Cogra Moss Forest Plan

Forestry Commission England

North England Forest District

Planning and District Context

The Strategic Plan for the Public Forest Estate in England outlines the delivery of forest policy at a national level. At a regional level there are six Forest Districts covering the country that directly oversee the implementation of policy actions in local public forest estate woodlands. Forest Enterprise England is the organisation responsible for managing the English public forest estate.

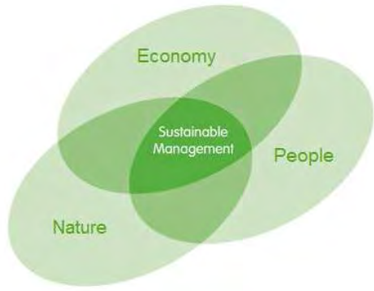
North England Forest District (NEFD) is the management unit that manages the public forest estate in Northern England. This is an extensive area encompassing 9 county or unitary authority areas from the Scottish border to Durham and Lancashire.

Our task is to realise the potential of each of the forests in our care for sustainable business opportunities, wildlife and nature conservation, and the enjoyment and well-being of local people and visitors. Each of our forests supports the economy through local jobs, sustainable timber production and the provision of recreation and tourism opportunities. All are funded by revenue from timber sales and recreation provision.

The woodlands of the district are currently arranged in 62 management areas, and their management is covered by individual ten year forest plans that identify local issues and the broad silvicultural management of the woods. Forest Plans are reviewed every five years.

These plans and their associated forest operations ensure that produce from the woodlands is endorsed by the Forest Stewardship Council® (FSC®) and the Programme for the Endorsement of Forest Certification™ (PEFC™) as being produced from woodlands under good management that meet the requirements of the UK Woodland Assurance Standard (UKWAS) and the UK Forest Standard (UKFS).

Individual Forest Plans aim to deliver a range of public benefits with achievable objectives that deliver the three drivers of sustainable land management outlined in the North England Forest District Strategy.



These key drivers are supported by the following Forest District Policy;

- we will optimise the financial return from timber production compatible with achievement of other forest district objectives while complying with the UK Forestry Standard and meeting the requirements of the UK Woodland Assurance Scheme

- we will provide public access to all our forests and woodlands where there are no legal or safety restrictions. We will encourage and permit a wide range of recreational activities from walking and quiet enjoyment to more specialised activities including orienteering, horse riding and motor sports.

- we will ensure that rare and threatened habitats are protected and managed to maintain or enhance their conservation value

Cogra Moss Forest Plan

This is the third revision for Cogra Moss Forest Plan which is being submitted early due to the impact of extensive windblow across the forest and consequently the need to reconsider the scheduling of felling coupes. The potential impact of Phytophthora Ramorum in larch and prolific Sitka spruce regeneration on sites planted with broadleaves has also prompted a review of species choice for restocking.

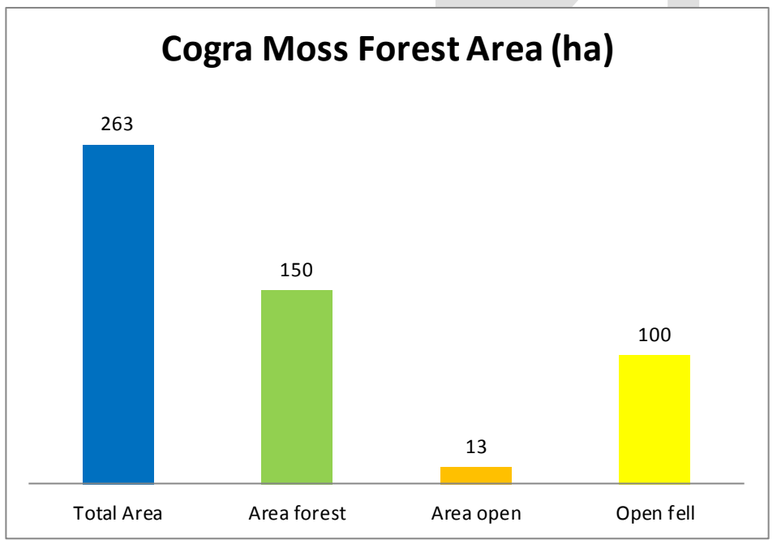
Part 1 Background Information

Introduction

Cogra Moss is situated on the north western edge of the Lake District National Park around 2km east of the village of Lamplugh. The forest is freehold, purchased by the Forestry Commission in the early 1960's and covers an area of 263ha. It was planted in the mid 1960's to early 1970's with predominantly coniferous species.

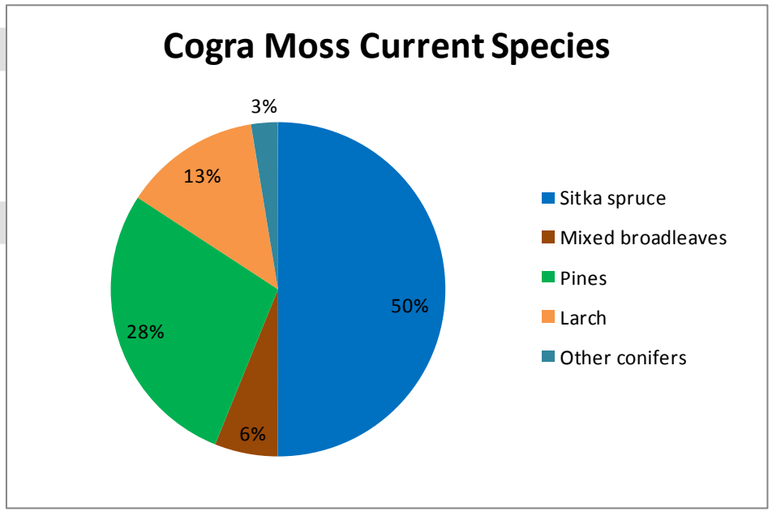
Current Woodland composition

Of the total 263ha area approximately 150ha is forested, which incorporates 13ha of open space and approximately 100ha of open fell and heathland above the treeline.



Species and timber potential

The current species composition is mostly conifer, a mixture of spruce, lodgepole pine and larch with Sitka spruce dominant and more recent restocking with mixed broadleaves. The location of these species tend to reflect the soils and exposure of the site with spruce generally being sited on the less fertile and more exposed sites at higher elevations, with the other conifers and broadleaves being planted on the less exposed lower elevation sites. Crops are generally growing well with Spruce typically obtaining yield class[1] 12 to 14, other conifer species 8 to 10 and broadleaf species 0 to 6. Lodgepole pine of Pacific west coast origin has not responded well to the locality and poor form and quality of this species are typically present throughout.



A program of felling and restocking has been underway throughout the period of the previous plan and the forest is now moving into its second rotation. Due to the relatively short time period of the initial afforestation many of the remaining first rotation plantations are approaching economic maturity and some are suffering from wind blow. In particular, where Lodgepole pine has been planted there has been significant wind damage which has reduced the value of this poor quality timber by increasing the cost and practicalities of working.

[1] Yield class is a measure of how fast the trees are growing. If they are yield class 12, the trees will put on 12m^3 of timber /hectare/annum as an average over their life

Designated areas

Cogra Moss is situated wholly within the Lake District National Park. There are no other statutory designations.

Landscape, Soils and Topography

The forest surrounds Cogra Moss, a now unused, man-made reservoir and is located generally within the transitional zone from a low-lying landscape of fields laid down to pasture to the expanse of the open fell above and the altitude of the forests varies significantly. The forest is visible from external viewpoints such as Felldyke, Lamplugh, Arlecdon and Asby. However, these views only reveal the forest edges as much of the forest is hidden from view by Knockmurton and the land rising up between Lamplugh and the reservoir dam. Soil types vary to reflect the elevation and terrain and include intergrade Iron Pan and skeletal soils over approximately half the forested area, Brown Earths and Peaty Gleys. The strata under Cogra Moss have in the past been an important source of iron ore and hematite.

Crop stability, as measured by Wind Hazard Classification[2], also reflects the changes with altitude and soil type, with higher scoring sites dominating the more exposed areas, whereas on less exposed sites the scores falls to below 3 (see WHC map) and the relative stability of these slopes presents opportunities for thinning. However, as t he majority of the first rotation crops are beyond the age of economic maturity at higher elevations windthrow is a limiting factor on rotation length.

Conservation and Heritage

As Cogra Moss moves into its second rotation increasing areas of open space, species and age diversity will enhance the conservation value of the woodland. There is considerable wildlife interest on the land adjacent to the forest including heather moor land, mires and acid grassland. A Phase 1 vegetation survey of Blake Fell in 2009 detailed the important habitats associated with this expansive open area. Dry dwarf shrub, acid grassland, blanket bog and marshy grassland were mapped and species recorded. The composition of the vegetation indicates past heavy grazing from which the site is now recovering. Maintaining a secure stock proof boundary is the main objective to prevent suppression of dwarf shrubs and spread of grasses. The mires adjacent to the reservoir also have conservation interest associated with the presence of the scarce sedge, Carex magellanica (Tall sedge).

[2] WHC is an indication of the windiness of the site. Areas with high scores above 4 are more restricted in forest management objectives such as the ability to thin or extend the rotation length of a crop.

No Scheduled Ancient Monuments are present within the forest, however there are a number of unscheduled sites associated with the remnants of mining dating back from the mid-nineteenth century with the remains of old mine workings, centred on Knockmurton. An extensive survey was carried out in March 1996. As more areas of the forest are felled it is possible that previously unrecorded archaeological features will be discovered and added to the records. Through detailed site planning these and existing features will be protected during harvesting and subsequent restocking operations.

Access and Roading

A single forest road, with the entrance on the south side of Knockmurton provides vehicular access for forest management and is shared with public access on foot. The section of road from the public highway to the forest gate although not owned by the Forestry Commission is maintained to an FC standard. There is also light vehicle access for FC and Cockermouth Angling Club members from Felldyke up to the reservoir car park. There are no plans to extend the forest road network but some improvements for lorry turning will be necessary when harvesting the coupes at the north of the forest.

Terrain is a limiting factor over much of the forest with slope being the most important determinant for harvesting machinery. Much of the afforested land is only suitable for extraction by cable crane or high lead systems. In addition the area of forest on the south side of the reservoir has poor access to the forest road network.

Pests and diseases

Roe deer are resident in the area and there is potential for damage to both tree crops and other habitat types through browsing and grazing. An annual cull is achieved by Forestry Commission rangers in response to crop damage.

Larch is potentially threatened by the disease Phytophthora ramorum and consequently there will be no long term restocking of larch in the future. However, larch will be retained where it h as been previously planted or where it is regenerating naturally.

Communities and recreation

It is Forestry Commission policy to promote informal recreation such as walking, cycling, picnicking, and studying wildlife. We also seek to provide opportunities for more specialist users and for events when this is compatible with site conditions and other management objectives.

Cogra Moss benefits from an extensive forest road, ride and path network providing good access to the forest and on to Blakefell with circular walking and running routes. The shore of the reservoir and the public right of way which leads from the LDNP car park at Felldyke provide the main access routes into the forest which is well used by the local community and visitors for informal recreation. The higher elevation permissive path gives good views into the central fells and out to the west coast and beyond.

The reservoir is maintained by United Utilities and fished by the Cockermouth Angling Association who uses the small informal car park on the southern shore. Blake fell follows the skyline in the centre of the view.

Part 2 Analysis and Concept

The factors outlined in Part 1 present various opportunities and issues. These are summarised below and represented on the accompanying map:

Factor	Opportunities	Issues
Soils	Better soils are generally toward the lower elevations of the forest.	Lodgepole pine not suited to soil conditions and is of poor form/quality and low value.
Alternatives to clearfelling	Some more sheltered areas have the potential to be thinned. Areas of mixed broadleaved/spruce regen woodland adjacent to the reservoir have potential to be managed as Long Term Retention.	Much of the forest at higher elevation is unsuitable for thinning.
Biodiversity	Enhancement of mire habitat adjacent to the reservoir through felling of standing crops which are increasingly at risk of windblow. Retention of extensive area of windblown Lodgepole pine could have long term ecological benefit as deadwood habitat. Realignment of upper forest margin after felling provides the potential for open woodland edge habitat and increased heathland/acid grassland open habitat. The vegetation communities found on Blake Fell provide an important biological resource which is in contrast to the surrounding heavily grazed fell land.	Difficult access to harvest crops adjacent to the reservoir Loss of productive land which needs to be balanced against the practicality, cost and health and safety issues of clearing the windblow from the site. Sheep ingress – need to maintain stock proof boundary.
Access/Roading	Good network of forest roads with good links to public highway and markets. Public and permissive paths provide good access for the public.	Harvesting and haulage along single forest road has the potential for conflict with recreational use of forest. Turning points for lorries at north end of forest is limited. Northern most corner of Compartment 2703 is inaccessible without major road investment.
Harvesting		The previous felling plan is no longer viable due to the onset of windblow and even aged nature of the crops. Some previously scheduled coupes were delayed in an attempt to even the amount of felling elsewhere in the district due to larch infection by P.Ramorum. Significant % of the forest is only accessible by cable crane or high lead systems.
Pests and disease	Wider alternative species choice at restocking will improve resilience of the forest to future pest and disease.	Significant % of larch is at risk of infection from P. Ramorum.
Future Species/ Climate change	Opportunity for species diversity and increased resilience through underplanting and management by CCF. Potential alternative conifer species could include WRC, DF, ESF, GF, NF, RSQ and JCR. Developing MB understorey could provide woodfuel opportunities.	Under clearfell system species choice limited to light demanding species. Larch no longer desirable species choice.
Current species	SS predicted to remain favourable under future high emissions climate models, particularly at higher elevations and SS remains the optimal commercial species for the site. Recently planted larch and Douglas fir are performing well and attaining high yield class.	Lodgepole pine not performing and increasingly prone to wind damage. Significant area of LP in Compartment 3017 is unmarketable due to extensive wind damage. Larch is at risk from P. Ramorum. Areas of recent broadleaved planting are infilling with prolific Sitka spruce regeneration with high associated costs for its removal.

Appraisal of Opportunities and Constraints

Cogra Moss presents a number of operational challenges, mostly associated with the age and composition of the current species, particularly with regard to Lodgepole pine and the onset of windblow across much of the forest. A rescheduling of harvesting coupes and wider use of alternative species at restocking will help to reduce this impact. Economic potential of the forest is a prime objective which will be optimised by the future species and clear fell/restocking regime. The recreational facilities on offer make a significant contribution particularly with the local community and there is potential to enhance the ecological quality of the forest through enhancement of deadwood and proactive management of open habitat.

Part 3 Objectives and Proposals

The following objectives have been identified based on FEE National Policy and NEFD Strategic Plan

Forest District Strategic Goal	How Forest Plan delivers
ECONOMIC Wood Production – '*we will optimise the financial return from timber production compatible with the achievement of other district objectives whilst complying with the UK Forestry Standard and meeting the requirements of the UK Woodland Assurance Scheme'*	Achieve the proposed felling plan and take opportunities to thin the forest where practical over next 10 years. Sitka spruce remains the principle commercial species for restocking but species diversification will be introduced to improve resilience of the forest. Alternative species could include Scots pine, Macedonian pine, Western red cedar, Lawson cypress, Douglas fir. Developing mixed broadleaved areas could provide local woodfuel market opportunities.
NATURE *'we will continue to diversify the age class structure of our even-aged woodlands and increase the value of all our woodlands and forest for wildlife'* *'we will ensure that rare and threatened habitats are protected and managed to maintain or enhance their conservation value'*	Manage Compartment 3017 as Minimum Intervention to reflect the long term potential and ecological benefits of the deadwood resource. Environmental improvements will be delivered through forest restructuring achieved through felling, thinning and restocking and open space management. At restocking, as indicated by the indicative restocking plan, the opportunity is being taken to restock both to mitigate the straight boundaries of the earlier planting, increase the open area, and introduce a wider range of conifer and broadleaf species. Fell Sitka spruce from areas of mire adjacent to the reservoir and restock with mixed broadleaves. Natural regeneration of spruce will be managed to an appropriate level to create diverse mixed species woodland which will be managed as Long Term Retention. Maintain stock proof boundary to enhance quality of open habitat on Blake fell. Deal with any sheep ingress promptly. Protect any locally scarce habitats or species through operational planning.
PEOPLE '*we will utilise the land and resources at our disposal to assist communities close to our forests to enhance their environments and hence their quality of life'* '*We will provide public access to all our forests and woodlands where there are no legal or safety restrictions…'*	Improve the internal and external attractiveness of the forest through restructuring and species choice. Species diversity and sympathetic management of external boundaries to enhance visual impact of the forest from public rights of way and the wider landscape. Maintain and enhance current informal recreation use of the forest through the maintenance of routes.

Part 4 Monitoring plan

The objectives identified in section 3 will be monitored in the following ways

Objective	Criteria for success	Assessment
ECONOMIC		
Wood production	Marketable parcels of timber on offer to the trade.	Production forecast and sales records. Harvesting facilitated according to the forest plan
Sustainable economic regeneration	Successful establishment of restocking and underplanting.	Restocking assessment
NATURE		
Restructuring	Delivery of felling/thinning and restocking proposals	Five yearly internal Forest Plan review
PEOPLE		
Visual enhancement to visitors.	Establishment of mixed woodland and ongoing restructuring of the plantations.	Five year Forest Plan review.

Part 5 Forest Plan Maps

- Location – 1:50,000 scale showing location in context of other woodland in the local area
- Current Species – species composition in 2016
- Landform – indicating topography of the woodland and local area
- Wind Hazard - windiness represented by Detailed Aspect Method Scores (DAMS)
- Yield Class – indicating the productivity of the current species
- Soils – indicating underlying soils composition across the forest area
- Conservation and Heritage – statutory and non-statutory conservation and heritage features.
- Recreation, Access and Services – formal public rights of way, access and constraints
- Opportunities and Issues
- Design Concepts – broad concepts of future management
- Felling Proposals – showing five yearly coupe felling periods and areas of CCF or long term retention.
- Future Species – representing design concepts and the long term vision (>2042) for future species composition and open habitat.

Forestry Commission England

Cogra Moss Location

N

1:50,000

Cogra Moss

Other FC woodland

Forestry Commission woodlands have been certified in accordance with the rules of the Forest Stewardship Council.

Forestry Commission
England

Cogra Moss
Current Species

N

1:10,000

- Open
- Mixed broadleaves
- Other conifers
- Larch
- Pines
- Sitka spruce

Forestry Commission woodlands have been certified in accordance with the rules of the Forest Stewardship Council

Forestry Commission
England

Cogra Moss
Landform

N

1:10,000

The forest surrounds Cogra Moss, a man-made reservoir and is located generally within the transitional zone from a low-lying landscape of fields laid down to pasture to the expanse of the open fell above and the altitude of the forests varies significantly. The forest is visible from external viewpoints such as Felldyke, Lamplugh, Arlecdon and Asby. However, these views only reveal the forest edges as much of the forest is hidden from view by Knockmurton and the land rising up between Lamplugh and the reservoir dam

Cogra Moss boundary

Water courses

50m contours

Forestry Commission woodlands have been certified in accordance with the rules of the Forest Stewardship Council.

Forestry Commission England

Cogra Moss Wind Hazard Classification

N

1:10,000

WHC is an indication of the windiness of the site. Areas with high scores above 4 are more restricted in forest management objectives such as the ability to thin or extend the rotation length of a crop.

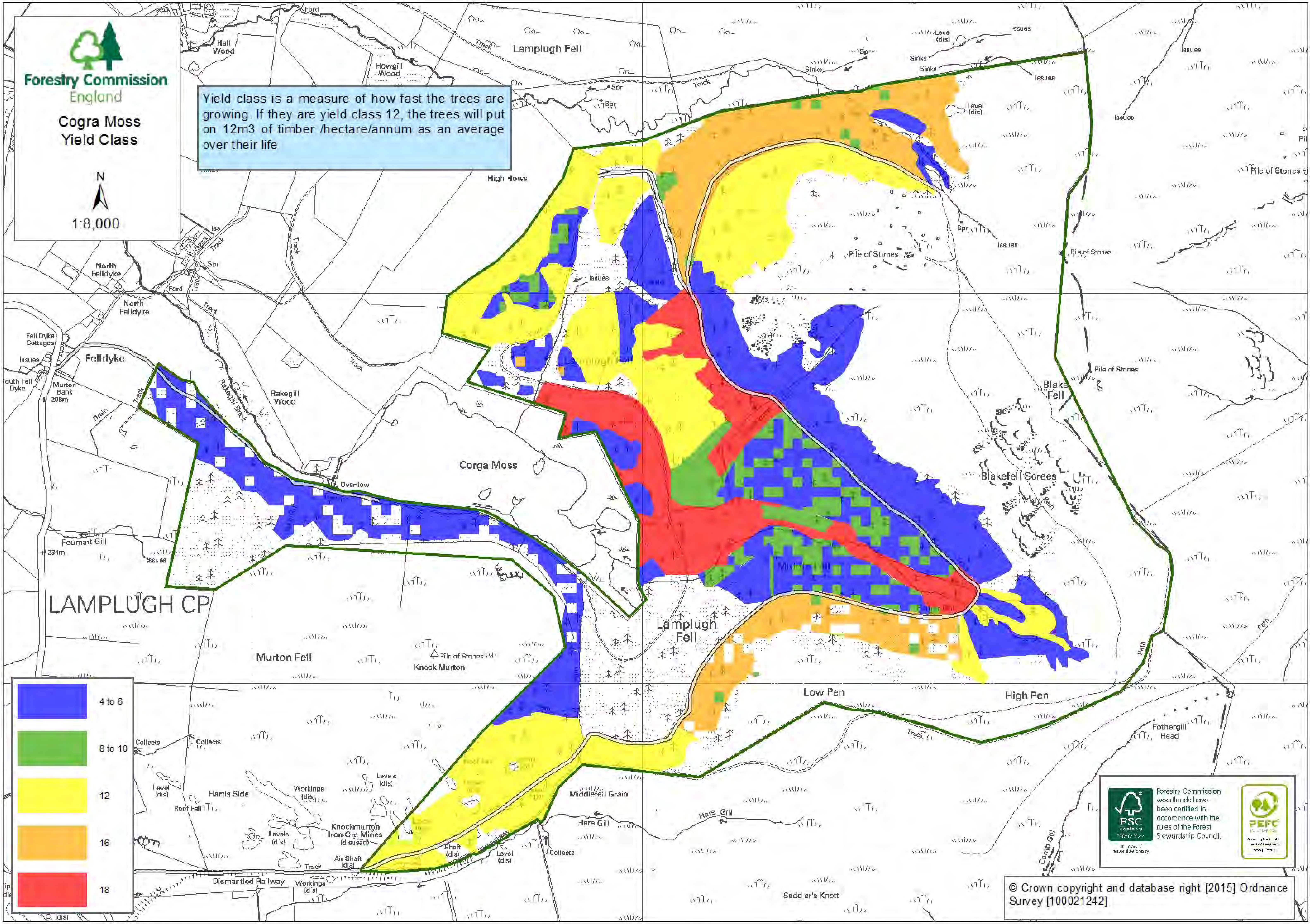
0

3

4

5

Forestry Commission woodlands have been certified in accordance with the rules of the Forest Stewardship Council.


Forestry Commission England
Cogra Moss
Yield Class
N
1:8,000
Yield class is a measure of how fast the trees are growing. If they are yield class 12, the trees will put on 12m3 of timber /hectare/annum as an average over their life
4 to 6
8 to 10
12
16
18
Lamplugh Fell
Corga Moss
LAMPLUGH CP
Murton Fell
Blake Fell
Blakefell Screes
Low Pen
High Pen
Fothergill Head
Felldyke
Rakegill Wood
Knockmurton Iron Ore Mines
Middlefell Grain
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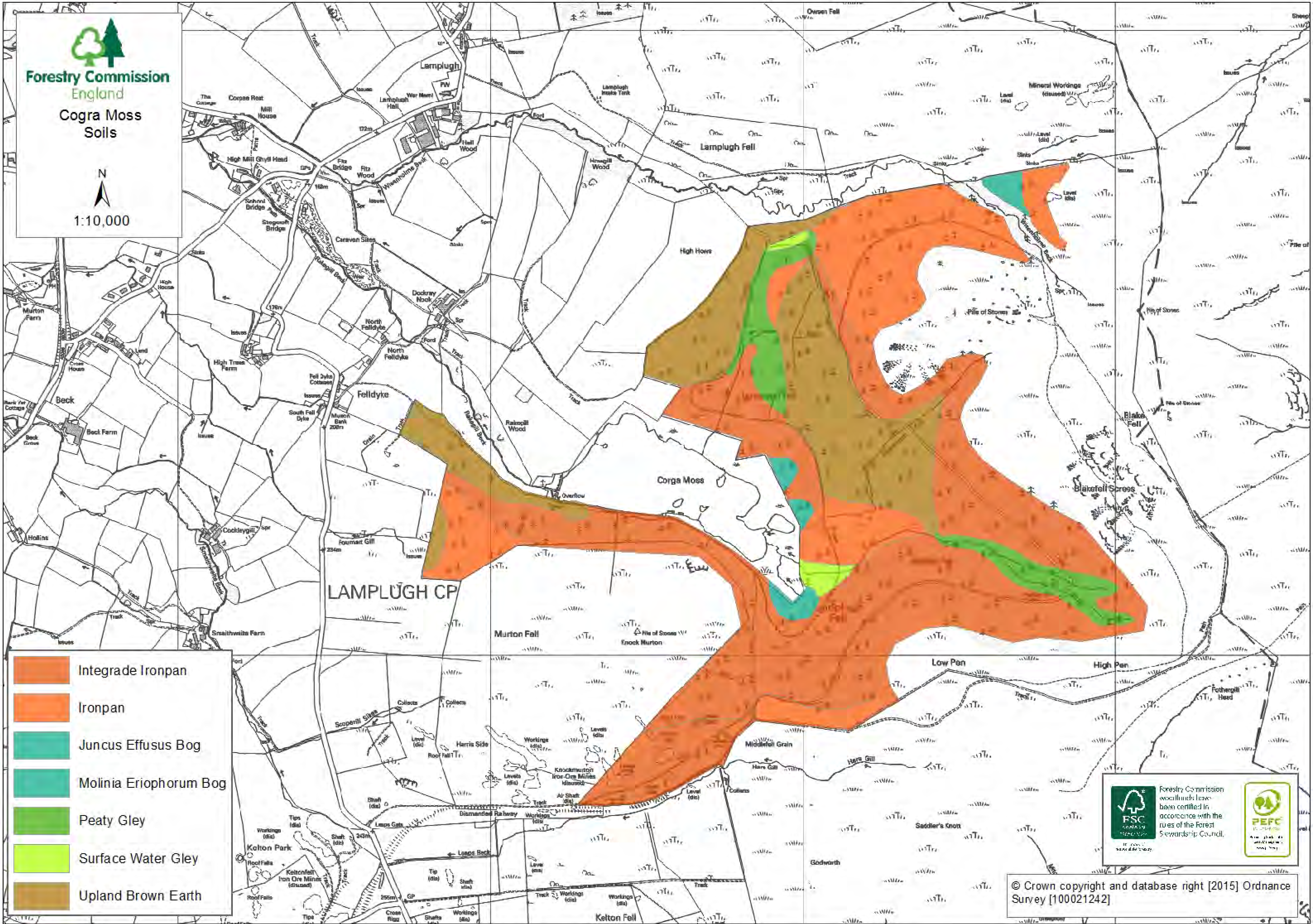
Forestry Commission England
Cogra Moss
Soils
N
1:10,000
Integrade Ironpan
Ironpan
Juncus Effusus Bog
Molinia Eriophorum Bog
Peaty Gley
Surface Water Gley
Upland Brown Earth
LAMPLUGH CP
Lamplugh
Lamplugh Fell
Corga Moss
Murton Fell
Low Pen
High Pen
Blake Fell
Blakefell Screes
Felldyke
Kelton Fell
Kelton Park
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Forestry Commission England

Cogra Moss Conservation and Heritage

N

1:8,000

A Phase 1 vegetation survey of Blake Fell in 2009 detailed the important habitats associated with this expansive open area. Dry dwarf shrub, acid grassland, blanket bog and marshy grassland were mapped and species recorded. The composition of the vegetation indicates past heavy grazing from which the site is now recovering. Maintaining a secure stock proof boundary is the main objective to prevent suppression of dwarf shrubs and spread of grasses.

- Mineshaft
- Localised juniper bush or stand
- Heritage feature
- Water courses
- SNCI – Meso/oligotrophic tarn/basin mire complex
- Upland heathland

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Forestry Commission
England

Cogra Moss Access and Recreation

N

1:10,000

- Access point
- Public highway
- Permissive path
- Footpath
- LDNP Boundary
- Open Access Land (CROW)

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Forestry Commission England

Cogra Moss Opportunities and Issues

N

1:10,000

Restocking with other conifer and broadleaves would improve species diversity

Larch crops are at risk of disease from Phytopthora Ramorum and current FE policy prohibits future restocking with larch

Inaccessible coupe. It is not economically viable to construct access across the steep gully to facilitate harvesting

Spruce adjacent to the reservoir is becoming increasingly unstable due to the wet ground conditions and needs to be harvested

Extensive area of ungrazed upland heathland habitat provides important habitat and diversity to the area

Poor access for harvesting from Felldyke to reach plantations west of the reservoir. No access from the east

Inaccessible coupe which is beginning to suffer windblow with the potential to cause turbidity downstream and into the reservoir

This coupe could be accessed across the open hill if combined with harvesting the sitka spruce coupe to the north to provide sufficient brash to support machines Convert to open/broadleaved habitat post felling

Area felled and restocked with broadleaves is becoming infilled with sitka spruce regeneration. High cost associated with its removal

Retaining the spruce to create a mixed woodland managed as Long term retention could provide valuable age class diversity in a forest managed principally through clearfell

Extensive windblow of Lodgepole Pine throughout the coupe and extending to the area above the forest road

Valuable deadwood resource which could be managed under Minimum Intervention for conservation benefit

Straight forest edge boundaries are intrusive in the landscape

A good network of permissive and public paths provides good access for recreational use of the forest The forest is well located for timber markets

Opportunities

Issues

FC Access

Intrusive boundaries

Area of poor access

Forestry Commission woodlands have been certified in accordance with the rules of the Forest Stewardship Council.

Forestry Commission England

Cogra Moss Design Concepts and Management Regimes

N

1:8,000

Clearfelling
Cutting down of an area of woodland (if it is within a larger area of woodland it is typically a felling greater than 0.25 ha). Sometimes a scatter or small clumps of trees may be left standing within the felled area.

Long-term retention
Trees retained for environmental benefit significantly beyond the age or size generally adopted by the woodland enterprise.

Minimum intervention
Management with no systematic felling or planting of trees. Operations normally permitted are fencing, control of exotic plant species and vertebrate pests, maintenance of paths and rides and safety work.

Upland management
Enhance habitats and species diversity through maintenance of the stock proof boundary to prevent sheep grazing

- Lower Slopes & Wetland - Species diversity and Long term retention
- Middle Slope - Timber production zone and species diversity
- Upper Slopes - Conservation and heathland habitat
- Minimum Intervention

Forestry Commission woodlands have been certified in accordance with the rules of the Forest Stewardship Council.

Forestry Commission England

Cogra Moss Felling Proposals

N

1:8,000

Fell to waste one tree length strip to mitigate damage to the boundary fence by windblown trees. This presents an opportunity to realign the straight forest boundary of this inaccessible coupe.

- Open
- 2017-2021
- 2022-2026
- 2027-2031
- 2032-2036
- 2047 onwards
- LTR/Min Int

Forestry Commission woodlands have been certified in accordance with the rules of the Forest Stewardship Council.

Forestry Commission England

Cogra Moss Future Species

N

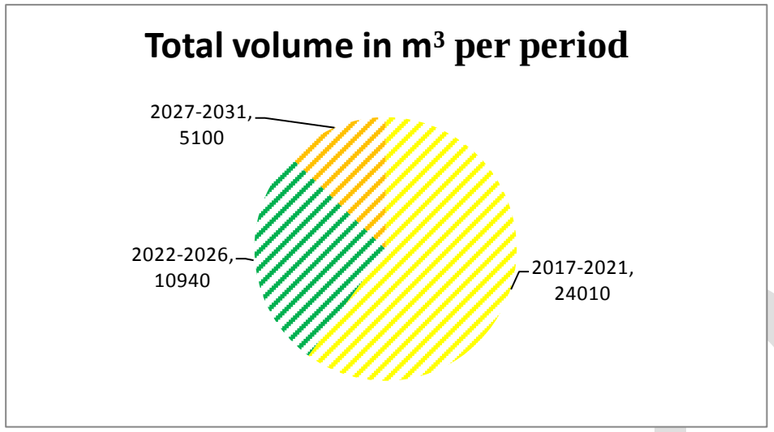
1:8,000

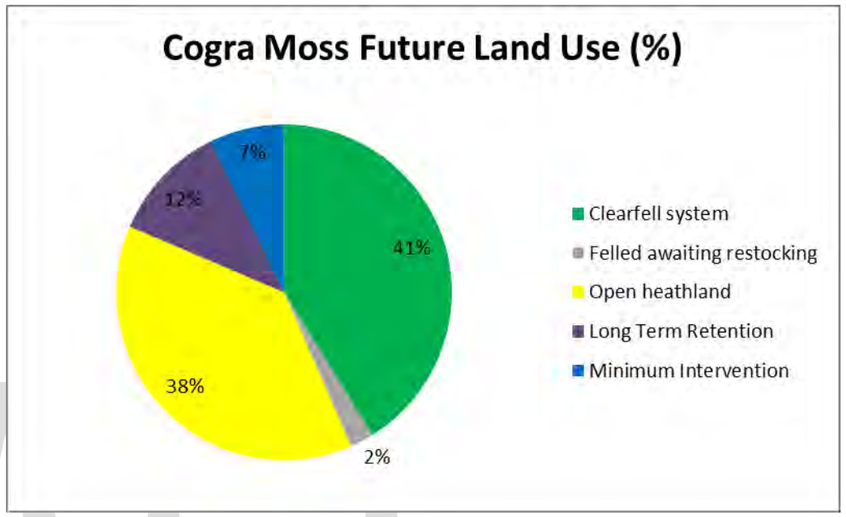
LAMPLUGH CP

- Open
- Sitka spruce
- Low density spruce
- Spruce/pine mix
- Broadleaved
- Broadleaved/spruce mix
- Other conifers
- Other conifers/broadleaved mix

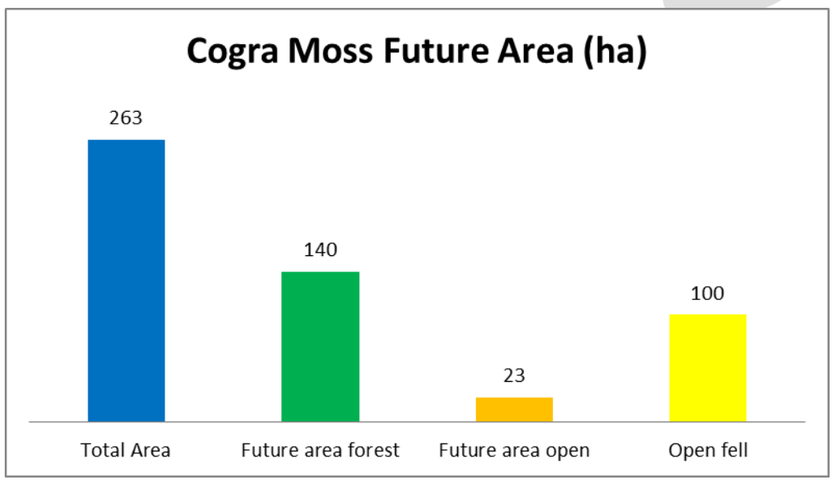
Timber production

Average timber production per period is shown below. Over the 10 year approval of the plan we will harvest approximately 35,000m³ of timber.



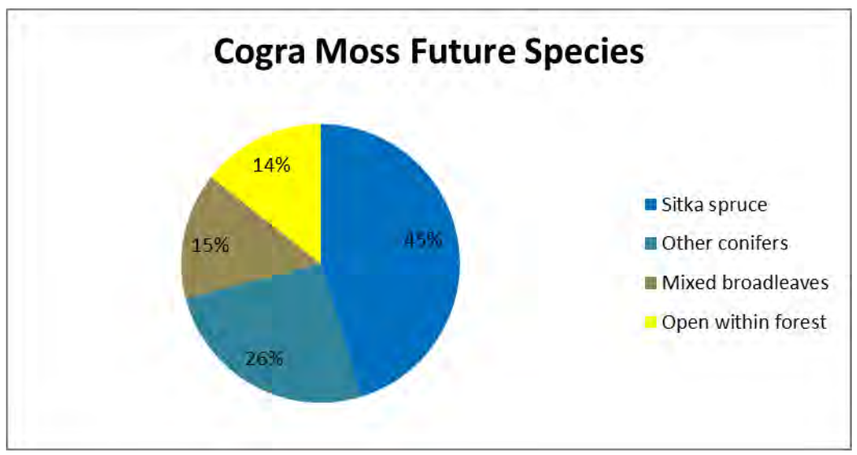


Future Area and Land Use



Future Species

The combined percentages of future species composition shown below comply with the requirements for UKFS and UKWAS (65% primary species (Sitka spruce), 20% secondary species (Other conifers) and 5% mixed broadleaves).



Productivity

The productive potential of the forest is optimised through timber production achieved through delivery of the harvesting plan and delivery of ecosystem services and other non-market benefits included in biodiversity, climate change mitigation, water, people and landscape. This is represented in the Productive Capacity Analysis below:

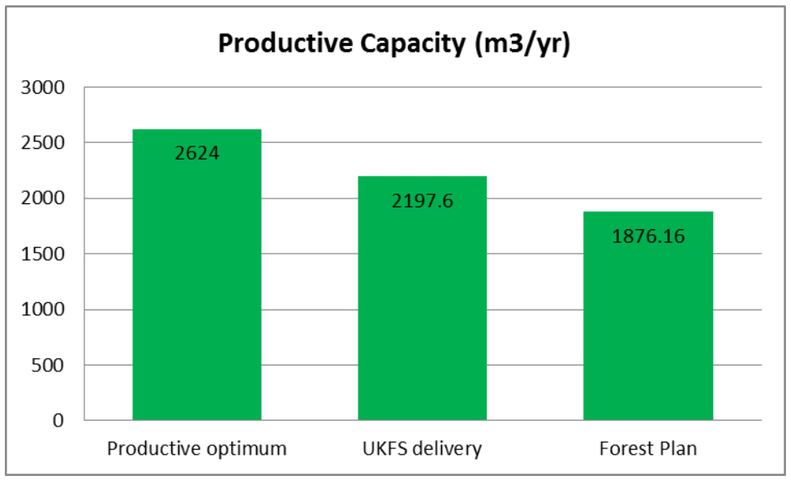
The graph shows the relative productive capacity (m^3/year) of the forest based on average yield class as a comparison between the following scenarios;

1. Productive optimum – productive capacity assuming that the total productive area is planted with the optimum commercial species suited to the site (i.e. Sitka spruce YC 14).

2. UKFS delivery – productive capacity achievable through minimum compliance with a species percentage mix comprising 65% primary species (SS YC 14), 20% secondary species (MC YC 14), 5% broadleaved (YC 4) and 10% open space.

3. Forest Plan – productive capacity based on the percentage species mix and open land from this plan.

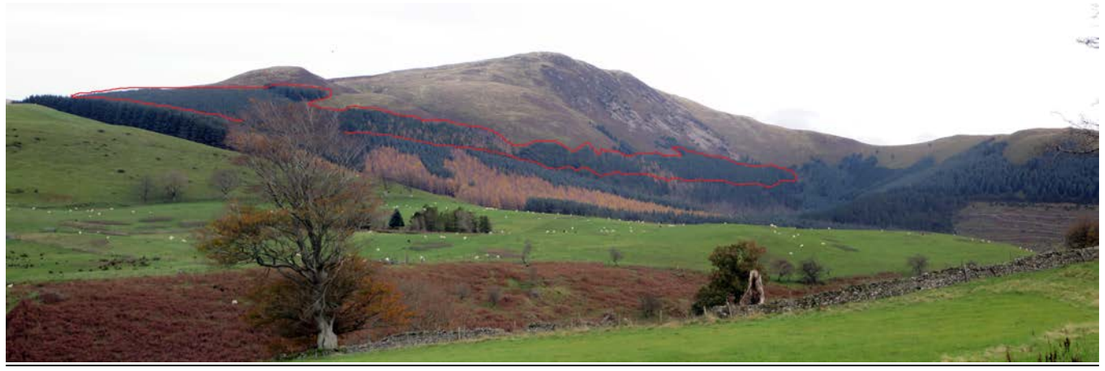
Note: The difference between UKWAS delivery and Forest Plan also includes requirements such as riparian corridors, landscape, ancient woodland, heritage etc. which require going beyond the minimum species composition and open space percentages to achieve UKFS.



Landscape Appraisal

The previous forest plan included a detailed landscape assessment from a number of viewpoints indicating that much of the forest is hidden from view by Knockmurton and the land rising up to the reservoir from Lamplugh. The visual impacts and amelioration of straight forest boundaries remains an objective through the ongoing felling and restructuring program. An exception to this is the area of Sitka spruce north of Wisenholme Beck which, due to inaccessibility, is being retained and will be managed under Minimum Intervention. When the adjacent coupe is felled in the period 2017-2021 this small block will be isolated for a time until the adjacent area has been restocked. Opportunities to soften the visual impact of the straight edged northern boundary will be taken in response to the ongoing requirement of clearing windblown trees from the boundary fence. The area is highlighted in the image below viewed from the public highway at Fitz Bridge near Lamplugh.

Otherwise most of Cogra Moss is hidden from distant views. The internal landscape becomes more apparent from within, shown in the image below taken from the hilltop above Felldyke. The area highlighted in red indicates the upper elevations scheduled to be felled in 2017-2021. Although the coupe is of a reasonable size, in response to the onset of wind blow, the shape of the coupe combined with the amount of retained forest elsewhere in the block means that this is not particularly detracting in the landscape.



The United Kingdom Forest Standard (UKFS)

The UKFS is the reference standard for sustainable forest management in the UK. The UKFS is supported by a series of guidelines which outline the context for forestry in the UK, defines standards and requirements and provides a basis for regulation and monitoring. These include General Forestry Practice, Forests and Biodiversity; Climate Change, Historic Environment, Landscape, People, Soil and Water.

Cogra Moss Forest Plan is able to demonstrate that relevant aspects of sustainable forest management have been considered and the stated objectives in Part 3 and outcomes in Part 6 show how sustainable forest management will be achieved. The plan provides a clear means to communicate the proposals and to engage with interested parties and serves as an agreed statement of intent against which implementation can be checked and monitored.

In addition to conforming to general sustainable forest management principles UKFS is demonstrated in the following key areas:

Productivity	The productive potential is dictated by timber production achieved through delivery of the harvesting plan and delivery of ecosystem services and other non-market benefits included in biodiversity, climate change mitigation, water, people and landscape. This is represented in the Productive Capacity Analysis graph.
Structure	Future species composition; 45% Sitka spruce, 26% other conifers and 15% mixed broadleaved and 14% internal open space, complies with UKFS requirements. Long term structure will improve through linking of permanent broadleaved and open habitats.
Silvicultural	A combination of clearfell and restocking will be continued with Long Term Retention of areas of mixed woodland around the reservoir. This will improve age class diversity.
Biodiversity	Habitats and species are considered during the planning phase. Ecological connectivity achieved by extending and linking areas of broadleaved woodland and open space and retaining a significant area of deadwood habitat will ensure that the area is managed with conservation and biodiversity as an ongoing objective.
Climate change	Long Term Retention areas will minimise soil disturbance. Forest resilience will be enhanced over time through greater species diversity, particularly establishment of alternative conifer species (26%), with age and stand structure diversification to help mitigate climate change and disease/pest outbreaks. Ecological Site Classification will be used to identify the most appropriate species at the time of restocking.
Landscape	The planning process refers to the Local Landscape Character to inform the forest design. Visual sensitivity and consideration to visibility and the importance and nature of views of the woodland from several key viewpoints is used to inform shape, landform and scale. Particular emphasis is made on mitigating geometric shapes, symmetry and distinct parallel lines in the landscape through species choice, forest edge and coupe design.
Historic	Historic features are recognised and their safeguard will be routinely incorporated into operational management.
People	The Forest Plan is consulted with individuals, the local community and organisations with an interest in the management of the forest.
Water	Quality will be protected through adherence to Forest and Water guidelines as a minimum during harvesting and forest management operations.

Longer term management proposals

The proposals in this plan will lead to a more diverse and resilient woodland, with a greater range of species and habitats. Substantial areas of alternative conifer species will have been established, and the range of broadleaved species will have been extended.

Timber production remains a priority and will continue through a clearfell/restock regime with the focus on Sitka spruce but with a much broader range of conifer species and broadleaves at the lower elevations. This strategy will also contribute toward climate change mitigation and long term forest resilience.

Public use of the forest will continue to be made available with ongoing maintenance of permissive and public routes as appropriate.