

Yorkshire Forest District

Stainburn Forest Plan

FDP 60

2016

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Stainburn

215.4 Hectares

Period of Plan: 2016 - 2025

1. Background

Stainburn Forest is part of a network of forests managed by Forest Enterprise (FE), Yorkshire Forest District, located within the York Beat. It is situated approximately 8 kilometres north-west of Harrogate on the boundary of and just within Nidderdale Area of Outstanding Natural Beauty (AONB).

The majority of land was acquired by the Forestry Commission in the 1950's and shortly afterwards started establishing the forest, previously managed as rough pasture and moorland. This is a freehold property.

2. Describing the Site

2.1 Geology and Soils (FP Map 01)

Underlying geology is predominantly sedimentary sandstone of the Pendle Grit Member, formed in the Carboniferous period. Associated with this is a superficial deposit of clay, sand and gravels of the Harrogate Till Formation of the Quaternary period. A ridge of Warely Wise Grit sandstone runs east to west along the upper margins and Norwood Edge plantation.

The soils at Stainburn can be split between simple and complex. The forest associated with Stainburn and Lindley Moor is a poorly draining peaty surface-water gley. Moving west toward Oaken Bank, Norwood Edge and Warren Plantation, a range of soil types are encountered including; podzolic brown earth, peaty ranker, typical brown earth, surface-water gley and peaty surface water gley. Based on Forest Research Ecological Site Classification, soils range between wet to slightly dry moisture regime and an overall poor nutrient status. These conditions impact on the range of 'suitable' productive species that can be considered for planting/restocking.

2.2 Tree Species (FP Map - 02)

Sitka spruce is the dominant species accounting for 36% of the forest area closely followed by Scots pine at 31%. In summary, evergreen conifers make up 73% of the forest area, deciduous larch species 7% and broadleaf species including birch, beech oak and alder account for 4%.

Open Ground accounts for 16% of the land at Stainburn, comprised of land currently felled awaiting regeneration, permanent open space and a small proportion attributed to car parks.

The forest has benefited from a phased programme of felling and restocking, developing a reasonable range of structural diversity (1953 to present day) across the block as shown on FP Map 03.

2.3 Wind Damage (FP Map – 04)

The Windthrow Hazard Classification ranges from 1 (very stable) to 6 (very susceptible to windthrow). At Stainburn approximately two thirds of the forest is in the intermediate hazard class 4 where thinning options can be more limiting and particular care needs to be taken over the timing, pattern and intensity of thinning to avoid precipitating the onset of serious windthrow.

2.4 Landscape (Photographic montage)

The forest is situated in the 'Stainburn Moor, Lindley Moor and Sandwith Moor' landscape character area and is planted on a gritstone outcrop adjacent to Little Alms Cliff. The forest gently slopes southwards across the moorland sections of the forest, whereas Norwood Edge and Warren Plantation fall more steeply toward the south and south-west.

As described in the character area assessment '*the conifer forest is situated on the higher ground to the south west in this elevated character area and is prominent on the skyline with more attention being attracted to it due the presence of a large communications mast at the highest point.*'

At the start of the previous plan (2002), the forest was largely coniferous in nature with 92% conifer planting, 3% broadleaf species and 6% temporary and permanent open space. Although still predominantly coniferous at 80%, there have been increases in broadleaf cover to 4% and 16% open space. The open space in Stainburn is a combination of permanent and temporal. Over time the latter will regenerate with a combination of conifer and broadleaf species whilst maintaining a proportion of open space, creating a mosaic habitat of wooded heath. The increase in broadleaf cover can be attributed in part to the restoration of conifer Plantations on Ancient Woodland Sites (PAWS) to site-native broadleaf species. In addition, second-rotation conifer stands have a greater proportion of birch regeneration and open space within them. The increase in species and structural diversification is having a positive impact on the forests contribution within the landscape.

2.5 People and Community (FP Map – 05)

This is a popular forest where walkers and horse riders make frequent use of the network of forest roads and rides on a daily basis. There is formal car park provision at Warren Plantation

and Stainburn Moor and a network of mountain bike trails have been created in partnership with a local user group in Warren Plantation.

This is freehold woodland and is dedicated as Open Access land through the Countryside Rights of Way Act (2000).

2.6 Natural Heritage (FP Map – 05) –

There are no statutory designated conservation sites on or adjacent this block of woodland.

In forestry-terms, this is recently established secondary plantation conifer forest, which has a limited but improving catalogue of ecological diversity. At Oaken Bank there are 3.6 hectares of recently restored conifer Plantation on Ancient Woodland (PAWS) where conifer trees have been removed and native birch are regenerating.

RSPB data (bird conservation targeting maps) indicate woodcock, redstart, tree pipit and lesser redpoll exist within or close enough to the forest to benefit from its improving woodland structure.

A network of water courses and forest drains pass through the forest, supporting an increasing area of riparian habitat. These sites typically support a more diverse woodland structure where native broadleaf tree species and ground flora can naturally regenerate.

Likewise, wider forest rides, road verges and areas of open ground are developing a more diverse range of ground flora, particularly those associated with northern Atlantic wet heath.

2.7 Cultural Heritage (FP Map 05)

There are no statutory designated heritage sites within this block of woodland, although the scheduled cup and ring marked rocks on Little Alms Cliff are within 65 metres of the forest boundary.

Current records suggest there are no heritage features within the forest.

3. Describing the Project

3.1 Project Brief

- manage natural and cultural heritage sites in accordance with their requirements,
- 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 age structure by use of appropriate silvicultural systems.

3.2 Objectives

People

- Encourage communities to become involved across these woods, its management and direction through consultation in planning and participation in volunteering.
- Maintain and improve the woodlands contribution to the wooded character within the Harrogate Borough Council “Stainburn Moor, Lindley Moor and Sandwith Moor character area”.

Environment, Nature and History

- Improve the resilience of the natural environment and realise the potential of these woods for nature and wildlife, to be measured by Non-Government Organisations and FC systems accordingly.

Economic Growth

- Maintain the land within our stewardship under UKWAS certification, to be measured by 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 the Production Forecast and Sales Recording Package.

3.3 Constraints

- Potential forest health issues on pine (*Dothistroma*), larch (*Phytophthora*) and spruce (*Dendroctonus* and *Elatobium*).
- The retention of windfirm conifer stands on extended rotations that will allow the development of continuous cover forestry systems to facilitate species and structural diversity.
- Challenges of managing expectations for public access across the forest.

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

Operational 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 Stainburn this will include:

- Managing Veteran trees and PAWS as set out in – ‘Ancient Woodland on the Forestry Commission Estate in England (March 2002)’ and ‘FEE Operations Instructions No. 3 (rev.2012), Ancient Woodlands’.
- Increase and improve the deadwood resource as set out in – ‘Managing deadwood in forests and woodlands Practice Guide (2012)’. Areas of high ecological value across which deadwood resources could be encouraged include; riparian zones and ancient woodland.
- Increase the diversity of tree species and age structure that will maintain and improve favourable habitats for target species and identified habitats. This is particularly beneficial for the range of habitats and species recorded at Stainburn from which a selection has already been mentioned at 2.6 - Natural Heritage.
- A number of watercourses currently identified as good, moderate or poor status through the Water Framework Directive (WFD) assessment are located downstream of Stainburn. Work undertaken through this plan will contribute to improving their condition by replacing existing conifer crops with riparian habitat where watercourses and forest drains feed into these. The implementation of continuous cover forestry systems and phasing of felling will avoid significant lengths of watercourse being felled at any one time.

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.

Through this plan 20.82 hectares are designated LTR.

Invasive species

There are currently no known invasive species that impact across this plan.

3.4.2 Timber Harvesting

We will continue to sustainably harvest timber from clearfell, group felling and thinnings, and where appropriate develop broadleaf stands to increase their contribution to timber production. These operations will be planned and controlled to ensure due regard for all other objectives of management at Stainburn.

3.4.3 Landscape

The woodland sits within ‘Stainburn Moor, Lindley Moor and Sandwith Moor’ landscape character area with 18.0 hectares falling within Nidderdale AONB, a designated landscape. As described in section 2.4, the forest is prominent within the landscape.

On a scale of low/medium/high, landscape sensitivity is considered to range from low to medium depending upon the viewers’ location and visibility across the wider landscape.

The forest is dominated by evergreen conifer species, ranging from 1950’s afforestation to present day restocking. The continuing process of felling and restocking is helping to create a more varied forest structure and species composition which is evident when viewed externally from public highways, rights of way and internally from forest roads and rides.

Future felling should retain climate-matched species such as pine, spruce and broadleaf species and diversify overall composition and age structure by continuing to fell uniform conifer stands. The adoption of Continuous Cover Forestry (CCF) and smaller-scale felling responding to landform across the forest will contribute toward a more varied and intimate forest landscape.

3.5 Plan (FP Map 06)

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 felling and restock maps.

3.6 Areas (FP Maps 08 and 09)

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	Projected volume (m ³)
2017 – 2021 Clearfell	21.09	10	5665
2022 – 2026 Clearfell	29.14	14	4630

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 Design Plan folder.

Habitat type - (based on principal species established)	Area – hectares		% age of total area	
	2016	2066	2016	2066
Conifer	172.54	130.51	80	61
Broadleaf	8.79	36.52	4	17
Temporal and permanent open ground (inc. felled)	34.10	48.37	16	22

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.

3.7.2 Standards

All operations within the forest will be carried out in accordance with the certification standard for the U.K. Woodland Assurance Standard and the U.K Forestry Standard 2011 i.e. Forests and biodiversity, Forests and climate change, Forests and historic environment, Forests and landscape, Forests and people, Forests and soils, Forests and Water.

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 Continuous Cover Forestry

All plans are required to consider lower impact silvicultural systems (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 CCF management, we will manage on an extended rotation basis to be thinned and monitored for future consideration for conversion to CCF.

Using the FC Forest Research Agency, Ecological Site Classification system (ESC), a range of conifer species identified as 'optimum', 'suitable' or 'marginal' will be employed where timber production is considered as an objective.

See Appendix 3 – CCF Justification.

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, Fourth Edition (2012), which aims to improve the safety and environmental standards of the timber haulage industry.

3.7.5 Restocking

Conifer

The areas of small group felling carried out as part of the CCF silvicultural systems will be replanted to diversify species and age structure and 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 3 and Appendix 4 'Species by soil type' will help inform restocking options.

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.

As indicated at 3.7.1 Planning, 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.

The areas of CCF silviculture 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.

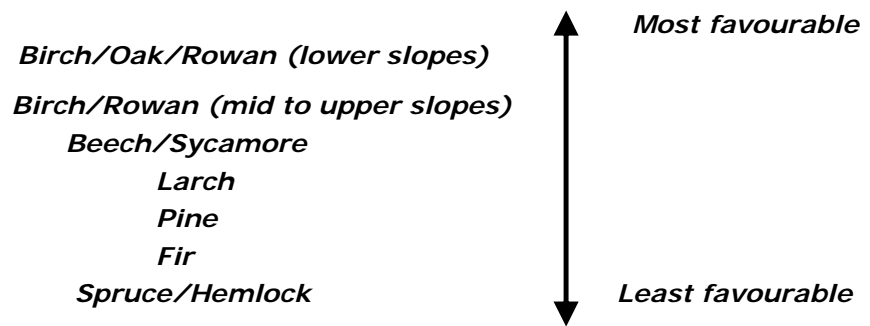
Broadleaf

The areas of PAWS at Oaken Bank will be restored to the native woodland type. The recent removal of conifer trees has promoted the establishment of birch natural regeneration and a more diverse ground flora.

Natural regeneration in PAWS 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) threatens the native woodland community, it will be removed as soon as practicable. Where the risk is lower it will be allowed to reach a harvestable size and removed as part of a routine felling or thinning operation.

On non-PAWS sites planned for conversion to broadleaf woodland, we will accept natural regeneration of both native and non-native species i.e. beech, sycamore.

Species regeneration on PAWS areas



Heathland/Wooded heath

It is proposed to develop a mosaic of successional habitat through natural regeneration across recently felled conifer sites, particularly where these can promote habitat corridors along linear features i.e. forest roads and rides. This will create an ecotone of wooded heath, combining elements of heathland flora and conifer and broadleaf tree regeneration. Habitat networks will be maintained and established across parts of the forest that will enhance and maximise the movement of flora and fauna by increasing the permeability both within and outwith the forest area. The development of these sites will be beneficial for a range of species including bird species identified in section 2.6.

We do not intend to manage these sites for future timber production.

4. Monitoring

4.1 Clearfells

All clearfell areas are managed spatially using the Sub Compartment Database to ensure the boundaries and designs are accurately reproduced on the ground. Significant variances in the areas to be felled will require a formal amendment of the plan plus the agreement of and approval by Forest Services staff, as per CSM 6.

4.2 Restock

All restock areas where timber production is an objective will be planted/naturally regenerated and monitored to ensure that the number of established trees per hectare fully meets the requirements of OGB*4. This document has mandatory requirements on the monitoring of the crop in Year 5 to ensure the establishment of at least 2500 trees / ha.

4.3 Continuous Cover

Continuous cover areas will be monitored using the methods and procedures contained in OGB*7. Similar in scope to the methods employed for restock areas, where timber production is the aim we need to have at least 2000 saplings per hectare after 10 – 15 years, these should be evenly spread over 90% of the site.

4.4 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 2020. This time period can be shortened if circumstances change significantly or if parts of the plan prove detrimental to the overall aims and objectives.

*Operational Guidance Booklet

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 more subtle (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. (www.forestry.gov.uk/keepersoftime)

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 native woodlands.

5.2 Flora

Heathland is a UKBAP Priority Habitat

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 of heathland where this will improve habitat networks within Stainburn. Maintaining a mixed resource of temporary and permanent open space will provide suitable habitat for woodland bird species indicated in Appendix 2 and other priority flora and fauna species within the forest area.

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 Stainburn. 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 woodland bird species throughout the woodland.

Appendix 2 – Priority woodland bird

Bird Species ¹	Forest location	Habitat enhancement ²
Nightjar Tree Pipit	Clearfell, restock sites.	<p>Maintain a continuity of suitable clearfell and permanent open habitat. Retention of some trees/standing deadwood in clearfell areas for use as song posts.</p> <p>Create and maintain open structure woodland/wooded heath, ride enhancement and glade creation.</p>
Woodcock Lesser redpoll Redstart Willow warbler	Established broadleaf and mixed broadleaf/conifer stands.	Group felling/thinning of closed canopy stands to improve, structural diversity, shrub layer structure, enhance rides and woodland edge, create and maintain successional woodland (birch)/scrub habitat and standing deadwood.

¹ Source – RSPB bird conservation targeting maps - www.rspb.org.uk/forprofessionals/targeting/targeting_maps.aspx and BTO Breeding Bird Survey data.

² Woodland Management for birds: a guide to managing for declining woodland birds in England

Appendix 3 – CCF justification

Site Factor	Suitability Score	Comment
Wind Hazard Classification: predominantly class 4	2	Tree stability may be a site-limiting factor across parts of the main block at higher elevations across Stainburn and Lindley Moor
Soil fertility: Mainly poor (ironpan, peaty SWG), Small proportion Medium (typical/podzolic B.E, typical SGW)	1 – Main block 2 – Norwood, Warren	Predominantly poor across most of main block but medium across parts of Norwood Edge and Warren Plantation, with a greater range of competing ground vegetation.
Current species suitability: Nil LP, SP, Silver birch SS	1 – Optimal 2 – Suitable 3 – Marginal	The current range of species offers a limited selection that can be developed for natural regeneration. However, there are currently examples of SS and birch advanced regeneration across the forest.

With a combined score ranging from 5 to 8, initial analysis indicates significant areas of Stainburn achieve a Moderate (5) site ranking for transformation to CCF. Further analysis of stand structure is considered to help inform whether transformation should be considered.

- Stand form – Scots pine is of moderate form and spruce is of a reasonable quality.
- Thinning history – Significant areas of the main block and Warren Plantation has not been thinned. Irregular thinning has been carried out at Norwood Edge. Only sites that have been regularly thinned will be identified as CCF on the felling map. Delayed thin sites will be managed on an extended rotation basis.
- Currently there is evidence that SS and birch are capable of developing as a natural regeneration resource across restock sites.

On the basis of the above information, we will consider CCF across even-aged conifer stands using a range of conifer species (LP, SP, SS and birch, but also enrichment planting with Macedonian pine and Western hemlock where conditions allow), aiming for a simple stand structure.


























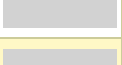
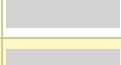
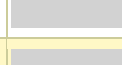
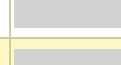
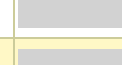





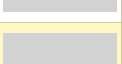
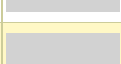
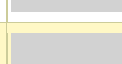
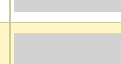
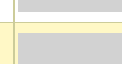
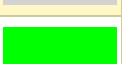
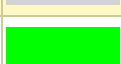
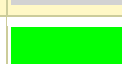
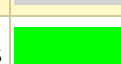
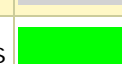





We will adopt a Group Shelterwood system through a combination of thinning, group felling (0.25 to 0.50 ha) and replanting with suitable species.

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

The Forest Research ESC table below supports the range of target species considered for natural regeneration and those where enrichment planting will increase species diversity.

[Stainburn, 6003b SE212513] Future Climate Analysis - 5km Area Projection UKCIP02

Species	Baseline			2050 Lo			2050 Hi			2080 Lo			2080 Hi		
	Lim Factor	Suitability	Yield	Lim Factor	Suitability	Yield	Lim Factor	Suitability	Yield	Lim Factor	Suitability	Yield	Lim Factor	Suitability	Yield
Corsican pine	SNR		10	SNR		12	SNR		12	SNR		12	SNR		12
Lodgepole pine	SNR		12	SNR		12	SNR		12	SNR		12	SNR		8
Macedonian pine	SNR		8	SNR		8	SNR		8	SNR		8	SNR		6
Maritime pine	DAMS		6	DAMS		6	DAMS		6	DAMS		6	DAMS		6
Monterey/Radiata pine	AT5		6	SNR		10	SNR		10	SNR		12	SNR		10
Scots pine	SNR		10	SNR		10	SNR		10	SNR		10	SNR		10
Weymouth pine	SNR		4	SNR		4	SNR		4	SNR		4	SNR		4
Norway spruce	SNR		4	SNR		4	SNR		4	SNR		4	SNR		4
Oriental spruce	SNR		0	SNR		0	SNR		0	SNR		0	SNR		0
Serbian spruce	SNR		6	SNR		6	SNR		6	SNR		6	SNR		6
Sitka spruce	SNR		12	SNR		12	SNR		12	SNR		12	MD		8
Douglas fir	SNR		4	SNR		4	SNR		4	SNR		4	SNR		4
Hybrid larch	SNR		10	SNR		10	SNR		8	SNR		8	MD		4
Japanese larch	SNR		10	SNR		10	SNR		10	SNR		10	MD		4
European larch	SNR		0	SNR		0	SNR		0	SNR		0	SNR		0
Western red cedar	SNR		0	SNR		0	SNR		0	SNR		0	SNR		0
Japanese red cedar	SNR		0	SNR		0	SNR		0	SNR		0	SNR		0
European silver fir	SNR		4	SNR		4	SNR		4	SNR		4	SNR		4
Grand fir	SNR		0	SNR		0	SNR		0	SNR		0	SNR		0

Noble Fir	SNR		6	SNR		6	SNR		6	SNR		6	MD		0
Nordmann fir	SNR		4	SNR		6	SNR		6	SNR		6	SNR		4
Pacific fir	SMR		6	SMR		6	SMR		6	SMR		6	SMR		6
Leyland cypress	SNR		2	SNR		2	SNR		2	SNR		2	SNR		2
Western hemlock	SMR		8	SMR		8	SMR		8	SMR		8	SMR		6
Giant redwood	SNR		0	SNR		0	SNR		0	SNR		0	SNR		0
Coast redwood	SNR		0	SNR		0	SNR		0	SNR		0	SNR		0
Lawson's cypress	SNR		6	SNR		6	SNR		6	SNR		6	SNR		6
Downy birch	SMR		0	SMR		0	SMR		0	SMR		0	SMR		0
Silver birch	DAMS		6	DAMS		6	DAMS		6	DAMS		6	DAMS		4

Site type		Species													
Upland sites	Lowland sites	SP	LP	Mac P	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/INFILL	Cat A Major species - currently widely used with no supply problems and should continue to play an important role
Bold lower case italics	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	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

[source data](http://www.forestry.gov.uk/fr/treespecies) http://www.forestry.gov.uk/fr/treespecies


[source data](http://www.forestry.gov.uk/forestry/inf-d-8mad67) http://www.forestry.gov.uk/forestry/inf-d-8mad67

Refer to cell comments for specific species notes



No planting where >1m peat depth

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

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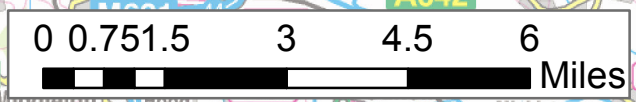


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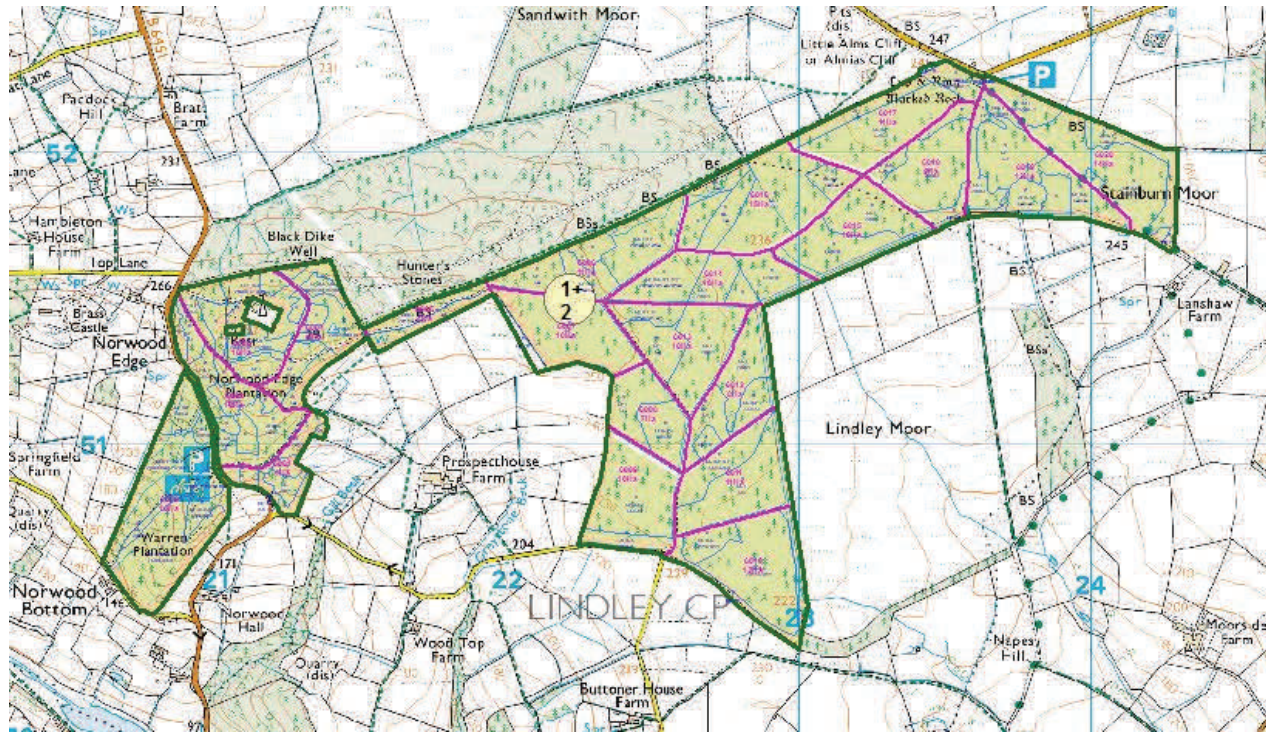



Scale: 1:150,000
when drawn @ A3

Stainburn Location Map



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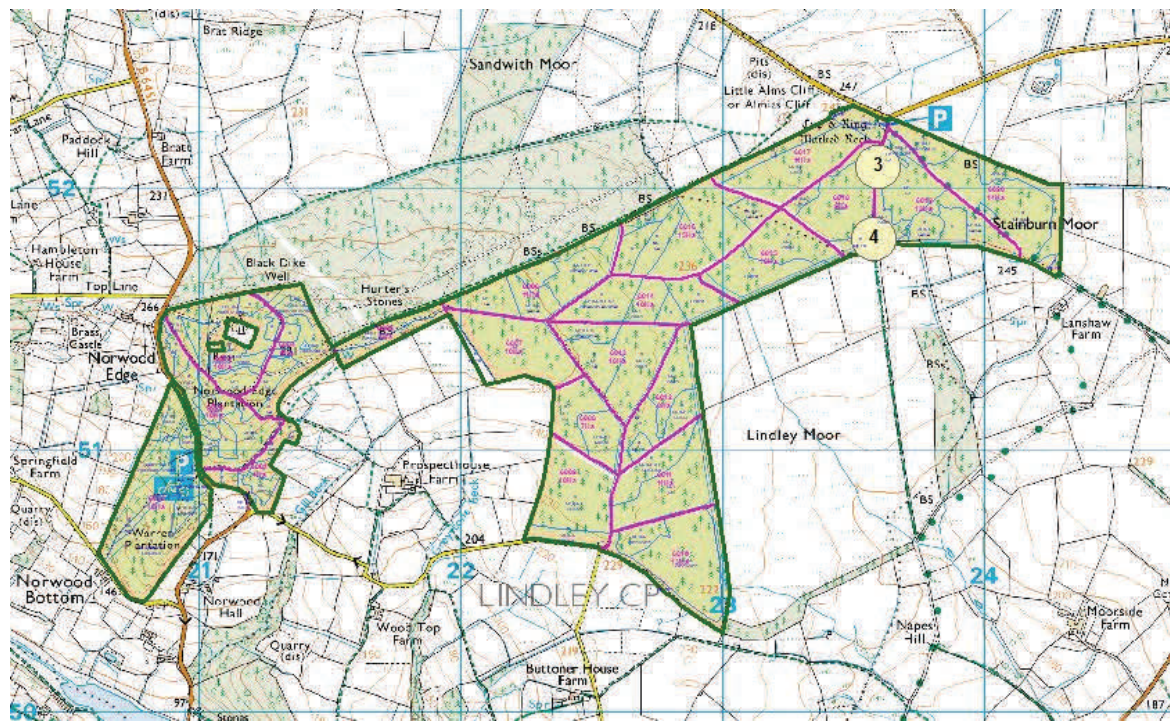
**Stainburn
Yorkshire Forest District
Forest Plan 60
Internal Views**



Opposing views at SE 223515

Views 1 & 2: Taken from the same location but diametrically opposite aspect, these two photographs highlight the changes Stainburn Forest is undergoing. Looking west the narrow forest ride is heavily shaded and lacks structural and species diversity. Looking east, recent restocking set back from the road with mixed conifer species and groups of native broadleaves (in shelters) will enhance the visitor experience and improve habitat for wildlife as these stands establish and develop.





**Stainburn
Yorkshire Forest District
Forest Plan 60
Internal Views**

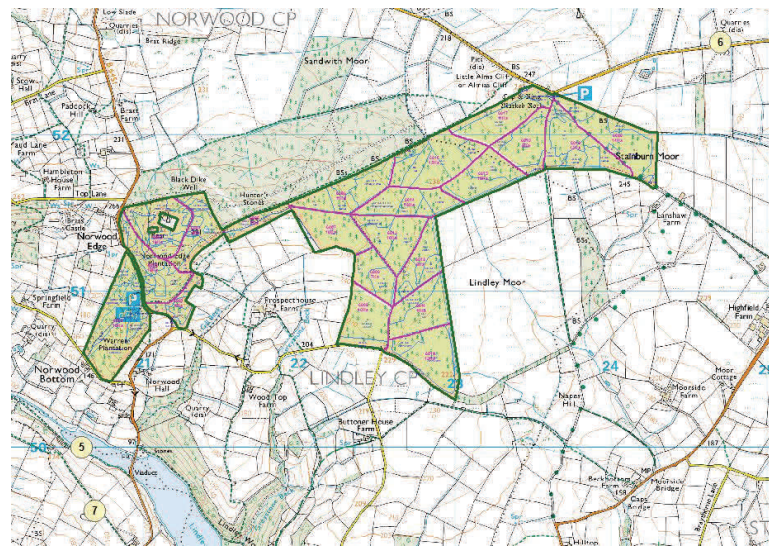
Internal forest structure: SE 236521

View 3: This view reinforces the improvements and development to the forests internal structure, where unplanted areas have developed heathland ground flora and young and old conifer crops provide structural improvements where previously even-aged stands grew.



Forest road looking across to Lindley Moor: SE 236518

View 4: From this position the viewer is able to pick out the structural changes within the forest where even-aged stands have been felled and subsequently restocked. Restocking several metres back from the road edge has allowed a more floristically diverse buffer between the forest drain and conifer crop to develop.



**Stainburn
Yorkshire Forest District
Forest Plan 60**

External Views



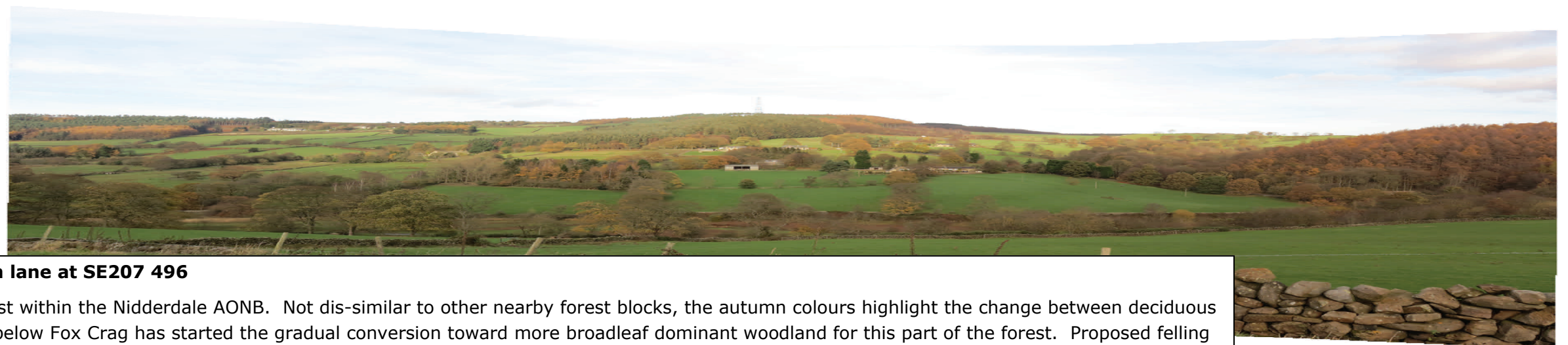
Warren Plantation from public footpath at SE 206500

View 5: This restock site was felled in 2005. The combined impacts of planting and natural regeneration help to create a more diverse stand of birch, alder, larch, pine and spruce contributing toward a more complex forest structure, benefiting wildlife and landscape alike. The trees obscure the popular mountain bike trails that run through this part of the forest.



From Norwood Lane to forest on Stainburn Moor at SE 247526

View 6: This view remains relatively unchanged since when the plan was last renewed in 2002. Although felling and restocking around the car park has been carried out, the developing copse of conifer in the adjoining field obscures the young pine and birch. At a distance the forest edge remains uniform and uninteresting. Future felling and restocking will break up the long continuous geometric edge.



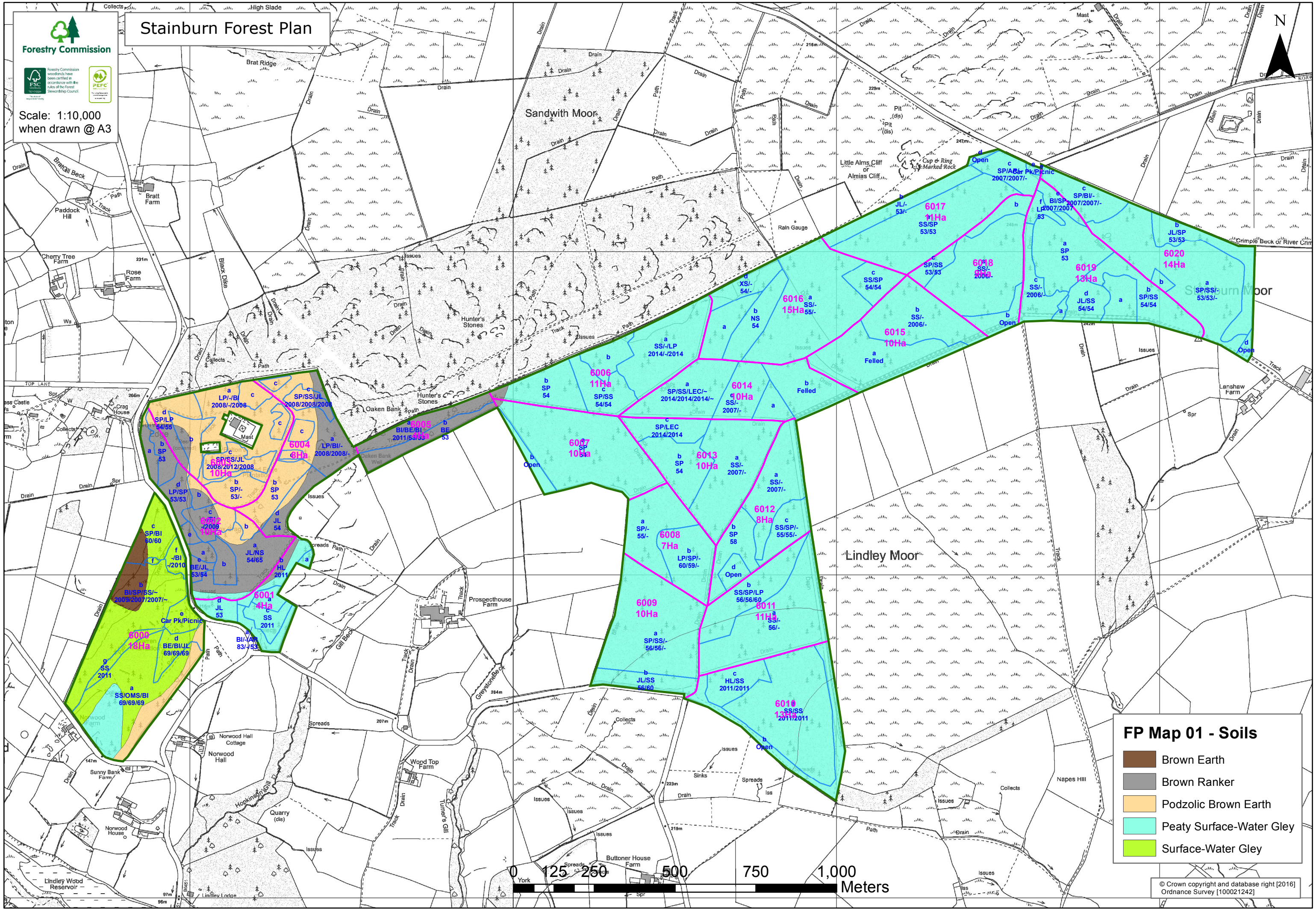
Warren Plantation from Rose Tree Farm lane at SE207 496

View 7: This view captures parts of the forest within the Nidderdale AONB. Not dis-similar to other nearby forest blocks, the autumn colours highlight the change between deciduous and non-deciduous species. Recent felling below Fox Crag has started the gradual conversion toward more broadleaf dominant woodland for this part of the forest. Proposed felling will continue this process with appropriate-sized coupes sympathetic to landform.



Stainburn Forest Plan

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FP Map 01 - Soils

- Brown Earth
- Brown Ranker
- Podzolic Brown Earth
- Peaty Surface-Water Gley
- Surface-Water Gley

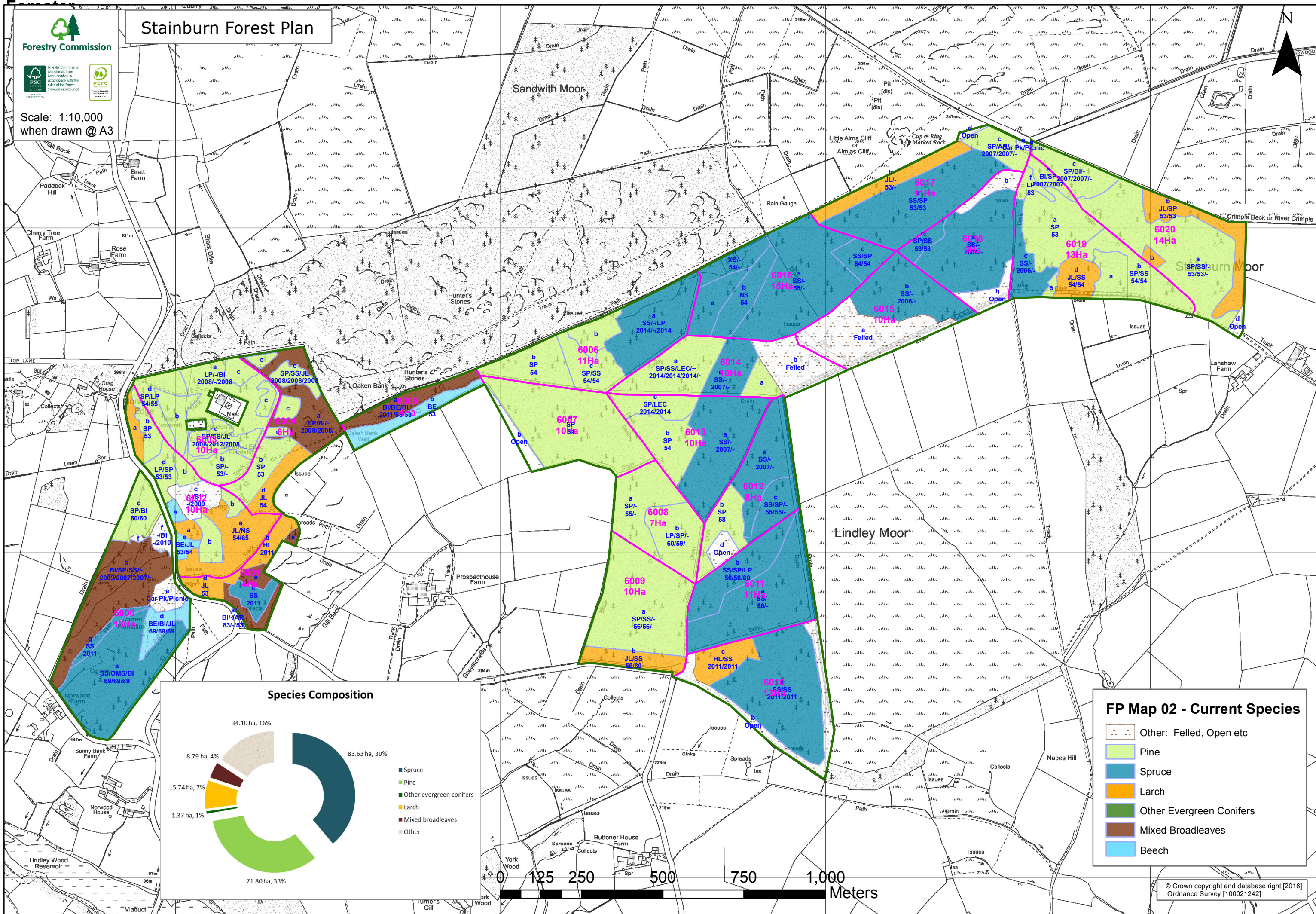


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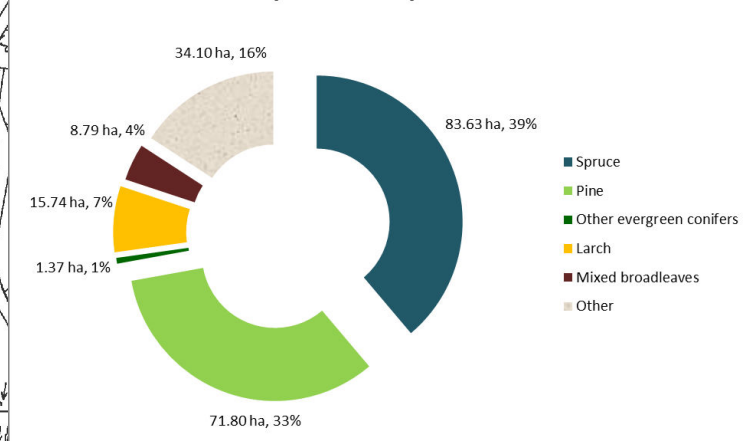
Stainburn Forest Plan



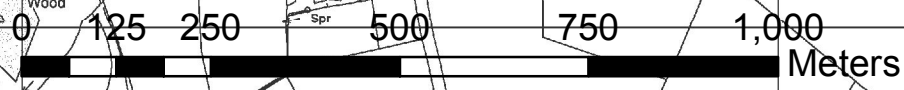
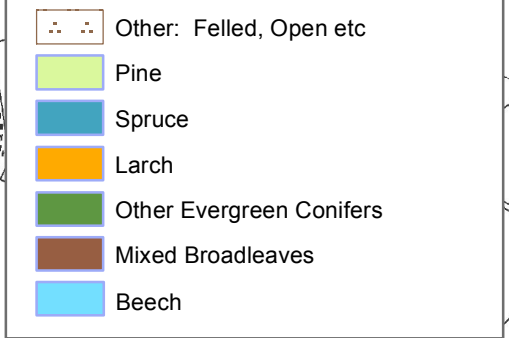
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Species Composition



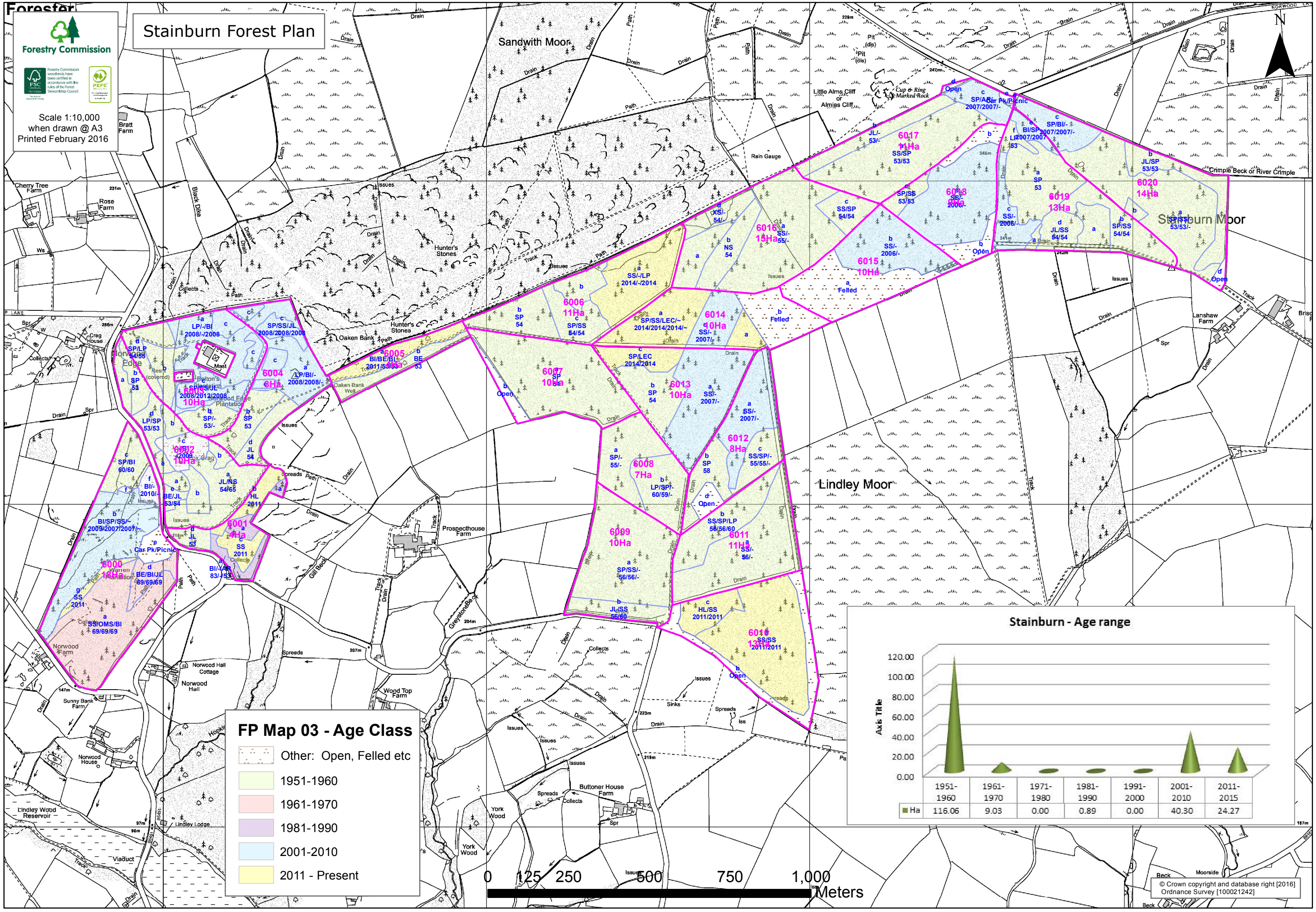
FP Map 02 - Current Species



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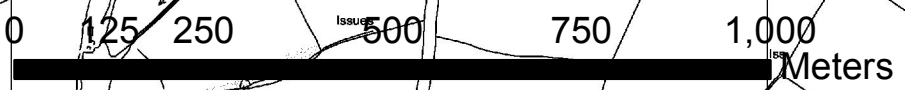
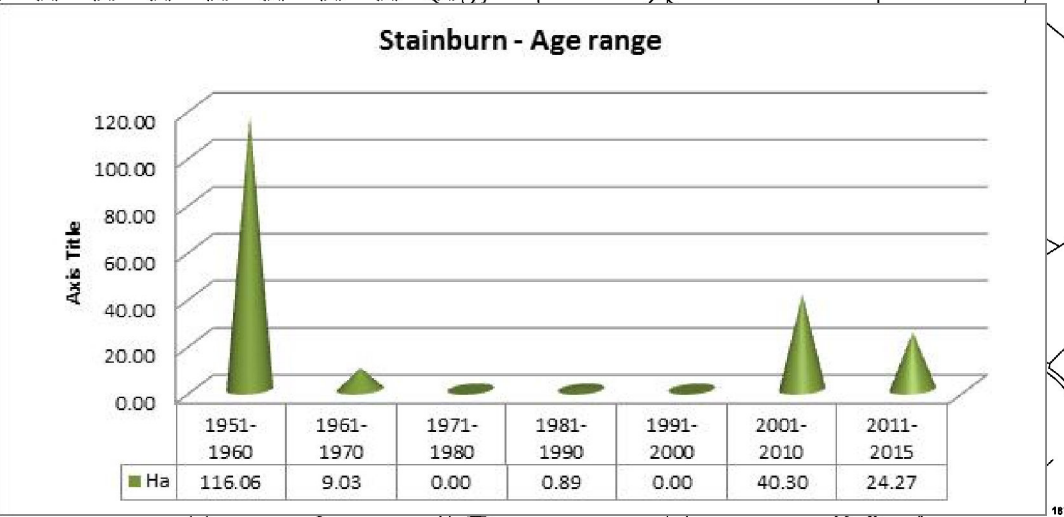
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FP Map 03 - Age Class

- Other: Open, Felled etc
- 1951-1960
- 1961-1970
- 1981-1990
- 2001-2010
- 2011 - Present



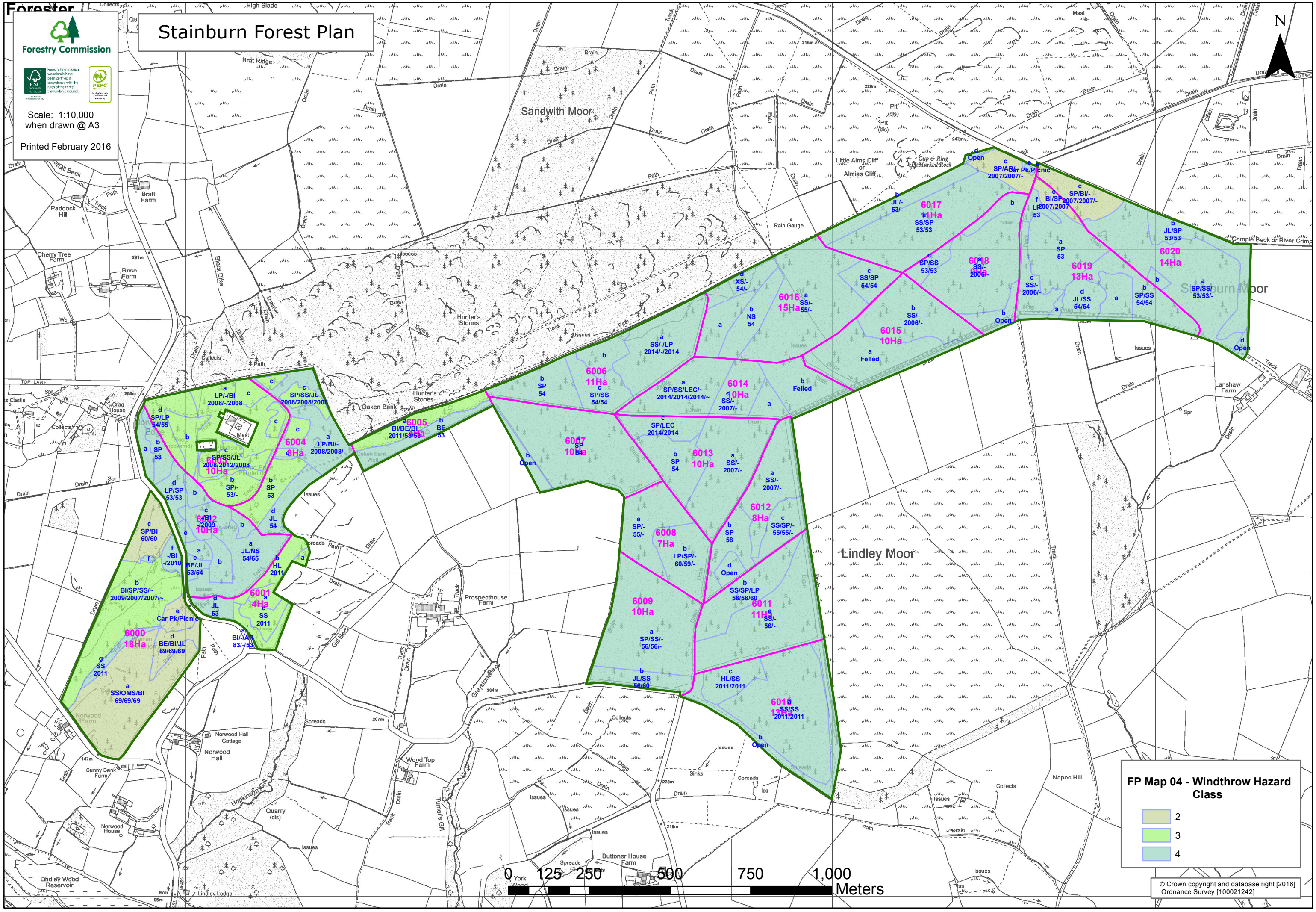
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Stainburn Forest Plan



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FP Map 04 - Windthrow Hazard Class

2
3
4

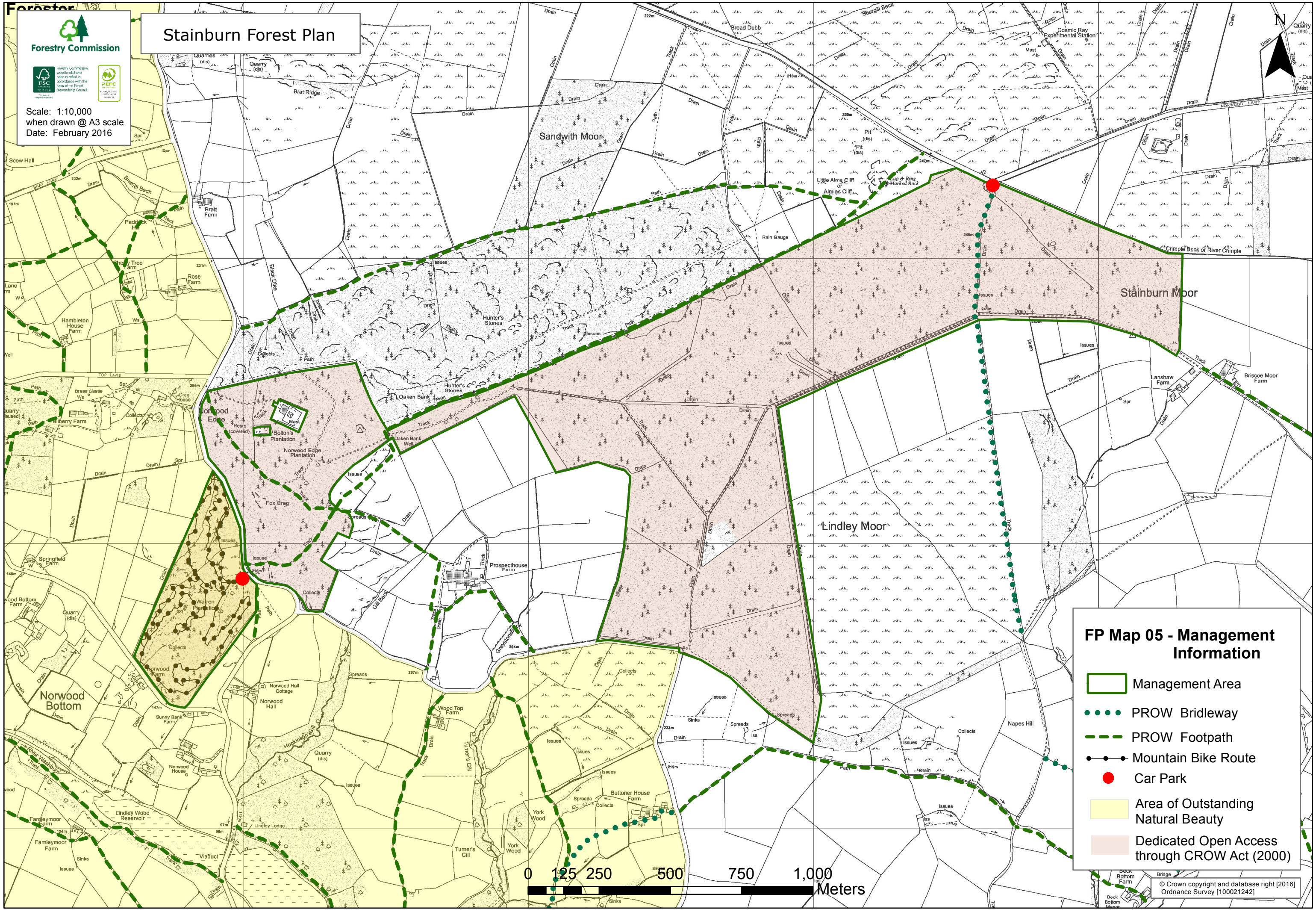


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Stainburn Forest Plan



FP Map 05 - Management Information

- Management Area
- . PROW Bridleway
- PROW Footpath
- Mountain Bike Route
- Car Park
- Area of Outstanding Natural Beauty
- Dedicated Open Access through CROW Act (2000)



Stainburn Forest Plan Yorkshire Forest District Analysis and Concept

FP Map 06 - Analysis and Concept

- Predominantly productive mixed conifer
- Convert to predominantly mixed broadleaf
- Open habitat/wooded heath
- Restore ancient woodland sites
- Forest drains

Forest landscape character is influenced by unsympathetic geometric boundaries and uniform crop structure.

- * Clearfell coupes will be designed appropriate to landform and local landscape. Allow hard-edged conifer boundaries to develop a mosaic of open and wooded habitats.
- * Management of 2nd- rotation stands using continuous cover systems and extended rotation silviculture will contribute toward the development of a more diverse forest habitat with the AONB.

Stainburn forest offers opportunities to develop benefits to improve ecological features.

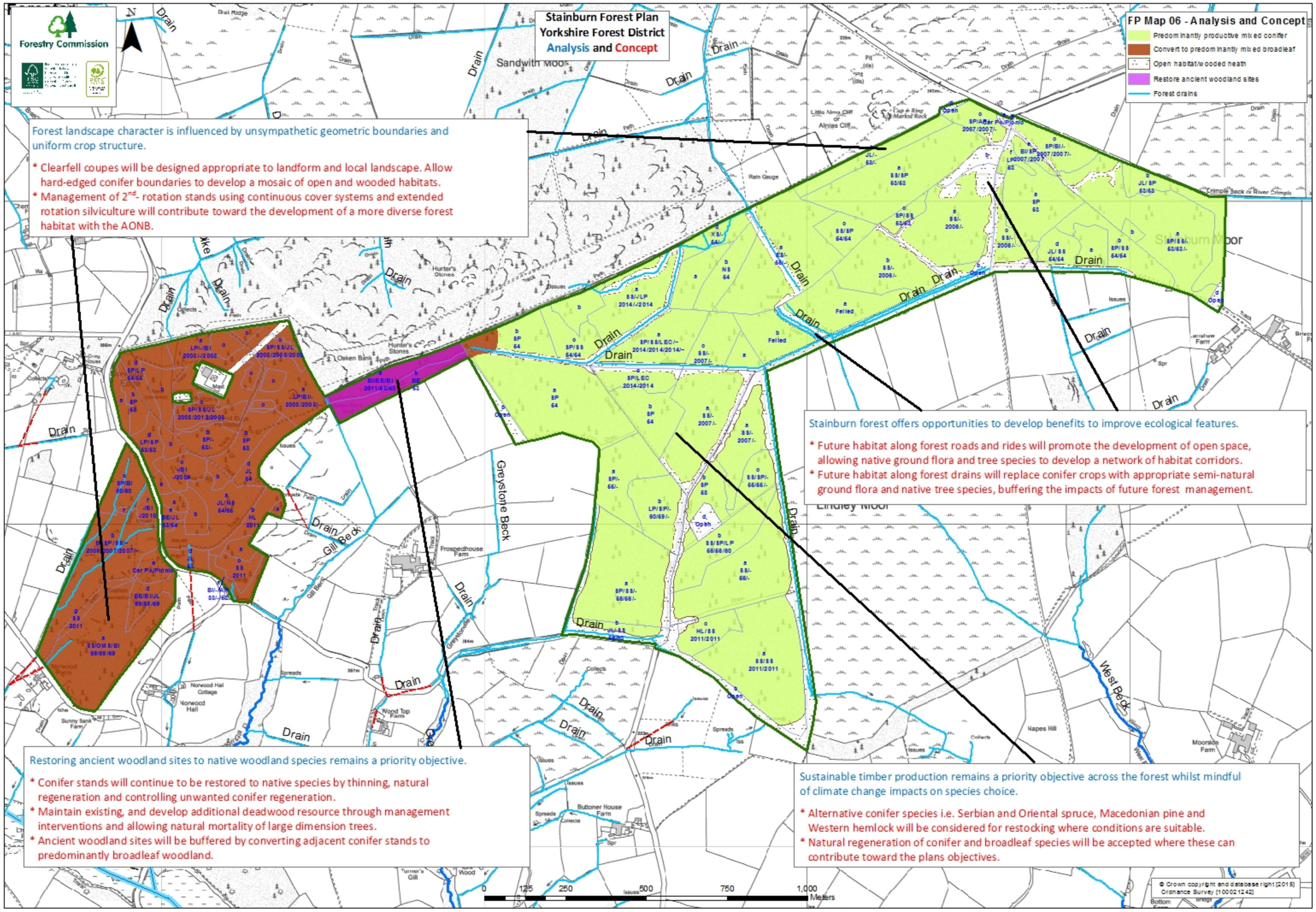
- * Future habitat along forest roads and rides will promote the development of open space, allowing native ground flora and tree species to develop a network of habitat corridors.
- * Future habitat along forest drains will replace conifer crops with appropriate semi-natural ground flora and native tree species, buffering the impacts of future forest management.

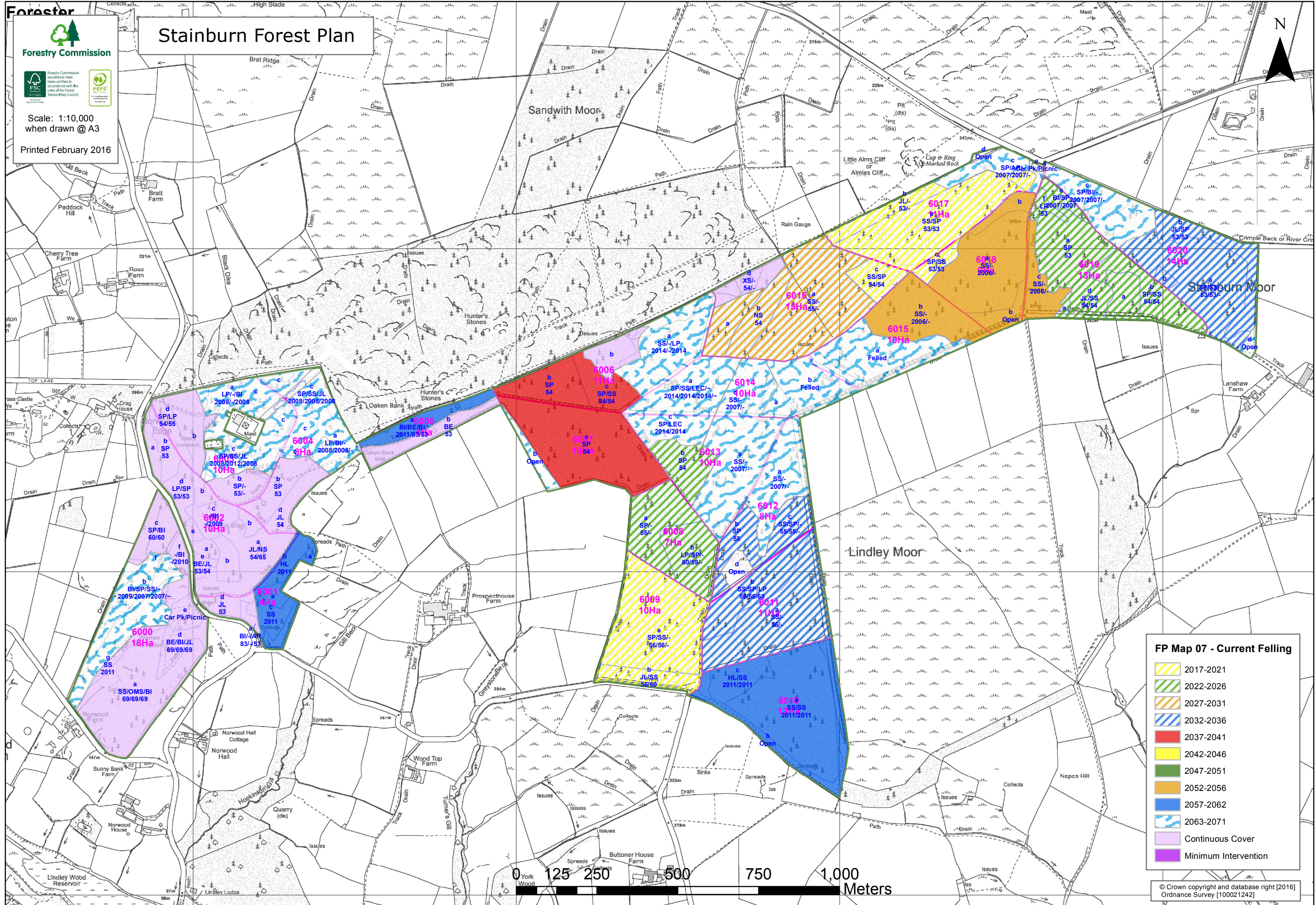
Restoring ancient woodland sites to native woodland species remains a priority objective.

- * Conifer stands will continue to be restored to native species by thinning, natural regeneration and controlling unwanted conifer regeneration.
- * Maintain existing, and develop additional deadwood resource through management interventions and allowing natural mortality of large dimension trees.
- * Ancient woodland sites will be buffered by converting adjacent conifer stands to predominantly broadleaf woodland.

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

- * Alternative conifer species i.e. Serbian and Oriental spruce, Macedonian pine and Western hemlock will be considered for restocking where conditions are suitable.
- * Natural regeneration of conifer and broadleaf species will be accepted where these can contribute toward the plans objectives.





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

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Stainburn Forest Plan

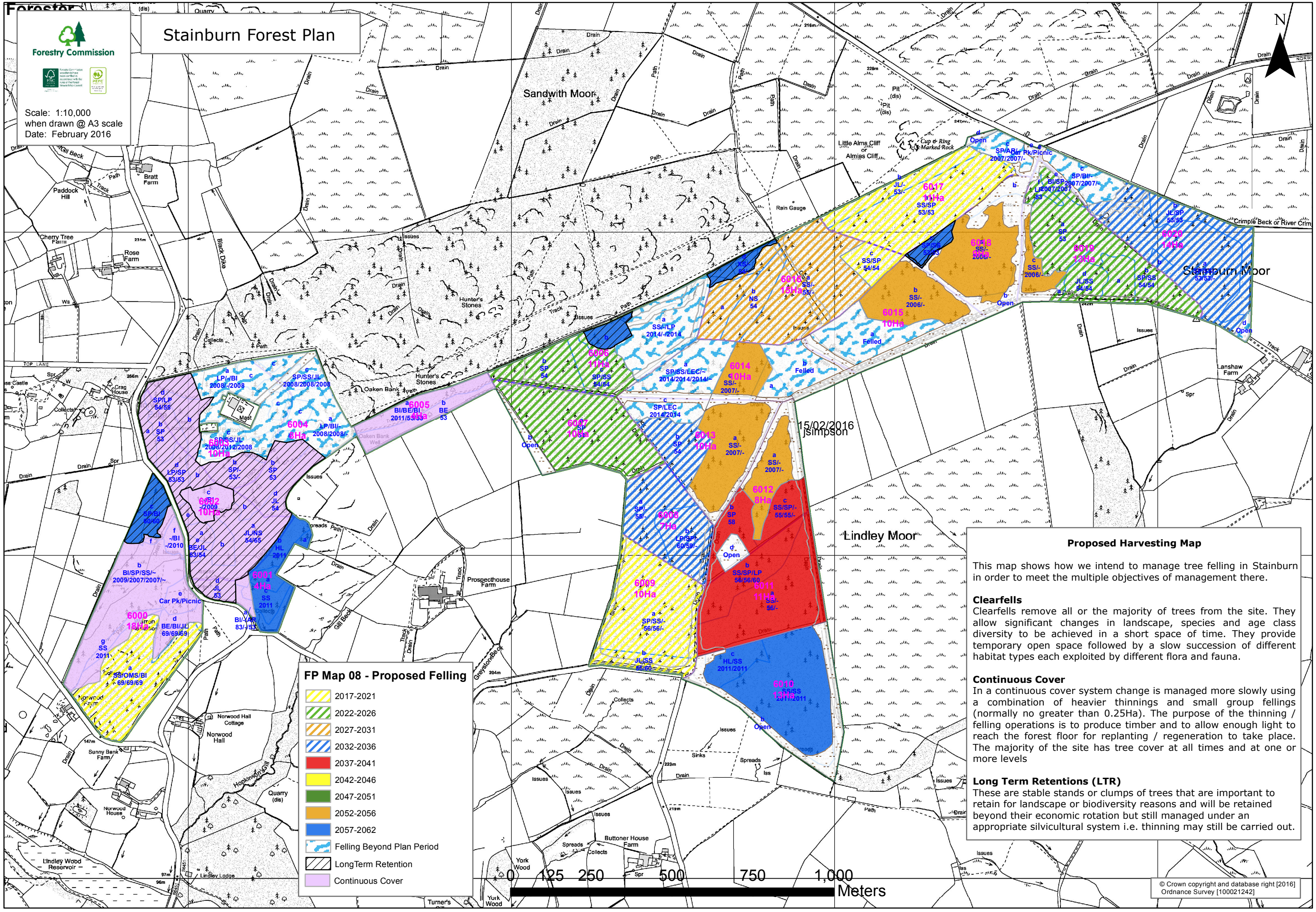


FP Map 07 - Current Felling

- 2017-2021
- 2022-2026
- 2027-2031
- 2032-2036
- 2037-2041
- 2042-2046
- 2047-2051
- 2052-2056
- 2057-2062
- 2063-2071
- Continuous Cover
- Minimum Intervention



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FP Map 08 - Proposed Felling

- 2017-2021
- 2022-2026
- 2027-2031
- 2032-2036
- 2037-2041
- 2042-2046
- 2047-2051
- 2052-2056
- 2057-2062
- Felling Beyond Plan Period
- Long Term Retention
- Continuous Cover

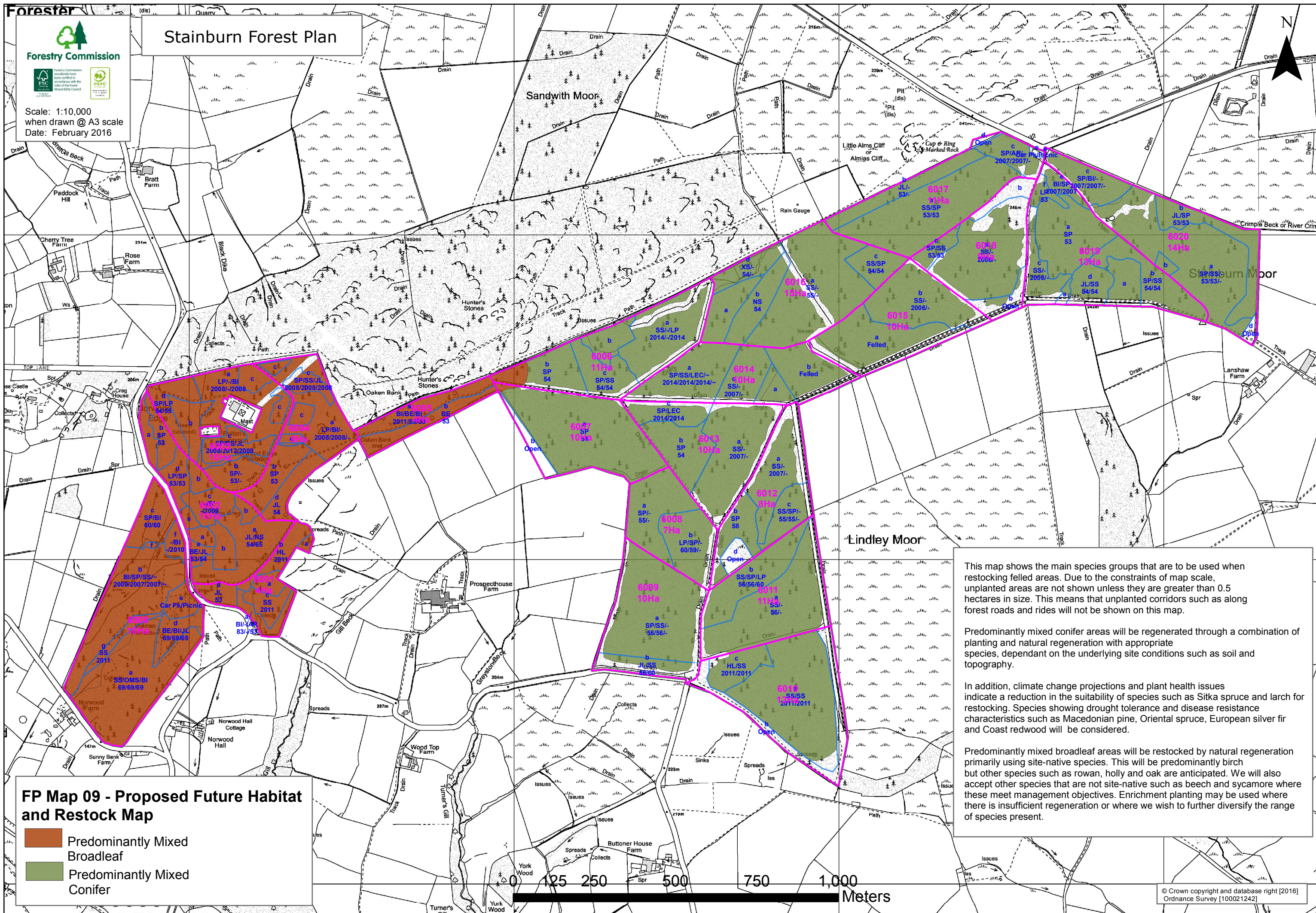
Proposed Harvesting Map

This map shows how we intend to manage tree felling in Stainburn 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.

Continuous Cover
 In a continuous cover system change is managed more slowly using a combination of heavier thinnings and small group fellings (normally no greater than 0.25Ha). The purpose of the 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

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.



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 Date: February 2016

Stainburn Forest Plan

FP Map 09 - Proposed Future Habitat and Restock Map

- Predominantly Mixed Broadleaf
- Predominantly Mixed Conifer

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, dependant 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 Sitka spruce and larch for restocking. Species showing drought tolerance and disease resistance characteristics such as Macedonian pine, Oriental spruce, European silver fir and Coast redwood 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.