

Cropton Forest Plan FP 11 2022

Yorkshire Forest District



Forestry England
forests and woodlands
have been certified in
accordance with the UK
Woodland Assurance
Standard (UKWAS)



Forestry England - Property

Forest District:	Yorkshire
Woodland or property name:	Cropton
Nearest town, village or locality:	Pickering
OS Grid reference:	SE 786950
Local Authority district/unitary Authority:	North York Moors National Park

Areas for approval

	Conifer	Broadleaf	Open
Felling	437.17		
Lower Impact Silvicultural Systems regeneration felling	60.00		
Restocking	336.43	80.01	20.73

1. I apply for Forest Plan approval for the property described above and in the enclosed Forest Design Plan.
2. I apply for an Opinion under the terms of the Environmental Impact Assessment (Forestry) (England & Wales) Regulations 1999 for afforestation as detailed in my application.
3. I confirm that the pre-consultation, carried out and documented in the Consultation Record attached, incorporated those stakeholders which FS agreed must be included. Where it has not been possible to resolve specific issues associated with the Plan to the satisfaction of consultees, this is highlighted in the Consultation Record.
4. I confirm that the proposals contained in this Plan comply with the UK Forestry Standard.
5. I undertake to obtain all permissions necessary for the implementation of the approved Plan.

Signed

Signed

Forest Management Director

Area Field Manager

District

Area

Date

Date of Approval..... **Date approval ends**.....

CONTENTS

1. Background

2. Describing the Site

- 2.1 Geology and Soils
- 2.2 Tree Species
- 2.3 Wind Damage
- 2.4 Landscape
- 2.5 People and Community
- 2.6 Natural Heritage
- 2.7 Cultural Heritage

3. Describing the Project

- 3.1 Project Brief
- 3.2 Objectives
- 3.3 Opportunities & Constraints
- 3.4 Implementation
 - 3.4.1 Conservation
 - 3.4.2 Timber Harvesting
 - 3.4.3 Landscape
- 3.5 Plan
- 3.6 Areas
 - 3.6.1 Breakdown of felling areas within the period of the plan
 - 3.6.2 Breakdown of constituent areas
- 3.7 Methods/Forest Operations
 - 3.7.1 Planning
 - 3.7.2 Standards
 - 3.7.3 Harvesting
 - 3.7.4 Haulage
 - 3.7.5 Restocking
 - 3.7.6 Successional open woodland
 - 3.7.7 New Planting
 - 3.7.8 Wildlife Management

4. Monitoring

- 4.1 Habitat Condition
- 4.2 Forest Plan
- 4.3 UKWAS Compliance

5. Determination of Impact Significance and Mitigation

- 5.1 Ancient and Native Woodland
- 5.2 Flora
- 5.3 Other Objectives

Appendices

1. Priority species
2. Lower Impact Silvicultural Systems justification
3. Restock species by soil type
4. Monitoring Plan
5. Agreed Tolerance Table for Yorkshire Forest District

Cropton

3662 Hectares (Ha)

Period of Plan: 2022 - 2032

1. Background

Cropton Forest is part of a network of forests and the largest in area managed by Forestry England (FE), Yorkshire Forest District, located within the North Riding Beat. It is situated approximately 9 km north of Pickering on the eastern fringe of the North York Moors National Park.

The forest is a freehold property where planting began in the 1920's but more significantly over the 1950's and 1960's and remains extensively coniferous in composition.

2. Describing the Site

2.1 Geology and Soils (FP Map 01)

Bedrock geology is mainly sedimentary, comprising sandstone, siltstone and mudstone formed in the Jurassic period and occupies the majority of the forest area. A narrow band of calcareous grit from the Corallian group outcrops primarily above the Newtondale and Raindale valley systems

The soils at Cropton are predominantly classed as surface water gleys, becoming peatier with increasing altitude and higher elevations. More freely draining podzolic soils occupy the outlying block at Hartoft and across Spiers Bank along the western fringe and plateaux sites above Newtondale at Scarfhill Rigg extending northwards to Needle Point. Occasional pockets of brown earth soils are scattered across a variety of sites, as are pockets of deep peat the largest of these at White Mires.

Based on Forest Research Ecological Site Classification, gleyed soils occupying the majority of the forest are; 'very moist' soil moisture regime (SMR) and 'poor' soil nutrient regime (SNR), ironpan sites are 'moist' SMR and 'poor to very poor' SNR. Together both soil types account for over 90% of the forest area. The difference between SMR and SNR impacts on the range of 'suitable' species that can be considered for restocking/regenerating although objectives and silvicultural management may be different.

2.2 Tree Species (FP Map - 02)

Over the past 12 years the more notable changes are the reduction in area of larch and the increase of 'open' as an overall percentage.

'Open' is mainly split between 37.57 ha of permanent open space designated as SSSI/SPA/SAC at Hartoft Rigg and the remaining 310.73 ha is made up of successional open space associated with conservation and archaeological sites, habitat corridors and streambanks.

Species	2009		2021	
	Ha	%	Ha	%
Spruce	1130.28	31	1167.29	31
Pine			954.70	26
Other evergreen conifers (inc. pine 2009)	1171.90	32	128.50	4
Larch	691.83	19	511.90	14
Broadleaf	183.11	5	244.20	7
Felled	219.73	6	150.70	4
Open/successional open	109.87	3	348.30	10
Agriculture, cabins etc	155.48	4	156.61	4

2.3 Wind Damage

The Windthrow Hazard Classification classes 1 to 2 occupy 43% of the forest area where thinning options are least limited and 57% in the intermediate classes 3 to 4, where thinning options can be more limiting and particular care needs to be taken to avoid precipitating the onset of serious windthrow.

Opportunities to carry out timely thinning has increased over recent years over which 434 ha has been carried out across a range of conifer stand types.

2.4 Landscape (Photographic montage)

The majority of the forest is covered by the; 'Forest character type - Cropton character area¹' and is located toward the south-east corner of the North York Moors National Park. The forest is referenced in the document with the following descriptions;

- *Sited on undulating upland rising to a high point at Brown Howe 267m, Wardle Rigg 262m and Leaf Howe at 290m and falling away towards the limestone escarpment in the south; the southern edge of the forest rising up the scarp slope and dropping away steeply into Newtondale and Rosedale to the east and west.*
- *Extensive areas of coniferous woodland, divided into a grid pattern by a network of forest rides, is often fringed by broadleaved trees including oak, birch and ash and interspersed by isolated pockets of ancient semi natural woodland within steeper areas. Scots pine are frequent. In some areas there is an abrupt geometric edge to the forest, particularly where it abuts moorland to the north.*
- *Pockets of grazing land, divided into a regular pattern of fields by wire fences, occur within the forest; the largest pocket being around the hamlet of Stape. A relatively dense pattern of farmsteads and occasional chapels interspersed by pockets of Scots pine and small pockets of upland heath and enclosed by forest create an unusual and distinctive character.*

Under the previous plan significant areas of clearfelling have been carried out, creating more irregular boundaries that respond better to landform when seen from different locations. Felling and restocking coupes no longer follow the original grid iron pattern, reducing the impact of geometric boundaries. Fixed-point photographs of both external and internal views demonstrate the changing structure across the forest and how this is providing a more positive contribution to the overall landscape.

Although the impact is less obvious and the effect will become more subtle as crops develop, recent conifer restocking is moving away from pure, single species stands where the planting of mixtures is becoming the default management practice. This will gradually contribute to a more diverse forest composition and structure.

The eastern flank of the forest sits within the 'Narrow glacial channel and griffs character type - Newtondale character area¹'. Some of the key characteristics of this landscape type are;

- *The dale, unique in character within the Park, is thought to have been cut as a glacial meltwater channel to drain a glacial lake and ice sheet in the Esk valley, is considered to be one of the best examples of its type in the country. The majority of the dale and the Hole of Horcum are protected as an SSSI.*
- *The valley sides are mostly clothed in a mixture of deciduous woodland, mixed and coniferous plantation, the western sides of the upper dale forming part of the North Riding Forest Park. Most of the woodland in the lower dale and smaller areas in the upper dale comprise semi natural or replanted ancient woodland. The upper dale is more open and clothed mostly with bracken, with occasional patches of heather, upland grass moor and scrub; the eastern dale sides occasionally open up between the trees to reveal the steeply indented and rounded landform of the valley sides.*
- *The well-wooded deep valley creates a strong sense of enclosure and contains the majority of views; views out are limited to occasional glimpses of the moor tops.¹*

Following significant improvements to timber haulage routes within Newtondale and Raindale initiated in 2013, thinning and felling activity has recommenced after an absence of over twenty years. Most visible is the clear fell at Rhumbard Snout as viewed from the NYM Railway and visitors to Levisham Station, where predominantly mixed broadleaf woodland will replace pure, even-aged conifer. Less visible in the landscape is over 19 hectares of felling in Raindale where conversion from conifer to mixed broadleaf woodland will have a positive impact across this enclosed dale.

2.5 People and Community (FP Map - 03)

The whole of the forest is freehold which is dedicated as Open Access land through the Countryside Rights of Way Act (2000). In addition, the forest supports a wide network of forest roads, rides and public rights of way.

Two commercial forest cabin sites at Keldy and Spiers ensure visitor numbers are high in and around the cabins and associated walking/mountain bike trails throughout the year. In addition, a number of recreational activities are granted use of the forest via our permissions system i.e. motorsport, cycle and running events.

The NYM Railway is a major tourist attraction within the National Park. It passes through the iconic landscape of Newtondale, with stations at Levisham and Newtondale Halt, and contributes towards a high visitor profile across this part of the forest.

2.6 Natural Heritage (FP Map - 03)

Cropton Forest hosts a range of international, national and regional important flora, fauna and bio-diverse habitats. Moorland margins are contiguous with the North York Moors Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Special Area for Conservation (SAC) cited for Atlantic Upland Heath and important for ground nesting birds such as golden plover and merlin, details for which may be found at; <http://www.sssi.naturalengland.org.uk>. Unit 69 sits within the

¹ North York Moors Landscape Assessment 2003

land owned and managed by Forestry England and is currently classed as being 'unfavourable - recovering' by Natural England. Following recent felling of conifer crops, an important ecotone is developing along parts of the moorland edge, particularly adjacent Rutmoor and Blawath Beck and Hartoft Moor.

The eastern flank of the forest sits within Newtondale, an iconic landscape feature as described in section 2.4 Landscape. It contains 330 ha of Newtondale SSSI, cited as *a classic geomorphological feature and is important for the succession of habitats between the upland and lower valley regimes*. SSSI units are either 'favourable' or 'unfavourable - recovering'.

The forest supports 104 ha ancient woodland sites (AWS) of which the majority are located in Newtondale/Raindale valley systems with the remainder across Spiers Bank and Low Muffles of which 40 ha are semi-natural and the remainder classed as plantation.

Through the previous plan, 19.1 ha of conifer AWS's have been felled and are being restored to site native species.

The forest supports a small number of native Juniper and Dwarf Cornel, the latter being one of a small number of sites in the locality that are now the most southerly in Britain.

Cropton Forest is very important for breeding Nightjar with numerous pairs recorded across clearfell and restock sites favoured for nesting and feeding. The forest also supports a number of Schedule 1 birds and the Great grey shrike is also a winter visitor to the forest.

A wide range of national and regionally important bird species utilise different habitat types across the forest (see Appendix 1):

Wooded heath/clearfell - Nightjar, Turtle dove, Tree pipit
Woodland edge/ride/glade - Willow warbler, Wood warbler, Dunnock, Redstart, Song thrush, Garden warbler, Marsh tit, Willow tit, Bullfinch, Spotted flycatcher, Linnet, Yellow hammer, Snipe,
Developed shrub layer - Woodcock,
Mature conifer woodland - Crossbill.

Adders are regularly seen across coniferous parts of the forest, particularly recently felled sites through to thicket stage stands where heathland flora and light levels provide suitable habitat.

A network of ponds, rivers, streams, water courses and forest drains pass through and adjacent to the forest, providing a large area of riparian habitat. These sites typically support a more diverse woodland structure where native broadleaf tree species, shrubs and semi-natural ground flora can naturally regenerate supporting Protected Species including Great crested newt and a range of bat species. A significant research project is currently being undertaken within the Sutherland beck valley where a beaver release trial is providing detailed insight into Natural Flood Management processes and riparian habitat restoration.

A survey carried out in 2011 identified approximately 1000 Northern hairy wood ant nests across Spiers Bank and Taylor Hill/Newtondale. This is an edge specialist and favours paths, tracks and rides benefitting from cyclical forest management allowing more light reaching the forest floor.

Habitats within Cropton forest support three Schedule 41-listed butterflies. These are; Small pearl-bordered fritillary, Dingy skipper and White-letter hairstreak. Several rare moth species are also recorded within the property, including Blomer's rivulet, Fen square-spot, Golden-rod brindle plus others. See Appendix 1 for the complete list of species and their associated habitats and preferred management.

2.7 Cultural Heritage (FP Map 03)

The forest supports a diverse range of historic features including 8 Scheduled Monuments within the forest boundary and a significant number of unscheduled features ranging from the Bronze Age cairns, the remains of a Roman road Wade's Causeway, Medieval wayside cross, holloways and mill race and 18th century boundary stones.

At the time of writing, of the 8 scheduled monuments, 4 are not at risk, 3 vulnerable-improving, 1 vulnerable-declining for which vegetation management is being carried out.

3. Describing the Project

3.1 Project Brief

- manage natural and cultural heritage sites in accordance with their requirements as per agreed management plans and district policy,
- work with partners to identify opportunities to develop a landscape-scale project across the iconic Newtondale valley in line with 'Biodiversity Plan: Forest Wilding'², which has the potential to extend beyond the management boundary of Forestry England,
- increase the proportion of native broadleaf cover, particularly along riparian buffer zones and areas of conifer plantation ancient woodland sites.
- consider the selection of alternative main tree species that will contribute toward a greater range of species diversity to maintain or increase timber productivity and increase resilience to plant health and biosecurity threats,
- increase the diversity of the forest age structure and reduce landscape impact by use of appropriate silvicultural systems.

3.2 Objectives

Nature

- Improve the resilience of the natural environment and realise the potential of these woods for nature and wildlife, to be measured by Natural England, NYMNP Authority and FC systems.
- Maintain the cultural and ecological heritage value of these woods, to be measured by Natural England, Historic England, NYMNP Authority and FC systems.

Economy

- All of our forests and woodlands are certified to the Forest Stewardship Council®(FSC®) licence code FSC-C123214 and the Programme for the Endorsement of Forest Certification (PEFC) licence code PEFC/16-40-1001 standards. We will maintain the land within our stewardship certified against the UK Woodland Assurance Standard, as independently assessed by annual independent surveillance audits.
- Improve the economic resilience of these woods from a more diverse range of site appropriate conifer and broadleaf species, to be measured by FC systems.

People

² Forestry England, Biodiversity Plan: Forest Wilding. Forestry England's approach to Wild Core Areas.

- Encourage communities to become involved across these woods, its management and direction through consultation in planning and participation in volunteering. To be measured by FC systems.
- Provision and maintenance of recreational facilities within the forest, to sustain economic and social function, whilst achieving the plans other objectives. Facilitating opportunities for third parties to utilise the land for recreational activities where appropriate. To be measured by stakeholder consultation and Business Accounting Systems.
- Maintain and improve the woodlands contribution to the landscape character within the North York Moors National Park 'Forest landscape type - Cropton Forest character area' and 'Narrow glacial channel and griffs character type - Newtondale character area'. To be measured by fixed-point photography.

3.3 Opportunities & Constraints

- Managing 2nd rotation spruce stands on nutrient-poor sites where options for managing heather check and nutrient status are limited. There are a number of opportunities to manage these sites through a variety of prescriptions including Whole-tree harvesting (WTH) and developing woodfuel markets. Proposed premature felling sites are highlighted on FP Map 04 - Analysis & Concept.
- Aligned with the above issue, subsequent restocking will need to consider future species choice, possibly incorporating novel site-improving broadleaf species within mixtures, including Aspen and alder species
- Identify where LISS management through the application of the Strip shelterwood system can be applied across suitable wind-firm conifer crops.
- Work with partners and neighbouring landowners to investigate the scope for developing a collaborative, landscape-scale project across Newtondale.
- Effective Deer management will be critical to ensure the objective of growing sustainable timber crops. A more detailed review will be carried out in tandem with the Forest Plan.
- Consider opportunities to increase the area of forest cover across former agricultural land.

3.4 Implementation

3.4.1 Conservation

Protect and, where appropriate, enhance all known sites of archaeological and ecological importance:

Archaeological sites

All sites, regardless of their designation, will receive the same level of care during the planning and execution of forest operations. The operational planning system will ensure they are recognised and the proper measures for their protection are in place before work begins. This planning system also ensures that, where possible, opportunities to enhance the condition of archaeological interest are taken during routine forest work.

Ecological sites

All work sites are surveyed prior to any operations being carried out, both to audit the accuracy of information already held on record and to identify opportunities to further improve the ecological value of the woodlands. For Cropton this will include:

- Managing North York Moors SSSI Unit 69 Hartoft Rigg and Newtondale SSSI units in line with the management plans agreed with Natural England to ensure they remain in target condition where management is controlled by Forestry England.
- Increase and improve the deadwood resource as set out in - 'Deadwood - Policy, Procedures, Guidance (PPG) 51 (2018)'. Areas of high ecological value across which deadwood resources could be encouraged include; Ancient Woodland, riparian zones, Long Term Retention sites and areas of broadleaf woodland.
- Managing Veteran trees and PAWS as set out in - 'Keepers of Time: ancient and native woodland trees policy in England (May 2022)', 'Ancient Woodland on the Forestry Commission Estate in England (March 2002)' and 'FEE Operations Instructions No. 3 (rev.2012), Ancient Woodlands'.

'FC - Managing England's woodlands in a climate emergency' provides guidance to implement adaptation actions including the acceptance of naturalised species and assisted migration.

Over the next ten years this plan will continue the process of de-coniferising conifer PAWS, mainly through thinning, felling and regenerating with site-native species. Refer to Proposed Felling Map - FP Map 05; periods 2022 - 2026 and 2027 - 2032. This identifies coupes we propose to harvest, retaining any windfirm broadleaves (Head House Wood, Rain Dale ancient woodland sites).

- Increase the diversity of tree species and age structure that will maintain and improve favourable conditions for target species and identified habitats. This is particularly beneficial for the range of habitats and species recorded at Cropton from which a selection has already been mentioned at 2.6 - Natural Heritage.
- The various in-forest streams and watercourses that pass through the property were classed as 'poor' and 'moderate' status through the Water Framework Directive (WFD) assessment (2012 data). Work undertaken through this plan will continue the process of improving the water quality and aquatic ecology where they pass through the forest, replacing immediately adjacent conifer crops with predominantly broadleaf species and considering opportunities to address known issues. Phasing of felling will avoid significant lengths of watercourse being felled at any one time throughout the approval period of the plan. Targeted watercourse clearance will be considered where these contribute to priority BAP/HAP targets. Building on measures deployed as part of the 'Slowing the Flow Partnership project' and the ongoing 'Yorkshire Beaver Enclosed Release Trial Project 2019 - 2024' will continue to provide evidence-based assessments across a range of outcomes; i.e. water attenuation and riparian habitat improvement.

Minimum Intervention - Natural Reserves

Natural Reserves are sites that are predominantly woodland which have been set aside where biodiversity is the prime objective. As far as reasonably practicable this is a permanent designation and will be managed on a minimum intervention system unless the outcomes from alternative interventions have higher conservation or biodiversity value.

There are 105.98 ha Natural Reserves at Cropton Forest; first rotation Scots pine stands across Middleton Moor and Low Muffles

Minimum Intervention - Candidate Natural Reserve

These are sites which have the potential to deliver greatest biodiversity benefit but without the formal designation as defined by the UKWAS.

There are 120.83 ha located across Newtondale, primarily to the less accessible parts of the valley east of the railway line. These range from 60-year old first rotation conifer stands to 90-year old ancient semi-natural woodland sites. Through this plan, we will investigate the feasibility for the removal of conifer crops with partners and neighbouring landowners. If access issues are resolved at some point in the future, these could be managed using alternative interventions that provide higher conservation or biodiversity value.

Long Term Retentions (LTR)

These are stable stands or clumps of trees that are important to retain for landscape or biodiversity reasons and will be retained beyond their economic rotation but still managed under an appropriate silvicultural system i.e. thinning may still be carried out. These are predominantly first rotation stands of Scots pine or mixed broadleaf sites.

Through this plan 255.31 ha are designated LTR.

Invasive species

Rhododendron ponticum is recorded across a number of sites in the forest, particularly areas located around the historic shooting lodges of Keldy Castle, Sutherland Lodge and Spiers House A programme of vegetation management will be carried out over the duration of this plan where this is likely to impact on high value conservation sites or could act as a vector for *Phytophthora ramorum*.

3.4.2 Timber Harvesting

We will continue to sustainably harvest timber from clearfelling, Lower Impact Silvicultural Systems (LISS) and thinning's. These operations will be planned and controlled to ensure due regard for all other objectives of management at Cropton.

3.4.3 Landscape

Cropton Forest lies within the North York Moors National Park, a protected and designated landscape where felling as seen from prominent viewpoints under the previous plan has reduced the negative impacts of hard geometric boundaries and even-aged plantation forest. This is particularly noticeable adjacent external boundaries; examples include Esp Rigg and Gale Hill Rigg, Hartoft Moor and Ramsden Head. The mosaic of habitats developing across these sites provides opportunities to manage a more diverse forest with variable proportions of open space and successional habitat.

Appropriate scale felling across the forest will continue the process of restructuring, moving away from even-aged, single species stands to a more mixed conifer/broadleaf woodland linking with other associated habitats. This plan will consider wider, landscape-scale opportunities to develop a mosaic of habitats in keeping with the Newtondale SSSI citation, both within and outwith Forestry England management boundaries.

Over time LISS with associated smaller-scale felling will contribute toward a more varied and intimate internal forest landscape, where simple and complex stand structures create a more diverse visitor experience within the forest.

On a scale of low/medium/high, landscape sensitivity is considered to be high.

3.5 Plan (FP Map 04)

The design concept map shows the key factors we need to address. These are taken forward and used to form the basis of a practical plan set out in the fell and restock maps.

3.6 Areas (FP Maps 05, 06 and 07))

3.6.1 Breakdown of felling areas within the period of the plan.

A map showing the location of felling sites can be found in the Forest Plan folder.

Felling	Area - hectares	% of total area (excl. SSSI)	Projected volume (m ³)
2022 - 2026 Clearfell	231.45	6.4	64,497
2027 - 2031 Clearfell	176.71	4.9	52,907
2032 - 2036 Clearfell	29.01	0.8	10,188
LISS*	60.00	1.7	16,500

* A large proportion of Cropton will be managed using LISS through Strip Shelterwood, Uniform Shelterwood and Group Shelterwood silvicultural systems. During the plan period, it is proposed areas of LISS where crops are over 25 years old will receive a silvicultural intervention (thinning and/or regeneration felling). The above area of woodland cover will be strip-felled and regenerated through a combination of restocking and natural regeneration, removing no more than 30% of the stems within any single compartment over the plan period. Management by the Uniform Shelterwood system, particularly across low yield class Scots pine stands will open the canopy evenly and gradually. Group shelterwood coupes will be up to 0.6 ha in size. See Appendix 2 - LISS justification.

3.6.2 Breakdown of constituent areas.

A Future Habitat and Species map showing the location and detail of the constituent areas can be found in the Forest Plan folder.

Habitat type - (based on principal species established)	Area - hectares			% age of total area		
	2022	2032	2052	2022	2032	2052
Conifer	2907.89	2761.66	2807.15	79	77	75
Broadleaf	244.20	346.45	324.21	7	9	10
Open/successional open inc. blanket mire, agriculture, felled, wooded heath, riparian corridors etc	472.34	516.32	493.07	13	13	14
Upland Atlantic Heath SSSI/SAC/SPA	37.57	37.57	37.57	1	1	1

3.7 Methods / Forest Operations

3.7.1 Planning

Before any major forest operations are undertaken an “Operational Site Assessment” is completed. This document details the proposed work and outlines all known environmental, social and operational considerations. The “Operational Site Assessment” then becomes an important reference document during the planning phase, at the pre commencement meeting before scheduled works begin and for supervisory visits during the operation. The “Operational Site Assessment” is kept along with other documents relating to the operation in the main office.

For routine maintenance operations (e.g. fencing, ride mowing, survey work etc.) the Yorkshire District policy on timing of operations to minimise wildlife disturbance will be followed.

Regarding wildfire, we will follow guidance as set out in ‘FC Practice Guide - Building wildfire resilience into forest management planning’. This will be applied proportionately dependant on a particular forest or woodland.

3.7.2 Standards

All operations within the forest will be carried out in accordance with the following standards;

- U.K. Woodland Assurance Standard
- U.K Forestry Standard (published 2017).

3.7.3 Harvesting

See 3.4.2. Forestry Commission staff will monitor work through regular site visits to ensure all guidelines and contract conditions are adhered to.

Clearfell V's LISS

All plans are required to consider LISS in windfirm conifer plantations as opposed to traditional clearfell systems. This decision is based upon the methodology provided in FC Information Note 40 - ‘Transforming Even-aged Conifer Stands to Continuous Cover Management’. Where existing coupes are not identified for LISS management, we may consider managing these on an extended rotation basis to be thinned and monitored for future consideration for conversion to LISS.

Using the FC Forest Research Agency, Ecological Site Classification system (ESC), a range of conifer species are considered 'optimum' to 'suitable' for LISS where timber production is considered as an objective. Through this plan the area to be managed under LISS is 1228.05 ha across a range of site types. See Appendix 2 - LISS Justification.

During the lifetime of this plan we will look to introduce the concept of Forest Development Types. *"A Forest Development Type is a long-term vision of how the species composition and structure of a forest stand is intended to develop. The concept encourages the greater use of mixed-species stands and a wider variety of stand structure than previously deployed in British forests".³*

3.7.4 Haulage

As in our other woodland blocks we will continue discussions with the relevant Highways Authority to agree haulage routes and discuss annual tonnages.

All timber traffic will be managed in line with the Road Haulage of Round Timber Code of Practice, Fifth Edition (2020), which aims to improve the safety and environmental standards of the timber haulage industry.

3.7.5 Restocking

Conifer

The areas of felling carried out as part of management by LISS and clear felling will be established through a combination of restocking using alternative productive conifer species to diversify age structure and species and natural regeneration to continue to provide a sustainable timber resource, whilst mindful of the projected impacts of climate change. The FC Forest Research Agency, Ecological Site Classification system (ESC) will aid species choice and selection. A range of timber producing conifer species as set out in Appendix 2 and Appendix 3 'Species by soil type' will help inform restocking options.

Areas of LISS will be managed to encourage natural regeneration, although it is accepted that replanting will be required to maintain and further diversify the current range of species.

Reference to Predominantly Mixed Conifer on the Future Habitat & Species Map will be used to describe those areas where a range of species will be planted and/or regenerated, where conifer species will comprise up to 80% of the component mix. Planting mixtures will aim to follow the design principles as set out in Quarterly Journal of Forestry, July 2020 Vol 114 No.3 - Technical Paper, Establishing robust species mixtures.

As indicated at 3.7.1, the Operational Site Assessment will provide site-specific data on soils and other site factors that will help inform the correct choice of species on a site-by-site basis.

All sites will achieve at least 2500 stems per hectare through planting, natural regeneration or a combination of both.

Broadleaf

There are 104 ha of AWS's across Cropton Forest of which 40.22 ha are semi-natural (SN) class 1 (see section 4.1 Habitat Condition) and the remaining range from SN 2 to 4. Through this plan we are proposing to continue the gradual restoration of conifer PAWS toward SN 1. Regeneration of these sites will primarily be through natural regeneration. We will accept 'naturalised' species i.e. beech

³ Forest Research - Forest Development Types: A guide to the design and management of site-adapted resilient mixed forest stands in Britain

and sycamore and the principles of assisted migration where these can enhance resilience to the impacts of climate change.

Natural regeneration across ancient woodland will be assessed and the risk it poses to the objectives of the plan considered. Where dense shade or invasive species (i.e. Western hemlock, Sitka spruce, rhododendron) threatens the native woodland community, it will be removed as part of routine felling or thinning operations.

Indicative regeneration

NVC native species

Beech/Sycamore

Larch

Pine

Fir

Spruce/Hemlock

↑ *Preferable*

↓ *Less preferable*

Reference to Predominantly Mixed Broadleaf on the Future Habitat & Species Map across non-PAWS will be used to describe those areas where a range of species will be planted and/or regenerated, with the exception of ancient woodland as described above, where broadleaf species will comprise at least 60% of the component mix.

Targeted enrichment planting will be considered across sites that fail to develop sufficient natural regeneration of broadleaf species.

The majority of sites (see 3.7.6 below) will achieve at least 1100 broadleaf stems per hectare through natural regeneration, planting or a combination of both.

3.7.6 Successional Open Woodland - Forest Wilding, Newtondale

As we explore opportunities to develop wild core areas and the principles of forest wilding across Newtondale valley, we anticipate a proportion of this area will move from secondary conifer plantation high forest to a more open, mixed species, predominantly broadleaf woodland habitat. These areas will achieve at least 20% canopy cover as per Forestry Commission Action Note 93, 'Definition of woodland and trees'. The location for this type of habitat will be subject to more detailed site surveys providing site-specific data on a site-by-site basis during the lifetime of the plan. Aligned with this work will be the opportunity to conserve and buffer the notified semi-natural habitats within Newtondale SSSI (see sections 5.1 Native Woodland and 5.2 Flora), to provide buffers that will allow extension of these habitats.

3.7.7 New Planting

The Design concept map (FP Map 04) highlights a number of indicative areas that we may wish to carry out new planting toward the second half of this plan. The purpose of including this now is to provide early insight of where this is being considered. We have not made any determination as to what habitat types these will be but will likely comprise of some areas being semi-natural mixed broadleaf woodland and areas of productive mixed conifer woodland. We will consult with stakeholders at the time of application to Forest Commission, Forest Services where we will set out in greater detail how we wish to develop these ideas.

3.7.8 Wildlife Management

The successful establishment of future restocking sites through planting and/or natural regeneration will require effective control of crop damaging mammals. Cropton forest supports a population of Roe deer and increasing numbers of Red deer. Besides being managed in line with the Yorkshire Forest District Deer Management Strategy 2019, opportunities will be taken to develop a network of related infrastructure such as deer glades, high seats, shooting mounds and access tracks to ensure effective control can be carried out.

4. Monitoring

See Appendix 4 - Monitoring Plan

4.1 Habitat condition

Over the lifetime of the plan where maintaining and improving semi-naturalness is important such as Ancient Woodland and Minimum Intervention Sites, we will monitor and record levels of change through the Sub-Compartment Database and the resulting Semi Natural Class scores. Across these sites we will maintain stands to SN Class 1 and 2 as set out in 3.7.5 Broadleaf.

Class 1	Semi-Natural Woodland	Includes native coppice woodland and high forest or site-native plantation with a relatively high percentage of native self-sown or coppice understorey.
Class 2	Reasserting Semi-Natural Woodland	Plantation or ex-plantation with 50-80% site-native species. Includes coppice regeneration and/or strong natural regeneration amongst planted trees.
Class 3	Plantation	Plantation with 20-50% site-native trees under established plantation stands
Class 4	Plantation	Plantation with less than 20% site-native species. Includes all non-native broadleaves and beech planted outside its natural range in England.

In addition to the above, the Forest Wilding project across Newtondale will collate baseline data across a wide range of habitat types, including Minimum Intervention sites. Surveys will be repeatable and over time will measure species abundance, richness and trends.

4.2 Forest Plan

All forest plans are formally reviewed as part of a "5-year mid-term review" and the plan's aims and objectives and its success at achieving those aims and objectives. This plan will be formally reviewed in 2027 with opportunity to share information where requested. This time period can be shortened if circumstances change significantly or if parts of the plan prove detrimental to the overall aims and objectives.

Where an amendment to the Forest Plan is required, the Forestry Commission Practice Delivery Note 01 - Tolerance Table will be applied as set out in Appendix 5.

4.3 UKWAS Compliance Table

Maintain the land within our stewardship certified against the UK Woodland Assurance Standard, as independently assessed by annual independent surveillance audits.

	Forest Plan Area (ha)	Forest Plan Percentage	Forest District Area (ha)	Forest District Percentage
Total Area	3,662	100	20,971	100
Total Wooded area	3,147	86	18,594	85
Natural Reserves - Plantation (1%)	106	3	294	1.7
Natural Reserves - Semi-natural (5%)	Nil	Nil	101	5.6
Long-term Retentions and Low Impact Silvicultural Systems (>1%)	969	27	9,346	45
Area of conservation Value (15%) including designations; SSSI, PAWS, ASNW, NR, LTR, LISS	1,075	29	9,346	45
Planned Open (Managed/Successional)	508	14	3,203	15

5. Determination of Impact Significance and Mitigation

5.1 Native Woodland

Threats to our native woodlands can be immediate and absolute (e.g. loss to infrastructure or development) or slower and subtler (e.g. shading from conifer species or invasive species such as Rhododendron). There are also more widespread environmental changes, such as diffuse pollution and climate change, which may threaten in the long term. [Keepers of time: ancient and native woodland and trees policy in England \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/61221/Keepers_of_time_-_ancient_and_native_woodland_and_trees_policy_in_England.pdf)

Major threats to native woodland are:

- Climate change and fragmentation
- Excessive browsing and grazing by deer & livestock
- Inadequate or inappropriate management
- Invasive and problem species
- Diffuse pollution
- Loss

Through this plan, we will continue to apply local and national policy and best practice guidance for the management and development of our existing and new native woodlands. Within Newtondale SSSI, this will include remnant upland oak woodland and wet woodland.

5.2 Flora

Blanket bog, heathland, alkaline mires and swamp communities, acid/neutral rush pastures and fen meadows are UKBAP Priority Habitats that are present across Cropton Forest, including Newtondale SSSI.

Within woods, concentrate on open space habitat expansion and management, developing heathland, neutral grassland and acid mires.

(G. Peterken - Native Woodland Development in the North York Moors and Howardian Hills)

This plan will continue the management and development across the range of important habitats where this will improve habitat networks across Cropton forest.

Maintaining a mixed resource of temporary and permanent open space with heathland flora will provide suitable habitat for Nightjar, Tree pipit, Woodcock and other priority species including Small pearl-bordered fritillary and large heath butterfly and adder.

5.3 Other Objectives

Concentrate on developing habitat-rich riparian corridors with marshes, meadows, woodlands, trees in farmlands. These would pass through both woodland and farmland.

(G. Peterken - Native Woodland Development in the North York Moors and Howardian Hills)

We will continue to apply local and national policy and best practice guidance to the management of riparian corridors across Cropton. This will improve and enhance the habitat network within the woodlands and benefit protected species. Continuing development of both species and structural diversity will benefit habitats for priority species throughout the woodland (Appendix 2 - Priority species).

Appendix 1 - Priority species

Bird Species ¹	Forest location	Habitat enhancement
Woodcock Dunnock	Developed shrub layer	Continue selective thinning and strip-shelterwood felling as part of LISS management, this will allow the development of shrub layer structure and increased structural and species diversity. Enhance rides and woodland edge habitat. Expand diverse riparian woodland habitat, create and maintain successional woodland (birch and oak)/scrub habitat and standing deadwood.
Nightjar Tree pipit Turtle dove	Wooded heath, Clearfell sites	Continue sequential conifer clear felling and heavy thinning adjacent to open areas; maintain a mosaic of open structure woodland/wooded heath. Maintain and extend herb and invertebrate rich roadside verges.
Willow warbler Garden warbler Redstart Song thrush Marsh tit Spotted Flycatcher Lesser redpoll Bullfinch Yellow hammer	Woodland edge, ride, glade	Continue selective thinning and strip-shelterwood felling as part of LISS management, this will allow the development of shrub layer structure and increased structural and species diversity. Enhance rides and woodland edge habitat. Expand diverse riparian woodland habitat, create and maintain successional woodland (birch and oak)/scrub habitat and standing deadwood.
Crossbill	Mature conifer woodland	Continue thinning conifer stands to develop canopy and subsequent seed production across a range of conifer species.

Sch.1 bird of prey	Mature conifer woodland	Ensure through the design plan that there are always suitable mature conifer stands for nesting throughout the forest. Plan operations to work within guidelines during nesting season to ensure no disturbance.
Lepidoptera ²	Forest location	Habitat enhancement
Dingy skipper	Woodland rides and clearings.	Maintain open rides, roadside verges and margins that will retain foodplants such as Bird's-foot trefoil. Improve connectivity of these habitats.
Small pearl-bordered fritillary	Damp grassy habitats and woodland clearings supporting <i>viola</i> species.	Maintain the known sites in suitable condition through vegetation management to prevent scrub development. Increase connectivity of these habitats by improving riparian corridor habitat through thinning operations.
White letter hairstreak Blomer's rivulet	Elms/ wych elms.	Maintain know sites of elm/ wych elm and plant more where opportunities arise.
Angle-striped sallow (<i>Enargia paleacea</i>). Square-spotted clay (<i>Xestia stigmatica</i>). <i>Coleophora orbitella</i> . <i>Nemaxera betulinella</i>	Mature broadleaved with established ground flora or successional birch woodland.	Maintain areas of mature broadleaves with standing deadwood and a good understorey with developed ground flora including dog's mercury, nettle and primulas. Create and maintain successional woodland areas with species including birch which is an important food plant for many moths. Improve connectivity between these habitats.
Fen square-spot (<i>Diarsia florida</i>). Golden-rod brindle (<i>Xylena solidaginis</i>). Beautiful snout (<i>Hypena crassalis</i>). <i>Ancylis unguicella</i>	Heathland woodland rides and clearings	Maintain open rides and roadside verges and clearings that will develop heathland vegetation such as bilberry, heather and bog myrtle. Improve connectivity of these habitats.

Reptile ³	Forest location	Habitat enhancement
Adder	Heathland/verges	Maintain the known sites in suitable condition through vegetation management. Plan operations to minimise damage to known hibernacula sites. Increase the connectivity of these habitats through thinning operations and maintain a mosaic of open structure woodland/wooded heath, wide rides and forest road verges.
Amphibians	Forest location	Habitat enhancement
Great crested Newt	Beulah ponds, Keys Beck, Muffles fire pond	Maintain the known sites in favourable condition through vegetation management around and within the ponds as necessary. Plan operations to work within the guidelines, ensuring less than 25% key habitat within the 250m buffer is worked in any year.
Invertebrates	Forest location	Habitat enhancement
Glow worm ³	Old Newtondale forest drive and Keldy	Maintain the known sites in suitable condition, ensuring longer tussock grass and scrub. Increase suitable habitat through thinning operations and limit disturbance to verges.
Northern Hairy Wood ant ⁴	Newtondale and Cropton East	Increase connectivity of suitable habitats by maintaining a mosaic of open structure woodland, wide rides and forest road verges.
Mammals ³	Forest location	Habitat enhancement
Otter	Riparian areas	Increase the connectivity of these riparian habitats through thinning operations. Continue sequential conifer felling and heavy thinning adjacent to riparian zones to encourage woodland of a more diverse structure.
Bats	Bat Box sites	Increase habitat connectivity throughout the forest along with the road and ride network and maintain a mosaic of open structure woodland and improve riparian corridors through thinning operations. Ensure veteran trees protected.

¹ Source - BTO Bird Atlas and Breeding Bird Survey data

The Breeding Bird Survey is run by the British Trust for Ornithology (BTO) and is jointly funded by the BTO, the Joint Nature Conservation Committee (JNCC) (on behalf of the statutory nature conservation bodies: Department of Agriculture, Environment and Rural Affairs - Northern Ireland, Natural England, Natural Resources Wales and Scottish Natural Heritage), and the Royal Society for the Protection of Birds (RSPB).

² Source - Butterfly Conservation Group

³ Source - FE wildlife monitoring volunteers

⁴ Source - University of York PhD studies

Appendix 2 - LISS justification

Site Appraisal

Site Factor	Suitability Score	Comment
Wind Hazard Classification: Class 1 & 2 across 60% of LISS sites, Class 3 & 4 across 40%	1 2	ESC indicates rooting depth up to 40cm across a range of soil types.
Soil fertility: Typical ironpan, Typical peaty surface-water gley Typical surface water gley	1	Competing ground vegetation is generally that associated with heathland communities and poor SNR.
Current species suitability: LP, NS, POK, CAR, ASP, ROW, HOL SP, SS, WRC, WH, SBI, SYC	(very moist SMR/poor SNR) 1 - Very suitable 2 - Suitable	LP, SP, NS, SS, WH, POK, ASP, ROW, HOL, PBI, SBI and SYC are well suited to the site and already regenerate within current stand structures where light levels allow and across clear fell sites.

With a combined score of 3 and 5, depending on site factors, initial analysis indicates stands of mature SP and SS achieve a 'Good' and 'Moderate' site ranking respectively for transformation to LISS. Although not optimal for transformation, the choice of strip shelterwood can incorporate low thinning of the remaining stand to develop existing seed trees and provide side shelter for the development of adjacent strip-felled crops. Stands of first rotation, low yield class Scots pine where rows are indistinct and understorey scrub birch restricts harvester operator vision, a Uniform shelterwood system will be adopted. Stem selection will focus on the retention of dominant and co-dominant trees where the proportion of stems removed will be up to 40-50%, by number, of sub-dominant and suppressed trees.

Stand Appraisal

Stand form - Overall stand form for first rotation Scots pine and first/second rotation Sitka spruce is good. There is good evidence of advanced regeneration of SS across a range of stand types and increasing evidence of regenerating SP where seedlings are protected from browsing pressure.

Thinning history - Thinning operations have been variable across a range of species and site types. Where access is not an issue stands are well developed but elsewhere there has not been a continuity of thinning and stands less developed. The majority of Scots pine stands across the upper plateaux have had a 10 to 15-year break in thinning. Delayed thinning of second rotation spruce stands across Newtondale are remaining windfirm, five years after first thinning. Currently there is good evidence that advanced regeneration across a range of suitable species are capable of developing across sites.

Access - Generally, this is not a limiting factor as good infrastructure exists across the majority of stands. Access can be limiting across parts of Newtondale due to steep, uneven topography and numerous watercourses linking with Pickering Beck. Thinning and LISS management will seek to maximise stand development where safe to do so.

On the basis of the above information, we will consider transformation to LISS across SP, SS, NS, DF and mixed conifer stands with the aim of increasing species diversity through enrichment planting using a wide-range of conifer and broadleaf species identified as Very Suitable and Suitable on the attached ESC report, aiming for a simple stand structure.

We will adopt a Strip Shelterwood system, where strips will aim to be between 25 to 30m wide, retaining seed trees within strips where stability is not a significant threat. A Uniform shelterwood system will be applied across a proportion of low yield class SP stands. Group shelterwood system will be applied to a range of stand types within Newtondale where the felling of small coupes, up to 0.6 ha in size, will contribute toward the development Predominantly mixed broadleaf woodland and Successional open woodland.

Some areas of high forest/clearfell coupes will be managed on an extended rotation basis and will be monitored for development of natural regeneration. Where appropriate these will be considered for developing toward LISS management as set out above.

The Forest Research ESC table below supports the range of target species considered for natural regeneration and those identified as very suitable (dark green) and suitable (light green) where enrichment planting will increase species diversity. For Cropton, enrichment planting could consider the introduction of Macedonian pine, European silver fir, Grand fir, Oriental and Serbian spruce, Japanese red cedar, Coast redwood, Lawson's cypress, Aspen, Hornbeam, Small-leaved lime, Wild cherry and Red, Grey, Italian, Common alder.

Future wildlife management issues may arise where deer browsing could impact across strips as more palatable species are introduced. Site monitoring, the development of deer management infrastructure as set out in Forest Plan, section 3.7.6 and adherence to the District Deer Management strategy will help inform future management.

Site type		Species													
Upland sites	Lowland sites	SP	LP	MCP	DF	ESF	GF	WH	WRC	Ley/Law C	Coast R	Giant R	SS	NS	Oriental S
Gley						y		y	y	y			Y	Y	y
Iron pan/podzol		Y	y	y	y	y	y				y	y		y	y
BE/intergrade		Y		y	Y	y	y	y	y	y	y	y	y	Y	y
Calcareous				y		y			y	y					y
	Gley					y		y	y	y	y	y	Y	Y	y
	Podzol	Y	y	y	y	y	y	y	y	y		y		y	y
	BE/intergrade	Y		y	Y	y	y		y	y	y	y	y	Y	y

BOLD CAPITAL (Y)/BOLD INFILL COLOUR	Cat A Major species - currently widely used with no supply problems and should continue to play an important role
Bold, lower case italics (y), pastel infill colour	Cat B Minor species - Species that either currently play a minor role but have demonstrated their suitability being part of a species range to diversify our forests. Climate change may increase or reduce their use
Normal lower case (y), pastel infill colour	Cat C Secondary species - Species with little information on forest performance but possible choice based on Arboreta. Use on small-scale experimental basis for now but may increase if favourable results

Refer to cell comments for specific species notes

No planting where >50cm peat depth

Pacific coast associated forest cover - consider in mixtures as part of underplanting for CCF					
DF	GF	WH	Law C	Coast R	ESF

Appendix 4 - Cropton

Objective	Method
People	
Maintain and improve the woodlands contribution to the landscape character within the North York Moors National Park 'Forest landscape type - Cropton Forest character area' and 'Narrow glacial channel and griffs character type - Newtondale character area' .	Fixed-point photography
Encourage communities to become involved across these woods, its management and direction through consultation in planning and participation in volunteering.	Provide opportunity for stakeholders to submit comments as part of plan renewal process.
	Input volunteering data and analyse results through RaisersEdge secure database.
Provision and maintenance of recreational facilities within the forest, to sustain economic and social function, whilst achieving the plans other objectives. Facilitating opportunities for third parties to utilise the land for recreational activities where appropriate.	Provide opportunity for stakeholders to submit comments as part of plan renewal process.
	Carry out liaison meetings with Forest Holiday representatives for Spiers and Keldy sites
Nature	
Improve the resilience of the natural environment and realise the potential of these woods for nature and wildlife	Update Forester Web GIS; sub compartment database, Semi Natural Class Scores , Conservation module.
	Review sample of Operational Site Assessments.
Maintain the cultural and ecological heritage value of these woods.	Newtondale Forest Wilding baseline data surveys in conjunction with Forest Research. Methodology includes soil eDNA sampling.
	Liaise with and review Historic England - At risk Register, NYMNP shared monuments data, update Forester Web GIS Heritage module.
	Liaise with Natural England (NE) re management of SSSI (Newtondale units and Hartoft) to achieve favourable status where FE manageemnt can have an impact.
Monitor Priority habitat condition by visual assessment.	

	Monitor Priority species; Schedule 1 birds, Adder, Great crested newt, Small pearl-bordered fritillary.
	Review sample of Operational Site Assessments.
Economy	
All of our forests and woodlands are certified to the Forest Stewardship Council®(FSC®) licence code FSC C123214 and the Programme for the Endorsement of Forest Certification (PEFC) licence code PEFC/16-40-1001 standards. We will maintain the land within our stewardship certified against the UK Woodland Assurance Standard	Independent audit across the organisation. Independent audit across the District.
Improve the economic resilience of these woods from a more diverse range of site appropriate conifer and broadleaf species.	Update Forester Web GIS; sub compartment database, Operational Thinning Layer, Management Coupe Layer.
Site-specific	
Clearfell coupes - ensure boundaries are accurately reproduced and within agreed tolerances as set out in Forestry Commission Practice Delivery Note 01 (FC PDN 01).	GPS unit or equivalent data recorders.
Restock & Future Habitat Coupes - Productive mixed conifer sites. Establish at least 2500 conifer stems per ha by planting and natural regeneration by year 5 since date of initial planting (allowing 2 years fallow for <i>hylobius</i>).	On-site stocking density plot surveys.
Restock & Future Habitat Coupes - Mixed broadleaf habitat. Establish at least 1100 broadleaf stems per ha through natural regeneration by year 10 since date of felling.	On-site stocking density plot surveys.
Restock & Future Habitat Coupes - Successional Open Woodland. Establish tree crown cover of at least 20% of the ground as per Action Note 93 - Definition of woodland and trees, with overall composition 60% broadleaf and 40% conifer species.	On-site stocking density plot surveys.
LISS coupes - Productive mixed conifer sites. Establish at least 2500 conifer stems per ha by year 10 after final removal overstorey.	On-site stocking density plot surveys.
PAWS regeneration.	Monitor change through abbreviated stocking density assessments and repeat condition surveys.

Wildlife management - Identify problem sites where mammal damage is affecting crop establishment or degrading woodland flora.	On-site stocking density plot surveys. Damage, Impact and Activity Assessments as set out in YFD Deer Management Strategy.
Plan specific	
Forest Plan mid-term review. Review the plan's aims and objectives and the progress of their implementation.	Apply a variety of measures as described in the above table.

n Forest Monitoring Plan	
Frequency/Timings	Actions
Year 0 baseline, 5-year review, 10-year review.	Review visual impact of coupes within the landscape and adjust future coupe shape if necessary.
At time of plan renewal	Make adjustments to proposals to ensure UKFS compliance
Quarterly	Review activity across the forest and wider District to measure activity and to provide insight into gaps and future opportunities through volunteering.
At time of plan renewal	
Annually	Implement agreed actions.
As recordable changes occur within the forest environment. At time of Year 0 plan renewal, 5-year review, 10-year review.	Measure changes in diversity across species, age structure, conservation siting's/records and broad habitat types; conifer, broadleaf, open. Ensure positive change through increasing diversity occurs over the lifetime of the plan.
Annually across the District	Provide feedback where management is not compliant with recommendations.
To be confirmed as part of the developing project strategy, ensuring surveys are repeatable to monitor changes over time.	Results will help identify future management that will support the process of Forest Wilding and help develop Natural Capital Accounting systems.
Annually or as data becomes available. At time of Year 0 baseline, 5-year review, 10-year review.	Review progress of annual maintenance programmes and adjust where At Risk status may decline from target condition.
Management Plan and site every 3 years.	Carry out management as agreed with NE.
5 years	Provide feedback where habitat is not in favourable condition and recommend programme of works to achieve favourable status.

Annual	Provide feedback where habitat is not in favourable condition and recommend programme of works to achieve favourable status that will benefit target species.
Annually	Provide feedback where management is not compliant with recommendations.
Annually	Implement corrective actions as required.
As per audit sample.	Implement corrective actions as required.
As recordable changes occur within the forest environment and End Of Year updates. Year 0 plan renewal, 5-year review, 10-year review.	Review long-term changes in productive capacity through the Production Forecast at the point of plan renewal and across the wider District.
Upon completion of all harvesting activity.	If significant coupe variation, apply for appropriate amendment to FC as required as per FC PDN 01 prior to felling. Update Forester Web for completed clearfells.
Beat-up surveys between years 1 to 4. Year 5 stocking assessment, internal guidance OGB4.	Carry out beating up where stocking density falls below prescribed number of trees/ha to achieve full stocking.
Beat-up surveys between years 1 to 4. Year 5 stocking assessment, internal guidance OGB4.	Carry out enrichment planting where stocking density falls below prescribed number of trees/ha to achieve full stocking.
Beat-up surveys between years 1 to 4. Year 5 stocking assessment, internal guidance OGB4.	Carry out enrichment planting where stocking density falls below prescribed number of trees/ha to achieve full stocking.
Beat-up surveys between years 1 to 4. Year 5 stocking assessment, internal guidance OGB4.	Carry out enrichment planting where stocking density falls below prescribed number of trees/ha to achieve full stocking.
Beat-up surveys between years 1 to 5 year assessment.	Monitor change from current Semi natural class toward target SN 1 (>80% native). Consider future changes in management that can achieve target score.

To be informed from results of beat-up surveys between years 1 to 4 and year 5 stocking assessment, internal guidance OGB4.	Target deer control in line with District strategy.
2027	Modify the plans aims and/or objectives where these are no longer compatible with National or District Policy. Significant plan changes will require consultation and formal amendment from the Forestry Commission.

Appendix 5 – Tolerance table *Agreed Tolerance Table for Yorkshire Forest District, England*

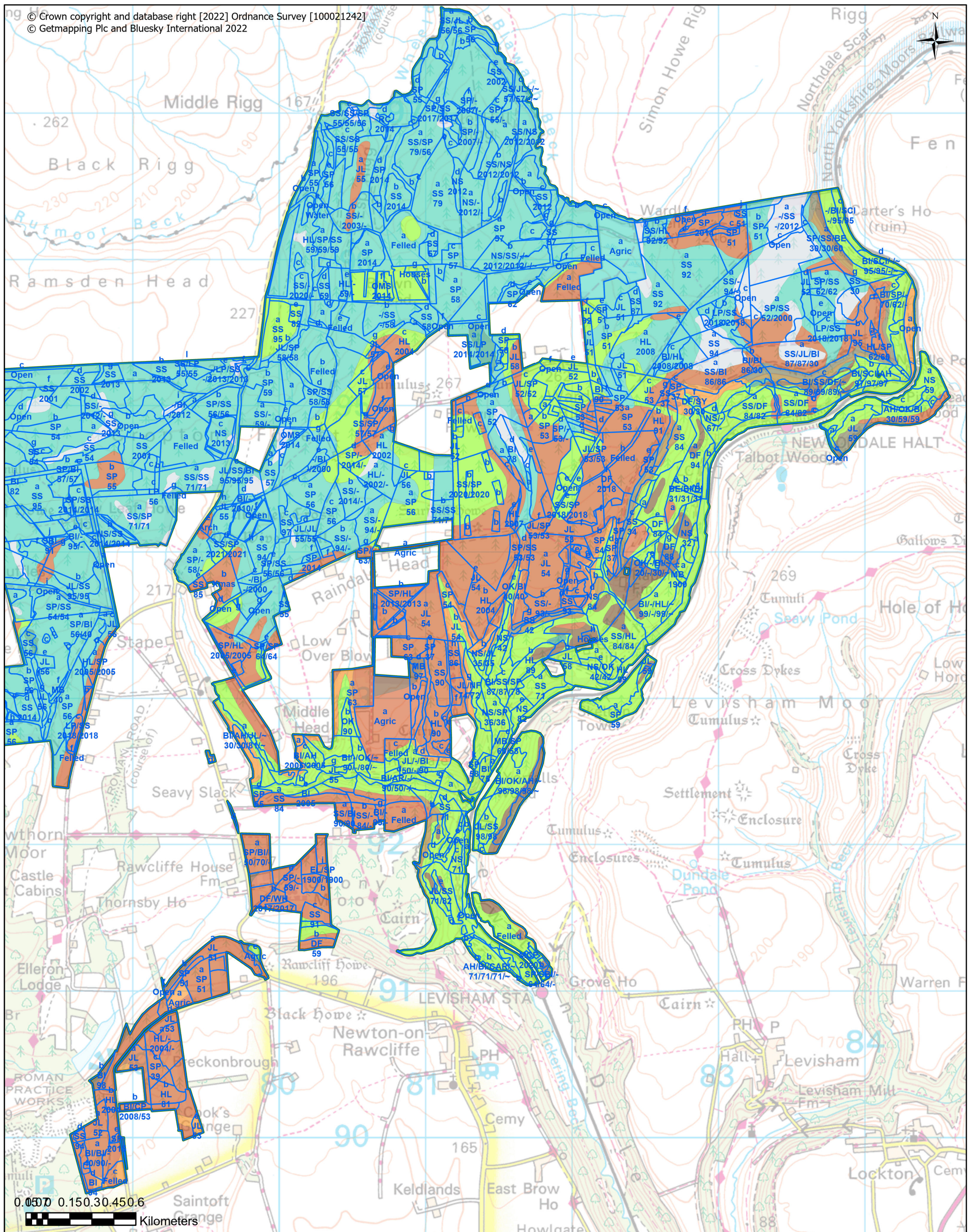
	Adjustment to felling coupe boundaries	Swapping of felling coupes	Adjustment to felling operation	Clearance of standing trees associated with wind-blown areas	Timing of restocking - including natural regeneration	Species choice	Tree health
Formal approval by area team required	≥25% of the coupe area	Where changes to the felling sequence is likely to result in a significant breach ¹ of the UKFS adjacency rules	Thinning to selective felling or clear felling	Sensitive² areas: all clearances of ≥1ha or clearances of ≥10% of the stand if area of stand is under 10ha. Non-sensitive areas: all clearances of ≥5ha or clearances of ≥25% of the stand if area of stand is under 20ha.	Where this is ≥ 4 planting seasons from the date of felling	From mixed, predominantly Broadleaves to evergreen conifer	Where no SPHN issued and felling required
Written approval only required from area team,²	Between 10-25% of the coupe area	Where changes to the felling sequence is likely to result in a minor breach ³ of the UKFS adjacency rules			Where this is at least 2 but no more than 4 planting seasons from the date of felling	Deciduous conifers to evergreen	Thinning ≥50% but ≤ 65%
Formal approval by area team <u>not required</u>⁴	≤ 10% of the coupe area	Where changes to the felling sequence does not result in a breach of the UKFS adjacency rules.	Clear felling to selective felling or thinning	Only if formal approval is not required.	Where this is ≤ 2 planting seasons from the date of felling	Any other changes	Where SPHN is issued or thinning up to 50%

¹ Greater than 20% of the coupe boundary

² Approval letter retained for compliance inspection purposes

³ 20% or less of the coupe boundary

⁴ District team must retain all relevant documentation for compliance inspections



FP Map 01 - Soils

Scale: 1:24,000 @ A3

Drawn: March 2022

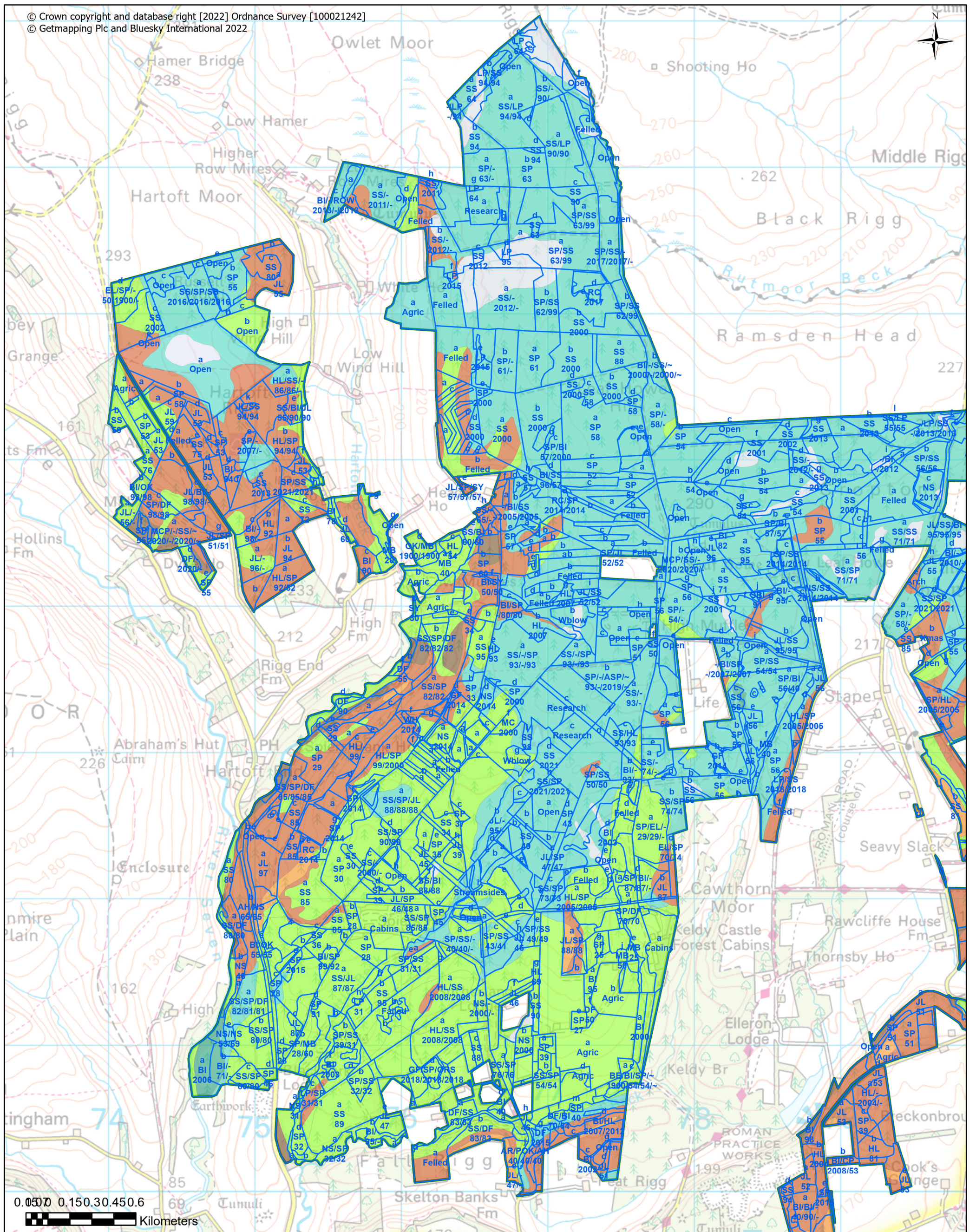
Soils

- 1 [Typical Brown Earth]
- 3 [Typical/Hardpan Podzol]
- 4 [Typical/Podzolic Ironpan Soil]
- 6 [Typical Peaty Surface-Water Gley]
- 7 [Typical/Podzolic Surface-Water]
- 8 [Juncus effusus Bog]
- 11 [Blanket Bog]



Forestry England forests and woodlands have been certified in accordance with the UK Woodland Assurance Standard (UKWAS)





FP Map 01 - Soils

Scale: 1:24,000 @ A3

Drawn: March 2022

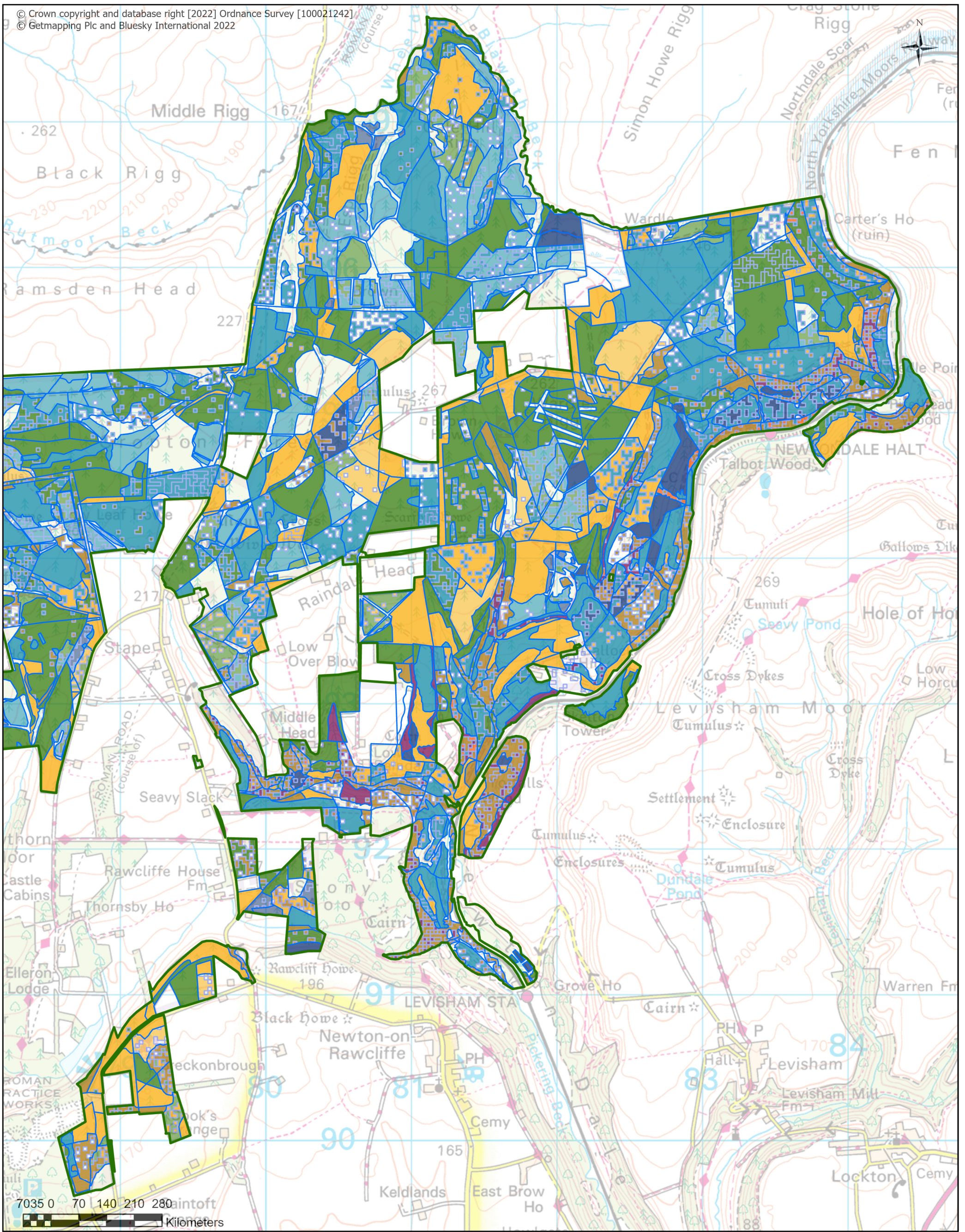
Soils


- 1 [Typical Brown Earth]
- 3 [Typical/Hardpan Podzol]
- 4 [Typical/Podzolic Ironpan Soil]
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- 11 [Blanket Bog]



Forestry England forests and woodlands have been certified in accordance with the UK Woodland Assurance Standard (UKWAS)













 Forestry England

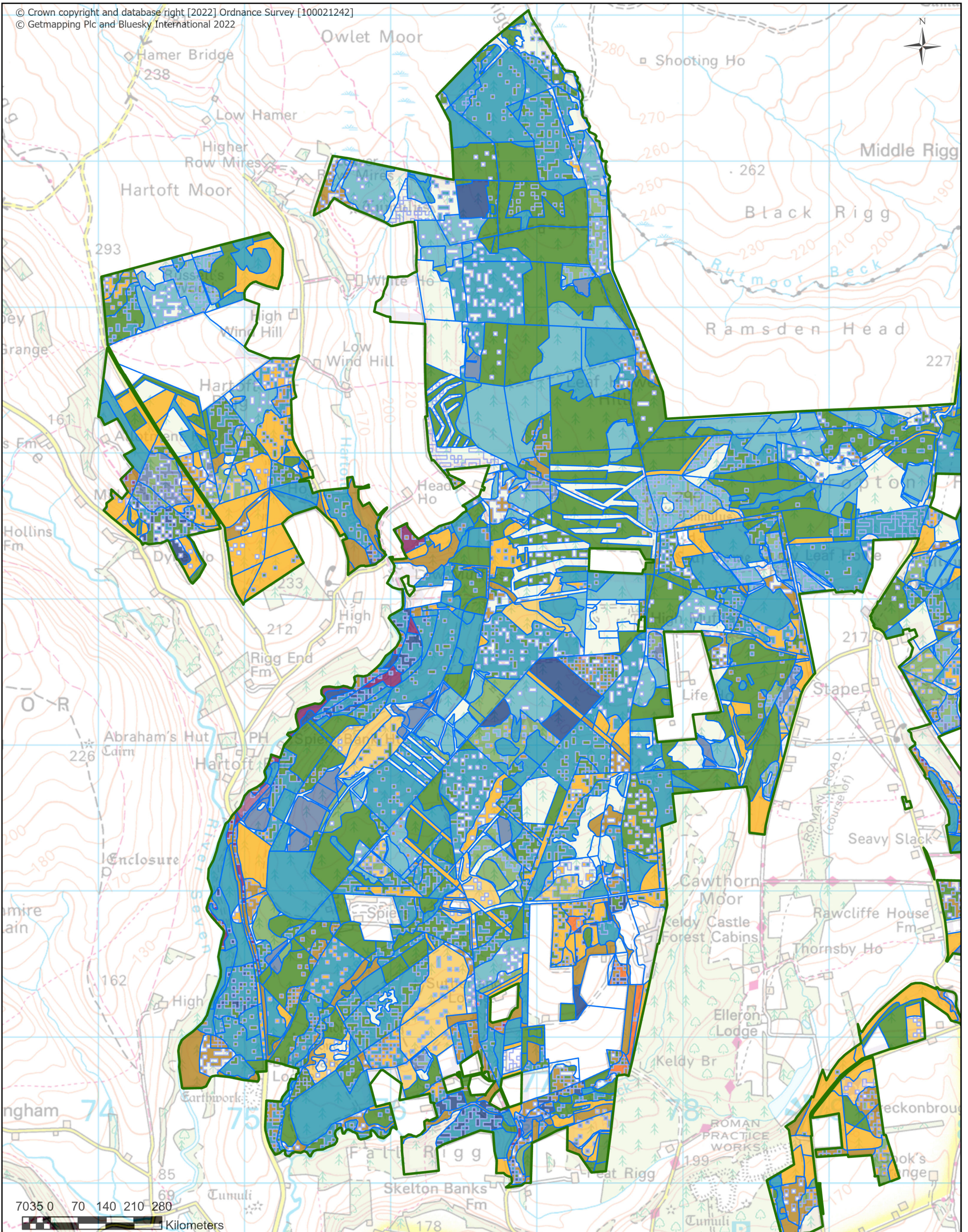
FP Map 02 - Current Species

Scale: 1:24,000 @ A3

Drawn: March 2022

- | | |
|---|--|
|  Beeches |  Other Conifers |
|  Larches |  Pines |
|  Oaks |  Spruces |
|  Other Broadleaves |  No Species |









	Forestry England forests and woodlands have been certified in accordance with the UK Woodland Assurance Standard (UKWAS)	
<small>The mark of responsible forestry</small>		<small>Promoting Sustainable Forest Management www.pefc.org</small>



FP Map 02 - Current Species

Scale: 1:24,000 @ A3

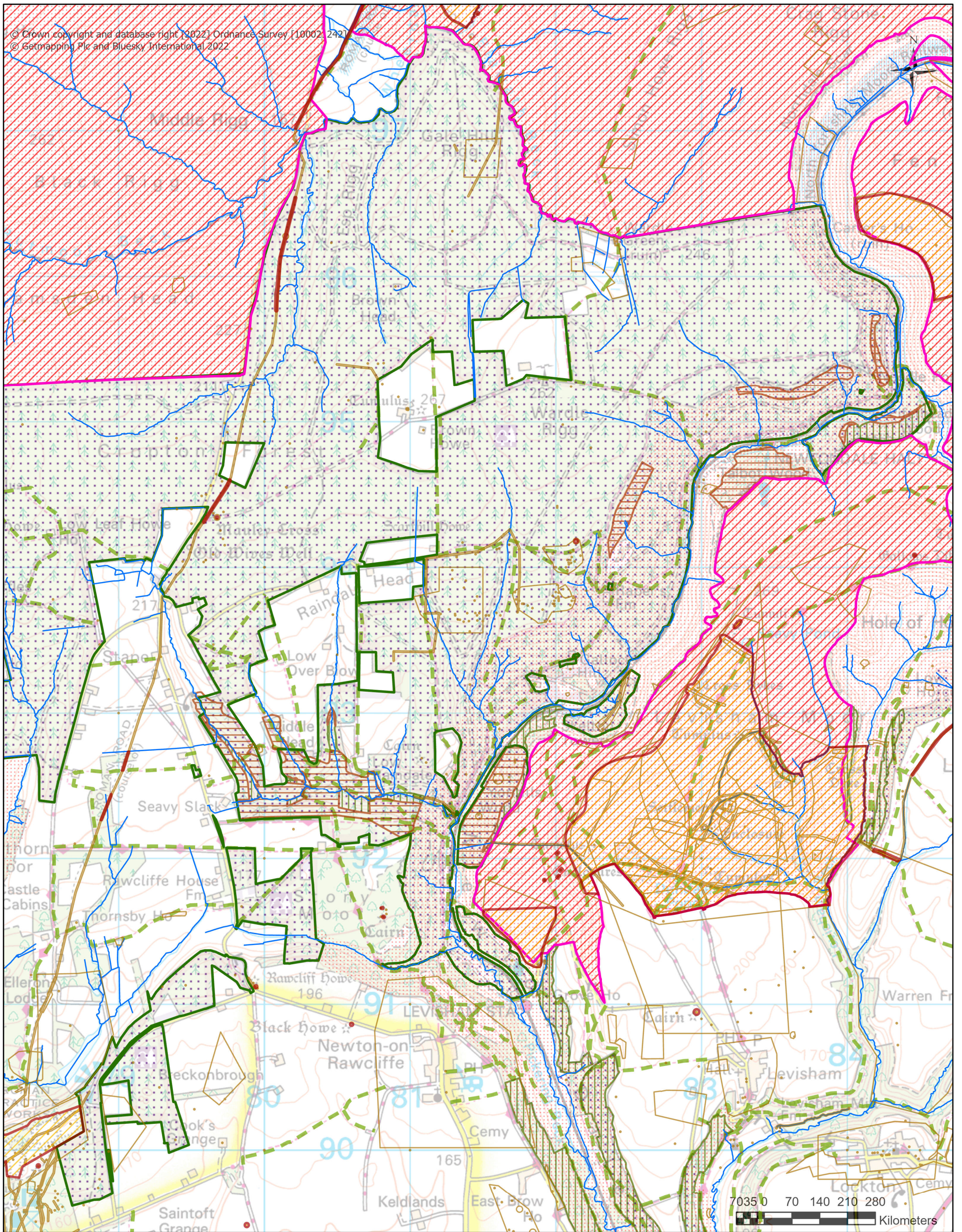
Drawn: March 2022

- | | |
|---|--|
|  Beeches |  Other Conifers |
|  Larches |  Pines |
|  Oaks |  Spruces |
|  Other Broadleaves |  Open, Felled etc |















Forestry England forests and woodlands have been certified in accordance with the UK Woodland Assurance Standard (UKWAS)





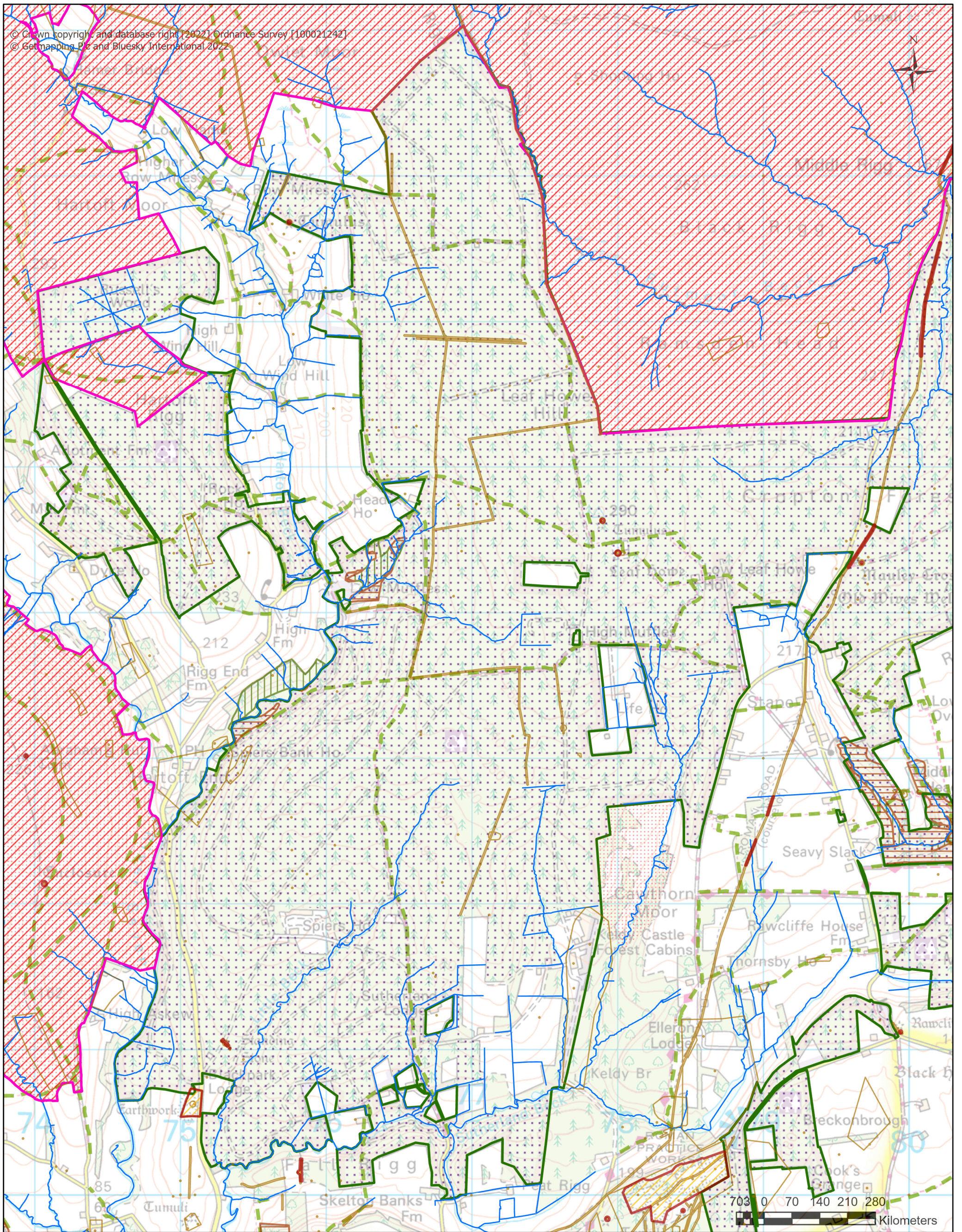
FP Map 03 - Management Information
 Scale: 1:24,000 @ A3
 Drawn: March 2022

- | | |
|--|--|
|  Scheduled Monuments |  Ancient & Semi-Natural Woodland |
|  Heritage |  Ancient Replanted Woodland |
|  Special Areas of Conservation |  Plantations on Ancient Woodland Sites (PAWS) |
|  Sites of Special Scientific Interest |  CROW S16 Dedicated Land |
|  Special Protection Areas |  Public Rights of Way |
|  Blocks |  OS Water Network |



Forestry England forests and woodlands have been certified in accordance with the UK Woodland Assurance Standard (UKWAS)

















FP Map 03 - Management Information

Scale: 1:24,000 @ A3

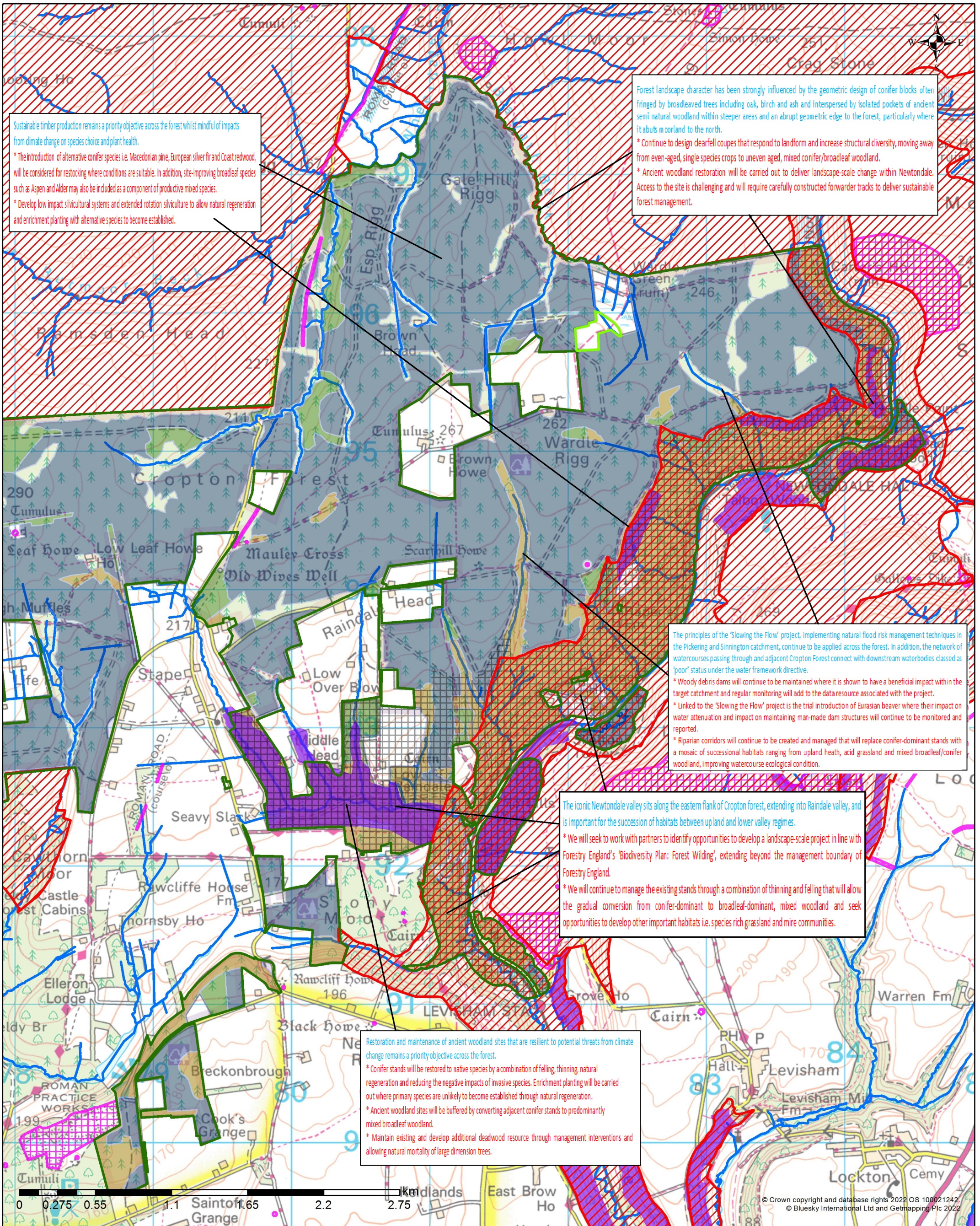
Drawn: March 2022

- | | |
|--|--|
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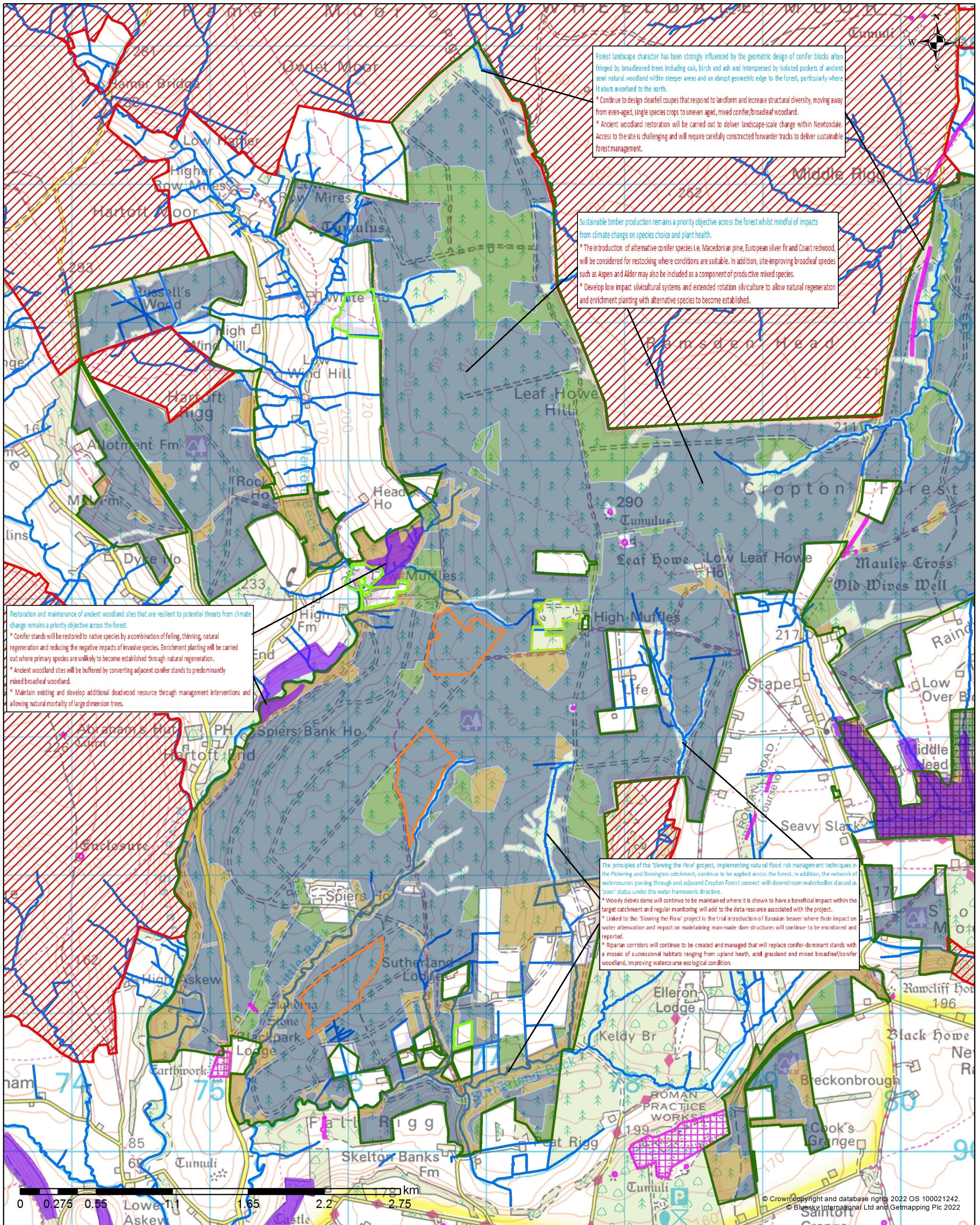
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- Forest block
- Convert and maintain as predominantly mixed broadleaf
- Continue to manage as predominantly productive mixed conifer
- Maintain as predominantly pine woodland
- Potential areas for new planting

- Develop a mosaic of succession open woodland across a range of habitat types: upland heath, wooded heath, riparian buffer zones
- SSSI, SPA, SAC to be managed in line with agreed management plans
- Scheduled monuments to be managed in line with agreed plans
- Restore and maintain ancient woodland sites
- Forestry England 'Forest Wilding' project within Newtondale valley
- Watercourses and riparian habitats



Forest landscape character has been strongly influenced by the geometric design of conifer blocks often fringed by broadleaved trees including oak, birch and ash and interspersed by isolated pockets of ancient semi natural woodland within steeper areas and an abrupt geometric edge to the forest, particularly where it abuts moorland to the north.

- * Continue to design clearfell coupes that respond to landform and increase structural diversity, moving away from even-aged, single species crops to uneven aged, mixed conifer/broadleaf woodland.
- * Ancient woodland restoration will be carried out to deliver landscape-scale change within Newtondale. Access to the site is challenging and will require carefully constructed forwarder tracks to deliver sustainable forest management.

Sustainable timber production remains a priority objective across the forest whilst mindful of impacts from climate change on species choice and plant health.

- * The introduction of alternative conifer species i.e. Macedonian pine, European silver fir and Coast redwood, will be considered for restocking where conditions are suitable. In addition, site-improving broadleaf species such as Aspen and Alder may also be included as a component of productive mixed species.
- * Develop low impact silvicultural systems and extended rotation silviculture to allow natural regeneration and enrichment planting with alternative species to become established.

Restoration and maintenance of ancient woodland sites that are resilient to potential threats from climate change remains a priority objective across the forest.

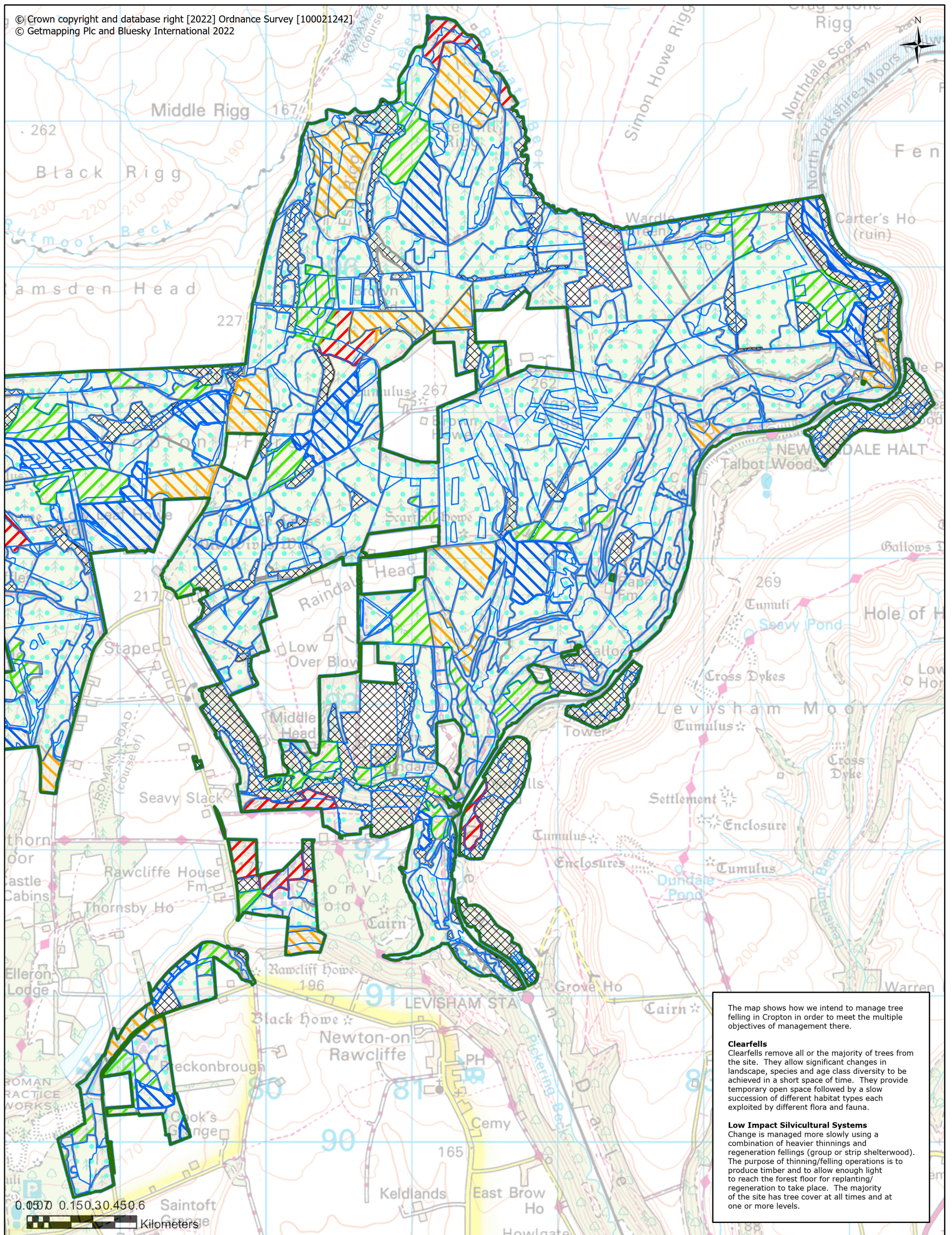
- * Conifer stands will be restored to native species by a combination of felling, thinning, natural regeneration and reducing the negative impacts of invasive species. Enrichment planting will be carried out where primary species are unlikely to become established through natural regeneration.
- * Ancient woodland sites will be buffered by converting adjacent conifer stands to predominantly mixed broadleaf woodland.
- * Maintain existing and develop additional deadwood resource through management interventions and allowing natural mortality of large dimension trees.

The principles of the 'Slowing the Flow' project, implementing natural flood risk management techniques in the Pickering and Sinnington catchment, continue to be applied across the forest. In addition, the network of watercourses passing through and adjacent Cropton Forest connect with downstream waterbodies classed as 'poor' status under the water framework directive.

- * Woody debris dams will continue to be maintained where it is shown to have a beneficial impact within the target catchment and regular monitoring will add to the data resource associated with the project.
- * Linked to the 'Slowing the Flow' project is the trial introduction of Eurasian beaver where their impact on water attenuation and impact on maintaining man-made dam structures will continue to be monitored and reported.
- * Riparian corridors will continue to be created and managed that will replace conifer-dominant stands with a mosaic of successional habitats ranging from upland heath, acid grassland and mixed broadleaf/conifer woodland, improving watercourse ecological condition.

- Forest block
- Convert and maintain as predominantly mixed broadleaf
- Continue to manage as predominatly productive mixed conifer
- Maintain as predominantly pine woodland
- Potential areas for new planting

- Develop a mosaic of succession open woodland across a range of habitat types: upland heath, wooded heath, riparian buffer zones
- SSSI, SPA, SAC to be managed in line with agreed management plans
- Scheduled monuments to be managed in line with agreed plans
- Restore and maintain ancient woodland sites
- Forestry England 'Forest Wilding' project within Newtondale valley
- Watercourses and riparian habitats
- Premature felling under-performing sitka spruce



The map shows how we intend to manage tree felling in Cropton in order to meet the multiple objectives of management there.

Clearfells
 Clearfells remove all or the majority of trees from the site. They allow significant changes in landscape, species and age class diversity to be achieved in a short space of time. They provide temporary open space followed by a slow succession of different habitat types each exploited by different flora and fauna.

Low Impact Silvicultural Systems
 Change is managed more slowly using a combination of heavier thinnings and regeneration fellings (group or strip shelterwood). The purpose of thinning/felling operations is to produce timber and to allow enough light to reach the forest floor for replanting/regeneration to take place. The majority of the site has tree cover at all times and at one or more levels.



FP Map 05 - Proposed Felling

Scale: 1:24,000 @ A3

Drawn: March 2022

Scenario Management Coupes
 Felling Year

- 2022 - 2026
- 2027 - 2031
- 2032 - 2036
- 2037 - 2041
- Beyond 2042 or LISS
- Other / Open Land
- No Felling Date Required



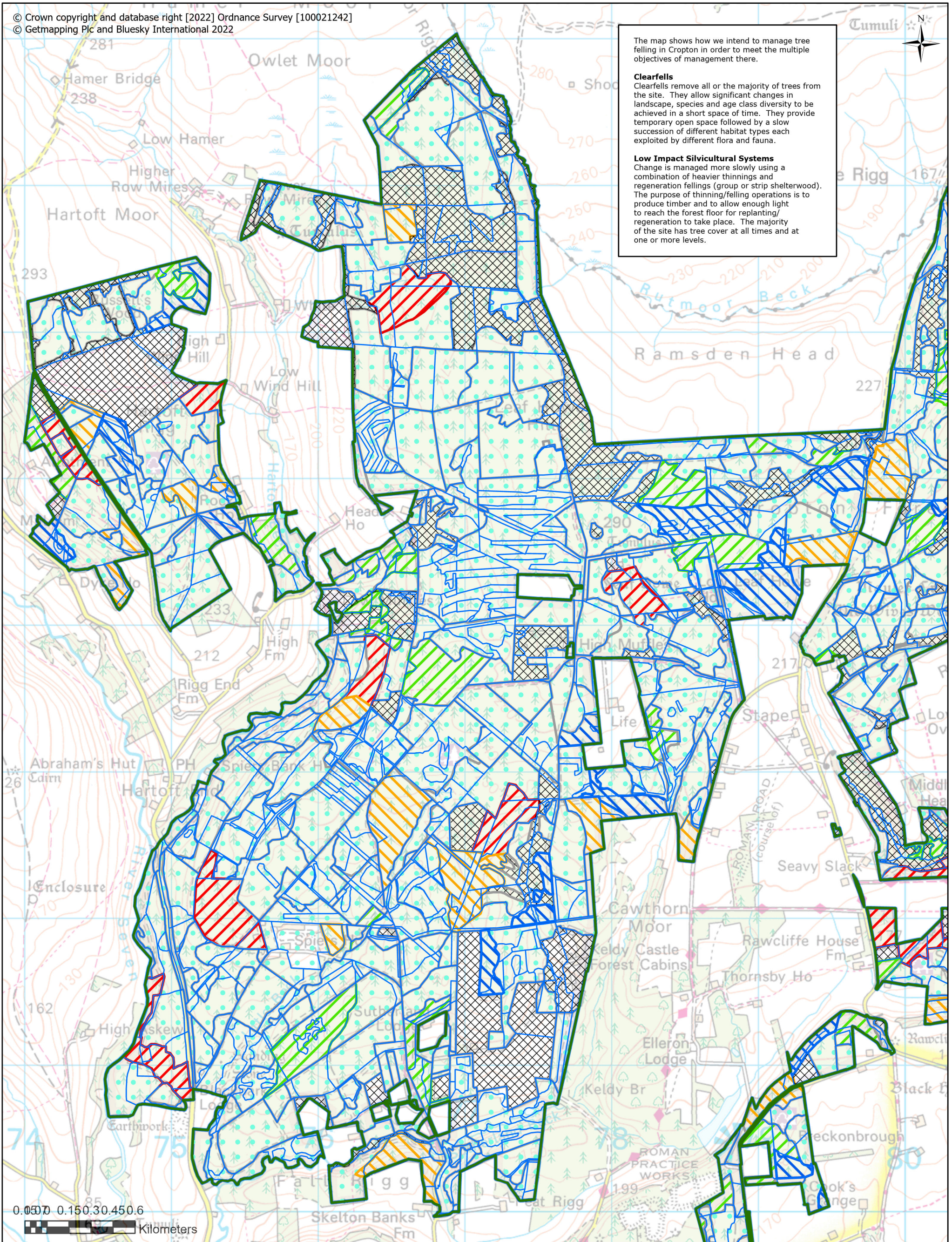
Forestry England forests and woodlands have been certified in accordance with the UK Woodland Assurance Standard (UKWAS)




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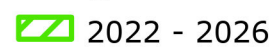

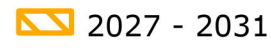
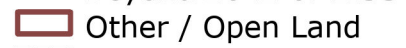
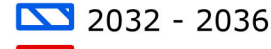
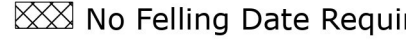
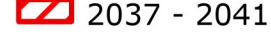
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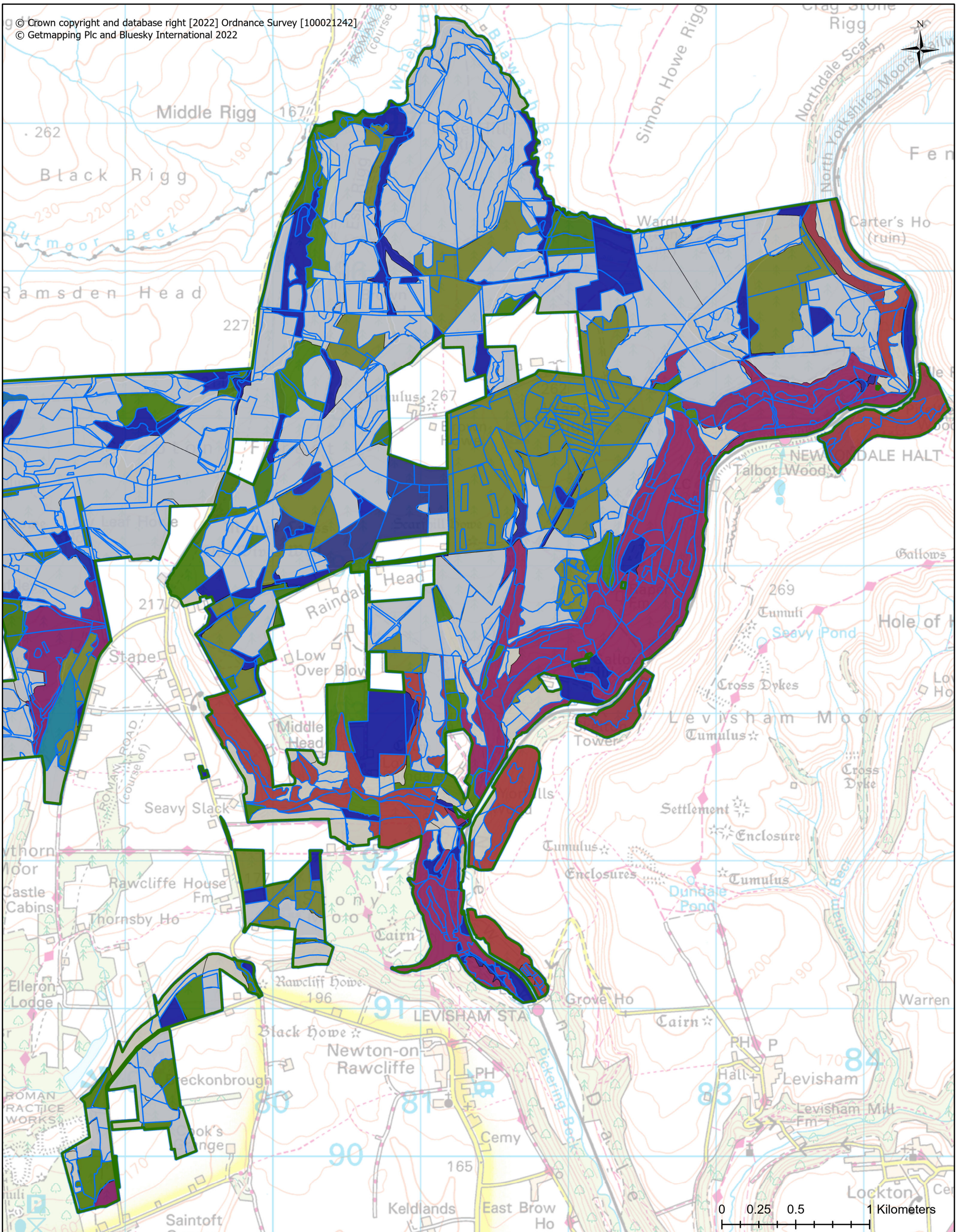


 Forestry England
 FP Map 05 - Proposed Felling
 Scale: 1:24,000 @ A3
 Drawn: March 2022

Scenario Management Coupes
 Felling Year

 2022 - 2026	 Beyond 2042 or LISS
 2027 - 2031	 Other / Open Land
 2032 - 2036	 No Felling Date Required
 2037 - 2041	

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FP Map 06 - Management Type

Scale: 1:24,000 @ A3

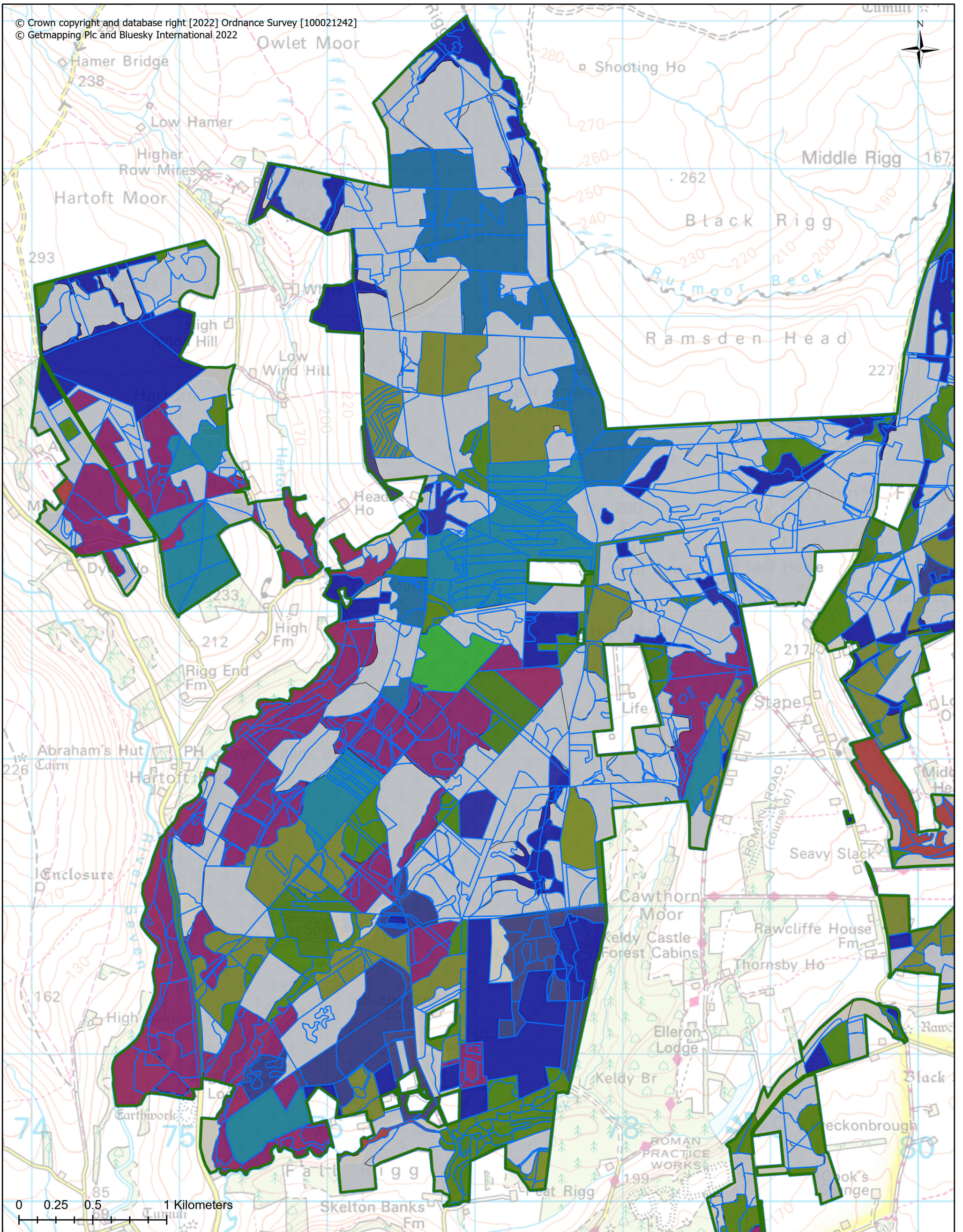
Drawn: March 2022

- | | |
|---|---|
|  Clearfell |  Uniform shelterwood |
|  Clearfell with seed trees |  Irregular shelterwood (general) |
|  Long Term Retention |  Minimum Intervention |
|  Strip shelterwood |  Natural Reserve |
|  Group shelterwood |  Other\Open Land |



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FP Map 06 - Management Type

Scale: 1:24,000 @ A3

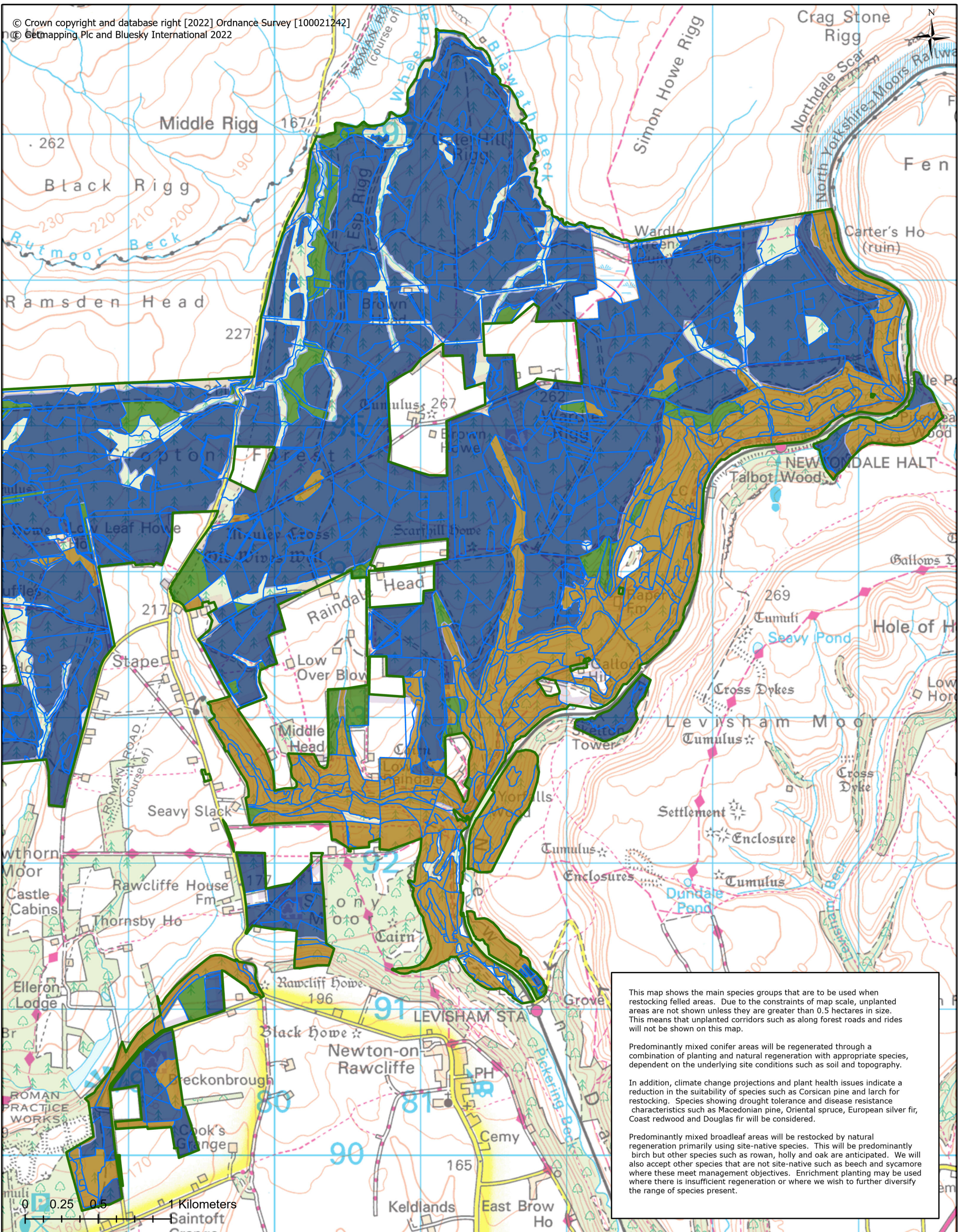
Drawn: March 2022

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|  Long Term Retention |  Minimum Intervention |
|  Strip shelterwood |  Natural Reserve |
|  Group shelterwood |  Other/Open Land |



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This map shows the main species groups that are to be used when restocking felled areas. Due to the constraints of map scale, unplanted areas are not shown unless they are greater than 0.5 hectares in size. This means that unplanted corridors such as along forest roads and rides will not be shown on this map.

Predominantly mixed conifer areas will be regenerated through a combination of planting and natural regeneration with appropriate species, dependent on the underlying site conditions such as soil and topography.

In addition, climate change projections and plant health issues indicate a reduction in the suitability of species such as Corsican pine and larch for restocking. Species showing drought tolerance and disease resistance characteristics such as Macedonian pine, Oriental spruce, European silver fir, Coast redwood and Douglas fir will be considered.

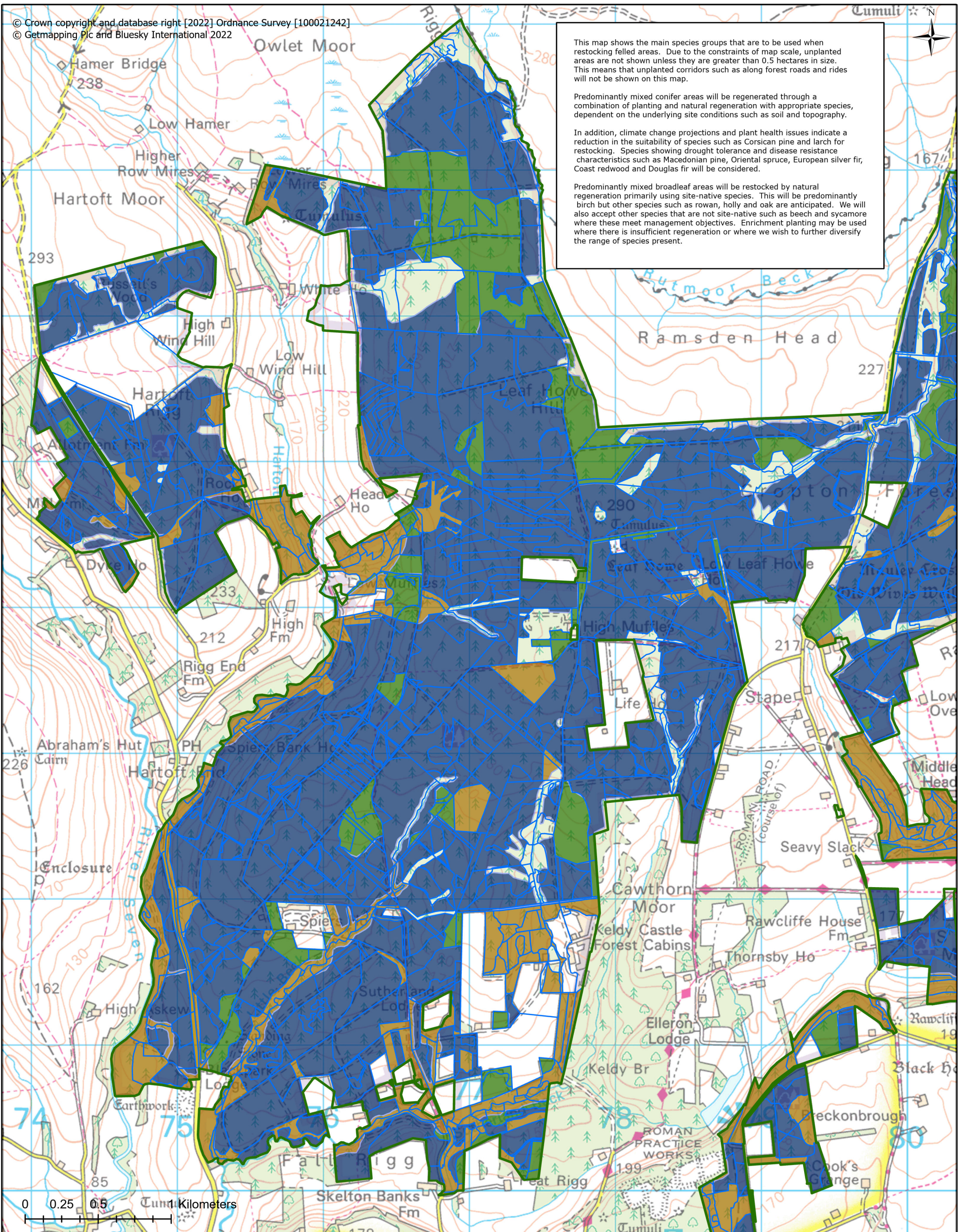
Predominantly mixed broadleaf areas will be restocked by natural regeneration primarily using site-native species. This will be predominantly birch but other species such as rowan, holly and oak are anticipated. We will also accept other species that are not site-native such as beech and sycamore where these meet management objectives. Enrichment planting may be used where there is insufficient regeneration or where we wish to further diversify the range of species present.

	Predominantly Mixed Broadleaves
	Predominantly Mixed Conifers
	Predominantly Pine Species
	Open Ground/Non Forest Habitats


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 Forestry England

FP Map 07 - Future Habitat & Restock

Scale: 1:24,000 @ A3

Drawn: March 2022

-  Predominantly Mixed Broadleaves
-  Predominantly Mixed Conifers
-  Predominantly Pine Species
-  Open Ground/Non Forest Habitats



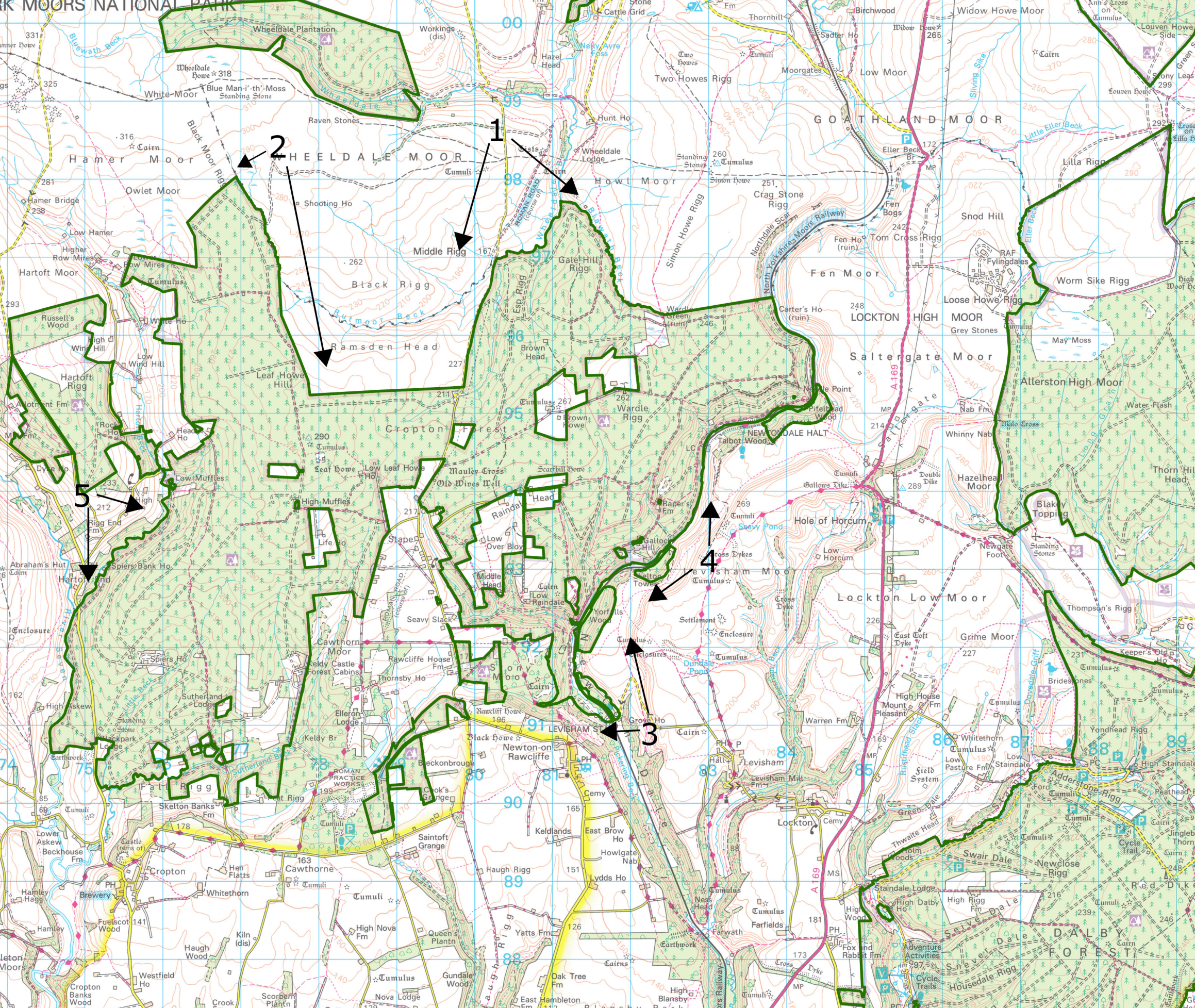
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NORTH YORK MOORS NATIONAL PARK



External

Forest restructuring over the past ten years has seen significant parts of even-aged, single species conifer crops felled across a wide range of sites. Felling sites range in shape and scale, where subsequent regeneration either by planting or natural regeneration is creating a more diverse forest by increasing the range of different species and age structure.

Future management through appropriately designed felling coupes will continue the process of restructuring. Low impact silvicultural management will contribute to the development of more varied and intimate internal forest landscapes.



1. View from Wheeldale Road, overlooking Esp Rigg and Gale Hill. Over the course of the plan, coupes will be felled across Esp Rigg and Gale Hill Rigg as a continuation of the restructuring process. Even-aged, single species stands will be restocked with a wider range of mixed conifer species.



2. View from Wheeldale Moor, overlooking the eastern side of Middleton Moor. Recent felling has started to break up the hard edge interface along the external boundary between the forest and North York Moors SSSI/SPA/SAC. Subsequent restocking will include areas of open ground that will form successional habitat that will allow heathland communities to re-colonise these sites. We also anticipate some natural regeneration of conifer species. Where conifer regeneration starts to dominate these sites, they will be removed as part of routine felling or thinning operations.

2010



3. **View from Braygate Balk 2010 and 2022, overlooking parts of Newtdale and the eastern fringe of Cropton Forest.** Felling through the previous plan has seen the reduction in conifer woodland above Levisham Station at Rhumbard Snout and the entrance to Newtdale. These sites will further increase the semi-natural characteristics within the dale as they develop toward mixed broadleaf woodland and upland flush/fen habitat. Further changes will occur with felling planned at the eastern end of Raindale, removing conifer and restocking to mixed broadleaf woodland. Other changes will be more gradual through the continuation of thinning operations and small-scale felling.

2022



4. **View from West Side Brow, overlooking parts of Newtdale.** A popular view when seen from this section of the Tabular Hills Walk where a wide range of conifer, broadleaf and mixed woodland species occupies land managed by Forestry England. There are currently few areas of open ground on the western side the dale, but areas of permanent pasture can be seen at Gallock Hill and Kale Pot Hole.

5. **View from Hartoft Wood across Spiers Bank.** This is a relatively stable forest landscape with only one clear fell planned within the lifetime of this plan. These are windfirm stands that will continue to be thinned and over time will increase in species and age diversity.



INTERNAL



6. **Windblown deadwood.** Large diameter windblown trees provide opportunities for deadwood habitat to develop and contribute to increasing biodiversity within the forest. These events also provide temporal open areas and seeding opportunities for other species and habitats to develop. Depending on scale, location and safety considerations, some areas of windblow will be retained to develop by natural processes, and not cleared as part of routine harvesting operations.



7. **Semi-natural refugia.** The steep, craggy outcrops along the scarp slope of Newtondale have retained some of their semi-natural characteristics. Thinning and selective felling of conifer stands adjacent to these sites will provide opportunities for species and habitats to migrate and colonise the spaces created.