Forestry and Land Scotland
Coilltearachd agus Fearann Alba

Central Region Lewinside Wood

Land Management Plan 2021-2031

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

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

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Approval date: 08 /07/2021 Plan Reference No: 032/21/05

Plan Approval Date: 8 July 2021 Plan Expiry Date: 7 July 2031

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Land Management Plan Details			
LMP Name:	Lewinside Wood		
LMP Number	032/21/05		
Plan Period: (ten years) (day/month/year)	From: 8 July 2021	To: 7 July 2031	
Grid Reference:	NS 941 502	Nearest town or locality:	Braehead, Forth
Local Authority:	South Lanarkshire Council Hamilton ML3 0AA		
Land Management Plan area (hectares):	65.4		

Owner's Details			
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Contents

1.0 Summary of Proposals

This Land Management Plan sets out proposals to be undertaken by the Central Region in order to create a resilient mixed woodland on a former agricultural site at Lewinside, Braehead.

This plan sets out proposals for a mixed coniferous productive woodland, together with native broadleaf planting to enhance the habitat provision on the site. This native planting will include the creation of a riparian corridor alongside Mouse Water, which forms the western boundary, and surrounding the pond and habitat area associated with the former Laigh Greenholes Lime Works to the east of the site. Areas of open space will be retained and enhanced to improve biodiversity provision on site, and will incorporate an appropriate setting for the heritage features found both within and outwith the block. Where possible, the existing mature trees which comprise an outgrown agricultural hedgerow will be retained and incorporated into the planting areas in order to provide structural interest and corridors for wildlife across the site.

Lewinside is within the Central Scotland Green Network (CSGN) boundary and delivers towards several of the project themes and objectives, principally associated with places which are resilient to a changing climate and places which include habitats for nature.

The Concept and Future Habitats and Species maps illustrate the long-term vision for the site's transformation.

2.0 FCS Regulatory Requirements

Approval is sought for the creation of 49.97 hectares of new woodland.

2.1 Summary of planned operations

Table 2.1: Summary of planned operations

Planned Operations	2021-2031
Felling	0 Ha
Thinning	0 Ha
Woodland Creation (planted area)	49.97 Ha
Natural Regeneration	0 Ha
Road Construction	336 m

2.2 Proposed felling in years 2021- 2031

There is no proposed felling within the 10 year plan period.

2.3 Proposed thinning in years 2021-2031

There is no proposed thinning within the 10 year plan period.

2.4 Woodland creation in years 2021-2031

49.97 hectares of woodland creation through new planting is proposed in this plan. Species prescriptions are described in section 7.2.

It is assumed that due to the historic land use, that there would not be sufficient seed source to establish any areas of woodland through natural regeneration during the lifetime of this LMP.

Map 5: Future Habitats and Species

2.5 Access and roading 2021-2031

336m of new roading, in two sections across the site, including one new bellmouth entrance from the public road, is proposed in this plan.

Map 6: Roading, Fencing and Access

2.6 Departure from UKFS Guidelines

The UKFS standards will be met through the delivery of this plan.

2.7 Standards and guidance on which this LMP is based

This land management plan has been produced in accordance with a range of government and industry standards and guidance as well as recent research outputs. A full list of these standards and guidance can be found online at:

Standards and Guidance on which LMP is based.

3.0 EIA Screening Determination for forestry projects

Proposed Work							
Please put a cross in the box to indicate the type of work you are proposing to carry out. Give the area in hectares and where appropriate the percentage of conifers and broadleaves							
Proposed Work	Select (X)	Area (ha)	Conifer	Broad-leaves	Proposed work	Select (x)	Length (m)
Afforestation	X	49.97	60.2%	39.8%	Forest roads	X	336m
Deforestation					Forest quarry		
Location of work	Across the Lewinside block						

3.1 Proposed deforestation

There is no proposed deforestation within the 10 year plan period.

3.2 Proposed forest road works

336m of new forest roads are proposed in this plan.

3.3 Proposed forest quarries

There are no proposed forest quarries within the 10 year plan period.

3.4 Proposed afforestation

49.97 Ha of afforestation on previous agricultural land is proposed in this plan.

New planting proposals, including species description and design, are detailed in section 7.2 and the supporting Future Habitats and Species map.

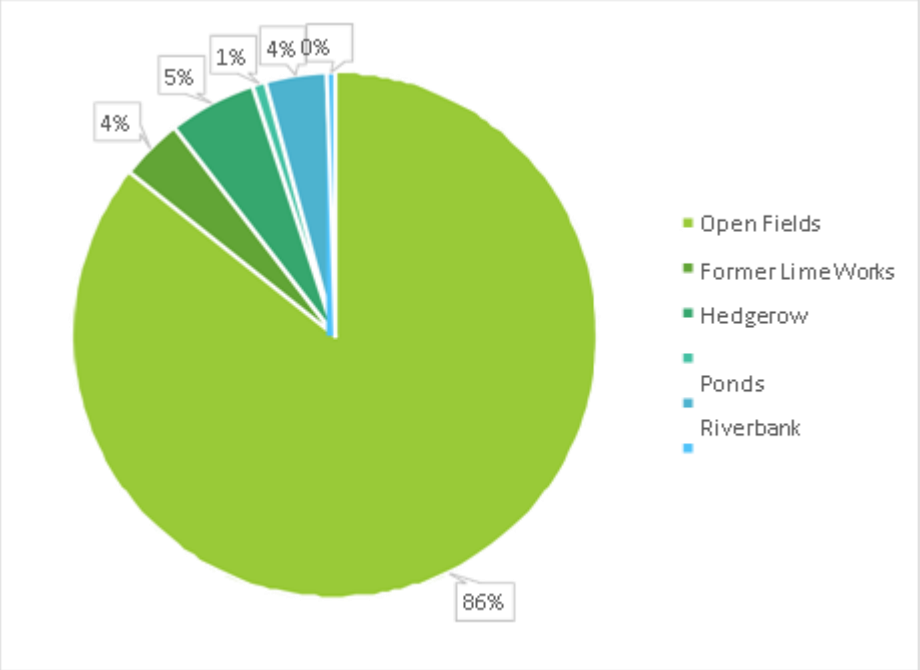
4.0 Introduction

See: Map 1: Context, Setting and Viewpoints

4.1 The existing land holding

Lewinside is 65.4 hectares in total. Prior to acquisition by FLS, the farm was historically used for dairy cattle, with sheep grazing taking place since the acquisition until planting takes place. The current land use is as follows:

Figure 1: Lewinside existing land use breakdown 2021



In addition to the land use illustrated above, the site includes 0.6ha of land (predominantly over open agricultural land) which forms part of a buffer to the Brewshott Quarry Scheduled Monument, which sits adjacent to the boundary, and approximately 5000m (approximately 5.4ha) of existing outgrown hedgerow.

See: Map 2: Existing Site

4.2 Setting and context

Lewinside is situated towards the northern extents of South Lanarkshire. The site falls within the Nature.Scot Landscape Character Assessment's 'Plateau Farmland - Glasgow and Clyde Valley' Landscape Character Type (LCT) (produced under Scottish Natural Heritage (SNH)). It is in close proximity to both the 'Rolling Farmland - Glasgow and Clyde Valley' and 'Plateau

Moorlands - Glasgow and Clyde Valley' LCTs, to the south and north respectively, and there is intervisibility between the western part of the site and these areas. The 'Plateau Farmland – Glasgow and Clyde Valley' LCT is described as a landform which is exposed by virtue of being open, extensive and flat, or gently undulating. It has a dominant pastoral land use, demonstrated by a large-scale field pattern, with some mosses remaining or under restoration. Urbanisation and industrial land use has resulted in diminishing tree cover in the area, with the majority of tree cover comprising over-mature field boundary trees and shelterbelts. Existing areas of forestry are present, including in close proximity to Lewinside, to the north of Carstairs and Carnwath.

The local landscape includes several villages such as Braehead (~500m to the north east), Forth (~2.7km to the north), Carstairs (~3.7km to the south) and Carnwath (~4.7km to the south east). Other neighbours include the residential properties at Winnyknowe and High Acres, Brewshot, Wester Braehead, West Yett and Cockrig Farms, and the hamlet of Muirhouse.

The site is indented by a small existing woodland 'Winnyknowe Wood'. There are several Forestry and Land Scotland (FLS) woodlands in the wider landscape. The Mosses' westernmost area is ~1.9km to the south east, West Forth's southernmost area is ~1.9km to the north, and Kingshill and Heathland are located in the wider landscape to the north west and north east respectively. These blocks predominantly comprise Sitka spruce, Lodgepole pine and mixed native broadleaves.

4.3 LMP Presentation

The Lewinside LMP covers a relatively small area and therefore has not been divided into zones, and is presented as a whole area.

5.0 Plan Objectives

The Land Management Plan Brief (Appendix III) illustrates objectives derived from the Forestry and Land Scotland Corporate Plan 2019-2022 and how these relate to Lewinside and the Management Objectives listed in section 5.3. The following Issues and Key Challenges have been considered during formulation of the Management Objectives and initial scoping meeting with FLS team members.

5.1 Issues

The key features and management considerations for Lewinside are illustrated on the Existing Site and Context, Setting and Viewpoints maps and can be summarised as:

- Recognising designated and undesignated heritage features and responding as appropriate, including maintaining the Brewshott Quarry Scheduled Monument buffer as open space;
- Existing habitat on-site, including the riparian zone and habitats associated with the ponds and former Laigh Greenholes Lime Works in the eastern part of the site; and
- Maintaining appropriate buffers to the overhead and underground utilities which cross the site;
- Forestry and Land Scotland's contribution to Scottish Government woodland expansion targets (further detail in Appendix III).

5.2 Key challenges

The key challenges for Lewinside revolve around the successful establishment of new planting and sensitivity to the existing landscape, heritage and environment. These include:

- Balancing an appropriate mixed species selection to maximise productivity while also ensuring a sensitive approach to planting within the riparian corridor, in proximity to the ponds and Laigh Greenholes Lime Works, adjacent the Lewinside farmhouse and within the vicinity of nearby dwellings; and
- Herbivore management while new planting is establishing.

5.3 Management objectives

The management objectives for Lewinside are:

- To establish a new productive and resilient mixed woodland for long-term sustainable timber supply, through considered species selection and using silvicultural systems which have been applied appropriately to respond to soil conditions, habitat types and proposed operational variables across the site;
- That the protection and establishment of planted crops is ensured through game management, including options for fencing during establishment and active management through establishment on to the long-term;
- To contribute to the conservation and enhancement of the site's biodiversity value through appropriate design e.g. tree species choice, retaining areas of priority open habitat and mature existing trees where possible, creating and improving habitat for protected and LBAP species and the riparian corridor;
- To protect historical features and maintain access to the Scheduled Monument and other heritage assets;
- To support research through collaboration with external partners to include an ash archive on part of the site;
- To protect water quality through the inclusion of a riparian buffer zone and consideration of topography on the site through the design;
- To include opportunities for informal public access into and around the site; and
- To design the boundaries of the site and planting area to minimise visual impact for the properties adjacent to the site and the property within the site.

6.0 Analysis and concept

6.1 Analysis

Table 6.1: Concept development through analysis of the opportunities and constraints of the objectives

Objective		
Opportunities	**Constraints**	**Concept**
To establish a new productive and resilient mixed woodland for long-term sustainable timber supply, through considered species selection and using silvicultural systems which have been applied appropriately to respond to soil conditions, habitat types and proposed operational variables across the site		
Lewinside benefits from good quality soils across a large area within the site, allowing for the consideration of a range of productive conifer species. The network of existing hedgerow trees provides some shelter, particularly in the west of the site, allowing for the inclusion of some more wind sensitive species, including ash (see below).	The site is relatively exposed, with DAMS scores (windiness values) which are generally too high for the successful establishment of a number of productive species, including most productive broadleaf planting.	The site will be planted with a combination of predominantly mixed productive conifer, which reflects the quality of the soils, and riparian wet woodland and native woodland planting for long term retention, where productive planting is not suitable (as well as the ash archive area described below).
That the protection and establishment of planted crops is ensured through game management, including options for fencing during establishment and active management through establishment on to the long-term		
Bringing Lewinside into a formal deer management programme will reduce browsing pressure on both the new woodland and the established woodland areas within and adjacent to the site.	Landscape scale buy-in is required to achieve effective deer control. Increased recreational access to the site can disturb and constrain deer management operations.	There will be a formal and strategic deer management programme, including the installation of access infrastructure to facilitate operations. Vulnerable tree species will be protected through a combination of individual tree guards, fencing and deer management throughout establishment, as guided by population surveys and Herbivore Impact Assessment.

Objective		
Opportunities	**Constraints**	**Concept**
To contribute to the conservation and enhancement of the site's biodiversity value through appropriate design e.g. tree species choice, retaining areas of priority open habitat and mature existing trees where possible, creating and improving habitat for protected and LBAP species and the riparian corridor		
Existing on site habitat includes: • Riparian corridor and small inlet; • Open habitats associated with the heritage features both outwith and within the boundary, including several associated ponds; • Mature hedgerow trees, predominantly beech; and • A range of species including barn owl and badger.	The existing hedgerow trees are in varying condition and a balance between reinforcing this habitat and the new planting proposals as a whole will need to be struck. Habitat provision is balanced with productivity and access objectives across the site, to ensure financial and social sustainability.	The various habitat types will be protected, expanded, complimented and connected through a well-designed planting of new, mixed woodland. Habitat and food availability will be improved across the site with planting of a combination of broadleaf and conifer tree and shrub species. Riparian, woodland and hedgerow habitats across the wider landscape will benefit from improved connectivity across the site.
To protect historical features and maintain access to the Scheduled Monument and other heritage assets		
Lewinside benefits from the former Laigh Greenholes Lime Works in east of the site as well as lime clamps which are registered on the National Monuments Record of Scotland. Following the sale of the farm buildings and associated land, the section of the Brewshott Quarry Scheduled Monument which is currently within the block will no longer be in FLS ownership. However access to it will remain immediately adjacent to FLS land.	Both the Laigh Greenholes Lime Works and Scheduled Monument have buffer zones (10m and 20m respectively) which will need to be considered within the design of the proposals. The open grassland of the former Laigh Greenholes Lime Works (and Scheduled Monument prior to its sale).	Access to both the Laigh Greenholes Lime Works and Scheduled Monument will be preserved within the proposals through informal routes. The open space buffers (to the Laigh Greenholes Lime Works, and on FLS land to the east and south of scheduled monument) will be in turn buffered by broadleaf planting. Options for maintaining the Laigh Greenholes Lime Works as open space will be considered, including potential low intensity grazing.

Objective		
Opportunities	**Constraints**	**Concept**
To support research through collaboration with external partners to include an ash archive on part of the site		
The Future Trees trust, in partnership with DEFRA and Forest Research, are looking for a potential location to plant a living archive of ash (*Fraxinus excelsior*) trees, which have been shown to be genetically resilient to Ash Dieback (*Hymenoscyphus fraxineus*). An area within the Lewinside block is being considered for this planting.	The timescales for this project do not align with the land management planning process, therefore a contingency plan will need to be included for the potential Ash Archive area in case the site is assessed as not suitable for the project.	An area to the immediate east of the road which bisects the block will be assigned as a 'research plot' to accommodate the Ash Archive. An alternative proposal for broadleaf planting will be developed, should the land be assessed as not suitable for the archive.
To protect water quality through the inclusion of a riparian buffer zone and consideration of topography of the site through the design		
Mouse Water runs along the western boundary of the site. The westernmost fields are relatively flat flood plain.	The topography of the site is generally falling westwards towards the watercourse.	The proposals will follow the UKFS Water Guidelines. This will include the design of the planting, and well as the delivery, including ground preparation and the creation of any drains, managed and, where relevant, harvested. The proposals include a substantial new riparian native woodland, which will be a permanent feature on the site, managed as minimum intervention.
To include opportunities for informal public access into and around the site		
The site is situated to the west of the village of Braehead. There is a core path which leads from the village to the road which bisects the site, through Winnyknowe Wood. There is potential to provide informal access to enhance this route and create a 'loop' back to the village.	The site is not suitable for the provision of parking spaces. Recreational opportunities will be focused on local residents who can travel by non-motorised means.	Informal access points will be included within the design of the proposed planting areas, with gates provided in any fencing which is installed. Opportunities for recreation on the site will be focused on the eastern part of the site, in proximity to Braehead.

Objective		
Opportunities	**Constraints**	**Concept**
To design the boundaries of the site and planting area to minimise visual impact for the properties adjacent to the site and the property within the site		
The topography of the site and network of existing hedgerow trees will help reduce the visual impact of the new planting as it establishes.	There are some properties, particularly those in Muirhouse, to the south of the site, which have views towards the interior of the site. The proposed planting layout will need to be considered with views from these properties in mind. Hedgerows as linear features which divide the site into an historic field pattern, together with the utilities lines could result in a blocky design for the proposed planting.	Buffer planting along the watercourse, routes of the utility lines and to the roads and internal buildings will augment the existing hedgerow trees in creating a permanent forest edge which will help to limit the impacts of views from the surrounding area in the longer term.

6.2 Concept

The attached Concept map spatially illustrate the strategies and prescriptions designed to deliver the plan objectives, with the site's opportunities and constraints (as detailed above) taken into consideration.

Map 4: Concept Map

7.0 Long Term Land Management Plan Proposals

The long term vision for the site is illustrated in the accompanying Future Habitat and Species map. Further details are provided in this section.

Map 5: Future Habitat and Species

7.1 Long Term Management

All proposals have been designed in accordance with sound silvicultural and 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 & Water Guidelines.

As this site is a new acquisition and the majority of the site is unplanted farmland, management and restock coupes have not been created for this plan. The Future Habitats and Species map shows the outline of the species choices and shapes within the site and these can be broken down into the following land uses and management types:

- Productive Conifer: Where the areas of the site where these trees will be planted is
- suitable, it is envisaged that thinning will be undertaken as part of a future plan, followed by a defined silvicultural system which will also be decided in a future plan;
- New Non-Productive Native Woodland and Wet Woodland: These areas will be managed as Minimum Intervention. There may be some re-spacing and thinning suggested in future plans where site conditions are suitable.
- Existing Hedgerow Tree Shelterbelts: A small number of the existing trees located along the roadsides are in decline and require some intervention to make safe, otherwise these trees will be managed as Minimum intervention;

- Ash Archive: This area is a potential research plot which will be delivered in partnership with DEFRA and the Future Trees Trust to test the suitability of Ash trees which have been shown to be genetically resilient to Ash Dieback. Further details of the management of these trees is outlined in section 7.1.3 below;
- Ash Archive Alternative: Productive broadleaf species will be planted should the Ash
- Archive not go ahead. It is envisaged that thinning of this planting will be undertaken as part of a future plan, followed by a defined silvicultural system which will also be decided in a future plan; and
- Open habitat: areas of open habitat will be maintained as appropriate.

7.1.1 Thinning and Future Management

There are no proposed thinning or harvesting operations within this plan period.

All bar the easternmost part of the site is considered suitable for thinning in terms of soils and DAMS (exposure). Future thinning will be confirmed, along with decisions to manage the planting as CCF / LISS or clearfell systems within a subsequent plan.

7.1.2 Minimum Intervention

Planting of areas of mixed native and wet woodland will be delivered as part of this plan. These areas will generally be managed under a Minimum Intervention prescription. This will consist of planting as it is assumed that there will not be sufficient seed source to establish planting through natural regeneration in the lifetime of this plan. In addition, some weeding operations will be required during the establishment phases. Once established, natural processes and succession will be allowed to develop in this new planting areas, which include:

- Riparian woodland along Mouse Water;
- New shelterbelt planting between the roadside and Ash Archive area;
- Wet woodland planting in the east of the site;
- Broadleaf and shrub planting adjacent to utilities corridors and in the vicinity of the Lewinside farmhouse; and
- Other areas of non-productive native woodland planting.

Minimum Intervention management for the existing hedgerow trees will consist of ongoing minor and focused operations on arising issues only, such as tree safety operations for example.

7.1.3 Ash Archive

An area of the block is being considered as a potential research plot in partnership with the Future Trees Trust and DEFRA. Specimens of Ash (Fraxinus excelsior) which have shown resistance to Ash Dieback (Hymenoscyphus fraxineus) will be planted as part of the Living Ash Project's National Archive of Tolerant Ash1.

Management of this area will be driven by the requirements of the project. There is a higher risk of failures due to the nature of the project. However, the planting will be monitored and where trees are shown to be less resilient, they will be replaced with other more robust trees over time.

If this project does not go ahead in this location, the area set aside for it will be planted with other broadleaf woodland planting instead. This area will then be considered for thinning and future management prescriptions in a future plan, as described in 7.1.1.

7.1.4 Other Tree Felling Exceptional Circumstances

FLS will normally seek to map and identify all planned tree felling in advance through the LMP process.
However, there are some circumstances requiring small scale tree felling where this may not be possible and where it may be impractical to apply for a separate felling permission due to the risks or impacts of delaying the felling.
Felling permission is therefore sought for the LMP approval period to cover the following circumstances:

- Individual trees, rows of trees or small groups of trees that are impacting on important infrastructure (as defined below*), either because they are now encroaching on or have been destabilised or made unsafe by wind, physical damage, or impeded drainage.

- *Infrastructure includes forest roads, footpaths, access (vehicle, cycle, horse walking) routes, buildings, utilities and services, and drains.

The maximum volume of felling in exceptional circumstances covered by this approval is 40 cubic metres per Land Management Plan per calendar year.
A record of the volume felled in this way will be maintained and will be considered during the five year Land Management Plan review.

7.2 Woodland creation: future habitats and species

Selection of the species and mixes described below have been made with consideration of the soils on site (following the soil survey undertaken on behalf of FLS by Forest Research, available in Appendix VI), local climate data (via the Ecological Site Classification Decision Support Tool), resilience to current and future pests and diseases and climate change, biodiversity contribution and the ongoing management of heritage assets on and adjacent to the site and the change in land use from pasture to woodland.

Table 7.1: Planting Prescriptions

Planting Prescription	Local Site Type	Indicative Species	Target Density (stems / ha)	Design	Area
Productive conifer	Brown Earths with some surface water gleys, moderately exposed (DAMS 15)	Mix 1: Sitka spruce and western hemlock	2500	Blocky mix, minimum group size of size of 49 trees (7 x 7)	11.72ha
Productive conifer	Brown Earths with some surface water gleys, moderately exposed (DAMS 15) with some local shelter.	Norway Spruce	2500		5.5ha

Planting Prescription	Local Site Type	Indicative Species	Target Density (stems / ha)	Design	Area
	gleys, moderately exposed (DAMS 15) with some local shelter				
Productive conifer	Surface water gleys with some brown earths and a small area of peaty surface water gley, moderately exposed (DAMS 15)	Sitka spruce	2500		2.6ha
Productive conifer	Brown surface water gleys, highly exposed (DAMS 17-18)	Mix 2: sitka spruce, noble fir, pacific silver fir	2500	Line mix. Minimum 4 rows of each species alternating	2.5ha
Productive conifer	Surface water gleys, exposed (DAMS 17)	Mix 2: sitka spruce, noble fir, pacific silver fir	2500	Line mix. Minimum 4 rows of each species alternating	3.4ha
Productive conifer	Brown Earths with some surface water gleys, exposed (DAMS 17)	Mix 3: sitka spruce, pacific silver fir	2500	Line mix. Minimum 4 rows of each species alternating	2.6ha
Productive conifer	Brown Earths with some surface water gleys, exposed (DAMS 17)	Sitka spruce	2500		0.5ha
Productive conifer	Surface water gleys, moderately exposed (DAMS 15)	Mix 3: sitka spruce, pacific silver fir	2500	Line mix. Minimum 4 rows of each species alternating	1.3ha
Native mixed broadleaf (NVC – W4, W7, W11)	Predominantly surface water gleys with some brown earths, varied exposure (DAMS 15-18)	Mixed broadleaves including: downy birch, alder, willow (grey, goat), aspen, rowan, hawthorn	1600	Blocky mix, minimum group size of 49 trees 7no. x 7no. 2.5 x 2.5 m spacing.	10 ha
Native wet woodland (NVC – W4, W7)	Riparian zone, small area adjacent to scheduled monument in north of the site,	Downy birch, alder, willow (grey, goat), with occasional rowan and mixed	1600	2.5 x 2.5 m spacing.	6.7ha

Planting Prescription	Local Site Type	Indicative Species	Target Density (stems / ha)	Design	Area
	wet ground in eastern part of site, relatively sheltered	shrubs in drier areas			
Native shrubs / shelterbelt planting (NVC – W11, W7)	Surface water gleys, moderately exposed (DAMS 15)	Mixed broadleaf trees and shrubs including: birch, blackthorn, hazel, hawthorn, rowan	1600	Blocky mix, minimum group size of 49 trees , 7no. x 7no. 2.5m x 2.5m spacing	0.2ha
Roadsides	Predominantly surface water gleys, some shelter	Open, with occasional beech standards	N/A	Single beech trees to enhance existing hedgerow to be established	3.2ha
Open area	Riparian buffer zone	No planting	N/A	Successional natural regeneration acceptable in some areas	2.4ha
Native broadleaf	(Ash Archive) surface water gleys, exposed (DAMS 15-17)	Ash	As per project specifications	As per project specifications	3ha
Productive broadleaf	(Alternative proposal for Ash Archive area) surface water gleys, exposed (DAMS 15-17)	Aspen, sycamore, birch, cherry, some rowan	2500	Intimate mix	3ha

7.2.1 Productive Conifer

The majority of the higher quality soils in the centre of the site will be planted with mixed productive confers. The primary objective for these areas is to produce softwood timber. With relatively favourable soil, climate and exposure conditions in this part of Lewinside, a long-term ambition to produce quality sawlogs should be achievable.

The favourable soil textures and topography in this part of the site will aid drainage and allow adequate rooting depth to support thinning interventions.

In areas around the western part of the site where the soils are of lower quality, or there is increased exposure, a more limited species mix has be selected accordingly. While these areas should still be suitable for thinning interventions, the quality of timber production in these locations may not be as high quality as in the centre of the site.

The easternmost part of Lewinside is suitable for a small area of productive conifer planting. Due to the higher exposure in this location, this area will not be suitable for thinning.

7.2.2 Broadleaf Planting

There will be a matrix of different forms of broadleaf planting within Lewinside. This will include the Ash Archive described in 7.1.3 above, shelterbelts and shrub planting in 7.2.3 below and the establishment of the riparian woodland along Mouse Water, described in 7.2.4 below.

In addition to these there will be areas of permanent native broadleaf planting across the site and the potential for productive broadleaf planting should the Ash Archive not go ahead.

7.2.3 Shelterbelts and shrub planting

Due to the exposed nature of the site there will be some shelterbelt establishment, in order to expand future potential species. This will be of particular importance for the Ash Archive area, where a shelterbelt will be planted to complement the protection given by the existing hedgerow.

The existing beech hedgerows are discussed further in 7.3.3. below.

Areas of shrub planting will be used to help create a network of woodland habitat types, while also allowing for transitional planting in the vicinity of the heritage and utilities buffers, and for the area adjacent to the internal farm buildings.

7.2.4 Riparian Corridor

As well as flood management and ecological benefits, this area will also act as an operational buffer to protect the watercourse from disturbance. Further details regarding the management of the riparian corridor are described in 7.3.1 below.

7.2.5 Protection of Plantings

As with all FLS deer management programmes, deer management in Lewinside will be guided by a Region specific Deer Management Strategy, which is underpinned by a national code of practice and industry best practice guides. Further details are provided in 7.5.1 below.

7.2.6 Open Space

Open space in Lewinside will largely be in the form of unplanted areas around paths and tracks, together with areas of open habitat within the riparian zone and the former Laigh Greenholes Lime Works. Vegetation cutting will be prescribed to maintain access routes where required. Management of open habitat is discussed in 7.3.2 below.

7.3 Environment and Biodiversity

7.3.1 Riparian Management and Water

As mentioned above, the effective management of the riparian zone has the capacity to contribute to flood mitigation in the Clyde catchment. Additionally this area has the potential to deliver greater biodiversity benefits through the planting of appropriate species across the low lying riparian zone.

The riparian zone will be suitable native broadleaf tree species. This will allow light and space for the natural development of rich ground flora and shrub layers, with associated soils stability, water regulation and biodiversity benefits. This area will be managed under a minimum intervention regime, as described in section 7.1.2.

The primary water feature of Lewinside is the Mouse Water, which demarks the western boundary of the site. Additionally, there are several ponds associated with the previous quarrying activities. These contribute to the habitat diversity across the site.

Lewinside is within the Clyde and Loch Lomond local plan district as identified within Scottish Environment Protection Agency's (SEPA) Flood Risk Management Strategy. The site is not within a Potentially Vulnerable Area, however there are areas which are prone to flooding downstream. While the scale of the planting at Lewinside is very small within a very large catchment, the establishment of new woodland across the site will still be beneficial in terms of flooding. Additionally, appropriate riparian corridor planting will demonstrate the benefits of woodland creation within a generally denuded floodplain.

Forestry and Land Scotland will comply with current industry best practice guidance and UKFS stipulations in order to protect water quality during forest operations.

The area surrounding the ponds in the former Laigh Greenholes Lime Works will be planted with native broadleaf species to complement the habitat provision here.

7.3.2 Open Habitat

The primary area of open habitat within Lewinside comprises of the former Laigh Greenholes Lime Works within the east of the site. The heritage elements of this area are discussed in 7.4.1 below.

This area is currently being maintained as open habitat through sheep grazing. However, the agreement which is in place for this will end when forest operations commence on the site. Alternatives to maintain this area as open are under consideration, which includes manual vegetation cutting, or a smaller scale grazing agreement.

7.3.3 Existing Hedgerows and Deadwood

There is approximately 5km of existing field boundary hedgerow at Lewinside. The majority of this comprises mature beech trees, with some additional species in places. As well as providing valuable habitat, these trees help create some sheltered areas and reflect the local landscape character.

New beech tree planting will be undertaken to augment the existing roadside network, in order to retain the habitat and landscape character which these trees provide. These plantings will be undertaken with single trees as required.

Operations, including new planting and fencing installation, in the vicinity of these existing trees, will be undertaking using hand dig methods, with careful attention to avoid root damage to these trees.

The existing and newly planted trees will be managed with minimum intervention as described in 7.1.2 above. Some maintenance to ensure the existing roadside trees remain safe may be required and the removal of a small number of trees will be required to facilitate the construction of the forest road. The arisings from these works will be retained on site to provide deadwood habitat.

Deadwood is an important habitat within a healthy forest ecosystem. The UKWAS long-term target for deadwood provision is for an average of 20m³/ha, including both standing and fallen deadwood. There is some existing deadwood within the field boundary hedgerow network.

Provision of future deadwood will be maintained through natural processes such as windblown, individual tree failure or natural limb damage/dieback within the existing and proposed broadleaf planting on the site. In the longer-term, naturally occurring deadwood may also be supplemented via operational interventions.

7.3.4 Important Species

Ecological monitoring by FLS staff has been undertaken since the acquisition of Lewinside. The presence of badger and barn owl has been noted on site. Appendix II includes a list of priority species and habitats present on site or in the landscape adjacent to Lewinside.

New woodland creation and habitat enhancement works on the previous pastoral land, as detailed in this plan, will diversify and extend various habitats across the site. On a landscape scale, proposed new planting will contribute to greater habitat connectivity, specifically between woodland and riparian habitats.

Operations proposed within this plan are focused on new woodland creation on the currently open fields. The existing open and hedgerow habitats will therefore experience limited impact during this plan period. Badger gates and strike markers may be installed in the fencing where appropriate.

7.3.5 Invasive Species

No invasive species have been detected during initial site surveys. If invasive species are discovered, mitigation activities will be undertaken in accordance with industry best practice.

7.4 Heritage

There are a number of heritage features within Lewinside, predominantly associated with former agricultural and industrial land uses (further details are available in Appendix II and the Heritage Report included in Appendix V). Table 7.2 below lists the sites identified in that survey (which remain in FLS ownership), and describes the appropriate mitigation for each. The mitigation follows the FES guidelines on historic environment categorisation which ensures that all important archaeological sites are evaluated and protected and demonstrates that reasonable steps have been taken as per UK Forestry Standard requirements.

Table 7.2: Heritage Features

Site No	Site Type	Value	Action	During operations
3	Roughskyes (mid-18th century) farmstead (not visible on site)	Other	No action. Indicate on all constraints mapping if deemed necessary	No action
4	Laigh Greenholes (19th century) demolished cothouse	Other	No action. Indicate on all constraints mapping if deemed necessary	Avoid if possible
5	Greenholes (19th century) demolished cothouse	Other	No action. Indicate on all constraints mapping if deemed necessary	Avoid if possible
6	Laigh Greenholes Lime Works (19th century) and associated lime clamp	Regional	Should be managed as a clearing and maintained as an open space, 10m buffer beyond boundary	Do not plant, avoid during mechanical operations (UKFS SFM* 18)
7	Puddockmure (mid-18th century) settlement	Other	No action. Indicate on all constraints mapping if deemed necessary	Avoid if possible
N/A	Lewinside well	Other	Located within the existing hedgerow line. 5m buffer to avoid potential damage to tank.	Do not plant, avoid during mechanical operations

While the Heritage Report suggests that Roughskyes, 'S3 should be managed as clearing and maintained as an open space. No buffer beyond site boundary.', in paragraph 48 on the previous page, it states that there are no remains visible on site, and this has been confirmed by FLS staff. Therefore, the internal decision was taken to approach this site in the same way as site numbers 4 and 5. We will plant in these locations but stop any works should any remains be found.

7.4.1 Brewshott Quarry Scheduled Monument

While the Brewshott Quarry Scheduled Monument is located outwith the Lewinside block, parts of it remain adjacent to FLS land. Therefore, where required, a 20m buffer to the monument will need to be maintained as open space.

7.4.2 Hartiesford Bridge

Hartiesford Bridge crosses the Mouse Water at the southernmost point of Lewinside. Although it is outwith FLS land, it will be important to ensure that works within the block in the vicinity of the bridge do not impact on its stability. Therefore a 5m buffer will be maintained for all planting and any on site ground works will be designed with it in mind.

Operational traffic will be directed away from this route to avoid heavy vehicles using the bridge.

7.5 Operations

7.5.1 Deer Management

An operational strategy for protection of new planting at Lewinside will be informed by on-site deer population monitoring and Herbivore Impact Assessment. Additional considerations such as tree species palatability, local topography and other operational constraints will be taken

into account. In practice a combination of tactics will be implemented, including deer management, tree tubes and fencing across the site.

A deer fence around the perimeter of the site is illustrated in the Planting Design map as an example of the scale and alignment at which fencing is considered applicable. However this may be subject to change once population surveys are complete.

Implementation of a formalised deer management programme will have positive effects on lower herbaceous and shrub layers within the block. Management of deer browsing pressure will improve the development of diverse ground flora and improve opportunities for natural regeneration of shrub and tree species. This in turn will improve structural and species diversity of both the new planted and existing woodland areas.

Map 6: Roads, Fencing and Access

7.5.2 Operational Access

Operational access to the western part of the site will be via the existing farm access track, which will lead to a new stretch of forest road.

Operational access to the eastern part of the site will be via a new stretch of forest road, which will extend into the site from the existing public road, at an existing gate access point. A new bellmouth will be required for this stretch of road to ensure safe access into and out of the site.

As there is no material suitable for roading on site, material will need to be brought in from quarries in the Heathland block, noting the public road restrictions below.

Timber movement, and other large vehicles, will be required to travel southwards out of the site, avoiding Henshilwood and Hartiesford Bridge. Traffic will be required to turn east towards Carnwath Road, B7016. We will work with the South Lanarkshire Timber Transport Forum to agree timings, frequency and routes of timber transport from this site prior to operations.

7.6 Access and Recreation

7.6.1 Public Access

Due to its history as a dairy farm, there has not been a history of public access across Lewinside, although there is some evidence of public access along the course of Mouse Water and in the eastern part of the site.

Informal access is available throughout the site. Access points will be retained where the core path within Winnyknowe Wood exists onto the road which bisects Lewinside.

Gates will be included in any deer fencing installation at strategic points, including opposite the core path access at Winnyknowe Wood into the west of the site, and at the existing gate on the south west corner of the east of the site.

Map 6: Roads, Fencing and Access

7.7 Landscape

The planting at Lewinside seeks to enhance the rural character of LCT 201: Plateau Farmland – Glasgow and Clyde Valley, though restoring some localised tree cover, which will include substantial new broadleaf planting. The woodland design reflects existing field boundaries and seeks to complement the existing patchwork of fields and woodland across the local area and will therefore not be incongruous in the landscape.

The design of the planting has also considered views from the farmhouse within the site and views into the site from nearby properties and has sought to limit the visual impact of operations through retaining the existing network of hedgerow trees and the use of mixed species planting across the site.

8.0 Critical Success Factors

Critical success factors are:

- Successful establishment of the new mixed woodland areas to the target stocking densities listed in section 7.2;
- Herbivore impact on new planted stock, ground vegetation and existing woodland areas managed to an acceptable level, as determined via the Herbivore Impact Assessment;
- Improved habitat networks and foraging opportunities for priority species via establishment of new woodland and open space habitats as designed;
- Access to and quality of the heritage assets within and outwith the site maintained as outlined in section 7.4;