs, and the linking of LEPO areas will enhance and enrich opportunities for species. All operations will adhere to best practice including SNH approved FCS Guidance notes and, if required, licenses to carry out operations will be applied for.

5.6 Community

Although the plan area is for the most part unsuitable for safe community use

- FD staff will look for opportunities to build links with local community groups and schools, possibly in partnership with neighbouring CSGNT in their Nature Park.

- There may also be scope to take adjacent woodland under FC management, which would allow more on-site involvement of local people.

- Volunteering work could contribute to the restoration of the bog in Mossband e.g. by removing NR by pulling or cutting. This aspect is noted in the FES Strategy for LRB: P26 para 8 “There are sites, such as Mossband where local community / school involvement could be encouraged. The site is small and at a practical scale for supervised voluntary work such as scrub cutting and ditch blocking - action that both makes a difference and volunteers can feel proud of.”

5.7 Critical Success Factors

5.7.1 Lowland Raised Bog

Continue to monitor cleared bog for tree regeneration and vegetation response to drain blocking. Incorporate additional drain blocking and tree regeneration removal into FD work programmes.

5.7.2 Native Woodland Expansion

Opportunities exist within Murdostoun to expand native woodland and create linkages between existing isolated LEPO areas. The James Hutton Institute have also expressed interest in planting low production fields with native woodland some of which are directly adjacent Murdostoun and Mossband. Existing native woodland will be monitored for non-native species eg Sitka spruce regeneration, and remove if their extent threatens to compromise objectives.

5.7.3 Pests and Disease

Continue to monitor forest for Dothistroma Needle Blight (DNB) and Phytophthora ramorum (P. ramorum) and additional forest pests through SLFD surveys programme in line with national guidance. Where required, apply for licence to carry out operation out-with the approval of this plan.

Appendix 1: Forest Design Plan Consultation Record

Statutory Consultee	Date contacted	Date response received	Issue raised	Forest District Response
Scottish Natural Heritage	21/05/14	10/06/14	None – referred to EIA Determination response	Requested EIA determination response from Conservancy
Charles Cefferty – Councilor - Fortissat Ward	21/05/14	No Response By 20/06/14	N/A	N/A
Thomas Cochrane Councilor - Fortissat Ward	21/05/14	12/06/14 Verbal	Supportive	N/A
James Robertson Councilor - Fortissat Ward	21/05/14	No Response By 20/06/14	N/A	N/A
Salsburgh Community Council	21/05/14	12/06/14 Verbal	Supportive, SLFD attended council meeting	N/A
Morag Forsyth Shotts Community Council	21/05/14	No Response By 20/06/14	N/A	N/A
Dave Sutton NLC Conservation Officer	21/05/14	No Response By 20/06/14	N/A	N/A
Hayley Andrew NLC Senior Officer - Access	21/05/14	No Response By 20/06/14	N/A	N/A
Neville Makan SNH Area Access Officer	21/05/14	No Response By 20/06/14	N/A	N/A
Laura McCrorie Senior Biodiversity Officer	21/05/14	No Response By 20/06/14	N/A	N/A
Douglas Worrall CSGNT	21/05/14	No Response By 20/06/14	N/A	N/A
Donald Barrie Home Farm Manager	21/05/14	20/06/14	Highly supportive	Requested Future collaborative working
Mr. and Mrs. J Wight East Fortissatt Farm	21/05/14	19/06/14	Expressed Concern regarding Agricultural holding	Responded to concerns & offered 1 to 1 meeting.
Statutory Consultee	Date contacted	Date response received	Issue raised	Forest District Response

Mr. George Baillie Neighbour	21/05/14	No Response By 20/06/14	N/A	N/A
Mr. and Mrs. Wagstaffe Resident	21/05/14	No Response By 20/06/14	N/A	N/A
Mr. Martin Casey Roughdyke Farm	21/05/14	No Response By 20/06/14	N/A	N/A
The Occupier South View Roughdyke Farm	21/05/14	No Response By 20/06/14	N/A	N/A
The Occupier Fortissat View	21/05/14	No Response By 20/06/14	N/A	N/A
The Occupier Fortissat Mains	21/05/14	No Response By 20/06/14	N/A	N/A
The Occupier Shuttlehill	21/05/14	No Response By 20/06/14	N/A	N/A
The Occupier Fortissat House	21/05/14	No Response By 20/06/14	N/A	N/A
Mr. Forrest Coleman Gartness House	21/05/14	No Response By 20/06/14	N/A	N/A

Appendix 2: Tolerance Table

	Adjustment to felling coupe boundaries	Timing of restocking	Change to species	Windthrow response
FC Approval not normally required	0.5 ha or 5% of coupe - whichever is less	Up to 3 planting seasons after felling	Change within species group e.g. evergreen conifers; broadleaves	Up to 2ha - if mainly windblown trees
Approval by exchange of letters and map	0.5ha to 2ha or 10% of coupe - whichever is less			> 2ha to 5ha in areas of low sensitivity
Approval by formal plan amendment	> 2ha or 10% of coupe	Over 3 planting seasons after felling	Change species from broadleaf to conifer	> 5ha

Appendix 3: Forest Design Plan Brief and Objectives

The work of Forestry Commission Scotland (FCS) is guided by the Scottish Forestry Strategy 2006, which sets out seven Key Themes:-

- **Climate change**
- **Timber**
- **Business development**
- **Community development**
- **Access & health**
- **Environmental quality**
- **Biodiversity.**

From this Strategy, Scottish Lowlands Forest District prepared a ten year Strategic Plan in 2007, which after public consultation, was finalised in 2009. This draws on the most important strands of the Key Themes relevant to the forest areas we manage, and sets out the policies and objectives under which other District plans are prepared and monitored.

In preparing the Brief and Objectives for this Forest Design Plan (FDP), issues were grouped under these Key Themes and assessed for their importance. Those relevant are in Table 1 below.

Table 1. Relevant issues under the SFS Key Themes

SFS Key Theme	Issues assessed as relevant by staff team for Murdostoun FDP
Climate change	Carbon sequestration, as effected by bog restoration Interest in Murdostoun from wind farm developer
Timber	Broadleaf production Access constrained by site conditions, and surrounding public roads
Community development	Existing community groups and/or partnerships Volunteering opportunities
Access & health	Informal access restricted by site conditions Improve access facilities in surrounding area through partnership working eg CSFT Hartwoodhill Hospital (now demolished) site as likely future housing.
Environmental quality	Unscheduled monuments (archaeological remains) Bog restoration reducing peak flows of South Calder Water
Biodiversity	Lowland Raised Bogs are restoration candidates in FES LRB Strategy Native woodland/LEPO and potential to expand and link sites

Following the analysis above, Table 2 sets out the Brief and Objectives agreed for developing the management proposals for Murdostoun and Mossband.

Table 2. Initial Brief and Objectives for developing management proposals

Brief	Objectives
Climate change	• Begin process of LRB restoration
Incorporate productive tree species where feasible	• Implement timber production where site conditions and access are suitable, subject to LRB requirements.
Community Development	• Work with partners to increase local involvement
Optimise access to improve recreational opportunities locally.	• Maintain clean access points. • Develop option for circular route round the perimeter of Mossband. • Strengthen links with CSFT's Nature Park adjacent to Mossband
Preserve landscape and historic features	• Protect the existing hedgerows. • Protect known historic features
Increase biodiversity value	• LRB restoration • Remove self-seeding conifer (SS & LP) from LEPO areas. • Expand and link areas of native woodland

Appendix 4:

LRB site survey reports and assessments

a) Murdostoun

4.a.1 Russell Anderson

4.a.2 Jeff Waddell

Appendix 4: Cont.

LRB site survey reports and assessments

b) Mossband

4.b.1 Russell Anderson

4.b.2 Jeff Waddell

Support documents: Maps

Map 1 Location map & Context

Map 2 Key Features & Survey Information

Map 3 Analysis and concept

Map 4 Felling & Thinning

Map 5 Future Habitats & Management