National Trust Alderley Edge Woodland Management Plan

Plan Period 2018 to 2028
5 year Review 2023

No.	UKFS Management Plan Criteria	Approval Criteria	Applicant Check
1	Forest management plans should state the objectives of management and set out how the appropriate balance between economic, environmental and social objectives will be achieved.	Have objectives of management been stated? Consideration given to economic, environmental and social factors (Section 2.2)	✓
2	Forest management plans should address the forest context and the forest potential and demonstrate how the relevant interests and issues have been considered and addressed.	Does the management strategy (section 6) take into account the forest context and any special features identified within the woodland survey (section 4)	✓
3	In designated areas, for example national parks, particular account should be taken of landscape and other sensitivities in the design of forests and forest infrastructure.	Have appropriate designations been identified (section 4.2) if so are these reflected through the work proposals in the management strategy (Section 6)	✓
4	At the time of felling and restocking, the design of existing forests should be re-assessed and any necessary changes made so that they meet UKFS Requirements.	Felling and restocking are consistent with UKFS forest design principles (Section 5 of the UKFS)	✓
5	Consultation on forest management plans and proposals should be carried out according to forestry authority procedures and, where required, the Environmental Impact Assessment Regulations.	Has consultation happened in line with current FC guidance and recorded as appropriate in section 7	✓
6	Forests should be designed to achieve a diverse structure of habitat, species and ages of trees, appropriate to the scale and context.	Do the felling and restocking proposals create or improve structural diversity (refer to the plan of operations)	✓
7	Forests characterised by a lack of diversity due to extensive areas of even-aged trees should be progressively restructured to achieve a range of age classes.	Do the felling and restocking proposals create or improve age class diversity (refer to the plan of operations)	✓
8	Management of the forest should conform to the plan, and the plan should be updated to ensure it is current and relevant.	Has a 5 year review period been stated (1st page) and where relevant achievements recorded in section 3	✓
9	New forests and woodlands should be located and designed to maintain or enhance the visual, cultural and ecological value and character of the landscape.	When new planting is being proposed under this plan is it consistent with UKFS and FC guidance on woodland creation	

Contents

Summary

The National Trust's Alderley Edge property covers 129ha of which 68ha is woodland. The woodland covers the steep scarp slope of Alderley Edge and the dip slope to the south. This plan covers the 15 woodland compartments and follows the Forestry Commission template for woodland management plans to ensure it is compliant with the UK Forest Standard and UK Woodland Assurance Scheme.

Woodland was established at Alderley Edge by the Stanley Family starting in the 1780's after the enclosure of the common. Beech and Scots pine were the main species planted. Some areas remained as open heathland until the 20th Century. Most of the woodland present today dates from 1900 and later. Beech and Scots pine are still a major feature, but oak and birch are also well established.

Alderley Edge is a geological SSSI and is the only place in Britain where non ferrous ores and the full succession of sedimentary host rocks are accessible for study. In addition it is an important archaeological site due to past mining activity and includes the only known Roman mine shaft in the Country. There are five Scheduled Monuments and nearly 300 other archaeological features. Its biological importance is less well appreciated but is also significant. Alderley Edge is of national importance for its bryophyte assemblage, it supports a number of BAP priority species including bats, birds and plants, as well as several Nationally Scarce invertebrates. Despite the relatively recent origin of much of the woodland, there are areas of ancient semi natural woodland and a number of veteran trees. Small areas of other important habitats also occur including heathland, unimproved grassland and ponds.

With a large and growing population on its doorstep, Alderley Edge attracts about 250,000 visitors a year and this is having a detrimental effect on the integrity of the site through trampling, soil compaction and disturbance. The majority of the woodland is even aged with areas dominated by shade bearing species. Other threats include grey squirrels, tree diseases, invasive non native species and the likely effects of climate change.

The long term vision is for the woodland to develop into a more natural stand type with greater structural diversity which is self sustaining and more resilient to climate change, pests and diseases, and increasing visitor pressure. This will be achieved by the gradual conversion of even aged stands to more diverse woodland through continuous cover forestry methods, protecting regeneration and ground flora from trampling, reducing the dominance of beech, gradual restoration of Plantations on Ancient Woodland to native broadleaves, eradication of invasive non native species, increasing dead wood volumes, identification and management of areas of high biodiversity, implementation of a footpath improvement plan, and maintenance of quiet areas with low disturbance.

1 Background information

1.1 Location

Site	Alderley Edge
Nearest town, village or feature	Alderley Edge, Cheshire
Grid reference	SJ 860 775
Total area (ha)	68.36 (whole Estate 129ha)

See Map 1		
Comp No	Comp Name	Area
A1a	Mottram Wood	4.45
A1b	Wizards Well	2.71
A1c	Castle Rock	2.58
A2a	Holy Well	5.65
A2b	Saddlebole	2.15
A2c	Mottram Quarry	2.19
A3a	Glaze Hill	3.48
A3b	Stormy Point	2.39
A3c	Goldenstone	0.53
A4	Dickens Wood	2.30
A5	Waterfall Wood	3.06
A6a	Waterfall Wood North	2.41
A6b	Dry Valley	0.31
A7a	Clockhouse Wood	1.73
A7b	Clockhouse Wood South	0.43
A8	Beacon Wood	1.53
A9	Canyon Mine Wood	3.12
A10a	Great Quarry Wood	3.85
A10b	Church Quarry Wood	2.52
A10c	Engine Vein Wood	2.03
A11a	Windmill Wood	3.94
A11b	Windmill Wood North	2.88
A11c	Hagg Wood	0.99
A11d	Brynlow Dell	2.61
A11e	Artists Lane West	0.70
A11f	Artists Lane East	0.23
A12	Bradford Lodge	3.31
A13	Finlow Hill	2.19
A14	Car Park Wood	1.55
A15	Thieves Hollow	0.54
	Total	68.36

1.2 Description of the woodlands in the landscape

Alderley Edge is a striking escarpment of sandstone that rises to a height of 150 metres above the Cheshire Plain, situated about 15 miles south of Manchester. The escarpment runs roughly west-east from Alderley Edge village to Daniel Hill, the steep scarp slope having a generally north-eastern aspect. Stormy Point forms a promontory at the mid-point of the Edge from which the ridge of Saddlebole projects. South of the escarpment, the land dips gently to the south. Originally the Edge would have been covered in oak woodland, but this was gradually cleared for grazing during the Medieval period with very little of the original woodland surviving. Alderley Edge was common land until the end of the 18th Century when the owning Stanley Family enclosed it and began to establish woodland. Today the Trust's landholding covers 129ha of which 68ha (52%) is woodland and 61ha (48%) farmland. It adjoins the Hare Hill Estate (111ha), also owned by the National Trust, and together they form a large and important area of undeveloped Cheshire countryside with significant woodland cover (only 4% of Cheshire is wooded). It lies within National Character Area 61 ‘The Shropshire, Cheshire and Staffordshire Plain’.

The woodland has almost 100% canopy cover with a mix of approximately 67% broadleaves (mostly oak and beech) and 27% conifers (mostly Scots pine). Since the 19th Century, Alderley Edge has been a well known 'beauty spot' and a popular destination for public recreation. Geologically the area is celebrated for its richly mineralised and intricately faulted Triassic sandstone and conglomerates, and for this reason part of the property is designated a Geological SSSI. The primary archaeological significance of Alderley Edge is its association with past mining activity, with copper, lead and cobalt all being extracted commercially. Alderley Edge is now known to be one of the earliest metal mining sites in England, and contains the only known Roman mine shaft in the country. It is also a very important site for biodiversity, being the largest single area of woodland in the immediate area and containing fragments of Ancient Semi-Natural Woodland. Some of its biological importance is directly associated with the mining activity for example uncommon metallophyte bryophytes and bat roosts.

1.3 History of Management

Following the enclosure of the common in the late 18th Century, the Stanley family started planting beech and pine 'for ornament and to gentrify the local landscape' (NT Statement of Significance). By 1872 most of The Edge was wooded. There are some remnants of this original planting, for example the beech grove in A6a and possibly some of the Scots pine in A2a, however most of the woodland probably dates from 1900 and later. The Stanley family sold their Estate in 1938 with Alderley Edge identified for possible housing development. The Pilkington sisters stepped in to save the site from this fate, and ownership was passed to the National Trust in 1947.

1960's- Group planting of beech, Scots pine and larch e.g. in comps A1c Castle Rock, A4 Dickens Wood, A5 Waterfall Wood. Also planting beech in A1a.

1980's- establishment of broadleaves .In the same period, mature oaks were harvested from Clockhouse Wood

1983-87 Woodland Management Plan (mentioned in Prag 2016).

1990's-present. planting of broadleaves under gaps in the canopy. Rhododendron control. Tree safety work. Path work

Woodland Grant Scheme Details

EWGS Ref	Date	Area	Comps	Details
28868	2012-17	60.87ha	All except A1b,A2c,A12, A13,A14	For carrying out tree hazard assessments and any remedial work, maintaining paths, increasing dead wood habitat, identifying veteran trees and halo thinning, control of non-native species (sycamore), controlling grey squirrel

The Alderley Edge Landscape Project (AELP) was a multi-disciplinary project run jointly by the National Trust and Manchester Museum between 1996 and 2005. The aim was to collect together as much information as possible on archaeology, social and cultural history, natural history and geology, through the involvement of local people and specialists, and make the information available to the local community via a website and publications. The Story of Alderley; Living with the Edge (Prag ed. 2016) summarises the findings of the project. The full records are held at Manchester Museum.

2009 work carried out on revegetating Engine Vein and fencing off of Pillar Mine following an increase in anti-social behaviour.

2 Woodland Information

2.1 Areas and features

Designated Areas	In Woodland	Adjacent to woodland
Special Areas for Conservation		
Special Protection Area		
Ramsar Sites		
National Nature Reserves		
Site of Special Scientific Interest	Yes	Yes
National Park		
Areas of Outstanding Natural Beauty		
Local Nature Reserves		
TPO / Conservation Area		
Local Wildlife Sites	Yes	

Details

Much of the woodland is part of the geological Alderley Edge SSSI. The citation is given in full below;

Alderley Edge is the most extensively and comprehensively documented of the seven principal localities in the Cheshire Basin where nonferrous ores, chiefly of copper but including lead, cobalt, vanadium, arsenic and other elements, occur in sedimentary host rocks of Triassic age. The Alderley district is of unique geological importance as the only site in Britain where such ore deposits and the full local succession of sedimentary host rocks remain accessible for study in extensive mine workings. At Alderley these extend throughout an area of about 1.5 sq km and comprise at least 12 km of workings of which over 9 km are currently accessible. Exposures in the mine workings significantly complement and are commonly superior to those available at the surface. Features of the mineralisation and its relationship to the sedimentary host rocks, and aspects of the stratigraphy and sedimentology of those rocks, which are not apparent at outcrop are displayed to advantage in unweathered sections in the mines.

The SSSI does not cover the whole site however, with comps A1a, A6-7, A11e+f and parts of A1b and A4 lying outside the boundary. See Map 2

Local Wildlife Sites

Dickens and Waterfall Wood Wildlife Site includes all/part of the following compartments;
A2b Saddlebole, A3a Glaze Hill, A3c Goldenstone, A4 Dickens Wood, A5 Waterfall Wood, A6a Waterfall Wood North, and A7a Clockhouse Wood.

A12 Bradford Lodge Farm Wood is a separate Wildlife Site

Details have been requested from Cheshire Wildlife Trust by John Hooson. NT Regional Ecologist.

Rare and important species	In Woodland	Adjacent to woodland
Schedule 1 Birds	**Kingfisher**	
BAP Birds	Bullfinch Cuckoo Dunnock Lesser spotted woodpecker Lesser redpoll Marsh tit Song thrush Spotted flycatcher Tree pipit Tree sparrow Wood warbler	Lapwing Yellowhammer
BAP Mammals		
Bats	Yes	
BAP Reptiles/Amphibians		
BAP Invertebrates	Wall butterfly See below	
BAP Plants	Annual knawel Bluebell (Cheshire BAP) See below	
BAP Fungi/Lichens	Unknown	

Details

Birds

Birds were recorded as part of two Atlas surveys carried out by Cheshire and Wirral Ornithological Society in 1978-84 and again in 2004-06. In addition to the BAP species listed above, the following Birds of Conservation Concern (Eaton et al 2015) were recorded;

Red list- woodcock, pied flycatcher

Amber list- kestrel, mistle thrush, willow warbler and redstart

The full list of birds recorded during both surveys is given in Prag (2016) Appendix 11.1. All species listed above were recorded during both surveys (except marsh tit, redstart, and tree pipit which were not recorded in 2004-6). 10 years on, it is likely that some of the species which have undergone major national declines (e.g. lesser spotted woodpecker, wood warbler) are no longer present at Alderley Edge.

A nest box scheme with 35 boxes operates in compartments A10c, A12 and A13 with records submitted to BTO Nest Records Scheme. Boxes are generally occupied by blue and great tits (M. Miles pers comm)

Bats

The Alderley Edge mines are known locations for winter roosts of bats (Daubenton, whiskered and brown long eared have been recorded), and some of the buildings are used as summer roosts (1997 Biological Survey). It is possible that trees on the site are also used as summer roosts, but there are no confirmed locations.

Invertebrates

An Invertebrate Survey was carried out by Liverpool Museum in 1996.

The Alderley Edge Landscape Project collected a huge number of records of invertebrates which are listed in Prag (2016) Included are 616 species of Lepidoptera (Appendix 13.1 in the book) BAP or Nationally Scarce species were not highlighted. (At least 45 of the moths are now BAP species but these may be old records).

In addition to the BAP priority wall butterfly, 19 other species of butterfly have been recorded including brimstone, purple hairstreak and holly blue (Dennis 2008).

'The woodlands support a relatively small number of Nationally Scarce and otherwise uncommon invertebrates, but these do include a number of species which are collectively indicative of relict ancient wood pasture-particularly species developing in wood decay' (1997 Biological Survey)
Nationally scarce species found in 1997 include (compartment number in brackets);
Hylecoelus dermestoides Beetle (A1)
Rhizophgus nitidulus Beetle (A1, A11)
Beris fuscipes Soldier fly (A11)

The Nationally Scarce stilt fly *Micropeza lateralis* was found in A2c Mottram Quarry in 1985 (1997 Biological Survey). The mines are also known to be a hibernation site for the Nationally Scarce winter gnat *Trichocera maculipennis*.

Plants

The AELP recorded 351 species of vascular plant (Prag ed 2016 Appendix 9.1).
The UK BAP priority species annual knawel *Scleranthus annuus* was recorded in A2b Mottram Quarry during the 1997 Biosurvey. Its current population status is not known.
Bluebell, a Cheshire BAP species occurs in several compartments (A6a, A7a, A11d).
In addition broadleaved helleborine has been recorded at two locations (A3 Glaze Hill and A11a Windmill Wood) (1997 Biological Survey). The gametophyte of Killarney bristle fern *Trichomanes speciosum* was recorded in A5 Waterfall Wood in 2015 (J Hooson pers comm)

Bryophytes

Alderley Edge is of national importance for its bryophyte assemblage, exceeding the threshold score for SSSI selection (although this is not a recognised feature within the SSSI designation). 131 species were recorded in 2015 (Callaghan) including the following rare/scarce species (compartments in brackets);
Cephaloziella massalongi Nationally Rare UK Red List-Vulnerable (A3a, A10c)
Calypogeia integristipula Nationally Scarce (A1b, A1c, A5)
Cephaloziella stellulifera Nationally Scarce (A3a)
See Map 3 for locations.
In addition a number of local, Atlantic or western species are present. See Callaghan 2015 for full details

Two BAP/UK Red list (vulnerable) species were previously known from the site; Great copperwort *Cephaloziella nicholsonii* and slender thread moss *Orthodontium gracile. Cephaloziella nicholsonii* was

found on the Sandhills only (which lie outside the woodland and indeed NT ownership), whilst *Orthodontium gracile* was found on Castle Rock. Neither species was refound in 2015 (Callaghan).

Fungi and Lichens

391 species of fungi have been recorded at Alderley Edge and lichens (see Prag ed 2016 Appendix 9.1). It is not known whether any BAP or scarce species are present.

Habitats	In Woodland	Adjacent to woodland
Ancient semi-natural woodland (ASNW)	Yes	No
Other semi-natural woodland	Yes	
Plantations on ancient woodland sites (PAWS)	Yes	
Veteran and other notable trees	Yes	
BAP Priority Habitats	Lowland Mixed Deciduous Woodland Lowland heath	

Details

ASNW- 4.45ha in the following compartments; A6a Waterfall Wood North, A6b Dry Valley, A7a Clockhouse Wood

PAWS- 11.77ha in the following compartments; A2b Saddlebole, A3a Glaze Hill, A3b Stormy Point, A3c Goldenstone, A4 Dickens Wood, A5 Waterfall Wood.

See Map 4.

Veteran Trees- Veteran tree surveys have been carried out in 1996 (J Milln) and 2010. The 2010 survey identified 55 trees within the woodland. 9 additional trees were found during surveying for this plan in 2016. See map 5 for locations and Appendix 1 for tree data

BAP Habitats- Lowland heathland is present but restricted to tiny relict areas in A3a Glaze Hill, A12 Bradford Lodge and A13 Finlow Hill. At most this makes up 1.5ha. The largest area in A12 (0.65ha) is being actively managed through grazing.

Water	In Woodland	Adjacent to woodland
Watercourses	Yes	
Lakes		
Ponds	Yes	
Wetland habitats		

Details

Watercourses- There are small streams in A5 Waterfall Wood, A2a Holy Well and A11d Brynlow Dell

Ponds- There is a temporary pond in A2c Mottram Quarry. Permanent ponds occur in A11 Windmill Wood sub compartments a and b which are thought to associated with mine workings (NTSMR), and A14 Car Park Wood which are thought to be old marl pits

See Map 3

Landscape	In Woodland	Adjacent to woodland
Landscape designated areas		
Landscape features	Yes	
Rock exposures	Yes	
Historic landscapes	Yes	

Details
Alderley Edge is a locally important landscape feature, but is of national importance as both a geological site and a historic landscape, for its geological exposures and past mining activity.

Cultural features	In Woodland	Adjacent to woodland
Public rights of way	Yes	
Prominent viewing points	Yes	
Existing permissive footpaths	Yes	
CROW Access land		
Public recreational facilities	Yes	
Visitor information	Yes	

Details
East of the B5087, the site is crossed by a dense network of public rights of way supplemented by permissive paths. There are several prominent viewpoints along the Edge with Stormy Point being the most visited. The paths are heavily used. It is estimated, that annually, approximately 250,000 to 300,000 people visit Alderley Edge. Very wide and additional desire lines are becoming established throughout the woodland areas leading to soil compaction and erosion. A programme of path construction (narrowing and surfacing) is ongoing in an attempt to reduce the damage.

The main car park adjoining compartment A14 has spaces for 125 vehicles. In low season half of the car park is usually closed. There is interpretation and a public toilet here. There is further parking in A2c Mottram Quarry (9 cars) and on the A5087 next to Beacon Lodge (not on NT land) for up to 15 cars. Additional interpretive boards are located at The Wizard and Beacon Lodge.

The compartments to the west of the B5087 have fewer public rights of way and permissive paths, and are much quieter. A12 and A13 have no public access. Together with A11a-d these provide an essential refuge area for wildlife.

There are two natural play areas, one in A10a Great Quarry Wood and one in A11a Windmill Wood.

Weekly guided walks led by volunteers are provided from April to September, and there are a number of self-guided trails.

Archaeological Features	In Woodland	Adjacent to woodland
Scheduled monument	Yes	Yes
Unscheduled monuments	Yes	Yes
Registered parks and gardens		
Listed buildings		Yes
Other		

Details

There are five Scheduled Ancient Monuments within the woodland at Alderley Edge (compartment in brackets);
33858 Armada Beacon (A8)
33859 Engine Vein (A10a)
33860 Golden Stone (A3c)
33861 Boundary Marker, Saddlebole (A2b)
33863 Wood Mine Cobalt Works (A11c)

There are 292 archaeological features on the National Trust Sites and Monuments Record (NTSMR) for Alderley Edge (some of these are outside the woodland boundary). See individual compartment descriptions and Map 6. Details of all sites are available on the National Trust's GIS browser.

Below ground, the mines are leased to, and are the responsibility of, Derbyshire Caving Club.

2.2 Woodland resource characteristics

Stand Type	Area (ha)	%
Broadleaf	33.64	49
Mixed conifer/broadleaf	24.27	36
Conifer	6.25	9
Open ground	4.19	6
Total	68.35	

Age Class	Area (ha)	%
P1850-1930	48.54	76
P1950-present	15.62	24

See Map 7 for stand types and Appendix 2 for full compartment schedule and Appendix 3 for species codes.

As part of the Alderley Edge Landscape Project a full tree survey was undertaken by Timberlake and Edwards (1997). The survey is summarised in Prag (2016) and full details are held at Manchester Museum.

2.3 Site description

See Map 1 for compartments
Appendix 2 compartment schedule

A1a Mottram Wood 4.45ha
Mottram Wood forms the north westerly corner of Alderley Edge and occupies the steep north-east facing scarp slope above Mottram Road. The wood is predominantly P1900 beech which has grown very well (typically 35m high with 20m clear timber). A second generation of beech was planted beneath the mature trees in the 1960's as replacements. The Western end is dominated by mature sycamore. As a result of deep shade cast by the beech canopy, the ground flora is sparse. Decaying beech trunks and branch wood support a good variety of wood decay invertebrates including two Nationally Scarce beetles (1997 Biological Survey). At the western end, gaps created by windblow and tree safety work are regenerating well with birch, beech, sycamore and oak. Other recent management has included re-spacing the P1960 beech and using the brash created to try to stabilise the slope and allow humus to develop. Archaeological sites include a mine shaft, quarry and an old rubbish tip (NTSMR).A number of the beech were recorded as veterans (NT 2010).Tree safety is a major issue in this compartment due to the proximity of Mottram Road on the northern boundary, and dwellings along the southern boundary. There is some dumping of garden waste from the latter. Rhododendron is occasional. Public footpaths cross the compartment. It is not part of the SSSI.

A1b Wizards Well 2.71ha
This compartment, on the steep north-east facing scarp slope, is predominantly mature (P1900) native oak-birch woodland with more recent (P1950) infill (1882 OS map shows it as open ground). Rowan, holly and occasional beech saplings form the understorey. The ground flora includes bracken and broad buckler fern. There are two significant rock outcrops; the Wizards Well and Castle Rock (which extends into compartment A1c). These are locations for three uncommon bryophytes *Tetrodontium brownianum, Calypogeia integristipula* and *Schistostega pennata* ('goblin gold') (Callaghan 2015).Archaeological sites include the

Wizards Well, a mine adit, quarry and old graffiti (NTSMR). An old hedge bank with large mature beech and oak form the northern boundary. Several veteran beech, an oak and a birch have been recorded (NT 2010). Recent work has involved clearing viewpoints on the public footpath which passes beneath Castle Rock and Wizards Well by felling small areas of mature trees. Rhododendron is occasional. A small strip of this compartment is within the SSSI (0.5ha).

A1c Castle Rock 2.58ha

A variety of stand types are present in this compartment which also occupies the steep north-east facing scarp slope. The northern part is P1900 Scots pine and mixed broadleaf woodland with occasional European larch. The central part is a stand of P1960 hybrid larch (DBH 40cm, 31m tall) with some P1970 Beech and lodgepole pine. Many of these semi-mature beech are badly damaged by grey squirrel. The southern part is P1900 mixed broadleaf (beech, birch) with some Scots pine and occasional mature European larch with little understorey. Two veteran trees have been recorded (NT 2010).Rhododendron is present with a particular cluster at the eastern end. The uncommon bryophytes *Calypogeia integristipula* and *Schistostega pennata* ('goblin gold') have been recorded on the Castle Rock itself (Callaghan 2015). Archaeology includes possible mine workings below Castle Rock, and a possible house platform on the north eastern boundary (NTSMR). A hedge bank with mature oak, beech and alder forms the north eastern boundary. Public footpaths cross the compartment. The whole area is SSSI.

A2a Holy Well 5.65ha

The compartment lies on the steep north-west facing scarp slope. It is an area of mature (P1900/1930) mixed broadleaves (oak, beech) with frequent Scots pine, occasional European larch, and a younger age class of birch. An important feature is the Holy Well which gives rise to two small watercourses/flushes (unusual on Alderley Edge) with mature alders and a ground flora including a small amount of Sphagnum moss, opposite leaved golden saxifrage, tutsan and ferns . This area is also important for invertebrates (1997 Biological Survey). Rhododendron has become established around the flushes and is threatening this interest. There are several large oaks on the field boundary including one veteran. A small stand (0.47ha) of P1990 Scots pine and mixed broadleaves (oak, birch, rowan) has been established at the top of the slope, below the main track. Scattered among the young trees are occasional mature (P1850-1900) beech, oak and sweet chestnut. A notable sweet chestnut at the junction of two paths has a diameter of 125cm. The uncommon moss *Schistostega pennata* ('goblin gold') has been recorded on the eastern boundary (Callaghan 2015), and uncommon soldier beetles have also been found within the compartment (1997 Biological Survey). Archaeological sites are abundant and include the well, mine shafts, boundary markers and a track way (NTSMR). Earth banks also form internal wood boundaries. Five veteran trees were recorded in this compartment (NT 2010). A notable veteran oak is sited on the parish boundary and the junction of several earth banks. Recent management has included clearing trees from the viewpoint above Holy Well. There has also been some tree planting (P1990 oak) in a gap created by a large dead beech tree (the hulk has been retained-cover photo). The oaks are now well established. Public footpaths cross the compartment with several large areas of soil compaction and erosion. The whole area is SSSI.

A2b Saddlebole 2.15ha

This compartment forms the northern end of the narrow ridge (known as Saddlebole) which extends north from Stormy Point. The eastern flank of the ridge is predominantly mature (P1900) mixed broadleaf woodland with P1900 beech , sweet chestnut, European larch and some Scots pine with an understorey of birch and rowan. The western side is a much younger wood, mostly p1950 to 1980 birch beech and oak and occasional mature Scots pine. The western part is shown as open ground on the 1882 OS Map. The eastern part (1ha) is shown as PAWS in the Inventory. A boundary marker stone on the ridge, which marks the parish boundary as well as the boundary between the De Trafford and Stanley estates, is a Scheduled Monument (no 33861). Other marker stones and a smelting site are also present (NTSMR). One of the oaks on the boundary is veteran. Public footpaths cross the compartment. The whole area is SSSI.

A2c Mottram Quarry 2.19ha

This late 19th century quarry, which forms the northern-most part of Alderley Edge, was until recently an open area but woodland is now starting to develop around the fringes. This is predominantly young sycamore and birch with some willow and rowan which has spread since quarrying ceased in the 1960's. The central part is still open and has a tight sward with the uncommon plants annual knawel *Scleranthus annuus* (now a BAP priority species) and birds foot *Ornithopus perpusillus* (1997 Biological Survey). The open ground is also valuable for invertebrates with the Nationally Scarce stilt fly *Micropeza lateralis* recorded in 1985. The scrubby areas support dunnock and bullfinch (ibid). There is a small seasonal pond. *Schistostega pennata* ('goblin gold') has been recorded in two locations (Callaghan 2015). Japanese knotweed was noted in 1997. This has almost been eradicated. Rhododendron also occurs in one of the quarries. There is a small car park, and a public footpath runs along the western boundary. It is part of the SSSI.

A3a Glaze Hill 3.48ha

This compartment occupies the steep north-east facing scarp slope below Stormy Point. The northern end is dominated by P1930 beech and European larch. The ground flora is sparse here due to heavy shade, but broad leaved helleborine *Epipactis helleborine* has been recorded in the past (1997 Biological Survey). A large multi stemmed beech near the eastern boundary may date from the original Stanley plantings (P1780). South of this is an extensive area of P1900 Scots pine with occasional oaks and a ground flora dominated by bracken. Open ground is an important feature with the mining spoil/natural landslips below Stormy Point and Pillar Mine largely clear of trees. These areas have been fenced off to encourage stabilisation and to protect the small areas of relict heath vegetation which occur here, including heather. There is also a narrow strip of heath vegetation along the eastern boundary. The uncommon bryophytes *Cephaloziella massalongi* (an obligate metallophyte) and *Cephaloziella stellulifera* have been recorded on the mine spoil (Callaghan 2015). There are numerous mines and find spots (NTSMR). Rhododendron is occasional. The whole area is SSSI. Public footpaths cross the compartment.

A3b Stormy Point 2.39ha

This compartment runs along the top of the escarpment from Saddlebole to Goldenstone and its main feature is the viewpoint at Stormy Point, probably the most heavily visited area at Alderley Edge. It is shown as PAWS on the Ancient Woodland Inventory. The southern end is a stand of 70% P1930 Scots Pine and 30% P1930-1960 beech and oak with occasional rowan in the understorey. This is a dense stand with some areas having very little ground flora. The next stand, running between the two main paths is mature beech (P1850-1900), semi mature beech (P1980), occasional mature Scots Pine and birch. One of the larger beech next to the main track has had tree safety work carried out recently. An area of mature and semi-mature Scots Pine, beech and birch next to Stormy Point has been fenced off (0.27ha). The lack of trampling here has enabled a ground flora to establish, predominantly mosses but also heather and birch natural regeneration. Most of the young beech throughout this compartment is badly damaged by grey squirrels. Two veteran trees have been recorded (NT 2010).There is a concentration of archaeological features around Stormy Point and these are mostly mines and quarries (NTSMR). Erosion is a major issue and much work has been/ is being carried out to reduce the impact of this. Rhododendron is occasional. It is SSSI. There are two public footpaths and numerous permissive paths.

A3c Goldenstone 0.53ha

This small triangle of land lies south of Stormy Point adjacent to the carriage drive. It is predominantly P1900 Scots pine with oak, beech and birch, and an understorey of younger planted beech, oak, birch, larch and holly. It is shown as PAWS on the Ancient Woodland Inventory. The young beech is badly damaged by grey squirrels. Holly becomes more dominant towards the southern end. The ground flora is bracken. The main archaeological feature is the Goldenstone which is a mere stone or boundary marker in the earth bank at the north western corner of the wood. This was first recorded in 1598 and is now a Scheduled Monument (no 33860). There is also a mine shaft, earth circle and hollow way (NTSMR). It is within the SSSI.

A4 Dickens Wood 2.3ha

The whole of this compartment is shown on the Ancient Woodland Inventory as PAWS. The central area was planted in the 1960's with European/Japanese larch/ sweet chestnut mix (0.93ha) and a block of P1960 Scots pine (0.25ha). The larch, which has been well thinned in the past (basal area 36m^2/ha), is now c25m tall with an average DBH of 46cm. The Scots pine, which has been less well thinned (basal area 50m^2/ha) is c23m tall with an average DBH of 29cm. The ground flora under these stands is bracken and broad buckler fern. Rabbits are abundant. The dry valley which forms the western boundary of the compartment contains a strip of semi-natural (possibly ASNW) mature oak woodland. One veteran oak has been noted (NT 2010). Elsewhere the woodland is of younger mixed broadleaves/mixed conifer (0.5ha) including beech and birch, both of which show signs of bark damage by grey squirrels. There are only two archaeological features; a track way and a quarry (NTSMR). Only a small part of the compartment (0.3ha) lies within the SSSI.A public footpath runs along the northern boundary.

A5 Waterfall Wood 3.06ha

Waterfall Wood lies in the narrow valley of an un-named stream, a tributary of Whitehall Brook which flows north through the centre of the compartment. It is shown on the Ancient Woodland Inventory as PAWS. It is predominantly mature oak and beech woodland, with some of the trees no doubt dating to the original Stanley plantings of the 1780's (two veterans recorded in 2010). Two small areas (totalling 0.61ha) were planted with Scots pine and larch in the 1960's. The trees are now 25m tall with DBH of 32-35cm. There are significant volumes of fallen and standing dead wood. The gametophyte of Killarney bristle fern *Trichomanes speciosum* has recently been discovered at the waterfall (J Hooson pers com).The uncommon bryophytes *Calypogeia integristipula* and *Schistostega pennata* ('goblin gold') have been recorded (Callaghan 2015).Together with Clockhouse Wood, this compartment is considered to be the most interesting for woodland flora and for invertebrates (1997 Biological Survey). Archaeological features include stone quarries, rock carvings, a rock shelter and possible tramway (NTSMR). The compartment is outside the SSSI. A public footpath runs alongside the stream.

A6a Waterfall Wood North 2.41ha

This compartment is shown as ASNW on the Ancient Woodland Inventory, however it has been altered considerably by past planting. The main feature is the grove of eight large beech trees next to the public footpath near the southern boundary. The largest tree (slightly apart from the main group) has a diameter of 152cm and is 36m tall. The trees are considered to be part of the original Stanley planting of the 1780's. The rest of the compartment is a mix of mature P1900 oak, beech, birch and occasional sycamore and alder, with an understorey of holly which is becoming very dense in places. The ground flora is dominated by bracken and bramble, but bluebells are also present. Gaps in the canopy have been planted with oak. *Schistostega pennata* ('goblin gold') has been recorded (Callaghan 2015). There appear to be no archaeological features, and the compartment lies outside the SSSI. There are two public footpaths.

A6b Dry Valley 0.31ha

A narrow strip of woodland extending south from A6a which is shown on the Ancient Woodland Inventory as ASNW, this may have originally been an access route to the Edge when it was a common. Mature birch, oak, holly, hazel and rowan are the main species. Six oaks are recorded as veterans (NT 2010). Approximately 25% of the stand is open ground. This is a quiet area with little or no public access. Rabbits are present. There appear to be no archaeological features and the compartment lies outside the SSSI.

A7a Clockhouse Wood 1.73ha

This compartment lies on a north-east facing slope above Clock House Farm and is shown on the Ancient Woodland Inventory as ASNW. It is predominantly mature oak-birch woodland (P1850-1900) with occasional beech and a holly and rowan understorey. The ground flora has bracken, bramble and broad buckler fern with some bluebells. Where gaps have formed in the canopy, these have been planted with oaks (P1990) which are

now well established. Some dense stands of holly have been cleared recently. No veteran trees were recorded in the 2010 survey but a veteran oak (diameter 103cm) was found on the eastern boundary in 2016.*Schistostega pennata* ('goblin gold') has been recorded (Callaghan 2015). There is an old quarry near the farm but otherwise no archaeological features (NTSMR). A public footpath crosses the wood and there is also a farm access which is in poor condition. The compartment lies outside the SSSI.

A7b Clockhouse Wood South 0.43ha
This compartment forms the eastern-most part of Alderley Edge. It is mostly an area of young (P1990) woodland on a north-east facing slope with oak, rowan, birch, sycamore, hazel, willow and holly. It is still fairly open and has a ground flora of bracken, bramble and buckler fern. At the northern end is a strip of more mature (P1950) oak. Rabbits are present. A power line crosses the southern end of the compartment. There appear to be no archaeological features (NTSMR) and the compartment lies outside the SSSI. A footpath and a permissive footpath cross the compartment.

A8 Beacon Wood 1.53ha
On flat ground, the eastern half of this compartment is a mature Scots pine / oak stand with occasional Norway spruce and sweet chestnut. The understorey includes birch and rowan. The western half is mostly mature P1900 beech. Here, gaps in the canopy have been restocked through planting and natural regeneration with beech, sweet chestnut and birch which are approximately 20-25 years old. At the north western corner is a stand of mature sweet chestnut with some very large specimens along the walled boundary. One of these is included as a veteran together with two oaks (NT 2010). Rhododendron is present at the entrance to the estate. Throughout this compartment, a dense canopy (especially under beech) and significant levels of trampling has resulted in an impoverished ground flora, soil compaction and areas of soil erosion. The main feature is the Armada Beacon which was located on the site of a Bronze Age burial mound. This is a Scheduled Ancient Monument (no 33858). There appear to be no other archaeological features (NTSMR). It is SSSI.

A9 Canyon Mine Wood 3.12ha
This compartment is a mixed stand of mature P1900 and P1960 Scots pine and mixed broadleaves including oak and beech with an understorey of birch, rowan, holly and semi-mature beech and oak. Some of the P1960 oak and Scots pine are well established, however, many of the younger beech have been badly damaged by grey squirrels. The ground flora is mostly, bracken, bramble and buckler fern, but is impoverished in areas under the dense beech canopy. Archaeological features include many mine shafts (including Canyon Mine), quarries, earth banks and the Druid's Circle (NTSMR). It is SSSI. This compartment is completely delineated by footpaths, most of which are public rights of way.

A10a Great Quarry Wood 3.85ha
P1930 Scots pine and mixed broadleaf (oak-birch) with an infill of younger oak and beech and a stand of younger (P1960) Scots pine at the western end. Gaps in the canopy have been planted with beech, oak, rowan and birch. The main feature is Great Quarry (aka Old Alderley Quarry) which is believed to be post-Medieval, but there are many other archaeological features within the compartment (NTSMR). Public footpaths run along the north and east boundaries and there are several permissive paths within the compartment. There is also a natural play area. It is part of the SSSI.

A10b Church Quarry Wood 2.52ha
This is a mixed stand of P1900-1930 Scots pine and mixed broadleaves, predominantly oak and beech with occasional sycamore and European larch. The understorey includes mature and semi-mature birch, beech and holly. A number of veteran trees were identified in 2010. Archaeological features include Church Quarry, a powder magazine, well and various earthworks (NTSMR). Rhododendron is present around the quarry and elsewhere in the compartment and is spreading. There are no public footpaths but a permissive path runs from Beacon Lodge to The Wizard. The compartment is within the SSSI.

A10c Engine Vein Wood 3.04ha
This compartment is predominantly a P1900/1930 Scots Pine and mature mixed broadleaf stand. Broadleaves include oak, sweet chestnut and birch. The older pines are impressive with diameters up to 85cm and some over 24m tall. The understorey includes mature birch and rowan. Engine Vein is a Scheduled Monument (No 33859) and most of the archaeology within the compartment is clustered around this area (NTSMR). Engine Vein is also a location for the uncommon (obligate metallophyte) bryophyte *Cephaloziella massalongi* (Callaghan 2015). The mine has been fenced off since2007 to prevent erosion. Most of the area within the fence is clear of trees and shrubs in order to prevent damage to the archaeological features. All paths within the compartment are permissive. The compartment is within the SSSI.

Compartments A11-13 all lie on the western side of the B5087 Macclesfield Road.

A11a Windmill Wood 3.94ha
The central part of this compartment is a mixed P1930/P1960 stand of Scots pine with occasional mixed broadleaves including oak, beech, birch and sycamore. The understorey includes young birch and holly. Small clearings in the pine have been restocked (P1960/1970) with beech and oak. The beech has been badly damaged by grey squirrels. The edges of the compartment are dominated by mature mixed broadleaves including P1800-1900 oak, beech sweet chestnut, sycamore and younger birch holly and rowan in the understorey. Here there is a good age class structure, naturally regenerating birch and good levels of fallen and standing dead wood. The ground flora includes bracken and buckler fern. Rhododendron and yellow archangel (garden escape) are present at the southern end of the compartment. Broad leaved helleborine has been recorded on the bank on the roadside (1997 Biological Survey). Several of the oaks on the earth bank of the western boundary are veterans (the largest has a diameter of 119cm).Two ponds adjacent to Cow Lane are thought to be collapsed mines. Other archaeological features include the site of a settlement and hollow ways (NTSMR). There are no public rights of way but a permissive path runs along the western boundary. Roadside tree safety both along the Macclesfield Road and Artists Lane is a key issue. The compartment is within the SSSI.

Younger Scots pine stand- Basal Area Scots pine=38 m^2/ha + Mixed broadleaves =18 m^2/ha. Total 56 m^2/ha. Scots pine average DBH =33cm

A11b Windmill Wood North 2.88ha
This compartment is predominantly P1900 oak with occasional beech and Scots pine, and an understorey of younger birch and holly. Several gaps have been planted with mixed broadleaves (P1960) including beech, sweet chestnut and oak. A small planting of c50 young beech near the Macclesfield Road entrance to the wood (av DBH 20cm HT 14m/6m) have been badly damaged by squirrels and have poor form. The rest of the compartment consists of two distinct stands (0.79 & 0.56ha) of P1960 Scots pine. These stands are unthinned and have a dense canopy with little understorey and a poor ground flora. There is a large area of open ground (0.44ha) which is associated with past mining activity (see archaeology below). Ponds near the northern boundary are thought to have been reservoirs. These are fairly shaded but contain Sphagnum moss, and water beetles and dragonfly larvae have been recorded here (1997 Biological Survey- presume it refers to these and not the ponds in A11a). Other archaeological features include the site of the old windmill, mine shafts, spoil heaps, and a hollow way (NTSMR). Rhododendron is locally dense around the ponds but sparse elsewhere. Japanese knotweed occurs under young pines in the western corner. A public footpath forms the southern boundary but there are no rights of way within the compartment. It is within the SSSI.

A11c Hagg Wood 0.99ha
Mature oak and beech with occasional sweet chestnut, sycamore European larch and horse chestnut. Some of the beech have a diameter of greater than 1m. The understorey includes holly and rowan and the ground flora of bracken, bramble and buckler fern. It is in the SSSI. There is a public footpath along the southern boundary.

Archaeological features include the site of a smelting house and a tramway (NTSMR) Wood Mine cobalt works is a Scheduled Monument (no 33863).

A11d Brynlow Dell 2.61ha
This compartment is a stand of mature beech, oak and Scots pine with an infill of younger birch and rowan. A large planting scheme has been undertaken (P1990) with oak, beech and birch now well established. Beech seedlings and some younger oaks are frequent .The ground flora is mainly bracken, bramble and broad buckler fern but bluebells are also present. The veteran tree survey (NT 2010) identified two beech and a sycamore, but missed a veteran ash on the northern boundary. Nearby is a small watercourse which flows into a deep man-made cleft (mine adit). This is a location for *Schistostega pennata* ('goblin gold') (Callaghan 2015). The stream gully provides damp conditions unusual at Alderley Edge. The young beech is being damaged by grey squirrels. Rhododendron is present. Part of the compartment is in the SSSI. There are permissive paths but no rights of way. Roadside tree safety is a key issue with many large beech along Artists Lane.

A11e Artists Lane West 0.7ha and A11f Artists Lane East 0.23ha
This is a narrow strip of woodland on the south side of Artists Lane which is dominated by mature (P1900) beech with occasional oak and Scots pine. There is very little understorey due to deep shade and the ground flora is sparse. The 2010 Veteran Tree survey identified six beech as veterans in A11f, however missed an oak on the southern boundary bank. Several large beeches have been felled and the timber left in situ as dead wood habitat. A pond at the western end of A11f is possibly an old marl pit. Other archaeology includes hollow ways and a shaft (NTSMR). A permissive bridleway has been created. These compartments are not part of the SSSI. Roadside tree safety is an issue with many large beech along Artists Lane.

A12 Bradford Lodge 3.31ha
This compartment contains an area of relict heathland (0.65ha), areas of semi-natural oak birch woodland (1.55ha), and a plantation of Scots pine (0.70ha). The heathland contains small areas of heather, bilberry and purple moor grass but is dominated by bramble and soft rush. Trees have been felled recently and a new fence erected to enable the central area to be grazed. Some turf stripping has been carried out. Grazing is on an *ad hoc* basis and is usually 2 cattle for 1 week per annum. There is no formal monitoring process on this site. Oaks were planted on the eastern edge of the heathland in the 1980's (drainage channels which appear on the NTSMR may be connected to tree planting).These have been well thinned but are probably compromising the objectives for this compartment (Sphagnum was noted beneath the trees). The P1950 Scots pine plantation on the western side has an average DBH of 38cm and is 23m tall. The rest of the compartment is semi-natural mature oak-birch woodland with occasional European larch sycamore and beech, with an understorey of birch, rowan and holly and a ground flora of bracken, bramble and buckler fern. A single veteran oak was recorded in 2010 but not measured. Rhododendron occurs along the eastern boundary and is seeding into the recently opened areas. There is a public footpath along the north eastern boundary but no public access within the compartment. It is in the SSSI. Archaeological features include the drainage channels, a mine shaft and earthwork (NTSMR)

A13 Finlow Hill 2.19ha
This is mostly young (P1980) birch woodland with some Scots pine, larch, oak and sweet chestnut which were planted at the same time. The ground flora is bracken, bramble and buckler fern. Two small areas of open ground at the southern end have relict heath with heather and bilberry, and this appears to have been subject to a turf stripping experiment with mixed results. Thinning has recently been carried out in the rest of the woodland, in an attempt to encourage heathland vegetation, however no heather or bilberry was seen here in 2016, and the lighter conditions/disturbed ground appear to be encouraging prolific birch regeneration in places . Archaeological features include an adit, shaft and mine workings (NTSMR). There is no public access. It is within the SSSI.

A14 Car Park Wood 1.55ha
This includes the amenity planting of oak, birch sycamore, beech, rowan, sweet chestnut, hazel, willow and Corsican pine, which screens the car park from the B5087, and the area at the eastern end of the car park. This southern area is oak-birch woodland with rowan, holly and occasional yew and a ground flora of bracken, buckler fern and bramble. A series of ponds on the northern boundary are old marl pits (NTSMR). Despite its proximity to the car park it is a quiet area with no public paths. It is within the SSSI. There is frequent ash sycamore and rowan natural regeneration near the car park along with dense stands of rhododendron.

A15 Thieves Hollow 0.54ha
This is a small area of mature P1900 oak woodland with occasional larch, and an infill of younger birch and rowan. The understorey includes scattered holly and elder. Canopy gaps were planted with oaks c 20 years ago and these are now well established. Levels of fallen and standing dead wood are high. The ground flora is mostly dense bracken and areas of nettle. There are some areas near the main track that are badly trampled and show signs of soil compaction. Archaeological features include a stone quarry ('Thieves Hole') and an adit (NTSMR).

2.4 Constraints, threats and opportunities

Visitors

Providing public access and a quality visitor experience is one of the main priorities for the National Trust at Alderley Edge, however the sheer number of visitors is now causing serious degradation of soils, loss of vegetation and damage to archaeology, and is reducing the quality of the visitor experience as well. Footpaths have become very wide and around path junctions there are large areas of bare ground. As well as damaging the ground vegetation, this is also preventing natural regeneration and leading to tree root damage. Although a programme of footpath works is ongoing, these problems are likely to persist.

Many visitors to the Edge bring dogs, and these have additional impacts. Dog waste is a major problem, dogs off leads cause soil erosion and regular disturbance in areas away from paths, and it is likely that dogs have a major impact on breeding birds. Additional threats include fires, anti-social behaviour and mountain bikes. See Marzano and Dandy 2012 for a review of research on recreational use and disturbance.

The impacts of high visitor numbers (path erosion, reduced wildlife) is likely to have a negative effect on visitor/member satisfaction.

Public interest in Trust activities is high and the reaction to management may be negative unless the work is clearly explained and justified.

Conflicting Objectives

The National Trust has prioritised conservation performance indicators for Alderley Edge (see Widger in Prag 2016). Industrial archaeology and archaeology are considered to be the most important features on the site, followed by the wider setting and views, geology and built structures. Trees and woodlands and nature conservation are considered to a lower priority.

Public Safety

The proximity of roads and properties, together with high public use mean that tree safety is a major concern. Annual assessments, tree surgery and felling have a large resource implication for the Trust, both in terms of staff time and cost of contractors. As trees reach maturity, this is likely to increase. Soil compaction, the presence of grey squirrels and tree diseases are all likely to contribute to this.

Access for management

Large parts of the site can be accessed by vehicle via public roads and tracks, however the steep scarp slope of the Edge and the narrow valley of Waterfall Wood have no vehicular access, and land in private ownership at the base of the slope prevents access to these areas. This may prevent any timber removal.

Age of woodland

As recent secondary woodland, the wood is generally even aged with a dense canopy and therefore little regeneration (except rowan and holly), and low levels of dead wood. As it has mostly developed on former heathland, the ground flora is still relatively species poor. Over time, the woodland is likely to become more

diverse with gaps forming, a new generation of trees becoming established, increased amounts of dead wood and a developing ground flora.

Shade tolerance of tree species

The three main species planted at Alderley Edge were beech, oak and Scots pine. The other main species includes birch which has established throughout the woods by natural regeneration. Beech is a shade bearing species whilst oak, Scots pine and birch are light demanding. Beech saplings are therefore able to establish under a dense canopy whilst oak, birch and Scots pine cannot. Without management (e.g. supplementary planting of desired species in gaps) it is likely that beech will become more dominant over time. Holly is a shade bearing species which can, in the absence of browsing, dominate the understorey leading to loss of ground flora and reduced tree regeneration. It is particularly dense in two areas- A6a Waterfall Wood North and A7a Clockhouse Wood where some control has been carried out.

Invasive non native plant species

Alderley Edge has relatively few invasive non-native plants. A rapid survey in 2016 found Rhododendron present in 15 (out of 30) sub compartments (see individual compartment descriptions). In most cases it occurs as several scattered bushes however in places it is becoming quite dense and threatening features of interest (flushes at A2a Holy Well, Quarry in A10c Church Quarry and ponds in A11b Windmill Wood North). It could be eradicated from the site fairly easily. Japanese knotweed occurs in two locations- A2b Mottram Quarry and A11b Windmill Wood North. The establishment of garden escapes from dumped material is always a threat. Variegated yellow archangel has become established around the southern access to A11a Windmill Wood, and dumping also occurs from the houses above A1a Mottram Wood.

New Zealand swamp stonecrop *Crassula helmsii* has been recorded in the Sandhills area. (Prag 2016). and could spread to water bodies on Trust land.

Tree diseases and pathogens

Chalara disease of ash is well established in the UK however there is very little ash at Alderley Edge so the impact of an outbreak will be low.

Dothistroma septosporum Red Band Needle Blight is now established throughout the British Isles (see http://www.forestry.gov.uk/PDF/fcrn002.pdf/$FILE/fcrn002.pdf). It has been found on a range of conifer species, especially Corsican and lodgepole pine and, to a lesser extent, Scots pine. Whilst Scots pine has generally been considered to be of low susceptibility, an increase in the distribution and severity of the disease on this species is now being seen. It weakens the tree, reduces productivity and vigour and eventually leads to mortality. Dispersal is thought to occur through moist winds and mist along with the movement of infected material. Scots pine is a major constituent of the woodlands and landscape at Alderley Edge and an outbreak of *Dothistroma* could have a serious consequences.

Phytopthora ramorum Sudden Oak Death mainly affects larch, but also has a wide range of conifer (Douglas fir, Sitka spruce) and broadleaf hosts (Turkey oak, beech, sweet chestnut, horse chestnut) as well as affecting rhododendron and bilberry. It is now well established in the UK , and there have been recent cases at the Trust's Styal Estate nearby. If a stand becomes infected there is a statutory requirement to fell the diseased trees and rhododendron, plus susceptible trees and rhododendron within a 250m buffer zone of the infected site. There are also severe restrictions on harvesting and processing, and on what could be re-planted. Larch is

not a major component of the woodlands here, but there are small plantations in compartments A1c, A4 and A5, and rhododendron is scattered throughout, although it is fairly sparse.

Other Tree Pathogens

Beech bark disease is caused by the fungus *Nectria coccinea var faginata*, which infects the bark through small feeding wounds caused by the beech scale insect *Cryptococcus fagisuga.* Severe infestations can kill affected trees. The white, woolly wax of the scale insect was noted on a number of beech at Alderley Edge in 2016 but this does not mean that the trees are necessarily infected. Infected trees typically have areas of dead bark.

Photo 2. Beech damaged by Grey Squirrel

Grey squirrel

Grey squirrels are well established at Alderley Edge. They cause considerable damage to broadleaf trees, by stripping the bark to feed on the unlignified tissue beneath, mainly between April and September (see Mayle, Ferryman and Pepper 2007). At Alderley Edge, beech is the main species affected (although damage to birch has also been noted), and as well as targeting young trees, damage has been noted in the crowns of mature trees (D Standen pers com), creating a potential hazard. Grey squirrels also predate birds' nests. The mixed oak-beech-Scots pine woodland provides a good food source, and availability of alternative food sources in nearby gardens mean that control is unlikely to have a meaningful impact on the population. The methods of control currently available (trapping, shooting) are unsuitable to a site with high levels of public access. The continued presence of grey squirrels will need to be taken into account in future selection of tree species.

Deer, sheep, rabbits

Good levels of holly, rowan and birch regeneration suggest that browsing is not a major problem at Alderley Edge. However a low browse-line and evidence of browsing on bramble was detected in 2016. Rabbits are present with warrens in several of the compartments (e.g. A4 Dickens Wood) and these may damage young trees. The boundary fences separating several of the compartments from adjacent farm land are three strand barbed wire i.e. not sheep proof (A7a, A5, A11 for example) , however sheep trespass is not problem.

Climate change

Natural England has identified possible threats to semi-natural woodland posed by climate change. Warmer winters may allow the expansion in distribution of many tree pests and diseases, as well as increasing the over-winter survival of mammals such as grey squirrel and deer. An increase in the frequency of storms is likely to lead to more regular disturbance of the woodland canopy which may change the species composition. Increased occurrence of summer drought will lead not only to tree stress, but also to loss of humid conditions for bryophytes and increased fire risk. See Natural England and RSPB 2014. Historic England has also produced

a document outlining the possible consequences of climate change for the historic landscape. See Historic England (2008).

Increased intensity of rainfall may increase soil erosion especially on trampled ground where there are no plant roots to bind the soil together. Drought may harm shallow rooted trees- have already been some losses of beech (from C Widger chapter in Alderley Edge book).

Lack of knowledge

Apart from bryophytes, the Trust does not have detailed up to date information about other biodiversity on the site (e.g. location of priority birds, plants etc) and this may mean that woodland operations inadvertently damage important features.

Resources

The Trust has an Area Ranger, Ranger plus 6-8 regular volunteers 2 days a week. Staff also cover 6 other sites in addition to Alderley Edge. Tree surgery is carried out by contractors, but all other work is done in-house. Alderley Edge has several sources of income e.g. pay and display, leases.

Bats, badgers and birds

All bats are European Protected Species. Damaging or destroying a breeding or resting place is an offence regardless of whether the act was deliberate or reckless. Any work which may disturb bat roosts requires a licence from Natural England. Badger are also protected by law and work near a badger sett may require a licence . Woodland work should avoid the bird breeding season (April-Aug).

Environmental factors

The site is characterised by thin, free-draining acidic soils. This will limit the type of vegetation that can be established. As the woodland matures, deeper and more humus rich soils will gradually develop allowing a wider range of species to thrive although this may not occur on steep erosion prone slopes.

Alderley Edge has a long boundary to area ratio and is thus prone to edge effects including fertiliser and spray drift from adjacent farm land.

Succession

Gradual leaching out of metals on old mine spoil and rock exposures, and succession on these sites may threaten the rare metalliferous bryophytes.

Heathland has been lost from most of the site. In two compartments (A12 and A13) there have been attempts recently to restore areas by felling trees and introducing grazing. It is not clear whether objectives are being met. Maintenance of these areas will require regular input of resources into the future if it is to be worthwhile.

3 Long term vision, management objectives and strategy

3.1 Long term vision (2066)

Alderley Edge is recognised for its geology, industrial archaeology and the opportunities for recreation it provides. The woodlands are integral to people's enjoyment of the site, but are also valued in their own right as an area of semi-natural habitat and diverse wildlife.

Alderley Edge supports a mixed woodland which is well able to withstand the pressures of high visitor numbers, climate change and the potential threat of tree diseases. Although Scots pine, beech and sweet chestnut are still a feature in some areas, much of the woodland is now moving towards a more native stand type of oak-birch with the full range of naturally occurring tree and shrub species present. The woodland structure is becoming more diverse. Gaps created by storms or human intervention have abundant natural regeneration and dead wood. Many of the oldest trees are now developing veteran characteristics, valuable for fungi, invertebrates and birds. Invasive non native species are absent. Alderley Edge supports a good assemblage of breeding birds and remains an important site for bryophytes with populations of rare/uncommon species stable or increasing. Other habitats such as ponds, unimproved grassland, flushes and small areas of heathland provide valuable niches for non-woodland species. The important archaeology of Alderley Edge is carefully protected. Local people have an active interest in the woodlands and are justifiably proud of this important asset. Although visitor numbers are high, erosion and disturbance to ground flora are minimal as people and dogs keep to the paths.

3.2 Management Objectives

1. Protect and enhance biodiversity in the woodland and open habitats
2. Conserve and protect cultural and historic features
3. Encourage safe and sympathetic public access
4. Ensure the woodlands and other habitats are resilient to climate change and plant diseases
5. Seek appropriate opportunities to offset the costs of management
6. Comply with UK Forest Standard and UK Woodland Assurance Scheme

3.3 Strategy

1. Protect and enhance biodiversity in the woodland and open habitats
a) Gradual conversion of woodland to more natural stand type including restoring some PAWS
b) Identify and conserve current and future veteran trees
c) Actively increase amounts of dead wood
d) Eradicate non native invasive plant species
e) Use opportunities provided by natural processes (such as storms) in management
f) Maintain areas of low disturbance
g) Time forestry operations to avoid the bird breeding season
h) In selected areas, control holly to protect ground flora
i) Maintain areas of heathland and ponds as open habitat
j) Carry out surveys for birds, bats, invertebrates etc and ensure results inform management
k) Maintain populations of rare plants

2. Conserve and protect cultural and historic features
a) Remove trees from archaeological sites as directed by the Regional Archaeologist
b) Continue to restrict public access to important mine sites
c) Consult Regional Archaeologist before undertaking works which may impact on historic features
d) Retain Scots pine, veteran beech and chestnut element in woodlands

3. Encourage safe and sympathetic public access
a) Manage woodland primarily for quiet enjoyment and limit other activities to designated areas
b) Maintain quiet areas with low disturbance
c) Implement path improvement plan to reduce erosion and trampling
c) Work with dog owners to reduce problems of trampling and fouling
d) Implement a programme of creating temporary exclosures (as part of good silvicultural practice)
e) Carry out regular patrols
f) Undertake regular tree safety inspections and carry out work appropriate to the risk zone but retain hulks where possible
g) Reduce proportion of beech in the woodland to reduce future liability
h) Recruit, involve and support volunteers

4. Ensure the woodlands and other habitats are resilient to climate change and plant diseases

a) Reduce the impact of other pressures on woodland and other habitats e.g. trampling, grey squirrel damage, effects of adjacent land use

b) Increase structural heterogeneity in the woodland

c) Maintain a diversity of native and near native tree species

d) Favour natural regeneration over planting where possible, but where planting is required, use locally grown trees

e) Pre-empt the spread of Phytopthora ramorum by eradicating Rhododendron from the site

f) Identify and conserve refuge areas

5. Seek appropriate opportunities to offset the costs of management

a) Maximise income from grants

b) Seek to utilise timber grown on the Estate for infrastructure where feasible

6. Comply with UK Forest Standard and UK Woodland Assurance Scheme

a) See UK Woodland Assurance Scheme 3rd Edition (2012)

b) See UK Forest Standard FC (2011)

c) Keep up to date records of management, monitoring etc

d) Follow guidance in all operations (e.g. protection of watercourses, use of pesticides, felling and restocking etc)

4 Management

Operational Site Assessments

When implementing management plan prescriptions into a detailed work plan Operational Site Assessments will be drawn up. The Operational Site Assessment and Plan of Operations will include checklists, detailed maps of operations and will follow Forestry Commission guidelines. (See Appendix 4)

4.1 Silvicultural systems

4.1.1.Phased felling and restructuring of even aged stands

The prominence and popularity of Alderley Edge suggest that low impact silvicultural systems with a continuous canopy will be preferred for the management and regeneration of the woodland. This will be a flexible, adaptive and opportunistic approach to stand management, which will diversify the stand structure, age class and species mix. Stand transformation is a long term process, sometimes greater than normal rotational age of the tree species.

The most appropriate management will be Irregular/group shelterwood with reserves. Small gaps in the canopy will be created either naturally or by selective group felling (minimum of two tree lengths), with new generation (natural regeneration or supplementary planting) encouraged. A priority will be the removal of stands of semi-mature beech. Further cuts will gradually expand the gaps. “Irregular” refers to the multiple age classes that become established in the expanding gaps. “Reserves” are old trees which are retained indefinitely as a seed source, biological reserve/ future veteran tree or for landscape reasons.

The following areas require restructuring; A1a Mottram Wood, A2a Holy Well, A3a Glaze Hill, A3b Stormy Point, A3c Goldenstone, A4 Dickens Wood, A8 Beacon Wood, A9 Canyon Mine Wood, A10a Great Quarry Wood, A10b Church Quarry Wood, A10c Engine Vein Wood, A11a Windmill Wood, A11b Windmill Wood North.

Photo 3. A8 Beacon Wood. An example of regenerating oak, birch and beech under a gap in the canopy.

In addition, areas of the woodland will be retained for the long term as Woodland Reserves. This can be applied to a whole stand or part of a compartment. This is specifically for wildlife and landscape conservation and areas of native woodland. It is also applicable to areas where timber felling and extraction is difficult and potentially damaging. In these areas, any timber removal is discouraged and the woodland allowed to progress to an old growth type rich in veteran trees and dead wood. Intervention may be required for safety reasons or to prevent unwanted species establishing or becoming or too dominant. Active inputs such as maintaining public access and stockproof boundaries, and controlling non-native species will be required. In some areas (e.g. PAWS) restoration management may be required to achieve a more semi-natural state after which the management will revert to long term retention for biodiversity and the landscape.

The following areas are identified for long term retention as Woodland Reserves; A1b Wizards Well, A2b, Saddlebole, A5 Waterfall Wood, A6a Waterfall Wood North, A6b Dry Valley, A7a Clockhouse Wood, A11c Hagg Wood, A11d Brynlow Dell, A14 Car park (south end) A15 Thieves Hollow.

4.1.2 Establishment, restocking and regeneration.

Natural regeneration will be favoured wherever possible, however this may result in the establishment of both native and non-native and also desirable and undesirable species. In some situations supplementary planting may need to be carried out in order to;

- maintain the continuity of a species in the landscape where it is not regenerating naturally or at a sufficient stocking density.
- re-establish a species in a stand where it has been excluded or suppressed by a more dominant vegetation, e.g. oak on an old beech stand.
- diversify the species mix in a stand.

Where planting is necessary, the tree species chosen must not generate a new threat to the woodland's health and structure. Trees and shrubs will be from locally selected seed or from an appropriate provenance and British grown from a reputable nursery. All recently established trees will need protection from trampling and grazing animals either through individual tree protection or temporary exclosures. Resources will be allocated to the aftercare of the young trees in the years immediately after establishment and this will be carried out until the planned species mix and stocking levels are achieved. The removal of undesirable species will be carried out during the weeding phase of the establishment process. Records will be kept for all stages during the establishment process. If tree guards and tree protection are used they should be fit for purpose, appropriate to the location within the estate, maintained and removed and/or recycled when no longer required.

4.2 New planting

No new woodland is proposed in this plan

4.3Protection and maintenance

Boundaries of all woodlands should be maintained in good stock proof condition. Regular inspection and repair of boundaries will be carried out.

4.3.1 Pest and disease management

Climate change and the expansion of international trade are likely to increase the threat posed to Britain's woodland by tree pests and diseases. The National Trust will preserve the health and vitality of its woodlands by excluding, detecting and responding to existing and new pests and pathogens of trees.

Phytopthora ramorum

The gradual thinning out of larch to favour other conifers as part of the restructuring process will be reduce the amount of larch at Alderley Edge and reduce the impact of Phytopthora if it does arrive. It is important to note that other species including rhododendron are hosts of this pathogen, so removal of larch alone will not remove the risk of infection

Constant vigilance is the key to preventing the spread of this disease. Staff and volunteers on the estate will be made aware of the disease, its symptoms and the reporting process.

Spores can be carried on footwear, clothing, plant material, machinery and tools. Any contractors arriving at Alderley Edge will follow FC advisory note FC 30/4/2010 (available on FC website)

If any larch does become infected by *Phytopthora ramorum* and is served notice by the Forestry Commission this will require immediate action.

To prepare for a possible future outbreak, an Emergency Plan will be drawn up covering:-

Biosecurity measures for the public, operators, staff, machinery and tools

Details of grants available for felling and restocking

Details of suitable contractors

Details of the felling operations, measures to avoid damaging important adjacent habitats.

The movement and storage of timber, restocking and the prevention of re-infection of restocked areas and the disposal of infected material.

Red Band Needle Blight. *Dothistroma*

Where planting of pine is necessary, trees should only be imported from nurseries known to be free of the disease. See http://www.forestry.gov.uk/dothistromaneedleblight and http://www.forestry.gov.uk/pdf/DNBStrategy11-04-2012.pdf/$FILE/DNBStrategy11-04-2012.pdf for more details

Grey squirrel

Tree species that are most vulnerable to squirrel damage will be avoided in all future tree planting schemes including beech, maples, including sycamore, and hornbeam unless adequate squirrel control is in place for the long term. If squirrel control is undertaken it will be strategic, will follow best practice, be humane, discreet and timed to be most successful and cost effective. (See Mayle, Ferryman and Pepper 2007)

Invasive non-native plants

A detailed survey of the woodlands for Rhododendron will be carried out. Rhododendron and Japanese knotweed will be completely eradicated from Alderley Edge during the plan period.

4.3.2 Fire plan

The Trust has a fire plan.

4.3.3 Waste disposal and pollution

Comply with COSHH regulations. See also 4.4.4 Pesticide Use

- Storage of fuel – See FC Forestry and water guidelines.
- Burning of cut rhododendron, lop and top should only occur if no alternative available. This will be burned on steel sheets supported off the ground. Fires will not be started on bare rock surfaces. Ash will be disposed of away from sensitive habitats, wetlands and watercourses.
- Emergency Pollution control. A contingency plan will be drawn up to deal with accidental spillages.- (See FC Forestry and Water Guidelines)
- Old fencing wire, posts and plastic tree shelters will be collected removed from site and disposed of appropriately
- All wastes will be disposed of to reputable and licensed waste disposal contractors.
- Timber harvesting (or any other potentially polluting) operations near to water will be planned under the relevant site risk assessment, and oil-scouring booms and silt traps will be deployed / constructed at suitable points downstream of the area(s) of possible disturbance.
- Biodegradable chain oil will be specified for all users.
- Machines with biodegradable hydraulic oil will be used for any works near or in water as specified by the Environment Agency.
- Contractors with machinery will be required to have anti-spill oil clean-up kits on site at all times with their machines.
- Suitable refuelling and overnight parking points will be discussed and marked on a map with the site risk assessment, to avoid sensitive areas such as proximity to water bodies or particularly sensitive ground vegetation.

4.3.4 Pesticide Use

Pesticide use will be minimised. Users of pesticides will take all precautions to protect the health of humans and safeguard the environment and avoid the pollution of water.

- It will be ensured that pesticides are stored, used and disposed of responsibly and sustainably
- The responsible and sustainable use of herbicides will only be one element in the effective control on non-native invasive plants
- Where chemical control is the only option, most of the foliage will be removed prior to treatment. The application of herbicide will primarily be directly on freshly cut stumps or the regrowth. The regrowth is considerably easier to treat than full grown bushes, requires less herbicide and is much more responsive to chemical treatment. This will also reduce the risk of spray drift affecting the environment and the operator.
- Young seedlings will be eradicated as soon as they establish preferably by hand, before they have a chance to spread. It is easier to control small seedlings by hand than large bushes.
- Pesticide application will take careful consideration of buffer areas, weather and ground conditions and the risk to water supplies.
- Care and precautions will be taken to avoid herbicide drift and accidental spraying of any other vegetation.
- Contractors and staff shall clearly understand and implement precautions, environmental protection plans, protocols and emergency procedures.
- See Reducing Pesticide Use in Forestry. FC Practice Guide 2004

4.3.5 Protection of other identified services and values

Soils

- Soils will be protected and enhanced in terms of physical, chemical and biological properties
- Estate and forest operations will be planned and managed in order to avoid damage to the soil structure and function. If damage does occur, reinstatement work will be undertaken.
- Timing of management works will be flexible to take into account the season and weather. Dry soils have a greater bearing capacity than wet soils. Operations will be monitored and modified, postponed or stopped if degradation starts to occur.

Water

- Forest operations will avoid creating pollution, erosion and sedimentation. Inspections will be carried out during forestry work and action will be taken immediately if pollution or sedimentation starts to occur. Forest machinery will not operate in or ford watercourses.
- Buffer zones and stream sides will be kept free of brash. The felling of trees into watercourses will be avoided but the brash removed immediately if it occurs.

Protection from unauthorised activities

Appropriate measures will be taken to reduce the threat of wood theft. Incidents will be reported to the police and a crime reference number obtained. Multi agency cooperation, engagement and education are key elements in the effort to reduce and prevent fly tipping. Campfires and illegal camping will be discouraged by regular ranger patrol. Unauthorised use of public footpaths and permissive paths by mountain bikers will be discouraged by regular ranger patrol.

4.4.Game management

Not applicable

4.5 Protecting and enhancing landscape, biodiversity and special features

All of the woodland at Alderley Edge will be managed for biodiversity, archaeology and public access.

4.6.1 Management of designated areas

Staff and contractors will be made aware of the status of the Alderley Edge as a SSSI and will follow current best practice. The impact of operations at Alderley Edge and surrounding land will be minimised. Specialist advice will be sought prior to any operation. Management proposals for work on the SSSI must be consented by Natural England prior to work going ahead.

4.6.2 Measures to enhance biodiversity and other special features [UKWAS 2.1.1/6.1.1]

(See Sections 3.3 Strategy and 5 Individual compartment prescriptions)

Surveys monitoring and records

Surveys and monitoring for breeding birds, bat roosts in trees, invertebrates of dead wood and open ground, pond fauna, rare/BAP vascular plants and rare bryophytes will be a priority. However opportunities to increase knowledge of other groups e.g. lichens, fungi, lepidoptera will also be encouraged. Existing records will be collated and updated regularly and be readily available to help inform and guide management decisions.

Structural and species diversity

Low impact silvicultural systems will generate a greater structural diversity over the whole Estate. Natural processes will be encouraged and natural regeneration will be promoted through creating the right conditions and protection. Veteran trees and potential veteran trees will be identified, recorded and protected. Trees will be retained beyond their normal rotational length until their demise. Stands will be allowed to develop towards an old growth type. Where practicable and acceptable, fallen and standing dead wood of all species will be retained. Woodland management and tree safety work will also contribute to the accumulation of dead wood (coronet cuts/bat slots in any tree surgery work).

Disturbance

Areas where little management is required, where access for management is poor/difficult, or which are habitats or breeding areas of important species will be identified as areas for low disturbance. Disturbance will also be reduced within areas of high visitor use by fencing off exclosures to protect natural regeneration and ground flora, and using brash/felled trees to restrict access.

Non native and ‘near native’ tree species

Scots pine and sweet chestnut are present in many of the compartments. Where they occur as mature/veteran specimens they have value for biodiversity. These species are not actively regenerating and are therefore unlikely to change the composition of the wood over the long term. These species can be considered ‘Honorary natives’ and should be retained. In contrast, beech and sycamore regenerate freely and retention may lead to significant changes in woodland composition (and therefore biodiversity). Management will generally seek to favour native and near native species by removing beech and sycamore where appropriate, although veterans of these species will be retained.

Timing of Operations
Felling will aim to avoid the bird nesting period (April to mid-August inclusive).

4.5.3 Special measures for ancient semi-natural woodland (ASNW) and semi-natural woodland (SNW)

See detailed prescriptions for A6a Waterfall Wood North, A6b Dry Valley and A7a Clockhouse Wood

4.5.4 Special measures for plantation on ancient woodland site (PAWS)

See detailed prescriptions for A3b Glaze Hill, A3c Goldenstone, A4 Dickens Wood and A5 Waterfall Wood

4.5.5 Measures to mitigate impacts on landscape and neighbouring land [UKWAS 3.1.2]

The preference for continuous cover forestry over clear fell and restocking will reduce or remove negative impacts on the landscape. The impact of any tree felling operation on the landscape will be evaluated especially on prominent landforms. The public will be kept informed of any operations and management including up to date interpretation and notices.

4.6 Management of social and cultural values

4.6.1 Archaeology and sites of cultural interest

Archaeology is a major feature at Alderley Edge and will be protected during all forestry and arboricultural operations. Staff, volunteers and contractors will be made aware of the location of archaeological sites and these will be marked on the ground prior to any works. In addition, many of the features will require ongoing conservation work such as tree removal. This work will be directed by the Regional Archaeologist.

4.6.2 Public access and impacts on local people

Forest operations may have an impact on local communities. Individuals, Parish Councils or the relevant organisations will be fully consulted at the planning stage of any major operation. Timing of operations will take account of traffic and visitor levels. The public will be kept informed of major management works and forestry operations through temporary on-site signage prior to operations. Public rights of way used as access routes will be reinstated promptly after forest operations. An annual ongoing programme of roadside and property tree safety surveys will aim to ensure the safety of people and property on or passing near to the National Trust Property. Improvement works and woodland furniture such as signs, waymarkers and path surfaces need to be maintained and be in keeping with the surrounding estate. All woods will be managed to a high standard demonstrating the National Trust's care for the countryside. Where possible the Trust will seek to support local employment. Volunteers will be actively encouraged to participate in the monitoring, management and maintenance of the National Trust woodland properties at Alderley Edge.
Footpath improvements are currently required in the following compartments; A2a Holy Well, A4 Dickens Wood, A8-A10 Beacon Wood-Engine Vein Wood.

5 5 Detailed Management Prescriptions

See Maps 8 and 9 and Appendix 5 Inventory and Plan of Operations

A1a Mottram Wood

The long term aim will be to gradually convert this area from beech to native broadleaves, and reduce the resources required for ongoing management. Work has already started on this with gaps at the western end regenerating well. These pole stage trees may require thinning and re-spacing to favour native broadleaves over beech and sycamore. Where gaps in the canopy were underplanted with beech in the 1960's, these younger trees should be removed and the gaps restocked with native species. This will be carried out over several phases. Removal of mature beech in a strip (ideally 30-35m wide) along Mottram Road and replacement with smaller trees (birch, rowan, holly etc) will reduce the ongoing costs of tree surgery. Where safe to do so, hulks should be left to provide dead wood habitat. Some brash may be retained to help stabilise the ground but too much will prevent regeneration of the ground flora. Rhododendron will be eradicated.

A1b Wizards Well

This compartment is already largely native broadleaf so no silvicultural management is required. Some beech saplings are present and should be removed. Rhododendron will be eradicated. The fence on the northern boundary will be replaced. As the Wizards Well and Castle Rock outcrops are locations for some of the rare bryophytes, advice should be sought from the Regional Ecologist about further opening up of viewpoints (as this may contribute to a loss of humidity).

A1c Castle Rock

The P1960 larch is now very tall and growing on a steep slope with poor access. Felling is not recommended. The P1980's squirrel damaged beech should be removed before they become too large. Any gaps will be restocked with native broadleaves. Rhododendron will removed from the flush in the eastern corner of the compartment as a priority, with care taken to remove brash from the flush area. Herbicide use will be minimised here by painting the recently cut rhododendron stumps and spot treating regrowth. As Castle Rock is a location for some of the rare bryophytes (and was the site for the now extinct *Orthodontium gracile*), advice should be sought from the Regional Ecologist about further opening up of viewpoints (as this may contribute to a loss of humidity). The old wire fence along the northern boundary will be removed

A2a Holy Well

Removal of the rhododendron from around the flushes below Holy Well is a priority here as it is already quite dense and is threatening the wetland flora and fauna. Care will be taken to remove brash from the flush area, and herbicide use will be minimised by painting stumps and spot treating any regrowth. The fence along the western and northern boundary has been stapled to trees (including veteran oaks) and this will be removed. The spiral guards on the P1990 oaks will be removed. Up on the plateau, a plantation of P1980 beech and oak will be thinned to favour the oaks (the beech are poor specimens and could be removed completely). The resulting gap will be restocked with native broadleaves. Protection of the whole area with fencing to restrict access by dogs and people will encourage natural regeneration and development of the ground flora. Damage to the surface roots the veteran oak on the parish boundaries will be prevented by fencing and mulching (see photo 4).

Photo 4. Veteran oak on the parish boundary.

A2b Saddlebole

No management currently required.

A2c Mottram Quarry

This compartment is gradually being colonised by woodland. Whilst the open areas appear to be being maintained by rabbits and human disturbance, in the long term succession is probably inevitable. A survey should be carried out for the BAP species annual knawel to determine whether it is still present, and for invertebrates associated with open habitats, particularly mining bees and wasps (as recommended in the 1997 Biosurvey) Long term, management may be required to retain key areas as open habitat. The single rhododendron bush will be removed, and Japanese knotweed eradicated.

A3a Glaze Hill (PAWS)
Fences around Pillar Mine and below Stormy Point will be maintained. Rhododendron will be eradicated. Restructuring of the woodland will be opportunistic with restocking of any natural canopy gaps as they occur with native broadleaves and Scots pine. Bracken is dense here and control may be required in these gaps until the trees are well established. A re-survey for broad leaved helleborine will be carried out.

A3b Stormy Point (PAWS)
The fenced area at Stormy Point will be maintained to protect trees and ground flora from trampling. Groups of young squirrel damaged beech will be felled and the areas restocked with native broadleaves and Scots pine. Rhododendron will be eradicated. Heavy use has led to the paths in this area being particularly wide, damaging tree roots and ground vegetation. Attempts to reduce the width of the paths using surfacing, edging, and by leaving whole felled trees on the ground will continue.

Photo 3. A3b Stormy Point. Fenced exclosure.

A3c Goldenstone (PAWS)
Squirrel damaged beech will be felled. The scheduled monument of Goldenstone will be protected. The Trust will seek to prevent encroachment/compaction by the adjacent property

A4 Dickens Wood
As this compartment is PAWS, the ultimate objective should be restoration to semi-natural woodland. During the plan period this will involve thinning the P1960 Scots pine (approx 50% thin to achieve basal area of 25m^2/ha , with halo thinning of broadleaves where they occur) to encourage development of an understorey, removal of squirrel damaged beech from the mixed broadleaf areas, restocking with oak and other appropriate species and removal of rhododendron. The P1960 larch will be retained for the time being, but could be used as a source of timber for in-house projects as needed (timber cannot easily be extracted).

A5 Waterfall Wood
Although classed as PAWS, the majority of this compartment is already broadleaf woodland with the P1960 Scots pine and larch occupying a relatively small area. These could be felled to waste or retained. Rhododendron will be removed.

A6a Waterfall Wood North
Holly has become very dense in parts of this compartment and will be cut back to encourage ground flora and natural regeneration of other species. The brash should be cleared from the ground (either by rowing/piling or burning) to prevent smothering of the ground. Opportunistic restocking of canopy gaps with native broadleaves should continue, with hazel being included in new plantings.

A6b Dry Valley
Remove old fence wire.

A7a Clockhouse Wood
Holly has become very dense in parts of this compartment, and some clearance work has been carried out. This will continue but brash should be cleared from the ground (either by rowing/piling or burning) to prevent smothering of the ground.
Opportunistic restocking of canopy gaps with native broadleaves should continue, with hazel being included in new plantings. The path needs major improvement.

A7b Clockhouse Wood South
No management currently required

A8 Beacon Wood, A9 Canyon Mine Wood,A10a Great Quarry Wood,A10b Church Quarry Wood and A10c Engine Vein Wood
These compartments adjoin one another and are broadly similar in woodland type, so the following management proposals apply to all. Group fellings of young beech will provide gaps for restocking with oak and Scots pine. Fencing these gaps will prevent human/canine disturbance and will encourage the ground flora as well as natural regeneration of birch and rowan. Where young beech are adjacent to and competing with young oaks, halo thinning should be carried out to encourage the oaks. Rhododendron will be eradicated. Archaeological sites, particularly the Scheduled Monuments (the Beacon and Engine Vein) will be kept clear of trees and protected.

A11a Windmill Wood
Rhododendron will be removed. Otherwise very little management is currently required. Restructuring of the woodland will be opportunistic with restocking of any natural canopy gaps as they occur with native broadleaves and Scots pine. This should be maintained as a quiet area. A resurvey for broad leaved helleborine should be carried out.

A11b Windmill Wood North
Rhododendron will be removed from around the ponds before it becomes too dense/unmanageable. The stand of poor quality young beech opposite Beacon Lodge will be felled and the area restocked with native broadleaves. The P1960 Scots pine on the northern boundary has a basal area of 50 and could be thinned by

50% to encourage better growth and development of an understorey. The Japanese knotweed here will be eradicated. This will be maintained as a quiet area.

A11c Hagg Wood
No management needed.

A11d Brynlow Dell
Within the P1990 mixed broadleaf planting, many of the beech have been badly damaged by squirrels. These will be removed and replaced with native broadleaves (where gaps are big enough). Rhododendron will be removed. This compartment will be maintained as a quiet area.

A12 Bradford Lodge
The stand of Scots pine will be thinned to a basal area of 25m^2/ha. Rhododendron will be eradicated. Maintain low levels of public access. Continue low impact grazing regime.

A13 Finlow Hill
Maintain as a quiet area otherwise no management is required.

A14 Car Park Wood
Eradicate rhododendron. Maintain as a quiet area.

A15 Thieves Hollow
No management currently required.

6 Work programme

Cpt no	Activity	Year					
		1	2	3	4	5	6-10
ALL	Carry out regular tree safety inspections and any remedial works	x	x	x	x	x	x
	Implement footpath improvement plan to reduce erosion	x	x				
	Reduce erosion/disturbance/fouling by dogs						
	Clear litter	x	x	x	x	x	x
	Maintain on-site presence with regular patrols	x	x	x	x	x	x
	Maintain boundaries	x	x	x	x	x	x
	Maintain estate infrastructure including gates, signs etc	x	x	x	x	x	x
	Carry out breeding bird survey	x		x			
	Survey woodland for bat roosts			x			
	Protect archaeology during all operations	x	x	x	x	x	x
	Conserve archaeology by appropriate tree removal						
	Survey and map extent of Rhododendron			x	x		
A1a	Fell P1960 BE in gaps and restock with NBL			x		x	x
	Fell strip of mature BE along Mottram Road and restock with BI, ROW, HY			x		x	x
	Eradicate rhododendron		x		x		x
	Respace pole stage trees along roadside.			x		x	x
A1b	Remove BE saplings			x			
	Eradicate rhododendron			x			
	Replace northern boundary fence			x			
A1c	Remove rhododendron from flushes					x	
	Fell P1970 BE				x		
	Remove old fence on northern boundary			x			
A2a	Remove rhododendron from flushes					x	
	Remove old fence on western and northern boundaries		x	x			
	Remove spiral guards from young oaks		x				
	Fell P1980 BE to favour POK and protect area with fencing				x		
	Protect veteran oak on parish boundary	x	x	x	x	x	x
	Protect Scheduled Monument (Boundary Stone)	x	x	x	x	x	x
A2b							
A2c	Resurvey for annual knawel				x		
	Survey for mining bees and wasps			x			
	Eradicate rhododendron and Japanese knotweed		x				
A2c	Maintain open grassland areas						

Cpt no	Activity	Year					
		1	2	3	4	5	6-10
A3a	Maintain fenced exclosures around Pillar Mine and below Stormy Point	x	x	x	x	x	x
	Resurvey for broadleaved helleborine				x		
A3b	Eradicate rhododendron			x			
	Maintain fenced exclosures to protect ground vegetation at Stormy Point	x	x	x	x	x	x
A3c	Thin out squirrel damaged BE		x				
	Protect Scheduled Monument (Golden Stone)	x	x	x	x	x	x
A4	50% thin P1960 SP						x
	Eradicate rhododendron						x
	Thin out squirrel damaged BE and restock with NBL						x
A5	Eradicate rhododendron						x
	Fell SP/JL						x
A6a	Clear areas of dense HY to protect ground flora						x
A6b	Remove old fence wire		x				
A7a	Clear areas of dense HY to protect ground flora						x
A7b							
A8-10	Group fell young BE and restock gaps with POK/SP						x
	Protect restock areas with fenced exclosures						x
	Eradicate rhododendron						x
	Protect Scheduled Monuments (Beacon, Engine Vein)	x	x	x	x	x	x
A11a	Eradicate rhododendron						x
	Resurvey for broad leaved helleborine				x		
A11b	Remove rhododendron from around ponds						x
	Survey pond fauna						x
	Fell young BE opposite Beacon Lodge and restock with NBL						x
	50% thin P1960 SP						x
	Eradicate Japanese knotweed		x				
A11c	Protect Scheduled Monument (Wood Mine)	x	x	x	x	x	x
A11d	Thin out squirrel damaged BE and restock with NBL						x
	Eradicate rhododendron				x	x	x
A12	Eradicate rhododendron				x	x	x
	Thin Scots pine						x
A13							
A14	Eradicate rhododendron						x
	Survey pond fauna					x	
A15							

7 Monitoring

Management objective / activity	Indicator of progress / success	Method of assessment	Frequency	Notes
Control invasive non native plants and animals	Reduction/elimination (rhododendron, Japanese Knotweed etc), reduction in bark damage	Ground survey	Annual	Results of ground survey will guide work programme
Maintain biodiversity	Stable or increasing populations of priority species, volumes of dead wood	Various surveys, breeding birds, bats, fungi.	As required	See detailed prescriptions and work plan for more detail
Maintain path network and estate infrastructure	Reduction of erosion/compaction	Ground survey	As required	Regular survey will enable early intervention
Tree Safety		Tree Safety Inspection	As required	
Extent woodland cover	Desired stocking levels achieved	Ground survey	Years 1-5 following establishment	

8 Stakeholder Engagement

Individual/ Organisation	Date Contacted	Date feedback received	Response	Action
National Trust regional archaeological advisor	February 2016	February 2016	All information included in plan	See management plan
National Trust Regional ecological advisor	February 2016	February 2016	All information included in plan	See management plan
National Trust regional woodland advisor	February 2016	February 2016	All information included in plan	See management plan

Bibliography/References

Callaghan D. 2015. Bryophyte Survey and Assessment of Alderley Edge, Cheshire. Report to Natural England.

Clement, Scruby and Lutley 1985 Biological Survey of Alderley Edge. National Trust internal report

Eaton M et al. 2015. Birds of Conservation Concern 4. Available from https://www.rspb.org.uk/Images/birdsofconservationconcern4_tcm9-410743.pdf

Forestry Commission. 2011. UK Forest Standard. Available from http://www.forestry.gov.uk/pdf/FCFC001.pdf/$FILE/FCFC001.pdf

Forestry Commission. 2005. Woodland Management for Bats. Available from http://www.forestry.gov.uk/pdf/woodland-management-for-bats.pdf/$FILE/woodland-management-for-bats.pdf

Forestry Commission. 2011.Forestry and Water Guidelines. Available from http://www.forestry.gov.uk/pdf/FCGL007.pdf/$FILE/FCGL007.pdf

Heritage England. 2008. Climate Change and the Historic Environment. Available from http://www.historicengland.org.uk/images-books/publications/climate-change-and-the-historic-environment/

Jackson PK and Alexander KNA. 1997. Biological Evaluation Alderley Edge Cheshire. National Trust internal report

Jenkins T, Gilbert J, Mackie E and Matthews R. 2012. Tree Species-A document listing the tree species included in the 2011 Production Forecast. Forestry Commission.

Marzano M and Dandy N. 2012. Recreational use of Forests and disturbance to wildlife- A literature review. Forestry Commission FCRP 020. Available from http://www.forestry.gov.uk/pdf/FCRP020.pdf/$FILE/FCRP020.pdf

Matthews R W and Mackie E D. 2006. Forest Mensuration-A handbook for practitioners. Forestry Commission. Edinburgh

Mayle B, Ferryman M and Pepper H.2007. Controlling Grey Squirrel Damage to Woodlands. FC Practice note 4. Available from http://www.forestry.gov.uk/pdf/fcpn004.pdf/$FILE/fcpn004.pdf

Natural England. 2014. Climate Change Adaptation Manual. Available from http://publications.naturalengland.org.uk/publication/5629923804839936

Plantlife Annual knawel factsheet. Available from http://www.plantlife.org.uk/uploads/documents/Brief%20sheet%20-%20Annual%20knawel%20Scleranthus%20annuus%20briefing%20sheet.pdf

Prag ed. 2016. The Story of Alderley;Living with the Edge. Manchester Museum

Stroh P A et al. 2014. A Vascular Plant Red List for England. Botanical Society of the British Isles. Available from http://www.bsbi.org.uk/England_Red_List_1.pdf

Symes, N and Currie, F. 2007. Woodland Management for Birds; a guide to managing declining woodland birds in England. RSPB/Forestry Commission

UK Woodland Assurance Standard 2013 United Kingdom Woodland Assurance Standard 3.1. Available from http://ukwas.org.uk/wp-content/uploads/2012/05/UKWAS-Third-Edition-version-3.1-20122.pdf