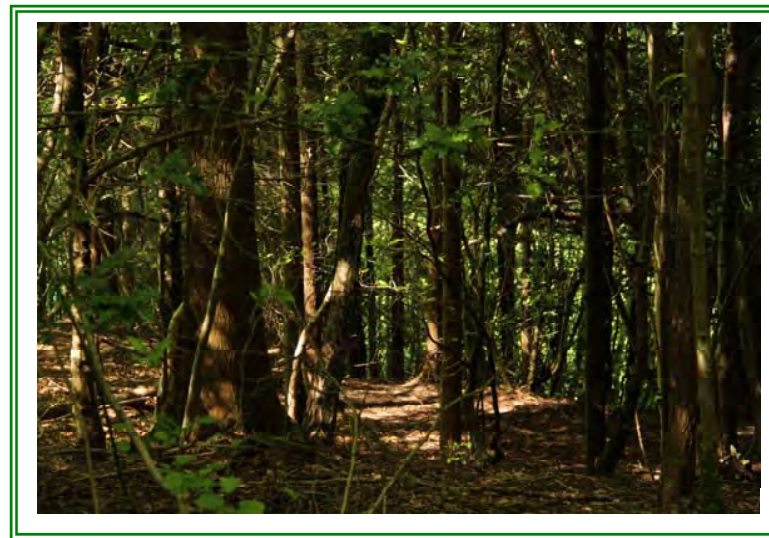


# Barrowfield Forest Design Plan.

August 2012



Planning context

This plan sets out the Forestry Commission’s plans for Barrowfield Wood. It covers the period 2012 to 2026 in outline, with detailed proposals for the first ten years and replaces the previous plan approved in November 2011.

Introduction

Barrowfield lies on the edge of the Lake District National Park, approximately four kilometres to the southwest of Kendal. It is situated in the Lythe Valley near to the village of Brigsteer. The Forestry Commission’s holding extends to 140 hectares, a small portion of which lies within the Scout Scar and Underbarrow Site of Special Scientific Interest (SSSI).

The area was acquired in 1964 under a leasehold agreement with the Bagot family, and comprises three distinct areas known as Barrowfield Wood, Honeybee Wood and Barrowfield Lot. Of these, Barrowfield Wood and Honeybee wood

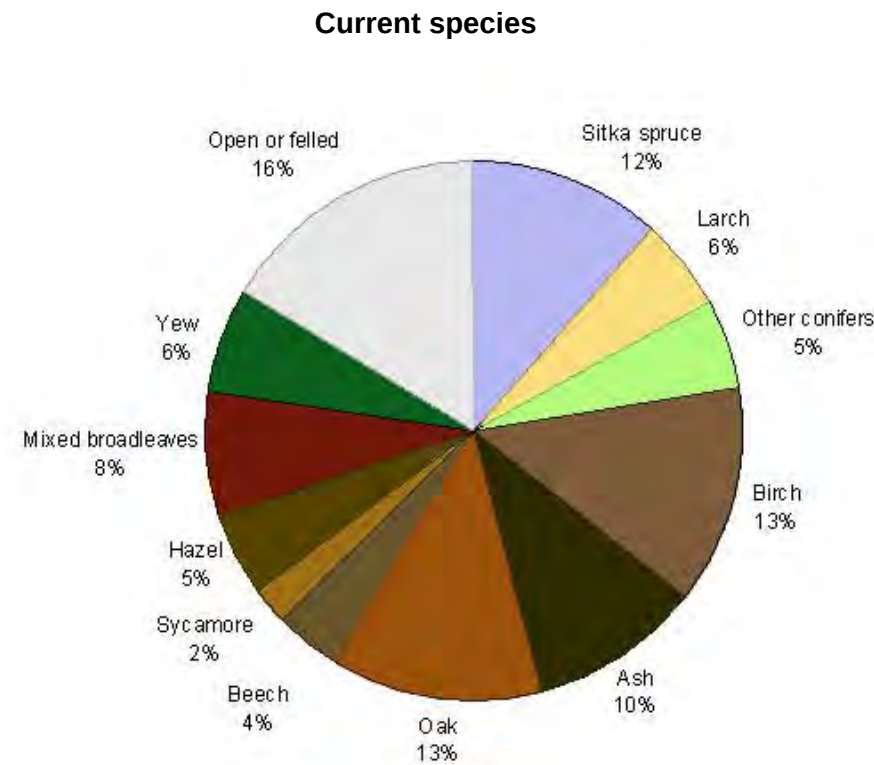
Analysis of previous plan

The previous plan included six main objectives. These are summarised in the table below, together with an assessment of how well these objectives were achieved

| Objective                                                                                                                                                                          | Achieved? | Comment                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Complete all work in accordance with UKWAS, The England Forestry Strategy and the District Strategic Plan                                                                          | Yes       | Work has been carried out in close accordance with the approved design plan, and to a high standard.                                                                                                                                                              |
| To keep Barrowfield self-supporting financially through giving rise to marketable parcels of timber generating an economic return                                                  | Yes       | Recent felling coupes have generated an economic return                                                                                                                                                                                                           |
| To create and maintain diversity in the woodland structure and species pattern through the regeneration and planting of locally native species and the creation of more open space | Yes       | Small scale work in the continuous cover area, as well as larger felling coupes in Barrowfield Lot have improved diversity of age class and species. Natural regeneration has been enriched with desirable species to increase diversity and future productivity. |
| To improve the integration of woodland with other land use and landscape features                                                                                                  | Yes       | Breaking up and removal of the large conifer block in Barrowfield Lot has reduced the visual impact of this wood, which now sits much less intrusively in the wider landscape                                                                                     |
| To protect and enhance features of geological or archaeological interest and species/habitats of biological interest                                                               | Yes       |                                                                                                                                                                                                                                                                   |
| To achieve other goals and commitments identified in our SSSI management plan                                                                                                      | Yes       |                                                                                                                                                                                                                                                                   |

Part 1. Background Information

Current Woodland composition



Barrowfield now consists of 23% commercial conifers and 77% broadleaves, open ground or yew. In 2004, these figures were 32% and 68% respectively and the difference reflects the amount of native woodland restoration that has taken place since then.

The broadleaved component includes a diverse range of locally native woodland types, principally northern calcareous hazel-ash woodland. This is present as high forest, neglected coppice and scrub. Notable species of local and national importance include small-leaved lime and yew.



The age class structure shows that the majority of the conifers left in Barrowfield are of an age at which they could be felled economically. The younger age class (post 2000) represents natural regeneration rather than planting

### Designated areas

6.1 ha of the woodland (4.3% of the area) is included within the Scout and Cunswick Scars SSSI. This is a large SSSI, 370.5 ha in total, with the FC holding accounting for less than 2% of the total area.

The woodland crosses the border of the Lake District National Park, with just the southern section (12% of the area) outside the park.

### Soils and Topography

Barrowfield rises from close to sea level up to a height of 220 metres on the eastern flank of the Lyth valley. It is orientated north to south along a steep west-facing limestone escarpment and the low ground immediately below this. Slopes are extreme on the upper edge of Honeybee wood and Barrowfield wood, both of which run along the escarpment and there are steep craggy sections within these woods. The topography is much gentler in Barrowfield Lot, below the escarpment.

This difference in topography is reflected in the soils, which are dominated by fertile brown earths in Barrowfield Lot and calcareous brown earths in Honeybee and Barrowfield Woods, giving way to more skeletal soils and scree on the steeper slopes.

### Landscape

The whole woodland is prominent in the wider landscape and is seen from a range of viewpoints. The views from the southwest, in the Lythe Valley, are particularly important. Shape and scale of topography have therefore been important influences over previous plans and continue to be so.

The overall shape and scale of the woodland in the wider landscape is acceptable. The remaining conifer of Barrowfield Lot is intrusive in a valley that is dominated by broadleaf woodland, although much less so than at the time the last plan was prepared

Internal landscape is important along paths and tracks. This has been greatly enhanced by recent felling and regeneration.

### Biodiversity

Much of the biodiversity interest lies in the variety of limestone habitats and the ancient semi-natural woodland, both of which support a wide range of flora and fauna.

The areas within the SSSI were surveyed in 1995 and a wide variety of calcicole vegetation was recorded, including Carlina thistle *Carlina vulgaris*, Hoary and common rock rose *Helianthemum canum* and *H. chamaecistus* and blue moor grass *Sesleria caerulea*. Shrubs included yew, juniper and dwarfed blackthorn. A variety of fern species was also noted, including the Limestone polypody, *Thelypteris robertiana*. A full list of species recorded in this survey is included in the appendix.

The limestone areas are also important for some very distinctive butterfly species, including Meadow Brown, Small Heath, High Brown Fritillary and Common Blue.

The designated sites of ancient woodland, both ASNW (ancient semi-natural woodland) and PAWS (plantations on an ancient woodland site) are concentrated on Honeybee Wood and Barrowfield Wood. These areas include ash, holly, hawthorn, whitebeam, yew, rowan as well as other native species. There has been an ongoing process of PAWS restoration in this area, which has been very successful. Restored PAWS areas have regenerated with native tree species and characteristic woodland flora. Remaining pockets of conifer are now concentrated on the least accessible, steeper slopes.

Numerous features give added interest throughout the woodland notably: streams, wet areas, rock outcrops and veteran trees.

### Communities and recreation

Recreation interest centres on use by walkers of public rights of way and the forest road. A small-scale pheasant shoot is exercised mostly in Barrowfield and Honeybee Woods. The woodland is also used for occasional orienteering events.

The conditions of the FC lease do not allow for an unlimited “right to roam”. There is, however, good provision of public rights of way, and these are well used, mainly by local people.

### Heritage

There are no scheduled monuments in Barrowfield, but forty-three separate historical features have been recorded, ranging from walls and quarries to old buildings, kilns and an earth bank. These features tend to be concentrated on the steeper slopes and are associated with the ancient woodland sites.

Timber potential

The productive capacity and management of the site is closely related to the soil type, topography and access.

The brown earth soil found in Barrowfield Lot on the western half of the site has enabled the achievement of yield classes of 22 for Sitka spruce, 14 for larches and 16 for Douglas fir; all exhibiting good form for timber..

The cleared areas are being encouraged to regenerate naturally and have an emerging cover of broadleaf and conifer tree species. The site conditions would support good growth of a wide range of productive conifer and broadleaved species in future rotations

Honeybee and Barrowfield Woods have a much less productive calcareous brown earth, skeletal in places and are much less suitable for timber production. These woodland areas are listed as Ancient Semi Natural Woodland. During the late 1990s most of the planted Western red cedar and beech was removed by thinning from this zone to enable restoration of semi-natural woodland. Some relic groups of red cedar remain to be tackled on less accessible terraces and slopes.

Pests and diseases

The Great Spruce Bark Beetle, *Dendroctonus micans* has been present on Sitka spruce in the wood since the early 1990s. There was at least one release of the predator *Rhizophagous grandis* soon after the discovery of the pest. Mortality so far has been low, at less than 5%, and this is concentrated in small groups of trees. Monitoring of the site has shown that *Rhizophagous grandis* continues to be present on site, so no further releases are planned.

At the time of writing, there is no evidence of the pathogen, *Phytophthora ramorum* in Barrowfield but the situation will be kept under review with continued monitoring of the remaining larch stands.

Access and roading

Though the local public roads are narrow, access into Barrowfield Lot, including all of the remaining conifer crops, is good. Access into Honeybee Wood is also reasonable, but in the northern section, Barrowfield Wood , this is restricted to unmade tracks, only suitable for tractors, quad bikes and other small scale machinery.

The most problematic access is into the small isolated block opposite Scar Foot Farm. Access onto the public road here is severely limited, and any timber extraction will have to be accompanied by road closures and access improvement.

Part 2. Analysis and Concept

The factors outlined in Part 1 present some opportunities and issues. These are summarised below.

| Factor            | Opportunities                                                                                                                                                                                                                                                  | Issues                                                                                                                                                                                                                                 |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Landscape         | Good work has been carried out in restoring this previously coniferised wood and integrating it better with the surrounding landscape. The pattern of coupe felling in Barrowfield Lot has laid the foundation for further felling without landscaping issues. | Remnant conifer patches on the upper slopes still present a minor landscaping issue.                                                                                                                                                   |
| Ancient Woodlands | Past restoration of the ancient woodland sites now gives opportunities for traditional management of these areas.                                                                                                                                              | The areas left to restore are going to be difficult to reach, and expensive to manage.                                                                                                                                                 |
| Access            | The good road in Barrowfield Lot and, to a lesser extent in Honeybee Wood, gives options for continued management for timber, even if on a smaller scale than previously.                                                                                      | Access into much of the PAWS and ASNW area is restricted to small scale machinery, which is more appropriate to these site types.<br><br>The isolated block at Scar Foot will present severe problems of access and traffic management |
| SSSI              | The patches of SSSI on FC land are in good condition and need no major interventions in the near future.                                                                                                                                                       | Only a small percentage of the SSSI is under FC management, so our actions have little effect on its overall status.<br><br>There is some larch regeneration in SSSI unit 11 which has the potential to damage the limestone grassland |
| Timber            | Barrowfield Lot remains a good site for the production of quality broadleaves, as well as fuelwood. Enrichment planting of the natural regeneration has ensured the presence of potentially valuable species in the next rotation.                             | Honeybee and Barrowfield Wood are less suited to future timber production, but small scale firewood production from thinnings and coppicing should still be possible.<br>Harvesting of the remaining cedar will be uneconomic.         |
| Recreation        | The current public access arrangements allow for reasonable public use                                                                                                                                                                                         | The conditions of the lease mean that increased public access is unlikely to be feasible                                                                                                                                               |
| Biodiversity      | The restored PAWS sites offer great potential for enhancement of biodiversity, through continued non-native removal, coppicing and glade and ride enhancement                                                                                                  |                                                                                                                                                                                                                                        |

Analysis of all the above factors, combined with the recent history of management, shows that the previous policy of conversion to native broadleaved woodland is still highly appropriate to the site. Conversion is now at an advanced stage, and the broad concept for this resubmission is to continue the processes of coupe felling in Barrowfield Lot and PAWS restoration in Barrowfield and Honeybee Woods.

As the regeneration in Barrowfield Lot develops into a closed canopy woodland, specific objectives for this area will have to be developed. These could range from minimal intervention woodland, coppice management, firewood production or broadleaved timber production. Whilst the public road network causes restrictions on large scale harvesting operations, the accessibility and fertility of this site mean that smaller scale working will still be a viable option after all the commercial conifers have been removed.

Part 3. Objectives

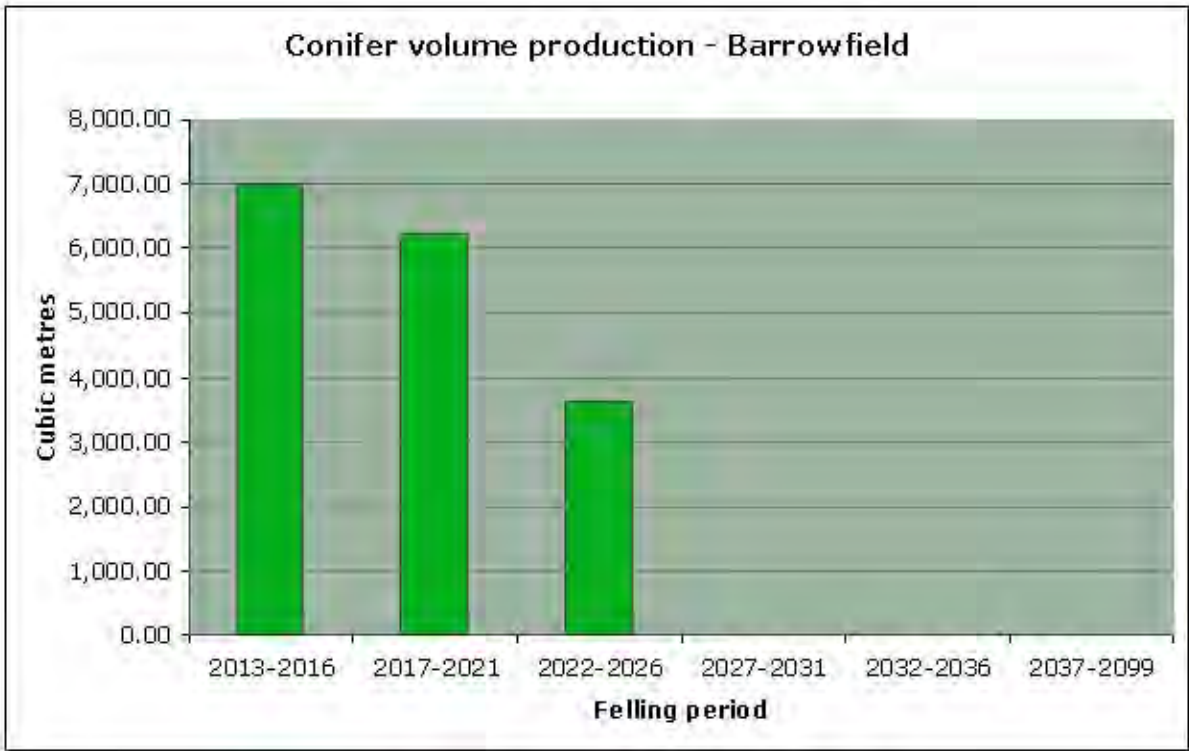
The following objectives have been identified for Barrowfield:

- PAWS restoration, and enhancement of the semi-natural woodland
- Efficient and economic harvesting of the remaining conifer stands
- Conversion of all areas currently under conifers to broadleaved woodland
- Protection and, where necessary, enhancement of the SSSI features
- Protection of the archaeological features
- Maintenance of the woodland as a productive site for broadleaved timber after all the conifers have been removed

Part 4. Proposals

Felling and regeneration

In the first felling period, two coupes are proposed in Barrowfield Lot, of 6.0 ha and 8.1 ha. In the second five year period, another two coupes, of 4.2 ha and 6.3 ha will be felled. This leaves only a further 10.5 ha of conifer plantation in Barrowfield Lot, which will be felled in the third period (beyond the approval date of this plan).



Honeybee and Barrowfield Woods have been scheduled for continuous cover. Work here will focus on continued removal of the remaining pockets of conifers, on thinning the broadleaves to favour locally native species, and on habitat improvement through coppicing and glade and ride management.

The small block at Scar Foot, while forming part of the continuous cover zone, will only receive one intervention during the plan period, because of the access issue. The intention is to remove all the conifers here in one operation, thin the broadleaves as appropriate, and leave the wood to regenerate.

Regeneration of all sites will be primarily by natural regeneration. As there is an objective of continued broadleaved timber production in Barrowfield Lot, the regeneration here will be supplemented by planting of productive species such as oak and ash. Supplementary planting may also be used to restore locally important species, such as small-leaved lime, whitebeam and yew in the PAWS restoration areas.

Thinning

Where it is feasible to do so, broadleaved crops will be thinned. During the lifetime of this plan, such thinnings are only expected to be of firewood quality. In selected areas, this thinning will have the potential to produce future crops of higher quality broadleaved timber.

PAWS restoration

Up to the present, it has been possible to restore PAWS sites in Barrowfield by means of thinning and small group felling. The current plan, however, proposes restoring the PAWS area in Barrowfield Lot by clearfelling rather than by thinning. Although not in line with current best practice, this is being proposed for silvicultural and ecological reasons. The current tree cover is mature Western hemlock with little or no remnant vegetation beneath the dense canopy and there is a strong likelihood that this species would start to regenerate profusely if thinned. So far, there is little or no conifer regeneration on the site and removing the mature trees in one coupe will minimise the risk of this appearing.

Longer term management proposals

Although the current plan, like its predecessors, focuses on the phased removal of conifers and their replacement by native broadleaves, longer term management of the woodland will include production of broadleaved timber, although at a lower level. This is likely to include quality saw-logs, firewood and coppice products.

Part 5. Monitoring plan

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

| Objective                                                                                                        | Criteria for success                                                                                                                                                                                                                                                                 | Assessment                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| PAWS restoration, and enhancement of the semi-natural woodland                                                   | Progress is made against clearing the remaining conifers from the PAWS sites. It is not essential that this process is completed within any particular timescale.<br>Conifers are cleared from Scar Foot.                                                                            | Changes to the sub-compartment database. 5 and 10 yearly reviews.                                                                                |
| Efficient and economic harvesting of the remaining conifer stands                                                | Coupes are harvested in close accordance with the design plan                                                                                                                                                                                                                        | 5 year review and ten year resubmission                                                                                                          |
| Conversion of all areas currently under conifers to broadleaved woodland                                         | Some conifer regeneration can be expected, but the species mix on all clear-felled and regenerated sites should be largely broadleaved                                                                                                                                               | Regeneration surveys, and changes to the sub-compartment database.<br>Assessment at the 5 year review.                                           |
| Protection and, where necessary, enhancement of the SSSI features                                                | The portion of the SSSI within the FC's ownership remains in good condition, as defined in the SSSI management plan. Larch regeneration has been removed from SSSI unit 11.                                                                                                          | Site visits, particularly during and after forest operations in neighbouring woodland.<br>Assessment as part of the SSSI plan resubmission.      |
| Protection of the archaeological features                                                                        | Good site planning ensures that archaeological sites are not damaged during forest operations.                                                                                                                                                                                       | Operational site plans show the location of archaeological sites.<br>visits show no damage to                                                    |
| Maintenance of the woodland as a productive site for broadleaved timber after all the conifers have been removed | Little production can be expected from Barrowfield Lot in this plan period. The species mix contains species such as oak and ash, which could have value as future timber trees.<br>Thinnings of firewood and other woodland products are marketed in Honeybee and Barrowfield Wood. | Changes to the SCDB show the presence of commercial species amongst the regeneration.<br><br>Thinning records for Honeybee and Barrowfield Wood. |



# Forestry Commission North England

## Barrowfield Location

Date: 11th May 2012

Scale: 1:25,000

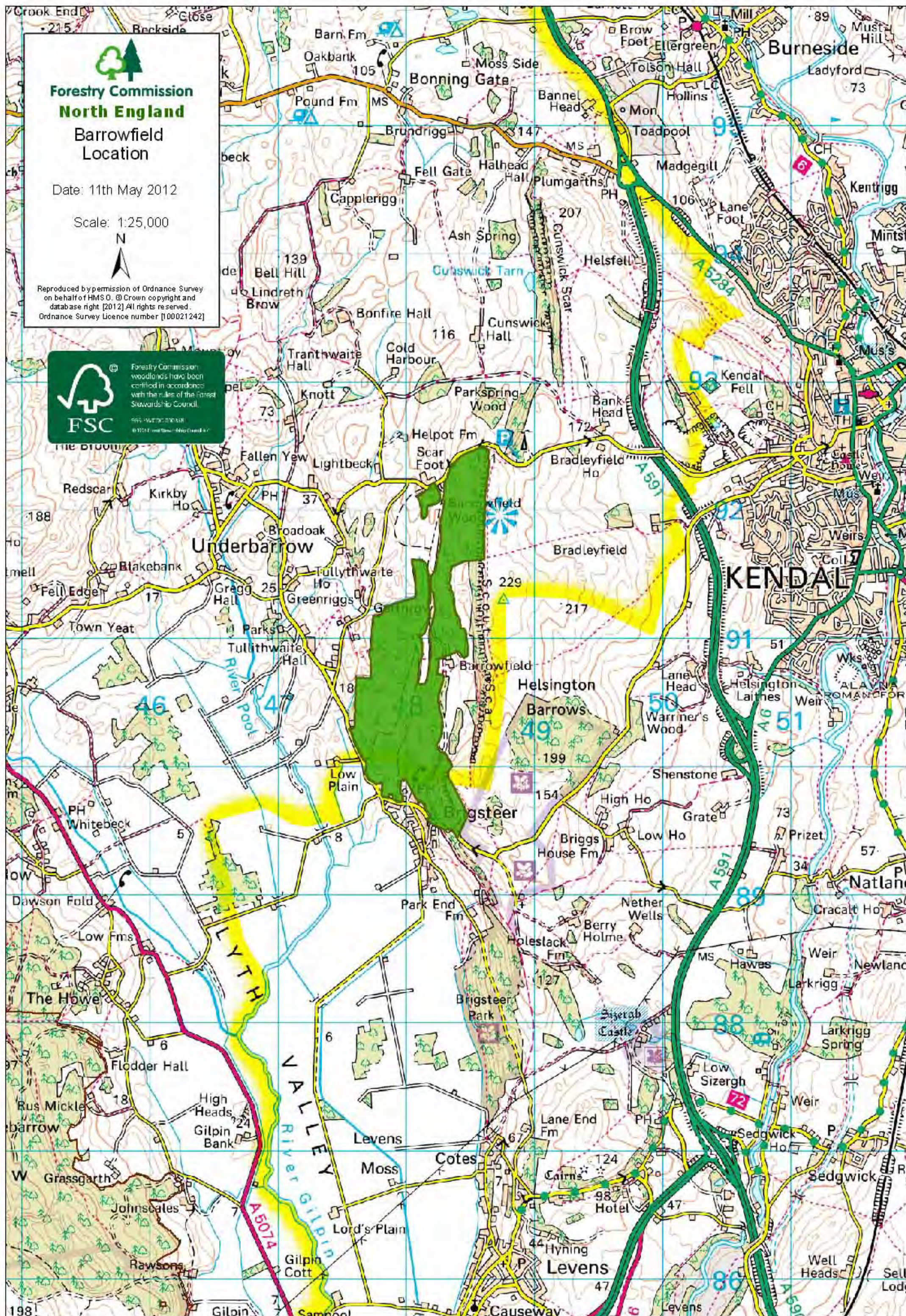


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**Forestry Commission  
North England**

## Barrowfield Soils and topography

Date: 16th May 2012  
Scale: 1:10,000



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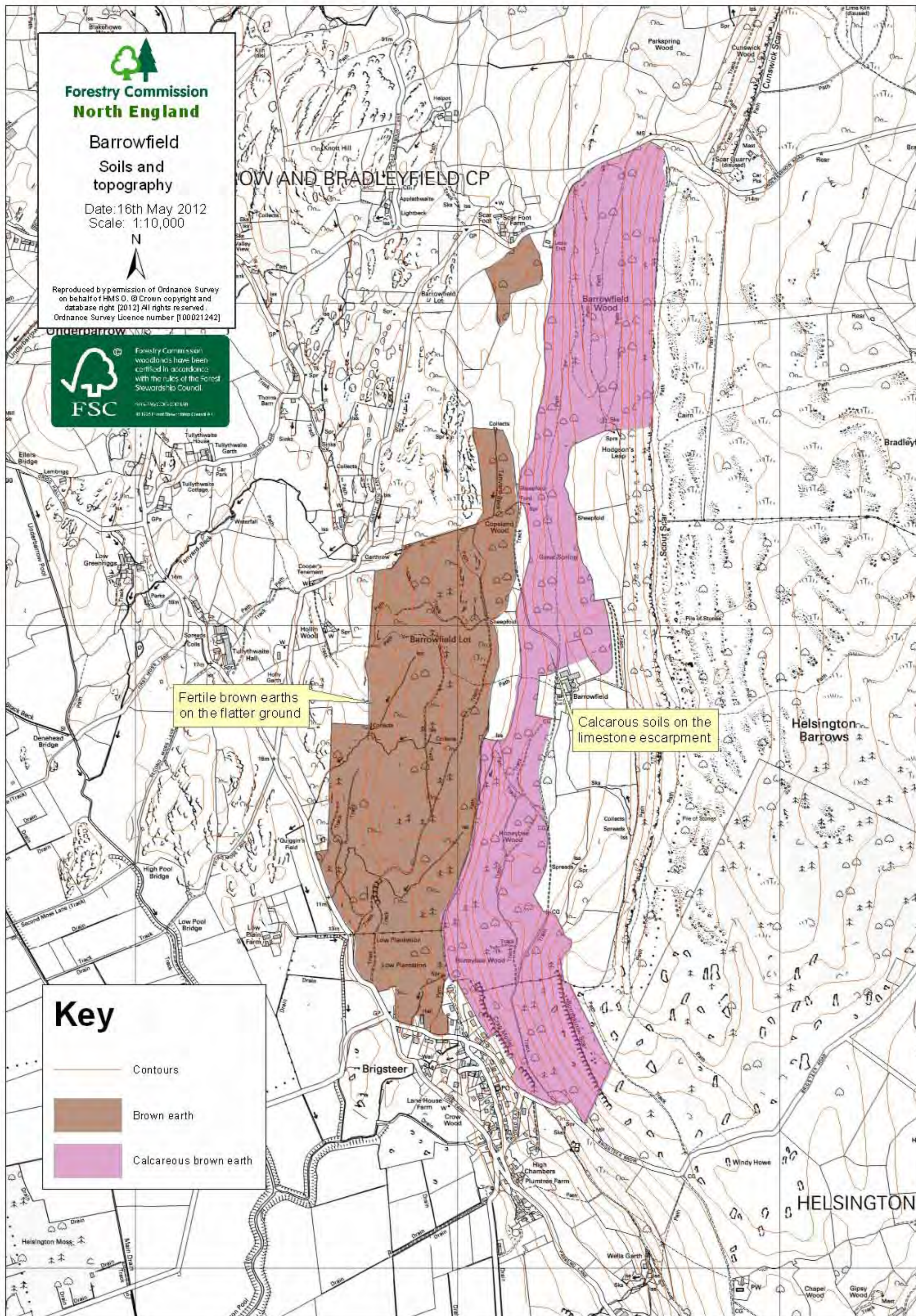
OW AND BRADLEYFIELD CP

Fertile brown earths  
on the flatter ground

Calcareous soils on the  
limestone escarpment

## Key

- Contours
- Brown earth
- Calcareous brown earth



- |                                                                                       |                   |
|---------------------------------------------------------------------------------------|-------------------|
|  | Open              |
|  | Spruce            |
|  | Larch             |
|  | Pine              |
|  | Yew               |
|  | Other conifers    |
|  | Oak               |
|  | Beech             |
|  | Other broadleaves |



**Forestry Commission  
North England**

**Barrowfield**

**Roads and access**

Date: 28th August 2012

Scale: 1:10,000



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## Key

Public right of way

## Forest roads

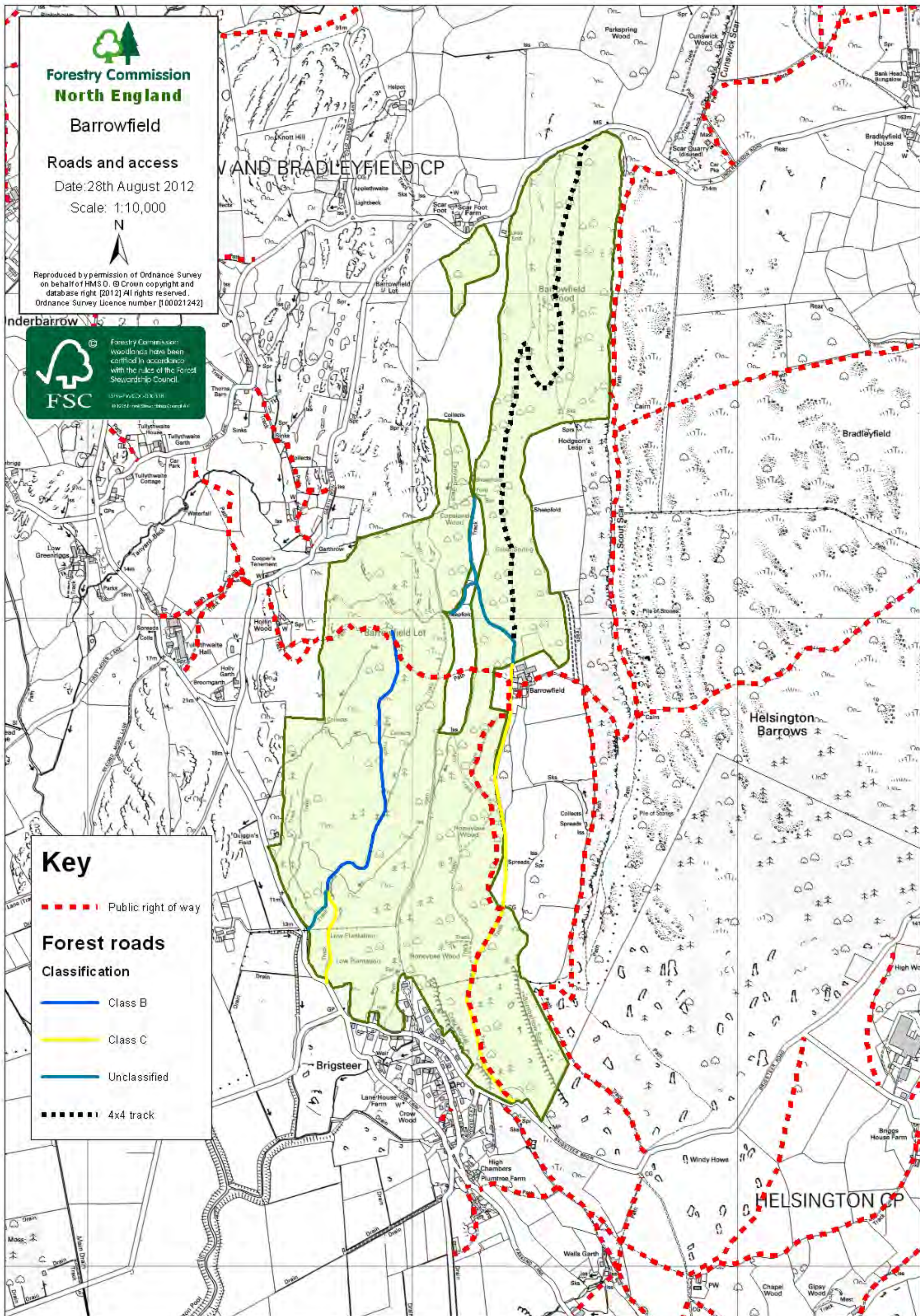
### Classification

Class B

Class C

Unclassified

4x4 track





**Forestry Commission  
North England**

**Barrowfield**

**Aerial photograph**

Date: 31st August 2012

Scale: 1:10,000



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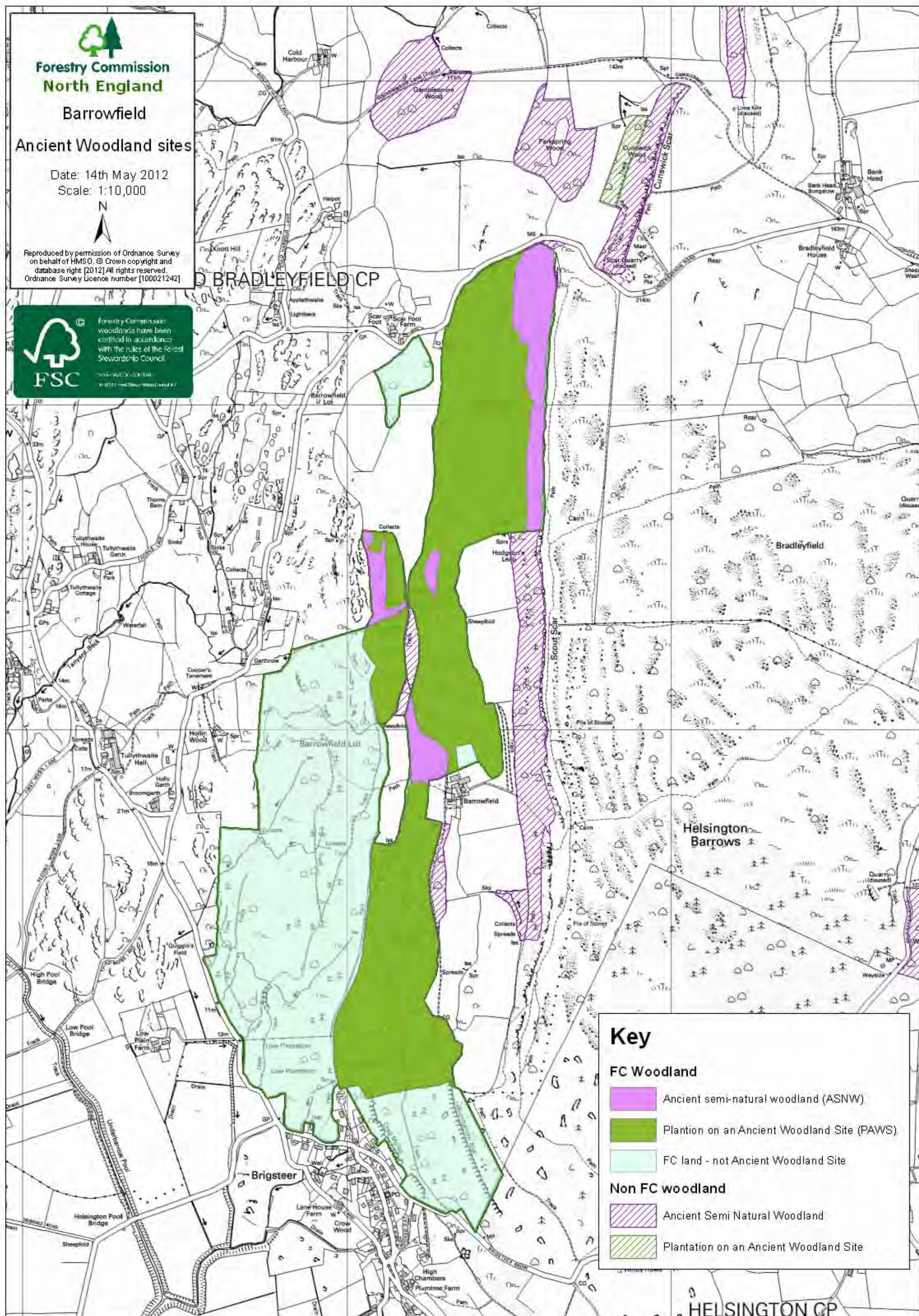


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## Key

===== Forest roads

----- Track



## Key

### FC Woodland

-  Ancient semi-natural woodland (ASNW)
-  Plantation on an Ancient Woodland Site (PAWS)
-  FC land - not Ancient Woodland Site

### Non FC woodland

-  Ancient Semi Natural Woodland
-  Plantation on an Ancient Woodland Site



**Forestry Commission  
North England**

**Barrowfield**

**SSSI map**

Date: 14th May 2012

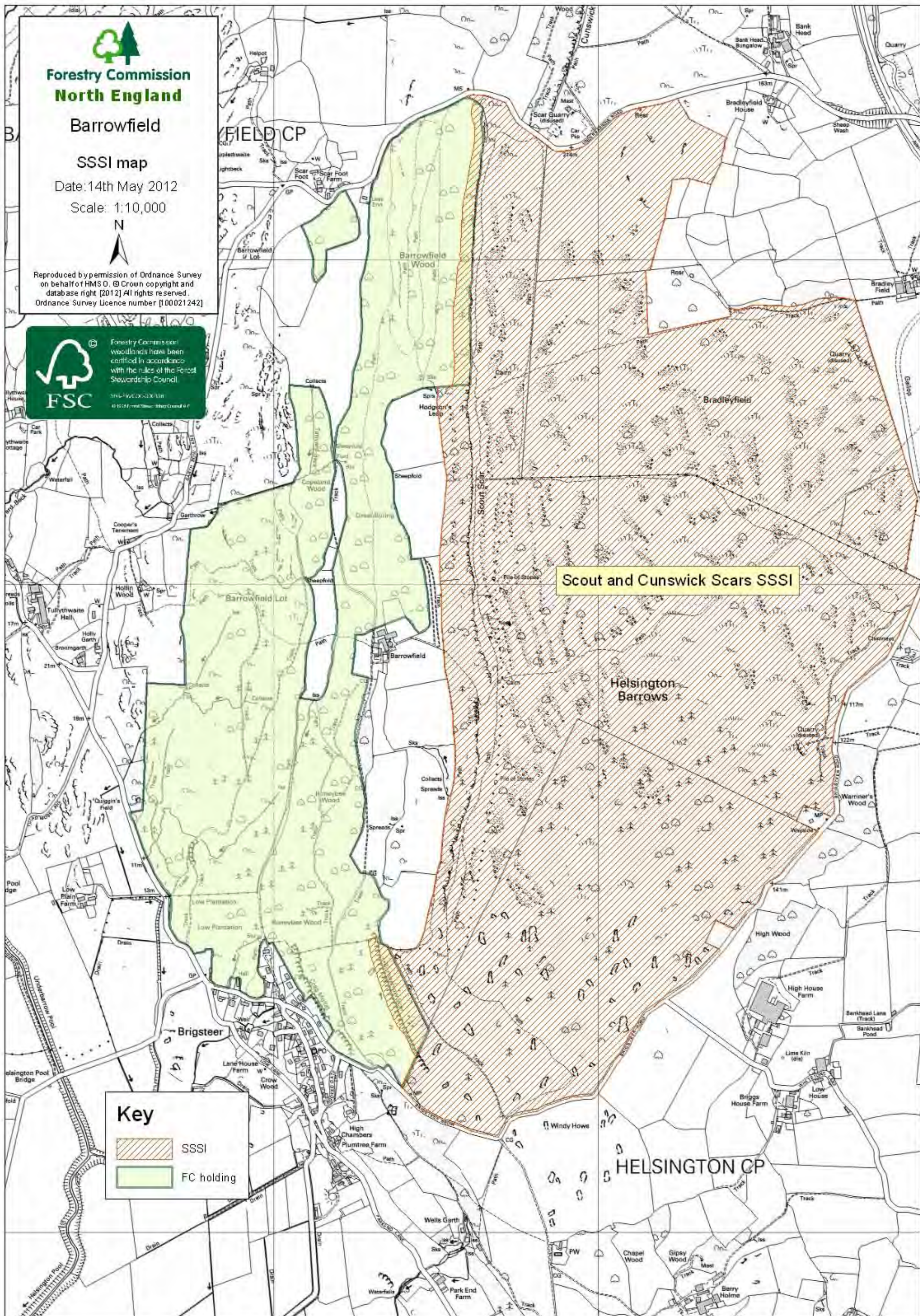
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**Forestry Commission  
North England**

**Barrowfield**

**Concept map**

Date: 16th June 2012

Scale: 1:10,000



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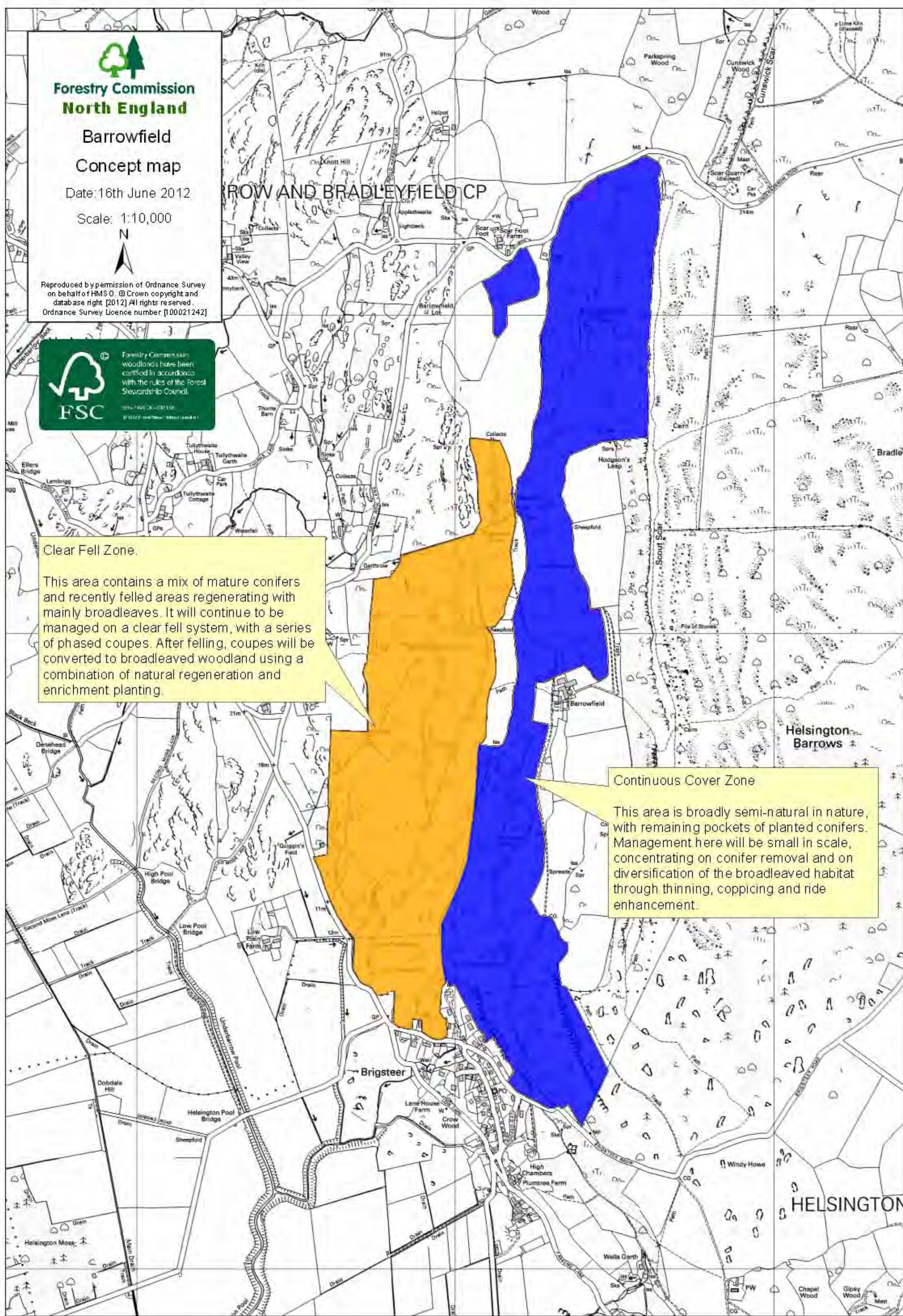
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#### Clear Fell Zone.

This area contains a mix of mature conifers and recently felled areas regenerating with mainly broadleaves. It will continue to be managed on a clear fell system, with a series of phased coupes. After felling, coupes will be converted to broadleaved woodland using a combination of natural regeneration and enrichment planting.

#### Continuous Cover Zone

This area is broadly semi-natural in nature, with remaining pockets of planted conifers. Management here will be small in scale, concentrating on conifer removal and on diversification of the broadleaved habitat through thinning, coppicing and ride enhancement.





**Forestry Commission  
North England**

**Barrowfield  
Felling Map**

Scale: 1:10,000

Date: 2nd October 2012

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Combination of selective  
and group felling to remove  
conifer species.

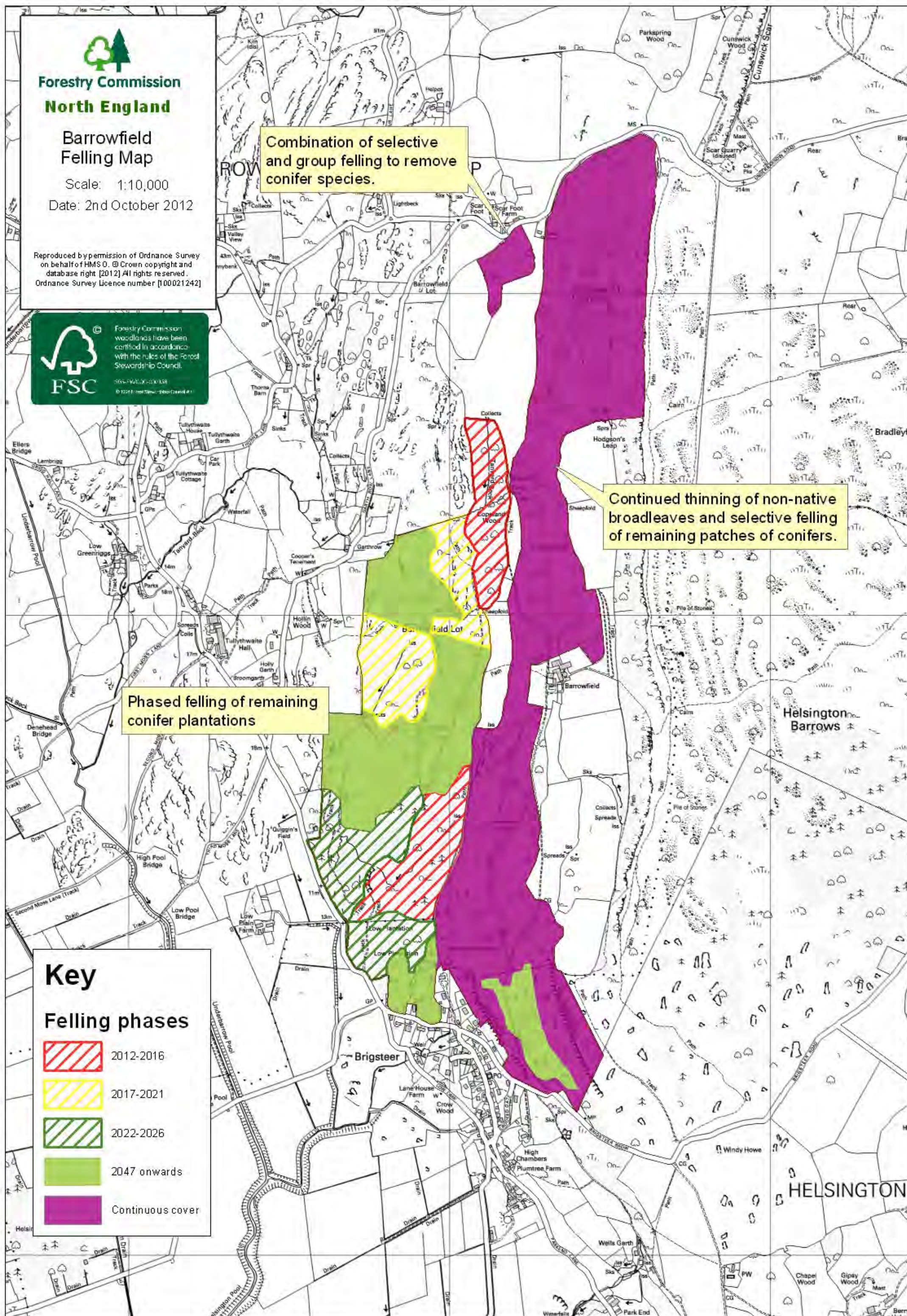
Continued thinning of non-native  
broadleaves and selective felling  
of remaining patches of conifers.

Phased felling of remaining  
conifer plantations

**Key**

**Felling phases**

-  2012-2016
-  2017-2021
-  2022-2026
-  2047 onwards
-  Continuous cover





**Forestry Commission**  
**North England**

## Barrowfield Future Habitats Map

Scale: 1:10,000

Date: 16th August 2012

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Expansion of mixed broadleaved  
woodland, including oak, ash and lime

Maintenance of open ground  
habitats on upper slopes

Calcareous slopes dominated by  
upland ash/hazel woodland,  
with enhancement and expansion of  
yew woodland.

Gradual replacement of beech by  
locally native species, although beech will  
probably be a permanent component in  
the long term.

### Key

- Upland ash/hazel woodland
- Mixed broadleaved woodland
- Open ground habitats
- Yew woodland

ND BRADLEYFIELD CP

HELSEINGTON CP