Harbottle and Holystone Forest Plan 2016

Forestry Commission England

North England Forest District

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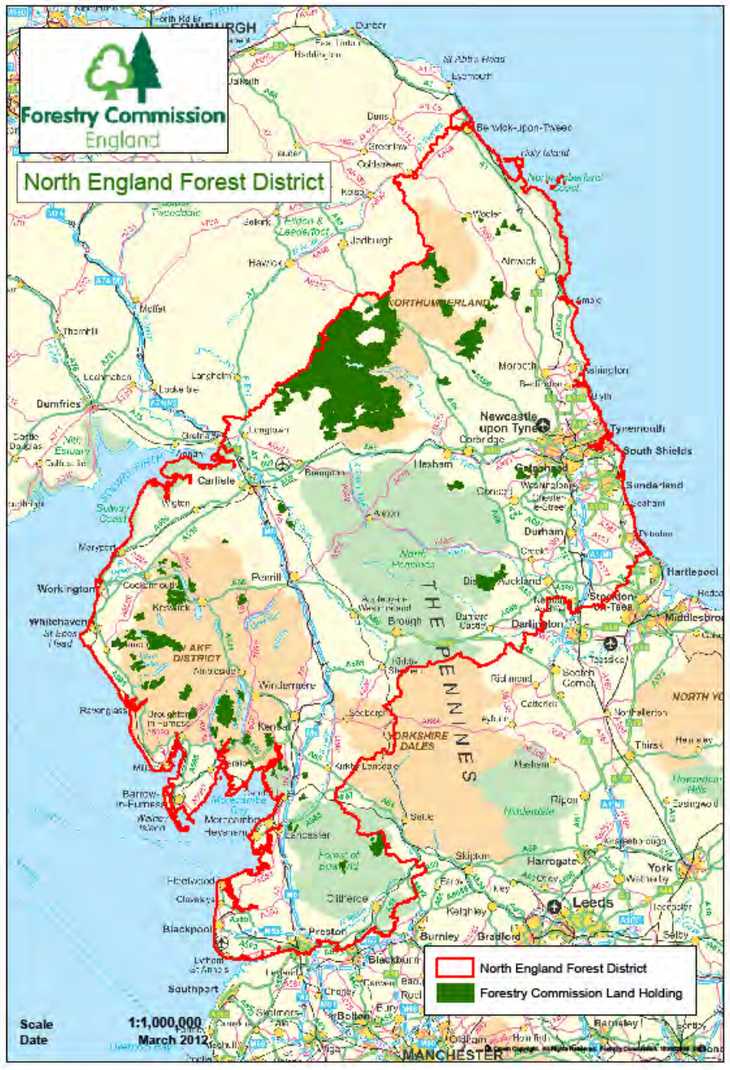
FSC www.fsc.org FSC® C123214 The mark of responsible forestry

PEFC Promoting Sustainable Forest Management www.pefc.org

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.

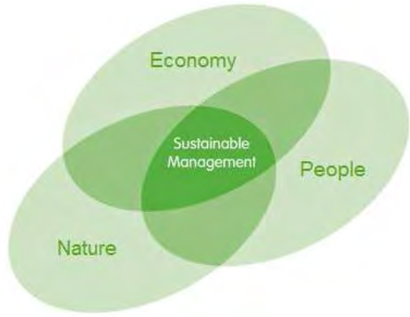


Our task is to realise the potential of each of the forests in our care for sustainable business opportunities, wildlife and nature conservation, and the enjoyment and well-being of local people and visitors. Each of our forests supports the economy through local jobs, sustainable timber production and 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

Harbottle and Holystone Forest Plan

This is the second revision for the Harbottle and Holystone Forest Plan. The objectives of the revised plan remain the same as the previous plan but changes and developments to note include:

1. The South western boundary coupe of the forest has been felled and restocked with open woodland (mixed native broadleaf planting). Though not yet fully established this will provide a transitional edge habitat from open moorland to high forest.

2. Rescheduling the timing of some of the clearfelling in light of crop stability and windthrow.

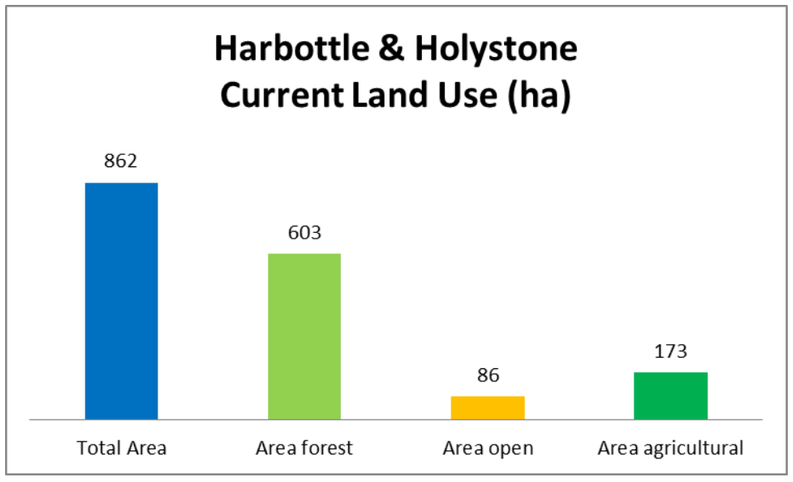
Part 1 Background Information and Appraisal

Introduction

Harbottle & Holystone are situated towards the eastern boundary of the Northumberland National Park, adjacent to the villages of the same name. The forest is owned freehold by the Forestry Commission and totals an area of 865 ha. The Forestry Commission gained the freehold ownership of the forest in a number of conveyances (eight in total). The first purchased in 1955 and the final from the Ministry of Defence (MOD) in 1987.

Current Woodland composition

Of the combined total area 603 ha is forested with approximately 86 ha permanent open land and 173 ha agricultural.

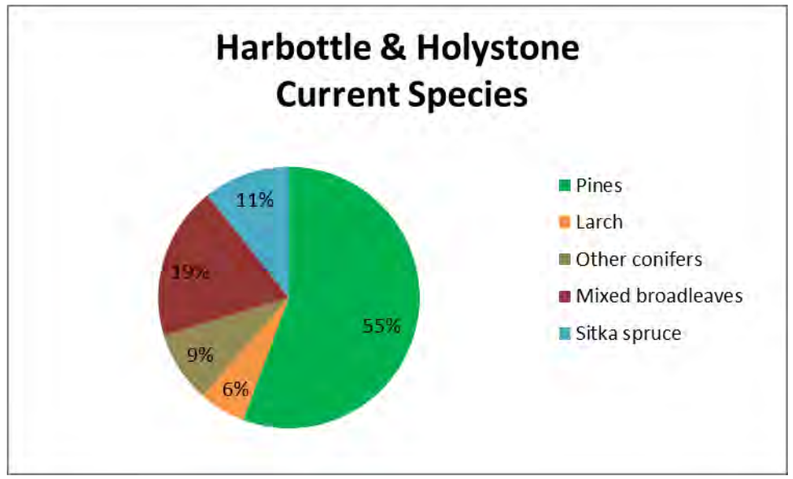


Species and timber potential

The current species composition is mainly coniferous, a mixture of pine, spruce and larch with scots pine and lodgepole pine dominant (see current species chart). The proportion of the forest which is broadleaf is significant in that the majority of the broadleaf is assessed as ancient semi-natural woodland.

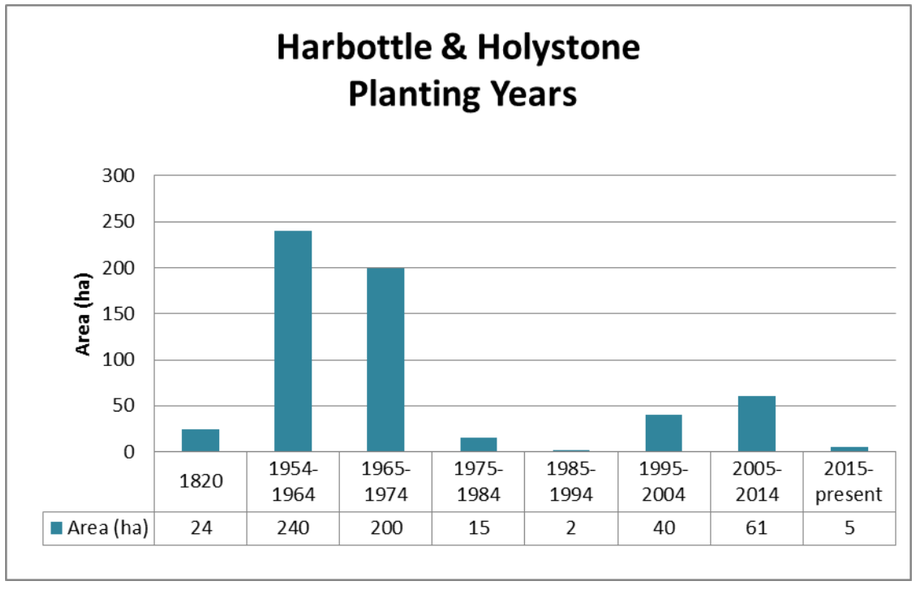
The crops are generally growing well with spruce obtaining yield class[1] 12 to 18 and pines 8 to 12, though an area of poor growing lodgepole pine is present on the higher elevation and exposed sites in West wood.

[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



Age class

Most of the current crops of trees were planted between 1954 and the mid 1970's. The early planting in 1820 is all broad-leaved woodland, mostly oak but also some beech and birch. Felling and restocking of the first rotation plantation commenced in the early 1990's and about a fifth of the woodland (18%) has since undergone felling and restocking.



The relative recent acquisition of Harbottle and Holystone is reflected in that the majority of the trees planted are first rotation, plus the Forestry Commission's ownership includes a significant proportion of open moor (Table 1).

Table 1 Percentage rotational distribution of crops	
First rotation	54
Second and subsequent rotation	15
Open	31

Designated areas

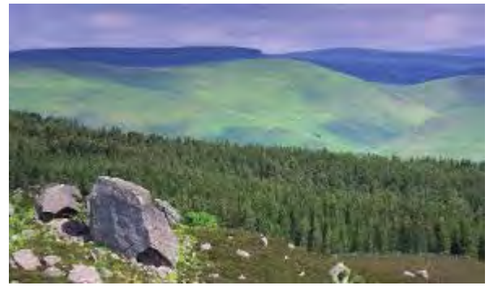
The woodlands lie wholly within the Northumberland National Park.

Three statutory designated Sites of Special scientific Interest (SSSIs), Holystone Burn Wood, Holystone North Wood and Harbottle Moor fall within the plan area which are covered by detailed management plans agreed with Natural England. Harbottle Crags is a Northumberland Wildlife Trust Reserve located on the Forestry Commission owned open moorland close to the Drake Stone forming part of the Harbottle Moor SSSI. The site is largely covered by upland heather. The peat bog at the eastern end of the lough has formed from a layer of sphagnum moss growing over deep water. The bog flora includes the carnivorous round-leaved sundew whilst the damp flushes contain bog myrtle. The reserve is managed in partnership with Forestry Commission. The site contains important outcrops of the fell sandstone group and consists of extensive areas of dwarf-shrub heath with associated blanket bog and valley mire. The plants and animals are typical of upland moorland communities some locally rare. The flora is dominated over much of the area by heather. Other species include cross leaved heath, cowberry, bilberry, crowberry, bell heather, petty whin and tormentil. Bracken is very widespread, particularly on the steeper better drained slopes and is steadily expanding its area. In the flat waterlogged areas between the cliffs lines there are mires dominated by bog mosses. They support typical mire species including hares tail cotton grass, common cotton grass, deer grass, cranberry, round leaved sundew and bog asphodel. There are a few, small, semi-natural woodland areas confined to the cliffs and steep gullies where they have escaped burning and grazing. Tree species are confined to mainly birch and rowan. There is at least one holly and a record of juniper. The cliffs, screes, gully and tops of big boulders support dwarf heath vegetation and, as with the woodland, the protection from grazing and burning has allowed ferns to flourish. Two common species are hard fern and broad buckler fern. North facing rocks have bryophytes and lichens. An interesting feature of Harbottle Moors is the widespread occurrence of bog myrtle. This shrub occurs in nutrient poor flushes and is especially important given the scarcity of bog myrtle elsewhere in Northumberland. Harbottle Lough attracts water birds such as teal, goosander and little grebe. The open moorland supports the locally scarce ring ouzel, snipe, curlew, wheatear, whinchat, skylark and red grouse, all restricted in their range by requiring upland habitat. Raptors include merlin, sparrow hawk, peregrine and short-eared owl. Harbottle Moors supports a wide range of invertebrate species and has both the emperor moth, large heath butterfly and the green hairstreak butterfly. Tiger beetles are often seen scurrying along the sandy paths. Adder, slow worm and common lizard have all been recorded on the site. There are the remains of old millstone quarrying on the site including partially cut out stones. The Harbottle moor SSSI is not affected by the proposals contained within the plan. Through the planting of an element of open woodland (see appendix 2) at the boundary with the moorland the aim is to both visually mitigate the transition from forest to moorland and provide an intermediate woodland edge habitat ideal for species such as Black grouse. The other SSSI sites are noted for their ancient semi-natural woodland (ASNW), and the plan proposes to maintain the area of ASNW, plus extend the area of native broadleaf woodland adjacent to these areas. Where practical this will be achieved slowly through continuous cover management, or through clearfelling and restocking where appropriate.

Heritage

Two Scheduled sites of archaeological interest, the bronze age Campville Cairn (smr 20950) and a prehistoric cross dyke Campville Dyke (smr 20951) cutting off the promontory formed by the confluence of the Dove Crag and Holystone Burns. Other none scheduled sites of archaeological interest within the plan area are the route of a former roman road, and the remains of Romano British Farmsteads. Artefacts have also been found within the forest (stone arrow, axe and hammer) and there is a report of a Priest's Bastle having been located in West wood.

Landscape, Topography and Soils



Harbottle and Holystone lies between approximately 135 and 350 metres above sea level and in terms of landscape the forest sits within the transitional zone of the more intimate landscape of mixed agricultural use on the lower land to the east to the more expansive open moor associated with the MOD Otterburn training area to the West. This transitional location is highlighted by the forest's location at a pinch point between three landscape character areas as described by Natural England (Northumberland Sandstone Hills, Cheviot Fringe, Border Moors and Forests). The typography is generally of an East facing slope incised by the Holystone burn, containing the Yardhope Oak Wood, and the North West facing ridge of West wood. The forest fits well into this mixed transitional landscape as viewed from the low-lying land to the east. However, at times the abrupt moorland boundary can feel intrusive when viewed from the more open moorland landscape to the west, especially the medium to short distance. Softening of the forest edge at this boundary has therefore been an aim of the plan and some planting of a more transitional mixed low density forest has taken place since the last plan revision.

The soils, a complex mixture are dominated by peaty surface water gleys and podzolic ironpan soils. Site stability as measured by Wind Hazard Class[2] reflects the changes with altitude and soil type, with class 5 sites dominating the more exposed areas, whereas on less exposed sites the hazard class falls to as low as 1 (see wind hazard class maps). The relative stability of these lower slopes does present opportunities to manage crops under continuous cover silvicultural systems. The majority of the crops have not yet reached the age of economic maturity though a significant proportion of the crop will reach it over the coming decade. At higher elevations windthrow is a limiting factor on rotation length and some sporadic windblow has started within crops on less stable sites.

The wood is a little lacking in structural and internal diversity but this is improving as the programme of felling and replanting progresses. Close up external viewpoints and internal landscapes are important.

Biodiversity

In addition to the designated areas a number of other sites of conservation interest are located within the plan area, ranging from habitat types to the location of specific species. Where appropriate these are noted on the plan.

Some benefit will follow from the programme of felling and regeneration, in the form of greater diversity in tree ages and woodland structure. Opportunities to retain some areas beyond their economic optimum would further add to age diversity and biological interest. Care should be exercised during operational planning to recognise and protect any micro sites, which are of floristic or other value.

[2] Wind hazard is measured on a scale of 1 to 6 with 1 being the most stable. Windhazard class 6 site would normally be considered too unstable to grow trees

Communities and recreation

It is Forestry Commission policy to promote quiet, 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. The woodland is accessible via a variety of public rights of way and the eastern part of the wood is designated as 'Access Land' under Section 16 of the Countryside Rights of Way Act 2000.

Harbottle and Holystone, though not heavily used for recreation are an important resource for the local community and visitors to the area. Two car parks are located within the forest with one waymarked walk associated with the Holystone car park to Lady's Well, located just off the Forestry Commission estate. Lady's Well, located adjacent to the route of a roman road is a stone water tank fed by a natural spring (possibly dating back to Roman times) which has been completely rebuilt at least once since the roman period. In West Wood the car park provides an access point to the bridleway leading to the Drake stone, Northumberland's largest isolated boulder, and Harbottle Lake.

Sporting rights are held by the Forestry Commission and there is no intention at present that they should be let.

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 taken by Forestry Commission rangers.

Larch in the UK is currently being effect by the disease *Phytophthora ramorum.* This is a notifiable disease that is generally fatal to the species once infected. As Harbottle and Holystone lie within the lowest risk zone for infection and there have been no outbreaks in the county the planting of larch has not been excluded from the plan, though this will be kept under review.

Access and roading

Access for timber harvesting is generally good although most internal tracks are shared with informal walking routes. There are no plans for further forest road development.

Part 2 Analysis and Design Concept

The factors outlined below present various opportunities and issues which guide the design concepts for the woodland.

Factor	Opportunities	Issues
Soils	Soils further east are generally better which provides potential for wider species diversity and management regimes.	Localised waterlogged areas– may be better suited to MB (willow, alder) or open space. Localised upland sphagnum bog along western upper boundary would be better managed as open ground.
Continuous Cover Forestry (CCF)	Consider identifying a core area of long term retention to retain structure and provide a stable habitat Wider conversion to CCF would provide greater opportunity for species diversity, climate change mitigation and improved long term resilience.	Species diversity only achievable by under planting of shade tolerant species. Protection from deer crucial to successful establishment.
Biodiversity	Link open and MB habitats through open woodland planting along upper forest margin will benefit species such as black grouse	
Access/Roading	Good links to approved timber haulage routes in the county. Freehold – potential to expand levels of public access if desired.	Internal network of tracks share forwarder access routes.
Harvesting	Thinning opportunities where low wind hazard classification and crops appear to be stable on good soils. Scale and shape of current coupes appropriate. Opportunity for CCF management.	Some crops beyond economic maturity. Increased risk of windthrow. Two 2012-2016 coupes not felled – these and adjacent coupes will need to be re-scheduled. Clearfell system provides limited opportunity to diversify the range of conifer species being limited predominantly to pines.
Pests and disease	Low risk zone for P. Ramorum, larch is still an appropriate species.	
Future Species	Potential for species diversity e.g. WRC, DF, ESF, GF, NF, RSQ and JCR. Climate change mitigation	Under clearfell system species choice limited to light demanding species i.e. pines which will limit diversity.
Current species	Restocking delivered through the period of the last plan is performing well.	Areas of mature Western Hemlock beginning to regenerate which is not a desirable future component.

Design Concepts

The design concept is a means of précising spatially the main influencing factors driving the felling and restocking proposals, highlighting instances or principles that need to be appropriately reflected. Main issues raised are:

1. Ancient semi-natural woodland (ASNW) and plantations on ancient woodland sites (PAWs): Look to maintain the area of ASNW and expand native broadleaf adjacent to these areas where practical through intimate Continuous Cover Management.

2. Continuous Cover Management: Extend the areas allocated for continuous cover management on the lower lying and more stable sites in order to form a continuous link with the mixed agricultural, hedgerow and forest landscape to the east.

3. Moorland boundaries: These can at times look harsh in the medium to short view. Look to mitigate this transition but at a scale that is also appropriate in the longer view. An area of low density transitional planting has taken place and once fully established will be managed through minimum intervention.

Appraisal

The felling and restocking plans presented represent a balance between the multi-objective management of the forest, balancing the conservation, landscape and recreation values within the constraints of both the current status of windthrow and future silvicultural management.

During the review clearfelling dates have generally been altered due to the onset of windblow and current assessment of crop stability. It should be noted that the majority of the remaining first rotation crops are beyond the age of economic maturity, and therefore of increased risk of windthrow. Two coupes previously scheduled for felling in the 2012- 2016 period were not felled. These and adjacent coupes have therefore needed to be rescheduled.

The area proposed for management under continuous cover silviculture has been slightly extended. The conversion of the PAWs of Yardhope oaks to native species through selective thinning has been initiated during the plan period together with some enrichment planting. The establishment of native woodland planting along the Dove crag Burn has also increased the area of native species in association with North Wood PAWs.

Restocking proposals (indicated on the restocking plan) will aim to mitigate the harsh moorland boundary of the earlier planting, increase the open area, extend the area of existing native broadleaves and introduce a broadleaf element into the wider forest. Where broadleaf species are planted the species will be chosen on the basis of their naturalness to the site (National Vegetation Classification).

Restocking plans are indicative and the proposals will need to be refined once sites are clear felled and ground features, that are difficult to assess under tree cover, become clear. The species percentages (of net-planted area) indicated with the indicative restocking plan are presented in Part 3. Pine, which is well suited to the site conditions, will be a major component of the 'other conifer' category within the forest. However, with the introduction of open space, mixed woodland and edge treatment the overall proportion of pine will decrease. Additionally some areas currently planted with Lodgepole pine which have proved unsuitable due to exposure will not be repeated for a second rotation.

Larch in the UK is currently being effect by the disease *Phytophthora ramorum.* This is a notifiable disease that is generally fatal to the species once infected. As Harbottle and Holystone lie within the lowest risk zone for infection and there have been no outbreaks in the county the planting of larch has not been excluded from the plan, though this will be kept under review.

Harbottle and Holystone delivers key national policy priorities of People, Nature and Economy. The woodland is important for local people and has potential for further recreational development if desirable. The ecological value is developing and important features of significance are being protected and expanded. Open woodland establishment along the upper forest margin will provide both landscape enhancement and potential black grouse habitat in the future. There is capacity to extend the rotation length in some more stable areas which will improve internal age and structural diversity and provides potential for species diversity both for productive conifers and locally native broadleaved regeneration.

Part 3 Objectives and Proposals

The following objectives are based on FEE National Policy and the NEFD Strategic Plan:

<table>
<tr><th>Forest District Strategic Goal</th><th>How Forest Plan delivers</th></tr>
<tr><td>ECONOMIC
<u>Wood Production</u> –

'we will maximise 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'</td><td>
<table>
<tr><th colspan="2">Felling</th></tr>
<tr><td>Period</td><td>Area (ha)</td></tr>
<tr><td>2017-2021</td><td>19</td></tr>
<tr><td>2022-2026</td><td>9</td></tr>
<tr><td>2027 -2031</td><td>17</td></tr>
<tr><td>2032 - 2036</td><td>5</td></tr>
<tr><td>>2036</td><td>9</td></tr>
<tr><td>Constant cover[3]</td><td>32</td></tr>
<tr><td>Minimum Intervention[4]</td><td>9</td></tr>
</table>
Projected volumes per period are shown in Part 6 Forest Plan Outcomes
<table>
<tr><th colspan="2">Restocking species percentage 25 years hence</th></tr>
<tr><td>Species</td><td>%</td></tr>
<tr><td>Larch</td><td>3</td></tr>
<tr><td>Sitka spruce</td><td>6</td></tr>
<tr><td>Other conifer</td><td>31</td></tr>
<tr><td>Broadleaf</td><td>14</td></tr>
<tr><td>Mixed Woodland[5]</td><td>14</td></tr>
<tr><td>Open woodland</td><td>6</td></tr>
<tr><td>Internal open space</td><td>21</td></tr>
<tr><td>Increase in external open space</td><td>5</td></tr>
<tr><td colspan="2">Future species percentages in the medium (25 years) and long term shown in Part 6.</td></tr>
</table>
</td></tr>
</table>

[3] Continuous cover describes areas proposed for management through a system of continuous thinning and small scale clearfelling, aiming to achieve a continuous woodland cover developing a mixed age composition

[4] Minimum Intervention – area proposed for management where silvicultural interventions will not be aimed purely towards timber production. These areas also form candidate sites for natural reserves under the UKWAS standard.

[5] Mixed woodland is generally associated with areas proposed for management under continuous cover. It is an aim to increase the proportion of native broadleaf species in these areas notably in areas associated with ancient replanted woodland sites.

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'*	Environmental improvements will be delivered through forest restructuring achieved through forest planning, thinning and restocking and open space management. The area proposed to be managed under CCF has been extended and will provide opportunity for wider species and age structure. Post felling opportunities to restructure and soften the northern edge of West Wood through species choice and planting density will be taken to mitigate the contrast between forest and moorland. The conversion of the PAWs of Yardhope oaks to native species through selective thinning has been initiated during the plan period together with some enrichment planting. The establishment of native woodland planting along the Dove crag Burn has also increased the area of native species in association with North Wood PAWs. Establish low density scrub habitat on forest margin to provide habitat for potential re-colonisation/introduction of black grouse. This habitat will also provide benefit for other species and ameliorate the harsh boundary between forest and open moor.
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…'*	Local value of woodlands is recognised. Retention of woodland area as CCF/LTR to retain mature structure and continuity of woodland cover. Maintain local access arrangements. Manage the car park and adjacent area maintaining a wooded feel

Appendix 1- Mixed Woodland

Within areas identified as mixed woodland, management will normally be under a constant cover silvicultural system. Therefore in order to avoid excess management costs, the ability to work with nature is required, accepting where appropriate, species which naturally establish following a regeneration felling. The majority of species within each area will normally be the same as the current dominant species, except on ancient woodland sites where transition to native broadleaves is the management aim. However, within all mixed woodland maintenance of pure species will not be an aim and a component of both pioneer and climax native hardwood species will be encouraged to develop. As with all constant cover silvicultural systems a rapid change in species composition is not practical without a major intervention. This would not normally be the intention, the objective being the maintenance of a constant forest cover. Any change within these blocks will therefore normally be progressive and relatively slow but opportunities to diversify species by underplanting will be considered where appropriate.

Appendix 2 - Open woodland

The aim is to establish an open woodland type to ameliorate the abrupt habitat change from the open moor to the high forest by establishing a low and varied density planting, establishing 300 – 400 trees per ha. The species mix will be based on the proportions in Table 2.

Table 2	
Species	**Approx. %**
Birch (Betula Pubescens)	40 -50
Willow (Salix aurita)	15 - 25
Rowan (Sorbus aucuparia)	10 -20
Aspen (populus tremula)[1]	5 -10
Alder (Alnus glutinosa) [1]	5 -10
Scots pine (Pinus silvestris)	5 -10
Juniper (Juniperus comunis)[2]	0 - 5
1 To be planted in localised areas where suitable ground conditions exist. 2 Planted only within its known distribution.	

The aim is to establish an unevenly spaced tree cover from groups to sparse singletons. There are no formal prescriptions for the most suitable means of establishing this form of woodland. However, being woodland edge habitat, fencing (especially deer fencing) needs to be avoided where practical to do so. It is therefore proposed that initially areas identified to be restocked as open woodland will be planted at a density higher than the final required stocking, with the prescribed sporadic form of woodland developing through natural losses. Natural regeneration will also be accepted where is does not establish to a level which could diminish the habitat value.

Part 4 Monitoring plan

The objectives identified in Part 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 felling plan
Sustainable economic regeneration	Successful establishment of restocking and underplanting.	Restocking assessments
NATURE		
Restructuring	Delivery of Forest Plan felling/thinning and restocking proposals	Five yearly Forest Plan review
PEOPLE		
Visual enhancement to visitors.	Establishment of mixed woodland and ongoing restructuring of the plantations.	Five year Forest Plan review.

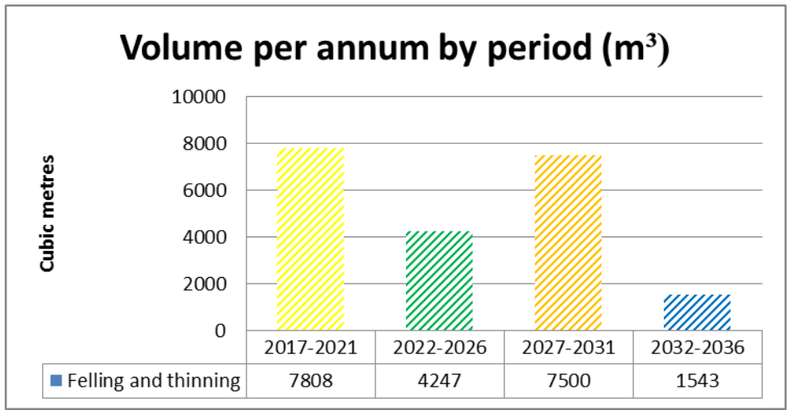
Part 5 Forest Plan Maps

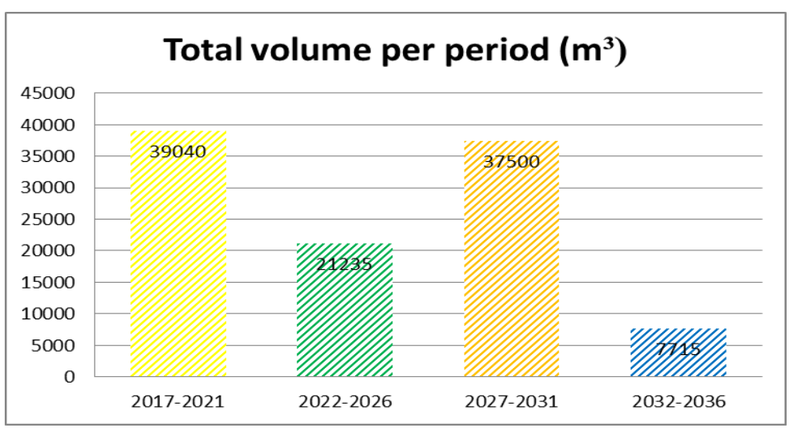
- Location – 1:50,000 scale showing location in context of other woodland in the local area
- Current Species – species composition in 2016
- Planting Year – indicating the age class distribution across the woodland
- Yield Class – indicating the productivity of the current species distribution
- Landform – indicating topography of the woodland and dominant lines of force
- Wind Hazard - windiness represented by Wind Hazard Class (WHC)
- Conservation and Heritage – statutory and non-statutory conservation and heritage features
- Recreation – recreation facilities and public rights of way
- Design Concepts – representation of major opportunities to be considered in the final design concept
- Felling Proposals – showing felling periods and areas of Continuous Cover Management
- Future Species – representing the broad design concepts with long term vision for future species and open habitat

Part 6 Forest Plan Outcomes

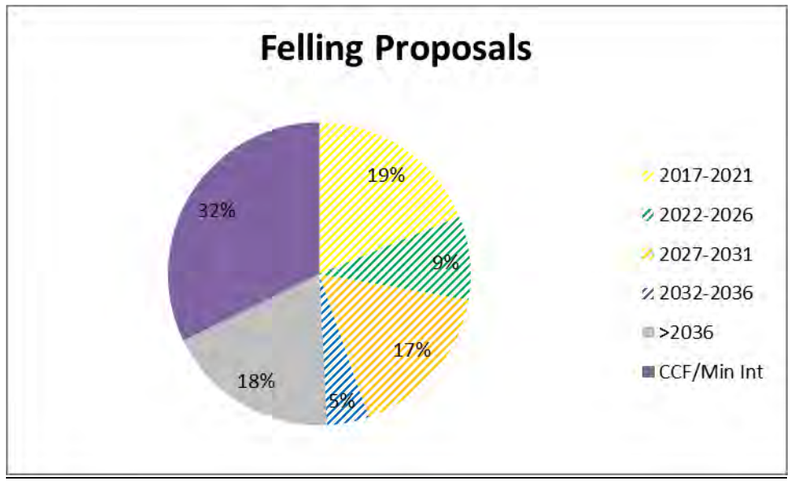
Timber production

Average timber production per annum and total volume per period is shown below.



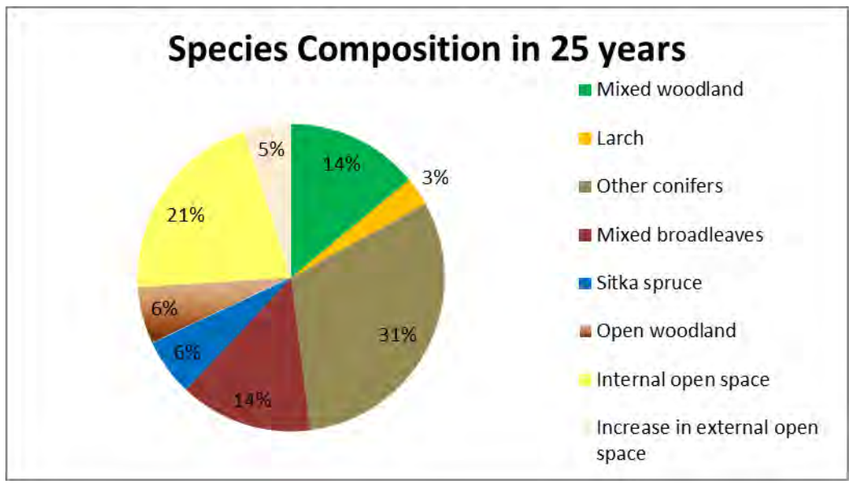


The percentage of the forested area being felled during each five year period is indicated below:

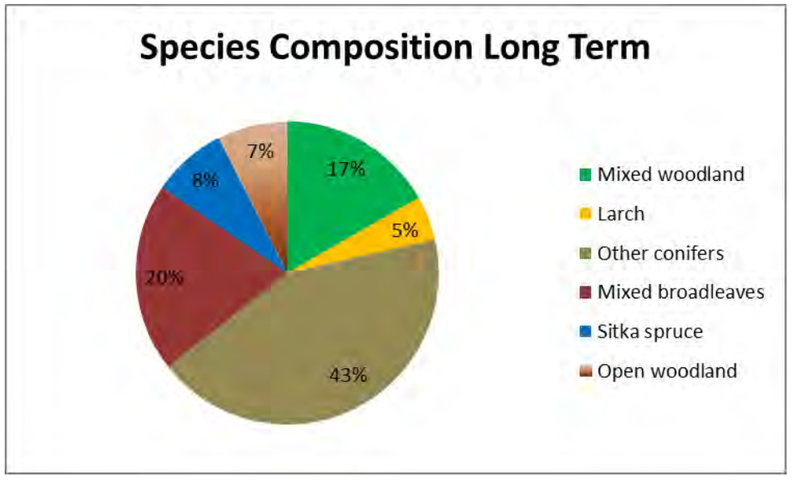


Future Species

The future species composition 25 years hence and for the long term proposals are shown in the charts below:



The combined percentage of future species composition shown below exceeds the minimum requirements for UKWAS and UKFS (65% primary species (MC (incorporating SP)), 20% secondary species (SS) and 5% mixed broadleaves).



<u>Productivity</u>

The productive potential 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:

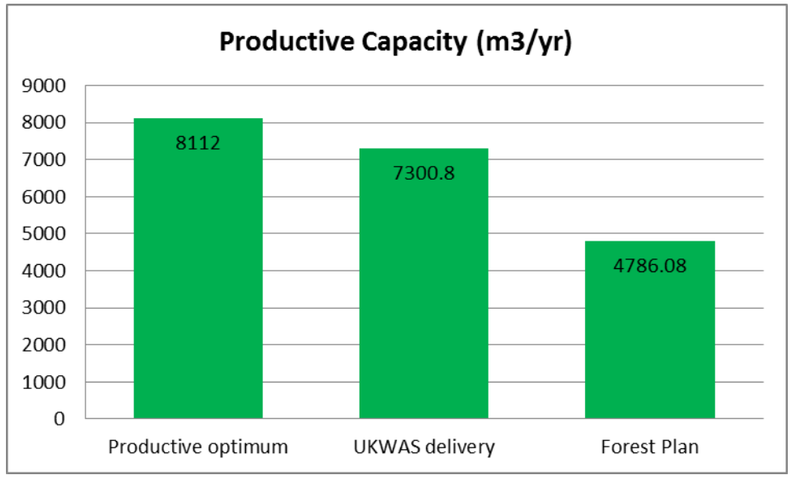
The graph shows the relative productive capacity (m^3/year) of the forest based on average yield class as a comparison between the following scenarios;

1. Productive optimum – productive capacity assuming that the total productive area is planted with the optimum commercial species suited to the site (i.e. Mixed conifer (Scots pine) YC 12).

2. UKWAS delivery – productive capacity achievable through minimum UKWAS compliance with a species percentage mix comprising 65% primary species (SP YC 12), 20% secondary species (SS YC 14), 5% broadleaved (YC 4) and 10% open space.

3. Forest Plan – productive capacity based on the percentage species mix from this plan. The significant difference between minimum UKWAS delivery and the proposed Forest Plan is mostly a reflection of the amount of ASNW and PAW's woodland in the plan and significant areas of permanent open habitat.

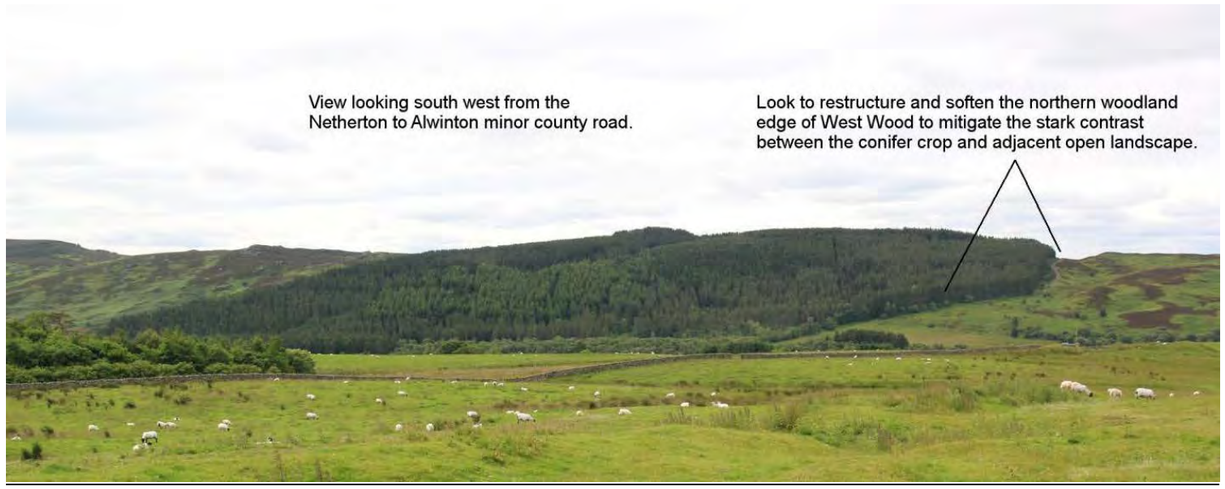
Note: The difference between UKWAS delivery and Forest Plan also includes requirements such as riparian corridors, landscape, ancient woodland, heritage etc. which require going beyond the minimum species composition and open space percentages to achieve UKFS.



<u>Landscape</u>

As there are no significant changes from the previous plan a full landscape appraisal has not been completed for this revision. Through the program of felling and restocking and continuous cover management particular emphasis is made on mitigating geometric shapes, symmetry and distinct parallel lines in the landscape through species choice, and planting density. This will be achieved through the establishment of 'open woodland' along the upper south west boundary of the forest, as indicated on the restocking proposals map.

Elsewhere opportunities will be taken post felling to diversify the species mix where the forest meets the moorland edge. For example, the northern edge of West Wood, which when viewed from the Netherton to Alwinton minor road stands out within the landscape as a geometric shape in contrast to the adjacent moorland as indicated below.



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.

The Harbottle and Holystone 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; 43% other conifers, 8% Sitka spruce, 5% larch and 20% mixed broadleaved, exceeds UKFS minimum requirements. Long term structure will improve through linking of permanent broadleaved and open habitats through the establishment of open woodland along the upper margins (7%).
Silvicultural	32% of the area will be managed using Continuous cover principles including Long Term Retention (LTR) of areas of broadleaved woodland. This will improve species and age class diversity.
Biodiversity	Priority habitats and species are considered during the planning phase. Ecological connectivity achieved by extending and linking areas of native broadleaved woodland and open space will be enhanced ensuring that the area is managed with conservation and biodiversity as a major objective.
Climate change	Long Term Retention and Continuous Cover areas will minimise soil disturbance. Forest resilience will be enhanced over time through greater species diversity, particularly establishment of alternative conifer species, 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.
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	Water quality will be protected through adherence to Forest and Water guidelines as a minimum during harvesting and forest management operations. Areas managed as CCF/Minimum Intervention will protect forest soils from erosion.

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 providing long term sustainability and greater resilience to potential pests and disease. Substantial areas of mixed conifer/broadleaved woodland will have been established managed through low impact systems, and the range of other broadleaved species will have been extended through the expansion of areas of Ancient Semi-Natural Woodland.

Timber production will continue according to the planned felling programme together with regular thinning of areas of continuous cover. Opportunities for the introduction of a broader range of commercial species, which will also contribute toward climate change mitigation will provide long term sustainability and the development of broadleaves away from designated areas could offer potential for alternative markets such as local woodfuel.

Wider species and age class diversity will enhance public benefit by improving the internal and external attractiveness of the woodland.

Forestry Commission
England

North England Forest District

Harbottle & Holystone

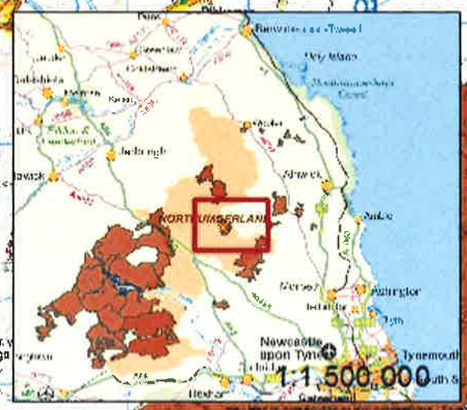
Location map

1:50,000

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

Legend

- Harbottle and Holystone
- Forestry Commission Woodland



Forestry Commission
England
North England Forest District

Harbottle & Holystone

Current Species

1:20,000

Sitka spruce
Larch
Other conifer
Broadleaves

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Forestry Commission
England

North England Forest District

Harbottle & Holystone

Planting Year

PLYR
- Pre1950
- 1950 to 1959
- 1960 to 1969
- 1970 to 1979
- 1980 to 1989
- 1990 to 1999
- 2000 to 2009
- 2000 to date

N

1:20,000

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FSC

PEFC

Forestry Commission
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North England Forest District

Harbottle & Holystone

Yield Class

N

1:20,000

YLDC
- 18 plus
- 16 to 14
- 10 to 12
- 6 to 8
- Less than 6

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FSC

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England

North England Forest District

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Landform

1:20,000

N

- Major Ridges and Spurs
- Minor Ridge and Spurs
- Major Hollows and Gullies
- Minor Hollows and Gullies

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Windhazard Class

1:20,000

N

WHCL
2
3
4
5

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FSC

PEFC

Forestry Commission England

North England Forest District

Harbottle & Holystone

Conservation

1:20,000

N

- Heritage Features Point
- Scheduled Monument
- Ancient & Semi-Natural Woodland
- Ancient Replanted Woodland
- SSSI
- Conservation Site Point
- Conservation Site Polygon
- Blocks

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FSC www.fsc.org

PEFC

Forestry Commission England

North England Forest District

Harbottle & Holystone

N

1:18,000

Recreation Facilities

Harbottle

Harbottle Wood

Holystone

- Public Bridleway
- Public Footpath
- NNPA Boundary
- Access Land (Section 16 CROW Act 2000)

FOREST FURNITURE

- Picnic Table

SIGNAGE

- Primary

Recreation Routes

WALKING

- Moderate

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Forestry Commission England

North England Forest District

Harbottle & Holystone

Design Concept

Internal ownership boundary
Potential to integrate with woodland neighbours

Continuos Cover
Look to extend the area of forest managed under continuous cover silviculture.

Black Grouse
At restocking develope transition habitat from high forest to moorland through more varied edge planting, providing suitable habitat for forest edge species such as Black grouse.

Seal burn

Maintain open space on Seal burn for conservation of rare plant species.

North wood

Maintain the area of ancient semi natural woodland and look to extend the area of native broadleaves. Species composition and silvicultural history necessitates clearfelling and restocking

Carpark

Look to maintain a wooded feel to the carpark and adjacent area.

Black Grouse

Restocking now developing the transition habitat from high forest to moorland through more varied edge planting, providing suitable habitat for forest edge species such as Black

Yardhope Oaks
Maintain the area of ancient semi natural woodland and through thinning extend the area surrounding native broadleaf woodland

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Forestry Commission
England
North England Forest District

Harbottle & Holystone

Paul Clavey
16/9/16

Felling Proposals

1:20,000

FELLING_YEAR
- 2017 - 2021
- 2022 - 2026
- 2027 -2031
- 2032 - 2036
- >2036
- CCF/Min Int
- Blocks

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Forestry Commission
England
North England Forest District

Harbottle & Holystone

Restocking Proposals

Paul Clavey
16/9/16

1:20,000

N

Larch
Broadleaf
Other conifer
Sitka spruce
Mixed woodland
Open woodland

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FSC

PEFC