

Dark Peak

Forest Plan

2017 to 2027



**Certificate of Approval
for
Tree Felling**

This is to certify that tree felling under

Forest Design Plan ref. Central/50 (17)

Dark Peak Forest Plan

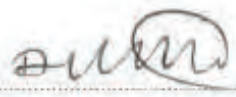
has been approved by the Forestry Commission as

being in accordance with Government policy for

the sound management of a renewable resource.

This certificate is valid only for the

period of the felling approval.

Signed 

Forestry Commission Officer

Date 18/2/2017

Summary

The Dark Peak Forest Plan (FP) summaries proposals by the Forestry Commission for the management of three woodlands, Snake (154.2ha), Lockerbrook (191ha) and Westend (240.2ha) which lie in the Peak District National Park, Derbyshire. The plan area of 585.4ha lies mid-way between Glossop and Sheffield adjacent to the A57, Ladybower and Derwent Reservoir.

The woodlands are dominated by productive mature conifer forest much of which is 70-90 years old and ready for harvesting. The new management plans objectives will be to continue to grow commercial crops on a sustainable basis, diversify the forest structure through harvesting operations, restore native clough woodland, expand the woodland boundaries to develop move open mixed stands designed to increase unity with open moorland and show an increase in visual 'naturalness' in the long term.

The principal ecological interest in the plan area is a combination of moorland, native woodland habitats and fauna associated with it. The FP will help to develop a wider range of woodland habitats through active forest management. This will be achieved specifically through the retention of some strands of trees in perpetuity, the development of mixed open stands along water courses and the interface with the surrounding open moorland, restoration of clough woodland and increased length of woodland edge habitat. Recent felling operations have already begun to increase the available nesting site for birds.

The Forestry Commission will continue to provide open access throughout all of the FP woodlands to the millions of visitors who come into the National Park each year. The two waymarked trails will be maintained and the woodland management adjacent to these will be carried out at an appropriate scale.

Forestry Operations 2016 to 2027

Woodland Name	Grid Reference	Total Area (ha)	Felling (ha)	Restocking, Natural Regeneration & Enrichment planting (ha)	Open Space
Snake	SK 109 910	154.2	29.2	27.9	1.3
Lockerbrook	SK 140 945	191	23.9	22.2	1.7
Westend	SK 165 900	240.2	24.2	37	

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1. What are Forest Plans?

Forest Plans are produced by us, the Forestry Commission (FC), as a means of communicating our management intentions to a range of stakeholders. They aim to fulfil a number of objectives:

- To provide descriptions of our woodlands to show what they are like now.
- To explain the process we go through in deciding what is best for the woodlands' long-term future.
- To show what we intend the woodlands to look like in the future.
- To detail our management proposals, for the first ten years so we can seek approval from the statutory regulators.

Our aim is to produce a plan that balances the public's needs with wildlife, conserves the historic environment and meets our management objectives.

We have produced this draft plan to illustrate our management proposals thereby creating an opportunity for you to comment on the plan, whether you are a user, a neighbour or a member of one of the many stakeholder groups that have an interest in the woodlands.

Information on how to get your comments to us is on our webpage.

This plan does not set out the detailed yearly management operations for each small piece of a wood, known as a coupe*. It is not possible to say which year a particular operation will take place, but we can say in which five-year period it should happen.

All tree felling in the UK is regulated and a licence is required before trees can be felled; the scale of tree felling in Central England Forest District, which this plan forms part of, is such that the Forest Plan is the best mechanism for applying for this licence.

Responsibility for checking that the plan meets all the relevant standards and statutes lies with another part of the FC (Forest Services). If all the criteria are met, full approval is given for the management operations in the first ten years (2017 - 2027) and outline approval for the medium term vision (2027 - 2066). The plan will be reviewed after the first five years (2021) to assess if the objectives are being achieved.

We use some technical words and phrases in the text because they best describe what we are doing. There is a glossary at the back of the plan with some commonly used technical forestry terms and abbreviations. These technical words are identified with an *.

A Application for Forest Plan Approval

i Plan Area Identification:

Forest District:	Central Forest District	
Beat:	Peak District	
Name:	Dark Peak Forest Plan	
Nearest Town:	Hope Forest	
OS Grid Reference:	Snake	SK 109 910
	Lockerbrook	SK 140 945
	West End	SK 165 900
Local Planning Authority	Peak District National Park	

ii Designations:

National Park, Special Area of Conservation (SAC), Site of Special Scientific Interest (SSSI), and lies within the Dark Peak Natural Character Area, Profile No.51, Secondary Woodlands, Clough Woodland.

iii Date of Commencement of Plan

As soon as possible once approved.

Area (ha)	Conifers	Broadleaves
Felling *	76	0
Restocking **	55	33
Low Impact Silvicultural Systems (LISS) ***	10	1

NB all above figure's refer to the gross area

* Excludes thinning operations that take place on a 5 year cycle in conifers and 10 year cycle in broadleaves.

** The restocking will be through a combination of restocking, natural regeneration and enrichment planting to reach full stocking in areas to be managed as productive high forest.

*** Refers to the net area of felling that may take place in the next 10 years.

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*** Refers to the net area of felling that may take place in the next 10 years.

Total felling operation 87ha
Forest Plan maps are attached

I apply for Forest Plan approval for the area described above and in the enclosed Forest Plan.

I undertake to obtain any permission necessary for the implementation of the approved plan.

Signed Andrew Cowers Approved [Signature]

FDM

District Central FD Conservancy East & East Midlands

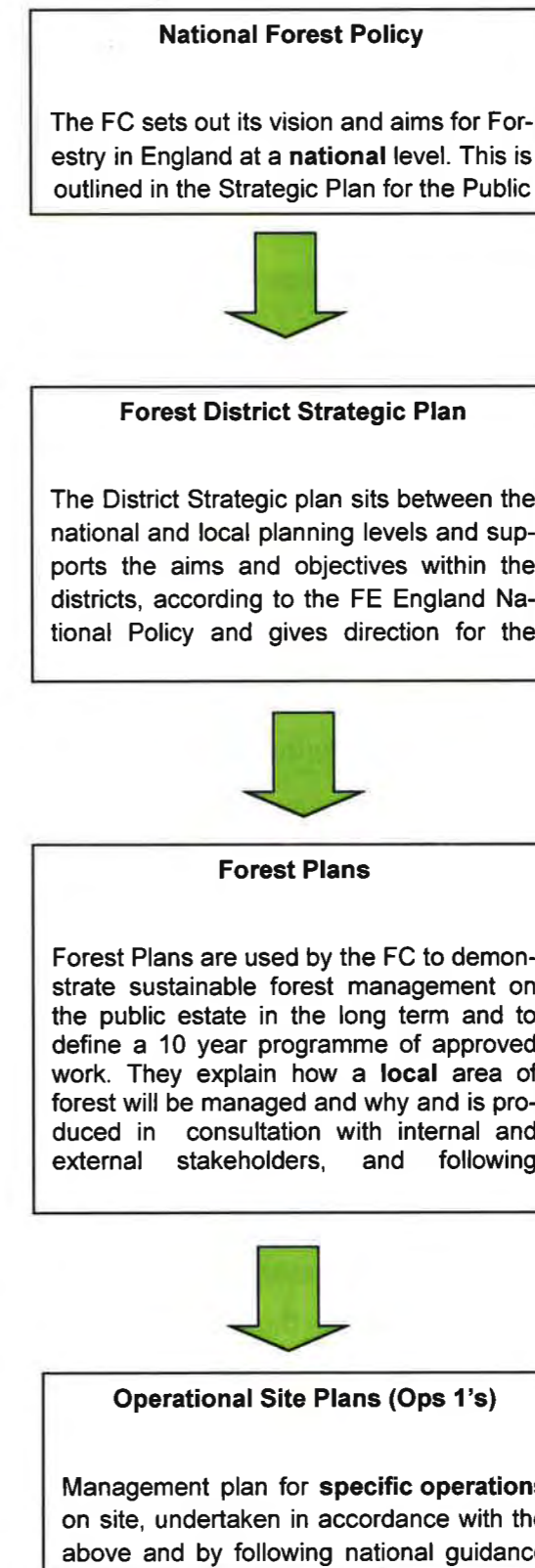
Date 11.12.18 Date 18th December 2017

1. Introduction

This Forest Plan (FP) is updating two older FP's prepared in 2001/2002 and provides approval for felling and restocking over the next 10 years and sets out our management proposals for the next fifty years. FP's are operational plans and although they do take into account the presence of social and environmental features, their management will be dealt with in separate documentation.

This FP is guided and directed by a number of policies and strategies - the main documents are summarised in Fig.1. Delivering this plan will require the Forestry Commission (FC) to be responsive to shifts in our operating environment and increasingly flexible in our approach, and to sustain this responsiveness over decades to come.

Fig 1. Forestry Commission England's Planning Strategy

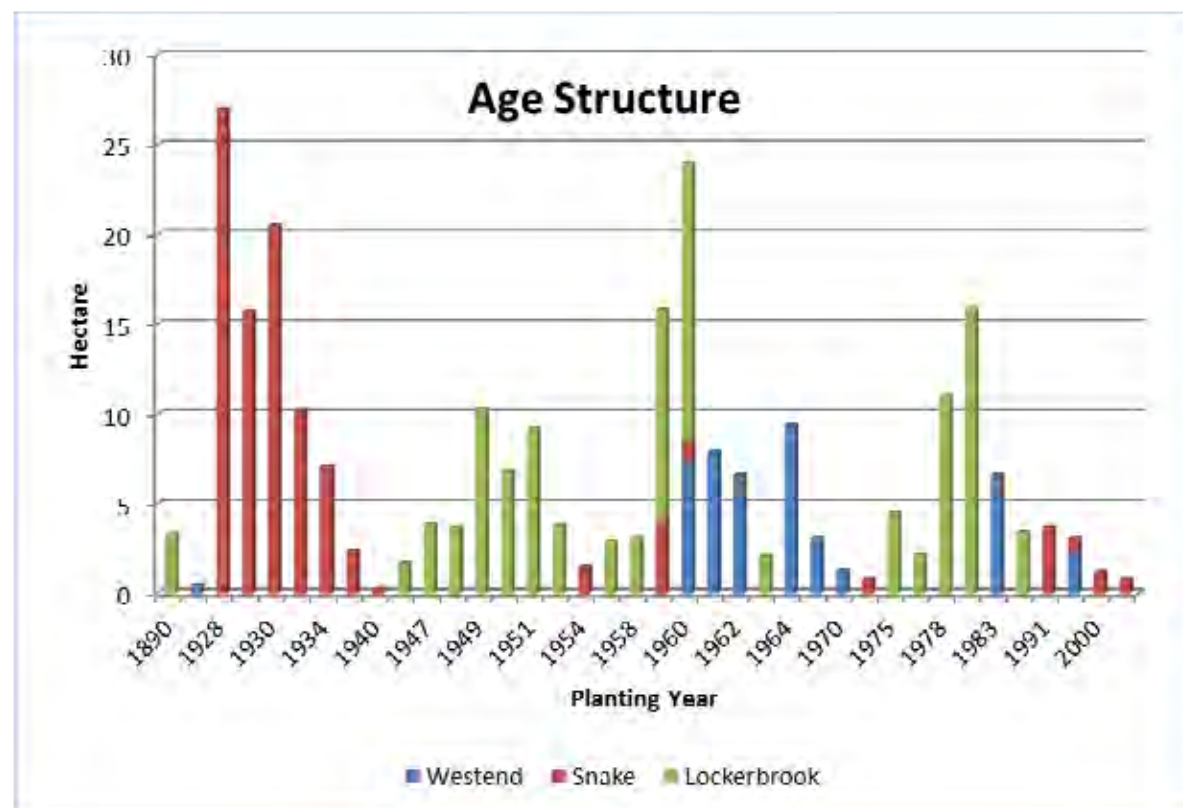


1.1. Dark Peak FP – Survey Data

The Dark Peak Forest Plan (585.4ha) comprises three woodlands, Snake (154.2ha), Lockerbrook (191ha) and Westend (240.2ha) which lie in the Peak District National Park and form part of the Dark Peak and Upper Derwent catchment, Derbyshire. The plan area of 585.4ha comprises 53% high forest and 47% open space which is largely moorland and rough grazing.

The woodlands were planted between 1930 and 1980 with Snake and Westend comprising more uniform mature stands and Lockerbrook having a more mixed age structure, see Fig1. Commercial species are mainly Lodgepole pine, Sitka spruce, Hybrid and Japanese larch. Spruce and larch are the most productive species with prolific natural regeneration of both species occurring on recently felled sites and under some more open mature stands. The Lodgepole pine has been badly affected by Dothistroma Needle Blight (DNB) a fungal pathogen that affects tree growth through defoliation which significantly reducing timber yields. It can also eventually lead to mortality. Corsican and Scots pine have also become infected by DNB but the impact currently has not been as great.

Fig 2.



The dominant local landscape character is of wild moorland, interspersed with clough woodland around streams and minor rivers, with extensive woodlands, mainly of plantation origin on lower slopes and adjacent to the reservoirs. Large areas of the forest plan (FP) lie on steep valley sides making the woodlands strong features in the local landscape but less visible in the wider landscape Pic.1. Lockerbrook and Westend adjoin non-FC woodlands which isolates them from the reservoirs and public roads making them less apparent in the landscape as individual features. Snake Forest stands alone and despite recent woodland creation projects on neighbouring land the forest is a major standalone feature in the local landscape. Principal views are from the public roads in the valley bottom. The woodlands are predominantly coniferous but contain some native broadleaved elements.

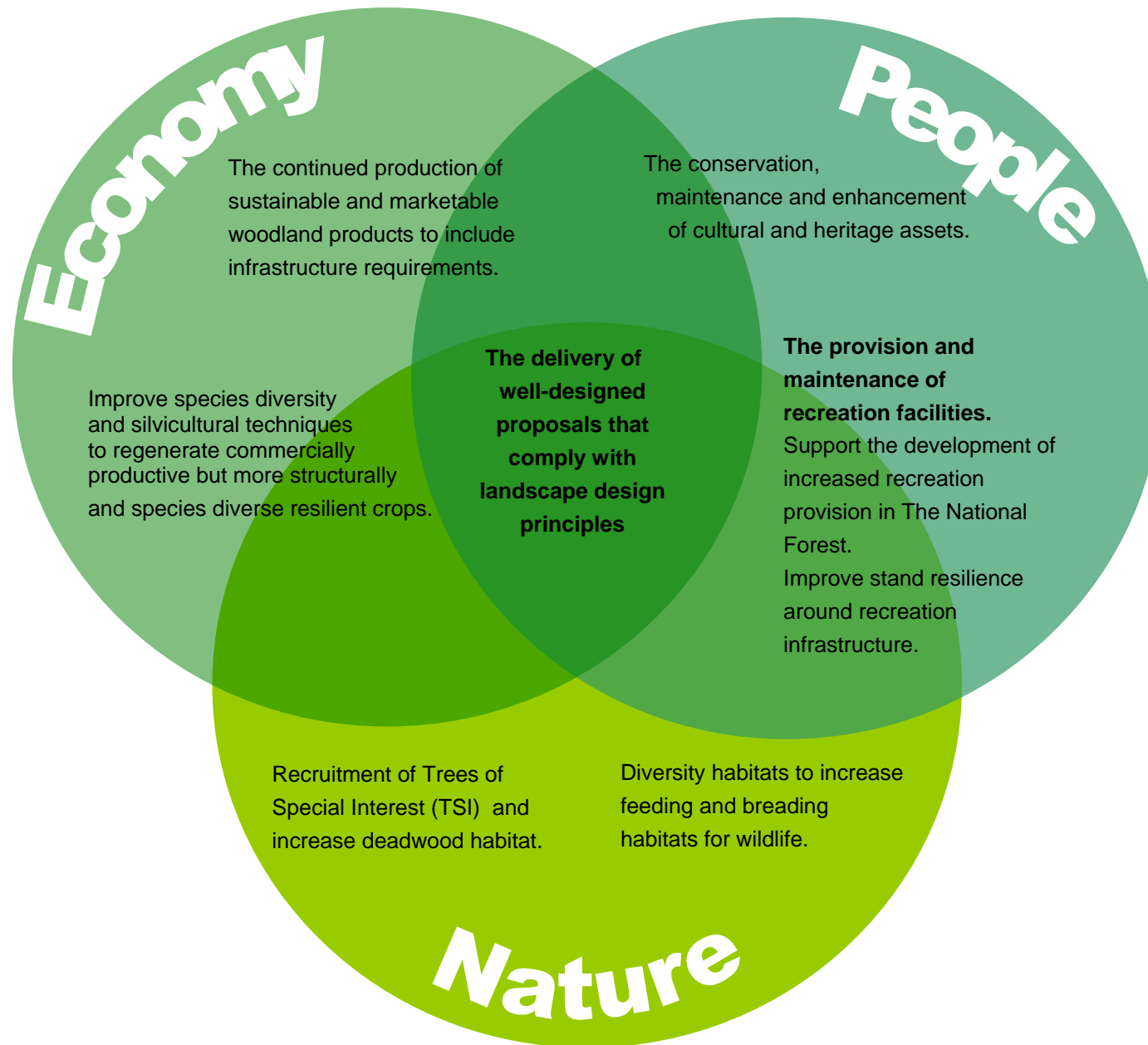
There are no public facilities within the forests and public access is currently low to medium despite high visitor numbers into the Derwent Valley and Peak District National Park. Parking is available at Snake Pass in Birchin Clough layby on the A57 where there are interpretation boards and the start of waymarked trails. There is no parking provision adjacent to Lockerbrook or Westend although public laybys and Seven Trent Water car parks are available nearby.

The FP lies adjacent to the A57 that runs between Sheffield (13 miles) to the east and Glossop (4 miles) and Manchester (15miles) to the west.



Pic.1 View of northern side of Snake Woodland in the valley and open moorland on plateau.

2. Management Objectives



3.0 Forest Plan Objectives

3.1 Woodland

Snake Forest was planted between 1928 and 1930 and Lockerbrook and Westend Forests between 1943 through to the early 1960's and are now dominated by mature conifer stands. Limited felling has taken place over the last 30 years and this has created some structural diversity within the woodlands and this will be expanded further through the felling proposals in this FP.

A principle management objective for the woodlands will be the continued production of sustainable timber resources. This will be delivered through a harvesting programme based on clearfells and Low Impact Silvicultural Systems (LISS). Clearfelling has been the preferred method on steeper ground and LISS have been used on level, fertile well drained soils and buffer zones, see silvicultural map. The size, shape, scale and timing of management operation have been designed in keeping with the landscape character of the area and provide the most suitable conditions to diversify the forest structure and establish future stands. To enable these planned operations a number of new forest tracks will need to be created to allow access for forest machinery, see Access Map.

The creation and restoration of clough woodlands will be a part of the new FP and will build upon the Forestry Commissions (FC) restoration projects that have taken place over the last 15 years, see Current Species and Future Landuse maps. This has been achieved on open ground through the introduction of stock fencing to exclude



Pic 2. Woodland restoration in Cote Clough

sheep and the planting of individual plants of native species within the cloughs, Pic.2. Within the existing high forest clough restoration will take place when adjacent stands are felled. These areas will be left open and any existing broadleaves retained to provide seed source, see Future Landuse maps.

The threat to timber production from climate change and more directly from pest and diseases (DNB) is already having a major impact in the forests, with Lodgepole and Corsican pine having been worst affected Pic.3. Phytophthora ramorum is a notifiable disease affecting larch and although not currently present in the FP forests it is in the region. To ensure long-term sustainable timber production, the present tree species will be diversified in future rotations selecting species that are more resistant to the current and increased incidence of pests and disease. Where natural regeneration is used to restock sites

enrichment planting will take place to allow for the introduction of alternative species. Lodgepole pine will be targeted where possible for early removal in the future harvesting programme due to the effect of DNB.

Fig.3 Current Species within Dark Peak Forest Plan

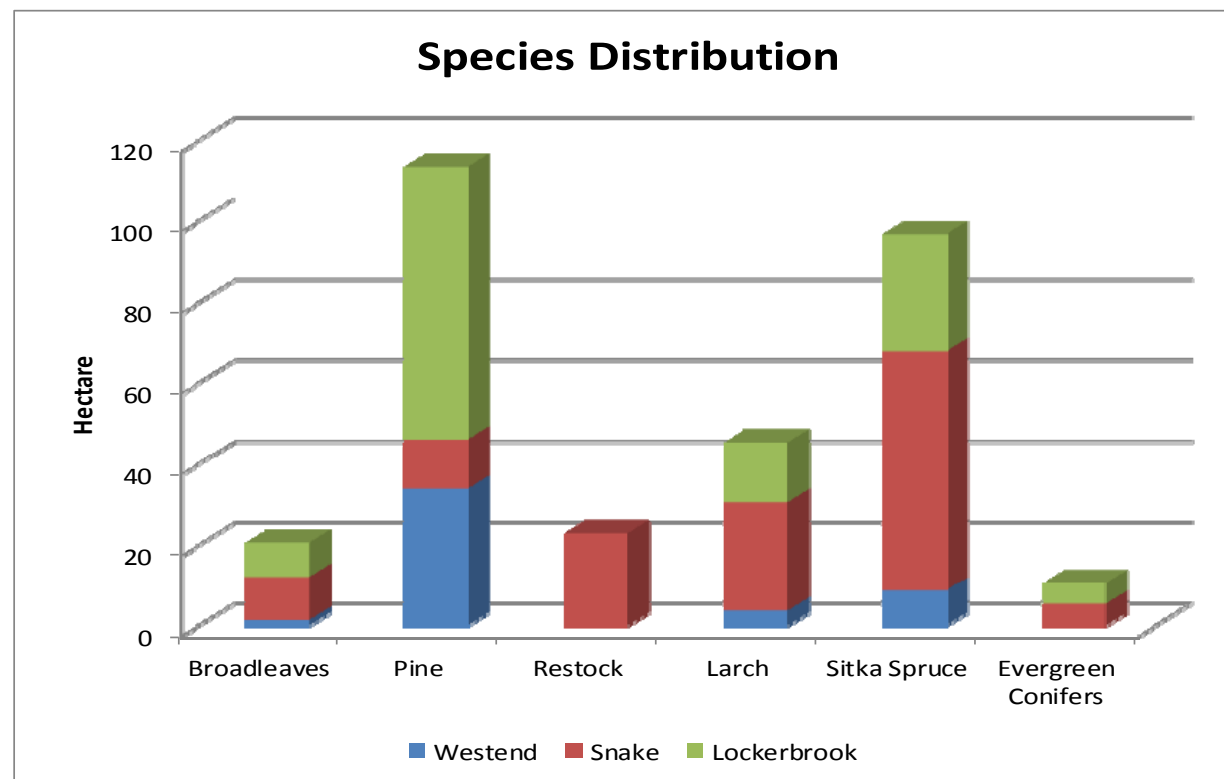


Table 1. Current Species

	West End	Snake	Lockerbrook	Hectare	Percentage
Open Space & Agri	191.0	28.4	55.5	274.9	47.0
Broadleaves	2.6	2.1	16.0	20.7	3.5
Sitka Spruce	8.8	59.0	29.0	96.8	16.5
Evergreen conifers		5.5	5.2	10.7	1.8
Scots pine	0.6	0.1	32.8	33.5	5.7
Corsican & Lodgepole pine	33.3	12.2	34.6	80.1	13.7
Larch	3.8	26.8	14.9	45.5	7.8
Restock	0.0	20.0	3.0	23.0	3.9
Grand Total	240.1	154.1	191.0	585.2	100.0

Due to the steep topography in parts of each forests and the wet peat soils on Lockerbrook plateau some stands have been and will continue to be managed as non thin crops, see silvicultural map. The last rotation of conifers has shown that stand stability is not an issue despite the forests exposed elevated location and most conifer stands will continue to be thinned every five years, ten years for broadleaves where terrain allows.

3.2 Environmental

The FP lies within the Dark Peak Natural Area with the moorlands being designated as Special Conservation Areas (SAC) and Sites of Special Scientific Interest (SSSI). It is an upland area of international importance supporting a wide variety of breeding moorland and moorland fringe birds and invertebrates. Deeply-incised cloughs with fast flowing streams run down the steep hillside, through the forests and into the valleys where the River Ashop feeds into the Derwent reservoir which provides clean drinking water for cities in Yorkshire and the East Midlands.

The mixture of forest, moorland, rough grassland and water feature found within the FP area provide a valuable habitat resource within the wider landscape and a primary objective of this plan will be to improve biodiversity and nature conservation. The current forest structure and woodland edge habitats are limited due to the mature stand structure but despite this bird surveys carried out over the last 3 years have recorded a wide variety of species, see Appendix II. Recommendations from the report identified a lack of nesting sites and measures have been introduced to create artificial nesting sites and through the planned harvesting operations more natural nesting sites will become widespread across the FP area. The introduction of LISS in the Snake and the south western edge of Lockerbrook will help create a more diverse internal stand structure. This along with the shape, scale and timing of clearfells will provide more diverse habitats with varied canopy levels, and transitional open space following felling operations that will increase further the available woodland habitats for wildlife. The edge of the forests and moorland will be modified by a combination of techniques to protect individual and groups of trees and reduce or remove grazing pressure. Subsequently when coupes are felled and restocking takes places the new stands will comprise a variety of species at different densities. This means that when they reach maturity they will not create a strong linear feature on the horizon when viewed from the surrounding open moorland. The edge of the new tree line will incorporate deep irregular lines running up and down the hill side (cloughs) which will create a more natural

woodland edge and interface with the open moorland with broadleaves Pic.5, Appendix VI. This will also provide space for broadleaves to become established within the conifer stands and then for a more open mixed stand to become established along the woodland edge and into the adjacent moorland. In practice it is anticipated that there will be a continuum from closed canopy conifer plantation woodland through broadleaved high forest, open canopied woodland to open moorland. This will provide valuable cover for wildlife and nesting sites for birds. Bird surveys will continue to help monitor the impact of the change in forest structure over time, Appendix I.

The FP lies within the water catchment for the Derwent reservoir and buffers will be established along the numerous water courses that pass through the forests in accordance with the Forestry and Water guidelines

Pic.4. Where conifer stands abut streams they will be gradually opened up when thinning operations take place to create space for broadleaves to become established prior to the main conifer stands being removed. The tree line adjacent to the aquatic and riparian zones will be carefully managed to allow the creation of dappled shade, open clearings and the development of associated vegetation. When coupes are clearfelled appropriate measures will be taken to reduce the risk of siltation and aid soil stability . These are not shown on the felling map due to the landscape scale of the plan but will be picked up on the coupe plans drawn up by the beat forester and agreed by district management team prior to any forestry operations being carried out.

Clough woodland restoration has already begun in Cote Clough, Lockerbrook (2005) and Dry Clough Westend (2000) and this will be expanded to include a number of valleys within Snake and Lockerbrook forest and the open moorland to the west of Westend, Pic.2. The clough woodlands will be managed through LISS with conservation being a major part of the management objectives for these areas.



Pic.4. Snake 2016 - High forest adjacent to watercourse with no understory.

There are currently very few veteran trees within the FP area and the only deadwood habitats are associated to some patches of small diameter conifers that have died within the current stands. Through the introduction of LISS and the over mature nature of some of the conifer stands individual and small groups of trees will be retained in perpetuity to create future veteran trees and standing deadwood. When felling operations take place any dead standing snags will be retained.

3.3 Open Habitats

3.3.1 SSSI – over 50% of the Westend area, and minor areas at the Snake and Lockerbrook are designated as part of the Dark Peak SSSI.

Additional European designations concurrent with the SSSI are:

South Pennines SAC, designated for:

- Blanket bogs
- European dry heaths
- Northern Atlantic wet heaths with *Erica tetralix*. (Wet heathland with cross-leaved heath)
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles. (Western acidic oak woodland)

Transition mires and quaking bogs

South Pennine Moors SPA, designated for:

- Merlin
- European Golden Plover
- Breeding Bird Assemblage

The management of these areas is covered in more detail in the Dark Peak SSSI Management Plan, but in summary the majority of the SSSI in Westend will be covered by a grazing agreement with a tenant farmer. The livestock stocking density will be agreed with Natural England, and the tenant may enter into subsequent agri-environment schemes with the agreement of all parties. Both within and without these grazed areas, native broadleaved woodland will be established in the cloughs and valley sides, at varying densities.

3.3.2 Unimproved grassland – this type of grassland, often called In-bye, is common in the South Pennine area. In-bye consists of unimproved and semi-improved grassland, and is often associated with wet, rushy or boggy areas, adjacent to, or close to unenclosed moorland. Within the FP there are two discrete areas of this type of grassland, above Bell Hagg Wood and at Lockerbrook Farm. Both areas are grazed by sheep and cattle, and there are restrictions in the lease on ploughing up existing grassland and application of fertilisers.

3.3.3 Acidic grassland – this is approximately 10ha of grassland on the moorland edge consisting of Molinia and Nardus communities with some ericoid species, graduating to a more in-bye type of acid grassland on the lower areas. Since 2010 this area has been grazed by cattle, mostly in the summer months, in an attempt break up the extensive Molinia and Nardus beds to improve the floristic diversity. Surveys have taken place since 2009 to monitor the changes in vegetation (see Appendix II).

3.4 Social

The Peak National Park experiences over 22 million day visits per year and has a strong association with the right to roam and the access movement. Tourism today also plays an important part in the local economy through the Dark Peak's ease of access from cities and large towns. Providing informal public access and conserve historical archaeological features are key objectives within the Dark Peak FP. The moorlands surrounding the plan area are the subject of an Access Agreement which allows free public access at all times. Coupled with the FC open access policy, the entire plan area is available for informal recreational use. There are no visitor facilities within the woodlands but there is one bridleway which cuts through the Lockerbrook woodlands and a public footpath in Snake Forest. General use is for the purpose of access between the reservoirs and open moorland. There are several waymarked trails, two in Lady Clough which is part of Snake Forest and one circular waymarked trail in Lockerbrook, promoted by Peak District National Park Authority (PDNPA). Seven Trent Water has a visitor centre and public facilities at Ladybower Reservoir close by. There are no plans to provide public facilities within the FP woodlands but consideration for public rights of way and informal access points have been included in the design proposals. The plans proposals to use LISS in valley bottoms and along water courses where some of the promoted routes lie which will allow individual character trees to be retained in perpetuity and a more varied open mixed woodland to

develop that will increase the aesthetic value of the forests to visitors.

There are no Scheduled Ancient Monuments in the plan area but the 1997 archaeological survey (Bevan, Upper Derwent Archaeological Survey: Snake Plantations) identified a number of archaeological features in the plan area. These are catalogued in the Survey Report 1997/98 and include trackways, revetments and built structures. The most notable feature in the area is the dam overlooked from Lockerbrook which was used by 617 Dambuster Sqd to train in World War II with the bouncing bomb.

3.5 Harvesting

The proposed harvesting programme will generate approximately 78,000m³ of timber over the next 50 years. This is similar to the old plan but with a greater volume of timber been removed in the first 20 years due to disease and wind damage. There is a slight reduction in timber to be harvested and this is partly due to the increased use of LISS as apposed to clearfelling the current stands when they reach economic maturity. To ensure the future harvesting programmes can be undertaken in in each of the woodlands a number of new forest road will be created following survey by our Civil Engineers, Environmental Impact Assessment (EIA) and planning approval.

Forecast Period	All Species	All Conifers	All Broadleaves
2017-2021	3184	3101	83
2022-2026	2738	2698	40
2027-2031	2216	2175	41
2032-2036	1616	1485	131
2037-2041	1669	1635	34
2042-2046	2104	2048	56
2047-2051	618	595	23
2052-2056	657	628	29
2057-2061	965	945	20
2062-2099	1432	1394	38

Table 2.—Annual Production forecast volume m³ within each felling period.

3.5.1 Restocking and Future Management

The current forest composition will change quite markedly over the next rotation moving away from pure conifer high forest to a combination of conifer, broadleaves and mixed conifer / broadleaved stands. Within the forests the pattern and distribution of species will

vary. Broadleaves will dominate in the buffer / riparian zones with some individual and small groups of conifers being retained for their aesthetic and biodiversity value. Conifers will be the most abundant species on the lower to mid slope moving into conifer / broadleaved mixtures higher up the slopes, See Appendix VI. On the edge of the forests broadleaves will become more prevalent creating mixed stands within the current area of forest and small groups and individual trees will be established in the surrounding moorland valleys. This will create a more natural interface between the open moorland and high forest. Through the exclusion of grazing in the south-east half of Westend, complemented by some enrichment planting, the areas of open heathland will be diversified by the introduction of some tree cover that will soften the landscape appearance of the conifer stands and diversify the ecological niches available in the adjacent heathland.

Restocking will be through a combination of natural regeneration in both clearfell and LISS coupes with enrichment and standard planting used to introduce a more diverse mixture of species and achieve appropriate stocking densities.

Sites due to be restocked will be assessed to select the most appropriate species that will be best adapted to the site conditions (soils and aspect) and the impacts of any future climate change, whilst maintaining species diversity. No one species will dominate the future forest structure and a wider variety of species will gradually become established over the next 50 years including some mixed stands (Appendix VI). The combination of clear fell sites (restock) and LISS (underplanting) will provide ideal microclimates for pioneer species (light demanders) and late successional species (shade tolerant species) to establish successfully throughout the FP.

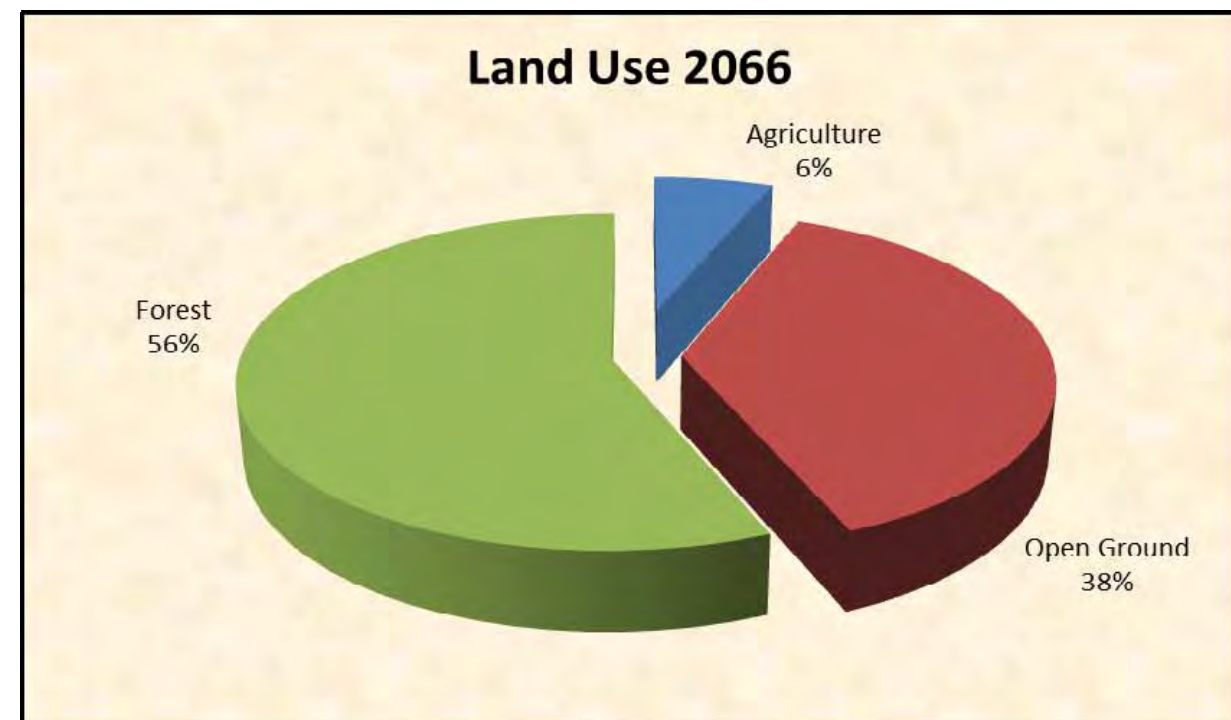
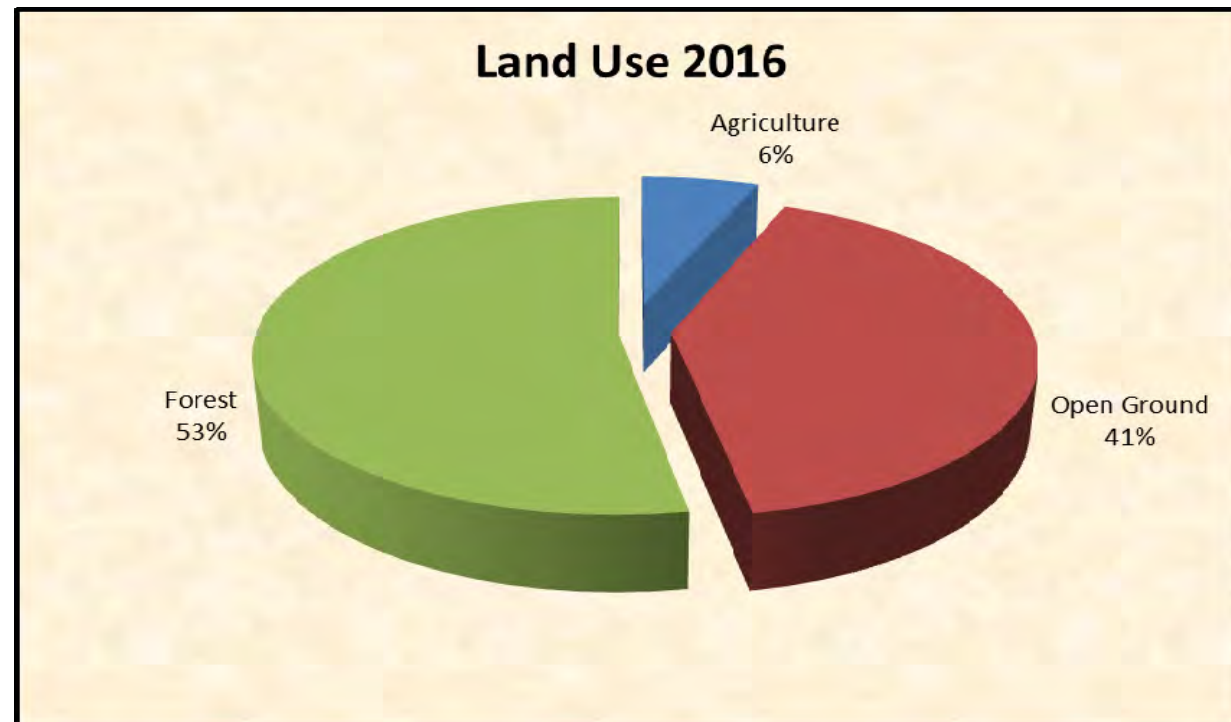
The new species that will be used to diversify the forest will be increasingly palatable to mammals and a greater level of protection may be needed to ensure successful establishment and a combination of mammal control and fencing will be used to achieve this.



Table 2 Future Species Composition – 2065

Habitat	Hectare	Percentage
Open Moorland and Agriculture	235	40
Open Moorland with some Broadleaves	32	5
Broadleaves	12	2
Mixed stand dominated by Broadleaves	13	2
Clough Woodland	37	6
Mixed stand dominated by conifers	108	18
Conifers	147	25

Fig.4 Current / Future Forest Structure



4. Meeting and Monitoring Management Objectives

<p>Woodland</p>	<p>The woodlands will be managed to produce commercial conifer and broadleaf timber using a variety of silvicultural systems which will be chosen to aid establishment.</p> <p>Pests and disease - <i>Dothistroma</i> Needle Blight (DNB) is now affecting the Lodgepole and Corsican pine stands. <i>Phytophthora ramorum</i> is now present in the Peak District and the risk to the larch in the Dark Peak is likely to increase.</p> <p>Restocking and future species.</p>	<p>Conifer stands will be managed using a combination of clearfell and LISS based on topography and landscape considerations. Crops will generally be thinned on a 5 year rotation with the exception of the peat soils on Lockerbrook plateau and the steepest sections of Snake Forest where crops will be left un-thinned</p> <p>Broadleaf stands will generally be managed as high forest using a LISS to produce quality timber and thinned on a 10 year cycle.</p> <p>Any stands badly affected by pests or diseases will be felled early and replanted with alternative tree species that will be more resilient. If <i>Phytophthora ramorum</i> is identified, then as a notifiable disease, infected stands will have to be clearfelled within 6 months.</p> <p>Natural regeneration with enrichment planting will be the preferred option where the appropriate and available seed source is present. Conifer stands throughout the FP area will be diversified using a range of species best suited to the site conditions and resilience to predicted impact of climate change, pest and disease.</p> <p>Due to the limited seed source of major timber trees, broadleaved stands will use restocking to diversify indigenous</p>	<p>Monitored through Sub-compartment database.</p> <p>Monitor annually by beat team and at FP review.</p> <p>Monitored through Sub-compartment database.</p>
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Objective	Description	Proposals	Methods of Monitoring
Woodland	Creation and restoration of Clough Woodlands.	species while utilising any regeneration that may occur. Over the last 15 years the restoration of three Clough woodlands has begun. Several other suitable areas have been identified in the plan for restoration and this will be achieved on open land through a combination of techniques to protect individual and groups of trees. Enrichment planting will be used to introduce a variety of broadleaved species.	Monitored through Sub-compartment database.

Biodiversity	Bird breeding and feeding sites.	Artificial nesting sites will continue to be maintained in the short term and when felling operations are carried out trees with good crowns will be retained and woodland edge habitat diversified to increase the available breeding and feeding sites.	Monitored by wildlife ranger and at FP review.
	Woodland edge habitat.	The current uniform mature high forest will be gradually broken up as felling operations take place. The current straight edges will be broken up to create space for an understory to develop links between short vegetation along rides and canopy of high forest.	Monitor by beat team and at FP review.
	Riparian areas.	The riparian areas alongside water courses and ponds will be opened up to create varying levels of dappled shade over the water and space for an understory to develop.	No monitoring required.

Objective	Description	Proposals	Methods of Monitoring
Biodiversity	Water quality.	The establishment of buffer zones along the streams and rivers will ensure the current levels of clean water can be maintained when forestry operations are carried out.	Monitored through Operational Plans and at FP review.
	Trees of special interest (TSI) and deadwood.	Standing snags will be left and individual and small groups of trees will be retained beyond their economic rotation, to become Trees of Special Interest and provide additional deadwood habitats.	Monitored through Operational Plans and GIS conservation layer.
	Open Habitats	The open habitats within Lockerbook will be managed either as unimproved acid grassland (typical in-bye) grazed by tenants with sheep and cattle, and at the moorland edge through a grazing regime with cattle that will help break up the dense molinia grass sward and allow a more diverse ground flora to develop. In Westend the northern half of the valley will be grazed by a tenant under conditions agreed with NE as part of the SSSI management plan. The southern half of the valley will be excluded from grazing and some enrichment planting carried out to allow pockets of woodland cover to become established which will provide valuable cover for wildlife and soften the outward appearance of the conifer stands. This management will be extended along the watercourses into the northern half of Westend to allow for clough woodland restoration.	Monitored by botanical surveys and at FP review.

Objective	Description	Proposals	Methods of Monitoring
Social & Recreation	The demand for access onto the Dark Peak FP area has increased over recent years.	The Forestry Commission will continue to allow open access onto its land and to facilitate the future demand for recreation and tourism where appropriate. No formal provision for new recreation facilities is planned at this time.	No monitoring required.
Heritage	There are no scheduled monuments in the FP area but a number of historical features have been identified.	Any significant heritage features found will be taken into consideration when operations are planned and undertaken.	Monitored through Operational Plans and at FP review.

5. 2017 Forest Plan comparison against the 2001/02 Forest Plans.

The new FP combines the Upper Derwent and Snake Forest Plans. The main variations in the new FP will be the timing and type of harvesting operations and the species that will be used to restock the forests. There will be greater use of natural regeneration to help new stands become established with any restocking focusing on the introduction of new species which it is hoped will be more resilient to the current and future treats posed by disease, insects and climate change. The harvesting programme being proposed will help deliver a number of ecological benefits through the diversification of woodland structure, creation of transitional open space and creation of more woodland edge habitats.

The riparian zones will see a marked change over the coming years moving from a uniform even aged structure to a more open mixed stands with broadleaves dominating. These areas will be managed through LISS to help reduce the risk of siltation and conserve water quality.

6. Consultees

<i>The consultation undertaken in the preparation of this plan has been wide ranging and extensive. Full documentation including letters, notes of conversations etc. are held at our District Offices.</i>				
Consultee	Date Contacted	Date Response Received	Issues Raised	Forest District Response to Issues
Paul Judd _ British Mountaineering Council Peak Region	30/06/17	21/07/17	Broadly welcome the approach of the proposed forest plan. Went to see crops planted only where they can be commercially viable, Support the use of LISS but wanted to see greater links recreation and recreational community when planning operations. Careful planning of clough woodlands and lowering the tree line on hillsides.	Clough woodland restoration will be carried out with due consideration for the landscape and environmental management objectives. The comments on recreation links have been passed onto the recreation manager and beat forester for future consideration. Clearfells will have to be used on many areas where the topography limits access. The nature of the soils and associated Wind Hazard Class also limits the potential to use LISS in much of the plan area.
Anne Robinson—Campaigner Friends of the Peak District and CPRE South Yorkshire	30/06/17	07/08/17	Concerned over the lack of progress from previous plans and changes in new plan to LISS and future species. Wanted to see greater emphasis to biodiversity, nature, recreation and climate change in management objectives. Concerned of seeding of conifers onto heathland and clough woodland. Welcomed buffers along streams and restoration of clough woodland although more extensive work was suggested. Lower tree line to reduce impact of forests in wider landscape. Wanted to see conservation of AWS and provision of information on archaeology for visitors.	The FC explained that the phased felling programme planned in the previous and current forest plan can be affected by fluctuations in timber markets and this may affect the timings of operations. Future forest structure models were created showing how the new moorland/woodland interface will soften the woodlands appearance in the landscape and create a more diverse woodland ecosystem for wildlife and nature (Appendix III). Records do not show any evidence of AWS on FC land. Request for recreation interpretation has been passed onto the beat forester and recreation manager.
Peak District National Park—Rhodri Thomas Natural Environment and Rural Economy Team Manager	30/06/17	28/07/17	Species selection in both conifer and cloughs, angular plantations in landscape, concerns on how archaeological features will be conserved during operations on all sites, query of an area of ancient woodland and planned operations. Supplied a number of wildlife recordings for the FC land to be taken into consideration. Welcomed overall objectives that favour biodiversity and landscape but wanted to see greater emphasis upon historic environment.	The FC confirmed that species selection is made at the time of restocking based on recommendation from Forest Research and based on an ecological site classification for each site and not shown in the plan. Future forest structure models were created showing how the new moorland/woodland interface will soften and remove geometric patterns and hard edges in the landscape (Appendix III). All archaeological features will be managed in accordance with the FC guidelines and where appropriate in consultation with English Heritage and Derby CC archaeologists. FC will use the wildlife data supplied to assist in its future land management. AWS as above.
Mr P Child—member of public—via website	Via website	07/08/17	Trails left in poor condition following harvesting operations, Would like to see provision for new recreation facilities is planned, provision of picnic benches and litter bins would reduce the amount of rubbish and campfire sites in the area. Some signage prohibiting camping and the lighting of fires would reduce the risk of fire.	Mr Child's comments have been passed onto the beat forester and recreation manager who are responsible for the operations and facilities in Snake Forest. These will be taken into due consideration when planning future forestry operations or assessing the provision of recreation services.
As part of the local consultation 11 stakeholder were contacted directly, copies of the plan made available via the FC website, Seven Trent visitor centre, local libraries and notices placed on site. Comments received and the Forestry Commission's responses are recorded above.				

7. Glossary

Biological Diversity

The richness and variety of wildlife and habitats.

Biodiversity Action Plan (BAP)

Describes the UK's biological resources and details the protection of these resources, including 391 Species Action Plans, 45 Habitat Action Plans and 162 Local Biodiversity Action Plans.

Canopy

The mass of foliage and branches formed collectively by the crowns of trees.

Clearfell System

The removal of all trees in one operation >0.5ha.

Coupes

Areas of forest that have been or will be managed together.

England Forestry Strategy (now England's Trees Woodlands and Forests)

Describes how the Government will deliver its forestry policies in England and sets out the Government's priorities for the next five to ten years.

Forestry and Water guidelines 5th edition 2011

Forests and Water is one of a series of seven Guidelines that support the United Kingdom Forestry Standard (UKFS). The UKFS and Guidelines outline the context for forestry in the UK, set out the approach of the UK governments to sustainable forest management, define standards and requirements, and provide a basis for regulation and monitoring including national and international reporting.

Forestry Commission Guidelines

Outline the principles and standards of good management practices in forests and woodlands for landowners, land managers and their advisors.

Forest Plan (FP)

An approved plan that outlines felling operation over a 10 year period, outlining proposals over the next 50 years. The FDP's are reviewed every 5 years and redrawn and approved every 10 years.

Forest Stewardship Council (FSC)

An internationally recognised body made up of non-government organisations promoting sustainable forest management to the forest industry and consumers.

Habitat Action Plans (HAP)

Habitat recognised as internationally important, for example those designated under the EU Habitats Directive; nationally or locally important.

Historic Environment

These are the physical remains of every period of human development from 450,000 years ago and include earthworks, buried remains, structures and buildings.

Landscape Character

England is renowned for its rich, diverse and beautiful landscapes which have their own distinct local character. These have been shaped over many thousands of years by natural influences such as soil and landform and by generations of human activity.

Long Term Retention

Trees that are being retained beyond their economic rotation.

Low Impact Silvicultural Systems (LISS)

Describes a number of felling systems (shelterwood, group felling, selection systems) which avoid large scale felling coupes and the forest canopy is maintained at one or more levels.

Natural Character Areas (NCAs)

England is divided into 159 distinct natural areas. Each is defined by a unique combination of landscape, biodiversity, geodiversity and cultural and economic activity.

Natural regeneration

The growth of trees from seed found in the soil or cast from adjacent trees and shrubs.

Operational Plans (Ops1)

Detailed site plans that are prepared in advance of all major forest operations and identify site constraints, opportunities and areas requiring special treatment or protection.

Public Rights of Way (PROW)

Access routes open to the public through legal designation.

Restocking

The re-establishment of trees where felling has taken place. Restocking may be achieved through natural regeneration but as a term, it is more usually associated with replanting.

Ride

Forestry term for unsurfaced roads, paths and tracks within a woodland.

Sites of Special Scientific Interest (SSSI)

Sites of special scientific interest (SSSIs) are protected by law to conserve their wildlife or geology (SSSI notification can be made on any area of land which is considered to be of special interest by virtue of its flora, fauna, geological or physiographical / geomorphological features).

Special Area of Conservation (SAC)

Special Areas of Conservation (SACs) are strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species. 78 of these habitats are believed to occur in the UK and 43 of the species are native to, and normally resident in, the UK.

Scheduled Monuments

Nationally important archaeological sites which are protected under the Ancient Monuments and Archaeological Areas Act, 1979.

Secondary Woodland

Woodlands that have been established on land that was formally used as pasture, meadows, arable, quarries etc and has not continually been wooded.

Selective Felling

Where individual trees of varying sizes are selected and removed from a stand. The whole stand is worked and its aim is to maintain full stocking of all tree sizes and ages, from seedlings to mature trees, in any one area.

Silvicultural Systems

Techniques of managing a forest through a variety of cutting / felling patterns and time scale.

Sub-compartments

Areas of forest comprising a more or less homogeneous crop in terms of age, species composition and condition. Their boundaries may change as the forest develops after felling and restocking.

Strategic Plan

Serves as a guide to the management of woodlands within Central England Forest District. It divides the district into zones for the purpose of management and ensures that forestry activities reflect the local ecological, social and cultural individuality of woodland. Strategic objectives for each zone are presented within the context of the Government's strategic priorities for forestry in England (e.g. forestry for rural development; forestry for economic regeneration; forestry for recreation, access and tourism and forestry for the environment and conservation).

Thinning

The removal of a proportion of the trees in a sub-compartment to improve the quality of the remaining trees, accelerate individual tree growth and provide income.

UK Forestry Standard (UKFS)

Outlines the Government's criteria and standards for the sustainable management of forests in the UK.

UK Woodland Assurance Scheme (UKWAS)

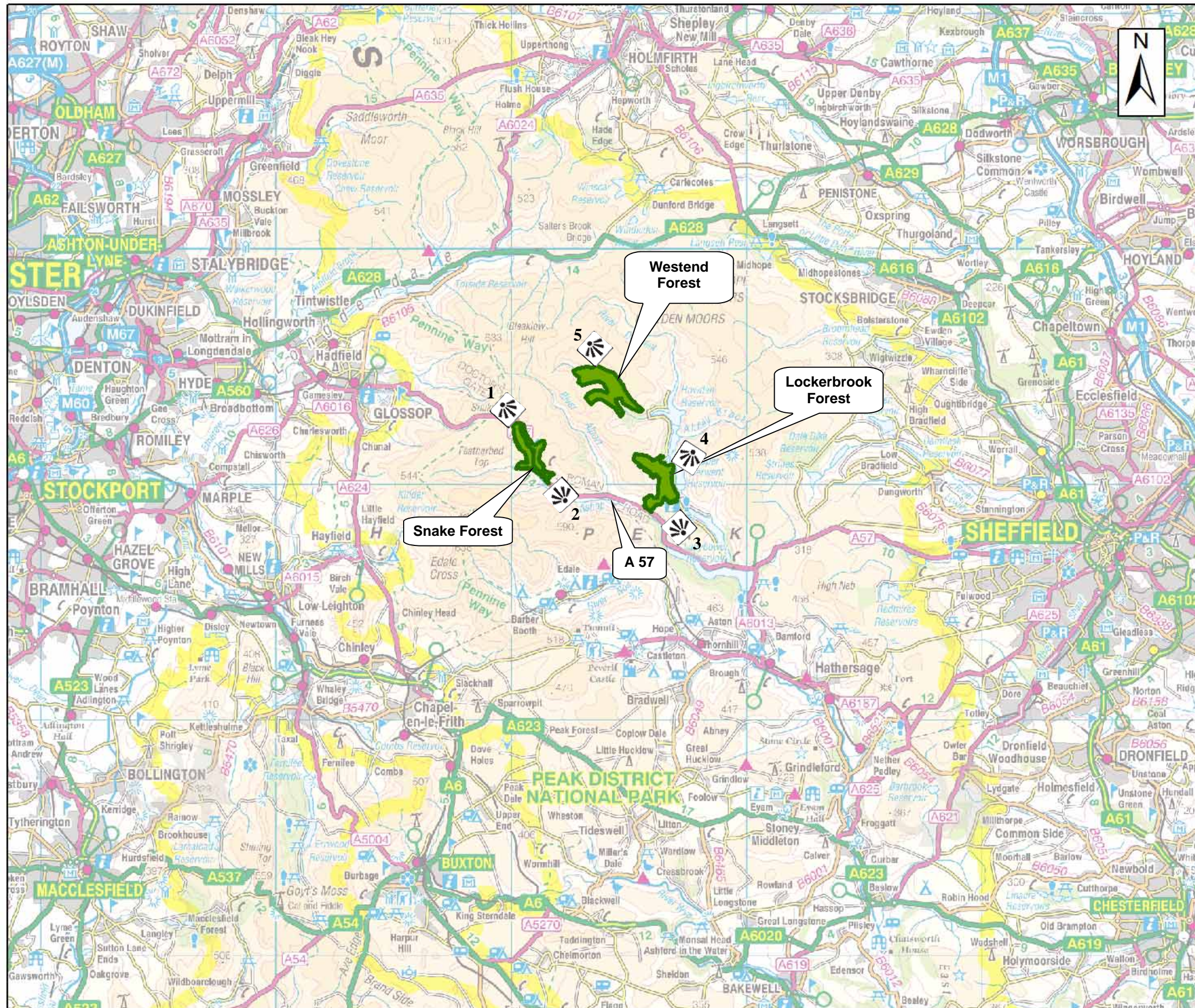
A voluntary scheme for the independent assessment of forest management in the UK. The Scheme has been developed by a partnership of forestry and environmental organisations in response to the growing consumer demand for timber products from sustainably managed forests. It has been designed to ensure that it reflects the requirements of both the Government's UK Forestry Standard - and through this the guidelines adopted by European Forestry Ministers at Helsinki in 1993 - and the Forest Stewardship Council's (FSC's) GB Standard.

Trees of special interest (TSI)

A tree that is of interest biologically, aesthetically or culturally because of its age, or a tree that is in the ancient stage of its life, or a tree that is old relative to others of the same species.

Yield Class

Yield class is a measure of the growth rate of a tree crop and is the maximum average rate of volume increment (increase) that a particular crop can achieve. For example, a crop capable of a maximum annual increment of 14 m³ per hectare has a yield class of 14.



Central Forest District

Location

The forests lie mid way between Glossop and Sheffield in the Peak National Park, Derbyshire covering 585.4ha. The landscape character area is known as the Dark Peak.

The Dark Peak is a landscape of large-scale sweeping moorlands, pastures enclosed by drystone walls, contrasting valleys, some of which are dominated by coniferous woodland and reservoirs.

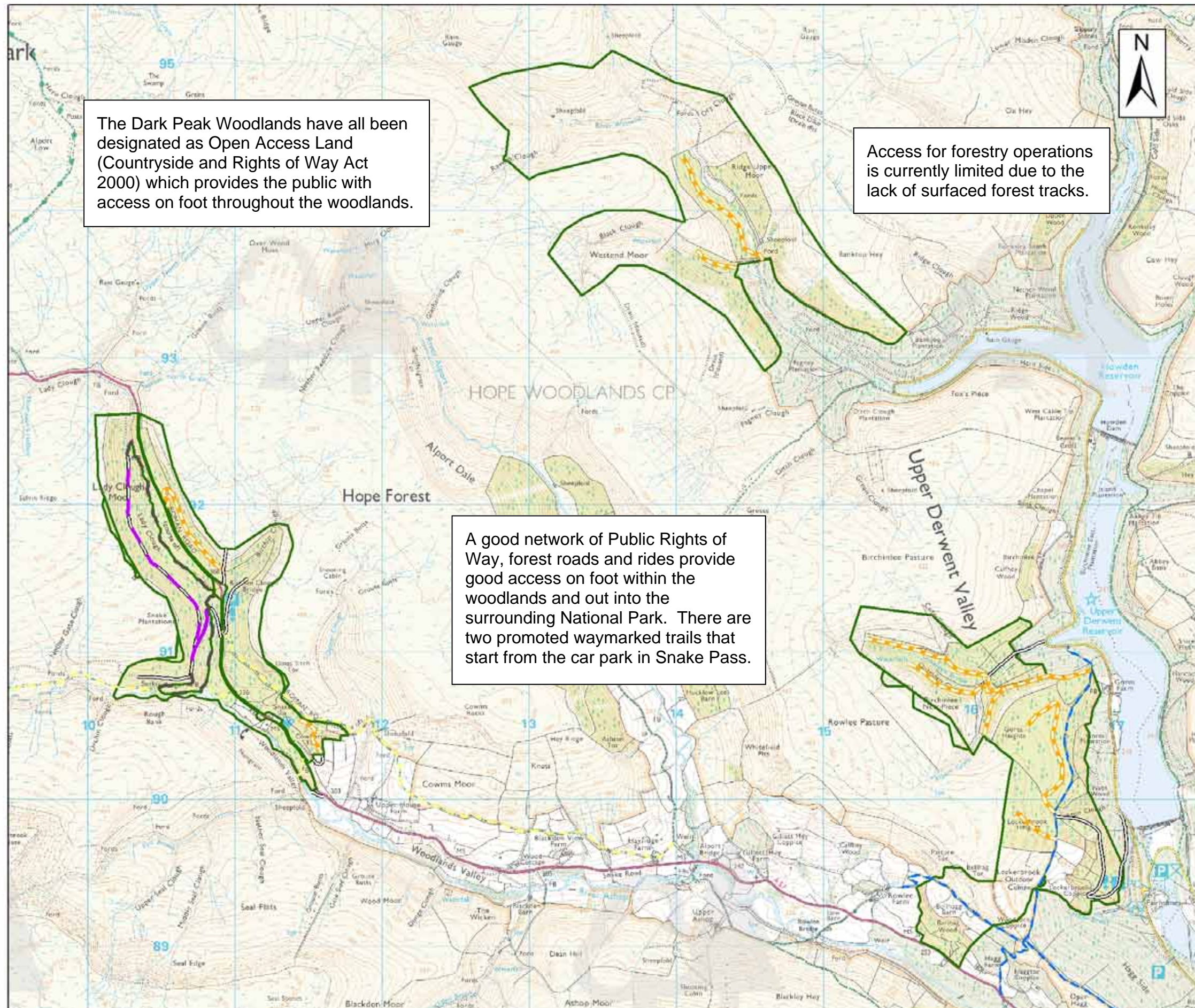
The forests lie within the catchment of the Derwent Reservoir that supplies drinking water to major conurbations. The current level of public access in the forests is low in comparison to the surrounding area. The forests are freehold and are managed as open access land.

 View Points



1:150,000
Scale at A3





The Dark Peak Woodlands have all been designated as Open Access Land (Countryside and Rights of Way Act 2000) which provides the public with access on foot throughout the woodlands.

Access for forestry operations is currently limited due to the lack of surfaced forest tracks.

A good network of Public Rights of Way, forest roads and rides provide good access on foot within the woodlands and out into the surrounding National Park. There are two promoted waymarked trails that start from the car park in Snake Pass.

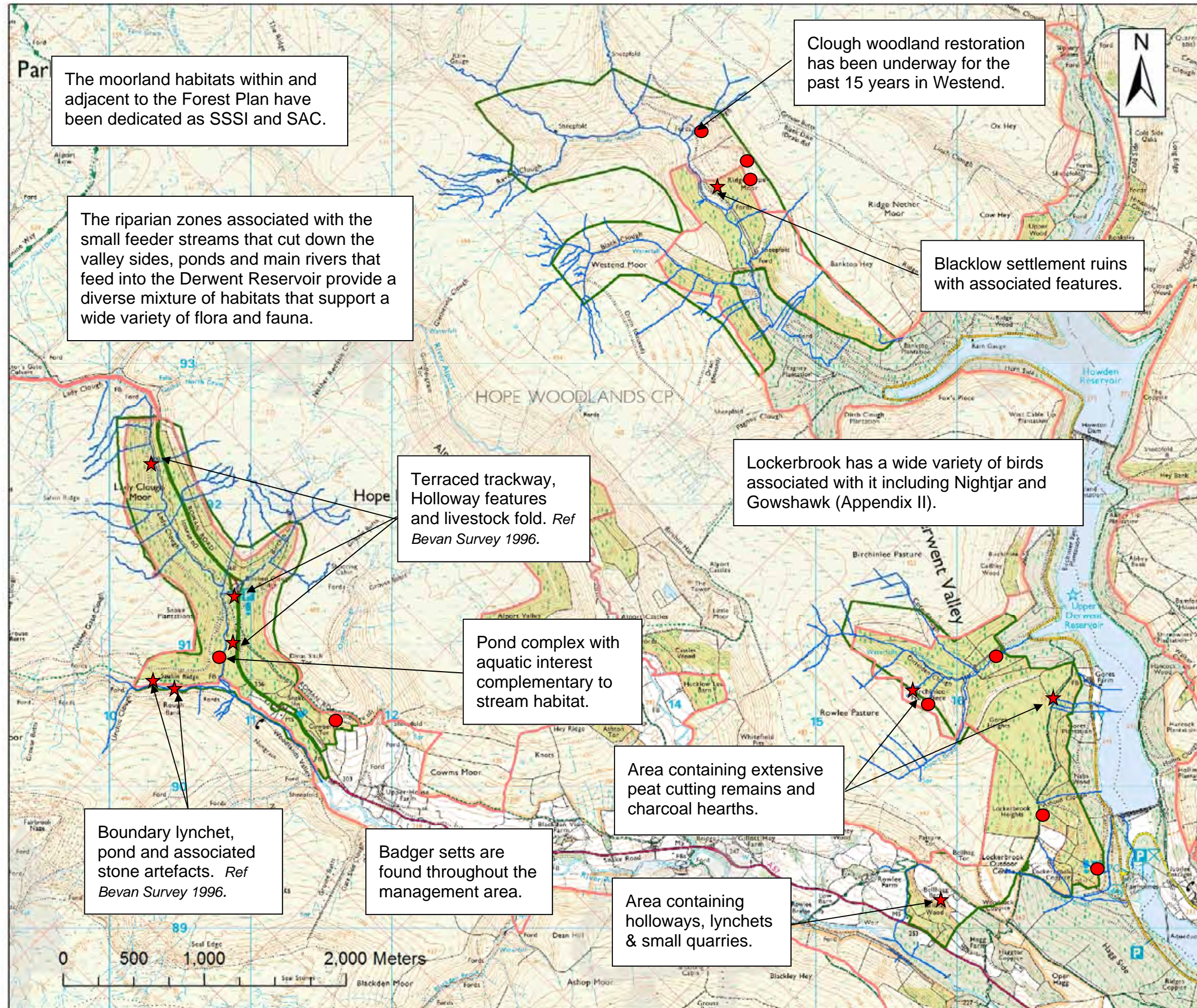
Central Forest District

Road & Access Map






- Forest Roads
- - - FC Promoted Trail
- - - Public Bridleway
- - - Public Footpath
- - - Forest Ride Improvements
- ▭ Management Area

Forestry Commission
 England
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 Scale at A3

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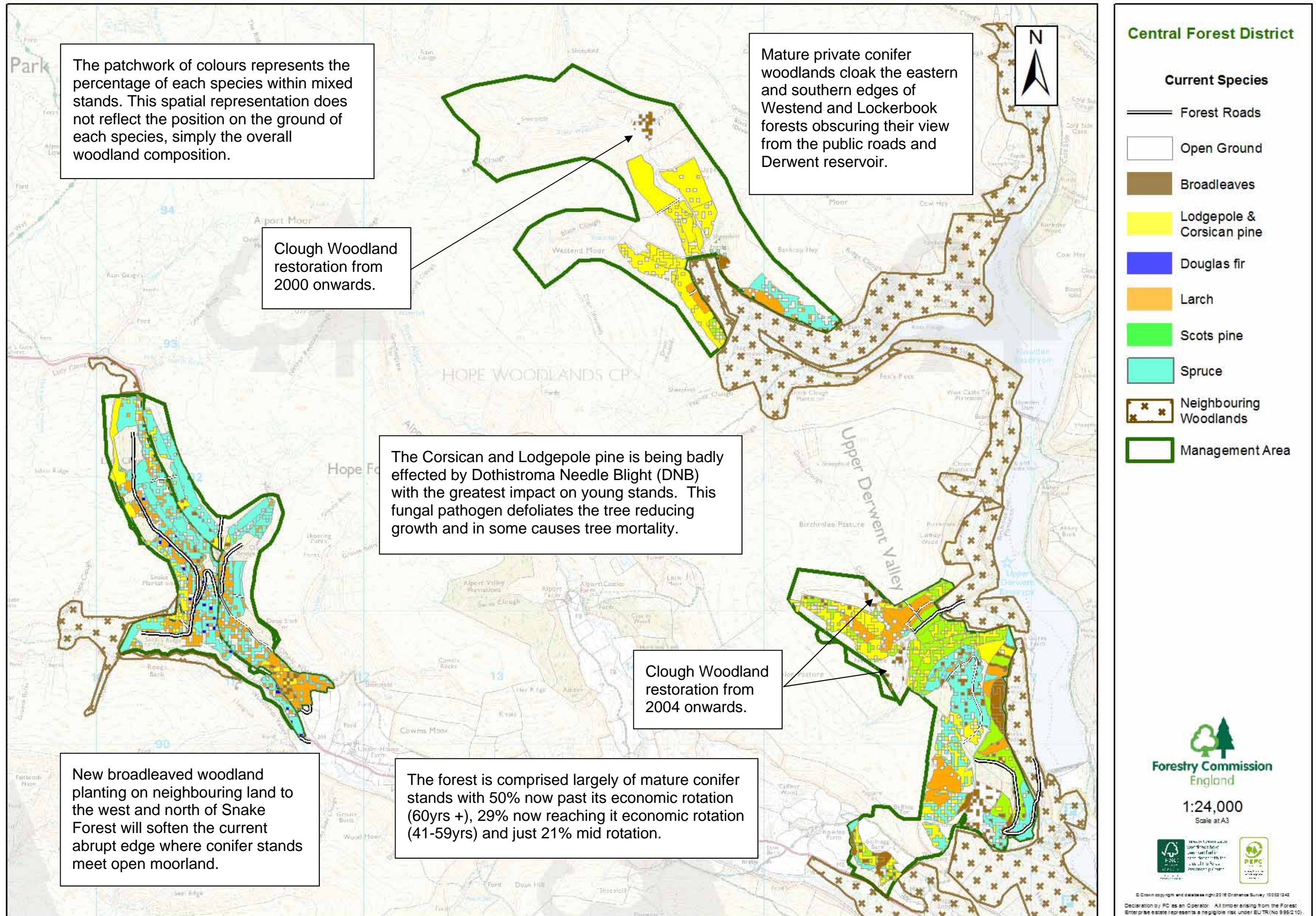
Central Forest District

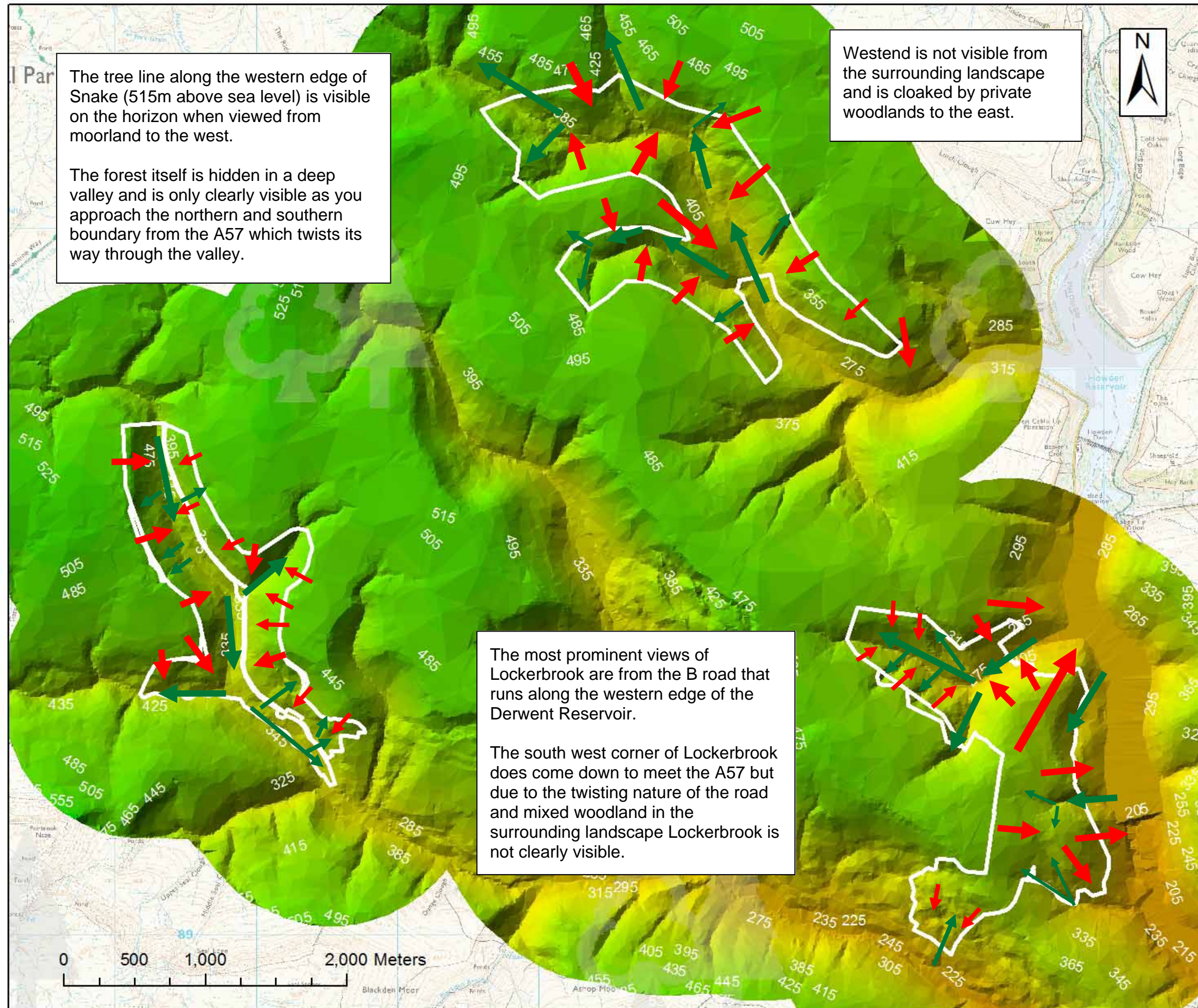
- Ecological & Cultural Interests**
-  Special Area of Conservation (SAC) & Site of Special Scientific Interests (SSSI)
 -  Water Course
 -  Conservation Site
 -  Unscheduled Ancient Monument
 -  Management Area



1:25,000
Scale at A3







The tree line along the western edge of Snake (515m above sea level) is visible on the horizon when viewed from moorland to the west.

The forest itself is hidden in a deep valley and is only clearly visible as you approach the northern and southern boundary from the A57 which twists its way through the valley.



Westend is not visible from the surrounding landscape and is cloaked by private woodlands to the east.

The most prominent views of Lockerbrook are from the B road that runs along the western edge of the Derwent Reservoir.

The south west corner of Lockerbrook does come down to meet the A57 but due to the twisting nature of the road and mixed woodland in the surrounding landscape Lockerbrook is not clearly visible.


Central Forest District

Elevation & Landform



-  Gullies, hollows & valley bottoms
-  Ridge, Plateau or high ground

Snake Forest is isolated from other woodland by moorland and improved pasture. There has been some recent broadleaved woodland planting along neighbouring land to the west and north, although this has yet to become established.

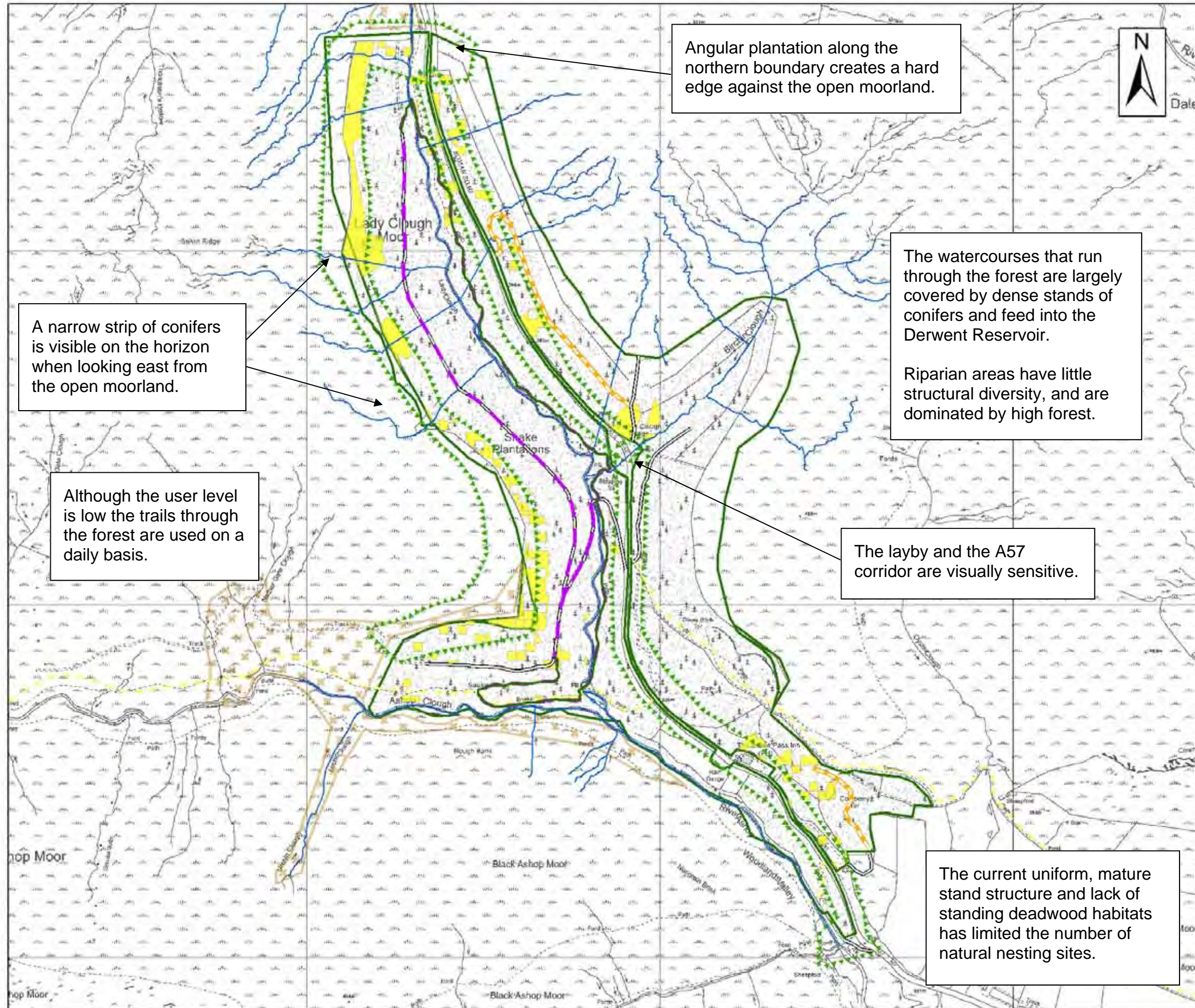
Westend and Lockerbrook adjoin non FC woodland which isolates them from the reservoirs. The component woodlands are visible from each other when seen from surrounding moorland but are not prominent in the landscape.



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Scale at A3

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Angular plantation along the northern boundary creates a hard edge against the open moorland.

A narrow strip of conifers is visible on the horizon when looking east from the open moorland.

Although the user level is low the trails through the forest are used on a daily basis.

The watercourses that run through the forest are largely covered by dense stands of conifers and feed into the Derwent Reservoir.
Riparian areas have little structural diversity, and are dominated by high forest.

The layby and the A57 corridor are visually sensitive.

The current uniform, mature stand structure and lack of standing deadwood habitats has limited the number of natural nesting sites.

Central Forest District

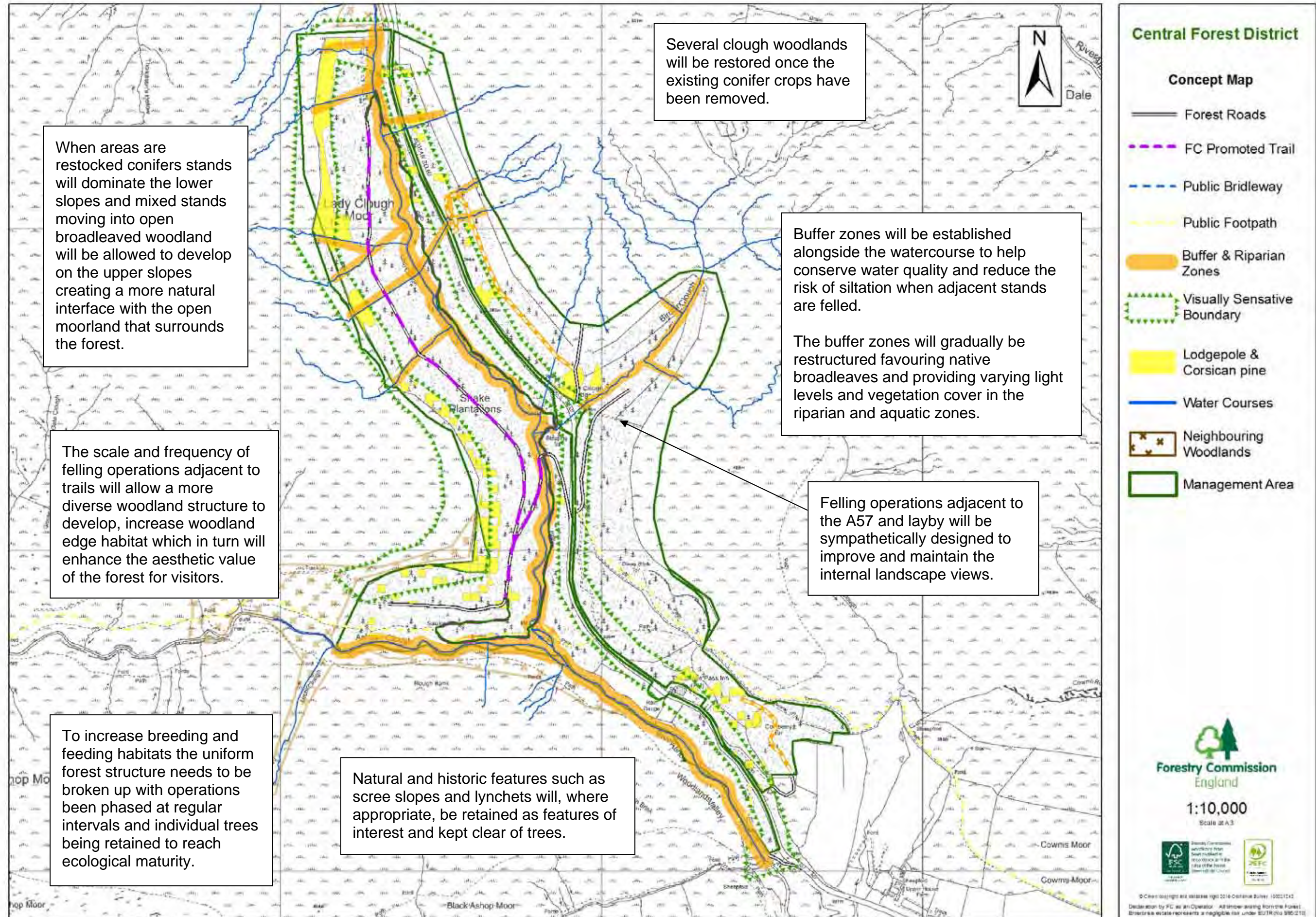
Analysis Map

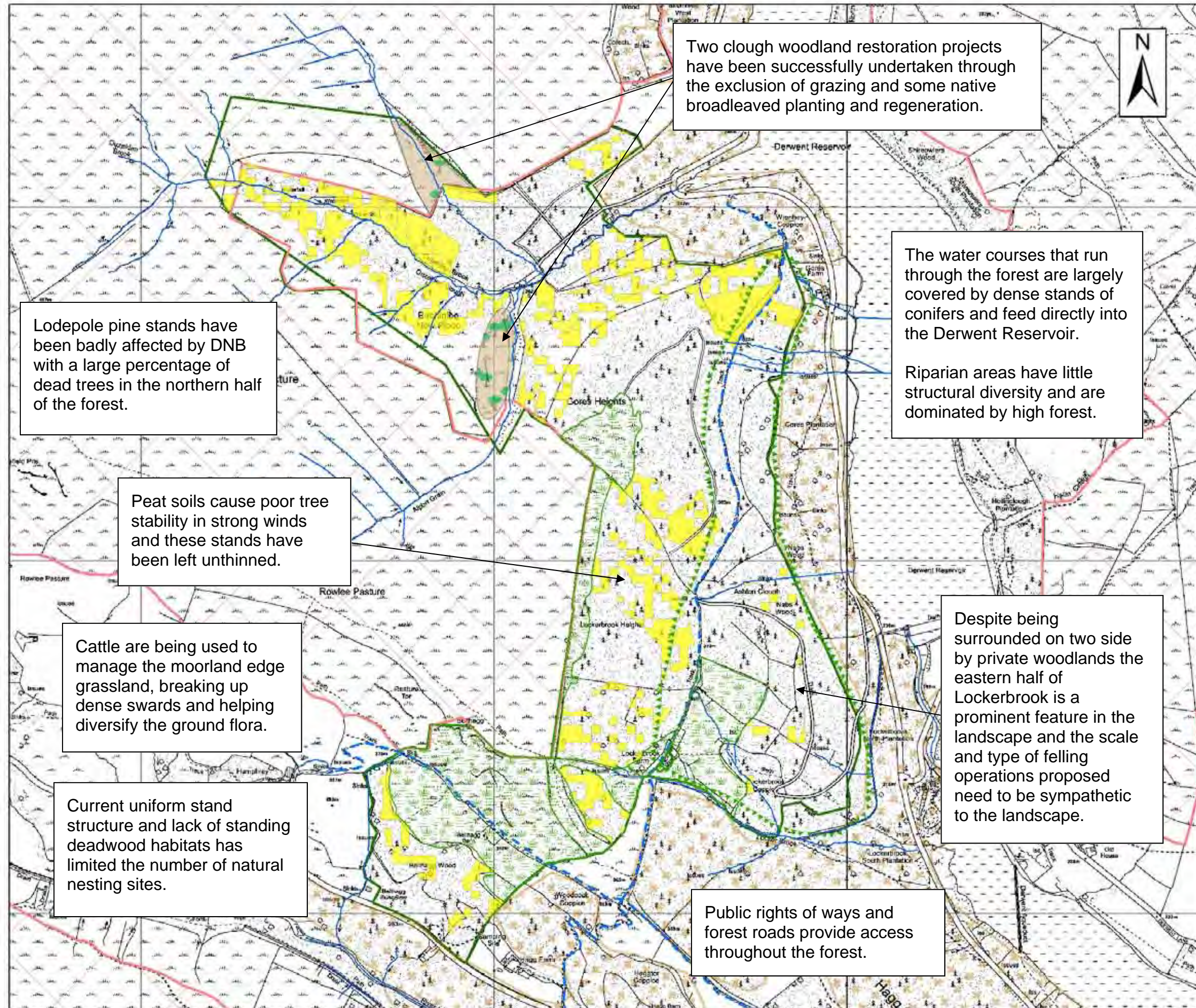
- Forest Roads
- - - FC Promoted Trail
- - - Public Bridleway
- Public Footpath
- - - Visually Sensitive Boundary
- Lodgepole & Corsican pine
- Water Courses
- Neighbouring Woodlands
- Management Area

Forestry Commission
England

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Scale at A3

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Brexit: this website represents a negligible tax under EUTR (EU 95/210)





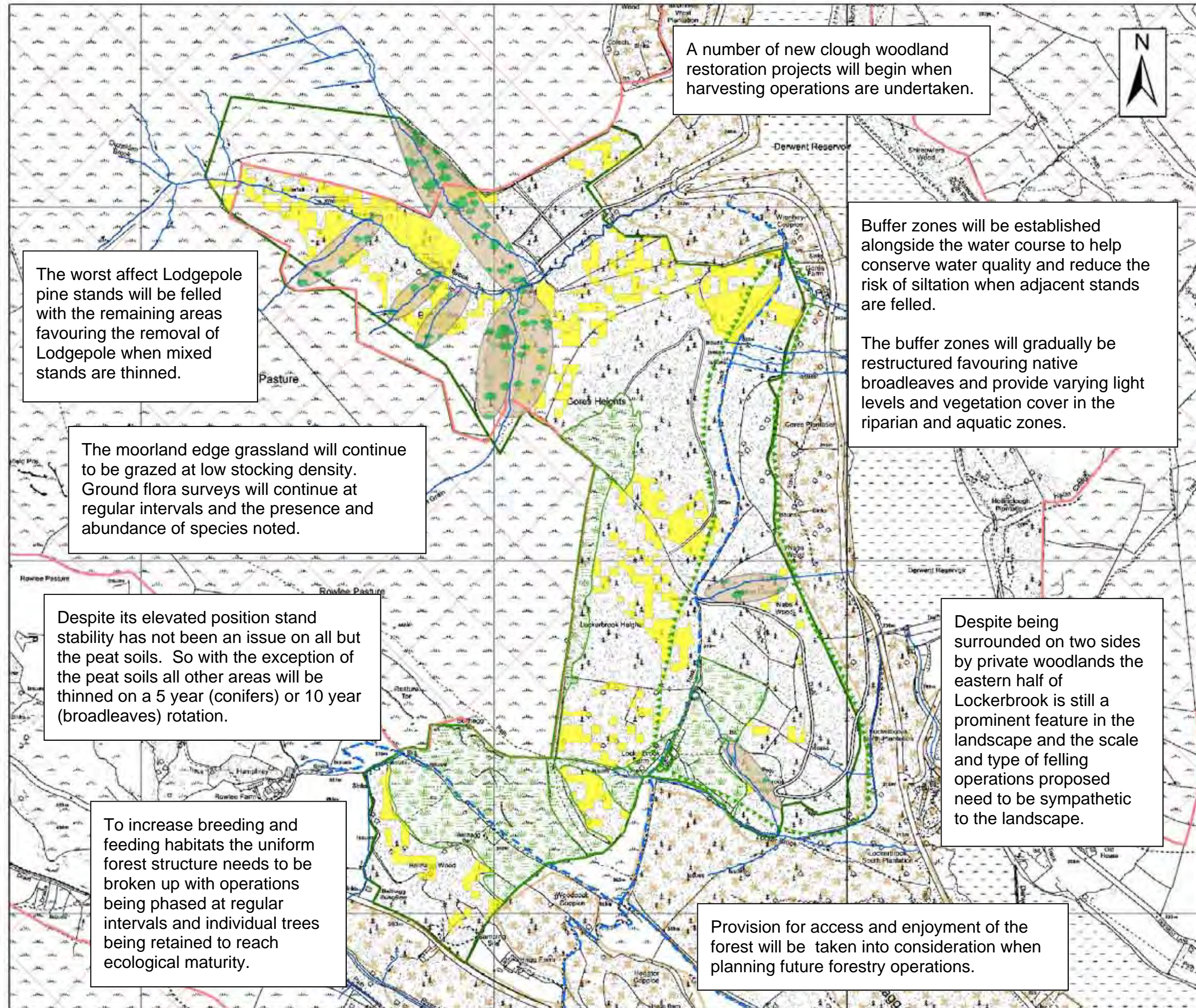
Central Forest District

Analysis Map

- Forest Roads
- - - Public Bridleway
- Public Footpath
- Visually Sensitive Boundary
- Clough Woodland Restoration
- Lodgepole & Corsican pine
- Water Courses
- Neighbouring Woodlands
- Unimproved Grassland
- Special Area of Conservation (SAC) & Site of Special Scientific Interest (SSSI)
- Management Area



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Scale at A3



A number of new clough woodland restoration projects will begin when harvesting operations are undertaken.

The worst affect Lodgepole pine stands will be felled with the remaining areas favouring the removal of Lodgepole when mixed stands are thinned.

The moorland edge grassland will continue to be grazed at low stocking density. Ground flora surveys will continue at regular intervals and the presence and abundance of species noted.

Despite its elevated position stand stability has not been an issue on all but the peat soils. So with the exception of the peat soils all other areas will be thinned on a 5 year (conifers) or 10 year (broadleaves) rotation.

To increase breeding and feeding habitats the uniform forest structure needs to be broken up with operations being phased at regular intervals and individual trees being retained to reach ecological maturity.

Buffer zones will be established alongside the water course to help conserve water quality and reduce the risk of siltation when adjacent stands are felled. The buffer zones will gradually be restructured favouring native broadleaves and provide varying light levels and vegetation cover in the riparian and aquatic zones.

Despite being surrounded on two sides by private woodlands the eastern half of Lockerbrook is still a prominent feature in the landscape and the scale and type of felling operations proposed need to be sympathetic to the landscape.

Provision for access and enjoyment of the forest will be taken into consideration when planning future forestry operations.

Central Forest District

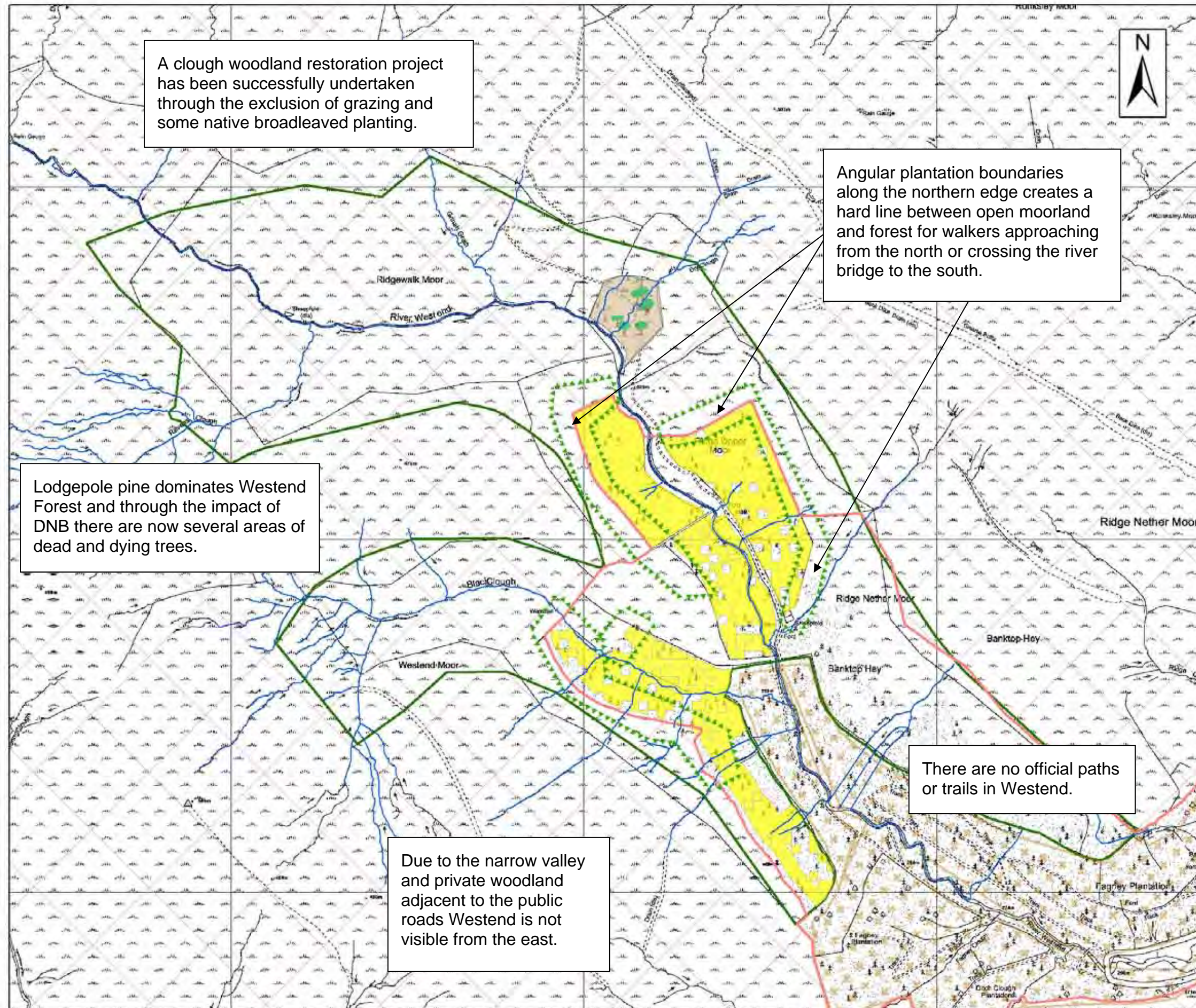
Concept Map

- Forest Roads
- Public Footpath
- Visually Sensitive Boundary
- Clough Woodland Restoration
- Lodgepole & Corsican pine
- Water Courses
- Neighbouring Woodlands
- Unimproved Grassland
- Special Area of Conservation (SAC) & Site of Special Scientific Interest (SSSI)
- Management Area

Forestry Commission
England

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Scale at A3

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A clough woodland restoration project has been successfully undertaken through the exclusion of grazing and some native broadleaved planting.

Angular plantation boundaries along the northern edge creates a hard line between open moorland and forest for walkers approaching from the north or crossing the river bridge to the south.

Lodgepole pine dominates Westend Forest and through the impact of DNB there are now several areas of dead and dying trees.

There are no official paths or trails in Westend.

Due to the narrow valley and private woodland adjacent to the public roads Westend is not visible from the east.

Central Forest District

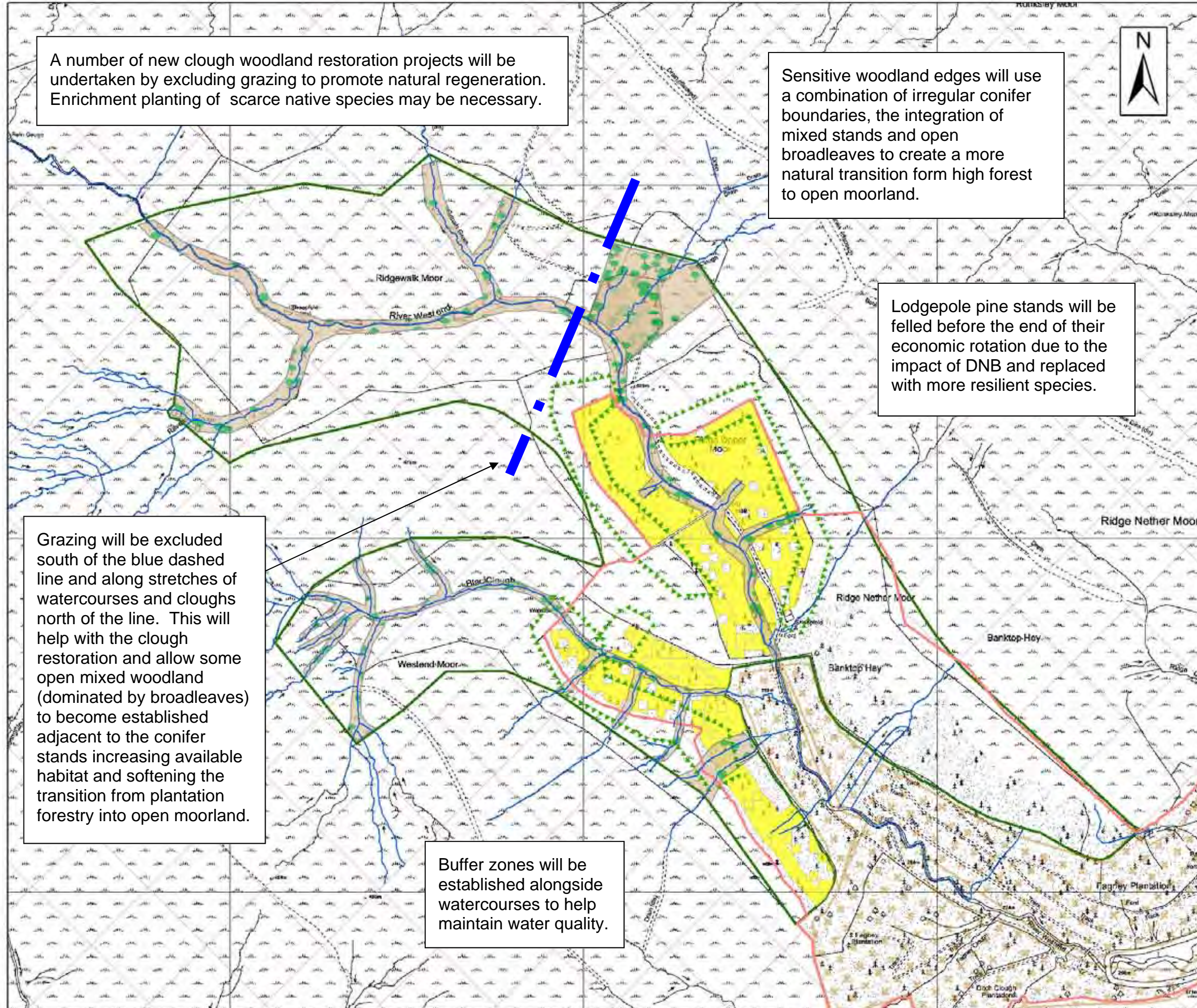
Analysis Map

- Forest Roads
- Public Footpath
- Visually Sensitive Boundary
- Clough Woodland Restoration
- Lodgepole & Corsican pine
- Water Courses
- Neighbouring Woodlands
- Unimproved Grassland
- Special Area of Conservation (SAC) & Site of Special Scientific Interest (SSSI)
- Management Area

Forestry Commission
England

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Scale at A3

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Central Forest District

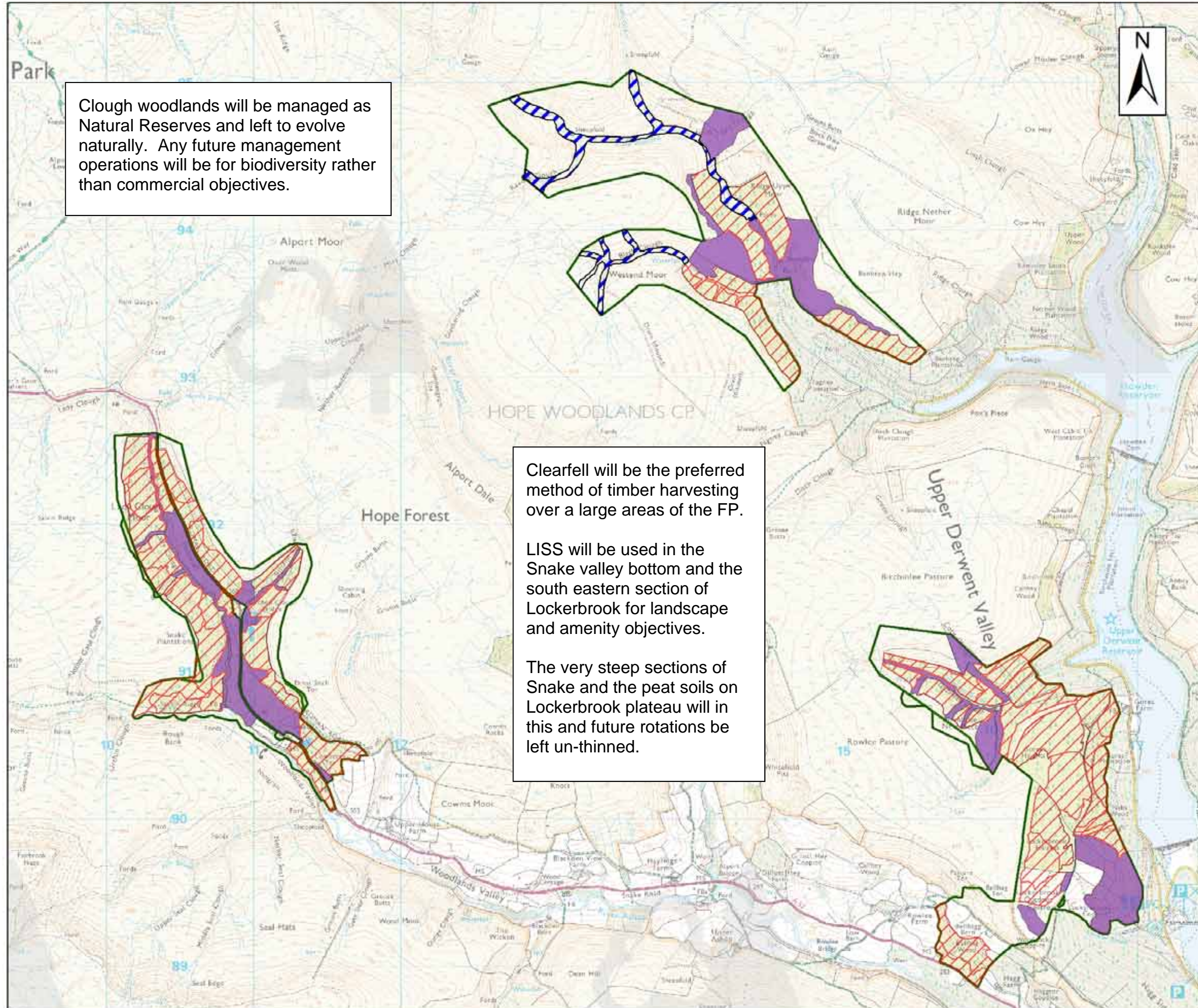
Concept Map

- Forest Roads
- Public Footpath
- Visually Sensitive Boundary
- Clough Woodland Restoration
- Lodgepole & Corsican pine
- Water Courses
- Neighbouring Woodlands
- Unimproved Grassland
- Special Area of Conservation (SAC) & Site of Special Scientific Interest (SSSI)
- Management Area

Forestry Commission
England

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Borealis estate represents a negligible risk under EU TR (EU 99/213)



Clough woodlands will be managed as Natural Reserves and left to evolve naturally. Any future management operations will be for biodiversity rather than commercial objectives.






Clearfell will be the preferred method of timber harvesting over a large areas of the FP.

LISS will be used in the Snake valley bottom and the south eastern section of Lockerbrook for landscape and amenity objectives.

The very steep sections of Snake and the peat soils on Lockerbrook plateau will in this and future rotations be left un-thinned.

Central Forest District

Silvicultural Systems

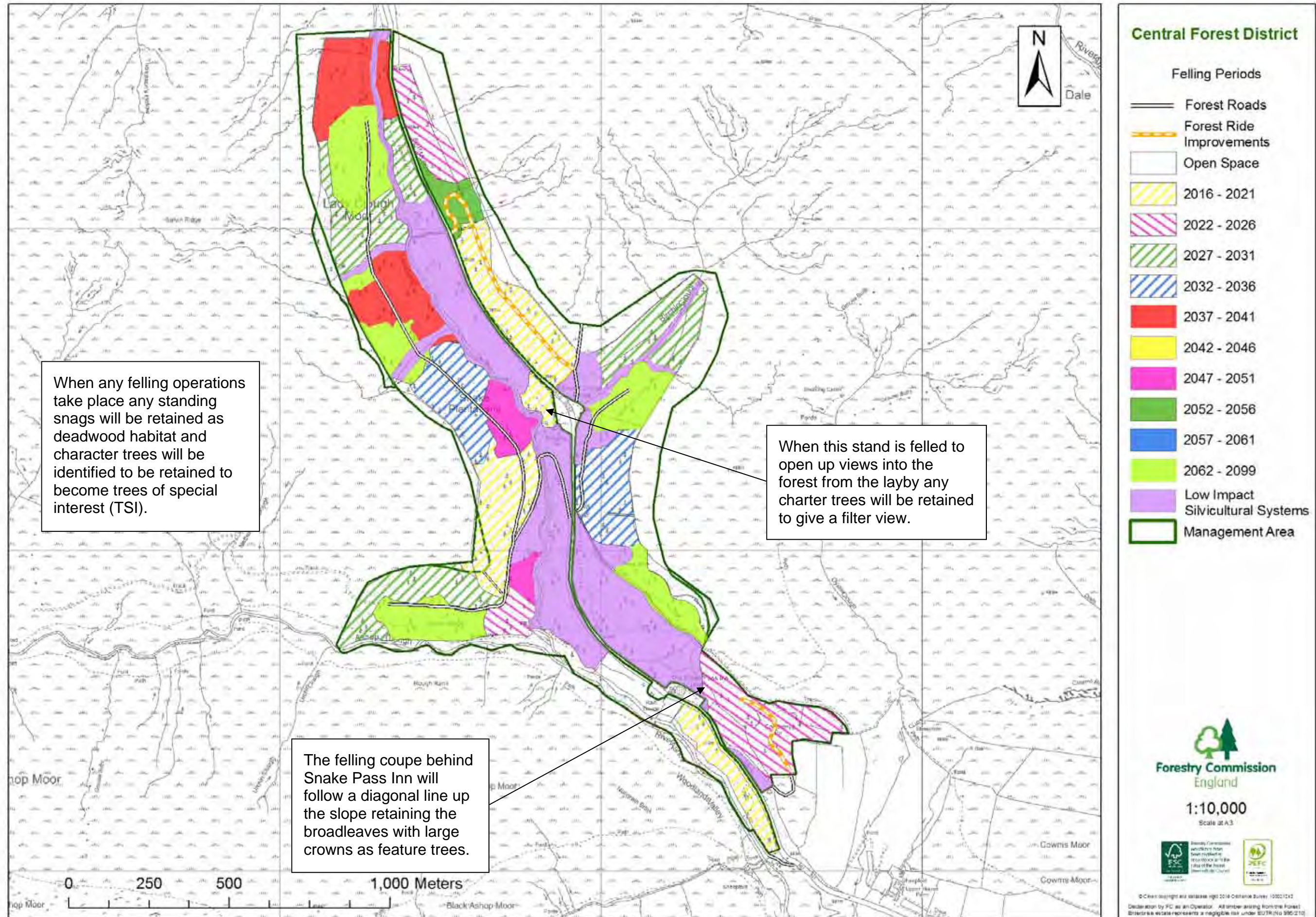
-  Open Land
-  Low Impact Silvicultural Systems (LISS)
-  Biological Retention
-  Clearfell
-  Management Area

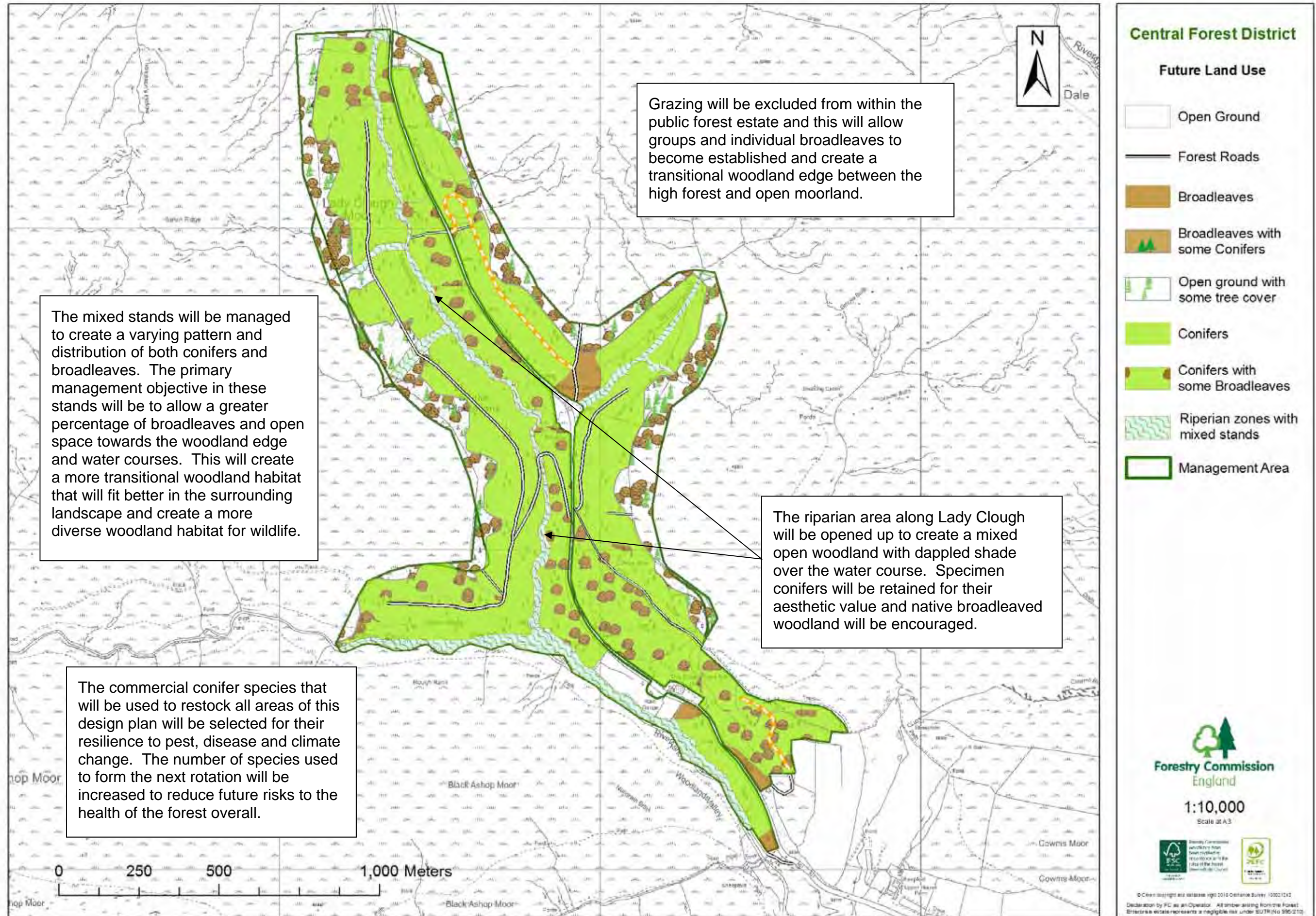


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Decided on by FC as an Operator. All timber arising from the Forest
Biodiversity estate represents a negligible risk under EUTR (No 995/210).



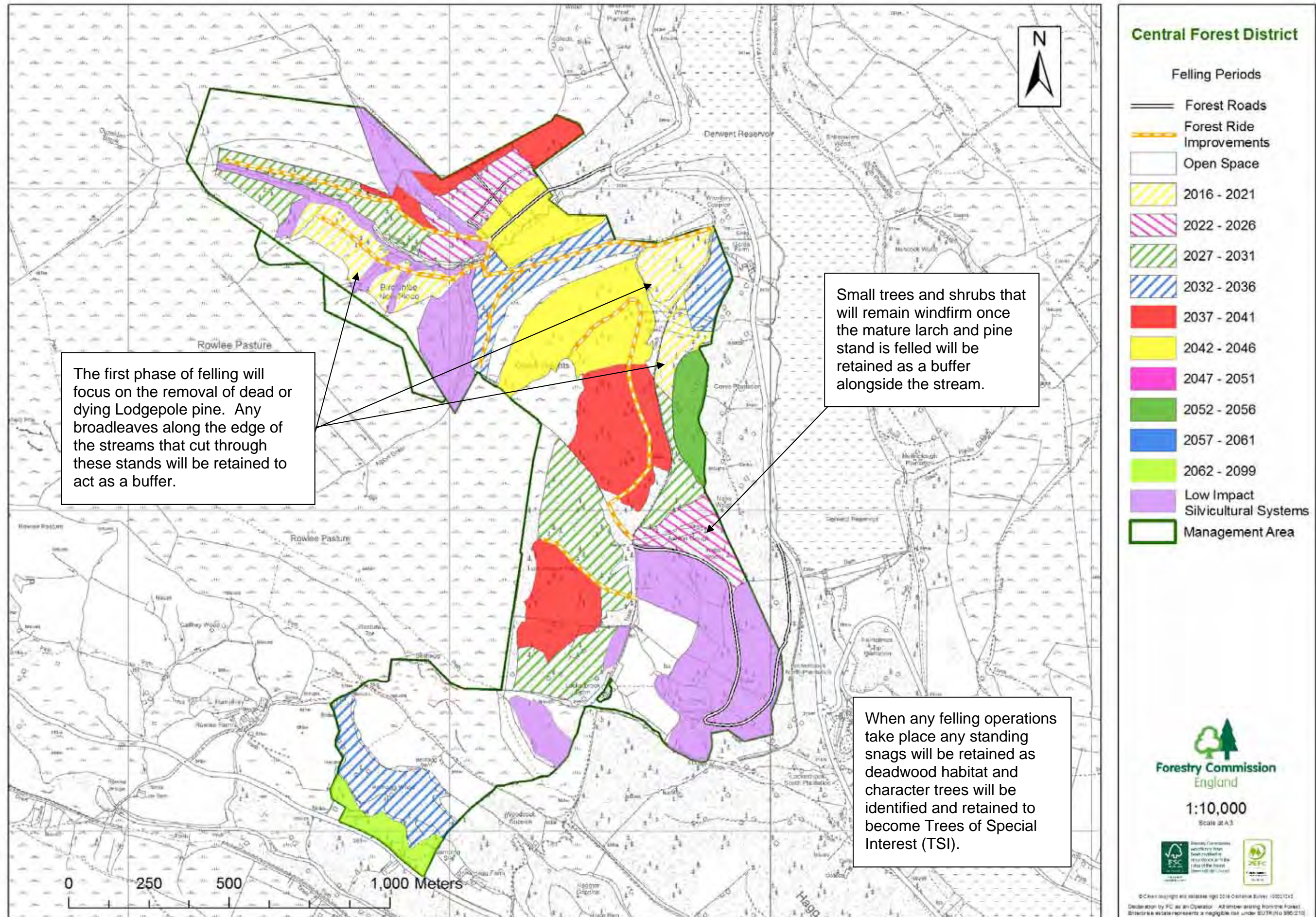


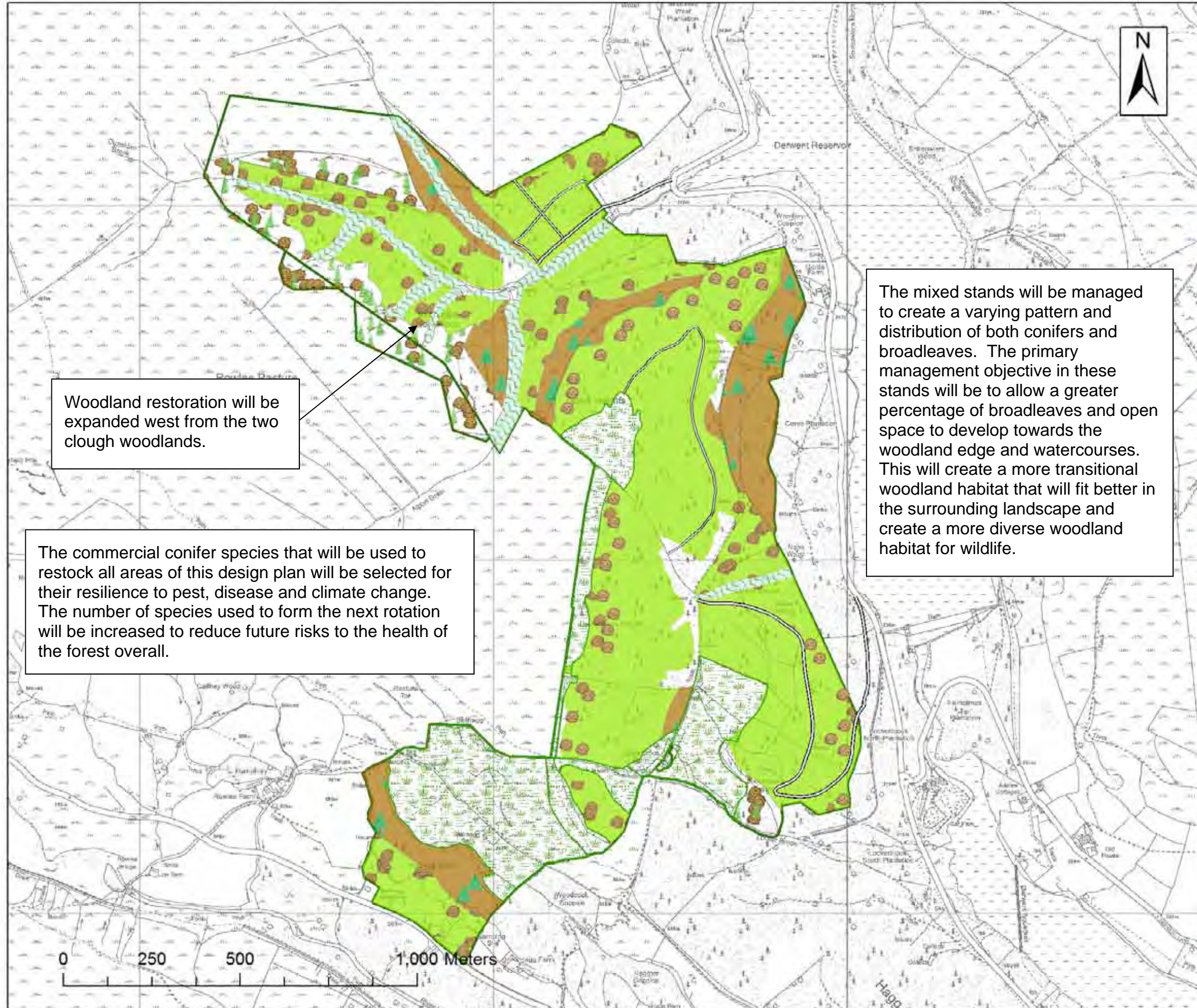
The mixed stands will be managed to create a varying pattern and distribution of both conifers and broadleaves. The primary management objective in these stands will be to allow a greater percentage of broadleaves and open space towards the woodland edge and water courses. This will create a more transitional woodland habitat that will fit better in the surrounding landscape and create a more diverse woodland habitat for wildlife.

Grazing will be excluded from within the public forest estate and this will allow groups and individual broadleaves to become established and create a transitional woodland edge between the high forest and open moorland.

The riparian area along Lady Clough will be opened up to create a mixed open woodland with dappled shade over the water course. Specimen conifers will be retained for their aesthetic value and native broadleaved woodland will be encouraged.

The commercial conifer species that will be used to restock all areas of this design plan will be selected for their resilience to pest, disease and climate change. The number of species used to form the next rotation will be increased to reduce future risks to the health of the forest overall.





Woodland restoration will be expanded west from the two clough woodlands.

The commercial conifer species that will be used to restock all areas of this design plan will be selected for their resilience to pest, disease and climate change. The number of species used to form the next rotation will be increased to reduce future risks to the health of the forest overall.

The mixed stands will be managed to create a varying pattern and distribution of both conifers and broadleaves. The primary management objective in these stands will be to allow a greater percentage of broadleaves and open space to develop towards the woodland edge and watercourses. This will create a more transitional woodland habitat that will fit better in the surrounding landscape and create a more diverse woodland habitat for wildlife.

Central Forest District

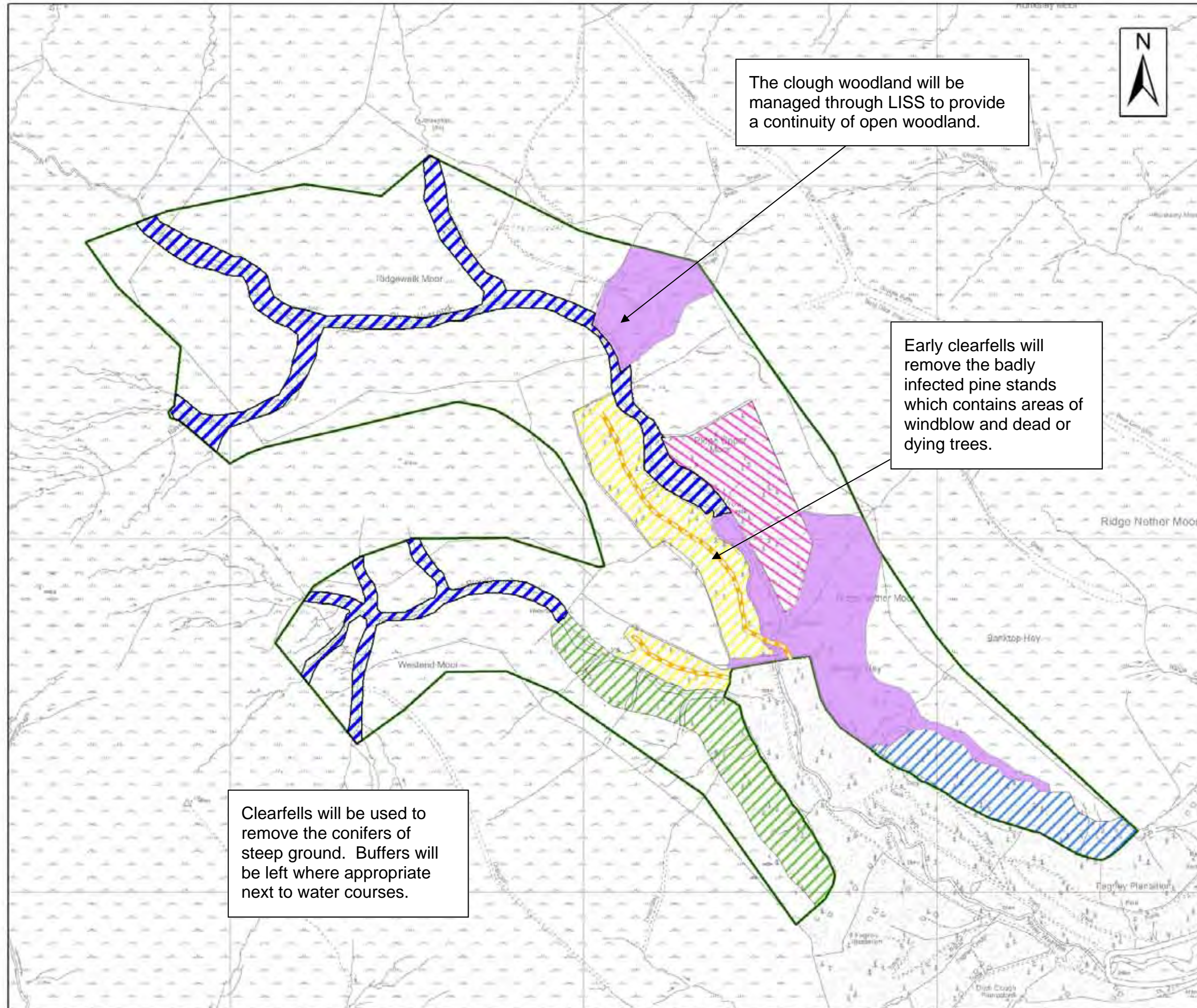
Future Land Use

- Open Ground
- Forest Roads
- Broadleaves
- Broadleaves with some Conifers
- Open ground with some tree cover
- Conifers
- Conifers with some Broadleaves
- Riparian zones with mixed stands
- Unimproved grassland
- Management Area

1:10,000
Scale at A3



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Declaration by FC as an Operator: All timber arising from this Forest
Biodiversity estate represents a negligible risk under SUTR (No 395210)



Central Forest District

Felling Periods

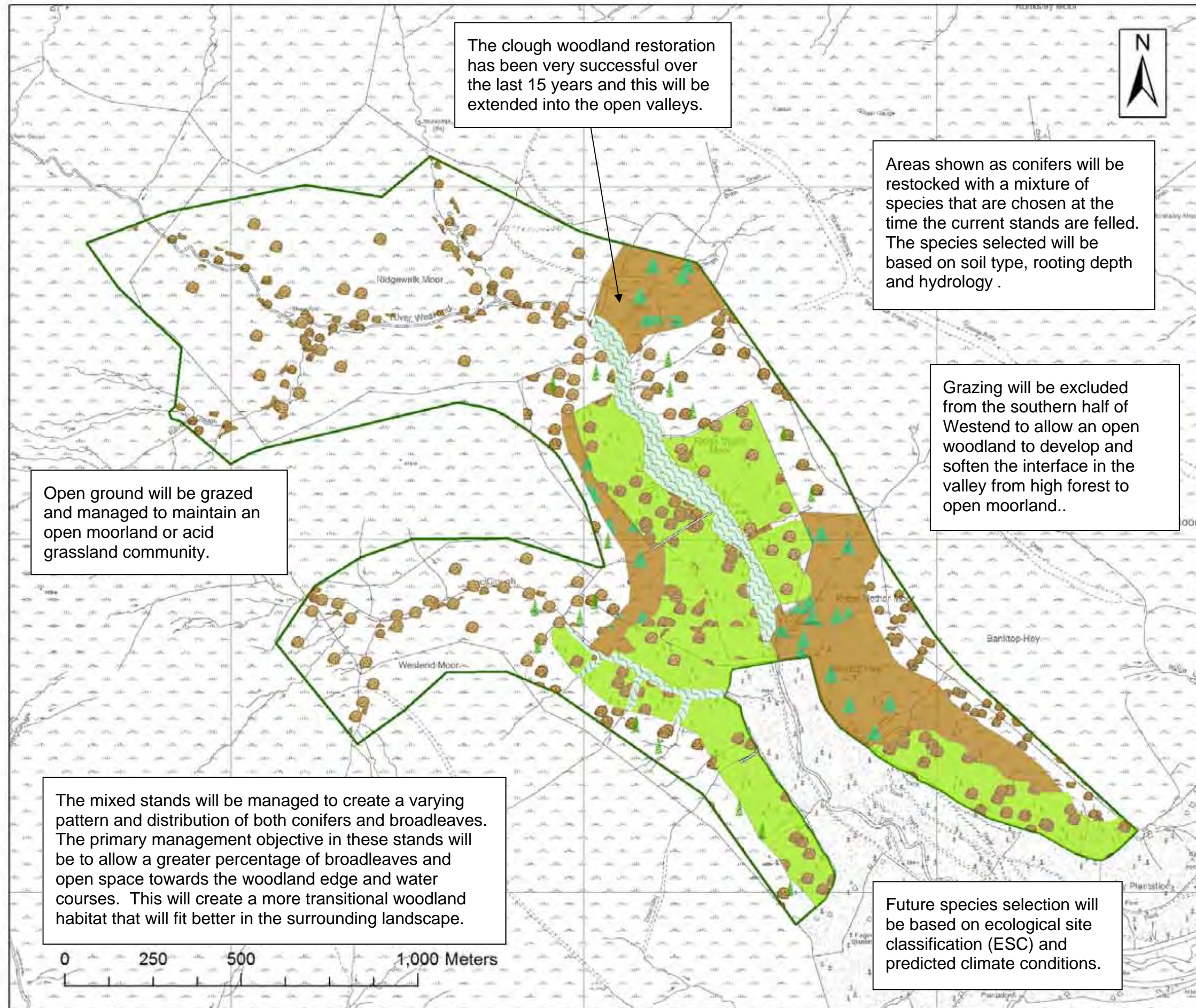
- Forest Roads
- Forest Ride Improvements
- Open Space
- ▨ 2016 - 2021
- ▨ 2022 - 2026
- ▨ 2027 - 2031
- ▨ 2032 - 2036
- 2037 - 2041
- 2042 - 2046
- 2047 - 2051
- 2052 - 2056
- 2057 - 2061
- 2062 - 2099
- ▨ Biological Retentions
- Low Impact Silvicultural Systems
- Management Area



1:10,000
Scale at A3



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 Declaration by FC as an Operator: All timber arising from the Forest
 Bracken estate represents a negligible risk under EUTR04 985/210.



Central Forest District

Future Land Use

- Open Ground
- Forest Roads
- Broadleaves
- Broadleaves with some Conifers
- Open ground with some tree cover
- Conifers
- Conifers with some Broadleaves
- Riparian zones with mixed stands
- Unimproved grassland
- Management Area



1:10,000
Scale at A3



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Declaration by FC as an Operator: All timber arising from the Forest
Bioscience estate represents a negligible risk under 32/19/016 396/210

View Point 1—Snake Pass looking south down the valley



Recent broadleaved tree planting on adjacent land will soften the current hard edge the conifer forest creates against the open moorland.

This will be enhanced further on the Forestry Commission land through the creation of an irregular tree line of mixed conifers and broadleaves.

Snake Pass looking south down the valley from ground level



Native broadleaves have already started to establish themselves on FC land now grazing has been excluded.

View Point 2—Snake Pass looking north.



Mature broadleaved stands of trees dominate the view of Snake Forest as driving north up the A57. Conifer stands are visible on the upper slopes and in the valley.

View Point 3 - Lockerbrook from across Ladybower Reser-



Lockerbrook Forest lies on the upper slopes (above the white line) overlooking Ladybower and the Derwent reservoirs. The proposed felling patterns and introduction of broadleaves and cloughs and some mixed stands will add to the texture, shape and diversity of the forest in the surrounding landscape.



View Point 4 - Lockerbrook from across Derwent reservoir



The large block of beech trees and broadleaved strips between conifer stands are clearly visible in the landscape.

The white line shows the Forestry Commissions boundary with the land below the line being privately owned.

The north eastern edge of Lockerbrook creates a hard edge in the landscape. This will be softened through the establishment of mixed open stands on adjacent land and the creation of an irregular conifer boundary when the area is felled and replanted.

View Point 5 - View south towards the northern boundary of Westend



Westend conifer stands currently create strong geometric patterns in the valley. Through a combination of felling, exclusion of grazing, creation of an irregular edge when restocking takes place and the introduction of mixed open woodland dominated by broadleaves on adjacent land, the outward appearance of the forest will change dramatically over the life of the Forest Plan. Work has already begun on the restoration of clough woodland up the valley and young broadleaved trees are now becoming established on the slope next to the conifers, following the introduction of a stock fence to prevent grazing.

Appendix I

The Dark Peak Forest Plan Brief

Introduction

This Forest Plan (FP) summarises proposals by the Forestry Commission for the management of three woodlands, Snake (154.2ha), Lockerbrook (191ha) and Westend (240.2ha) which lie in the Dark Peak and Upper Derwent catchment, Derbyshire. The plan area of 585.4ha lies mid way between Glossop and Sheffield adjacent to the A57, Ladybower and Derwent Reservoir.

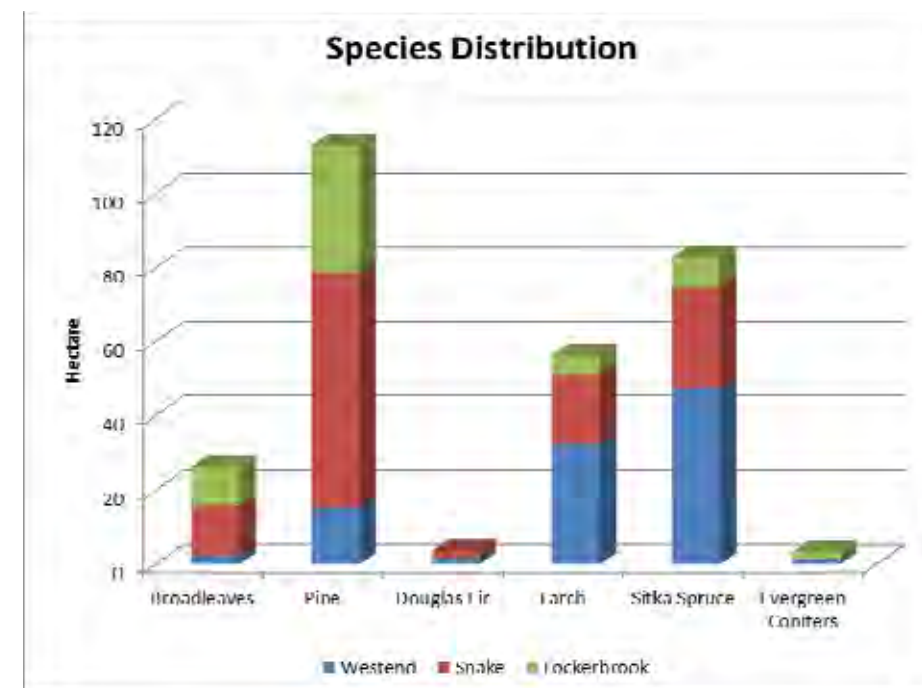
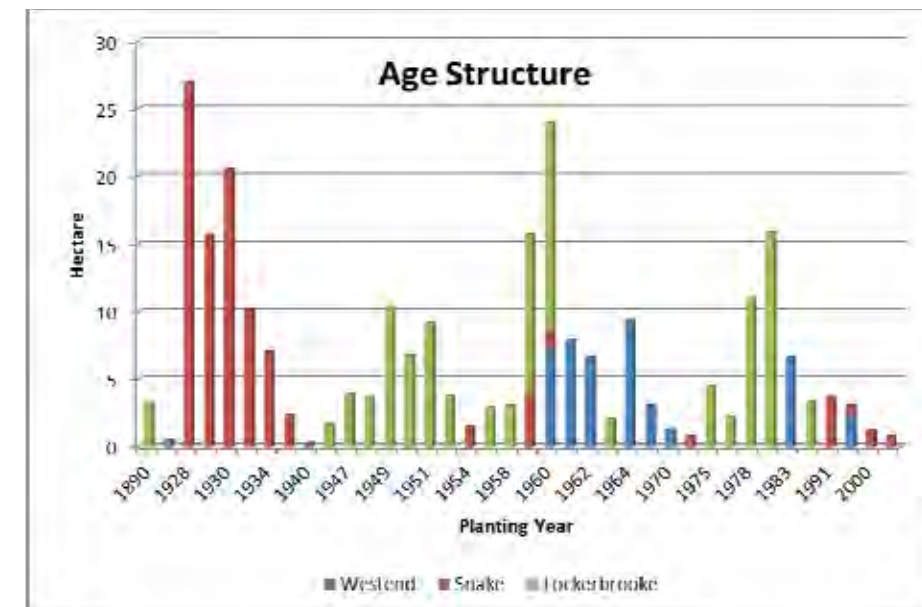
Landscape setting

The plan area comprises plantation woodlands within the High Peak and Gritstone Edge Character Area, adjacent to the Gritstone Moorland Natural Zone within the Upper Derwent Valley. The dominant local landscape character is of wild moorland with extensive woodlands, mainly of plantation origin on lower slopes and adjacent to the reservoirs. Large areas of the FP lie on steep valley sides making the woodlands strong features in the local landscape but less visible in the wider landscape. Snake Woodland stands alone but Lockerbrook and Westend adjoin non-FC woodland which isolates them from the reservoirs and public roads. Principal views are from the public roads in the valley bottom. The woodlands are predominantly coniferous but contain or are associated with some native broadleaved elements.

Economic

Snake Woodland was planted between 1928 and 1930 and Lockerbrook and Westend between 1943 through to the early 1960's and are now dominated by mature conifer stands. Some felling has taken place over the last 20 years and this has created some structural diversity within the woodlands. Commercial species are mainly Lodgepole pine, Sitka spruce, Hybrid and Japanese larch. Spruce and larch are the most productive species with prolific natural regeneration of both species occurring on recently restocked sites. These are replacing Lodgepole pine which is of poor form throughout.

The major components and planting periods within each woodland are shown below.



The new management plans objectives will be to continue to grow commercial crops on a sustainable basis, diversify the forest structure through harvesting operations, restore native clough woodland, expand the woodland boundaries to develop move open mixed stands designed to increase unity with open moorland and show an increase in visual 'naturalness' in the long term.

Environmental

The Dark Peak moors are of special interest for upland vegetation, breeding birds, invertebrates and geological features. The vegetation has the full range of upland plant communities found in the South Pennines. The Peak District Moors Special Area of Conservation (SAC), which includes the Dark Peak SSSI, is an upland area of international importance. It provides habitat for an important assemblage of breeding moorland and moorland fringe birds.

The principal ecological interest in the plan area is therefore a combination of moorland and native woodland habitats. The FP will help to develop a wider range of woodland habitats across the FP area through the retention of some trees in perpetuity to provide deadwood habitats and allow mixed open stands of trees to develop creating new woodland edge habitats.

Social

The moorlands surrounding the plan area are the subject of an Access Agreement which allows free public access at all times. Coupled with the FC open access policy, the entire plan area is available for informal recreational use. There are no visitor facilities within the woodlands but there is one bridleway which cuts through Lockerbrook, and 2 public footpaths in Snake Woods. There are two waymarked trails in Lady Clough which is part of Snake Wood and a circular waymarked trail promoted by Derwent Water that passes through Lockerbrook. Seven Trent Water has a visitor centre and public facilities at Ladybower Reservoir. There are no plans to provide public facilities within the FP woodlands but provision for public rights of way and informal access points will be included in the design proposals. There are no Scheduled Ancient Monuments in the plan area but the 1997 archaeological survey (Bevan, Upper Derwent Archaeological Survey: Snake Plantations) identified a number of archaeological features in the plan area. These are catalogued in the Survey Report 1997/98 and include trackways, revetments and built structures. The most notable feature in the area is the dam overlooked from Lockerbrook which was used by 617 Dambuster Sqd to train in World War II with the bouncing bomb.

Consultation

The consultation period will run from June through till July 2017 after which time the Forest Plan will be finalised and submitted onto the public register for approval.

Appendix II

Lockerbrook Vegetation Monitoring report 2015 - Kay Dulieu and Julie Westfold

Introduction

This is a continuation of the vegetation survey by the Forestry Commission ecologist Adrienne Bennett which was first carried out in 2009 and continued over subsequent years. The surveys obtained over this period have been used in conjunction with a survey carried out in Summer/Autumn 2015 to gauge the impact of grazing on the vegetation and floristic diversity.

Limitations

The period allocated for the work was one day field work (two surveyors) and two days allocated to report production. In order to cover all the quadrats it was agreed that a variation on the methodology used by Forestry Commission ecologist would be employed. Both Kay Dulieu and Julie Westfold are experienced moorland/heathland botanists. As in 2014, it was felt that a quicker survey method would not skew the result allowing meaningful conclusions to be drawn from the survey results obtained. Quadrat B1 was not recorded as it could not be located. The other quadrats from this habitat type had a very similar composition so it was felt that the results will not have been significantly changed. Quadrat E3 was also not recorded as a very active wasps nest was in this quadrat.

Methodology

The survey area was divided according to the dominant vegetation type and fixed quadrat points marked by stakes (selection and distribution of stakes in each area is detailed in 'Vegetation monitoring report, Lockerbrook 2009', Forestry Commission 2009, Adrienne Bennett). Where stakes were located, 2 X 2 (see map – Appendix 2) quadrats were laid out and the percentage of each species was recorded. This allowed a relatively quick method of quantifying each species and made it possible to cover all but two quadrats (see limitations).

Results and Conclusions

Area A

Acid Grassland – Purple Moor-Grass (*Molinia*) Community

All seven quadrats were surveyed this year. Purple moor-grass (*Molinia caerulea*) still remains highly dominant in each quadrat, although there are small changes in frequency particularly in QA3 which has had a decreasing frequency over the surveys years. This year it was recorded at 30% in the previous year this was 40%. The presence of common bent (*Agrostis capillaris*), wavy hair-grass (*Deschampsia flexuosa*) and sheep's fescue (*Festuca ovina*) are typical components of *Molinia* grassland where the tussocks have been opened up. Other almost constant species include heath bedstraw (*Galium saxatile*), springy turf-moss (*Rhytidiadelphus squarrosus*), and bilberry (*Vaccinium myrtillus*). Heather (*Calluna vulgaris*) recorded as present (+), although not recorded in 2012, 2013 or 2014. Looking back at the survey results carried out by the Forestry Commission's ecologist Adrienne Bennet (2009 – 2011), heather was also recorded as present and some years not at all. Heather frequently grows on dryer ground and perhaps reflects the topography of the habitat. Its frequency may remain at this low level. On Burbage Moor this is also a feature of the heather that is seen both where *Molinia* or bracken (*Pteridium aquilinum*) dominate. Many of the Ericaceous species (heather, bilberry, crowberry and cowberry) grow on the dry

tops of boulders and rocks away from the competition of these two species.

New species noted were broad-buckler fern (*Dryopteris dilatata*) and lichens, the most common probably being Devil's matchsticks (*Cladonia floerkenana*) a species with very distinctive fruiting bodies and common on peaty soils. Apart from *spring turf-moss*, other species of moss were noted but not identified specifically.

The action of the cattle trampling continues to open and break up the tussocks of the *Molinia* gradually allowing a more biodiverse sward to develop.

Area B

13 species were recorded this year. Bilberry is still highly dominant in the area. *Molinia* occurs at much lower levels than in Area A forming a distinct change from one habitat to another. Wavy hair-grass was found at low levels in all of the quadrats and also in the surrounding habitat. The area has some areas which are waterlogged, some due to water filled hollows created by the cattle grazing in this area, creating habitat for highly specific species. These include cranberry (*Vaccinium oxycoccos*), flat-topped bog-moss (*Sphagnum fallax*), hare's-tail cotton-grass (*Eriophorum vaginatum*) and cross-leaved heath (*Erica tetralix*). Interestingly, cross-leaved heath appears to be increasing in the wetter areas compared to last year's report. It does not appear in any of the quadrats so this is a subjective assessment made by the surveyors. Cranberry was also assessed to be increasing, but again fell outside of the quadrats. Cowberry (*Empetrum nigrum*) is present in 3 of the quadrats at low percentages but is recorded in the habitat outside the quadrats. Heather is also appearing more frequently favouring the dryer areas, but again this is a subjective assessment made without quantitative data from quadrats. The combination of the ericoid dwarf shrub community of heather, bilberry, crowberry and cross-leaved heath is a specific habitat and is a European Habitat Action Plan (HAP). 'Ericoid' in this context describes 'heath' as opposed to a 'moorland' and is the correct term for this habitat type (Anderson and Shinwell, 1981).

Area C

Matt-Grass (*Nardus*) Community

The habitat type remains matt-grass (*Nardus stricta*) dominated grassland, varying in percentage from 80 – 99% in the four quadrats. The wetter areas have a flora which includes rushes e.g. soft rush (*Juncus effusus*) and heath rush (*Juncus squarrosus*) and also includes both Hare's-tail cotton-grass (*Eriophorum vaginatum*) and common cotton-grass (*E. angustifolium*). Low numbers of other herbs and grasses are present e.g. common bent, wavy hair-grass and herbs such as heath bedstraw and bilberry. Heather was recorded outside the quadrat.

As with last year, continued trampling of cattle to break up the *Nardus* tussocks creates opportunities for other species which cannot compete directly with the *Nardus* cover.

The large number of vole runs and holes are still present providing good foraging opportunities for raptors.

Area D

Acidic Grassland

Nardus dramatically decreases in area D as in previous years and makes up less than a quarter of the sward. The variety of other grass species such as wavy hair-grass, bent species, and sheep's fescue (*Festuca ovina*) are characteristic of acidic grassland habitat. Although there are still ericoid species present such as heather and bilberry, there is more variety of herbs such as tomentil, white clover (*Trifolium repens*) and heath milkwort

(*Polygala serpyllifolia*) appearing in the turf in response to the grazing regime.

Area E

Acidic Grassland

Heath milkwort was recorded in quadrat 1 where it had not previously been recorded. This area is in many respects similar in composition to Area D with the exception that there is a bigger reduction in ericoid species; heather was recorded as just + (present but too small to record as a percentage). Interestingly heather, bilberry and bell heather (*Erica cinerea*) were found on the steeper slopes less accessible to the cattle giving a direct comparison of the effects of the grazing.

Pond

The pond is fenced and so is not accessible to the cattle (and the effects of grazing and trampling). Both species of cotton-grass (*Eriophorum spp.*) are present totalling 50% of the vegetation with purple moor-grass at 60%. Other species are at much lower percentages. However outside of the quadrat, cross-leaved heath, birch (*Betula sp.*) seedlings and flat-topped bog-moss was recorded.

Future Survey Work

It has become apparent that over the last two years the quadrats are not necessarily giving a good representation of the flora in the areas surveyed. Examples are given below.

Area B

Outside the quadrats cross-leaved heath is abundant. Heather, bilberry and *Sphagnum* are all underrepresented in the quadrat data when compared to the area as a whole. The wet and water filled hollows created by the trampling by the cattle have abundant cranberry which has very specific ecological requirements.

Area C

Heather and cotton-grass are noted frequently outside of the quadrats. The percentages recorded from the quadrats do not reflect the actual habitat found here.

Area D

Heath milkwort is very much more common throughout the sward than is shown by the percentages recorded in the two quadrats surveyed. Bilberry, heath bedstraw and bird's-foot trefoil (*Lotus corniculatus*) are also more frequent than the quadrat data suggests.

Area E

Heath milkwort, western gorse (*Ulex gallii*) and bilberry were more abundant than indicated by the quadrat data.

It has been discussed and agreed that some additional quadrat be included to try and capture a better picture of each of the areas. These will be introduced in the 2017 survey season.

Appendix III

Lockerbrook Bird Survey 2015 – 2016

Andrew Hill and Dave Buttle, Wharnccliffe Heathlands Trust
April 2016

1 INTRODUCTION

1.1 Terms of reference

The Wharnccliffe Heathlands Trust was invited by the Forestry Commission to undertake a series of ornithological surveys at Lockerbrook, Upper Derwent Valley, Derbyshire. These surveys included a breeding bird survey, a winter walkover survey and a vantage point survey.

1.2 Site description

Lockerbrook (hereafter referred to as the Site) is located in the Peak District National Park, close to the Ladybower and Derwent reservoirs, in the Upper Derwent Valley, Derbyshire (approximate central OS grid ref SK 16421 89360). The area is under the ownership and management of the Forestry Commission. The area consists mainly of conifer plantation of varying maturity, with smaller areas of deciduous plantation, extensive grazing pasture and is separated by well used recreational pathways. On the highest area of the site to the west is Lockerbrook Heights, which is an area of conifer plantation and moorland grassland, with two ponds close to the edge of the plantation. Some of the conifer plantation has been clearfelled in recent times, which has been replanted. To the west of the site is Bellhagg wood (see Plate 1), an area of mixed woodland consisting mainly of conifers and beech. Bellhagg is a rocky escarpment located to the north of Bellhagg wood. To the north of the Site is Ouzelden Clough, which contains the most mature pine plantation found on the site, with Ouzelden beck running through the valley bottom. Lockerbrook farm is located central to the site, although this is not under the ownership of the Forestry Commission. Some areas of the surrounding woodland are under private ownership, and are not part of this study.

2 METHODOLOGY

2.1 Breeding Bird Survey

An adapted version of the CBC methodology used by the BTO was used for the breeding bird surveys. This involved walking through the Site, recording activity indicative of breeding behaviour, such as singing birds, nest building and entering nest boxes with food. In order to qualify as a territory, registrations of territorial bird activity (singing, aggressive encounters between birds) had to be present in consecutive surveys. If evidence of breeding was recorded, such as food carrying, nest building, entering a nest-hole etc. then this was regarded as a territory with one visit. The survey visits took place on the 26th April, 4th May and 6th June 2015.

2.2 Winter walkover

The winter surveys covered the same areas as the breeding surveys. A similar route to the breeding bird surveys was walked through the site. Incidental records of what species were present on the site on each visit, and in what location were recorded. The winter surveys were undertaken on 6th December 2015 and on 6th March 2016.

2.3 Vantage point survey

A vantage point survey was undertaken from the clearfell located in the centre of the Site on 27th September. On-site birds of prey and evidence of migration (such as passage swallows) or local movement (such as passage of woodpigeons) were recorded.

2.4 Nocturnal Visit

A visit to the site on the evening of the 16th June was made to establish what nocturnal birds, such as Owls, were present. The area around the clearfell and the conifer plantations were checked for calling juvenile owls, churring nightjar etc.

2.5 Limitations

A map was not used to record the breeding birds on the May survey visit. Most of the vantage point survey was undertaken in foggy conditions, which was not ideal for viewing birds in the surrounding area.

3 RESULTS

3.1 Breeding Bird Survey

A complete list of all the species found during the breeding bird survey can be found in Appendix B. Nine red list species of conservation concern were present during the breeding season and 5 were recorded at other times (Eaton, 2015). Four Tree Pipit territories were located on the site, with the more sheltered area below Lockerbrook heights, Ashton Clough and to the north of Lockerbrook Coppice being the preferred areas. A pair of Redstart was observed in the vicinity of Lockerbrook farm, and were recorded on the site on several occasions. A pair with at least 1 fledged juvenile was observed close to Lockerbrook Heights, but it is not clear if this was the pair from around Lockerbrook farm or another pair. A pair of Ring Ouzel was present in the vicinity of Bellhagg during the April survey, but was not recorded in subsequent surveys. A pair of Kestrels were found to be breeding at Bellhagg, which may have been responsible for displacing the ring ouzels. A Cuckoo was heard calling from the area around the clearfell and Lockerbrook heights. At least 4 Willow Warbler territories were established on the site, mainly in the area around the clearfell and the silver birch woodland near Lockerbrook Farm. A Grey Wagtail was seen alarming around Ouzelden Beck, which would indicate a nest nearby, but no nest was proved in this location.

3.2 Winter Walkover

A complete list of species seen during the winter walkover can be found in Appendix C. Bird activity on Site during the winter surveys was low, with 3 Fieldfare being the only “winter visitors” recorded, along with a small number of resident species such as Robin, Raven, Common Buzzard etc. The only other bird of note was a female Goshawk near Lockerbrook farm during the survey of the 6th March.

3.3 Vantage Point Survey

Migration and raptor activity seen from the vantage point was quite limited. Most of the birds seen during these sessions were off-site, and as such were not included in this survey. Two Pink Footed Geese, 25 Swallows and a Woodpigeon were the only birds recorded during the migration survey, although the foggy weather may have been partly responsible for this poor showing.

3.4 Nocturnal Visit

A male Nightjar was recorded in flight and churring from 22:00 onwards, which was followed by another male and a female bird at 22:20. Two juvenile Long-eared Owls were recorded calling from the plantation at Lockerbrook Heights, confirming successful breeding for the second consecutive year, although no adult birds were observed during the survey. At least 1 Woodcock was also seen roding over the plantation, and a Tawny Owl was heard calling from the plantation below Lockerbrook Heights.

4 Recommendations

It is likely that the instigation of extensive cattle grazing has been beneficial to bird species diversity, by providing open areas rich in invertebrates. The species diversity and nesting opportunities of the Site would be improved further with the provision of nest boxes, as has been the case at Westend. Nest Boxes were noted in woodcock coppice, an area of woodland not in the ownership of the Forestry Commission that is directly next to Bellhagg Wood. These boxes were occupied by a variety of species including Redstart and Pied Flycatcher, the latter species not found to be present on the Site. Ideal locations for nest boxes would be around the edges of Bellhagg, and the mature alders along Ouzelden Beck .

The area of clearfell has no doubt led to the arrival of species such as Nightjar. Continued clearfelling over time might be expected to provide further benefit, particularly if some of the clearfell is left to develop and mature naturally. Continued monitoring of the clearfell area for nightjar and long eared owl, as well as nest box monitoring (if some are placed) would also be recommended.

Appendix IV

Westend Breeding Bird Survey 2013

Methodology

The Westend breeding bird survey is designed to compare an area that has been enclosed, to prevent grazing, from the rest of the site which is grazed by sheep. The breeding birds of Westend were surveyed using a variant of the Common Bird Census (CBC) methodology used by the British Trust for Ornithology (BTO). The CBC method uses a territory mapping approach to survey birds, and covers the area of Westend owned by the Forestry Commission. The method involves walking through Westend along a pre-defined route, which was repeated on each visit to the site. Any territorial or breeding behaviour seen or heard (singing males, birds carrying food etc) were marked on a map of the area using the standard activity codes used by the BTO. Four morning visits were made using this method from 09/06/13 to 28/07/13 (see Appendix for maps). When the four visits were completed, individual species maps were made. On these species maps, the territorial records for each species are marked on the map and given a letter, which corresponds to a visit (visit one would be represented by an 'A', visit 2 by a 'B' etc). If clusters of records become apparent, and the letters are consecutive, then this qualifies as a territory. Any other bird species seen, but not showing signs of breeding activity, were also recorded on the maps, and will be part of the site species list.

Results

Confirmed Territories

Below are the results of the breeding bird survey, compared with the previous years' results.

Species	Scientific Name	2012	2013
Willow Warbler	<i>Phylloscopus trochilus</i>	8	6
Ring Ouzel	<i>Turdus torquatus</i>	1	1
Meadow Pipit	<i>Anthus pratensis</i>	1	3
Kestrel	<i>Falco tinnunculus</i>	1	1
Grey Wagtail	<i>Motacilla cinerea</i>	0	1
Spotted Flycatcher	<i>Muscicapa striata</i>	0	1
Chaffinch	<i>Fringilla coelebs</i>	1	2
Coal Tit	<i>Periparus ater</i>	0	1
Robin	<i>Erithacus rubecula</i>	0	1
Wren	<i>Troglodytes troglodytes</i>	5	3
Canada Goose	<i>Branta canadensis</i>	0	1

Other Birds Recorded

Goldcrest, Siskin, Peregrine, Red Grouse, Common Buzzard, Merlin, Goshawk, Red Grouse, Grey Heron, Mallard, Blackbird, Jay, Song Thrush, Blackcap, Chiffchaff, Curlew, Crossbill, Lesser Redpoll, Dipper, Reed Bunting, Woodcock.

The 2013 breeding territories data were then separated according to habitat;

Species	Scientific Name	Enclosure	Grazed Moorland	Conifer Plantation	River Westend	Total
Willow Warbler	<i>Phylloscopus trochilus</i>	3	3	0	0	6
Ring Ouzel	<i>Turdus torquatus</i>	0	1	0	0	1
Meadow Pipit	<i>Anthus pratensis</i>	0	3	0	0	3
Kestrel	<i>Falco tinnunculus</i>	0	1	0	0	1
Grey Wagtail	<i>Motacilla cinerea</i>	0	0	0	1	1
Spotted Flycatcher	<i>Muscicapa striata</i>	0	1	0	0	1
Chaffinch	<i>Fringilla coelebs</i>	1	0	1	0	2
Coal Tit	<i>Pericarus ater</i>	0	0	1	0	1
Robin	<i>Erithacus rubecula</i>	0	0	1	0	1
Wren	<i>Troglodytes troglodytes</i>	1	1	1	0	3
Canada Goose	<i>Branta canadensis</i>	0	0	0	1	1

Five breeding territories were confirmed in the enclosure, compared with ten on the grazed moorland and four in the coniferous woodland. When the differences in area are taken into account, this represents a much higher breeding density in the enclosed area compared to the other habitats.

Breeding Bird Results from Enclosed Area

3 Willow Warbler territories were confirmed in the enclosure during 2013. A pair of Ring Ouzels was alarming in the enclosure on 22nd June, and the birds were also seen carrying food, but were not seen on any subsequent visits. A Wren territory was established in the enclosure, with singing recorded on all 4 visits. A Chaffinch territory was also present, which is a species that was not present in 2012. A pair of Canada Geese was observed with 8 goslings on the River Westend on 22/06/13, suggesting probable breeding close to, if not within the enclosure.

Breeding Bird Results from Surrounding Area

There were 3 Willow Warbler territories outside of the enclosure in 2013. The gorge at Grinah Grain held 2 of the Willow Warbler territories, with the other at a clear-felled area near Banktrop Hey. 3 Meadow Pipit territories were confirmed, with 2 territories located around the periphery of the enclosure, as well as the slopes of River Westend near the bog area. Grinah Grain held a Ring Ouzel territory, with food carrying/alarming birds noted on all but the last survey date. A pair of Spotted Flycatchers were observed feeding in Grinah Grain on 06/07/13, and breeding was confirmed on 28/07/13, when 3

juveniles were seen being fed by the adults. A pair of Grey Wagtails was confirmed to be using the box under the bridge near Banktrop Hey on 22/06/13, and juveniles were seen in the area on 28/07/13. A pair of Grey Wagtails and at least 2 juveniles was also seen on the River Westend close to Grinah Grain on 06/07/13, but it is unclear if these bred within the site boundary. A pair of Kestrels was observed on 22/06/13, calling in the general vicinity of the previous year's nesting site (an exposed cliff opposite the bog near Grinah Grain). On 06/07/13, both adults and a juvenile were observed in various locations around Westend, indicating probable breeding. A pair of Kestrels and 2 juveniles was observed on the site on 28/07/13. 2 Wren territories were confirmed in 2013, with 1 in the conifer plantation to the south of the enclosure, and another opposite the bog area near Grinah Grain. Coal Tit, Robin and Chaffinch territories were located in the conifer plantation to the south of the enclosure. A pair of Peregrines was occasionally present around the cliffs to the south of the enclosure, but there was no obvious breeding attempt in 2013.

Recommendations

The developing trees (mostly alder with rowan, birch and oak) within the enclosure are now probably large enough to withstand some grazing pressure, and removing the fences would allow this area to develop into wood pasture, which is known to be an excellent habitat for many bird species and may provide breeding sites for other BAP species such as Tree Pipit and Spotted Flycatcher. The provision of hole bird boxes within the wood pasture may also tempt Pied Flycatcher and Redstart. If it were possible to remove the fencing to a new site nearby, the process of increasing the amount of open deciduous tree habitats could continue. Traditionally these have been restricted to wooded doughts in the Peak District, mostly of sessile oak, and at first glance Grinah Grain may appear to be an obvious site. However, there already seems to be something special about this area, as it almost matched the enclosed area for density of breeding territories and was used by Spotted Flycatcher as well as Willow Warbler. Most importantly, Ring Ouzels have nested there for the past two years at least. It may be advantageous to introduce a few planted trees to Grinah Grain, of sessile oak, alder and rowan but the advantages of enclosing the area may be outweighed by the possible disadvantages.

Another possible site that could be enclosed would be the valley side immediately opposite the current enclosed area. This would provide a continuation to the current enclosure, across the River Westend. If it ran up against the conifer plantation it might also provide an ecotone between woodland and moorland. A few trees have already been planted in this area, and there is already a fence line running up the valley side at about the right distance from the woodland edge to provide a NW boundary to the enclosure. One possible disadvantage to this proposal is the possibility of introducing grey squirrels to the current enclosed site. No grey squirrels were seen there during the 2 years of surveying, which could be a distinct advantage to bird breeding success. However if the squirrel population is being successfully controlled in the nearby plantation woodland, it would not represent a problem.

Appendix V

Westend Botanical Survey
 Julie Westfold and Kay Dulieu Summer 2013

Method

This survey continues on from the previous survey in 2012. The extent of that survey is shown in Appendix 4.

Two field visits took place to Westend in June and August 2013. Habitats were recorded and classified as described in the JNCC (Joint Nature Conservation Committee) Phase 1 Handbook. These data are presented as a Phase 1 map (Appendix 1) and are discussed below. Features of interest are described in more detailed Target Notes (TN) in Appendix 2. The discussion takes into account the work done on the breeding bird survey (Andrew Hill and Dave Suttle) which also took place in 2013 (please note the area for the bird survey was more extensive than that of the botanical survey).

Description

The area surrounding Grinah Grain is dominated by stands of bracken (*Pteridium aquilinum*), but there are species richer areas of dry grassland with predominantly mat grass (*Nardus stricta*), but with occasional bilberry (*Vaccinium myrtillos*), tormentil (*Potentilla erecta*) and heath bedstraw (*Galium saxatile*). This is highly characteristic of many of the grassland areas found in the Dark Peak with the bleached mat grass standing out starkly against the bracken stands. The mat grass dominated habitat occasionally grades into a slightly more species rich acid grassland with sheep's fescue (*Festuca ovina*), sweet vernal grass (*Anthoxanthum odorata*) with species of sedges and rushes growing in the grass sward.

There are significant areas of acid flush habitat surrounding and draining into Grinah Grain. The first of these is dominated by *Sphagnum spp.* sedges, *Carex spp.*, occasionally with marsh violets (*Viola palustris*) and marsh thistle (*Cirsium palustre*).

The second acid flush which runs parallel to Grinah Grain is heavily dominated by bracken with a mossy understorey comprising much *Polytrichum commune* and *Hypnum jutlandicum*. This flush feeds into a deep valley mire, with predominantly *Sphagnum spp.* and *Carex spp.*, and occasional common cotton-grass (*Eriophorum angustifolium*). Of particular interest are patches of bog asphodel (*Narthecium ossifragum*), marsh violet and cranberry (*Vaccinium oxycoccus*) scrambling around the margins of the flush and growing over the carpets of *Sphagnum*.

Grinah Grain tributary stream forms a deep clough with scattered broadleaved trees, birch (*Betula sp.*) and rowan (*Sorbus aucuparia*). There was no regeneration of tree species noted. There are numerous small seepages and flushes on the lower slopes dominated by soft rush (*Juncus effusus*) and common cotton-grass. Bell heather (*Erica cinerea*) dominates areas where there has been slippages exposing the bare, dry subsoil before bracken can become established. On the wetter subsoil. Hard fern

(*Biechnum spicant*) is extensive.

Evaluations and Recommendations

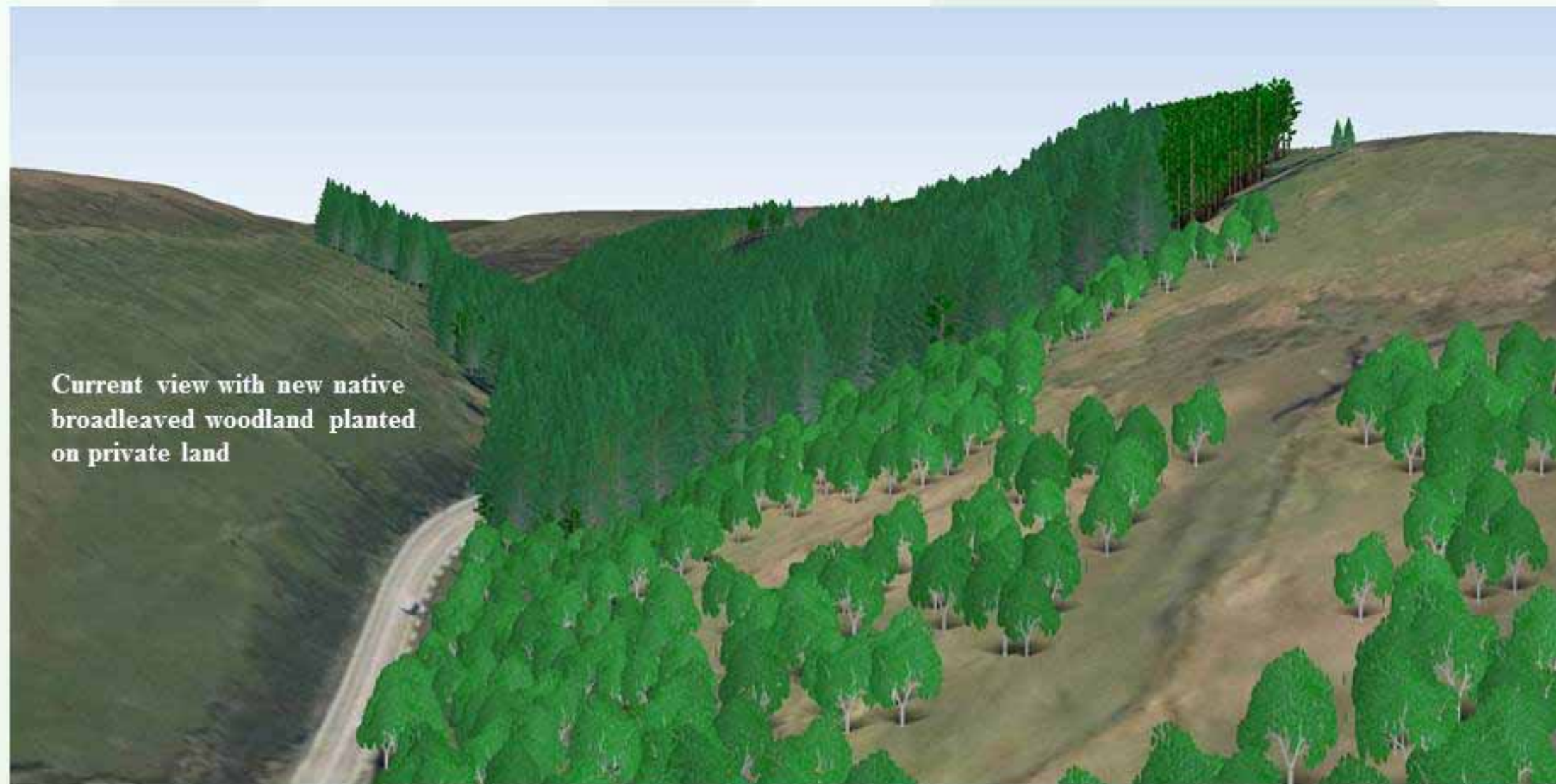
Grinah Grain forms a valuable habitat with scattered willow and rowan in a *bracken/Nardus* dominated landscape. Acid flushes and seepages drain into the clough and have a distinctive species assemblage creating a more biodiverse habitat. The slippages of soils allow species to become established e.g. hard fern and bell heather that would be out-competed by the bracken established on the peats.

Of note during the botanical survey of the actual clough was the presence of ring ouzel feeding on the rowan berries. The bird survey records that this species has bred here for the past two years

The lack of regeneration suggests that there is some grazing along the steep slopes. This gives a time limit on this habitat in its present form. The botanical survey would support the bird survey on the introduction of additional tree planting but not necessarily enclosing the site. Perhaps the use of tree guards would enable greater tree coverage to be established. This would allow the erection of bird boxes in the future.

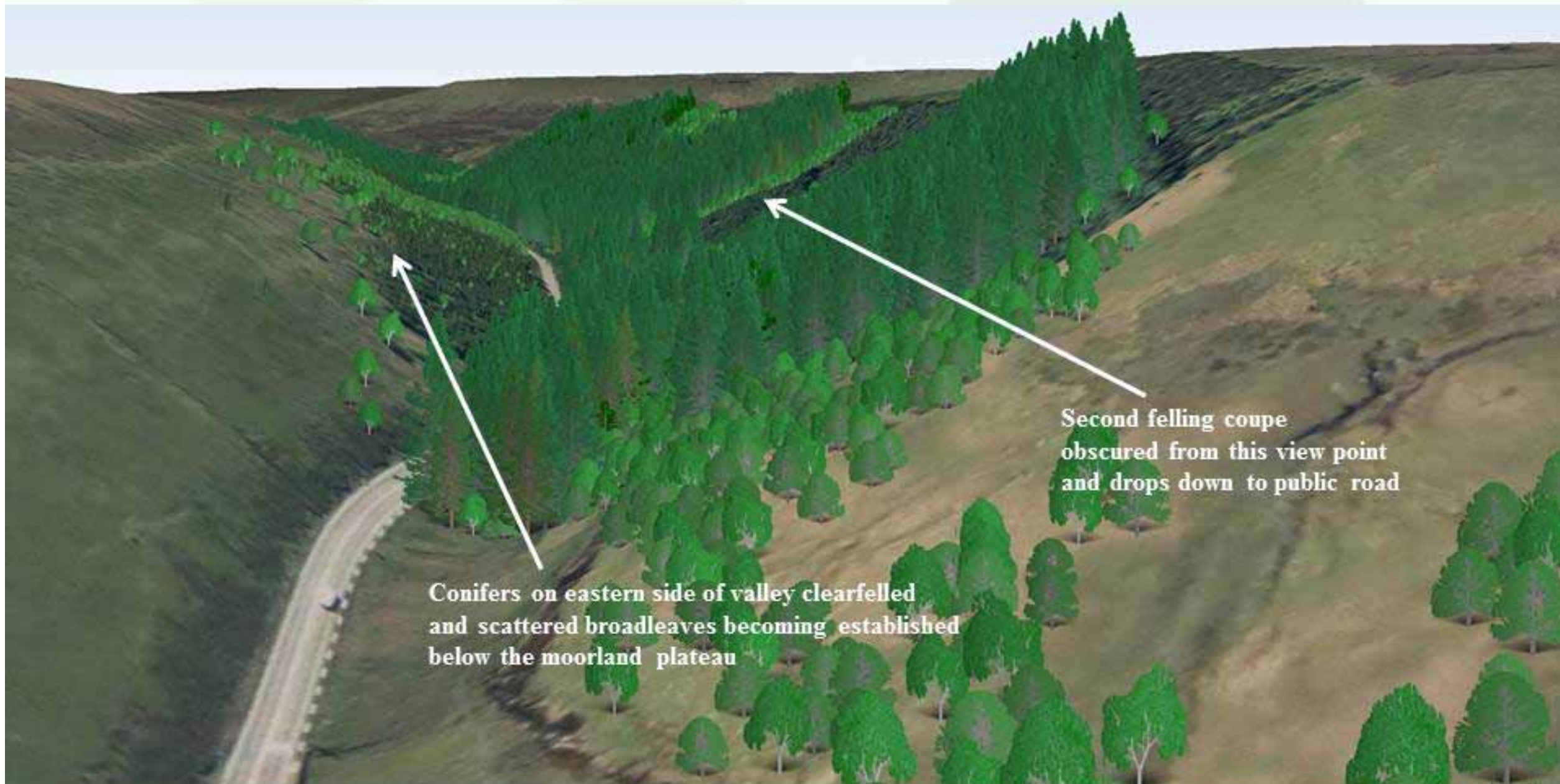
A certain degree of grazing maintains acid flush communities. This is in contrast to the 2012 survey results for the enclosure were wet and rush dominated grassland outcompetes smaller bog species such as round-leaved sundew and *Sphagnum* species leading to a loss of this valuable habitat type.

Appendix VI



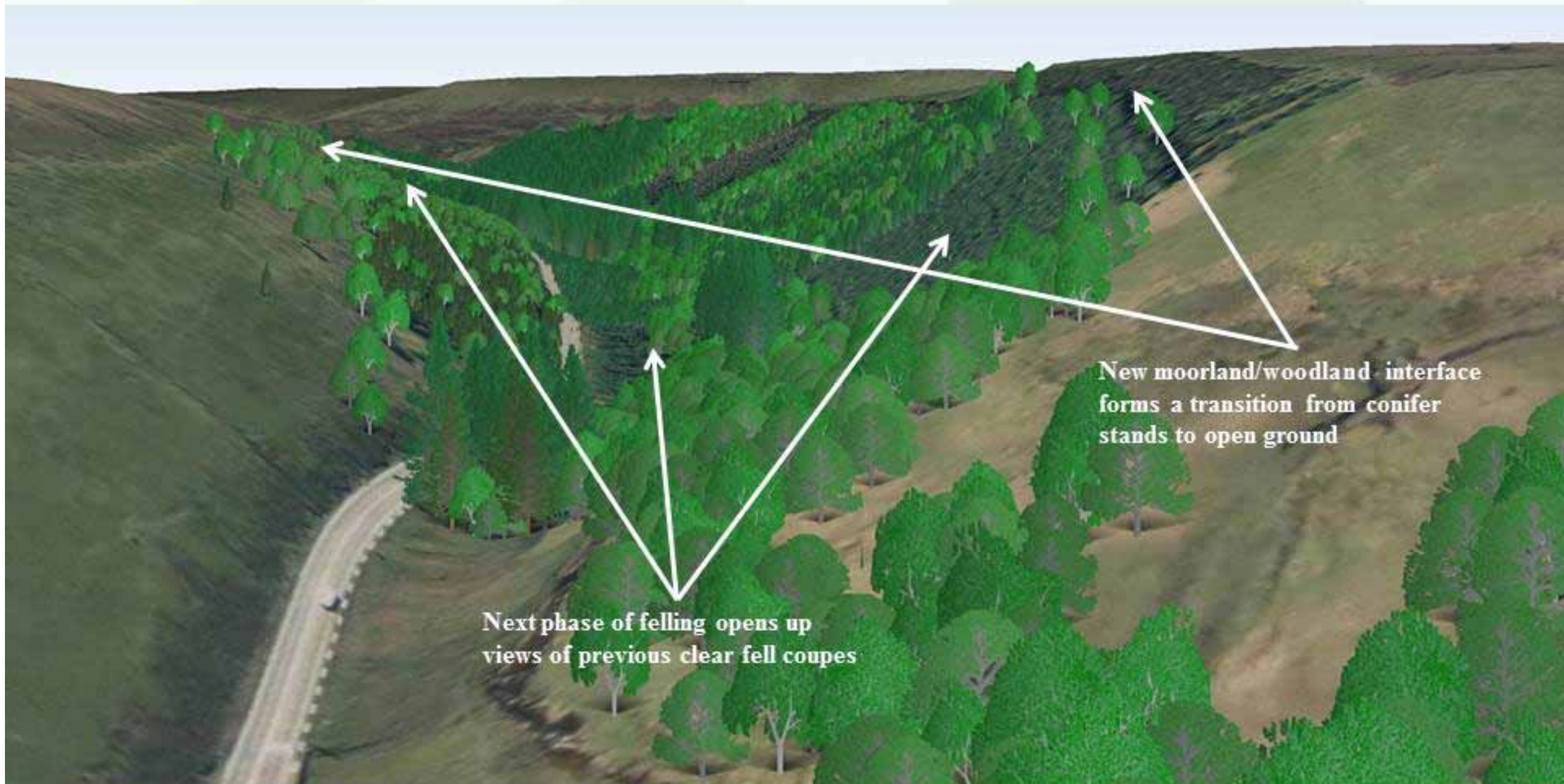
 Forestry Commission
England

Snake 2030

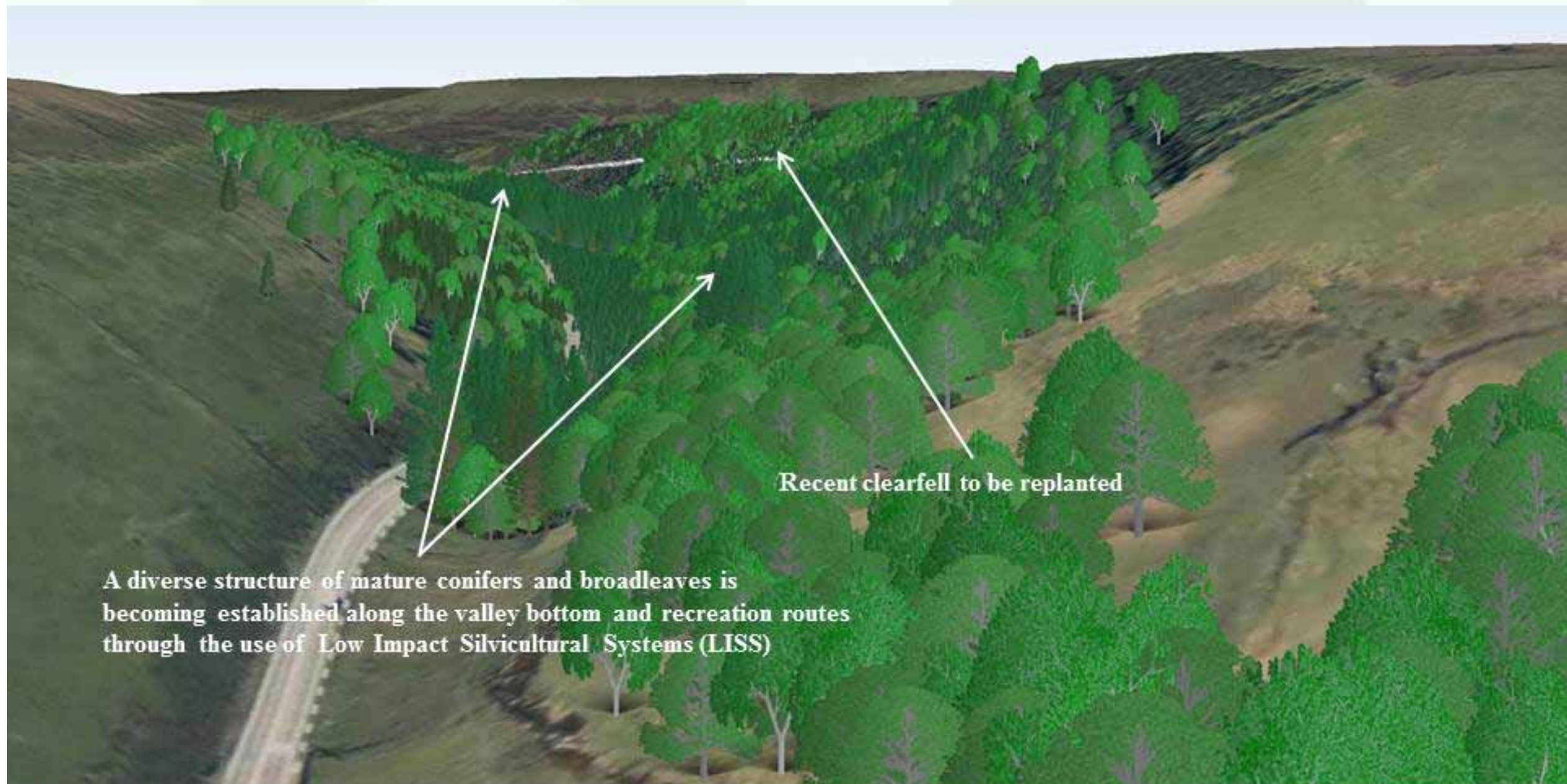


Forestry Commission
England

Snake 2040



Snake 2050



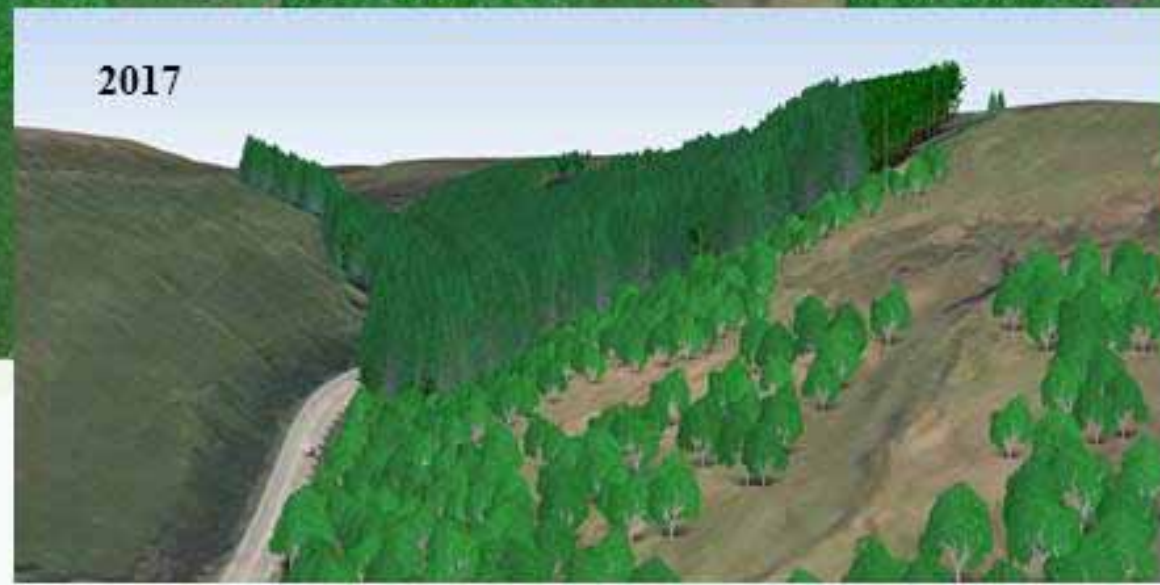
Forestry Commission
England

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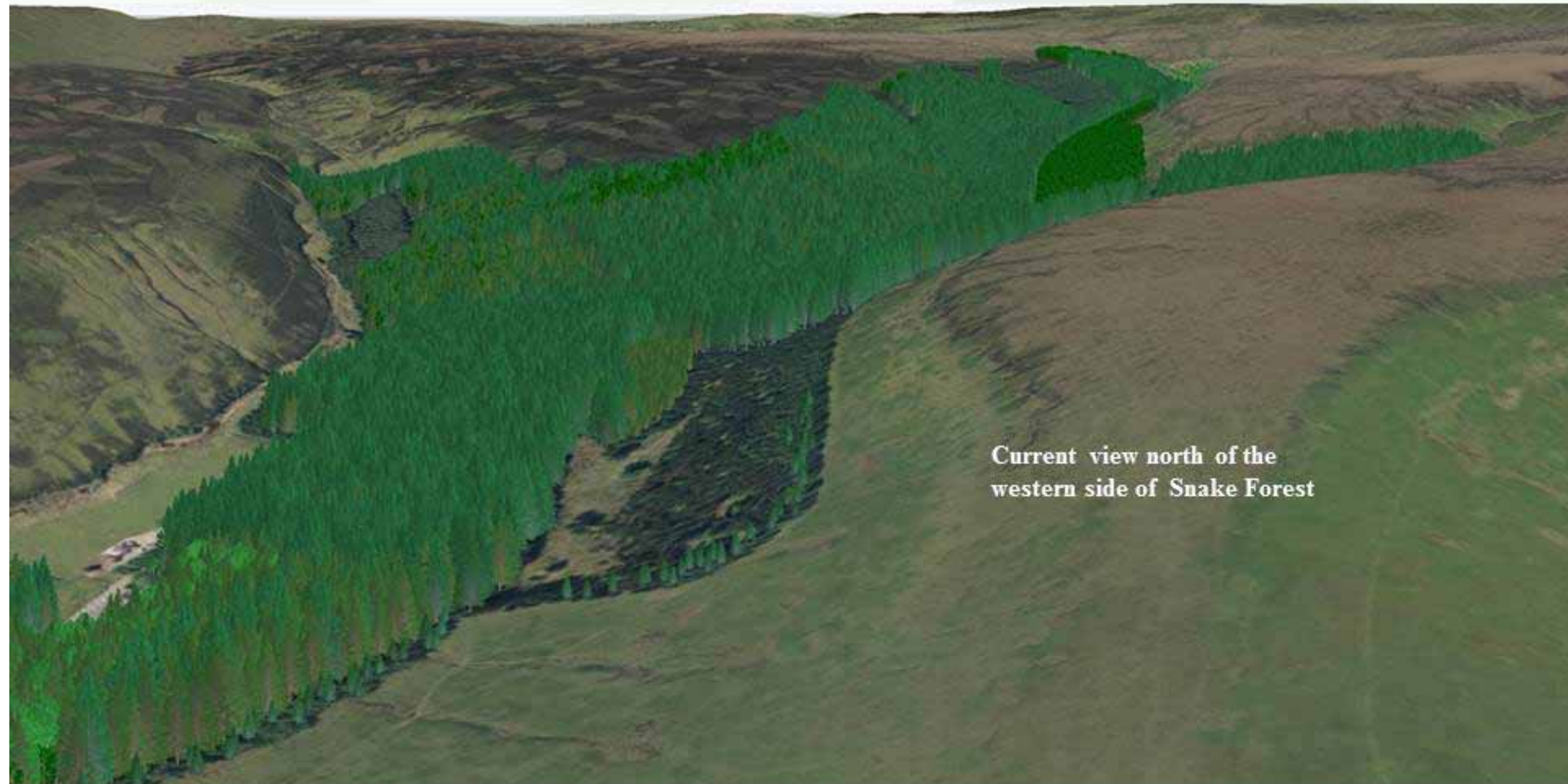


Open broadleaved woodland has become established along water courses running down into Lady Clough

Planned future forest structure above and insert to the right of Snake forest in 2017

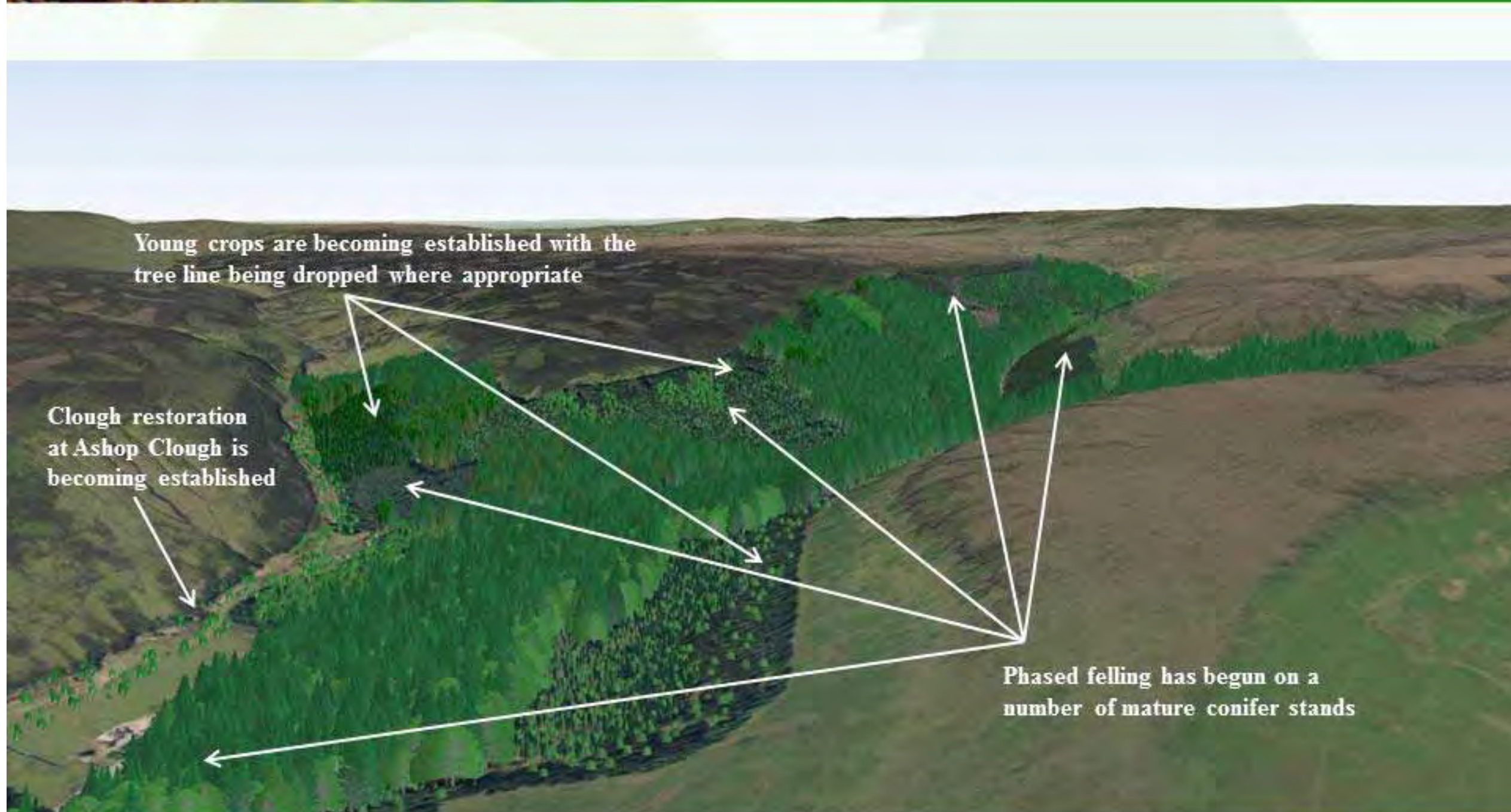


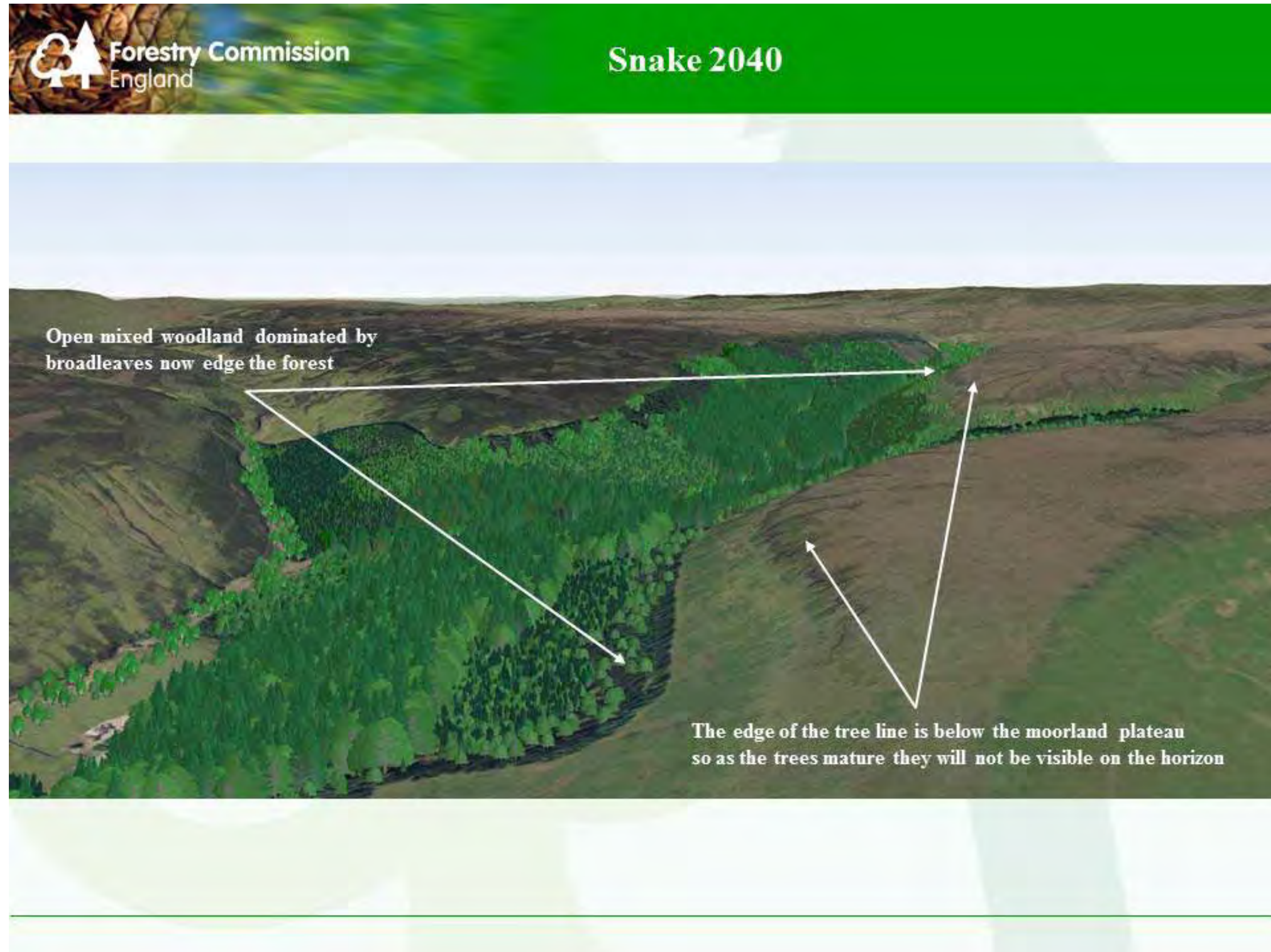
Snake 2017



Current view north of the
western side of Snake Forest

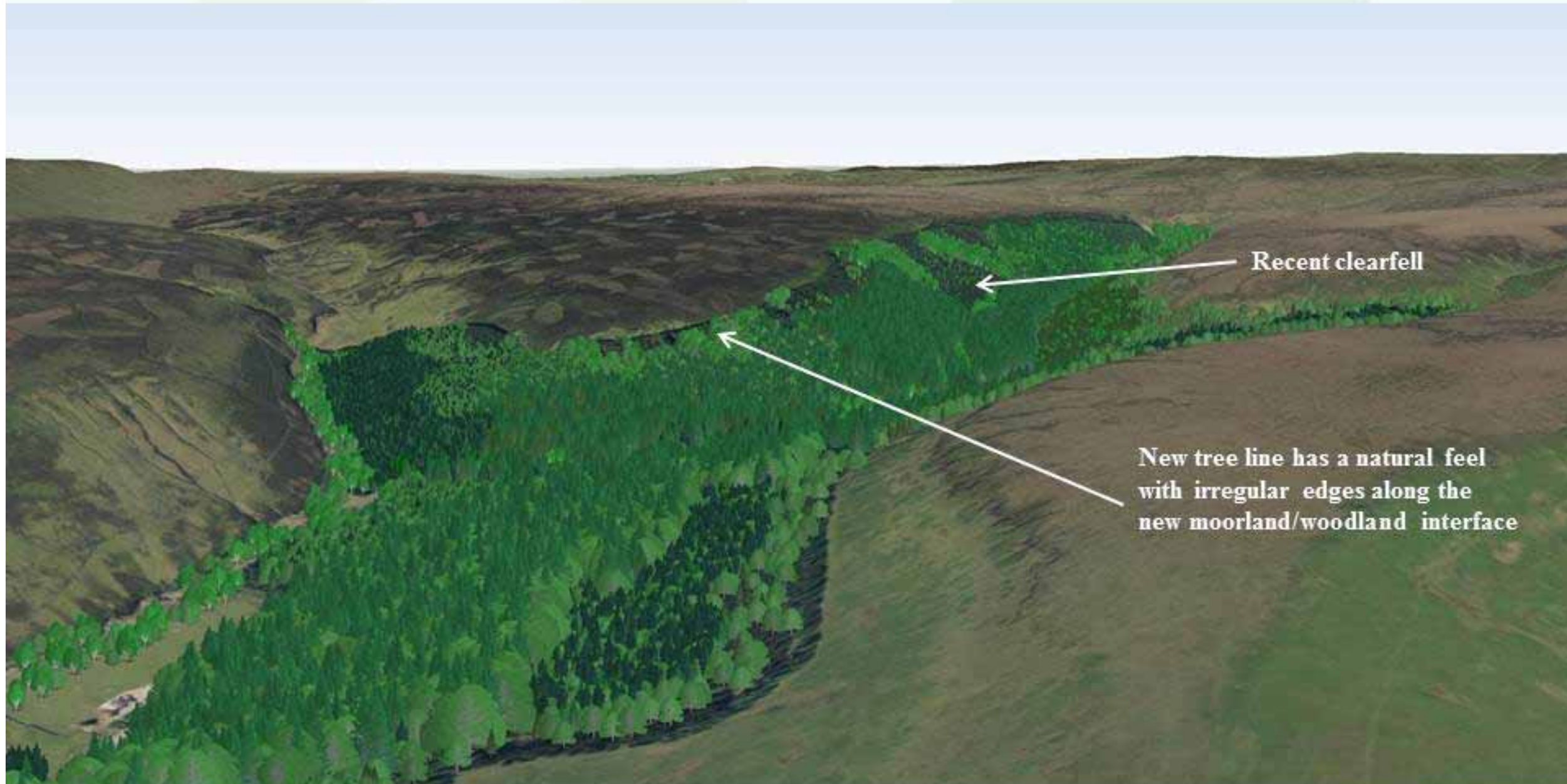
Snake 2027

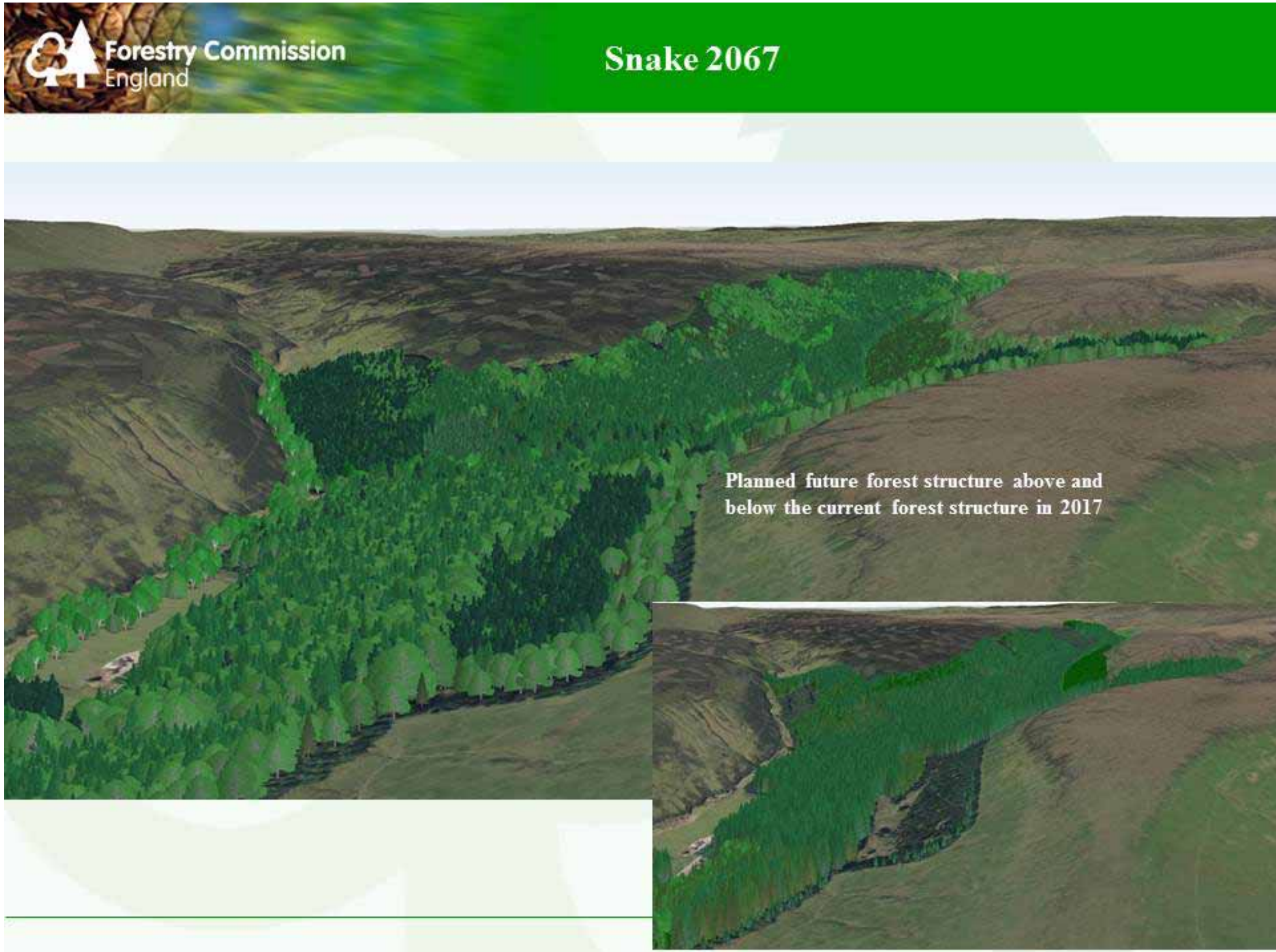




Forestry Commission
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Snake 2050



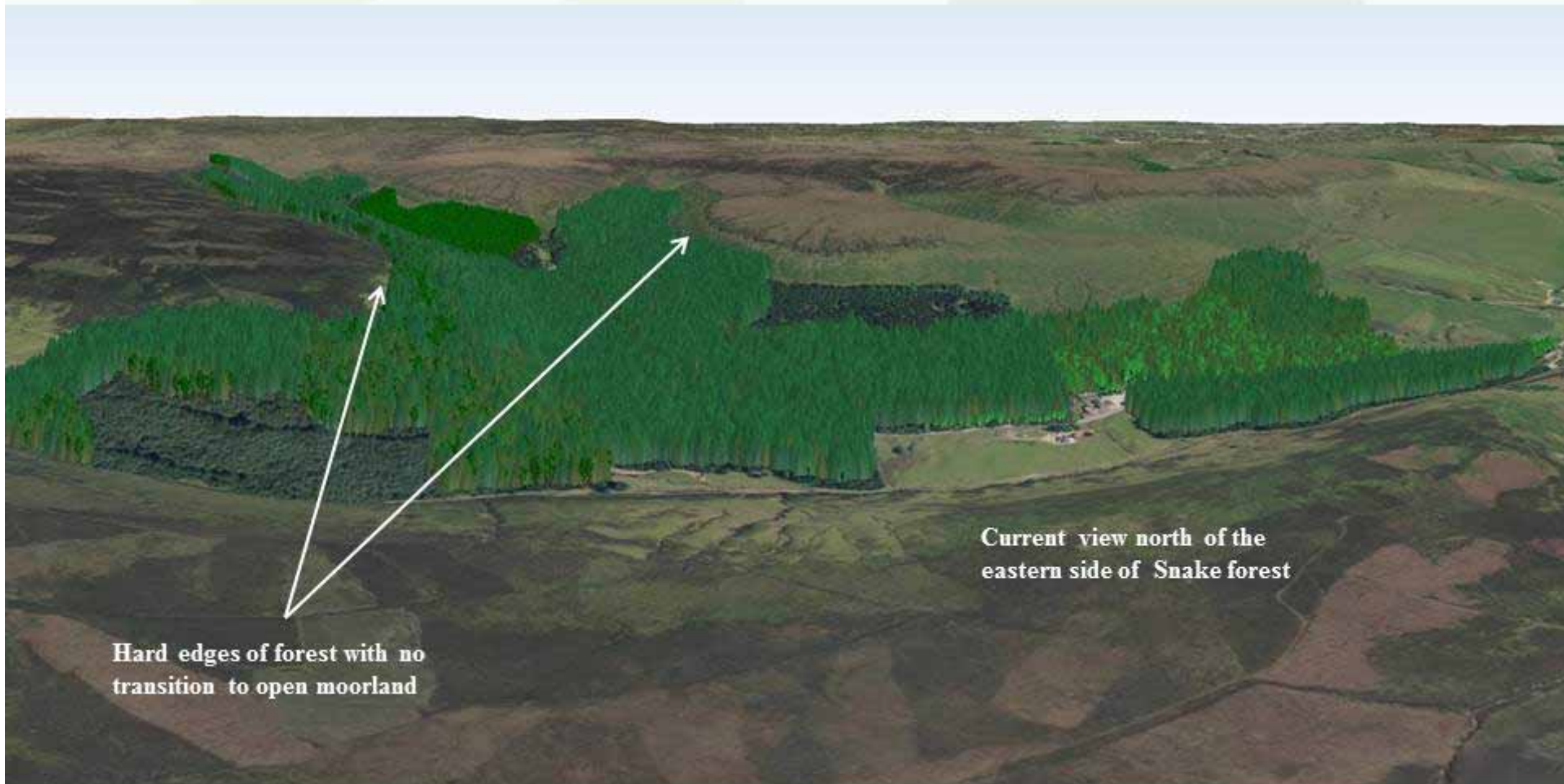


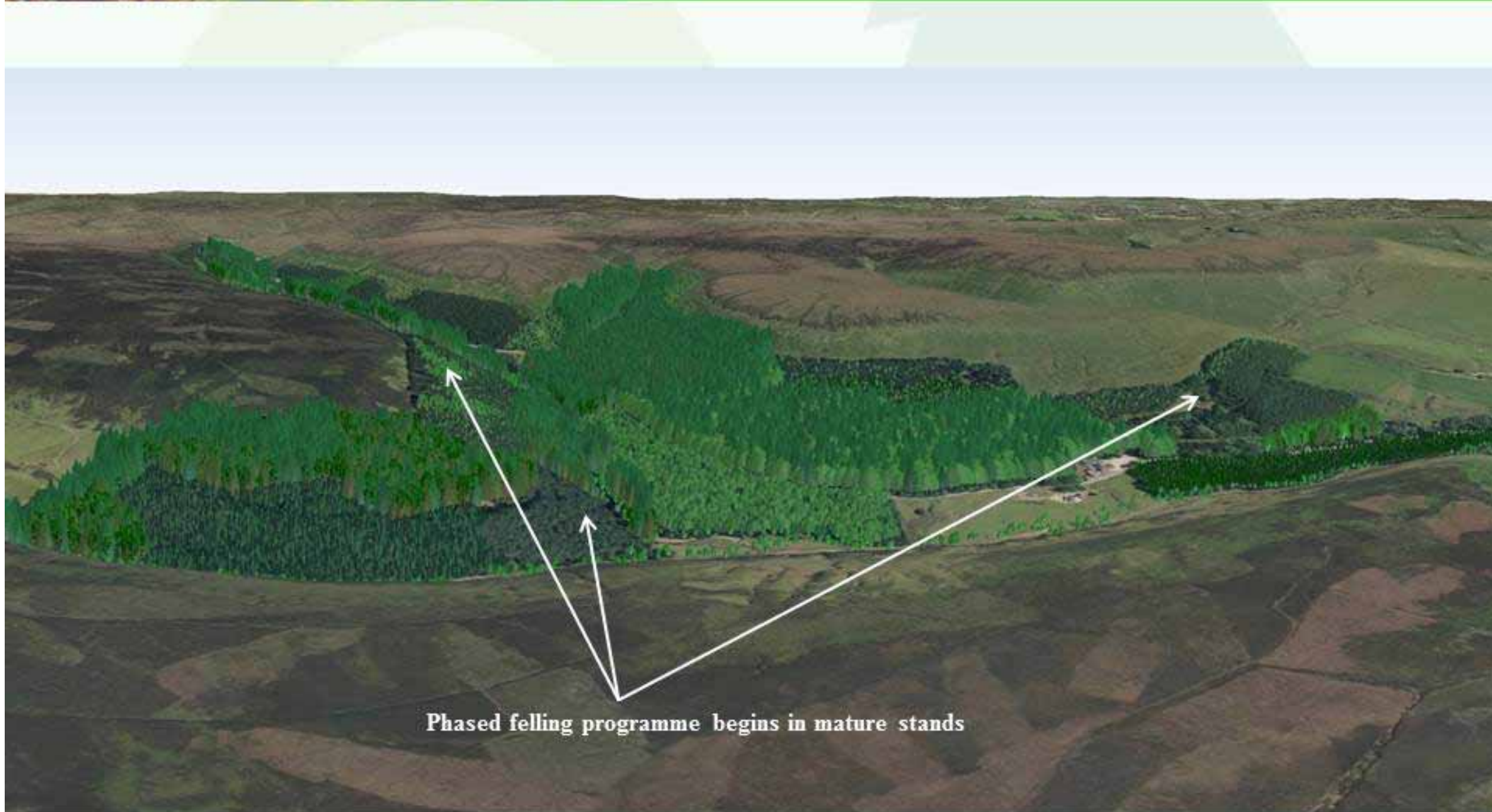
Snake 2067

Planned future forest structure above and below the current forest structure in 2017

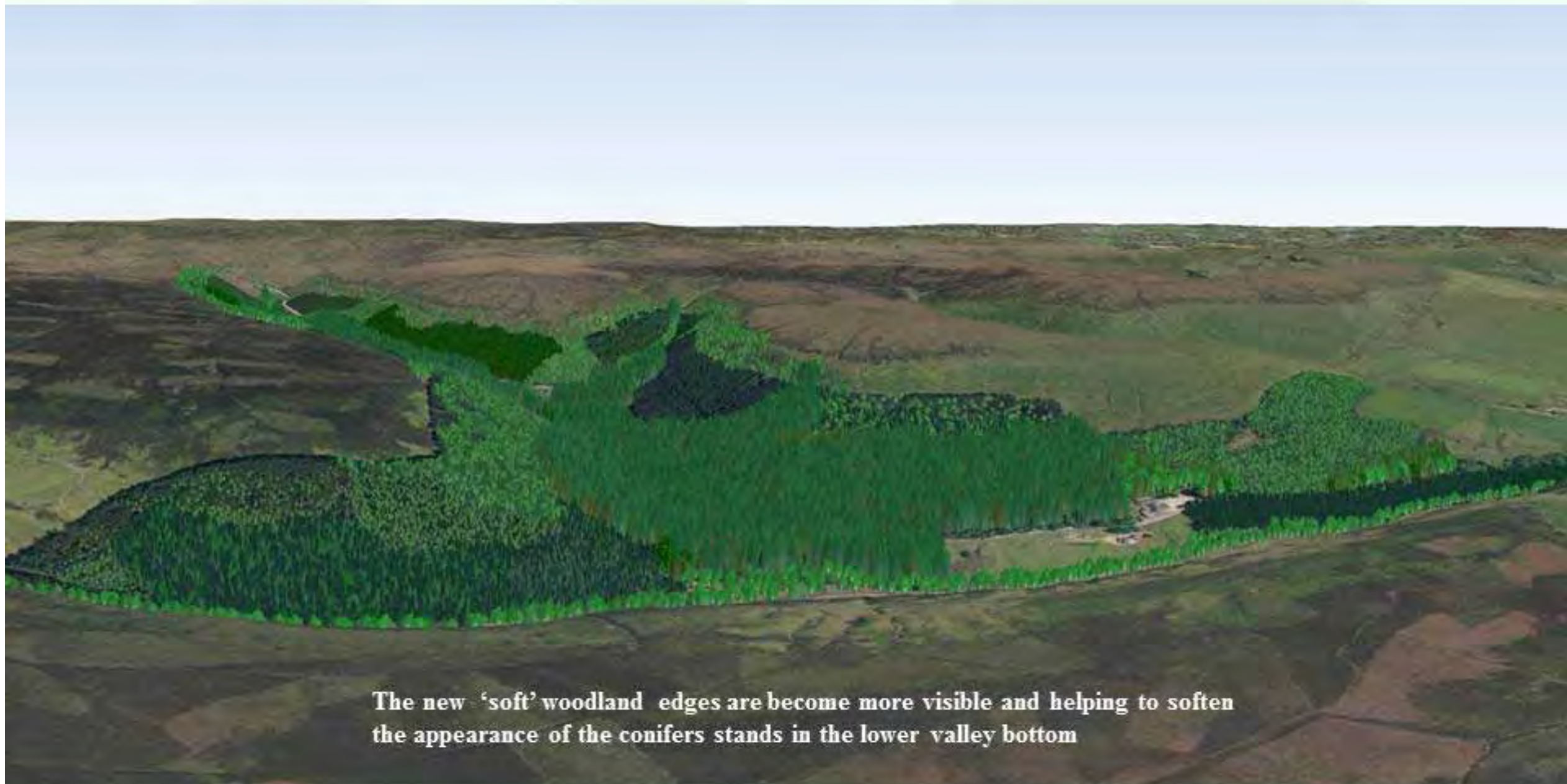
 Forestry Commission
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Snake 2017



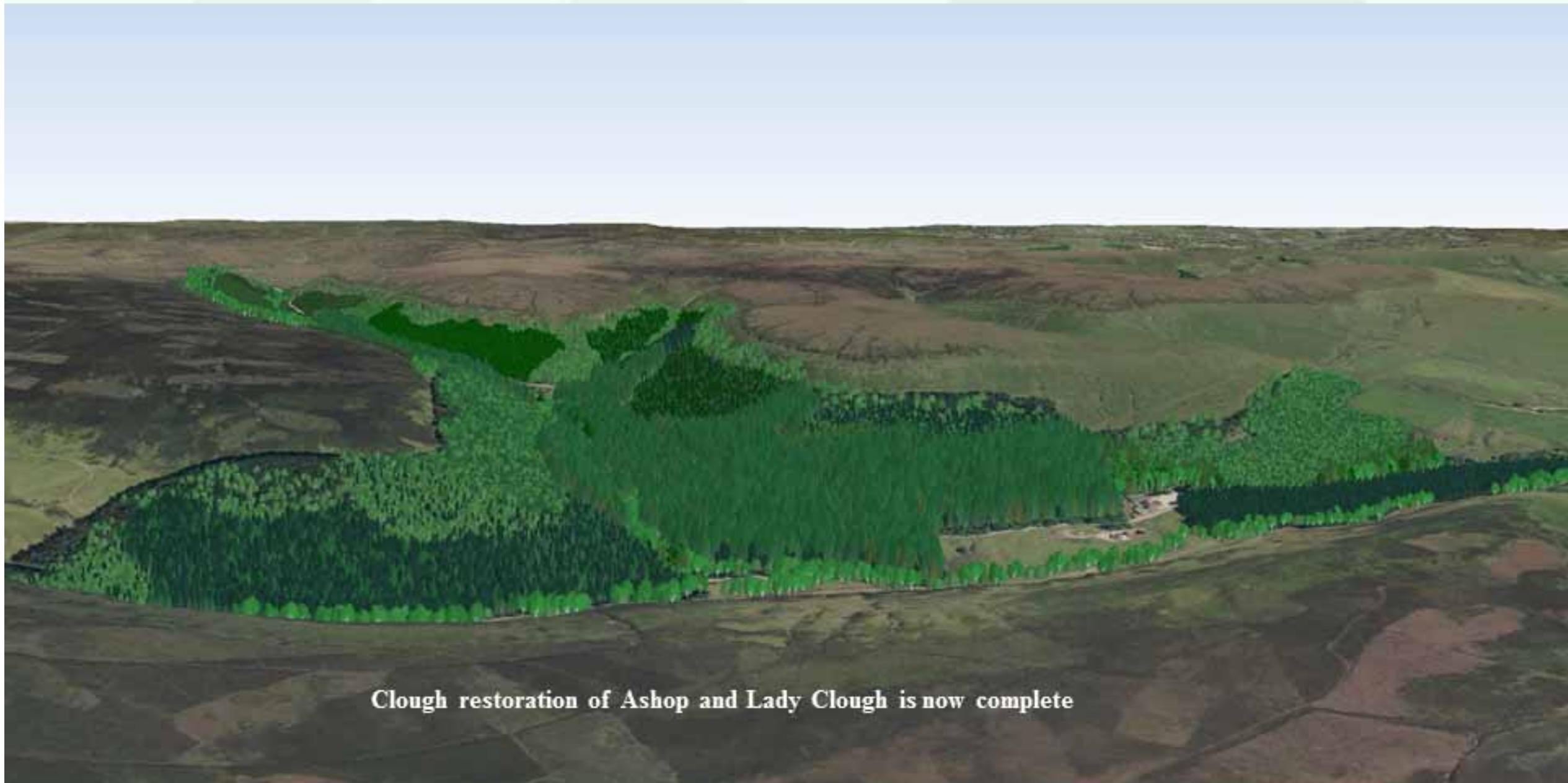


Snake 2040



The new 'soft' woodland edges are become more visible and helping to soften the appearance of the conifers stands in the lower valley bottom

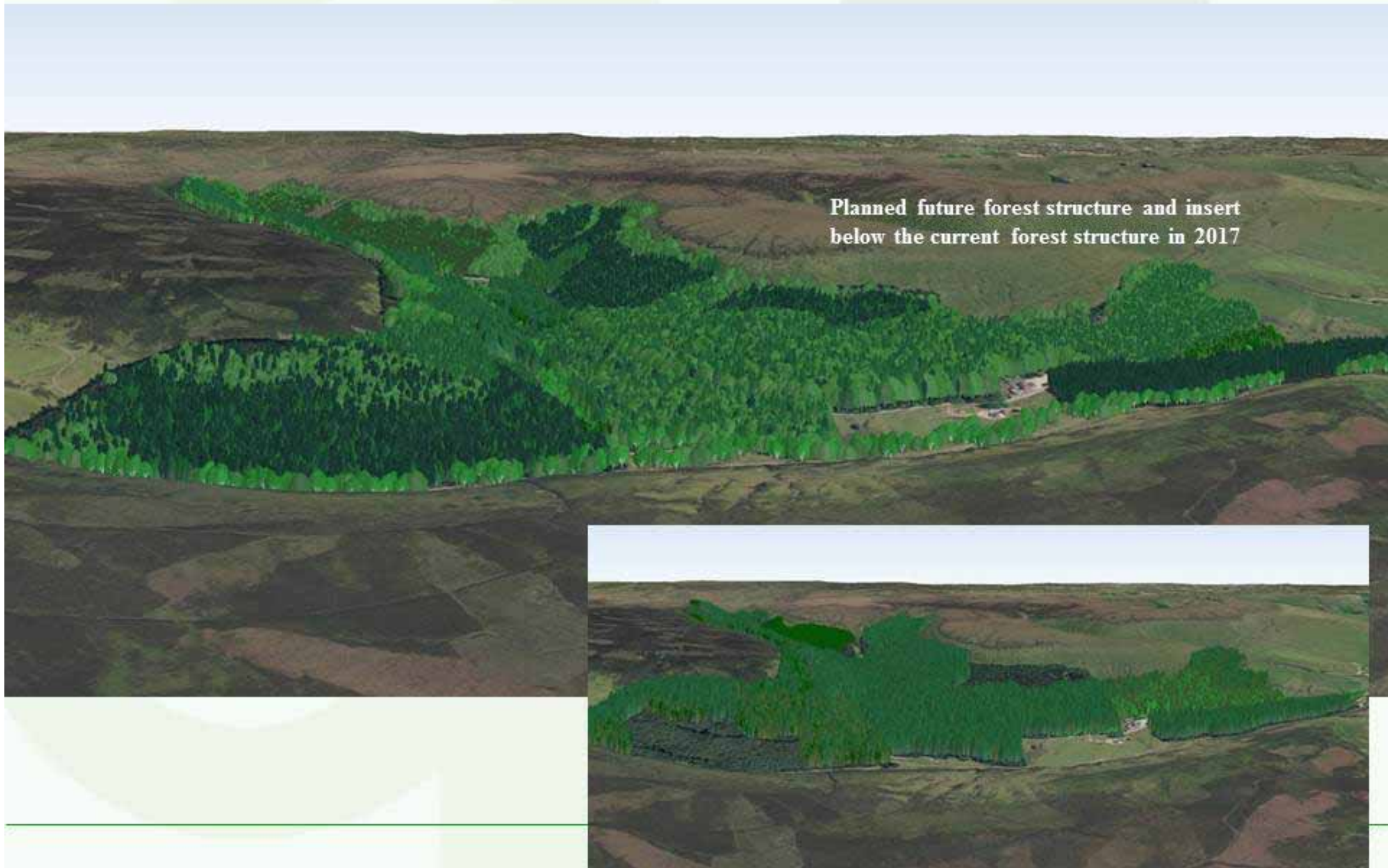
Snake 2050



Clough restoration of Ashop and Lady Clough is now complete

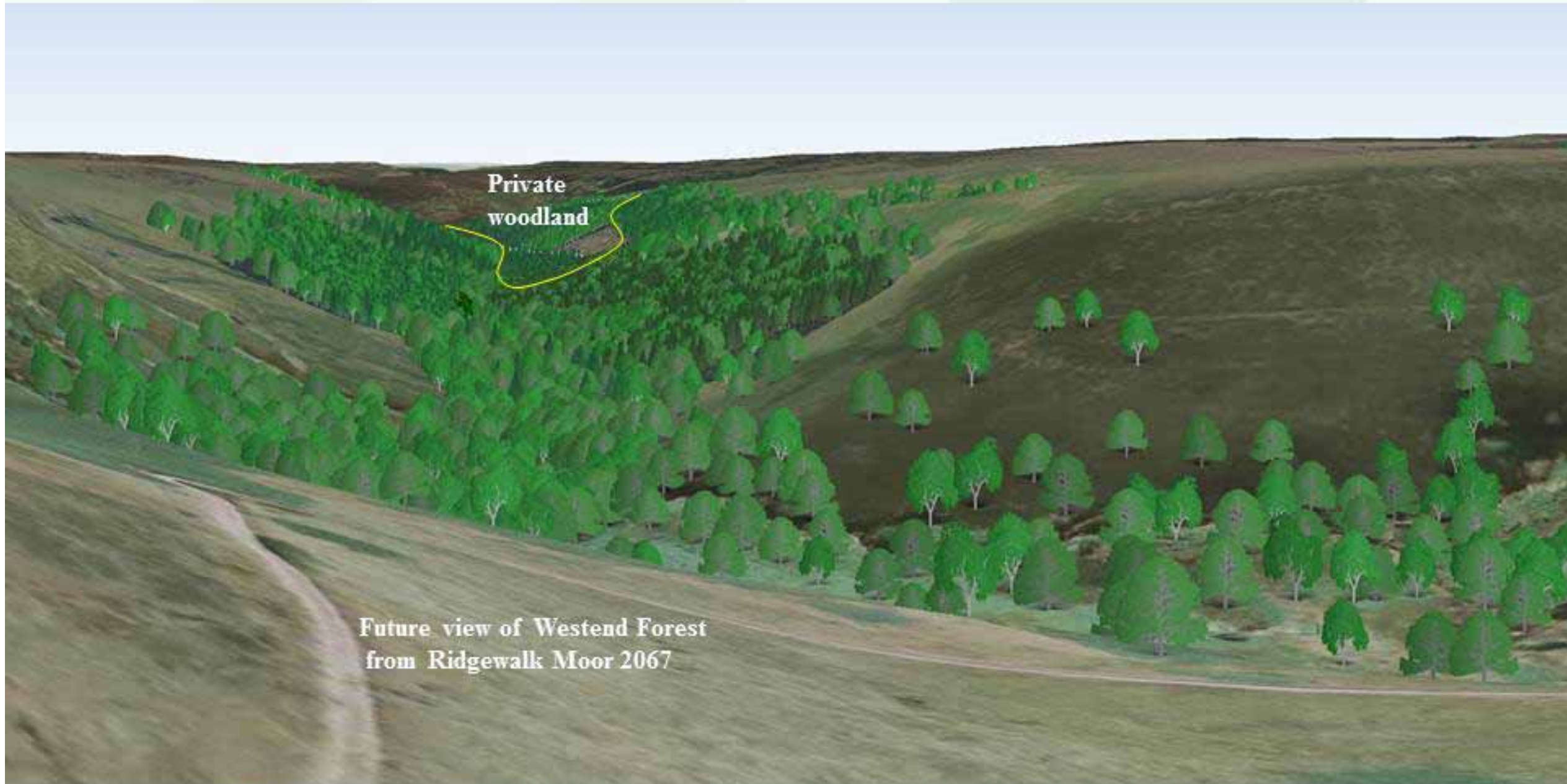
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Snake 2067



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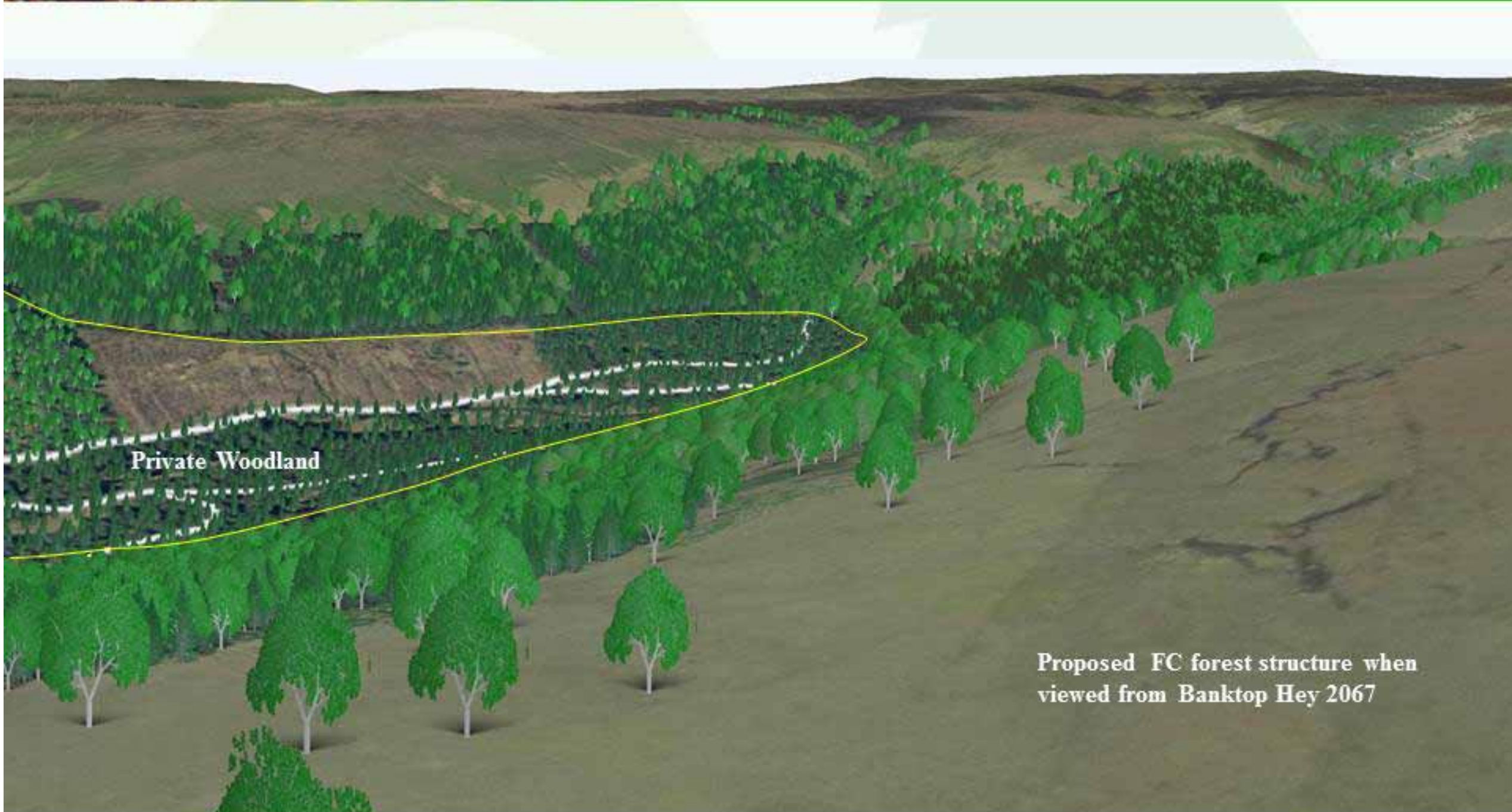




Future view of Westend Forest
from Ridgewalk Moor 2067



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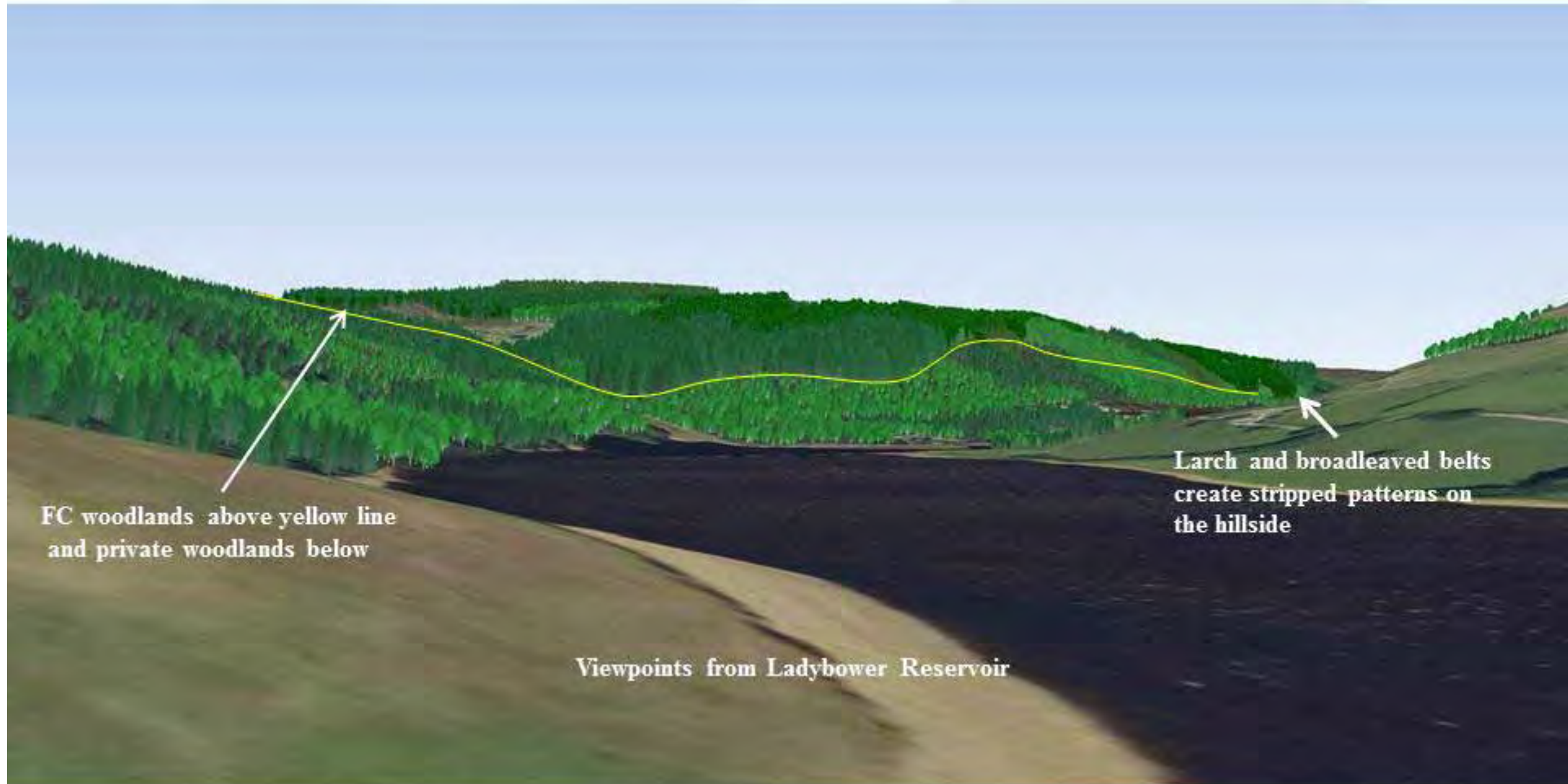


Proposed FC forest structure when viewed from Banktop Hey 2067

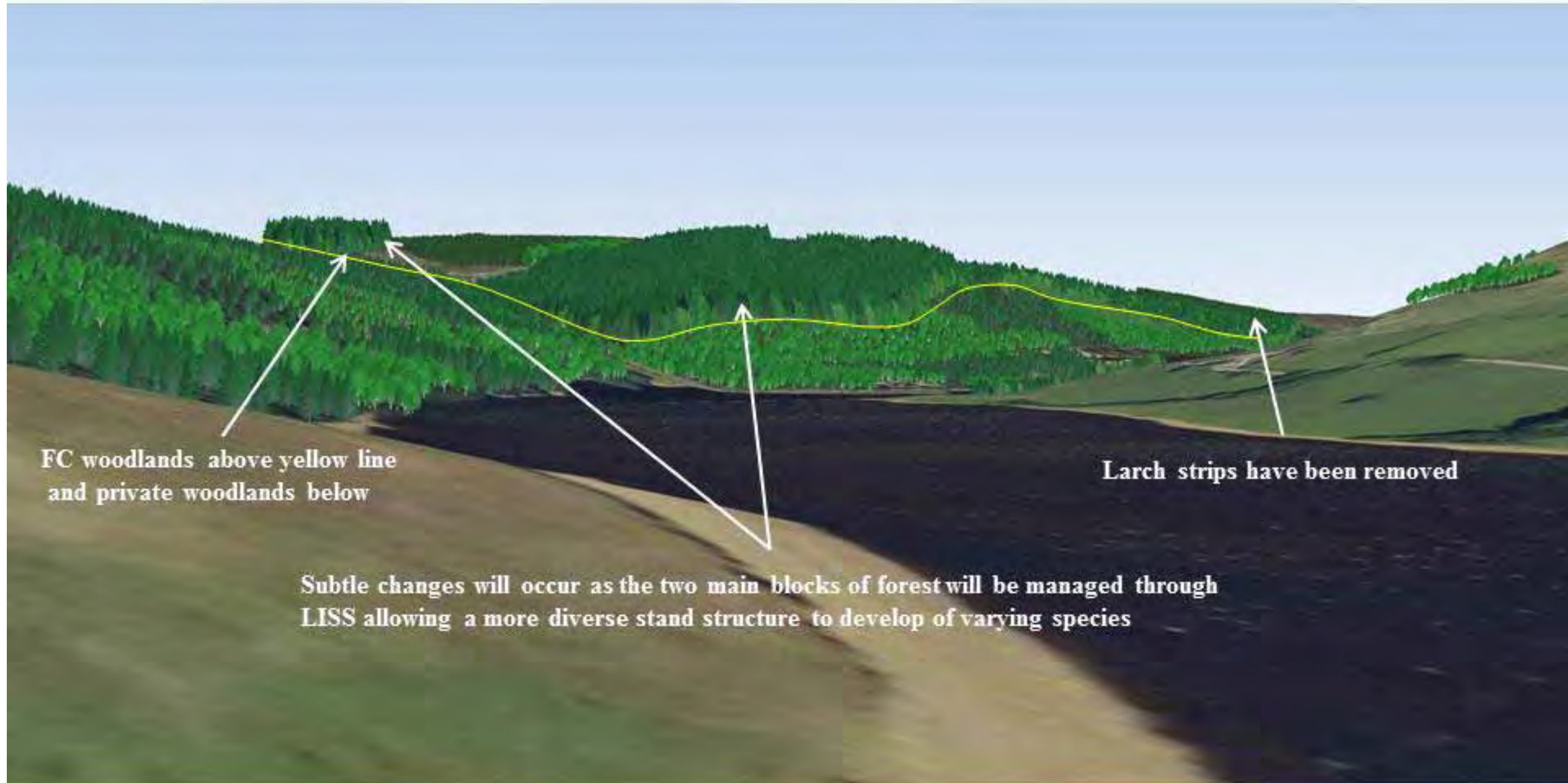




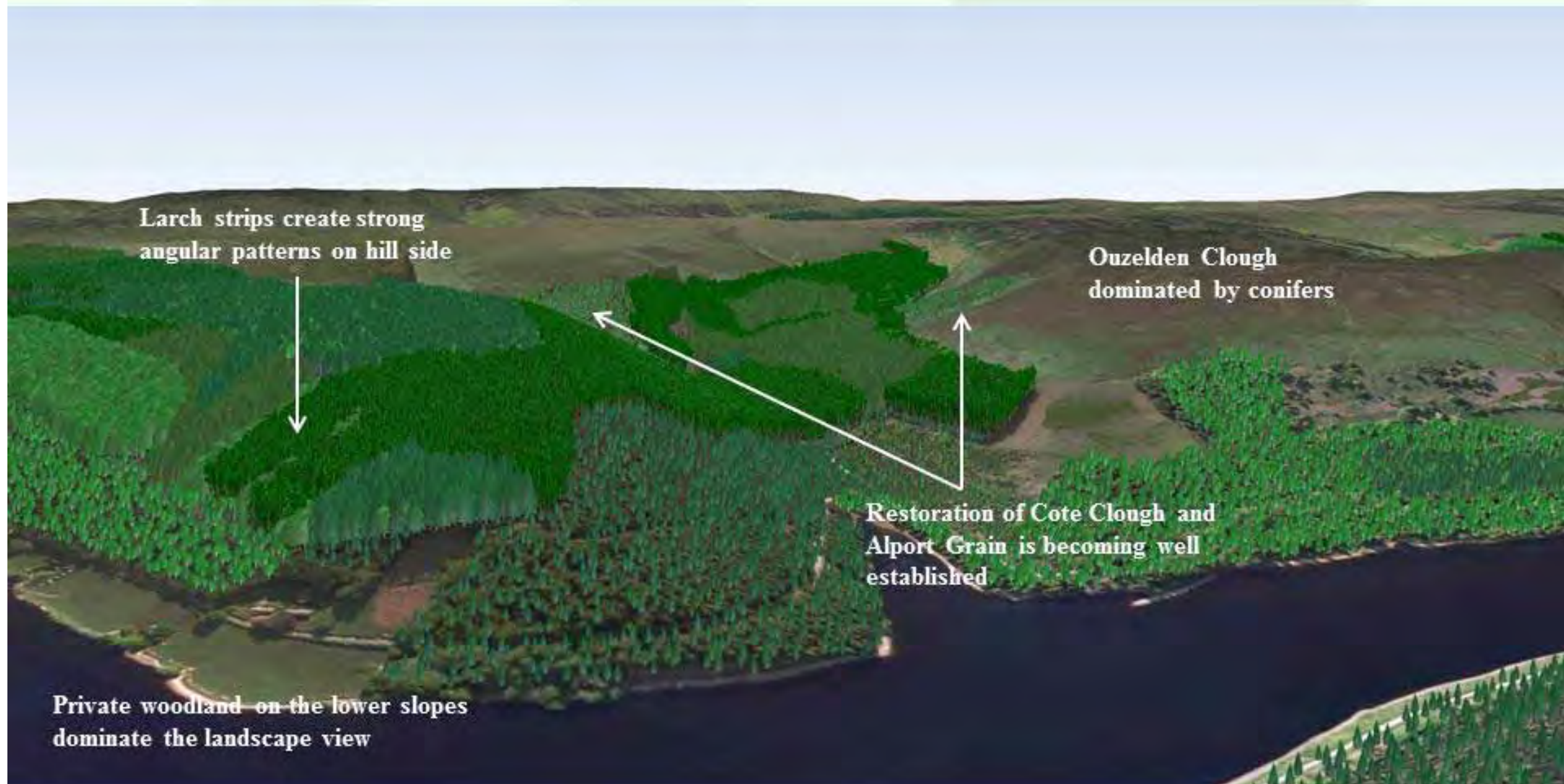
Lockerbrook 2017



Lockerbrook 2067



Lockerbrook 2017



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