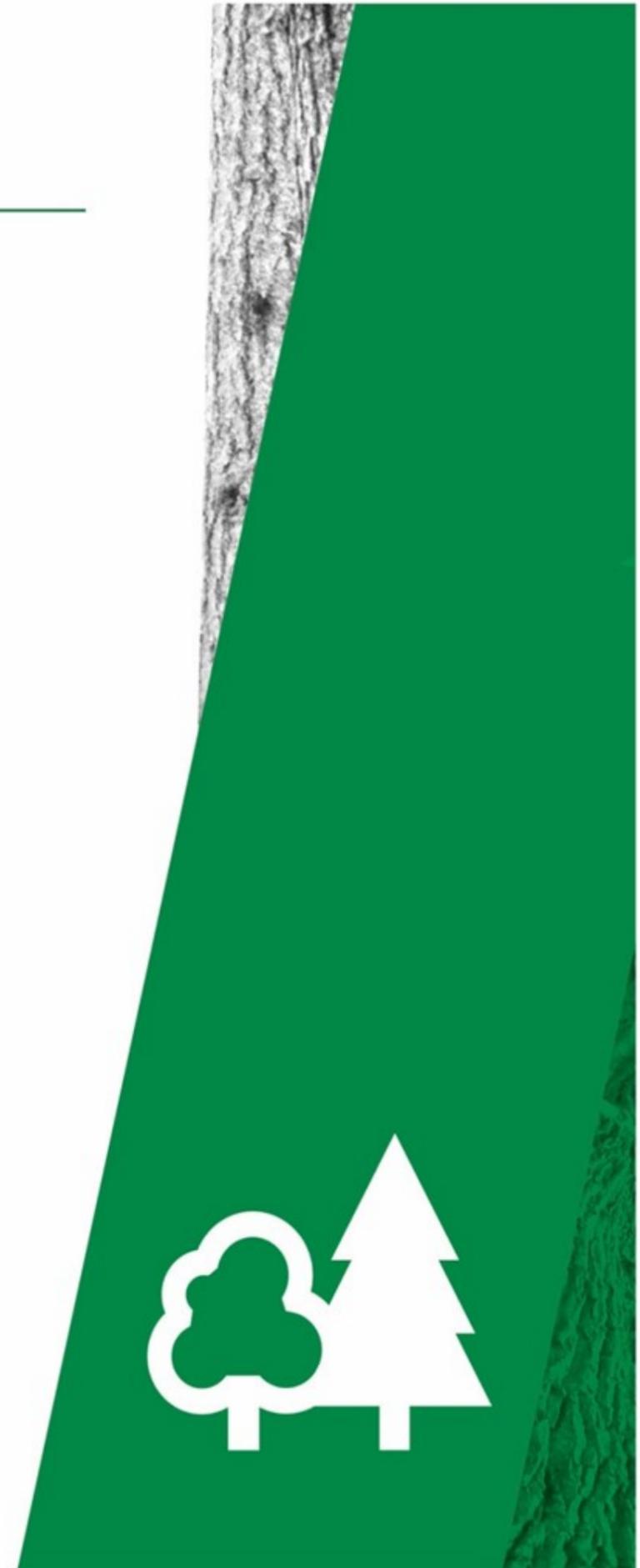


# Birklands Forest Plan 2023 – 2033



The mark of  
responsible forestry

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





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## Summary

This Forest Plan (FP) summarises proposals by Forestry England for the management of the Birklands. The Birklands FP area is a single wooded block of 587ha and is wholly leasehold, comprising woodlands leased from the Welbeck, Thoresby and Fitzherbert Estates.

Situated in North Nottinghamshire, Birklands lies between the villages of Market Warsop and Edwinstowe, approximately 9km NE of Mansfield centre. See *Location Map, p.14*. The woodland straddles two local authorities: Newark and Sherwood District to the east and Mansfield District to the west.

The Birklands falls within the Sherwood National Character Area (NCA). The elevation is between 60-120m and the landform is relatively flat with gently rolling hills and shallow valleys. The NCA is characterised by woodland (both historic oak/birch wood pasture and more recent pine plantations), large estate parklands, heathland, open arable land and a strong mining heritage. The Birklands is contiguous with woodland in Sherwood Forest Country Park and the Thoresby Estate, sitting within the well-wooded wider landscape including Clumber, Bilhaugh and Sherwood Pines. The woodland is prominent in the local landscape with principal views from the A6075 road to the south (between Mansfield Woodhouse/Edwinstowe) and Netherfield Road to the north (between Meden Vale and Budby).

The principle geology is Permo-Triassic reddish sandstone with nutrient poor, well-drained, sandy and coarse loamy soils. The species composition and forest type are mixed: consisting of conifer plantation with significant mature broadleaved components in the secondary woodland to the north and west; alongside SSSI-designated ancient oak-birch woodland pasture to the south and east. The population of veteran and ancient oaks and standing hulks is internationally important.

The primary management objectives for the Birklands FP are to:

- Maintain and improve the ecological value of the priority habitats, the Trees of Special Interest\* (TSI) and the open and woodland edge habitats.
- Sustainably grow commercial timber using species and systems resilient to the impacts of pests, diseases and climate change to maximise yields and prioritise producing quality timber.
- Conserve the heritage features and maintain public access.



## Application for Forest Plan Approval

### i Plan Area Identification:

Forest District: Central Forest District  
 Beat: Sherwood North Beat  
 Name: Birklands Forest Plan  
 Nearest Town: Edwinstowe  
 Grid Reference: SK 5986 6764

Local Planning Authorities: Mansfield District Council and  
 Newark and Sherwood District Council

### ii Designations:

Sherwood Forest National Nature Reserve\* (NNR) - NE183  
 Birklands & Bilhaugh Special Area of Conservation\* (SAC)  
 Birklands & Bilhaugh Site of Special Scientific Interest\* (SSSI)  
 Birklands West & Ollerton Corner SSSI  
 NCA: Sherwood (Profile 49)

### iii Date of Commencement of Plan: On approval.

Proposed felling and restocking summary for 10 year FP period:

	Conifers	Broadleaves	Open
Clear Fell	43.3	11.3	n/a
Restocking	42.2	3.5	8.9

*The above figures refer to the gross area and exclude routine thinning operations.*

Total clear fell area: 54.6ha  
 Forest Plan maps are attached

In addition to the proposed felling, 340.1ha will be managed using Lower Impact Silvicultural Systems\* (LISS). This will be done through the removal of small groups of trees, removing no more than 40% of the stems within any single management unit/compartments over the plan period. This operation will provide sufficient light to boost growth of understorey and ground flora, allow adequate space for the development of crowns and stem form for quality timber and accelerate individual tree growth; and also be supported, where necessary, by supplementary planting in order to increase species diversity.

I apply for Forest Plan approval for the area described above and in the enclosed Forest Plan.

**Birklands FP approved on** .....

All of our forests and woodlands in this Forest District are certified to the Forest Stewardship Council® (FSC®) licence code FSC-C123214 and the Programme for the Endorsement of Forest Certification (PEFC) licence code SA-PEFC-FM-006972 standards.

All Forestry England forests and woods are independently certified as sustainably managed, to continue to benefit future generations.



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



## 1. What are Forest Plans?

Forest Plans are produced by us, Forestry England, as a means of communicating our management intentions to a range of stakeholders. They aim to fulfil a number of objectives:

- To provide descriptions of our woodlands to show what they are like now.
- To show what we intend the woodlands to look like in the future.
- To detail our felling and restocking management proposals for the first 10 years in order to obtain approval from the statutory regulators.

We use some technical words and phrases in the text because they best describe what we are doing. These technical words are identified throughout the plan with an asterisk \* and their meaning shown in a glossary (*Appendix I, p.11-13*).

A Forest Plan is a ‘felling and restocking’ plan and is written at a landscape scale. It does not set out the detailed yearly management operations for each small area in a wood, known as a coupe\*. It is not possible to say in which year a particular operation will take place, but we can say in which five-year period it should happen. Operational Plans\* are written by the Beat Forester before work is undertaken. These plans outline the site specific features and constraints, and the measures in place to account for these during the work. This forest plan does not deal with the specific management of recreation, ecological or archaeological features. Planning for these elements follows a different management cycle and process.

*Terms of Reference (p.10)* are included, which set out the management objectives for the plan area, how these relate to national and district policies, and how these will be monitored.

All tree felling in the UK is regulated and a licence is required before trees can be felled. The scale of tree felling in Central England Forest District is such that the Forest Plan is the best mechanism for applying for this licence. Responsibility for checking that the plan meets all the relevant standards and statutes lies with the Forestry Commission. If all the criteria are met, full approval is given for the management operations in the first 10 years and outline approval for the medium term vision (10 years to 50 years).

All of our forests and woodlands are certified to the Forest Stewardship Council® (FSC®) and the Programme for the Endorsement of Forest Certification (PEFC) standards. All Forestry England's forests and woods are independently certified as sustainably managed, to continue to benefit future generations.



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



## 2. Review of Previous Forest Plan

The management objectives set out in the 2002 Birklands Forest Plan have been successfully delivered over the last 20 years:

### I. To improve biodiversity and nature conservation interests.

- Approved NNR\* and SSSI\* management plans are in place for the highest priority habitats. Units within the Birklands FP area are categorised as “Unfavourable—Recovering”
- Considerable work has been undertaken to conserve and improve the conditions for the irreplaceable ancient oaks. Extensive surveys have been commissioned to assess the individual status of the most significant veteran oaks and to prescribe specific management regimes. There are 334 TSI\* mapped within the FP area. This work is ongoing.
- Areas of transitional open space created by clearfelling support a wide variety of wildlife.
- Good progress has been made with the removal of invasive species within the woodland.

### II. To grow timber on a sustainable basis.

- Over 166ha of forest have been felled and restocked, through both planting and natural regeneration. This area has been restocked with 22 different species (11 broadleaf and 11 conifer), helping to improve species diversity and future forest resilience.

### III. To improve visual and structural diversity within component woodland.

- Structural diversity has been improved considerably from 2002 where the forest was previously dominated by 30-50 year old Corsican pine, see *Fig.1 below*:

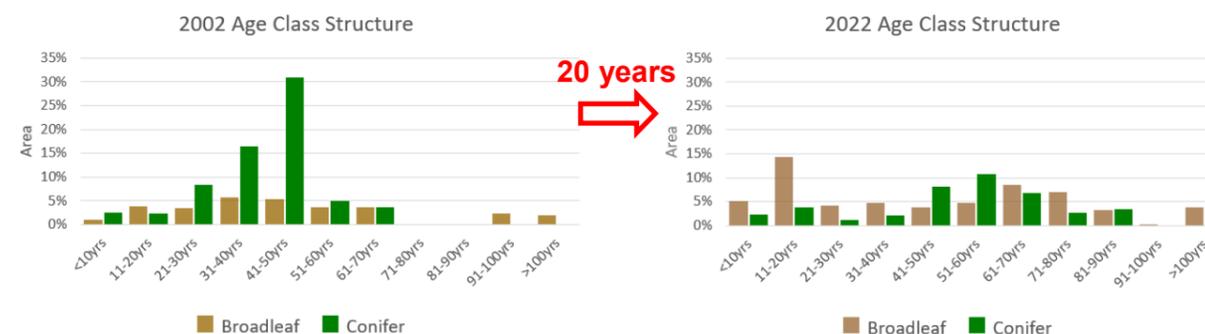


Fig.1: Birklands structural diversity: 2002 & Current (2022)

### IV. To improve the visual contribution of the woodlands in the local landscape.

- Felling patterns over the last 20 years have been sympathetic to both internal and external views, and a long-term broadleaf woodland edge has been retained along the visually sensitive boundaries.

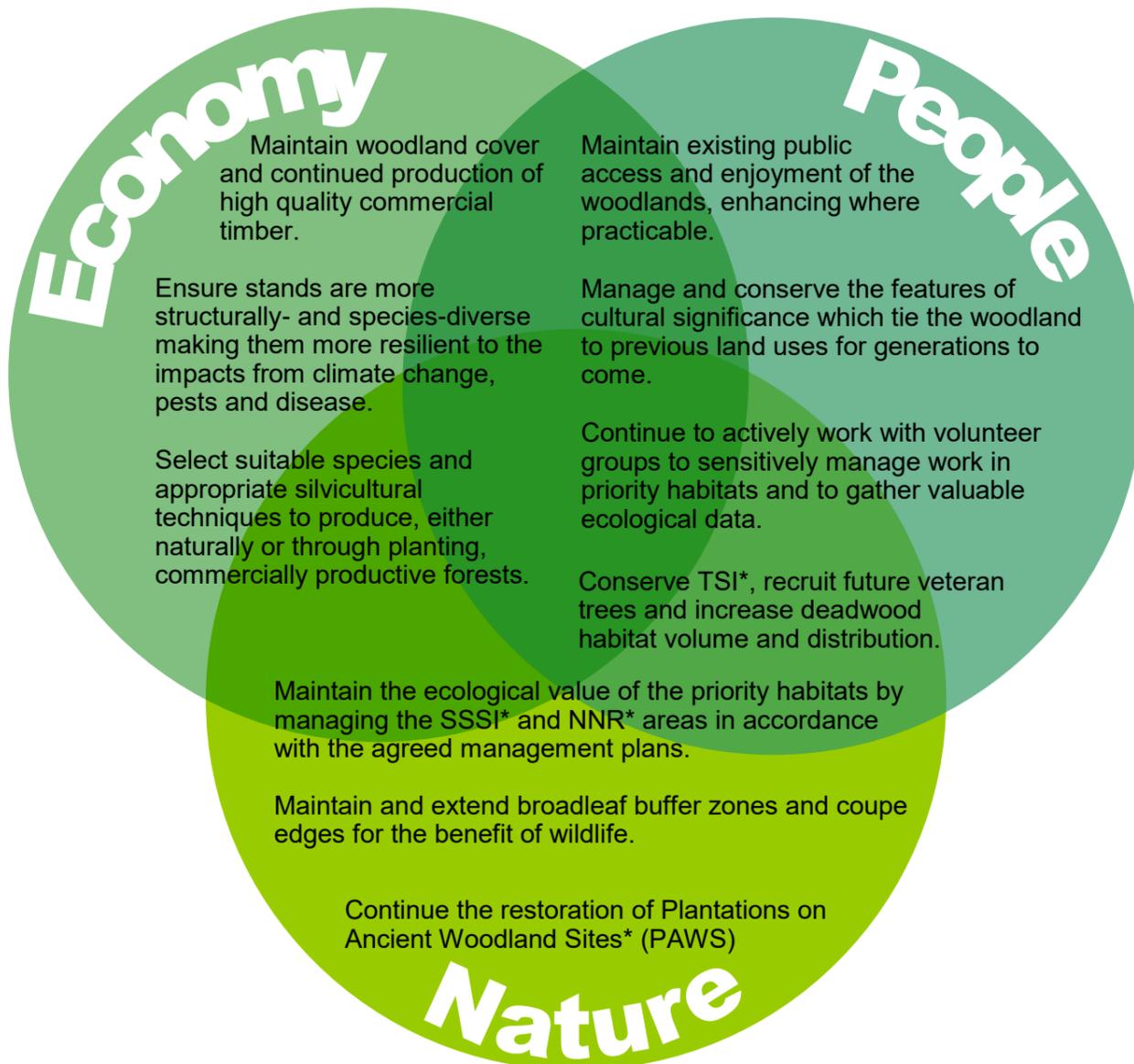
### V. To sustain public access provision appropriate to the District’s recreation strategy

- Unlike the nearby freehold Sherwood Pines, the Birklands is leasehold tenure and not dedicated open access land under CRoW (Countryside and Rights of Way Act 2000). However public rights of way have been well maintained to provide access, and the forest roads, rides and paths continue to support informal recreation for locals and visitors.

### 3. Management Objectives

Forestry England’s mandate is to protect and expand England’s forests and woodlands and increase their value to society and the environment. Our mission is to connect everyone with the nation’s forests by creating and caring for our forests for people to enjoy, wildlife to flourish and businesses to grow.

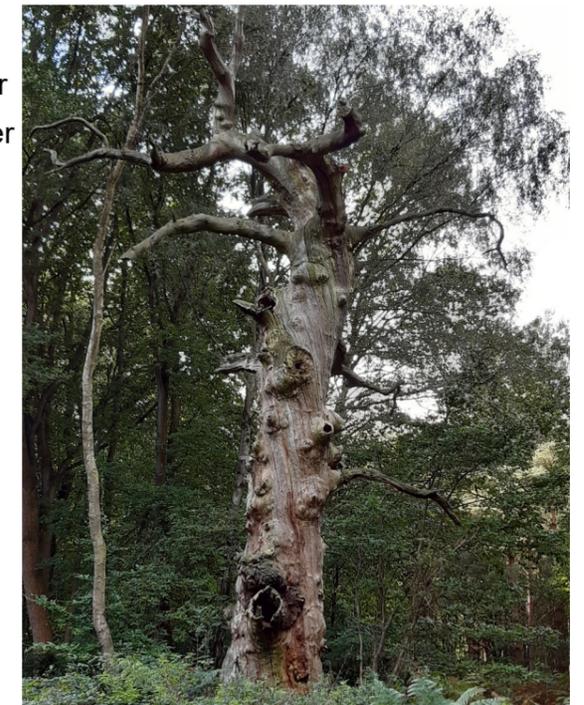
In the Birklands FP area we aim to achieve the following management objectives:



#### 3.1 Nature

The Birklands woodland provides an important habitat for many species, and this is reflected by over half of the FP area being covered by overlapping environmental designations. See *Designations Map, p.15*. These designations relate primarily to remnants of the historic Sherwood Forest, thought to be over 1000 years old. This forest remnant contains Europe’s highest concentration of ancient trees plus the associated rich invertebrate fauna (particularly saproxylic beetles and spiders), a diverse fungal assemblage (including the endangered Oak Polypore) and an important breeding bird community. These designated areas will continue to be managed in accordance with the approved SSSI/NNR management plans to preserve these irreplaceable ancient trees and associated ecology.

Deadwood habitats are prolific across the entire Birklands woodlands, offering a food source and/or nesting and roosting sites for birds (including lesser spotted woodpecker, common redstart and marsh tit) and bats (such as brown long-eared and Leisler’s). In addition to conserving the existing deadwood hulks, opportunities to increase deadwood will be taken during future operations where safe to do so. There are now 334 TSI recorded within the Birklands including the ancient and veteran trees, large diameter standing and fallen deadwood and future TSI. We will continue to identify more TSI to be retained and protected, increasing valuable deadwood and ensuring continuity of habitat as trees of different ages/cohorts reach biological maturity and decay.



Pic.1 Important deadwood habitat within the Birklands

A priority for Forestry England is the management of open space and associated woodland edge habitat for the benefit of wildlife. Birch recolonises profusely here (hence the name “Birklands” / “Birch-lands”), and natural regeneration in areas of open space will be routinely removed. Recent operations have included regeneration clearance in the ‘Neutral Ground’ area, in this instance in conjunction with the Sherwood Forest Trust.

Further to the 67.3ha of permanent open space, around 54ha of transitional open space will be created during the 10 year plan period as a consequence of the clearfell operations.

Monitoring by the Birklands Ringing Group over the last 50 years has shown how important these transitional open spaces are for woodland and woodland-edge species; leading to an increase in populations of nightjar, tree pipit, redstart and garden warbler.



**Pic.2** Purple emperor (*Apatura iris*)

The Birklands is an important site for Lepidoptera where 838 different species have been recorded since 1800. A key species is the Welsh clearwing moth; the Birklands being one of only two sites in England where this species is known to occur.

There is also a high incidence of the purple emperor butterfly in the Birklands, its larvae favouring the regenerating goat willow habitat.

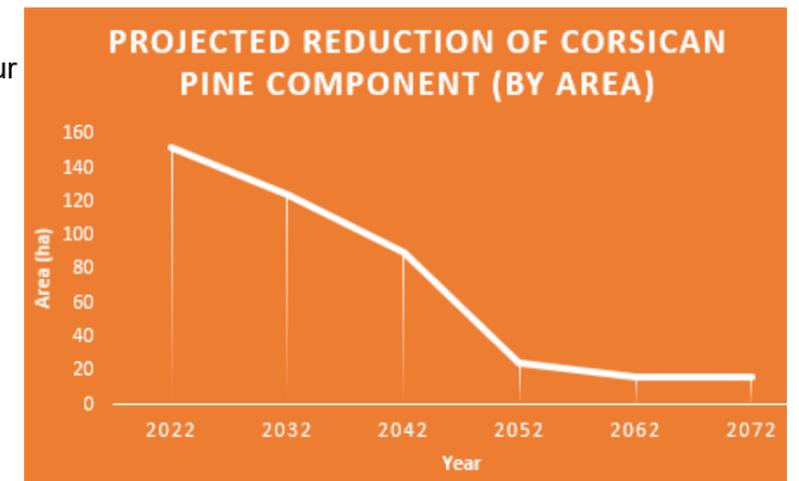
Additional open space and edge habitats are anticipated through planned ride widening and glade creation.

There are extensive mature broadleaf road and ride edge habitats, offering a strong network of wildlife corridors within the Birklands and functional links to surrounding habitats in the wider landscape. These broadleaf buffers can also provide natural firebreaks, particularly important in the coniferous areas of secondary woodland. Where windfirm these broadleaf edges will be retained during operations and enhanced during restock. Again, where possible, small groups of windfirm broadleaves will be retained in clearfell areas as song posts and to provide additional food sources for birds.

Work to remove invasive rhododendron and cherry laurel will continue throughout the plan period.

### 3.2 Economy

The secondary woodland element of the Birklands is still dominated by Corsican pine. Unfortunately the health of the Corsican pine has been adversely impacted by the onset of Dothistroma Needle Blight\* (DNB), resulting in significant yield reductions and requiring early intervention. Relatively high timber prices in recent years have lessened the consequential loss of income, but DNB will no doubt reduce the availability of larger log sizes over the next 20 years and beyond. To mitigate against this and to improve forest diversity and adaptive capacity, our restock programme now includes a wider range of productive conifer species. As the removal of Corsican pine continues in the Birklands (*Fig.2 below*), Forestry England will continue to introduce more species and species-mixes into our forests to improve resilience against future pests and diseases and to ensure the woodland habitats can be adapted to the rapid climate change we are now seeing. This will enable us to continue to provide sustainable timber resources needed by society while maintaining other woodland ecosystem services\*.



**Fig.2:** Current and projected Corsican pine component within the Birklands

**Table 1:** Timber volumes and clearfell areas by period

Forecast Period	Average annual timber volume (m3)	Average annual clearfell area (ha)
2023-2026	4315	4.6
2027-2031	3518	6.2
2032-2036	4060	3.8
2037-2041	5190	5.8
2042-2046	4675	10.3
2047-2051	3348	7.5

Table 1 displays the predicted average annual timber production (from clearfelling, selective felling and thinning combined) alongside the average annual clearfell area within each five year period for the next 30 years. The annual combined volumes are split approximately 56% from conifer & 44% from broadleaf.

A range of silvicultural systems\* will be adopted in the Birklands, designed to create ideal conditions to establish the next rotation of trees. A wider variety of shade tolerant\* species are being planted which are better suited to LISS\*. It is hoped the use of LISS will also reduce the likely impacts of more extreme weather events. LISS offers greater protection to soils and ground flora by maintaining canopy cover, thus reducing the variation in micro climates throughout the day and between seasons. 37% of the forest area will still be managed under a traditional clearfell and restocking programme, providing transitional open space for wildlife and cost-effective timber production.

Squirrel damage is becoming more prevalent in the Birklands and across the district. Not only does this stress the trees and often lead to tree death, stunt tree development and inhibit form, but also reduces carbon-capture potential and yield. Other browsing from deer and small mammals also needs to be monitored and controlled to ensure the forest can regenerate and trees reach maturity.

### 3.3 People

The abundant ancient oaks are the true stars of the Birklands, many having stood for nearly 1000 years. During their time they have provided shade, cleaned our air and water, nurtured our soil and wildlife, sequestered carbon and witnessed unprecedented change. Other notable heritage features within the Birklands include the Thynghowe Viking Assembly Point at Hangar Hill, St Edwin's Chapel Cross, the lime tree avenue along Clipstone Drive, various forest and boundary stones, ancient trackways, earth banks and WWII-related features. All known features of historic and cultural significance are recorded to ensure forest operations in their vicinity can be conducted sensitively to preserve and protect them. Similarly any new findings will also be recorded. During the plan period the opportunity will be taken to enhance and restore the lime tree avenue by opening up the immediate area around it.



**Pic.3:** One of the Birklands' many ancient oaks



**Pic.4:** The lime tree avenue, a living heritage feature

Local heritage, conservation and wildlife groups (including our own Forestry England volunteers and staff) are regularly on site in the Birklands, conducting important and long-running ecological surveys and vital practical conservation work. We will continue to engage with groups with compatible aims who share our interest in conserving the Birklands' ecological and cultural value; through our permissions system and also directly-led volunteers.

Although not dedicated open access land due to the leasehold tenure, there are many visitors to the Birklands who enjoy cycling and walking on the public rights of way, forest roads and network of informal paths. The Sustrans National Cycle Route 6 (stretching from London to the Lake District) passes through the Birklands, linking a number of local villages, towns and the nearby Sherwood Pines Forest Centre. There is informal parking by the north-eastern forest gate and also along the Mansfield Road (A6075) on the southern edge.

### 4. Harvesting Operations

Over the last 20 years the age structure at Birklands has gradually been diversified, significantly improving forest resilience (*Fig. 1, p5*). A total of 54.6ha of clearfell (9.3% by plan area) will be undertaken during the 10 year Plan duration, involving 15 coupes spread throughout the secondary woodland area. These coupes are predominantly within Corsican pine stands, either to harvest mature timber or prematurely fell DNB\*-infected immature trees.

The management of broadleaf stands will be predominantly through LISS\* group felling systems (group selection and small coupe felling), wherein small clearings of up to 2ha are created to restructure the crop and diversify the age- and species-composition. The size and shape of the clearings will be designed around the light requirements of the trees to become established (including aspect\* and shade cast by adjacent stands), helping create optimum growing conditions. For the benefit of wildlife the larger clearings will be elongated to maximise edge habitat. There are two broadleaf clearfells scheduled for within the plan period: the first as part of the lime tree avenue restoration and open-space creation; and the second to harvest a red oak stand within the ancient woodland/SSSI area, as part of the PAWS\* restoration programme to revert the area back to native species.

In addition to the aforementioned felling programme, thinning assessments will be made every 5 years and thinning operations planned accordingly. Managing stand density and light availability through thinning is essential for each tree's crown and root systems to develop fully, helping ensure the trees remain stable in the wind as they mature. In the Birklands the 5 year operational thinning cycle is split into five distinct areas, with one area worked each year. Along with the areas of long term retention (*See Silvicultural Systems Map, p20*) this rotational approach ensures there are always undisturbed areas during operations to maintain ecologically important habitats.

## 5. Intended Landuse

The current balance of woodland habitats in the Birklands is approximately 59% broadleaf and 41% conifer. Over the next rotation the broadleaf component will increase by up to 4%, mainly as a consequence of some of the remaining conifer within the ancient woodland being restored to broadleaf species. (*See 'PAWS Area #1' on the Concept Map, p19*). In response to the current threats from pests, disease and climate warming, we aim to introduce a wider range of broadleaf and conifer species and genetic types from a provenance 2 to 5 degrees south of the forest plan area. These will be better suited to the predicted local climatic conditions at the end of this century. Similarly, the forest's resilience and adaptive capacity will be enhanced as Corsican pine is gradually replaced with alternative, site-suited conifers over the secondary woodland area.

There will also be an increase in open space during the plan period (of approximately 9ha) following the planned ride widening, glade creation and the lime tree avenue restoration operations.

## 6. Contribution towards Forestry England Central District's commitments to UKWAS and UKFS from the new Birklands FP

	Forest Plan Area (ha)	Forest Plan Percentage	Forest District Area (ha)	Forest District Percentage
Total Area	587	100%	27,144	100%
Total Wooded Area	510.8	87%	23,909	88%
Open Habitat (>10%)	76.2	13%	3,244	12%
Natural Reserves* - Plantation (1%)	0	0%	251	1.57%
Natural Reserves - Semi Natural (5%)	0	0%	381	4.81%
Long-term Retentions* & LISS* (>1%)	350.5	59.7%	14,637	54%
Area of Conservation Value (>15%) including designations, Ancient Woodland*, PAWS,* Natural Reserves, Long Term Retentions & LISS	378.4	64.5%	17,582	64.8%

**7. Terms of Reference**

National Strategy	District Strategy	Forest Plan Objective	Monitoring
<p><b>Economy:</b></p> <p>1) Maintain the land within our stewardship under UKWAS certification.</p> <p>2) Improve the economic resilience of our woods and forests.</p> <p>3) Encourage and support business activity on and around the Estate.</p>	<p>1) Adapting our management practices to suit the character and requirements of local woodlands whilst satisfying national standards and business requirements.</p> <p>2) We will use the opportunity presented by additional, unscheduled clear felling as a result of disease control to accelerate the diversification of both conifer and broadleaf species appropriate to each local area and site type, and in some areas trialling species which may not have been previously planted in forest conditions, using a range of silvicultural systems.</p>	<p>Continue to sustainably grow commercial timber, prioritising quality and yield, using a variety of species that will be more resilient to the impacts of climate change, pests and diseases.</p> <p>Use a variety of silvicultural systems based around the light requirements of the trees to be established.</p> <p>Ensure stands are more structurally diverse, actively managing the woodland to promote age- and species-diversity.</p>	<p>All forestry operations and restocking will be recorded in the Forestry England subcompartment database and monitored at the 5 year mid-term review and 10 year renewal.</p> <p>Record the silvicultural systems used in the Forestry England GIS system.</p> <p>Monitor as part of the 10 year forest plan renewal.</p>
<p><b>Nature:</b></p> <p>1) Improve the resilience of the natural environment of the Estate under our Stewardship.</p> <p>2) Realise the potential of the Nation's Forests for nature and wildlife.</p> <p>3) Maintain and improve the cultural and heritage value of the Estate.</p>	<p>1) Adapting more sensitive timber harvesting arrangements and adopting recent FC guidance on forest operations to reduce the impact of forest operations on soils and ground vegetation on sensitive sites.</p> <p>2) Contributing to and undertaking control programmes to limit the impact of deer and other species on woodland habitats in order to reduce the adverse impacts of grazing and disturbance to native habitats and their flora and fauna.</p> <p>3) Where possible, work with interested parties to explore ways to maintain or improve features of cultural or heritage value to the local community.</p>	<p>Continue the restoration of AWS through the gradual reduction of exotic species and the introduction of a variety of species that will be better suited to the impacts of climate change, pests and disease.</p> <p>Identify key species and habitats and make appropriate provision for their requirements. Manage the SSSI and NNR areas in accordance with the agreed management plans. Maintain the ecological value of the priority habitats and reduce the impact from invasive species.</p> <p>Continue to create temporary open space created through felling operations for ground nesting birds. Management operations will be planned to consider the habitat requirements of European Protected Species associated with Forestry England's land.</p> <p>Manage and expand open and woodland edge habitats for the benefits of flora and fauna.</p> <p>Continue to manage the existing TSI. Consider their succession by using appropriate management to recruit future veteran trees. Identify further TSI within the secondary woodland areas to increase the volume and distribution of deadwood.</p>	<p>AWS restoration will be monitored as part of the 10 year forest plan renewal.</p> <p>Monitored by the ecologists as part of the operational plan process and through SSSI/NNR management plan reviews with Natural England.</p> <p>Areas of temporary open space associated with felling operations will be reviewed as part of the 5 year forest plan review process. Monitored by the ecologists as part of the operational plan process.</p> <p>Increases to open space area to be recorded and mapped on the Forestry England GIS system.</p> <p>Existing and future TSI to be recorded on the conservation database, reviewed as part of operational planning process, and as part of the 10 year forest plan renewal.</p>
<p><b>People:</b></p> <p>1) Encourage communities to become involved in the Estate, its management and direction.</p> <p>2) Provide high quality woodland-based recreational opportunities for people and business.</p> <p>3) Enable everyone, everywhere to connect with the nations' trees and forests so that they understand their importance and act positively to safeguard forests for the future.</p>	<p>1) Provide safe and accessible woodlands.</p> <p>2) Offering opportunities for quiet recreation and adventurous activities, to enable people to experience the potential health and wellbeing benefits.</p> <p>3) Developing partnership with private businesses and public bodies to expand and improve recreational opportunities across the estate.</p> <p>4) Creating a wide variety of opportunities for schools, groups, families and individuals to engage with and learn about trees and forests in accordance with the National and District Strategies.</p> <p>5) Encouraging third party environmental educators and other partners to offer learning opportunities in the Nation's Forests.</p>	<p>Plan sympathetically designed and appropriately scaled interventions to improve and maintain the visual integration of the forest boundaries into the wider landscape.</p> <p>Conserve the features of cultural significance in line with Forestry England Historic Environment PPG 57; including Thynghowe, boundary and forest stones, the Lime Tree Avenue and World War II features.</p> <p>Maintain existing public access.</p> <p>Continue to actively work with volunteer groups to sensitively manage work in priority habitats and to survey/collate valuable ecological data.</p>	<p>Review operations at the 5 year mid-term review and as part of the 10 year forest plan renewal.</p> <p>Monitored by the Ecology and Heritage team at the operational planning stage.</p> <p>No monitoring required.</p> <p>No monitoring required.</p>

## Appendix I

### Glossary

#### Acute Oak Decline

Oak decline is a complex syndrome in which several damaging agents interact and cause a serious decline in tree condition, and can kill oak trees within four to six years of the onset of symptoms. The agents can be abiotic or biotic; the latter often include insects and fungi which are not capable of invading healthy trees but which can be very destructive to stressed oaks.

#### Ancient Woodland

Areas of semi-natural native woodland that have had continuous woodland cover since at least 1600. They are particularly rich in biodiversity and this is often notable in their characteristic ground flora.

#### Aspect

The direction a slope faces. This can have a strong influence on the microclimate, ground vegetation, soils and hydrology.

#### Canopy

The mass of foliage and branches formed collectively by the crowns of trees. The shade it casts has a strong influence on the plants, trees and shrubs beneath it.

#### Carr Woodland

A wet woodland area, usually dominated by willow, birch and alder species.

#### Chalara Ash Dieback

Ash dieback is a highly destructive fungus killing native ash trees across the UK. Young and coppiced trees will die quickly once infected, more mature ash may survive for a number of years once infected. Causes the timber to lose strength, become brittle and trees to start dropping limbs.

#### Clearfell System

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

#### Climax Species

Tree species that will eventually dominate the forest canopy, maximising their exposure to sunlight and out-competing other species.

#### Coppice

Coppicing is a Lower Impact Silvicultural System (LISS) based on regeneration by regrowth from cut stumps (coppice stools). The same stool is used through several cycles of cutting and regrowth. Coppice can also refer to an area of woodland in which the trees or shrubs are periodically cut back to ground level to stimulate growth and provide wood products. 'Coppice with standards' refers to coppice with a scatter of trees grown on a long rotation to produce larger-sized timber and to regenerate new seedlings to replace worn out stools.

#### Coupes

Areas of forest that have been or will be managed together.

#### Dothistroma Needle Blight (DNB)

DNB is a fungal disease affecting mainly pine species. The fungus affects the needles of the infected tree, which are eventually shed. This can continue year on year and gradually weaken the tree, significantly reducing timber yields. It can also eventually lead to mortality.

#### Ecological Site Classification (ESC)

ESC is an online tool developed by Forest Research to help a forester choose tree species that are suited to a specific site. It models how well each species is likely to grow using information on climate and soil properties. It can also be used to forecast how climate change may impact suitability.

#### Ecosystem

An ecosystem is an interconnected network formed of all the living things in a given area (plants, animals and organisms) and their interactions with each other and their non-living environments (eg: weather, earth, sun, soil & climate).

#### Ecosystem Services

Ecosystem services are the goods and services that people depend on that arise from ecosystems. They are usually categorised into Provisioning (eg: timber, water, food production), Regulating (eg: regulation of climate and diseases), Cultural (eg: recreational opportunities, aesthetic value) and Supporting services that underpin these (eg: crop pollination).

#### England Trees Action Plan

Sets out the Government's long-term vision for the treescape it wants to see in England by 2050 and beyond.

#### Forestry England

Forestry England is the executive agency of the Forestry Commission that is responsible for managing the Nation's Forests in England.

#### Forests and Water Guidelines

One of seven sets of guidelines that support the United Kingdom Forestry Standard (UKFS). The UKFS and guidelines outline the context for forestry in the UK; set out the UK Government's approach to sustainable forest management; define standards and requirements; and provide a basis for regulation and monitoring, including national and international reporting.

#### Forest Plan (FP)

An FP is primarily a landscape-scale felling and restocking plan. It provides a holistic, long-term approach to planning and forest design, detailing felling operations over a 10 year period for the purposes of licencing felling and outlining proposals over the next 50 years. FPs are reviewed every 5 years and redrawn and approved every 10 years.

#### Forest Stewardship Council® (FSC®)

An internationally recognised body made up of non-government organisations promoting sustainable forest management to the forest industry and consumers.

#### Group Selection

A method of managing irregular stands in which regeneration is achieved by felling trees in small groups. Group selection involves felling groups of trees (generally <0.25 ha per group)

#### Historic Environment

The physical remains of every period of human development starting from 450,000 years ago and including earthworks, buried remains, structures and buildings.

#### Landscape Character

England is renowned for its rich, diverse and beautiful landscapes which have their own distinct local characters. These have been shaped over many thousands of years by natural influences such as soil and landform and by generations of human activity.

#### Long Term Retention

Individual, stable stands and clumps of trees retained for environmental benefit significantly beyond their normal economic age or size.

#### Lower Impact Silvicultural Systems (LISS)

Silvicultural systems including group selection, shelterwood or under-planting, small coupe felling, coppice or coppice with standards, minimum intervention and single tree selection systems which are suitable for windfirm conifer woodlands and most broadleaved woodlands.

## Glossary (continued)

### Minimum Intervention

Management with no systematic felling or planting of trees. Operations normally permitted are fencing, control of exotic plant species and vertebrate pests, maintenance of paths and rides and safety work. Management only involves the basic inputs required to protect the woodland from external forces or ensure succession of key habitats and species.

### the Nation's Forests

The woodlands managed by Forestry England. These include both freehold and leasehold land. (Previously referred to as the Public Forest Estate.)

### National Character Area (NCA)

Broad divisions of landscape form the basic units of cohesive countryside character, on which strategies for both ecological and landscape issues can be based. There are 159 Character Areas, each of which is distinctive with a unique 'sense of place'.

### National Nature Reserve (NNR)

NNRs were established to protect some of our most important habitats, species and geology, and to provide 'outdoor laboratories' for research. Most NNRs offer opportunities to the public to experience wildlife first hand and learn more about nature conservation.

### Native

Native tree species colonised Britain without human assistance at the end of the last ice age, before the English Channel cut Britain off from mainland Europe.

### Naturalised

Naturalised trees have colonised Britain since the land divide with mainland Europe and are growing and reproducing successfully within their natural climatic range without human intervention.

### Natural Regeneration

The growth of new trees from seed found in the soil or cast from adjacent trees. Regeneration only occurs where suitable seed sources and conditions are present.

### Natural Reserve

Natural Reserves are areas which are predominantly wooded, usually mature and intended to reach biological maturity. They are permanently identified and in locations which are of particularly high wild-life interest or potential. They are managed by minimum intervention unless alternative interventions have higher conservation or biodiversity value.

### Nest Planting

Trees planted in small groups which are distributed across the restock site with remaining unplanted areas left to naturally regenerate. A useful way to introduce new species or provenances to a site.

### Notifiable Disease

Some tree pests and diseases are notifiable, which means that, in England, they must be reported to the Forestry Commission or Animal & Plant Health Agency. Notifiable tree pests and diseases are typically those with the potential to cause greatest damage to our trees, woods and forests.

### Open Grown Trees

Trees that have been given space to develop a large crown and natural shape. In comparison trees planted closely in a plantation managed for timber or biomass tend to have a more uniform shape.

### Open Space

Areas within a forest without trees, such as glades, stream sides, grass or heathland, water bodies, rocky areas, roads and rides.

### Operational Plans

Detailed site plans prepared in advance of all major forest operations providing guidance to Forestry England staff and contractors. They identify site constraints, opportunities and areas requiring special treatment or protection.

### *Phytophthora ramorum* and *P.pluvialis*

*P.ramorum* is a very destructive pathogen affecting over 150 plant species, particularly larch trees. Some broadleaved plants (such as sweet chestnut and rhododendron) can also host *P.ramorum*. *P.pluvialis* was first recorded in the UK in 2021 and affects a range of species including Douglas fir and western hemlock.

### Plantation on Ancient Woodland Site (PAWS)

Ancient Woodland areas where semi-natural woodland has been cleared and replaced by plantation, often including non-native species. PAWS sites can include both broadleaved and conifer woods and often retain remnant ancient woodland features like species-rich ground flora or undisturbed soils. Also known as Ancient Replanted Woodland.

### Pollarding

A form of pruning where the upper branches of a tree are removed, promoting a dense head of foliage and branches. Cutting is usually around 2.4 metres above ground – the height that wild animals or domesticated stock could reach. Traditionally, trees were pollarded for fodder or for wood. Fodder pollards are generally pruned every two to six years, wood pollards at longer intervals, usually of eight to 15 years, to produce upright poles for eg: fence rails and posts.

### Production Forecast

The projected volume of biomass that the forest will produce each year. Calculations are based on species, age, net area and yield class.

### Public Rights of Way (PROW)

Access routes open to the public through legal designation. These include footpaths, by-ways and bridleways.

### Respacing

Thinning of dense natural regeneration at a young age (generally when trees are 2-5m tall) to produce a more consistent crop, focus available resources on the remaining trees and promote good development.

### Restocking

The establishment of trees where felling has taken place. Restocking may be achieved through natural regeneration, but it is more usually associated with replanting.

### Ride

Forestry term for unsurfaced roads, paths and tracks within a woodland which provide access for management and other activities.

### Scheduled Ancient Monument (SAM)

A scheduled monument is a site that is legally protected because of its historical importance.

### Secondary Woodland

Woodland that has been established on land formerly used for another purpose (eg: as pasture, arable fields, quarries, etc.). Unlike ancient woodland it has not been continuously wooded in the past.

### Seed Trees

Trees with good shape and growth rates chosen to produce seed for restocking. Seed trees need to be of an age and size where they produce fertile seeds in large quantities.

### Selective Felling (Regeneration Felling)

Where individual trees of varying sizes are selected and removed from a stand. The whole stand is worked and the aim is to maintain full stocking of all tree sizes and ages, from seedlings to mature trees, in any one area.

## Glossary (continued)

### Semi-natural woodland

Those woodlands which are comprised mainly of locally native trees and shrubs, and have some structural characteristics of natural woodland.

### Shade Tolerant Species

Trees that have adapted to lower light levels and will regenerate and establish freely under the shade of the surrounding tree canopy, as opposed to light demanding species which require full sun/high light levels to establish and grow.

### Silvicultural Systems

Silviculture is the process of tending, harvesting and regenerating a forest. Different patterns of felling and regeneration form distinct 'silvicultural systems'. Different systems may be suitable for different management objectives (eg: conservation in an ancient woodland vs timber production in a conifer plantation).

### Site of Special Scientific Interest (SSSI)

A SSSI is a formal conservation designation. Usually, it describes an area that is of particular interest to science due to the rare species of fauna or flora it contains - or even important geological or physiographical features that may lie in its boundaries.

### Small Coupe Felling

A small-scale clearfelling system. The system is imprecisely defined but coupes are typically up to 2 ha in extent, with the larger coupes elongated in shape so the edge effect is still high.

### Special Area of Conservation (SAC)

SACs are protected areas in the UK designated under the Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales. These areas form an internationally important network of high-quality conservation sites that make a significant contribution to conserving Annex I and Annex II habitats and species.

### Special Protection Area (SPA)

SPAs are protected areas selected to protect one or more rare, threatened or vulnerable bird species listed in Annex I of the Birds Directive, or specific regularly occurring migratory species. They form an internationally important network of high-quality conservation sites that make a significant contribution to conserving important habitats and species.

### Strategic Plan

Forestry England's guide to the management of woodland in Central England Forest District. It divides the district into zones for the purpose of management and ensures forestry activities reflect the local ecological, social and cultural individuality of each woodland.

### Strip Felling

Strip felling involves removal of some trees in rows, leaving strips of mature trees in place rather than clearfelling a crop in one operation. This creates space between remaining trees suitable for planting new trees (especially species that require sheltered growing conditions) and maintains woodland cover while new trees are established. The width of strips may vary and multiple strips are removed from one stand at a time.

### Sub-compartments

Areas of forest that form a homogeneous crop in terms of age, species composition and condition. They may be split across several locations and their boundaries may change as the forest develops after felling and restocking.

### Thinning

The removal of a proportion of trees in a forest after canopy closure, usually to promote growth and greater value in the remaining trees.

### Trees of Special Interest (TSI)

Trees that are of interest biologically, aesthetically or culturally because of their age, or trees that are in the ancient stage of their life, or trees that are old relative to others of the same species. Also referred to as Veteran or Ancient trees.

### UK Forestry Standard (UKFS)

Outlines the Government's criteria and standards for the sustainable management of forests in the UK.

### UK Woodland Assurance Standard (UKWAS)

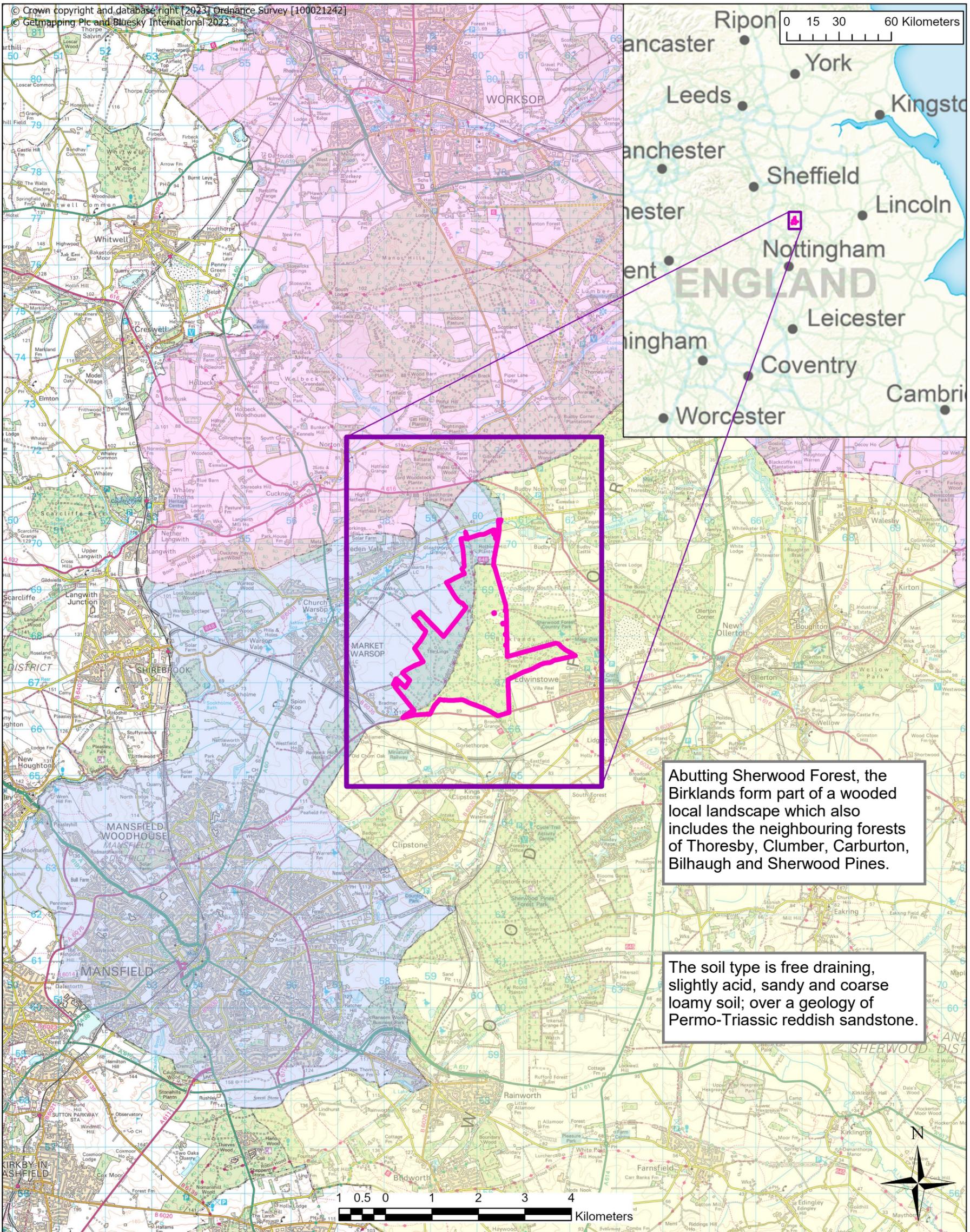
A voluntary scheme for the independent assessment of sustainable forest management in the UK. The Scheme has been developed by a partnership of forestry and environmental organisations in response to growing consumer demand for timber products from sustainably managed forests.

### Understorey Woodland Species

Minor tree species that live under top canopy trees or are 'pioneer' species that arrive in clearings before climax species become established. Once the overstorey is established understorey species are more common on woodland edges and clearings where light levels are higher.

### Yield Class

Yield class is a measure of the growth rate of a tree crop on a given site. It describes the maximum average volume increase that a particular crop can achieve on 1 ha of land each year. For example, a crop capable of a maximum annual growth of 14 m<sup>3</sup> per hectare has a yield class of 14. Yield Class varies depending on factors including the species, how it is managed and local site conditions.



**Birklands Forest Plan 2023**

**Location Map**

Date: March 2023

Scale @ A3: 1:75,000

 Birklands Forest Plan Area

Local Planning Authority

 Bassetlaw

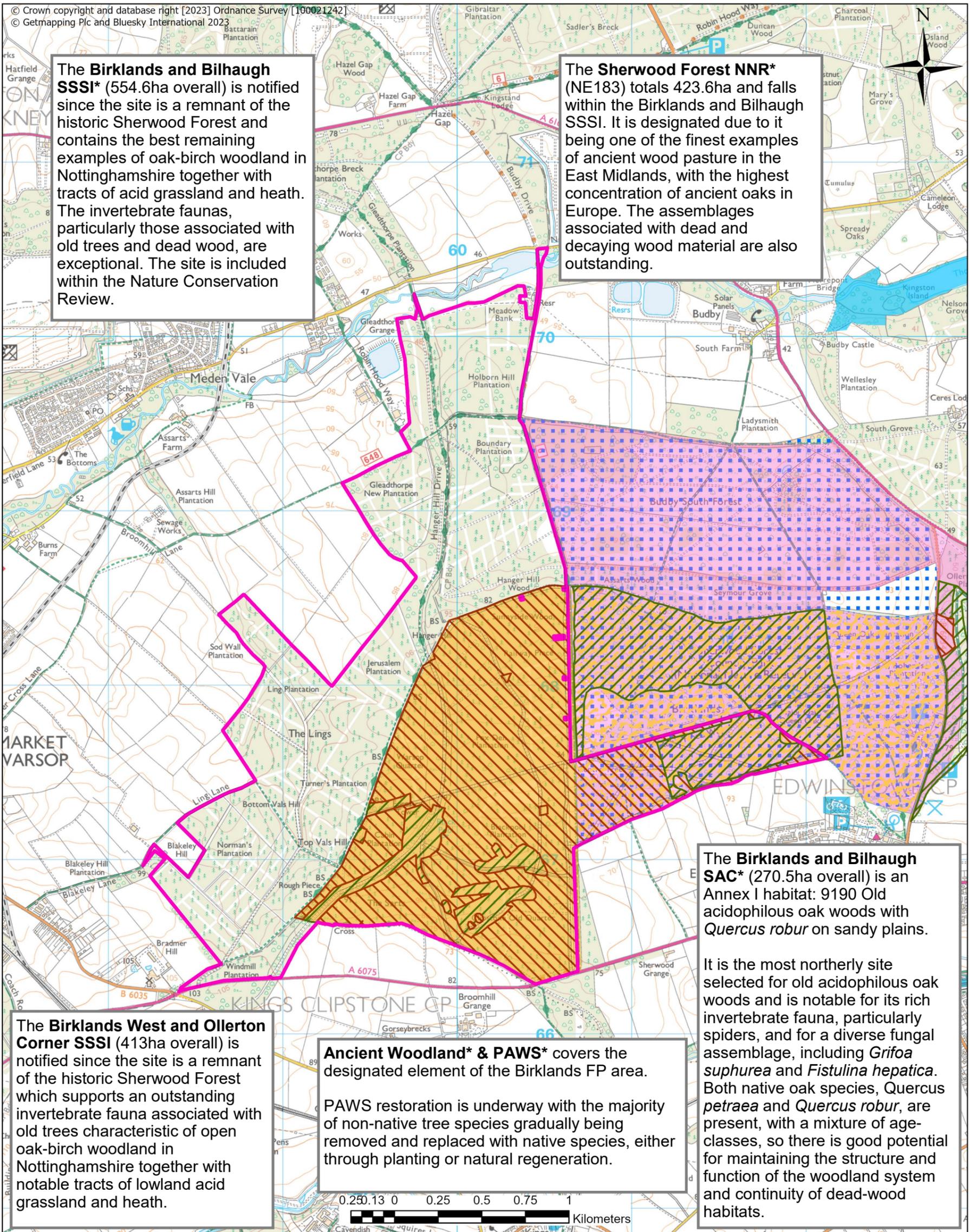
 Mansfield

 Newark and Sherwood



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



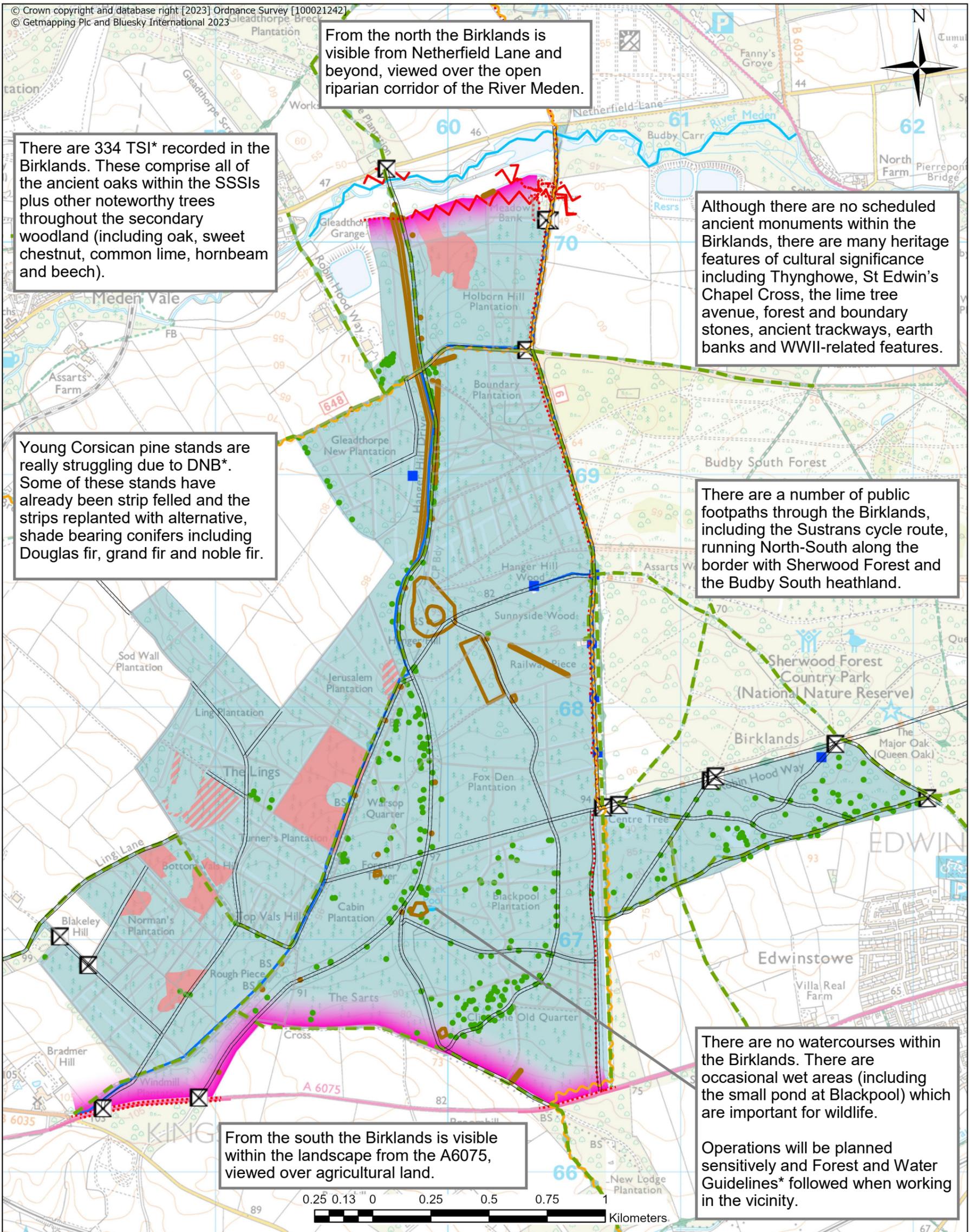


**Birklands Forest Plan 2023 Designations Map**

Date: March 2023  
Scale @ A3: 1:20,000

Birklands Forest Plan Area	<b>Designations</b>
Forest Roads	Sherwood Forest NNR
Ancient Woodland	Birklands and Bilhaugh SAC
Ancient & Semi-Natural Woodland	Birklands West and Ollerton Corner SSSI
Plantations on Ancient Woodland Sites (PAWS)	Birklands and Bilhaugh SSSI
	Thoresby Lake SSSI

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**Birklands Forest Plan 2023**  
**Survey Map**

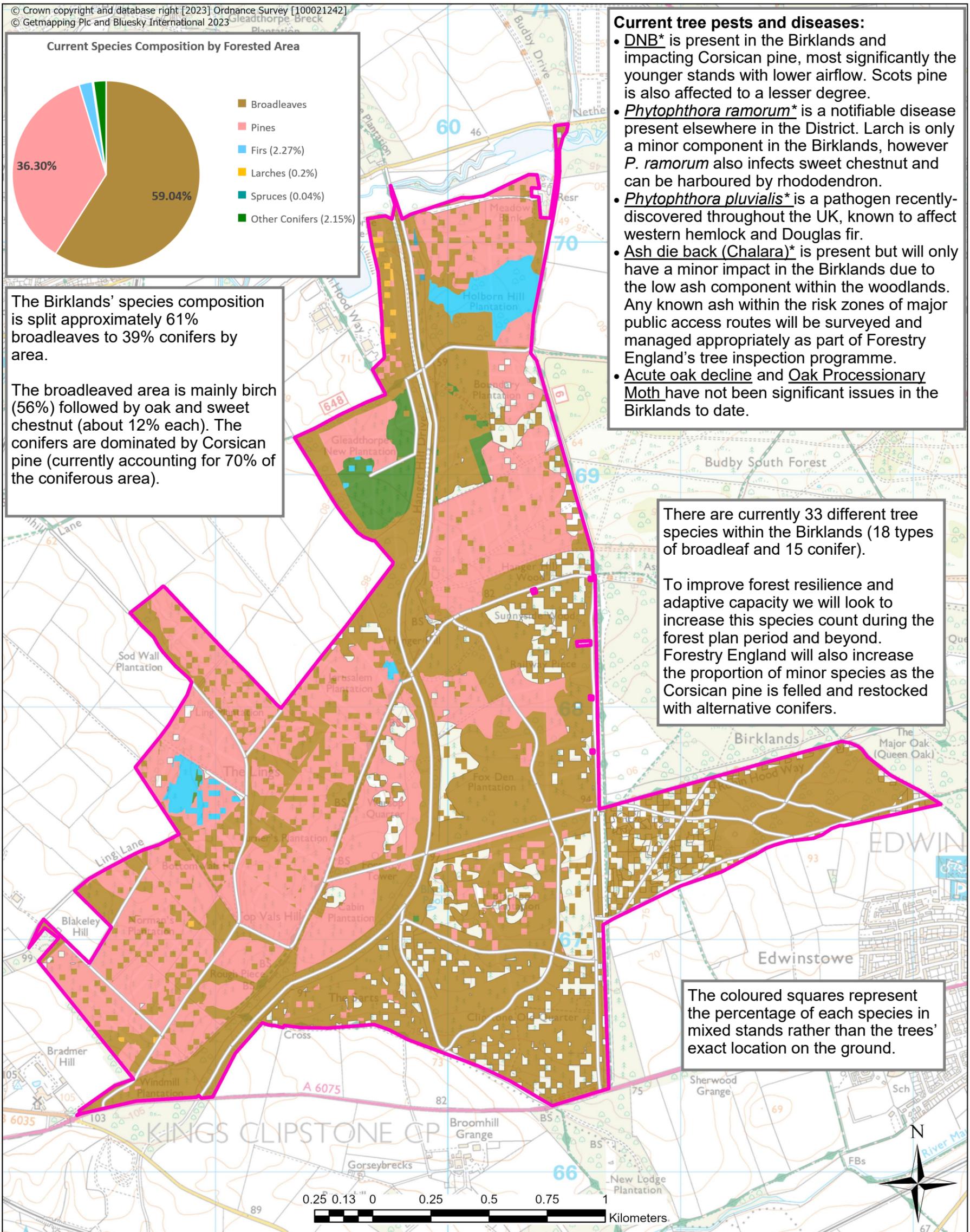
Date: March 2023  
 Scale @ A3: 1:15,000

<ul style="list-style-type: none"> <li>Birklands Forest Plan Area</li> <li>Access</li> <li>Rides</li> <li>Forest Roads</li> <li>Sustrans National Cycle Network</li> <li>Public Rights of Way</li> <li>Gates/Barriers</li> </ul>	<ul style="list-style-type: none"> <li>Utilities</li> <li>Overhead Powerline</li> <li>Underground Powerline</li> <li>Gas Pipelines</li> <li>Water Pipelines</li> <li>Water Supply Points</li> </ul>	<ul style="list-style-type: none"> <li>Visually sensitive boundaries</li> <li>Watercourses</li> <li>Open Water</li> <li>Corsican pine, Age &lt; 40 years</li> <li>no intervention yet</li> <li>already restructured</li> <li>Heritage features</li> <li>TSI</li> </ul>
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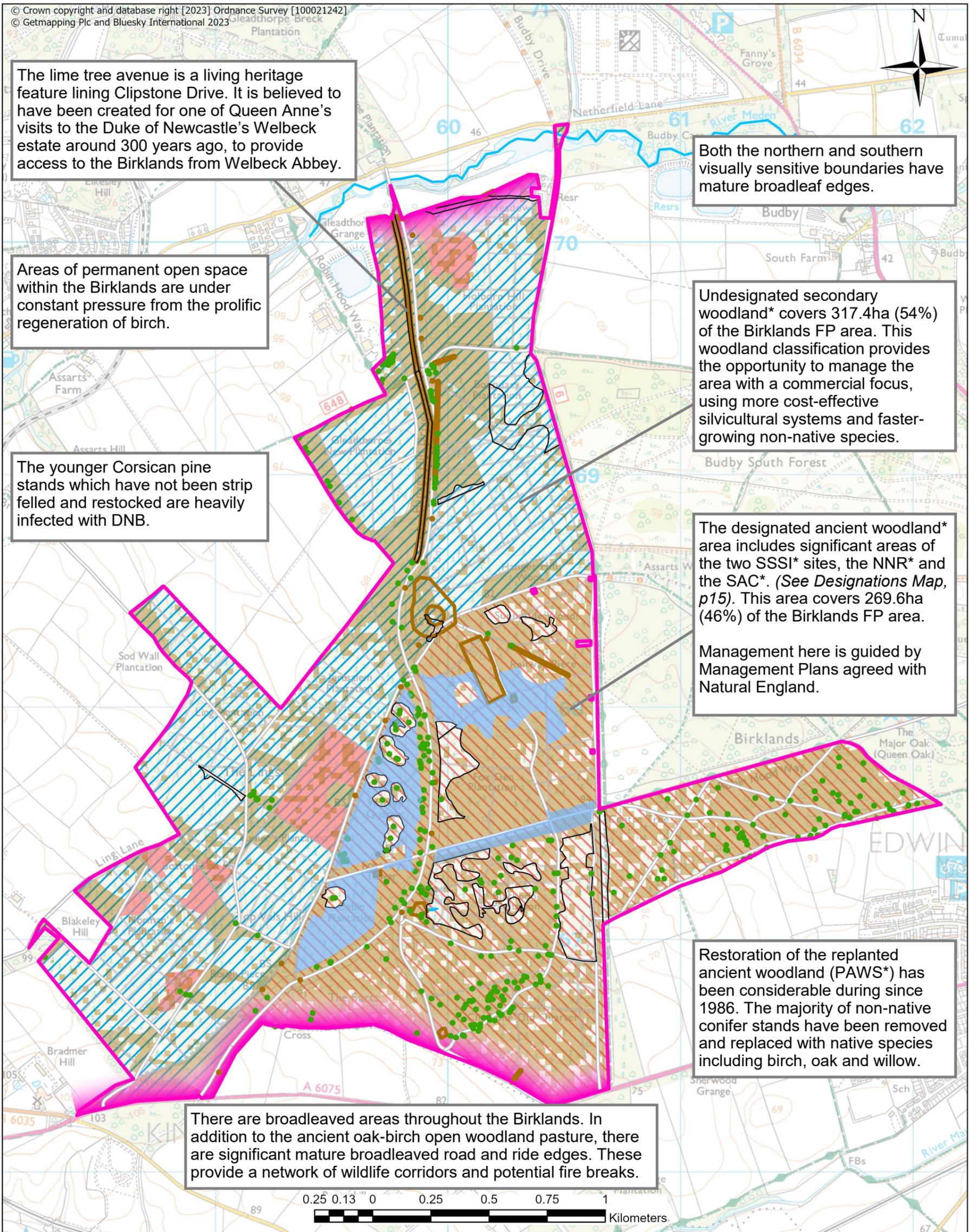
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**Birklands Forest Plan 2023**  
**Current Species Map**

Date: March 2023  
 Scale @ A3: 1:15,000

<p> Birklands Forest Plan Area</p> <p> Forest Roads</p> <p> Open</p>	<p><b>Species Group</b></p> <p> Broadleaves</p> <p> Pines</p> <p> Firs</p> <p> Larches</p> <p> Spruces</p> <p> Other Conifers</p>	<p> Forestry England</p> <p> FSC www.fsc.org FSC® C123214 The mark of responsible forestry</p> <p> PEFC PEFC® 40-1001 Promoting Sustainable Forest Management www.pefc.org</p>
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**Birklands Forest Plan 2023**  
**Analysis Map**

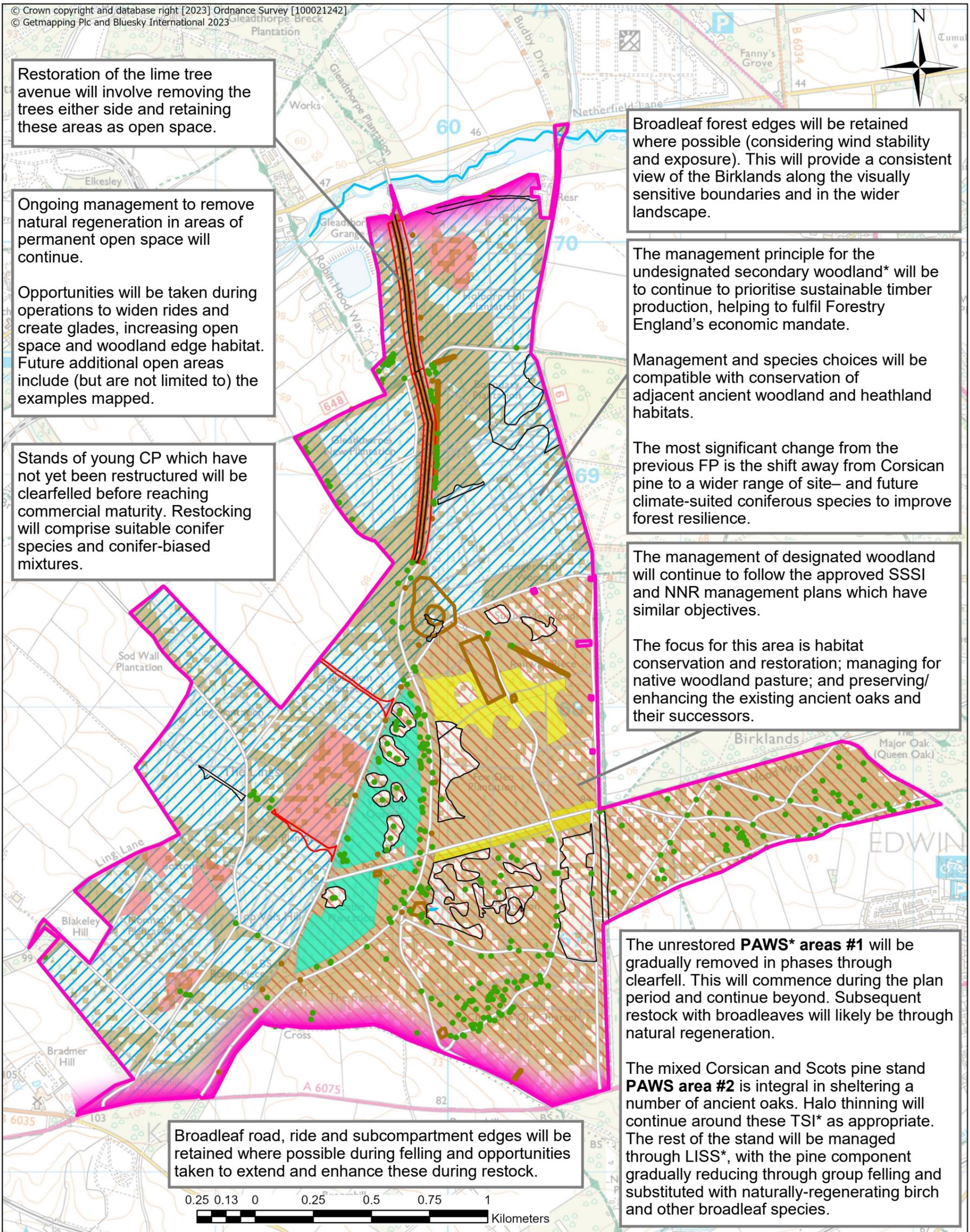
Date: March 2023  
Scale @ A3: 1:15,000

Birklands Forest Plan Area	Open subcompartments
Visually sensitive boundaries	Broadleaves
Unrestored PAWS stands	CP, age < 40yrs, no intervention yet
TSI	<b>Designations</b>
Heritage features	Designated (SSSI/NNR/SAC/AWS/PAWS)
Forest Roads	Undesignated Secondary Woodland
Rides	

Forestry England

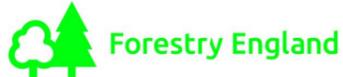
Forestry England forests and woodlands have been certified in accordance with the UK Woodland Assurance Standard (UKWAS)

Promoting Sustainable Forest Management

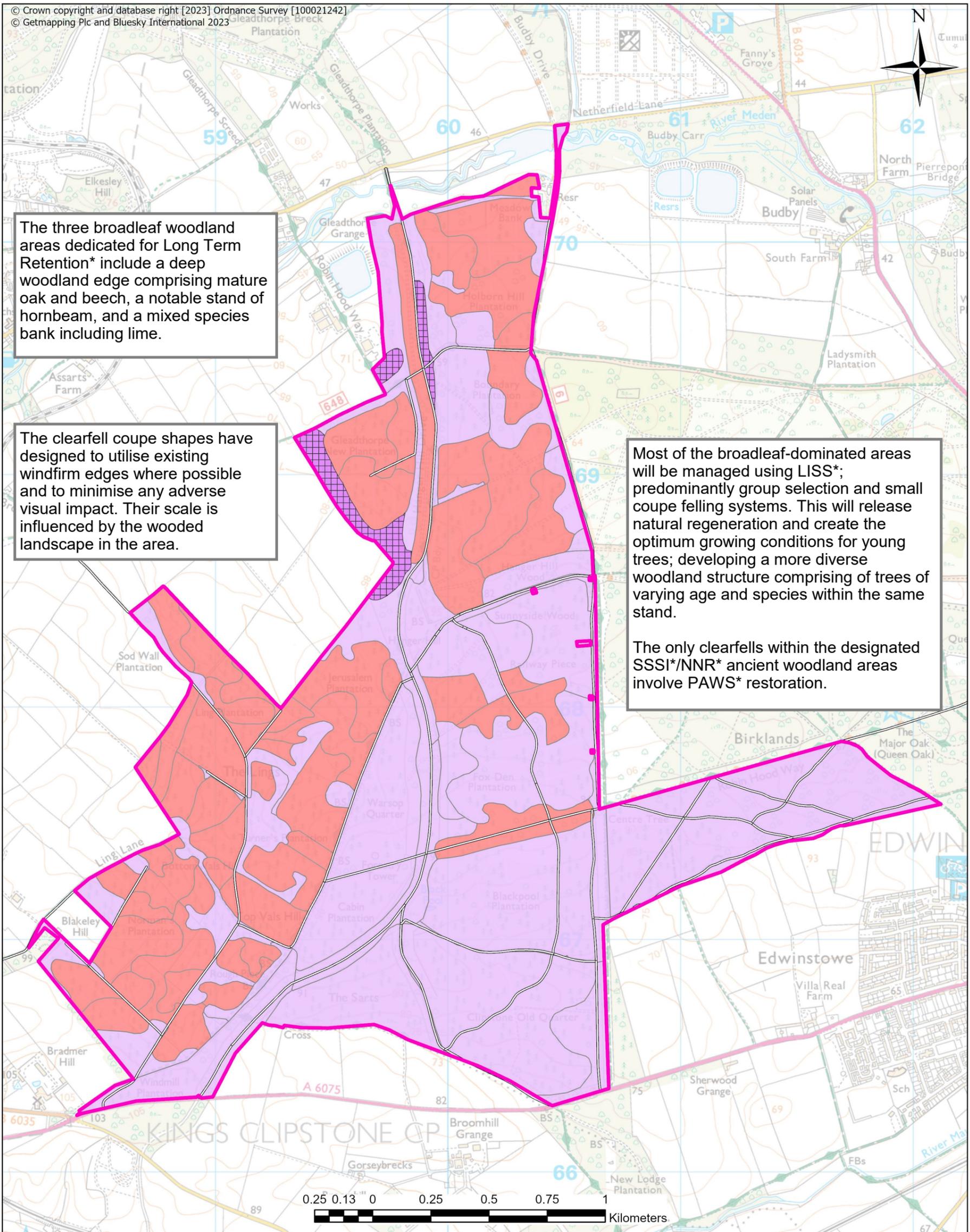


**Birklands Forest Plan 2023**  
**Concept Map**

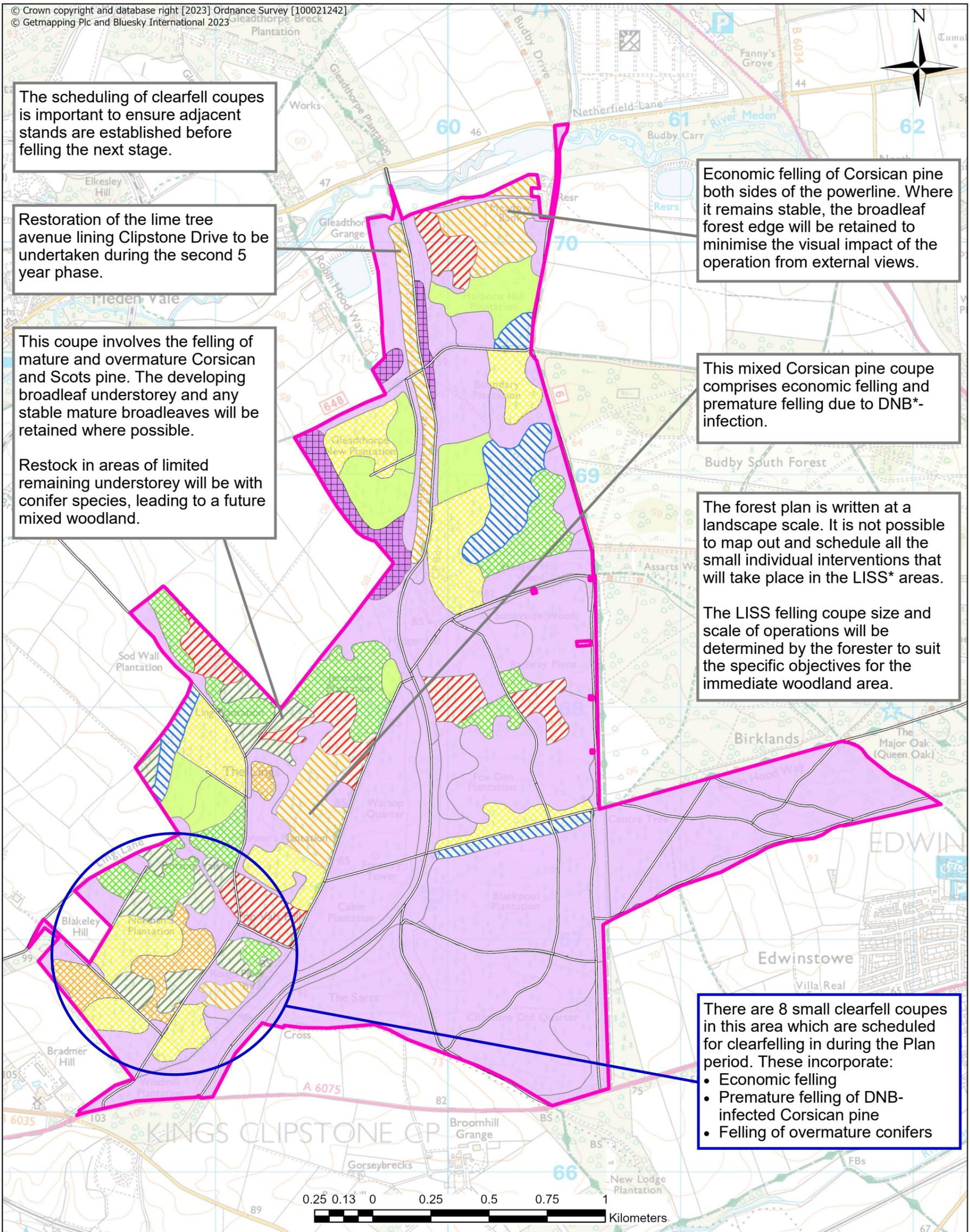
Date: March 2023  
Scale @ A3: 1:15,000

<ul style="list-style-type: none"> <li><span style="border: 2px solid magenta; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Birklands Forest Plan Area</li> <li><span style="border: 2px solid cyan; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Visually sensitive boundaries</li> <li><span style="color: green; font-size: 12px; margin-right: 5px;">●</span> TSI</li> <li><span style="border: 1px solid black; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Open subcompartments</li> <li><span style="border: 2px solid red; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Examples of future additional open areas</li> <li><span style="border: 2px solid brown; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Heritage features</li> <li><span style="border-bottom: 1px solid black; width: 15px; display: inline-block; margin-right: 5px;"></span> Forest Roads</li> <li><span style="border-bottom: 1px dashed black; width: 15px; display: inline-block; margin-right: 5px;"></span> Rides</li> </ul>	<ul style="list-style-type: none"> <li><span style="background-color: yellow; width: 15px; height: 10px; display: inline-block; margin-right: 5px;"></span> PAWS areas #1</li> <li><span style="background-color: cyan; width: 15px; height: 10px; display: inline-block; margin-right: 5px;"></span> PAWS area #2</li> <li><span style="background-color: brown; width: 15px; height: 10px; display: inline-block; margin-right: 5px;"></span> Broadleaves</li> <li><span style="background-color: red; width: 15px; height: 10px; display: inline-block; margin-right: 5px;"></span> CP, age &lt; 40yrs, no intervention yet</li> </ul> <p>Designations</p> <ul style="list-style-type: none"> <li><span style="border: 1px dashed red; width: 15px; height: 10px; display: inline-block; margin-right: 5px;"></span> Designated (SSSI/NNR/SAC/AWS/PAWS)</li> <li><span style="border: 1px dashed cyan; width: 15px; height: 10px; display: inline-block; margin-right: 5px;"></span> Undesignated Secondary Woodland</li> </ul>	  
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Forestry England forests and woodlands have been certified in accordance with the UK Woodland Assurance Standard (UKWAS)



<p><b>Birklands Forest Plan 2023</b></p> <p><b>Silvicultural Systems Map</b></p> <p>Date: March 2023</p> <p>Scale @ A3: 1:15,000</p>	<p> Birklands Forest Plan Area</p> <p> Forest Roads</p> <p>Silvicultural System</p> <p> Clearfell</p> <p> LISS / Open</p> <p> Long Term Retention</p>	<p> Forestry England</p> <p> FSC www.fsc.org FSC® C123214 The mark of responsible forestry</p> <p>Forestry England forests and woodlands have been certified in accordance with the UK Woodland Assurance Standard (UKWAS)</p> <p> PEFC PEFC® 40-1001 Promoting Sustainable Forest Management www.pefc.org</p>
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**Birklands Forest Plan 2023**  
**Felling Phases Map**

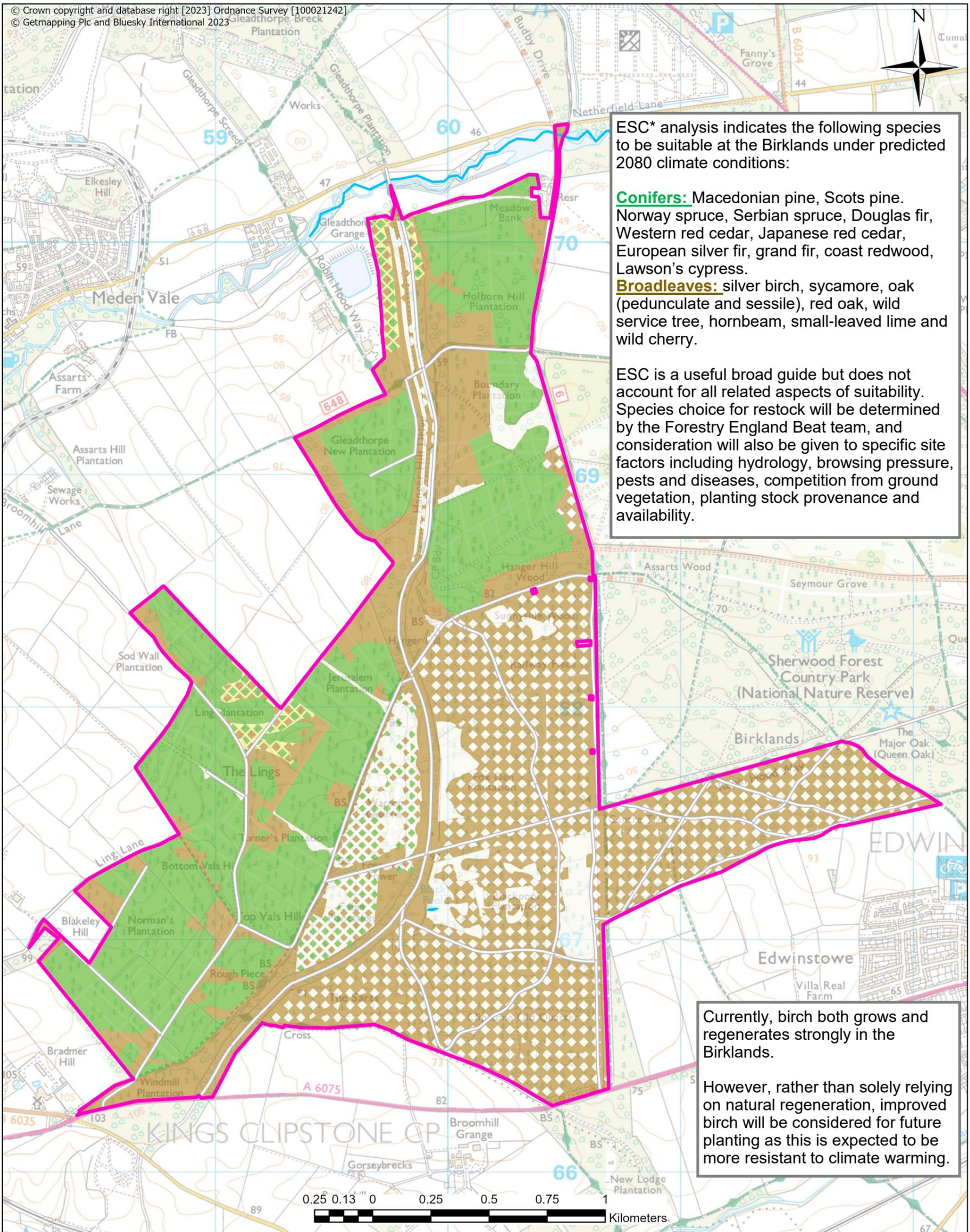
Date: March 2023  
Scale @ A3: 1:15,000

Birklands Forest Plan Area	2052-2056
Forest Roads	2057-2061
<b>Felling Phase / Silvicultural System</b>	2062-2066
2023-2026	2067-2071
2027-2031	Beyond 2072
2032-2036	LISS / Open
2037-2041	Long Term Retention
2042-2046	
2047-2051	

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

Forestry England  
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PEFC  
PEFC® 40-1001  
Promoting Sustainable Forest Management  
www.pefc.org



ESC\* analysis indicates the following species to be suitable at the Birklands under predicted 2080 climate conditions:

**Conifers:** Macedonian pine, Scots pine, Norway spruce, Serbian spruce, Douglas fir, Western red cedar, Japanese red cedar, European silver fir, grand fir, coast redwood, Lawson's cypress.

**Broadleaves:** silver birch, sycamore, oak (pedunculate and sessile), red oak, wild service tree, hornbeam, small-leaved lime and wild cherry.

ESC is a useful broad guide but does not account for all related aspects of suitability. Species choice for restock will be determined by the Forestry England Beat team, and consideration will also be given to specific site factors including hydrology, browsing pressure, pests and diseases, competition from ground vegetation, planting stock provenance and availability.

Currently, birch both grows and regenerates strongly in the Birklands.

However, rather than solely relying on natural regeneration, improved birch will be considered for future planting as this is expected to be more resistant to climate warming.

**Birklands Forest Plan 2023**  
**Intended Landuse Map**

Date: March 2023  
Scale @ A3: 1:15,000

- |                            |   |
|----------------------------|---|
| Birklands Forest Plan Area | Intended Landuse                            |
| Forest Roads               | Coniferous woodland with some broadleaves   |
| Open Water                 | Broadleaf woodland with some conifers       |
| Watercourses               | Mixed broadleaf/conifer woodland            |
| Open                       | Open, broadleaf woodland with some conifers |
|                            | Open, mixed broadleaf/conifer woodland      |

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