

WOODLAND MANAGEMENT PLAN REPORT

FOX FALL WOOD, STONYHURST COLLEGE

For and on behalf of Treecheck Ltd.

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INTRODUCTION

This report was commissioned to satisfy planning conditions for the proposed access road through Fox Fall Wood, Stonyhurst College, Lancashire BB7 9PZ to the proposed Retreat Centre on the site of the former Corn Mill to the north of Fox Fall Wood.

Fox Fall Wood is a mature, mixed broadleaved and conifer plantation approximately 10.6 hectares in area. The woodland is located to the south-west of the Stonyhurst College buildings and forms an important landscape feature to the south of the main (axial) drive. The Ordnance Survey grid reference of the wood is SD 689 387.

The tree officer for Ribble Valley Borough Council has stated that the woodland management plan should include a description of the current woodland; an indication of the potential for timber harvesting; suggestions for the future use of the woodland resource; and recommended woodland management operations to achieve the owner's objectives.

Therefore this report does not seek to be as comprehensive as the woodland management plan format required to gain Forestry Commission approval using UK Forestry Standard (UKFS) management planning criteria. A full woodland management plan meeting this requirement would need to consider all of the woodlands within the curtilage of Stonyhurst College Estate.

A walk-over woodland survey was undertaken on 11 October 2016 to assess the characteristics of Fox Fall Wood. This included tree species composition and woodland structure, as well as the heath and condition of tree stands, and any evidence of past management.

The woodland comprises a variety of sub-compartments resulting from the historical planting pattern and from subsequent woodland management interventions and natural events. In the absence of any historical woodland management plan or sub-compartment map, this report defines a new sub-compartment layout reflecting the current stand characteristics and proposed management units for the wood.

A desk top study using internet sources was used to provide data on the site characteristics.

The agent for Stonyhurst's woodlands indicated that most of the prime timber has already been removed by commercial scale harvesting in Fox Fall Wood. However this report makes recommendations for future thinning and selective felling where appropriate in the interests of sustainable woodland management. These operations may be feasible using small scale harvesting and marketing methods for the sub-compartments in question, or to compliment timber harvesting yields from other woodlands on the estate.

A set of woodland management objectives is stated, based on background knowledge, and these should be subject to discussion and affirmation by the owners and key stakeholders.

Recommendations are made for woodland management interventions by sub-compartment.

A distinction is made between recommendations based on fundamental silvicultural advice and those of a more speculative and optional nature. The latter should be seen as ideas for future consideration, depending on the priorities of the owner and stakeholders, and for potential project development in the future.

1. SITE ASSESSMENT

1.1 The study area of Fox Fall Wood, outlined in red, is shown in Figure 1 below.

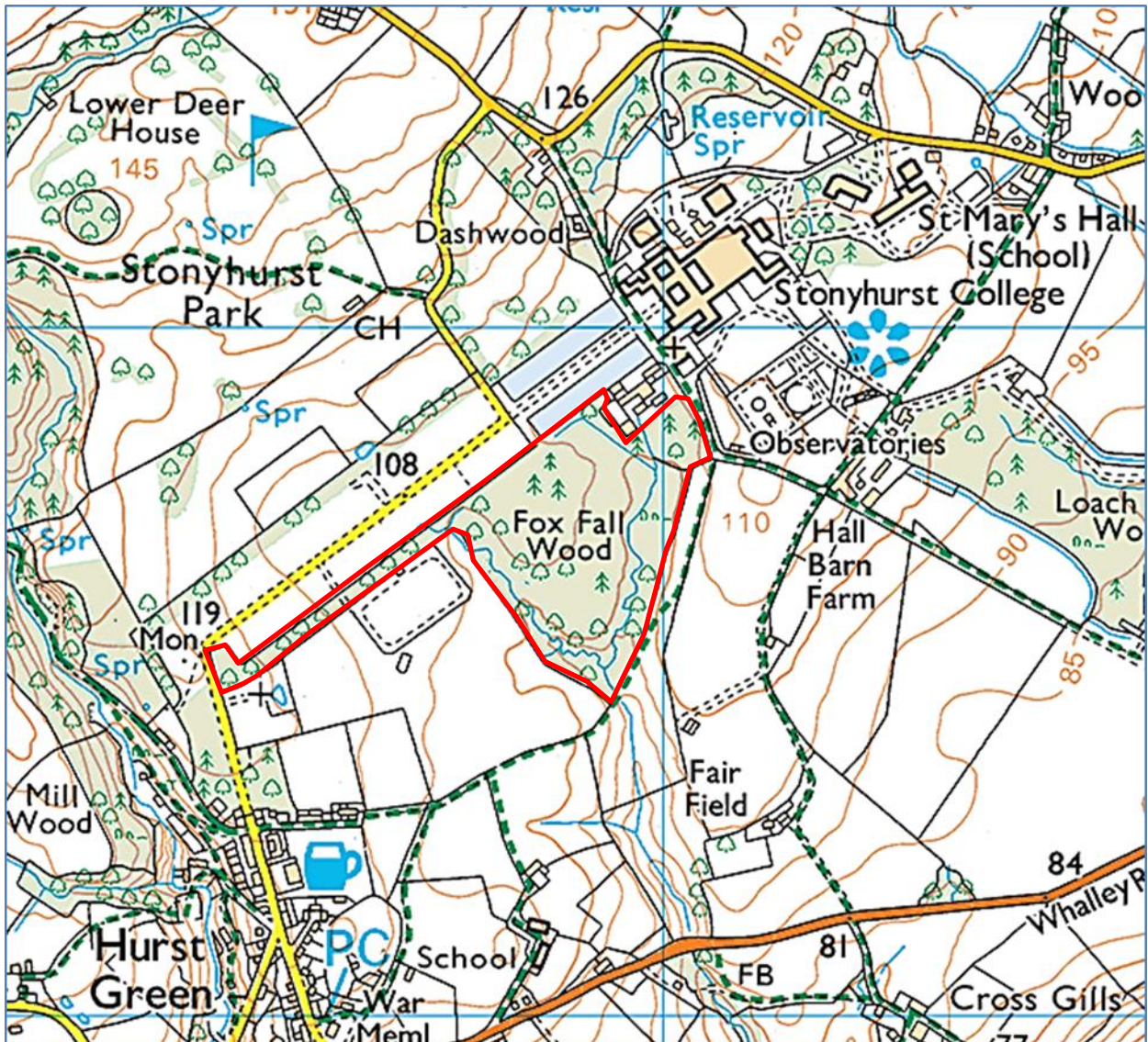


Figure 1: Location of Fox Fall Wood

1.2 The site lies within the Forest of Bowland Area of Outstanding Natural Beauty (AONB) and National Character Area (NCA) 33: Bowland Fringe and Pendle Hill.

Within the AONB the landscape character is defined as Landscape Character Type G: Undulating Lowland Farmland with Parkland, in Landscape Character Area G4: Hurst Green.

1.3 The bedrock geology is predominantly sandstone of the Pendle Grit Member. A band of mudstone (also Pendle Grit Member) underlies part of the western narrow strip of woodland adjacent to the axial drive. The extreme western portion of the wood has bedrock of sandstone and siltstone (Warley Wise Grit). The entire area is overlain by a superficial deposit of till (Devensian-Diamicton).

1.4 The soils are classified by Soilscape as Type 17: slowly permeable, seasonally wet acid loamy and clayey soils. Ecological Site Classification (ESC) categorises the natural soil moisture regime as 'Wet' and the soil nutrient regime as 'Medium' fertility.

Much of the site has wet, soft ground conditions. This is particularly associated with level areas and is exacerbated by the historical drainage ditches being infilled over time and no longer functioning to their optimum extent. Limited areas of waterlogging due to soil compaction are associated with former timber extraction rides. The two small natural watercourses found within the wood, running parallel to the west and east boundaries of the main section of woodland, results in good drainage on the streamside slopes. Elsewhere low ridges provide small areas of drier ground and add to habitat variety.

1.5 The altitude of the site ranges from approximately 90 m. above sea level (in the south) to 120 m. a.s.l. (in the west). The topography is predominantly level or gently sloping, although moderately steep and steep slopes are found adjacent to the streams.

1.6 The average annual rainfall is approximately 1189 mm, comprising 544 mm in the summer half-year and 645 mm in the winter half-year.

The average annual temperature is approximately 9 degrees Celsius and the annual accumulated temperature (day-degrees above 5 degrees Celsius) is 1542.

There are approximately 50 days of air frost and 110 days of ground frost on average per year, although the actual durations experienced within the woodlands is less due to the microclimate being influenced by tree canopy cover.

Windiness as measured by DAMS (detailed aspect method of scoring) falls within the range of 10.3 to 13.5. DAMS scores of less than or equal to 12 are categorised as 'sheltered' sites, whilst a score within the range 12 – 17 is 'moderately exposed'. Most of Fox Fall Wood is moderately exposed, with only limited areas in the south and in the stream valleys being sheltered.

1.7 A search on 25/10/16 using the online Forestry Commission (FC) 'Land Information Search' facility revealed the following statutory and non-statutory designations located fully or partially within the site:

- Area of Outstanding Natural Beauty (Forest of Bowland AONB)
- Less Favoured Area (DEFRA)
- Objective 2 (DEFRA)
- Registered Parks and Gardens – Stonyhurst College (English Heritage)
- Woodland Grant Scheme Mk 3 (Stonyhurst Estate Woodlands FC Ref. No10001106)
- Woodland Bird Priority Area (FC)
- Countryside Stewardship (CS) Biodiversity – Priority Habitat Network (FC)
- CS Biodiversity – Priority Habitat Proximity, Broadleaved Woodland (FC)
- CS Biodiversity – Priority Species – Woodland Bird Assemblage (FC)
- CS Biodiversity – Woodland Improvement (FC), *predominantly Lower Spatial Priority*
- CS Cross-cutting – Keeping Rivers Cool (FC)
- CS Cross-cutting – Project Areas – Woodland for Water Priority Catchments (FC)

On further enquiry the Woodland Grant Scheme Mk 3 listed above was found to cover a number of woodlands on Stonyhurst Estate. The contract period was 1997 to 2002 and for Fox Fall Wood included the thinning selective felling and restocking works evident today, representing the last time any significant woodland management interventions took place.

Stonyhurst College Registered Parks and Gardens is list entry No. 1000953. This land is registered under the Historic Buildings and Ancient Monument Act 1953 within the Register of Historic Parks and Gardens by English Heritage for its special historic interest. With regard to Fox Fall Wood, only the narrow strip of trees adjacent to the axial drive (sub-compartment a) is within the registered area (see Figure 2 below).

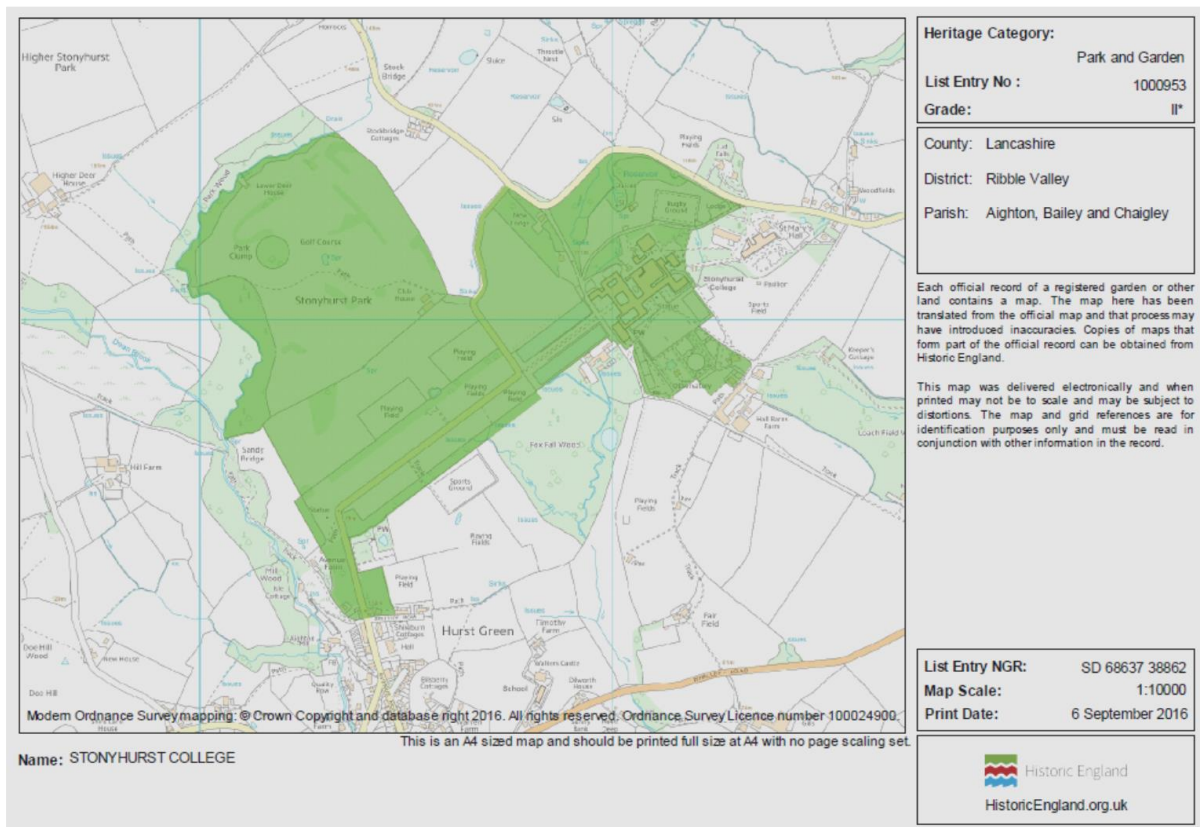


Figure 2: Map of Registered Parks and Gardens, Stonyhurst College

1.8 Fox Fall Wood is not subject to Tree Preservation Orders or Conservation Area status.

Trees which are proposed to be felled as part of an approved Planning Permission would be exempt from the Felling Licence Regulations. However any tree felling carried out as part of the silvicultural thinning or felling recommended in this report would require a felling licence where the timber volume exceeds 5 cubic metres in any calendar quarter.

1.9 Fox Fall Wood is accessed from the village of Hurst Green to the south, along the minor public road (Avenue Road), which is the main access to Stonyhurst College.

Access into the wood is currently across adjacent playing fields and grassland. The proposed new access road to The Retreat development would go through the northern part

of Fox Fall Wood and could provide direct access into the woodland. This would be advantageous to future woodland management.

Within the woodland there are no hard-surfaced tracks or paths. Historical timber harvesting rides provide for limited machine access, but the ground conditions are soft and limited to periods of dry weather if heavy machinery is to avoid making deep ruts and damaging soil structure.

Pedestrian access is possible and relatively easy within the level areas of the woodland, albeit hampered by wet ground conditions and thickets of vegetation in the areas where young trees have been planted or are regenerating naturally, together with scrub.

The internal drainage ditches and streams limit access, particularly where the stream banks form steep gullies. However the ditches are small and would be easy to bridge, and the gullies are on the periphery of the site and narrow, limiting the severity of their impact on any future timber harvesting operations in these areas (mostly sub-compartment b).

There are no public rights of way within the woodland. The nearest public footpath (FP 66) is located outside the wood, adjacent to the eastern boundary.

2. WOODLAND RESOURCE ASSESSMENT

2.1 Fox Fall Wood is a plantation comprising stands of broadleaved, conifer and mixed (i.e. broadleaved with conifer), species of trees.

By area these components are approximately 57% broadleaved (6.02 ha); 32% mixed, broadleaves with conifers (3.44 ha); and 11% conifers (1.14 ha).

A sub-compartment structure was devised for this report based on stand composition, history and proposed management units. The locations of the 8 No. sub-compartments (a-h) are shown on the map below (Figure 3, page 6). The boundaries were not accurately surveyed and the area measurements for the sub-compartments are estimated.

2.2 The extent of the woodland as it appears on the O.S. first edition map (1844) coincides with the present day boundaries, apart from the north-east corner (sub-compartment h and the northern part of sub-compartment b), which at that time was a field adjacent to the Corn Mill (Figure 4, page 7).

No historical records were available for the woodland; therefore it is not possible to accurately age the stands from documented planting years. However with reference to historical maps and aerial photographs it is possible to estimate ages based on the pattern of past fellings, and assign an age class or age classes to sub-compartments.

The oldest cohort of trees are found in sub-compartments a and b, where the largest beech, oak and lime trees exceed 150 years. There appear to have been significant episodes of felling and restocking approximately 70, 50 and 15 years ago. This has resulted in predominantly even aged stands, which form a patchwork within Fox Fall Wood and represent this relatively wide range of age classes.



Figure 3: Location of Sub-Compartments in Fox Fall Wood

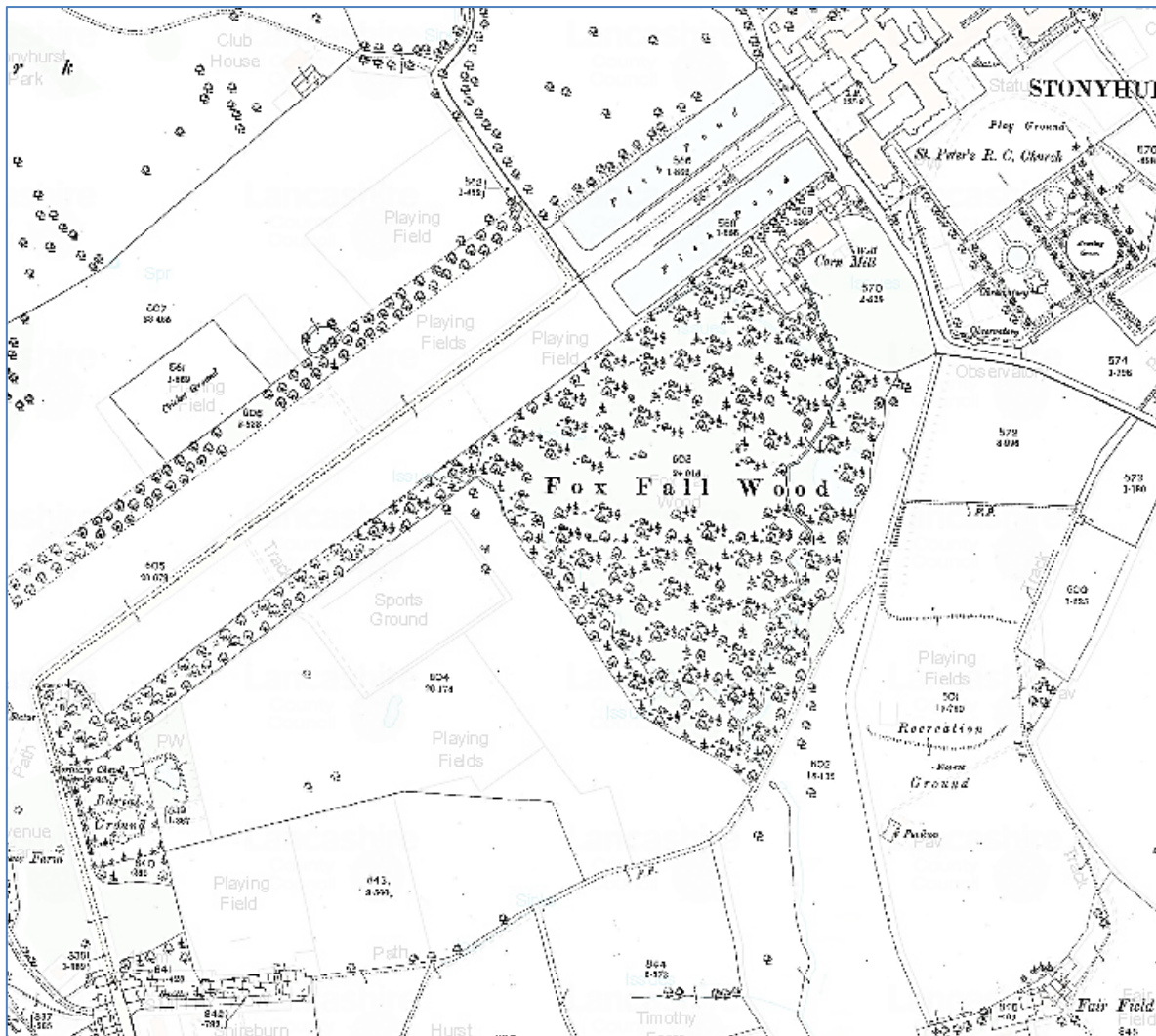


Figure 4: Fox Fall Wood as depicted on the O.S. first edition map (1844)

2.3 A moderately wide range of native and non-native tree and shrub species are present in Fox Fall Wood. Historical species choice reflects both timber production and landscaping objectives and most species are adapted to site conditions, particularly when drainage was presumably more effective in the past.

A full list of tree species is included with the summary of sub-compartment characteristics in Table 1 below (page 9).

2.4 Fox Fall Wood contains a wide variety of woodland habitat types; including open ground, mires, open canopy woodland and closed canopy woodland. This together with the range of tree species and mixtures, and wide range of age classes, contributes to a biodiverse woodland.

Woodland structure is generally well developed and diverse, with ground, herbaceous, shrub and tree layers represented over most of the area. The maximum canopy height of the mature stands is approximately 20 m. for broadleaves and 22 – 25 m. for conifers, depending on the species.

2.5 Stand density is highly variable, from very open canopied woodland to overstocked. Some sub-compartments contain patches of natural regeneration or young trees planted for restocking, either in canopy gaps or as a shrub/second tree layer. Natural regeneration of broadleaved species e.g. beech, ash, sycamore, birch and holly is widespread where light conditions allow.

2.6 There is a moderate quantity of standing and fallen deadwood, including windthrown trees, cut stumps from historical fellings, fallen branches, branch snags and dead and dying branches, particularly in the older trees.

A small number of the oldest beech and lime trees are elective veterans, having features such as stem and branch cavities, loose bark and bark crevices, decaying wood, fungal fruiting bodies and sap runs.

2.7 European Protected Species (EPS) are represented by bats, which utilise the woodland for summer roosting and feeding locations.

UK Priority Species are likely to include treecreeper (bird) and common toad (amphibian).

Rhododendron and Himalayan Balsam are present in small areas and should be controlled to eradicate them or prevent their spread as invasive non-native species.

2.8 Wetland habitats are represented by a pond, two minor streams, drainage ditches, mires and areas of seasonal waterlogging.

2.9 Tree health is generally good, with no widespread tree death or significant deterioration apparent over most of the area due to disease, other than the expected decline in vigour and senescence to be expected in the oldest cohort of trees.

Damage caused by grey squirrels is apparent in a small proportion of younger broadleaved trees, and damage inflicted by roe deer and rabbits is sporadic on saplings not protected by treeshelters.

Vigilance will be required to monitor for possible outbreaks of Chalara die-back disease in ash trees, and for *Phytophthora ramorum* in the larch and Rhododendron.

2.10 Incipient windthrow is occurring, particularly where large trees are growing in areas with poor rooting conditions due to a high water table.

2.11 Although there has been a history of thinning, some areas are currently overstocked. These areas would benefit from thinning in the future to improve the growth and stability of the remaining trees, as well as to ensure the survival of light demanding tree species and to encourage the development of the ground flora and shrub layer.

2.12 Opportunities exist for improving access to and within the woodland, particularly in connection with the proposed new access road to The Retreat.

2.13 Maintenance of the young trees will be required in the recently planted areas and for selected areas of natural regeneration. Thinning and Selective Felling is recommended in the long term to deliver woodland management objectives (see 3.2 below) in the mature and over-mature stands, to ensure woodland regeneration on a continuous cover forestry basis.

Table 1: Summary of Sub-Compartment Characteristics

Sub-cpt	Area (Ha)	Tree species	Age Class(es)
a	1.77	BE, POK, SYC, CLI, AH, PBI, WCH, ROW	Over-mature; Mature and Young
b	3.60	SYC, BE, AH, POK, CAR, PBI, WCH, BCH, EM, HOL, HAZ, HAW, <i>Rhododendron</i>	Mature and Over-mature
c	2.66	BE, SYC, PBI, AH, POK, CAR, NS, HOL, HAZ, GWL	Young and Mature
d	0.43	SS, BE, HOL, <i>Rhododendron</i>	Mature
e	0.65	BE, SOK, SYC	Mature
f	0.78	EL, NS, BE, SYC, PBI, POK, DF, HOL	Mature
g	0.34	NS, SYC, BE	Mature
h	0.37	WRC, SYC, AH	Mature
Total Area	10.6		

KEY to tree species: AH=ash; BE=beech; BCH=bird cherry; CAR=common alder; CLI=common lime; DF=Douglas fir; EL=European larch; EM=elm; GWL=grey willow; HAW=hawthorn; HAZ=hazel; HOL=holly; NS=Norway spruce; PBI=downy birch; POK=pedunculate oak; ROW=rowan; SOK=sessile oak; SS=Sitka spruce; SYC=sycamore; WRC= western red cedar.

Guide to stand age classes: Overmature >100yrs; Mature 26 – 100 years; Young 1 – 25 years.

3. WOODLAND MANAGEMENT OBJECTIVES

3.1 VISION STATEMENT: The owners wish to maintain Fox Fall Wood as mixed species high forest to provide an important landscape feature in the grounds of Stonyhurst College and in the wider landscape of the Forest of Bowland AONB.

The woodland is an amenity resource for Stonyhurst College and the proposed Retreat, as well as being valued for nature conservation. It is also a source of timber within the wider context of Stonyhurst Estate woodlands.

3.2 WOODLAND MANAGEMENT OBJECTIVES:

1. Maintain the woodland as a feature in the landscape.
2. Maintain or increase woodland biodiversity.
3. Provide quiet recreation for visitors to The Retreat.
4. Provide an educational and recreational resource for the students and staff of Stonyhurst College and Stonyhurst St. Mary's Hall.
5. Grow timber sustainably for sale, or for use by the College, where compatible with other woodland management objectives, and in the context of the timber harvesting programme for the whole estate.

4. RECOMMENDED WOODLAND MANAGEMENT INTERVENTIONS

A plan of operations for Fox Fall Wood should include 1) the work items necessary in the short term for sound silvicultural management, and 2) suggestions for projects to deliver other aspects of the woodland management objectives. The latter may be aspirational at this stage and will require further discussion and stakeholder engagement before possible affirmation and action.

Table 2 (below) makes recommendations for woodland management interventions by sub-compartment. Silvicultural operations considered to be necessary in the short term are highlighted in bold type.

Table 2: Recommended Woodland Management Interventions

Sub-Cpt	Work Items and Suggested Projects
a	<p>Remove treeshelters from restock areas when appropriate. Respace or thin young trees to encourage the growth and stability of the remaining trees, and to ensure the survival of light demanding species. Consider formalising and stone-surfacing the internal timber extraction ride as a footpath, keeping the existing track width to facilitate future machine access. This would provide an alternative, parallel pedestrian route to The Avenue road. Monitor the health of the over-mature specimen trees and plan for future selective fellings and restocking to maintain the continuity of the woodland belt.</p>
b	<p>Survey the condition of the boundary fence and replace or repair as required. Restore the pond and adjacent wetlands, to deal with possible water pollution issues and increase biodiversity. Thin overstocked areas to favour the better formed trees and to ensure the survival of light demanding species in mixtures. For the large canopy gap in the north, consider a work programme for future management as either continuation as a glade, or restocking as woodland. Identify elective veteran trees and lightly thin the surrounding canopy trees where the old tree is experiencing strong competition from its neighbours.</p>
c	<p>Remove treeshelters from restock areas when appropriate. Beat-up (i.e. replace failures) in restock areas where sapling death or disease has resulted in an unacceptable failure rate (e.g. >15% loss) In overstocked restock/natural regeneration areas respace or thin young trees to encourage the growth and stability of the remaining trees, and to ensure the survival of light demanding species. Manage the vegetation in selected larger canopy gaps to create permanent glades. Install tree and shrub shelters to protect selected natural regeneration saplings in restock areas or in canopy gaps chosen to be future woodland regeneration areas.</p>
d	<p>Either i) Thin little and often to perpetuate this stand of spruce for species and habitat variety overall, or ii) Clear fell the sub-cpt and restock with mixed broadleaves and conifers.</p>
e	<p>Thin to the best beech (in pure beech areas), and to favour a proportion of oak in the mixed 'beech with oak' area in the north of the sub-cpt.</p>
f	<p>Thin overstocked areas to maintain unique mixture of species and open canopy.</p>
g	<p>Either i) Thin little and often to perpetuate this stand of spruce for species and habitat variety overall, or ii) Clear fell the sub-cpt and restock with mixed broadleaves and conifers.</p>
h	<p>Clear fell the western red cedar and restock with either i) new native woodland, or ii) mixed broadleaves and conifers</p>
b+c+d+e+f	<p>Consider the construction of a stone-surfaced track, creating a circular path linking with the new access road and The Retreat. This would provide all-weather pedestrian access for recreation as well as occasional machine access for forestry operations. Consider the creation of a sculpture trail (e.g. 'Stations of the Cross') at intervals along the newly created access route (see above).</p>