Planning context

This plan sets out the Forestry Commission's plans for Dalton Crags for the period 2012 to 2021. It replaces the plan previously approved by the Forest Authority on 16th November 2001 and extended until 1st February 2013.

Introduction

Dalton Crags is situated approximately 2 kilometres east of the M6 motorway, near to the village of Burton-in Kendal. The woodland area amounts to 119 hectares and occupies a south-west facing slope on the edge of the Hutton Roof massif.

The woodland was acquired from Dalton Hall Estate in 1947 on a 999 year lease. The estate retained the sporting rights.

Prior to acquisition by the Forestry Commission, the site had a history of being managed for conifer production, with a crop of European larch, Scots pine and Norway spruce being felled during the Second World War and the years that followed. The native broadleaves were also felled at that time and regenerated as coppice.

In 1946 Storth Wood (the main woodland area) contained coppice of all ages and species but chiefly naturally regenerated sycamore and ash saplings. It also contained about 10% conifers (mostly Scots pine but with an occasional European larch) in small groups or scattered throughout. There were also numerous short boled and heavily branched ash, sycamore and beech. An area of very recently planted larch was present near the western boundary. Extensive outcrops of rock and pavement were present on the site, and 27.5 ha was described as unplantable on account of this. Blue moor grass was present on the bare land, whilst there was a thick covering of bracken on the deeper soils.

Following acquisition, the site was managed for timber production and was used as a trial area for the afforestation of limestone soils. Grazing was discontinued in 1951 and there was a notable increase of birch and heather. Most of the areas of grass and bracken were planted with a 2:1 mix of beech and Scots pine. Some areas of grassland were planted with Corsican pine and Scots pine with trial plantings of Macedonian pine, Serbian spruce, Japanese cedar, Western hemlock, Lawson cypress and Leyland cypress. Elsewhere on the site, trial species included western red cedar, dawn redwood, noble fir, southern beech and common walnut. Avenues of Norway maple were planted along the ride sides and whitebeam was planted near some of the pavements. The coppice areas were thinned, some areas of ash coppice were underplanted with beech, other areas of coppice were cleared and replanted with pure beech. Experimental plantings also took place on the limestone pavements: in 1951 young sycamore with balls of soil around the roots were planted into grikes; black walnut was also established in the same manner. In 1955 trial sowings of ash seed were made directly into pavement grikes.

Recent management of the woodland has involved the removal of nurse crops, felling of conifer blocks and general thinning, which has favoured native species wherever possible.

In 2008, cattle grazing was re-introduced in an attempt to maintain open space and grassland habitats. This is low key and extensive, and is having a positive effect on the diversity of the site. Initial problems were encountered with the lack of water at the top of the hill, meaning that the cattle were spending most of the time in the woodland at the bottom of the hill rather than on the grassland at the top. This has now been resolved, and the cattle are using the whole site.

.

Analysis of previous plan

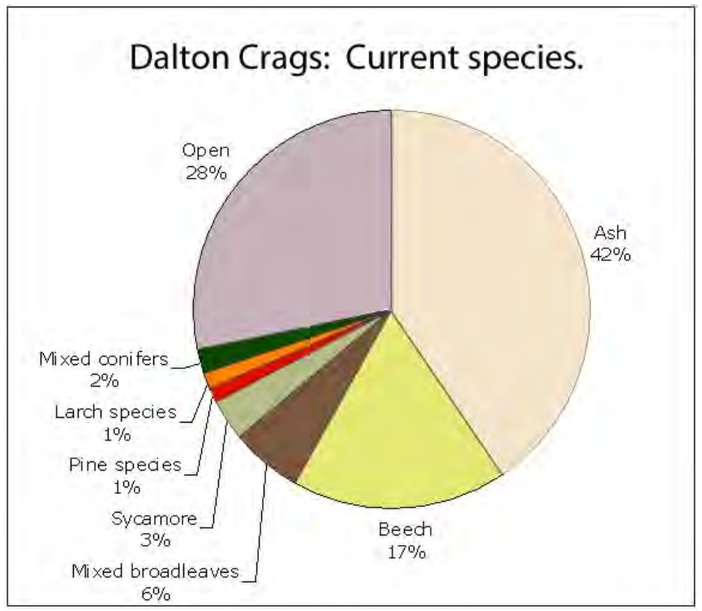
The previous plans included a number of main objectives. These are summarised in the table below, together with an assessment of how well these objectives were achieved.

.

Objective	Achieved?	Comment
To keep Dalton Crags self-supporting financially through giving rise to marketable parcels of timber generating an economic return	Yes	Timber has been harvested efficiently and economically. Once the last conifers are removed, the wood should remain capable of generating positive returns through firewood sales.
To achieve all other goals and commitments identified in our SSSI management plan	Partially	The objectives relating to expansion of calcareous grassland, restoring species richness in the woodland and maintaining the botanical interest of the limestone pavements are being met. There is no evidence yet of expansion of the yew, juniper and dwarf shrub heath communities.
To protect and enhance features of geological or archaeological interest and species/habitats of biological interest	Yes	No further damage to the limestone pavements has been recorded
To remove non-native tree species through a programme of felling and thinning	Ongoing	The conifers have largely been removed, and the focus is now on removing the beech where it is damaging ground vegetation
To further diversify the woodland structure and species pattern through the regeneration of locally native species and the creation of more open space	Yes	The introduction of cattle grazing has helped the creation and management of open space.
To improve the integration of woodland with other land use and landscape features	Yes	The expansion of open space and the removal of planted conifers has led to a better integration of the site into the surrounding landscape.
To seek to improve the educational use and value of the area through liaison with local organisations and appropriate on or off site interpretation		

Part 1. Background Information

Current Woodland composition



Landscape

Dalton Crags forms part of the Morecambe Bay Limestones Landscape Character area. This area fringes the northern and eastern edge of Morecambe Bay and is characterised by conspicuous limestone hills rising from farmland. Exposed limestone is visible on the steeper scarp slopes and on limestone pavement features, and the gentler plateaux and dip slopes are generally clothed in woodland, both broadleaved and coniferous. The plateau tops mainly consist of open common fells, with rough pasture.

Dalton Crags forms a typical part of this landscape and is fairly prominent. From the west, the woodland dominates the southern limit of Hutton Roof. In this view, the straight tree line that has developed along the northern boundary is quite prominent. From the east, the views tend be close range, or from a great distance, where the woodland only shows up as a thin band of trees.

Geology/geomorphology

Solid geology
The area of Hutton Roof Crags is of considerable geological importance for its limestone pavements and is covered by a Limestone Pavement Order. Limestone pavements are a rare habitat of international importance and are recognised as being a habitat of European priority interest under the EC Habitats Directive.

Hutton Roof, with Farleton Knott, is the finest site in Britain for the great range of structural dip and aspect, and for the outstanding relationship between morphology and glaciation.

At Dalton Crags the limestone pavements outcrop over an altitudinal range of 140 - 260m. The folded limestones dip down to the south-east but are level bedded on their north-east margin. The site displays a range of morphologies associated with the changing dip. The pavements have massive clints, some occur on more than one stratum and the pavements are “stepped” in form separated by low scars. Solution features include deep grikes, linear runnels, solution basins and the occasional centripetal drainage form. Many of the pavements have been extensively damaged in the past by removal of rockery stone.

Soils
Glacial drift is present over parts of the site. The soils tend to be shallow with a mixture of clay and grit. Where glacial drift is absent, very thin rendzina soils have developed on the edges of the pavements.

The presence of small deposits of brown silt is of particular interest, these are identified as loessic sediments and are interpreted as the wind-blown products of glacially derived sediments which accumulated in Morecambe Bay as the Lake District and Irish Sea ice wasted. The loessic soils do not contain calcium carbonate and are more acidic than the soils derived from glacial drift or weathering of the limestone bedrock. Although loessic deposits are widespread and well preserved on the limestone hills around Morecambe Bay, they are generally uncommon in Britain and are mostly confined to the south of England.

Biodiversity

Hutton Roof Crags SSSI supports a diverse range of semi-natural habitats. Within this, the Forestry Commission holding at Dalton Crags comprises a mosaic of semi-natural and planted broadleaved woodland, scrub, conifer plantation and calcareous grassland on discontinuous limestone pavement.

Much of the area is an ancient woodland site which has largely been replanted, although some areas of semi-natural woodland remain, these support the northern calcareous hazel-ash stand type. The dominant tree is ash with some oak, wild cherry and elm; there is only a small amount of hazel. There are also records of the rare wild service tree. The ground flora includes dog’s mercury, wood false brome, bramble, honeysuckle, male fern, violets, herb robert, bluebell, barren strawberry and lords and ladies. Large parts of the woodland have been replanted with non-native species including beech, sycamore, European larch, Lawson cypress and Scots pine. The ground flora is generally sparse and impoverished beneath the non-native species.

The limestone pavements form open clearings within the plantations. Mature trees occur on most pavements, the most common species being sycamore and ash with occasional beech, holly, European larch, Scots pine, wild cherry, wych elm and yew. One of the pavements supports an open woodland dominated by yew. Young trees occur on all of the pavements: sycamore and ash are the most common, but rowan and yew are also frequent. Scrub is also present with hawthorn being the most abundant species, other species include hazel, holly, juniper, buckthorn, gooseberry, common dog rose, raspberry, bramble, grey willow, elder and blackthorn. The rare Lancastrian whitebeam has also been recorded on the pavements.

The limestone pavements support a rich flora with a number of rare and uncommon species. The nationally scarce rigid buckler fern is abundant or frequent on most of the pavements, and Hutton Roof Crags is the British stronghold for this species. Other nationally scarce species include angular Solomon’s seal, mountain St John’s wort, limestone fern and blue moor-grass; uncommon species include lily of the valley, lesser meadow rue, mountain mellick and brittle bladder fern. The grikes also support many commoner species including wall rue, hart’s tongue fern, maidenhair spleenwort, male fern, hard shield fern, herb robert, dog’s mercury and wood sage.

Where thin soils overlie the limestone, calcareous grassland is present, this is dominated by the nationally scarce blue moor-grass. Grassland herbs include limestone bedstraw, lady’s bedstraw, common bird’s-foot trefoil and wild thyme with occasional cowslips and early purple orchids. Many of these grassland areas have been planted with conifers, others have been planted with broadleaved trees or have been colonised by scrub. The litter and shade produced by the trees is causing impoverishment of the flora. Dwarf shrub heath, dominated by heather or bilberry, occurs in very small clumps on pockets of loessic soils, this is often within a mosaic of calcareous grassland. Bracken is also associated with the deeper loessic soils.

The Hutton Roof Crags complex supports a diverse invertebrate fauna. The Forestry Commission holding has not been systematically surveyed for many invertebrate groups, however, it is an important site for butterflies and supports a strong colony of the nationally declining pearl-bordered fritillary; other species present include dark green fritillary and grayling. There is also an unconfirmed record of the high brown fritillary (a Red Data Book species).

Mammals which have been recorded include badger, fox, roe deer, rabbit, hare, mole, pygmy shrew and grey squirrel. Red squirrels were formerly present on the site but they have not been seen for a number of years and are now believed to have died out.

Reptiles recorded on the site include common lizard and slow worm.

Birds present include sparrowhawk, buzzard, tawny owl, green woodpecker and wood warbler.

Designations

The whole of Dalton Crags forms one unit within the Hutton Roof SSSI and SAC. It was last assessed in 2010 and its condition was graded as “unfavourable, recovering”. The site was assessed for limestone pavements, limestone grasslands and limestone woodlands and he main findings are summarised as follows:

a. Limestone pavements

The pavements met their targets for species composition. The baseline species were still present in good abundance. The vegetation was emergent and woody cover was generally within the 5-25% cover range and there was little evidence of browse except on yew. This confirms that grazing levels are appropriate for pavement. Beech and sycamore were still an issue on some pavements. Generally those further down slope. Occasionally bracken cover on pavements was too high. Agricultural weeds were not an issue.

b. Grassland

Grassland was under-grazed and often species poor. The grassland failed on its litter cover, herb-grass ratio and presence of indicator species: thyme and limestone bedstraw being the only constant.

c. Woodland

The woodland was very variable. Stands of beech were of low interest but these are being progressively removed. Natural stands had reasonable structure with understory and canopy targets met and standing and fallen deadwood present. Composition (in these stands) was within target and the ground flora rich. Regeneration was strong and met targets. The woods here have been progressively restored over the past 15 years so there is some lack of old growth and mature age-class. However this is a matter of patience rather than management change. Juniper stands were not assessed on this visit. The vascular plant assemblage passed assessment.

Generally the site is improving and the transformation of the upper margin is astounding. The grazing level could be increased. The areas which need increased grazing are generally at the top of the slope (furthest away from the water supply). This needs to be considered as there is little merit in heavily grazing the woodlands closest to the water.

In addition to the SSSI abd SAC, the whole of the woodland is covered by a Limestone Pavement Order which confers a legal duty to protect the limestone features from further damage. All damage is now considered to be historic, with no evidence of continued theft for gardens.

Communities and recreation

In 2006, an agreement was reached with the lessor to dedicate the land under the Countryside and Rights of Way (CROW) act. This formalised the existing *de facto* public access that had already developed on the site. The wood has good links to existing rights of way and access land, and is popular with walkers who use the woodland tracks to gain access to the summit plateau of Hutton Roof. There is a car park and picnic site in a disused quarry, just outside the Forestry Commission’s holding and this is used by visitors to the wood.

Heritage

There are three mounds recorded in the Historic Environment Register (HER) and these are shown on the heritage map. In addition to these, there is a lime kiln behind Russell Farm and the traces of an old summer house or folly in the middle of the wood. Neither of these last two features is recorded in the HER but they are worth preserving as historic features of the previous land use.

Access and roading

There are no roads suitable for timber wagons in the wood but there is an extensive network of tracks and rides suitable for tractors and forwarders. In previous harvesting operations, timber has been brought down to timber transfer points at the bottom of the wood

Timber potential

There is still some potentially valuable larch along the roadside but, once this has been felled, future production will almost entirely be of broadleaved timber. This is a wood with good potential for broadleaved timber production on a sustainable basis in the future. There is still a large volume of beech that can be felled and sold as firewood, together with pockets of remaining Corsican pine and Lawson cypress. This will have a positive effect on the ground flora.

Tree Health

At the time of preparing this plan, *Chalara fraxinea,* ash dieback, has been identified on a planting site within 10 km of Dalton Crags. The long term implications of this disease are not yet clear but have the potential to change both the age class structure and species composition of the woodland quite dramatically.

Part 2. Analysis and Concept

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

Factor	Opportunities	Issues
Biodiversity	Further opportunities exist to diversify the site, particularly restoration of native woodland in the beech-dominated areas	The rate of restoration will have to be balanced against the landscape effects within the wood of working large areas at once.
Geology and geomorphology	Opportunities exist to further expose some of the limestone features	Care will be needed in harvesting timber from these sites in order to avoid damage
Timber	The site is reasonably accessible and is suited to sustainable production of broadleaved timber – initially beech, and later native broadleaves	Scale of working must be large enough to be economic, but small enough not to conflict with the other objectives
Landscape	Removal of the remaining blocks of Corsican pine and Lawson cypress will improve internal views. Externally, landscape can be considered already restored.	No major landscape issues left to resolve.
Tree health		There is the possibility of significant loss of young and mature ash trees, depending on the eventual severity of the Chalara ash dieback disease. The extent of this will not be known for some time

Part 3. Objectives

1. Protect the limestone pavements and their associated geological features
2. Maintain and enhance the botanical interest of the limestone pavements
3. Continue restoration of the ancient woodland sites
4. Bring the SSSIs further towards favourable condition
5. Maintain small-scale broadleaved timber production, generating an income for the woodland

Part 4. Proposals

The site has been split into three main management zones in order to achieve the objectives outlined above.

i. Continuous cover woodland

This area will receive periodic thinning interventions. The aim will be to remove remaining pockets of beech and conifer and to allow more light to reach the forest floor. Thinning will be varied in intensity, allowing the development of open spaces, coppiced woodland and diverse canopy structures

ii. Beech and conifer clearfell zone

These areas, mainly of pure beech or Corsican pine, with some larch are less likely to respond positively to thinning, and will be felled in a series of felling coupes. Much of this zone is on the upper part of the woodland and it is anticipated that, following clear-felling, this will develop into a mosaic of open calcareous grassland, scrub and scattered trees similar to zone iii. The larch areas at the bottom of the hill will revert to broadleaved woodland and eventually become part of zone i.

iii. Open ground and scattered woodland zone

The upper slopes are where most of the reversion to calcareous grassland has already taken place. This process will continue, with more felling of pockets of beech and conifers where present. Grazing will be encouraged in this area by manipulation of the water supply. It is hoped that this area will also see an expansion of juniper, yew and broadleaved scrub. Depending on the results of monitoring, it may prove necessary to do some limited planting of these species.

Grazing will be continued and the effects monitored. The objectives are to keep a mix of species-rich calcareous grassland and scattered open woodland in the upper slopes, and a diverse mixed native woodland on the lower areas. If the current grazing regime is not achieving this, either by overgrazing the woodland or under-grazing the grassland, the policy will be reviewed.

Timber harvesting in all the zones will be carried out on an economic basis, with produce being sold, either for firewood or for more valuable uses. Over time, it will be possible to build up a higher value broadleaved resource on the site

The situation with Chalara will continue to be monitored. A national strategy is being developed and any response to dieback will be governed by this guidance. Due to the non-commercial nature of the site, and the biodiversity objectives, neither sanitation felling nor extensive replanting of alternative species are likely to be preferred options. It is to be hoped that there is enough genetic diversity in the wood for regeneration of disease-resistant stock to regenerate any areas where mature trees are killed. However, it is too early to know this, and some element of restocking with resistant ash may prove necessary in the long term.

Part 5. Monitoring plan

Objective	Criteria for success	Assessment
Protect the limestone pavements and their associated geological features	Pavement features are marked on operational plans and no damage observed following harvesting operations.	Any operational plans show limestone features, and site diaries record no damage.
Maintain and enhance the botanical interest of the limestone pavements	Baseline species (as defined in the SSSI notification) continue to be present in abundance.	Natural England assessment of the SSSI shows progress against their criteria for favourable status
Continue restoration of the ancient woodland sites	Non-native species continue to be removed, regeneration of these species is controlled and native species regenerate. Chalara ash dieback does not threaten the long term integrity of the woodland.	Sub-compartment database shows a reduction in the percentage of non-native species. Areas currently recorded as “felled” on the SCDB are re-classified to show regeneration of native species. Tree health checks show continued regeneration of ash after the disease has been identified.
Bring the SSSIs further towards favourable condition	The grassland becomes more species rich, and there is an expansion of native woodland	SCDB shows an increase in native species, and the next Natural England assessment of the SSSI shows progress against their criteria for favourable status
Maintain small-scale broadleaved timber production, generating an income for the woodland	Timber is felled and sold generating a positive income	The five year review and records of timber sales show economic harvesting operations taking place.

Forestry Commission
North England

Location map

Dalton Crags

Date: 7th September 2012
Scale: 1:50,000

N

FSC

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

Key

- Dalton Crags
- Other FC woodland

Forestry Commission
North England

Current Species

Dalton Crags

Date: 12th October 2012

Scale: 1:10,000

N

Key to species

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

Burton-in-Kendal

BURTON-IN-KENDAL CP

Hutton Roof Crags

Hutton Roof Park

Dalton Crags

Forestry Commission
North England

Contours and landform

Dalton Crags

Date: 12th October 2012

Scale: 1:10,000

N

Hutton Roof Crags

Forestry Commission
North England

SSSIs/SACs

Dalton Crags

Date: 12th October 2012
Scale: 1:11,000

N

Farleton Knott

Hutton Roof Crags

Key

SSSI and SAC

Burton-in-Kendal

BURTON-IN-KENDAL CP

Clawthorpe

Hutton Roof

Hutton Roof Park

Forestry Commission
North England

Ancient Woodland Sites
Dalton Crags

Date: 7th September 2012
Scale: 1:10,000

N

Key

- ASNW
- PAWS
- FC woodland, not PAWS or ASNW
- ASNW
- PAWS

Lawthorpe Quarry
The Rakes
Birkber
Low House
Ubercash Breast
Potslacks
Park Wood
Hutton Roof Crags
Moor End
Pickles Wood
Lancelot Clark Storth
Ploverlands
Hutton Roof Park
Cockshot Hill
Church Bank Farm
Burton-in-Kendal
Russell Farm
Dalton
Crag House
Sheepfold
Grow Trees
Home Farm
Dalton Lane
Plain Quarry
Harry Wood
Dalton Hall
Dalton Park
Henridding
Major's Nursery
Keer Wood
River Keer
Co Const & CP Bdy

Forestry Commission
North England

Access and public rights of way

Dalton Crags

Date: 12th October 2012
Scale: 1:10,000

N

Key

- CROW access land
- Public rights of way
- Dalton Crags

Burton-in-Kendal

BURTON-IN-KENDAL CP

Hutton Roof Crags

Hutton Roof Park

Forestry Commission
North England

Heritage features

Dalton Crags

Date: 23rd October 2012
Scale: 1:10,000

N

Key

Heritage Features

Mounds

Lime kiln

Dalton Crags

BURTON-IN-KENDAL CP

Burton-in-Kendal

Hutton Roof Crags

Hutton Roof Park

Uberash Roughs

Lancelot Clark Storth

Dalton Park

Keer Wood

Major's Nursery

River Keer

Forestry Commission
North England

Aerial photograph

Dalton Crags

Date: 7th September 2012
Scale: 1:5,500

N

Forestry Commission
North England

Concept map

Dalton Crags

Date: 12th October 2012

Scale: 1:10,000

N

Key

Management Zones

- Continuous cover woodland
- Beech and conifer clearfell zone
- Open ground and scattered woodland zone

These areas represent the remaining stands of pure beech and conifer.
These will be clear-felled, and converted to mixed open woodland and calcareous grassland.

This upper part of the wood is intended to be a mixture of open ground, with pockets of woodland and scattered trees. Thinning and small scale felling will increasingly open up more areas which will be kept open by grazing.

This zone will be thinned on a continuous cover basis with the aim of producing mixed native woodland incorporating a range of age classes and open space.

These remaining larch stands will be clear-felled, and converted to mixed native woodland.

NB. These zones are broadly indicative. In practice, there will be an intergrade between the continuous cover woodland and the open ground with scattered trees. Pockets of woodland and scrub will develop on the open ground. Thinning and felling practices across all zones will be used to encourage this diversity

Burton-in-Kendal

BURTON

Dalton Crags

Dalton

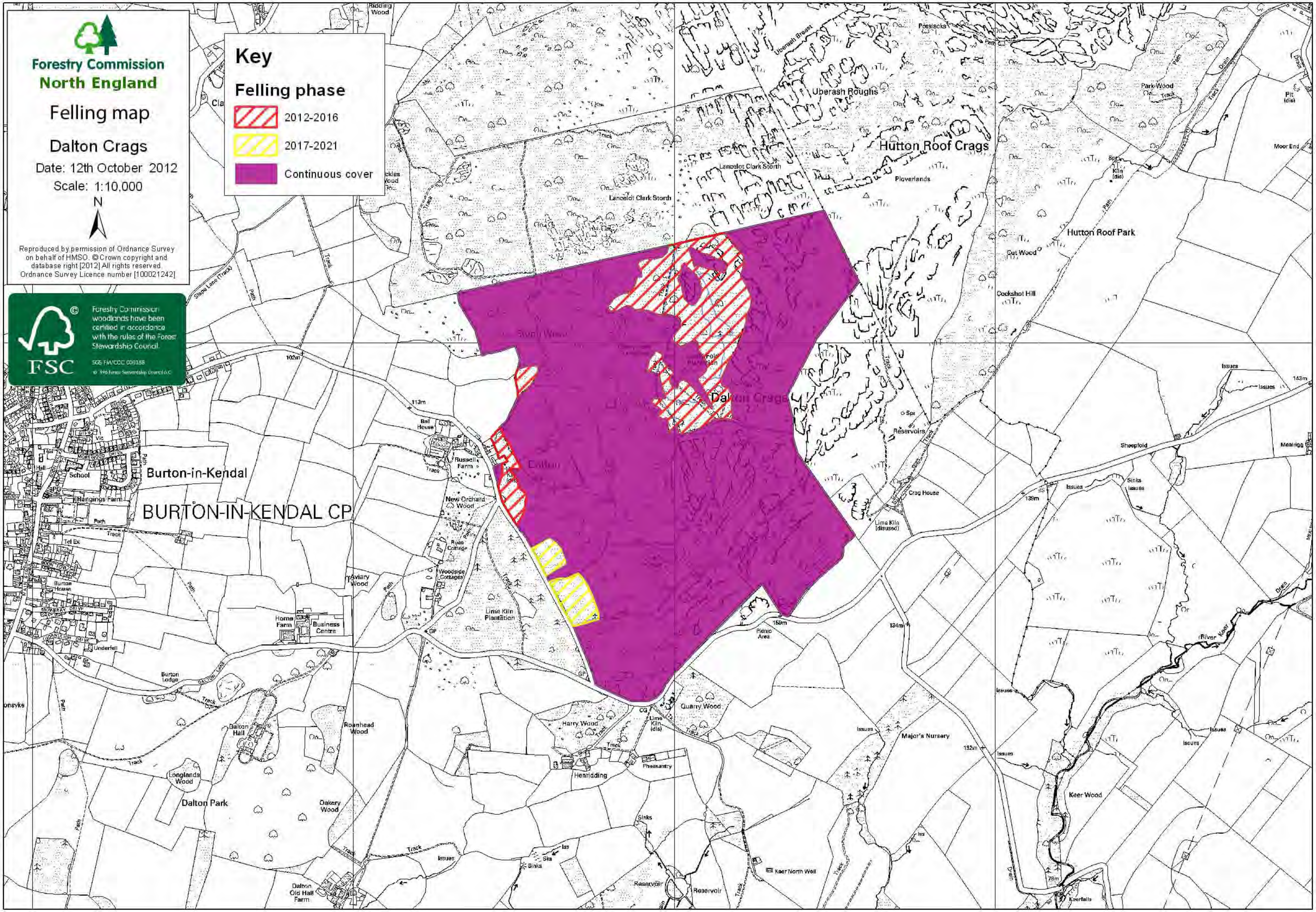
Dalton Park

Uberash Roughs

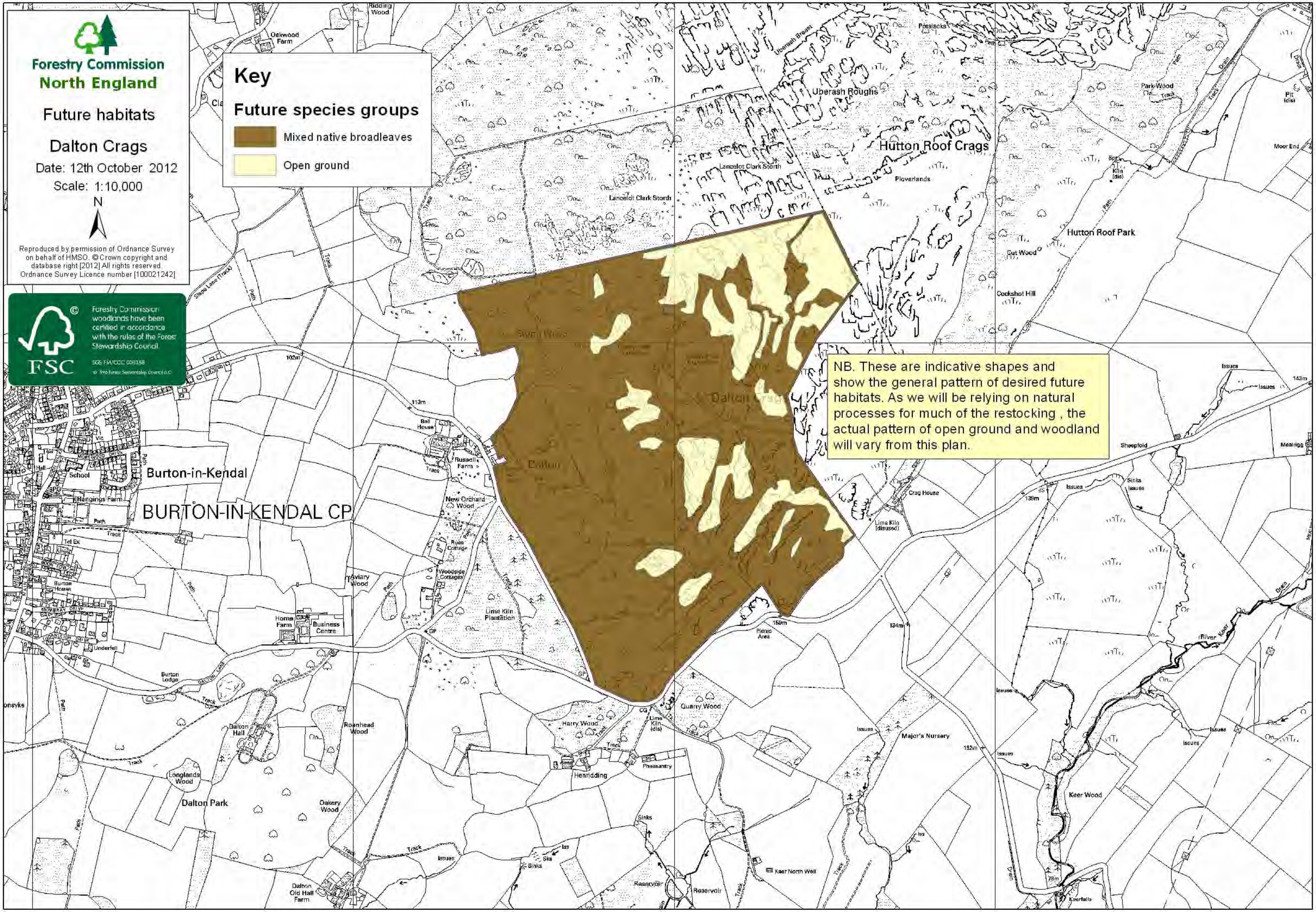
Hutton Roof Park

Keer Wood

River Keer



Forestry Commission
North England
Felling map
Dalton Crags
Date: 12th October 2012
Scale: 1:10,000
N
Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right [2012] All rights reserved. Ordnance Survey Licence number [100021242]
Forestry Commission woodlands have been certified in accordance with the rules of the Forest Stewardship Council.
FSC
Key
Felling phase
2012-2016
2017-2021
Continuous cover
Burton-in-Kendal
BURTON-IN-KENDAL CP
Hutton Roof Crags
Uberash Roughs
Hutton Roof Park
Dalton Crags
Lancelot Clark Storth
Ploverlands
Cut Wood
Cockshot Hill
Park Wood
Moor End
Sheepfold
Crag House
Lime Kiln (disused)
Reservoirs
Picnic Area
Quarry Wood
Harry Wood
Henridding
Pheasantry
Major's Nursery
Keer Wood
River Keer
Keer North Well
Reservoir
Keerfalls
Roanhead Wood
Dalton Hall
Dalton Park
Longlands Wood
Oakery Wood
Dalton Old Hall Farm
Home Farm
Business Centre
Aviary Wood
Lime Kiln Plantation
New Orchard Wood
Russell Farm
Bell House
Woodside Cottages
School
Hangings Farm
Underfell
Burton Lodge
Burton House
Ridding Wood
Issues
Sinks
Track
Path
Drain



Forestry Commission
North England
Future habitats
Dalton Crags
Date: 12th October 2012
Scale: 1:10,000
N
Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right [2012] All rights reserved. Ordnance Survey Licence number [100021242]
Forestry Commission woodlands have been certified in accordance with the rules of the Forest Stewardship Council.
FSC
Key
Future species groups
Mixed native broadleaves
Open ground
NB. These are indicative shapes and show the general pattern of desired future habitats. As we will be relying on natural processes for much of the restocking , the actual pattern of open ground and woodland will vary from this plan.
Burton-in-Kendal
BURTON-IN-KENDAL CP
Hutton Roof Crags
Uberash Roughs
Hutton Roof Park
Lancelot Clark Storth
Dalton Park
Keer Wood
Quarry Wood
Major's Nursery
Henridding
Dalton Hall