



Loughborough University
**Burleigh Wood, Holywell Wood
& Associated Woodland
Management Plan 2018-2023**

September 2018



Cover photographs:
(Large) – Dense bracken beneath old coppice oak (Burleigh Wood)
(Small) – Old wind thrown field maple (Burleigh Wood)

Right:
Old crab apple (Holywell Wood - Forest School area)



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1.0 INTRODUCTION

Background

- 1.1 Loughborough University is committed to ensuring that its actions are sustainable and socially responsible¹, and this commitment extends to management of the 175ha estate at the Loughborough campus; one of the largest single-site campuses in the country².
- 1.2 Burleigh Wood (8.5ha) and Holywell Wood (6.7ha) form a key component of the estate. Both are listed on the Ancient Woodland^A Inventory³ and both are designated as Local Wildlife Sites^B.
- 1.3 As part of its sustainability commitment the University has produced a Loughborough University Biodiversity Action Plan (LUBAP)⁴ which has the objective to evaluate the status of habitats and species on the main campus and to identify objectives for maintaining and enhancing biodiversity. The University is in the process of developing a Science and Enterprise Park (SEP), and to ensure that biodiversity is fully integrated into the evolving SEP an Ecological Management Plan⁵ has been produced for the SEP.
- 1.4 The original (2009) version of the LUBAP identified the need for a Woodland Management Plan for Burleigh Wood and Holywell Wood and this was produced in 2013 as a 5-year plan covering the period 2013/14 – 2017⁶. As the plan has now come to the end of its term, Loughborough University have commissioned FPCR Environment and Design Ltd. to review and update the plan to cover the period 2018 – 2023.
- 1.5 Burleigh Wood and Holywell Wood are linked by a young, linear broadleaved plantation known as Horseshoe Wood. The previous management plan highlighted the need for Horseshoe Wood to be surveyed so that its long-term management could be considered; this revised plan has therefore included this block of woodland.
- 1.6 A new area of broadleaved plantation has been created along the northern boundary of Burleigh Wood, and this forms a continuous wooded link to a further area of older, but still relatively young, plantation, located to the north of the University observatory. Whilst very different in their structure, composition and age to the two blocks of ancient woodland, these are important areas of complementary habitat and their management has therefore been included in this revised plan. The plantation to the north of the observatory is known as the Carbon Offset Woodland, and the plantation adjacent to Burleigh Wood is hereafter referred to as 'Burleigh Wood Extension'. Their location in the wider landscape is shown on Figure 1, and in closer detail on Figure 2.

Review Methodology

- 1.7 The review has involved the following actions.

Site Survey

^A Ancient semi-natural woodland is formed by land which has been continuously wooded since pre-1600 and where the woody component (e.g. the canopy and understorey) is formed by species native to the site and which have arisen by natural regeneration or re-growth following coppice management.

^B Local Wildlife Sites are a non-statutory ecological designation, sitting below Site of Special Scientific Interest (SSSI) in the hierarchy of nature conservation designations in England. Like SSSI's they are designated on the basis of scientific criteria, but unlike SSSI's which have a set of nationally applied criteria, most counties have their own individual selection criteria. Unlike the SSSI system which has the objective to capture a representative sample of qualifying sites within the SSSI network, LWS systems aim to capture all habitats and species which meet the criteria; consequently, sites within a county LWS system may be of sufficient biodiversity interest to also qualify for SSSI status.

- 1.8 The woodlands were surveyed on 8th June 2018 by N Law (Principal Ecologist). This involved a thorough walkover survey to record the species composition of the various woodland layers (canopy, understorey and ground (or field) layer). Additional notes were also made for features of interest. This was followed up by a second survey on 20th July 2018 to map the paths and rides using a handheld Global Positioning System (GPS) which has a 3m accuracy under a woodland canopy.

Consultation

- 1.9 A site meeting was undertaken with the University arborists on 20th July to discuss the previous management plan, review work undertaken during the plan period and consider future management. This involved a walkover of the woodland with the arborists. Dr Jonathan Millet was also consulted regarding woodland management in Holywell Wood where the University Geography and Environment Department undertake long-term monitoring research. Jo Shields (Sustainability Manager–Campus Services) managed the contract to review the Management Plan and provided background information (previous version of the Management Plan, copies of ecological surveys and data, etc.) and answered all other general queries.

Review of relevant documents

- 1.10 The following documents and reports have been reviewed:
- Burleigh and Holywell Woodland Management Plan (2013)⁶;
 - Loughborough University Biodiversity Action Plan (2015)⁴;
 - Loughborough University Science and Enterprise Park Ecological Management Plan (2015)⁵;
 - Invertebrate Survey of Loughborough University Campus (2016)⁷;
 - Loughborough University Bat Survey (2012)⁸;
 - Loughborough University Pond Diversity (undated)⁹;
 - Loughborough University Badger Survey (2014)¹⁰;
 - Loughborough University Water Vole Survey (2017)¹¹;
 - Loughborough University Hedgehog Survey (2014)¹²; and
 - Correspondence (email) - Loughborough University Pond Biodiversity regarding bird box checks (2016 & 2017)

2.0 REVIEW OF MANAGEMENT & MANAGEMENT PLAN 2009-15

Review

- 2.1 The previous plan contained two sets of objectives:
- Primary in order of priority within 10 years; and
 - Secondary in order of priority within 5 years.
- 2.2 These are reviewed via Tables 1 and 2 below:

Table 1: Review of Primary Objectives 2013-17

Objectives		Achievement/Comments
1	To fulfil any legal obligations within the period of the plan	The plan did not specifically define any relevant legal obligations. Key ecological legislation that management should be aware of is: <ul style="list-style-type: none"> The Conservation of Habitats and Species Regulations 2017¹³ The Wildlife and Countryside Act 1981 (as amended)¹⁴ The Natural Environment and Rural Communities Act 2006¹⁵ The Protection of Badgers Act 1992 (as amended)¹⁶
2	To establish non-intervention areas in both woods but with a higher proportion in Holywell Wood to maintain the “wilder” habitat with a naturally developed understorey.	Significant areas within Burleigh and Holywell woods have been managed as non-intervention areas but these areas have not been specifically mapped.
3	Develop, restore and maintain a system of rides, and glades to provide habitat for herbs, grasses and a rich diversity for invertebrates	The main ride in Holywell Wood has been maintained by rotational cutting and is currently open and with good structure. Whilst Burleigh Wood and Holywell Wood are not small woods, they are probably too small to accommodate an extensive network of rides and glades. Holywell Wood has a relatively long, wide ride and Burleigh Wood is of sufficient size to accommodate a similar sized ride located centrally within the wood, but without very regular mowing this ride would tend to be dominated by bracken <i>Pteridium aquilinum</i> .
4	Reinstate and maintain the system of ditches and banks on site and the adjacent Burleigh Brook	No specific management undertaken and most likely none needed as the ditch network appears to be intact.
5	To conserve a predominantly high forest woodland with areas of coppice and clearings	A mainly non-intervention approach across a significant part of the woodlands has helped to conserve the high forest canopy. Some low-scale coppice cutting has occurred i.e., just sufficient to generate hazel poles needed for fence and other management. The locations for this work appear to be ad-hoc, but this approach adds to the overall structural diversity.
6	Maintain the colony of badgers living in Burleigh and Holywell Wood and its environs	The legislation afforded to badgers <i>Meles meles</i> is such that compliance has ensured that the badger population has not been subjected to any actions which would threaten the population. Future management will need to continue to be compliant.
7	Improve transitional habitat through native species planting	There has been no apparent planting in Burleigh and Holywell Wood, but the new plantation on the northern edge of Burleigh Wood provides an excellent extended margin to the wood. With careful future management this feature could be enhanced to create a high-quality woodland edge to Burleigh Wood; how this might be achieved is illustrated in Appendix B.
8	Enhancement of Horseshoe Wood by thinning of oak saplings	Some thinning has been undertaken at the southern end of Horseshoe Wood where it adjoins Burleigh Wood, but this was mainly removal of regenerating ash <i>Fraxinus excelsior</i> .
9	To schedule bat and bird surveys every 5 years	Some monitoring of the bird boxes was undertaken during 2016 and 2017 but no bat surveys appear to have been undertaken.

Table 2: Review of Secondary Objectives 2013-17

Objectives		Achievement/Comments
1	Develop and control pedestrian access in Burleigh Wood and discourage public access into Holywell Wood	Much work has been done in Burleigh Wood to achieve this objective with new boundary fencing and, in several areas, evidence of where woven hazel <i>Corylus avellana</i> fences have been created on the boundary where unofficial access paths were being created by the general public. This has been less of an issue in Holywell Wood, but there has been at least one instance where measures have had to be taken on the boundary to prevent continued development of an unauthorised path.
2	Continue to control invasive species such as sycamore	The update surveys undertaken as part of the Management Plan review recorded a very low level of sycamore in the various woodland layers, which reflects the ongoing effort to ‘weed’ out this species. A small number of Indian balsam <i>Impatiens glandulifera</i> plants were noted close to Burleigh Brook at the northern end of Holywell Wood, but it is understood that annual management to remove this non-native and invasive species has been ongoing.
3	Improve security of boundaries to both woodlands using a mixture of fencing and hedging by planting or laying	See note against Objective 1
4	Establish surveying and monitoring programmes, particularly involving local volunteers and experts and in-house academics	A range of different surveys of varying depth/detail have been undertaken during the plan period. These include the following taxon groups: birds, badger, hedgehog <i>Erinaceus europaeus</i> and invertebrates.
5	Divide Burleigh wood into managed areas to initiate regimes of non-intervention, selective thinning and coppicing	A predominantly non-intervention approach across a significant part of the woodlands has helped to conserve the high forest canopy. Some coppice has taken place but only low-scale, just sufficient to generate hazel poles needed for fence and other management.
6	Install additional bird and bat boxes	A programme of installation and maintenance of boxes has continued during the plan period with approximately 15 boxes in Burleigh Wood and 4 in Holywell Wood.
7	Consider bracken control in Burleigh Wood	No specific management to control bracken has been undertaken. This may not be necessary as part of future management as bracken is an important element of the woodland type present within Burleigh Wood, where bracken is abundant.
8	Resurvey badger population	A survey of the wider campus for badger was undertaken in 2014 and included the woodland.
9	Retain deadwood	Where health and safety issues allow, all deadwood is retained.

Discussion

Mapping

2.3 Maps (or plans) are an important aspect of management planning, particularly for woodlands as often the woodland is large and management is done on a compartment basis, and individual compartments often cover a large area. However, this is also important in smaller woods. Being able to visually locate where woodland paths and rides and associated infrastructure are, and where there are sensitive ecological features, saves time and assists greatly with delivering management objectives.

2.4 The previous management plan only provided a Phase 1 habitat map of the woodland and surrounding area, and was dated 2010. This is now out-of-date as the adjoining land use has changed. This revision of the plan has included several maps and it is recommended that this series should be expanded when this version of the plan is updated in 2022/23.

Location Plan (Figure 1)

2.5 Whilst most people with an interest in the woodlands and Woodland Management Plan will know the general location of the woods, occasionally others will need a more general location plan.

Woodlands & Designation Plan (Figure 2)

2.6 This shows the location of the woods in relation to one another, the broad woodland type and any nature conservation designations.

Features Plan (Figure 3)

2.7 The purpose of this plan is to show the location of features of ecological or management interest; for example, rare and/or uncommon plants, invasive plants, veteran trees or other trees of interest, waterbodies etc.

Access & Infrastructure Plan (Figure 4)

2.8 A plan showing the location of the woodland paths, access points, and associated infrastructure like boardwalks and interpretation signs.

Woodland Management Recording Plan (Figure 5)

2.9 It is important that management activity is captured within some form of recording process. The best way to achieve this is to have a relatively simple system which does not place an unnecessary burden on those charged with delivering management. This plan provides a very simple but effective method of logging all management activities. This can be printed off as 'field sheet' and used by anybody undertaking management within the woodlands to record all tasks. Completed sheets can then be returned to the office to be collated.

2.10 It is possible that additional plans may be required in the future, particularly if the Features Plan becomes too crowded as it is developed further. One notable omission on the plans produced for this review are the locations of the long-term research plots which Dr Jonathan Millet and his team are using for their research into the carbon forest cycle^c.

Recording

2.11 As discussed above, reporting is an important aspect of management planning and during the review process there was no evidence of any formal process to log management work. Consequently, the simple procedure outlined above has been included in this revision.

Long-term vision

2.12 The natural dynamic processes which shape semi-natural woodlands are long-term and as such, in the absence of human intervention, woodland changes relatively slowly. It is therefore important to have a long-term vision for woodland. The previous plan had a main aim as a backdrop to the plan objectives:

“The main aim is to conserve and enhance the nature conservation interest of the woods through sensitive management whilst promoting controlled public access to Burleigh Wood and restricted access to Holywell Wood”.

2.13 But this doesn't give a particularly clear picture of what the woodland state should be at a fixed point in the future. This updated plan has therefore attempted to provide a clearer long-term vision for the woodland based on the objectives within the previous plan and on-site discussions with the University arborists.

Plan Format

2.14 The previous plan format took account of the Forestry Commission recommended format for Woodland Management Plans, as required for the Woodland Grant Scheme (WGS). This revision has continued to be guided by the Forestry Commission format. Should funding be sought via the Forestry Commission grant schemes at some point in the future, there would be a requirement for a Woodland Management Plan and for this to be in a format similar to the WGS plan format.

3.0 VISION & OBJECTIVES

Long-term Vision

To maximise the biodiversity value of all the woodlands, with controlled public access to protect this over-arching objective.

Burleigh Wood and Holywell Wood continue to be maintained as Ancient Semi-Natural Woodland (ASNW) with a balanced woodland structure formed by: a continuous canopy cover, well-defined understorey and field layers, retained trees of interest, an extensive and diverse deadwood resource, a network of woodland paths (and woodland ride in Holywell Wood). The woodland is free of non-native and potentially invasive plants.

The adjoining young plantations continue to provide complementary habitat for the ASNW. Horseshoe Wood is maintained as an important habitat link between the two blocks of ASNW. Management of Burleigh Wood Extension has created a structure so that this young woodland provides a high biodiversity value woodland edge to Burleigh Wood.

Local residents continue to enjoy walking through Burleigh Wood and the adjoining young plantations and Holywell Wood continues to provide a focus for long-term research, particularly in relation to the forest carbon cycle.

^c The Geography and Environment Department have eight permanent research plots in Holywell Wood where air temperature, humidity, photosynthetically active radiation, soil temperature, soil respiration, litter fall and soil respiration are monitored, as part of long-term monitoring to research the dynamics of UK forests. <http://www.lboro.ac.uk/departments/geography/resources-facilities/research-forest/>

Objectives

- 3.1 To achieve the long-term vision the following management objectives (see Table 3 below) are considered necessary.

Table 3: Management Objectives

No.	Objective
1	To maintain and enhance the current biodiversity value of the woodland.
2	To maintain and develop Holywell Wood as a research and teaching resource with minimal or no adverse impact.
3	To continue to encourage usage of Burleigh Wood and its adjacent plantations (Burleigh Wood Extension and the Carbon Offset Woodland) as a recreational resource for local residents and University students and staff. Maintain restricted access in Holywell Wood.
4	To fulfil all legal obligations during management of the woodland and ensure that management is in accordance with UK Forestry Standards guidelines.
5	To monitor and record woodland management to assess the effectiveness of management against objectives, and to enable rapid response to unexpected outcomes arising from management.

4.0 WOODLAND SURVEY

Location

- 4.1 The woodland is located on the south-western edge of Loughborough, Leicestershire (see Figure 1).

Extent

- 4.2 The woodland sizes and designations are shown in Table 4 below.

Table 4: Extent of woodland & designations

Woodland	Size	Ancient Semi-Natural Woodland	Designated Local Wildlife Site	Tree Preservation Order
Burleigh Wood	8.5ha	8.5ha	8.5ha	None
Burleigh Wood Extension	1.2ha	-	-	None
Horseshoe Wood	1.3ha	-	-	None
Holywell Wood	6.6ha	6.6ha	6.6ha	None
Carbon Offset Woodland	0.9ha	-	-	None
TOTAL	18.5ha	15.1ha	15.1ha	0.0ha

Description

Burleigh Wood

Composition and structure

- 4.3 The canopy is formed by pedunculate oak *Quercus robur*, which are frequently multi-stemmed, and silver birch *Betula pendula* with ash relatively frequent. In many areas a well-developed understorey is present, formed by various species but with hazel, hawthorn *Crataegus monogyna*, holly *Ilex aquifolium* and elder *Sambucus nigra* the principal components. In some areas the understorey is absent, and the woodland is very open.
- 4.4 In spring, bluebell *Hyacinthoides non-scripta* dominates the field layer through most of the wood, but is then replaced in summer by bracken *Pteridium aquilinum*. Bramble *Rubus fruticosus* agg. is present in varying abundance, and ferns (mainly male-fern *Dryopteris filix-mas*) are ever present. The path edges and woodland edge support a slightly more diverse flora. Approaching Horseshoe Wood there is a slight transition to more of an ash type of woodland.
- 4.5 There is a reasonable deadwood resource present including standing deadwood, decaying fallen trees, and brash.

Type

- 4.6 The composition of the different woodland layers is highly indicative of the National Vegetation Classification (NVC)^D W10 Pedunculate Oak-Bracken-Bramble woodland¹⁷.

Additional features

- 4.7 Two small ponds in the north-eastern corner, and a small brook which forms the western boundary, provide additional diversity. The stream issues close to the wood and is therefore relatively small in stature but has good structure with sections flowing over exposed bedrock and with small woody debris dams present. Like many waterbodies during the exceptionally dry summer of 2018, the ponds were dry during the survey. The most easterly of the two is heavily shaded but does have a stand of yellow iris *Iris pseudacorus* on its western edge. West of this, the second pond has a more diverse marginal/emergent vegetation with frequent branched bur-reed *Sparganium erectum* and small amounts of other species like gypsywort *Lycopus europaeus* and soft-rush *Juncus effusus*. Other aquatic plants noted included water-starwort *Callitriche* sp. and common duckweed *Lemna minor*.
- 4.8 Whilst the multi-stemmed canopy trees are clearly very old, there are other trees of interest present. Close to the northern boundary there are a couple of old crab apple *Malus sylvestris* with good deadwood features. In the north-east section of the wood there is an old wind-thrown field maple *Acer campestre* which has regenerated by throwing up new stems along the length of the now horizontal trunk.

^D The NVC is a vegetation classification system based on plant species composition and frequency within a sampled stand of vegetation. The system has been produced following detailed studies of the vascular plant, bryophyte (mosses and liverworts) and lichen species which occur within distinct vegetation types. The system covers nearly all natural, semi-natural and some major artificial vegetation communities and is documented over 5 volumes of British Plant Communities with Volume 3 covering grassland and montane communities. There are 268 community types spread across 12 major types of habitat. Many of these community types are then divided further into 'sub-communities', of which there are 578, with some broken down even further into a third level known as 'variants' [JNCC. (2008). UK Habitat Classification – NVC types and their names. [online]. Available at: <http://jncc.defra.gov.uk/page-4264> [Accessed 22/09/2018]

History

- 4.9 A feature of the wood is that most of the mature oak are formed by multiple large stems, which have resulted from coppice re-growth following clear-fell, most likely during the War years. In more recent times it appears that the previous owner (British Gas) undertook hazel coppice work for conservation objectives.
- 4.10 The University has been responsible for management since 2003 and this management has predominantly involved access management with small amounts of localised hazel coppice, normally associated with the need to generate material for 'dead hedging' or 'hazel weaving' to block off unauthorised access points.

Access & Usage

- 4.11 The wood is used frequently by local residents, with the circular path and central cross path providing two circular walks, one approximately 0.75km and the other just over 1km. A series of boardwalks and footbridges cross small ditches and damp areas.

Burleigh Wood ExtensionComposition and structure

- 4.12 This is a mixed broadleaved plantation less than five years old. The species planted include: silver birch, rowan *Sorbus aucuparia*, wild cherry *Prunus avium*, pedunculate oak, hazel, dog-rose *Rosa canina* agg., hawthorn, and self-set willow *Salix* spp. and butterfly-bush *Buddleja davidii*. The field layer is formed by species-poor false oat-grass *Arrhenatherum elatius* grassland. A new hedgerow with a fence separates the plantation from the adjacent sports pitches.

Access & Usage

- 4.13 The plantation is served by a main path along the northern edge and a short cross-path leading into Burleigh Wood.

Carbon Offset WoodlandComposition and structure

- 4.14 This is also relatively young mixed broadleaved plantation but older than the Burleigh Wood Extension. Planted species include: wild cherry, rowan, hazel, hawthorn, field maple, apple *Malus* sp., sweet chestnut *Castanea sativa*, Japanese rose *Rosa rugosa*., guelder-rose *Viburnum opulus*, pedunculate oak, elder, butterfly-bush, gorse *Ulex europaeus*, elder, walnut *Juglans regia* and red oak *Quercus rubra*. The field layer is formed by species-poor false oat-grass grassland.

Additional features

- 4.15 There are several large old tree trunks placed amongst the trees, presumably to provide deadwood habitat within this young woodland. Also, there has been some localised coppice management with habitat piles created from the arisings.

Access & Usage

- 4.16 The plantation is served by numerous paths which at the northern end link into Burleigh Wood. These appear to be well-used by local people.

Horseshoe WoodComposition and structure

- 4.17 This plantation woodland is much older than Burleigh Wood Extension and the Carbon Offset Woodland and is formed by two blocks, divided by one of two access tracks to Holywell Farm, the second one separates the plantation from Holywell Wood. The canopy species composition is less diverse than the younger plantations and is formed by abundant pedunculate oak with locally frequent apple, occasional ash and holly with a small number of horse-chestnut *Aesculus hippocastanum*. Due to its young age, there is no clearly defined understorey but blackthorn *Prunus spinosa* is locally frequent and elder occasional. The ground flora is typical of early plantation woodland at this stage of development, with frequent to locally abundant/dominant wood avens *Geum urbanum*, a few other locally frequent species like Yorkshire-fog *Holcus lanatus* and common nettle *Urtica dioica* and then a small number of species which are just occasional or rare.
- 4.18 The northern block has a ground flora where grass species are more prominent, with an abundance of rough meadow-grass *Poa trivialis*, cow parsley *Anthriscus sylvestris* and wood avens, and closer to Holywell Wood there are a few young silver birch otherwise the area is an open sward dominated by Yorkshire-fog, rough meadow-grass with frequent false oat-grass and meadow foxtail *Alopecurus pratensis*.

Holywell WoodComposition and structure

- 4.19 This ancient woodland has a canopy formed mainly by ash and pedunculate oak, with minor contributions from birch, alder *Alnus glutinosa* and elm *Ulmus* agg. The understorey is well-formed with hazel and hawthorn the principal species, but elm can be locally frequent. A good range of other shrub species contribute to this somewhat diverse layer, which in some localised areas forms a sub-canopy.
- 4.20 The field layer is relatively diverse with many Ancient Woodland Indicator species present, such as: dog's-mercury *Mercurialis perennis*, wood anemone *Anemone nemorosa* and with a single stand of herb Paris *Paris quadrifolia* of particular note. As is often the case, the abundance and frequency of individual species varies throughout the wood. Damper areas are marked by the presence of plants like pendulous sedge *Carex pendula* and enchanter's nightshade *Circaea lutetiana*. Several paths cross the wood and a single long and wide ride runs north-south.

Type

- 4.21 Overall, most of the woodland has a composition indicative of the NVC woodland type W8 ash - field maple - dog's-mercury woodland. This is a woodland type which has a very varied composition and often there are transitions to other woodland types¹⁷. This is the case in Holywell Wood with localised areas where alder is present in the canopy and the field layer composition includes plants of damper soils such as meadowsweet *Filipendula ulmaria* and tufted hair-grass *Deschampsia cespitosa* representing small localised transitions to alder woodland types. Elsewhere, where dog's mercury becomes scarce and bramble and ferns are more prominent, there is some resemblance to W10 woodland, but bracken which is such an important and prominent constant species of W10 is absent here.

Additional features

4.22 The wood contains a series of woodland ditches which add to the overall structure. Like Burleigh Wood, many of the canopy trees are multi-stemmed, reflecting past clear-fell management.

Access & Usage

4.23 The woodland is not open for public usage but a Forest School operates on a regular basis during school term-time in the northern section of the wood. Eight permanent monitoring plots form the focus for a long-term study into the woodland carbon cycle. A 0.8km circular path with numerous small footbridges and boardwalks, provides access to the Forest School area, the monitoring plots and low-level recreational access for University students and staff.

Species Information

4.24 The previous version of the Management Plan provided some detail of the species which have been recorded within Burleigh Wood and Holywell Wood, with some of this information extracted from previous management plans when the woodland was owned by British Gas. For clarity and to maintain a focus on where up-to-date species information is lacking, this information is not reproduced in this updated plan and the previous plan⁶ should be used as reference source for this historic data.

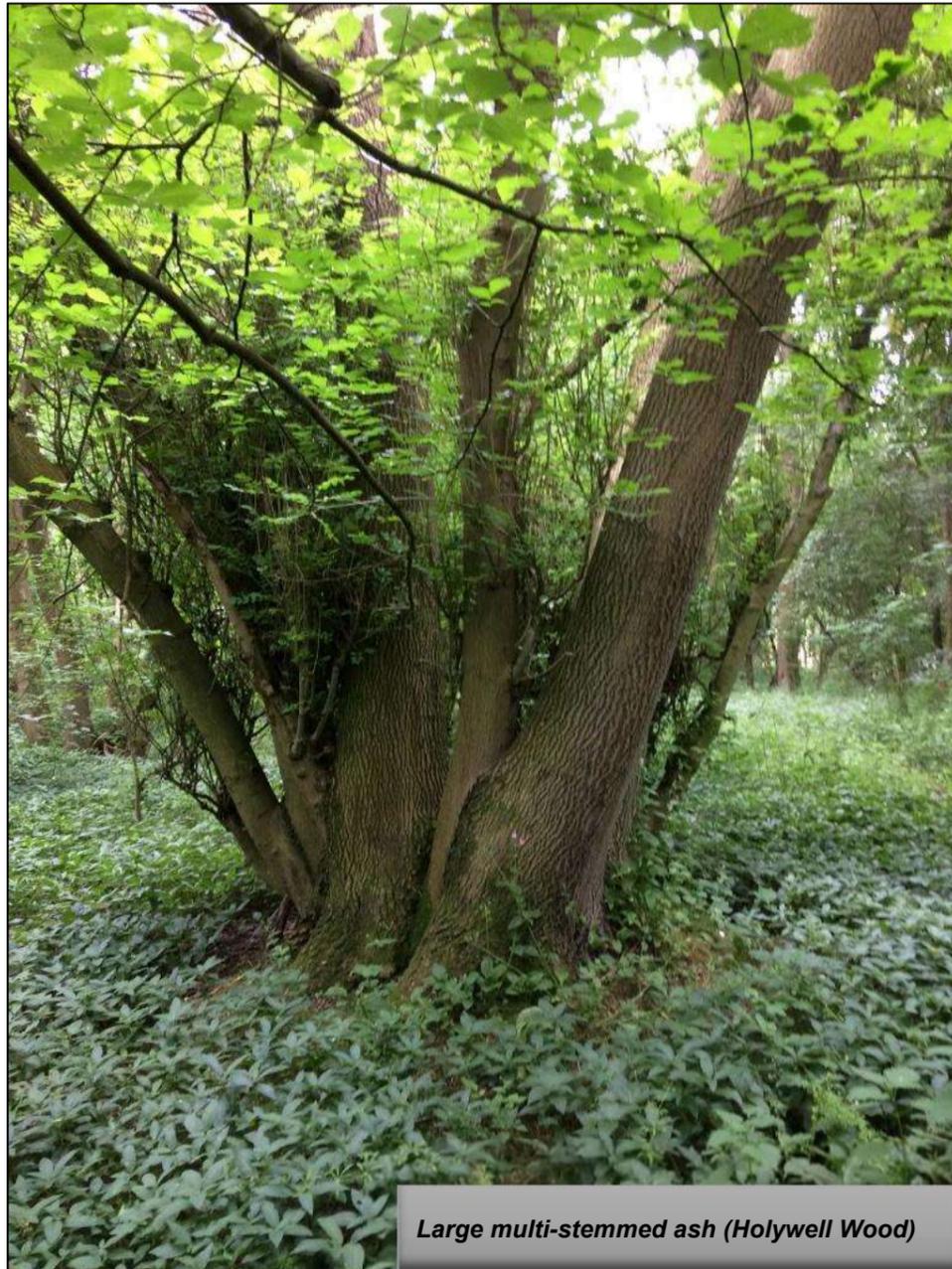
4.25 Table 5 below reviews and summarises the more recent survey data which has been made available for the management plan update.

Table 5: Species information

Taxon	Surveys	Notes
European Protected Species		
Bats	No surveys of bat activity within the woodland during the previous plan period.	Historic surveys (pre-2012) recorded the following species within Burleigh Wood: <i>Plecotus auritus</i> Brown Long-eared Bat <i>Pipistrellus pipistrellus</i> Common Pipistrelle <i>Nyctalus leisleri</i> Leisler's Bat <i>Myotis nattereri</i> Natterer's Bat <i>Pipistrellus pygmaeus</i> Soprano Pipistrelle And within Holywell Wood: <i>Plecotus auritus</i> Brown Long-eared Bat <i>Pipistrellus pipistrellus</i> Common Pipistrelle <i>Myotis nattereri</i> Natterer's Bat <i>Pipistrellus pygmaeus</i> Soprano Pipistrelle
Great Crested Newt <i>Triturus cristatus</i>	No surveys of the ponds in Burleigh Wood during the previous plan period.	No historic records for this species in these ponds. The previous plan had an objective for an amphibian survey of the Burleigh Wood ponds in spring 2017, but this does not appear to have taken place.
Protected Species (UK Legislation)		
Badger	Survey undertaken in 2014 and recorded continued maintenance of previously recorded populations in Burleigh Wood and Holywell Wood.	Survey for woodland management plan update noted incidental evidence of continued activity in both woods and Horseshoe Wood.

Taxon	Surveys	Notes
General (including Species of Principal Importance)		
Birds	Informal checking of bird boxes in Burleigh and Holywell Wood during previous plan period. No complete species lists.	There does not appear to have been any specific breeding bird survey undertaken using a standardised survey methodology.
Hedgehog	Specific survey for hedgehog (a Species of Principal Importance) was undertaken on the University Campus in 2014. The survey area did not include the woodlands.	
Invertebrates	An invertebrate survey of the University Campus was undertaken in 2016. This included sampling in Burleigh Wood and Holywell Wood.	Sampling was limited in the woodland but the survey concluded that Burleigh Wood and Holywell Wood were of value for their invertebrate assemblages, particularly for saproxylic ^E species. Several priority and uncommon species were recorded: <u>Burleigh Wood</u> <i>Limonia masoni</i> (a cranefly) <i>Gyrophana pulchella</i> (a rove beetle) <i>Platypalpus aurantiacus</i> (a fly) <i>Oedalea apicalis</i> (a fly) <i>Gyrophana manca</i> (a beetle) <i>Anobium inexpectatum</i> (a beetle) <i>Atypophthalmus inustus</i> (a cranefly) <u>Holywell Wood</u> <i>Limonia masoni</i> (a cranefly) <i>Amiota basdeni</i> (a fruit fly) <i>Acartophthalmus bicolor</i> (a fly) <i>Stegana nigrithorax</i> (a fruit fly) <i>Platypalpus aurantiacus</i> (a fly) <i>Atypophthalmus inustus</i> (a cranefly) <i>Sphegina verecunda</i> (a hoverfly)
Vascular Plants	The 2018 survey for the update of the management plan involved collection of a comprehensive plant list for each woodland. Ad-hoc records appear to have been made during the previous plan period.	The 2018 survey included records for a previously un-recorded population of herb Paris <i>Paris quadrifolia</i> in Holywell Wood. Whilst not listed as a County Rare plant ¹⁸ , this is an uncommon plant in Leicestershire. Herb Paris is reported to have been recorded in Burleigh Wood during the previous plan period, but the precise location is unknown.
Bryophytes	The 2018 survey for the update of the management plan included some recording of bryophytes.	Unlike the vascular plants, the records from the 2018 survey are not complete lists for the woodland, this would require a specific survey undertaken during the period late autumn to early spring.
Fungi	There does not appear to have been any specific fungi survey since December 1990	

^E Saproxylic invertebrates are dependent on dead or decaying wood for at least part of their life cycle, or are species which are dependent on other organisms that are themselves dependent on dead wood. (Amateur Entomologists' Society - <https://www.amentsoc.org/insects/glossary/terms/saproxylic>)



Large multi-stemmed ash (Holywell Wood)

Management Structure and Responsibilities

- 4.26 Management of the woodlands is the responsibility of the Gardens Team, and the Woodland Management Group which is formed by local residents, former University employees, other interested parties and on occasion, members from Charnwood Borough Council. It also provides a forum for the University to communicate openly with key stakeholders about how the University manages the woodlands.
- 4.27 Day-to-day implementation of management is usually undertaken by the University arborists who form part of the University Gardens Team in Campus Services. This normally involves a number of ‘volunteer’ days when students spend a day (or part of a day) undertaking tasks like coppicing.
- 4.28 There is a University budget allocation (undisclosed sum) for management of the woodland.

5.0 POTENTIAL THREATS AND CONSTRAINTS TO ACHIEVING OBJECTIVES

5.1 This section considers potential threats and constraints to achieving the management objectives and the long-term vision for the woodlands.

Table 6: Potential threats and constraints to achieving objectives

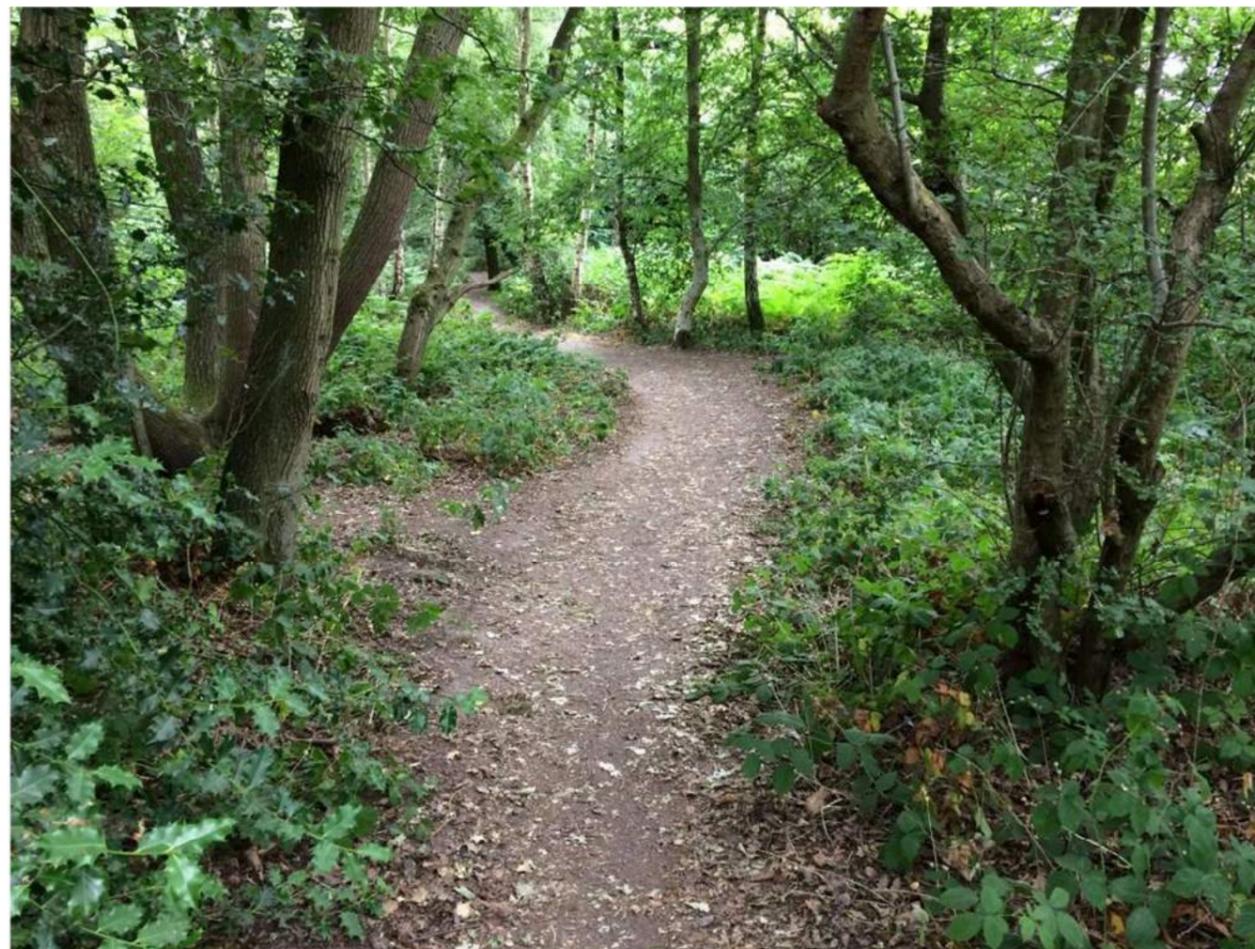
Threat	Comments
<p>Plant Health:</p> <ul style="list-style-type: none"> i) Ash Dieback due to <i>Hymenoscyphus fraxineus</i> fungus ii) Oak decline (multiple potential causes) iii) <i>Phytophthora ramorum</i> – cause of Sudden Oak Death 	<p>i) The arborists have noted some ash dieback in the northern part of Holywell Wood but this doesn't seem to be developing throughout the wood.</p> <p><u>Recommendation:</u> Continue to monitor and follow current Forestry Commission guidance¹⁹</p> <p>ii) The arborists have noted potential oak decline in Burleigh Wood. There are multiple potential causes of oak decline and identifying the type (Acute Oak Decline, or Chronic Oak Decline)²⁰ and the cause is important to inform subsequent management.</p> <p><u>Recommendation:</u> Arborists to survey and monitor and follow current Forestry Commission guidance regarding management of oak decline and best practice if felling of diseased trees is the most appropriate option.</p> <p>iii) (see Non-native invasive plants below).</p>
<p>Deer:</p> <p>There is evidence of muntjac <i>Muntiacus reevesi</i> within the woodland.</p>	<p>Muntjac can have a damaging effect on woodland flora where population levels are high; they graze woodland herbs and coppice re-growth. Control at individual woodland level is not feasible, requires a widespread population level management approach.</p> <p><u>Recommendation:</u> Protect any coppice re-growth by piling coppice arisings over the cut stump to project new shoots which will work their way through the brash.</p>
<p>Non-native invasive plants:</p> <ul style="list-style-type: none"> i) Sycamore – present in small amounts in the field and shrub layers. ii) Rhododendron <i>Rhododendron ponticum</i>. The arborists have reported a very small amount of rhododendron in Holywell Wood. Listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). iii) Indian balsam <i>Impatiens glandulifera</i> – small amounts present in the northern part of Holywell Wood. Also, listed on Schedule 9. 	<p>i) Ongoing management has considerably reduced the level of sycamore in the wood.</p> <p><u>Recommendation:</u> Continue ongoing management to ‘weed’ this species out at the seedling and small shrub stage.</p> <p>ii) Rhododendron can be invasive and is a host plant for <i>Phytophthora ramorum</i> which is a cause of Sudden Oak Death²¹.</p> <p><u>Recommendation:</u> Remove and dispose of any rhododendron plants in accordance with Forestry Commission guidance.</p>
<p>Anti-social behaviour:</p>	<p>The woodlands are free of fly-tipping but repeated attempts are made in Burleigh Wood and Holywell Wood to create new entrance points along the boundaries.</p> <p><u>Recommendation:</u> Continue current management practice of blocking off entrances as they are created.</p>
<p>Development pressure:</p>	<p>Further development of the Science and Enterprise Park has the potential to impact on the ancient woodland by isolating the woods within built development.</p>

6.0 MANAGEMENT STRATEGY

Table 7: Management strategy

Management Objective	Feature	Management Action
1: To maintain and enhance the current biodiversity value of the woodland.	1.1: Woodland Structure 1.1.1: Woodland edge	1.1.1.1: Manage Burleigh Wood Extension on a graduated coppice cycle to create a graded edge to the Ancient Woodland (see Appendix B) 1.1.1.2: Maximise opportunities to create similar extensions adjacent to Holywell Wood and the southern side of Burleigh Wood that might arise from further development of the Science and Enterprise Park. 1.1.1.3: Maximise any opportunities to create a graded edge to the woodland from any tree works required along the woodland edge or health and safety work.
	1.1: Woodland Structure 1.1.2: Age class	1.1.2.1: Support natural regeneration within Burleigh Wood and Holywell Wood by identifying seedling/saplings of the canopy and understorey species and protecting them from deer grazing with tree guards. Undertake as an annual operation, in random locations within the wood. Guard 20 plants/year/wood. Follow up with bracken control if necessary in Burleigh Wood. 1.1.2.2: Continue to undertake low-level, ad-hoc coppicing of hazel within Burleigh and Holywell Wood. Record locations on Management Recoding Plan. Protect coppice re-growth from deer grazing by creating brash piles over cut coppice.
	1.1: Woodland Structure 1.1.3: Rides	1.1.3.1: Continue to manage the main ride in Holywell Wood by rotationally cutting half the ride (lengthwise) each year.
	1.1: Woodland Structure 1.1.4: Deadwood	1.1.4.1: Retain all deadwood in-situ unless plant health reasons require removal and destruction off-site. 1.1.4.2: Maximise opportunities to create standing deadwood during any tree works required for health and safety issues.
	1.1: Woodland Structure 1.1.5: Trees of Interest	1.1.5.1: Continue to identify and map onto the Management Plan Features Map Trees of Interest (e.g. veteran, or near veteran etc.)
	1.2: Species Composition 1.2.1: Non-native species	1.2.1.1: Sycamore – Continue to weed this species out at the seedling and sapling stage. 1.2.1.2: Rhododendron - Locate and destroy any plants in any of the woodland in accordance with Forestry Commission guidance 1.2.1.3: Indian balsam – Continue to annually remove from Burleigh Brook and Holywell Wood by either pulling and composting the entire plant before the seed has set, or removing just the seed heads (ensuring this is done well before the pods are ready to dehisce).
	1.2: Species Composition 1.2.2: New planting	1.2.2.1: Ensure any new planting within or immediately adjacent to the existing woodland only involves native species which reflect the current species composition of the two Ancient Woodlands.
	1.3: Species knowledge 1.3.1: Commission surveys for important woodland species groups	1.3.1.1: Invertebrates (Burleigh Wood & Holywell Wood) 1.3.1.2: Breeding Birds (Burleigh Wood & Holywell Wood) 1.3.1.3: Fungi (Burleigh Wood & Holywell Wood) 1.3.1.4: Amphibian Survey of ponds in Burleigh Wood.
2. To maintain and develop Holywell Wood as a research and teaching resource with negligible or no adverse ecological impact.	1.4: Species Habitats 1.4.1: Bird & bat boxes	1.4.1.1: Continue with ongoing programme of installing, maintaining and monitoring bird and bat boxes in Burleigh Wood and Holywell Wood. Replacement and new boxes to be of a 'wood-crete' type to ensure long-term durability and to minimise predation.
	2.1: Forest School	2.1.1: Encourage continued use of Holywell Wood as a Forest School site 2.1.2: Ensure, through regular monitoring and liaison with Forest School staff, that the current 'footprint' of the Forest School area does not expand further in order to avoid adverse impacts on the ground flora.
3. To continue to encourage usage of Burleigh Wood and its adjacent plantations (Burleigh Wood Extension and the Carbon Offset Woodland) as a recreational resource for local residents and University students and staff. Maintain restricted access to Holywell Wood.	2.2: Long-term research monitoring plots	2.2.1: Accurately map the position of the monitoring plots either onto a revised Access and Infrastructure Plan, or a separate standalone plan within the Management Plan. 2.2.2: Manage the woodland adjacent to the monitoring plots the same as the rest of the woodland (as advised by Dr Millet when consulted about the revised Management Plan) 2.2.3: Undertake liaison with Dr Millet to see if data being gathered can inform future management of Holywell Wood.
	3.1: Boundary management	3.1.1: Continue to regularly monitor woodland boundaries (all woods) and block off unauthorised new entrance points with hazel weaved fencing and deadwood.
	3.2: Access infrastructure & signage	3.2.1: Continue to maintain access infrastructure (gates, fences, footbridges and boardwalks) in a safe condition. 3.2.2: Add any new infrastructure onto the Management Plan 'Access and Infrastructure Plan'. 3.2.3: Maintain existing signage on entrance gates and existing interpretation boards.

Management Objective	Feature	Management Action
4. To fulfil all legal obligations during management of the woodland and ensure that management is in accordance with UK Forestry Standards guidelines.	4.1: Protected Species	4.1.1: Ensure that prior to any work on mature trees, that the trees have been assessed for their potential to support roosting bats. 4.1.2: Aim to undertake all management work involving vegetation removal outside of the nesting bird season (March to August inclusive). Where this is not possible, to ensure that the area of proposed work has been checked by a competent ecologist for the presence of nesting bird activity. 4.1.3. Ensure that any woodland management within 30m of a badger sett complies with current legislation ¹⁶ and guidance ²² .
	4.2: UK Forestry Standard (UKFS) ²³	4.2.1: The UKFS is "...the reference standard for sustainable forest management in the UK...and this...applies to all UK forests and woodlands." ²³ It is therefore important that those responsible for managing the woodlands are aware of the standards. Adoption and implementation of this Management Plan will ensure that the UKFS guidelines are being followed.
5. To monitor and record woodland management to assess the effectiveness of management against objectives, and to enable rapid response to unexpected outcomes arising from management.	5.1: Recording	5.1.1: When any management action has been completed record this on the Management Plan 'Management Recording Plan' (see Figure 5) 5.1.2: Review recorded management at the end of each year to ensure that an accurate record has been kept and to provide a summary report for the Woodland Management Group. 5.1.3: Record any ecological surveys undertaken on the Management Plan 'Management Recording Plan' noting where the full survey results/report is held.
	5.2 Management Plan Review	5.2.1: Undertake a review of the Woodland Management Plan during 2022 with a view to update the plan for the period 2023-2027.



Footpath (Burleigh Wood)



Resting place (Burleigh Wood)

WORK PLAN

Table 8: Work plan

Feature	Management Action	2018		2019				2020				2021				2022				2023	
		Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su
1.1: Woodland Structure 1.1.1: Woodland edge	1.1.1.1: Manage Burleigh Wood Extension to create a graded edge to the Ancient Woodland (see Appendix B)					x	x			x	x			x	x			x	x		
	1.1.1.2: Maximise opportunities to create similar extensions adjacent to Holywell Wood and the southern side of Burleigh Wood that might arise from further development of the Science and Enterprise Park.	Continuous																			
	1.1.1.3: Maximise any opportunities to create a graded edge to the woodland from any tree works required along the woodland edge or health and safety work.	Continuous																			
1.1: Woodland Structure 1.1.2: Age class	1.1.2.1: Support natural regeneration within Burleigh Wood and Holywell Wood by identifying seedling/saplings of the canopy and understorey species and protecting them from deer grazing with tree guards. Undertake as an annual operation, in random locations within the wood. Guard 20 plants/year/wood. Follow up with bracken control if necessary in Burleigh Wood.	x	x			x	x			x	x			x	x			x	x		
	1.1.2.2: Continue to undertake low-level, ad-hoc coppicing of hazel within Burleigh and Holywell Wood. Record locations on Management Recoding Plan. Protect coppice re-growth from deer grazing by creating brush piles over cut coppice.	x	x			x	x			x	x			x	x			x	x		
1.1: Woodland Structure 1.1.3: Rides	1.1.3.1: Continue to manage the main ride in Holywell Wood by rotationally cutting half the ride (lengthwise) each year.	x	x			x	x			x	x			x	x			x	x		
1.1: Woodland Structure 1.1.4: Deadwood	1.1.4.1: Retain all deadwood in-situ unless plant health reasons require removal and destruction off-site.	Continuous																			
	1.1.4.1: Maximise opportunities to create standing deadwood during any tree works required for health and safety issues.	Continuous																			
1.1: Woodland Structure 1.1.5: Trees of Interest	1.1.5.1: Continue to identify and map onto the Management Plan Features Map Trees of Interest (e.g. veteran, or near veteran etc.)	Continuous																			
1.2: Species Composition 1.2.1: Non-native species	1.2.1.1: Sycamore – Continue to weed this species out at the seedling and sapling stage.	x	x			x	x			x	x			x	x			x	x		
	1.2.1.2: Rhododendron - Locate and destroy any plants in any of the woodland in accordance with Forestry Commission guidance	x	x																		
	1.2.1.3: Indian balsam – Continue to annually remove from Burleigh Brook and Holywell Wood by pulling and composting before the seed has set			x	x			x	x			x	x			x	x			x	x
1.2: Species Composition 1.2.2: New planting	1.2.2.1: Ensure any new planting within or immediately adjacent to the existing woodland only involves native species which reflect the current species composition of the two Ancient Woodlands.	Continuous																			
1.3: Species knowledge 1.3.1: Commission surveys for important woodland species groups	1.3.1.1: Invertebrates (Burleigh Wood & Holywell Wood)		x	x	x																
	1.3.1.2: Breeding Birds (Burleigh Wood & Holywell Wood)							x													
	1.3.1.3: Fungi (Burleigh Wood & Holywell Wood)					x															
	1.3.1.4: Amphibian Survey of ponds in Burleigh Wood.			x																	

Feature	Management Action	2018		2019				2020				2021				2022				2023	
		Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su
1.4. Species Habitats 1.4.1: Bird & bat boxes	1.4.1.1: Continue with ongoing programme of installing, maintaining and monitoring bird and bat boxes in Burleigh Wood and Holywell Wood. Replacement and new boxes to be of a 'wood-crete' type to ensure long-term durability and to minimise predation.	x	x			x	x			x	x			x	x			x	x		
2.1: Forest School	2.1.1: Encourage continued use of Holywell Wood as a Forest School site	Continuous																			
	2.1.2: Ensure, through regular monitoring and liaison with Forest School staff, that the current 'footprint' of the Forest School area does not expand further in order to avoid adverse impacts on the ground flora.	Continuous																			
2.2: Long-term research monitoring plots	2.2.1: Accurately map the position of the monitoring plots either onto a revised Access and Infrastructure Plan, or a separate standalone plan within the Management Plan.	x	x																		
	2.2.2: Manage the woodland adjacent to the monitoring plots the same as the rest of the woodland (as advised by Dr Millet when consulted about the revised Management Plan)	Continuous																			
	2.2.3: Undertake liaison with Dr Millett to see if data being gathered can inform future management of Holywell Wood.	x	x																x	x	
3.1: Boundary management	3.1.1: Continue to regularly monitor woodland boundaries (all woods) and block off unauthorised new entrance points with hazel weaved fencing and deadwood.	Continuous																			
3.2: Access infrastructure & signage	3.2.1: Continue to maintain access infrastructure (gates, fences, footbridges and boardwalks) in a safe condition.	Continuous																			
	3.2.2: Add any new infrastructure onto the Management Plan 'Access and Infrastructure Plan'.	Continuous																			
	3.2.3: Maintain existing signage on entrance gates and existing interpretation boards.	Continuous																			
4.1: Protected Species	4.1.1: Ensure that prior to any work on mature trees, that the trees have been assessed for their potential to support roosting bats.	Continuous																			
	4.1.2: Aim to undertake all management work involving vegetation removal outside of the nesting bird season (March to August inclusive). Where this is not possible, ensure that the area of proposed work has been checked by a competent ecologist for the presence of nesting bird activity.	Continuous																			
	4.1.3: Ensure that any woodland management within 30m of a badger sett complies with current legislation and guidance	Continuous																			
4.2: UK Forestry Standard (UKFS) ²⁴	4.2.1: The UKFS is "...the reference standard for sustainable forest management in the UK...and this...applies to all UK forests and woodlands." ²³ It is therefore important that those responsible for managing the woodlands are aware of the standards. Adoption and implementation of this Management Plan will ensure that the UKFS guidelines are being followed.	Continuous																			
5.1: Recording	5.1.1: When any management action has been completed record this on the Management Plan 'Management Recording Plan'	Continuous																			

Feature	Management Action	2018		2019				2020				2021				2022				2023	
		Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su
5.1: Recording	5.1.2: Review recorded management at the end of each year to ensure that an accurate record has been kept and to provide a summary report for the Woodland Management Group.		x				x				x				x				x		
	5.1.3: Record any ecological surveys undertaken on the Management Plan 'Management Recording Plan,' noting where the full survey results/report is held.	Continuous																			
5.2: Management Plan Review	5.2.1 Undertake a review of the Woodland Management Plan during 2022 with a view to update the plan for the period 2023-2027.																			x	x



Storm damage creating potential bat roost habitat (Burleigh Wood)



Access management (Burleigh Wood)

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Storm damage creating micro-habitat (Burleigh Wood)

9.0 APPENDIX A: WOODLAND VEGETATION SURVEY 2018 SPECIES LISTS

Burleigh Wood – 8th June 2018

Burleigh Wood			
Taxon	Vernacular	Quantity	Comment
Canopy			
<i>Quercus robur</i>	Pedunculate Oak	Abundant	
<i>Fraxinus excelsior</i>	Ash	Locally frequent to abundant	
<i>Betula pendula</i>	Silver Birch	Locally frequent	
<i>Acer campestre</i>	Field Maple	Occasional	
<i>Sorbus aucuparia</i>	Rowan	Rare	
<i>Quercus x rosacea</i>	Hybrid oak	Present	
Understorey			
<i>Corylus avellana</i>	Hazel	Frequent	
<i>Crataegus monogyna</i>	Hawthorn	Frequent	
<i>Ilex aquifolium</i>	Holly	Frequent	
<i>Sambucus nigra</i>	Elder	Frequent	
<i>Quercus robur</i>	Pedunculate Oak	Occasional to locally frequent.	
<i>Acer campestre</i>	Field Maple	Occasional	
<i>Ribes rubrum</i>	Red Currant	Rare	
<i>Rosa arvensis</i>	Field-rose	Rare	
<i>Rosa canina agg.</i>	Dog-rose	Rare	
<i>Rubus idaeus</i>	Raspberry	Rare	
<i>Sorbus aucuparia</i>	Rowan	Rare	
Field layer			
<i>Hyacinthoides non-scripta</i>	Bluebell	Frequent to locally abundant/dominant.	
<i>Galium aparine</i>	Cleavers	Frequent to locally abundant.	
<i>Lonicera periclymenum</i>	Honeysuckle	Frequent to locally abundant.	
<i>Pteridium aquilinum</i>	Bracken	Frequent to locally abundant.	
<i>Rubus fruticosus agg.</i>	Bramble	Frequent to locally abundant.	
<i>Milium effusum</i>	Wood Millet	Frequent	
<i>Geum urbanum</i>	Wood Avens	Locally frequent to abundant	Along path edges.

Burleigh Wood

<i>Hedera helix</i>	Common Ivy	Locally frequent	On wood edges.
<i>Carex sylvatica</i>	Wood-sedge	Locally occasional.	
<i>Chamerion angustifolium</i>	Rosebay Willowherb	Locally occasional.	
<i>Circaea lutetiana</i>	Enchanter's-nightshade	Locally occasional.	
<i>Digitalis purpurea</i>	Foxglove	Locally occasional.	
<i>Dryopteris dilatata</i>	Broad Buckler-fern	Occasional to locally frequent.	
<i>Holcus mollis</i>	Creeping Soft-grass	Occasional to locally frequent.	
<i>Lamium galeobdolon</i> subsp. <i>montanum</i>	Yellow Archangel	Occasional to locally frequent.	
<i>Melica uniflora</i>	Wood Melick	Occasional to locally frequent.	
<i>Urtica dioica</i>	Common Nettle	Occasional to locally frequent.	
<i>Arum maculatum</i>	Lords-and-Ladies	Occasional	
<i>Dryopteris filix-mas</i>	Male-fern	Occasional	
<i>Rumex sanguineus</i>	Wood Dock	Occasional	
<i>Silene dioica</i>	Red Campion	Occasional	
<i>Mercurialis perennis</i>	Dog's Mercury	Rare but locally frequent where present.	
<i>Cardamine flexuosa</i>	Wavy Bitter-cress	Rare to occasional.	
<i>Acer campestre</i>	Field Maple	Rare	Seedlings.
<i>Alliaria petiolata</i>	Garlic Mustard	Rare	
<i>Allium ursinum</i>	Ramsons	Rare	
<i>Anemone nemorosa</i>	Wood Anemone	Rare	
<i>Arctium minus</i>	Lesser Burdock	Rare	
<i>Carex pendula</i>	Pendulous Sedge	Rare	
<i>Chrysosplenium oppositifolium</i>	Opposite-leaved Golden-saxifrage	Rare	Close to stream.
<i>Dryopteris affinis</i> agg.	Scaly Male-fern	Rare	
<i>Geranium robertianum</i>	Herb-Robert	Rare	
<i>Heracleum sphondylium</i>	Hogweed	Rare	
<i>Lapsana communis</i>	Nipplewort	Rare	
<i>Luzula sylvatica</i>	Great Wood-rush	Rare	
<i>Lysimachia nemorum</i>	Yellow Pimpernel	Rare	
<i>Moehringia trinervia</i>	Three-nerved Sandwort	Rare	
<i>Poa annua</i>	Annual Meadow-grass	Rare	

Burleigh Wood

<i>Poa trivialis</i>	Rough Meadow-grass	Rare	
<i>Sanicula europaea</i>	Sanicle	Rare	
<i>Scrophularia nodosa</i>	Common Figwort	Rare	
<i>Taraxacum</i> agg.	Dandelion	Rare	
<i>Veronica montana</i>	Wood Speedwell	Rare	
Ponds			
<i>Callitriche</i> agg.	Water-starwort	Abundant	Pond.
<i>Lemna minor</i>	Common Duckweed	Abundant	Pond.
<i>Sparganium erectum</i>	Branched Bur-reed	Frequent	Pond.
<i>Solanum dulcamara</i>	Bittersweet	Occasional	Pond.
<i>Iris pseudacorus</i>	Yellow Iris	Rare	Pond.
<i>Juncus effusus</i>	Soft-rush	Rare	Pond.
<i>Lycopus europaeus</i>	Gypsywort	Rare	Pond.
Liverworts			
<i>Calypogeia arguta</i>	Notched Pouchwort	Rare	Stream bank. Field layer.
<i>Chiloscyphus polyanthos</i>	St Winifrid's Moss	Present	Pond.
<i>Lophocolea heterophylla</i>	Variable-leaved Crestwort	Present	On trees.
<i>Metzgeria furcata</i>	Forked Veilwort	Present	On trees.
Mosses			
<i>Orthotrichum affine</i>	Wood Bristle-moss	Frequent	On trees.
<i>Fissidens bryoides</i> var. <i>bryoides</i>	Lesser Pocket-moss	Locally frequent	Stream bank. Field layer.
<i>Kindbergia praelonga</i>	Common Feather-moss	Locally frequent	Field layer.
<i>Mnium hornum</i>	Swan's-neck Thyme- moss	Locally frequent	Field layer.
<i>Pseudotaxiphyllum elegans</i>	Elegant Silk-moss	Locally frequent	Field layer.
<i>Atrichum undulatum</i> var. <i>undulatum</i>	Common Smoothcap	Occasional to locally frequent.	Field layer.
<i>Brachythecium rutabulum</i>	Rough-stalked Feather- moss	Occasional	Field layer.
<i>Amblystegium serpens</i>	Creeping Feather-moss	Present	On trees.

Burleigh Wood

<i>Cryphaea heteromalla</i>	Lateral Cryphaea	Present	On trees.
<i>Hypnum cupressiforme</i> var. <i>cupressiforme</i>		Present	On trees.
<i>Isoetecium myosuroides</i>	Slender Mouse-tail Moss	Present	On trees.
<i>Leptodictyum riparium</i>	Kneiff's Feather-moss	Present	Pond.
<i>Orthotrichum diaphanum</i>	White-tipped Bristle- moss	Present	On trees.
<i>Rhynchostegium confertum</i>	Clustered Feather-moss	Present	On trees.
<i>Ulota bruchii</i>	Bruch's Pincushion	Present	On trees.

Holywell Wood – 8th June 2018

Holywell Wood

Taxon	Vernacular	Quantity	Comment
Canopy			
<i>Fraxinus excelsior</i>	Ash	Abundant	
<i>Quercus robur</i>	Pedunculate Oak	Frequent	
<i>Betula pendula</i>	Silver Birch	Occasional to locally frequent.	
<i>Alnus glutinosa</i>	Alder	Occasional	
<i>Ulmus</i> agg.	Elm	Occasional	
<i>Larix</i> sp.	a larch	Rare	
Understorey			
<i>Corylus avellana</i>	Hazel	Frequent	
<i>Crataegus monogyna</i>	Hawthorn	Frequent	
<i>Cornus sanguinea</i>	Dogwood	Occasional to locally frequent.	
<i>Ilex aquifolium</i>	Holly	Occasional	
<i>Prunus spinosa</i>	Blackthorn	Occasional	
<i>Ribes rubrum</i>	Red Currant	Occasional	
<i>Rosa arvensis</i>	Field-rose	Occasional	
<i>Sambucus nigra</i>	Elder	Occasional	
<i>Acer campestre</i>	Field Maple	Rare	
<i>Acer pseudoplatanus</i>	Sycamore	Rare	
<i>Ligustrum vulgare</i>	Wild Privet	Rare	
<i>Rubus idaeus</i>	Raspberry	Rare	

Holywell Wood				Holywell Wood			
<i>Paris quadrifolia</i>	Herb-Paris	Rare	Approx. 20 stems widely scattered across an area of 30 m ² centred on SK-50715-18365.	<i>Atrichum undulatum</i> var. <i>undulatum</i>	Common Smoothcap	Occasional	Field layer.
<i>Poa nemoralis</i>	Wood Meadow-grass	Rare		<i>Dicranella heteromalla</i>	Silky Forklet-moss	Present	Field layer.
<i>Populus tremula</i>	Aspen	Rare	Seedling.	<i>Fissidens taxifolius</i> var. <i>taxifolius</i>	Common Pocket-moss	Present	Field layer.
<i>Quercus robur</i>	Pedunculate Oak	Rare	Seedling.	<i>Pseudotaxiphyllum elegans</i>	Elegant Silk-moss	Present	Field layer.
<i>Ranunculus repens</i>	Creeping Buttercup	Rare	Rare but locally frequent where occurs.	<i>Thuidium tamariscinum</i>	Common Tamarisk-moss	Present	Field layer.
<i>Rumex conglomeratus</i>	Clustered Dock	Rare		<i>Ulota bruchii</i>	Bruch's Pincushion	Present	Fruiting.
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Rare		<i>Hypnum cupressiforme</i> var. <i>cupressiforme</i>		Present	
<i>Schedonorus giganteus</i>	Giant Fescue	Rare		<i>Orthotrichum affine</i>	Wood Bristle-moss	Present	
<i>Scrophularia nodosa</i>	Common Figwort	Rare		<i>Isoetecium myosuroides</i>	Slender Mouse-tail Moss	Present	
<i>Tamus communis</i>	Black Bryony	Rare		<i>Bryum capillare</i>	Capillary Thread-moss	Present	
<i>Taraxacum agg.</i>	Dandelion	Rare		<i>Amblystegium serpens</i>	Creeping Feather-moss	Present	
<i>Valeriana officinalis</i>	Common Valerian	Rare		<i>Rhynchostegium confertum</i>	Clustered Feather-moss	Present	
Liverworts							
<i>Pellia endiviifolia</i>	Endive Pellia	0	Field layer.				
<i>Lophocolea bidentata</i>	Bifid Crestwort	Present					
<i>Lophocolea heterophylla</i>	Variable-leaved Crestwort	Present					
<i>Metzgeria violacea</i>	Blueish Veilwort	Present					
Mosses							
<i>Kindbergia praelonga</i>	Common Feather-moss	Abundant	Field layer.				
<i>Brachythecium rutabulum</i>	Rough-stalked Feather-moss	Frequent	Field layer.				
<i>Mnium hornum</i>	Swan's-neck Thyme-moss	Frequent	Field layer.				
<i>Eurhynchium striatum</i>	Common Striated Feather-moss	Locally frequent to abundant	Field layer.				
<i>Plagiomnium undulatum</i>	Hart's-tongue Thyme-moss	Occasional to locally frequent.	Field layer.				
<i>Thamnobryum alopecurum</i>	Fox-tail Feather-moss	Occasional to locally frequent.	Field layer.				



Herb Paris *Paris quadrifolia* (Holywell Wood)

Horseshoe Wood – 8th June 2018

Horseshoe Wood			
Taxon	Vernacular	Quantity	Comment
Canopy			
<i>Quercus robur</i>	Pedunculate Oak	Abundant	
<i>Malus sylvestris</i>	Crab Apple	Frequent	
<i>Fraxinus excelsior</i>	Ash	Occasional	
<i>Ilex aquifolium</i>	Holly	Occasional	
<i>Aesculus hippocastanum</i>	Horse-chestnut	Rare	
Understorey			
<i>Prunus spinosa</i>	Blackthorn	Locally frequent	
<i>Sambucus nigra</i>	Elder	Occasional	
Field layer			
<i>Geum urbanum</i>	Wood Avens	Frequent to locally abundant.	
<i>Galium aparine</i>	Cleavers	Locally frequent to abundant.	
<i>Holcus lanatus</i>	Yorkshire-fog	Locally frequent	
<i>Urtica dioica</i>	Common Nettle	Locally frequent	
<i>Fraxinus excelsior</i>	Ash	Occasional to locally frequent.	Seedlings.
<i>Poa trivialis</i>	Rough Meadow-grass	Occasional to locally frequent.	
<i>Rubus fruticosus agg.</i>	Bramble	Occasional to locally frequent.	
<i>Acer campestre</i>	Field Maple	Occasional	Seedlings.
<i>Crataegus monogyna</i>	Hawthorn	Occasional	Seedlings.
<i>Epilobium ciliatum</i>	American Willowherb	Occasional	
<i>Heracleum sphondylium</i>	Hogweed	Occasional	
<i>Milium effusum</i>	Wood Millet	Occasional	
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Occasional	
<i>Silene dioica</i>	Red Champion	Occasional	
<i>Angelica sylvestris</i>	Wild Angelica	Rare	
<i>Circaea lutetiana</i>	Enchanter's-nightshade	Rare	
<i>Cynosurus cristatus</i>	Crested Dog's-tail	Rare	
<i>Dactylis glomerata</i>	Cock's-foot	Rare	
<i>Dryopteris dilatata</i>	Broad Buckler-fern	Rare	

Horseshoe Wood			
<i>Dryopteris filix-mas</i>	Male-fern	Rare	
<i>Hedera helix</i>	Common Ivy	Rare	
<i>Hyacinthoides non-scripta</i>	Bluebell	Rare	
<i>Mercurialis perennis</i>	Dog's Mercury	Rare	
<i>Ranunculus repens</i>	Creeping Buttercup	Rare	
<i>Rosa arvensis</i>	Field-rose	Rare	Seedlings.
<i>Sorbus aucuparia</i>	Rowan	Rare	Seedlings.

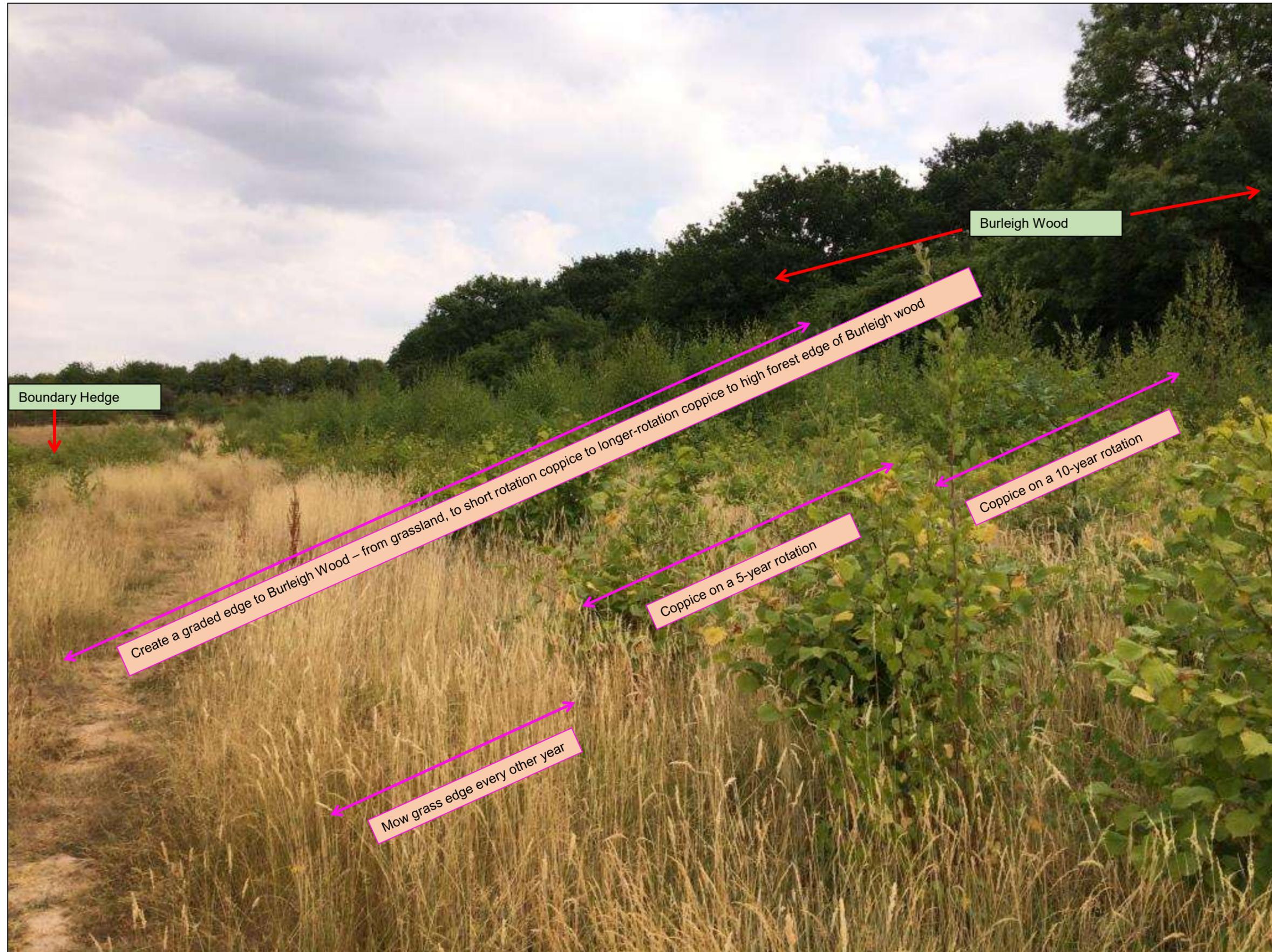


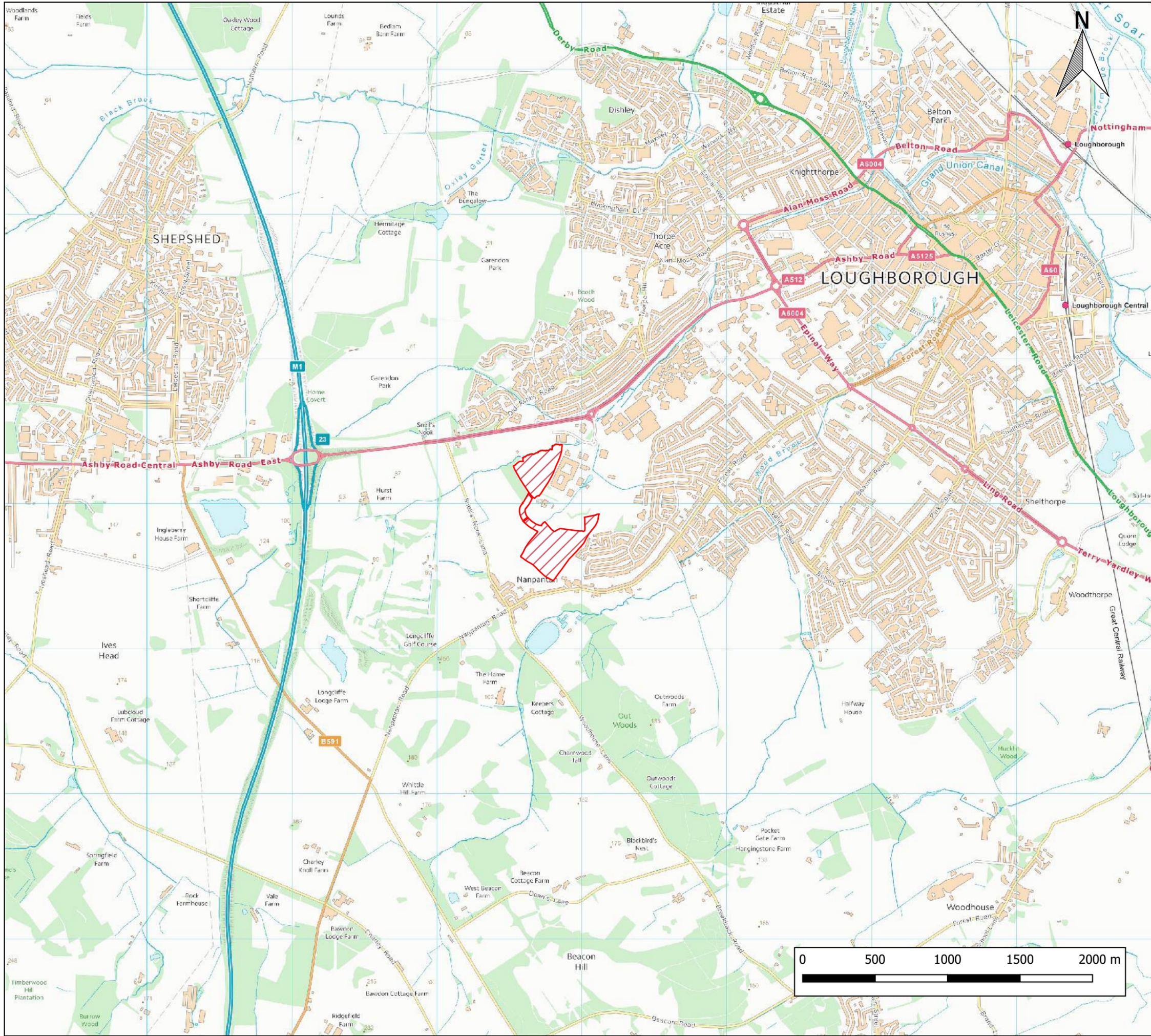
Forest School (Holywell Wood)



Deadwood (Holywell Wood)

10.0 APPENDIX B – POTENTIAL FUTURE MANAGEMENT OF BURLEIGH WOOD EXTENSION





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Legend

 Management Plan Area

-	30.07.2018	First Draft	NJL	NJL
rev	date	description	drn	chkd

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- landscape design
- urban design
- ecology
- architecture
- arboriculture

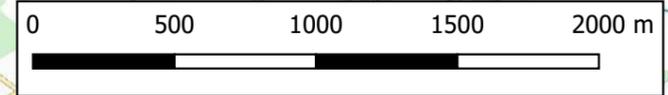
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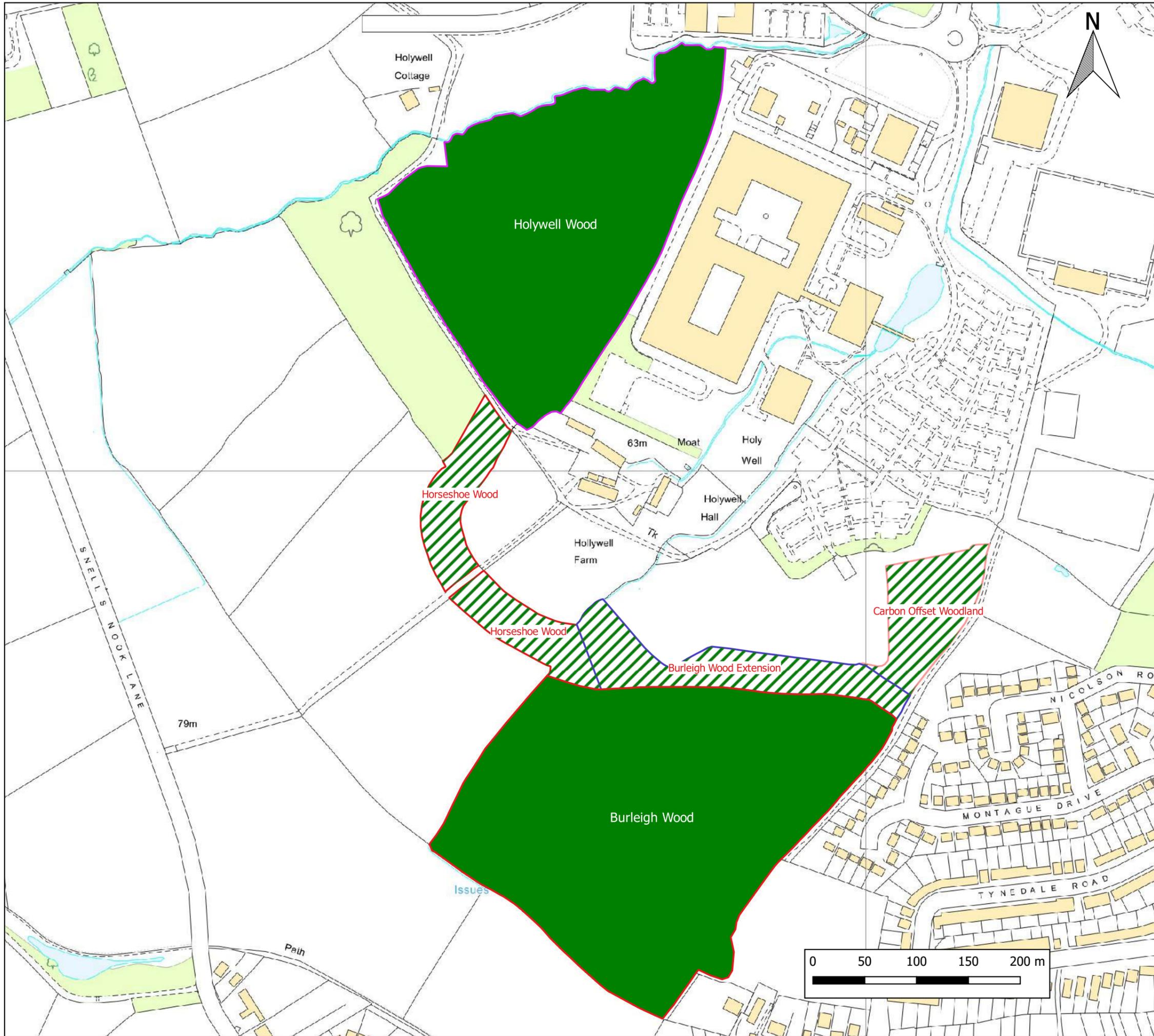
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Loughborough University

Woodland Management Plan

Location Plan





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Legend

- Ancient Semi-Natural Woodland & Designated Local Wildlife Site
- Young Plantation Woodland - Broadleaved
- Burleigh Wood (8.5ha)
- Holywell Wood (6.6ha)
- Horseshoe Wood (1.3ha)
- Burleigh Wood Extension (1.2ha)
- Carbon Offset Woodland (0.9ha)

rev	date	description	drn	chkd
A	26.09.2018	Amend wood names	NJL	NJL
-	30.07.2018	First Draft	NJL	NJL

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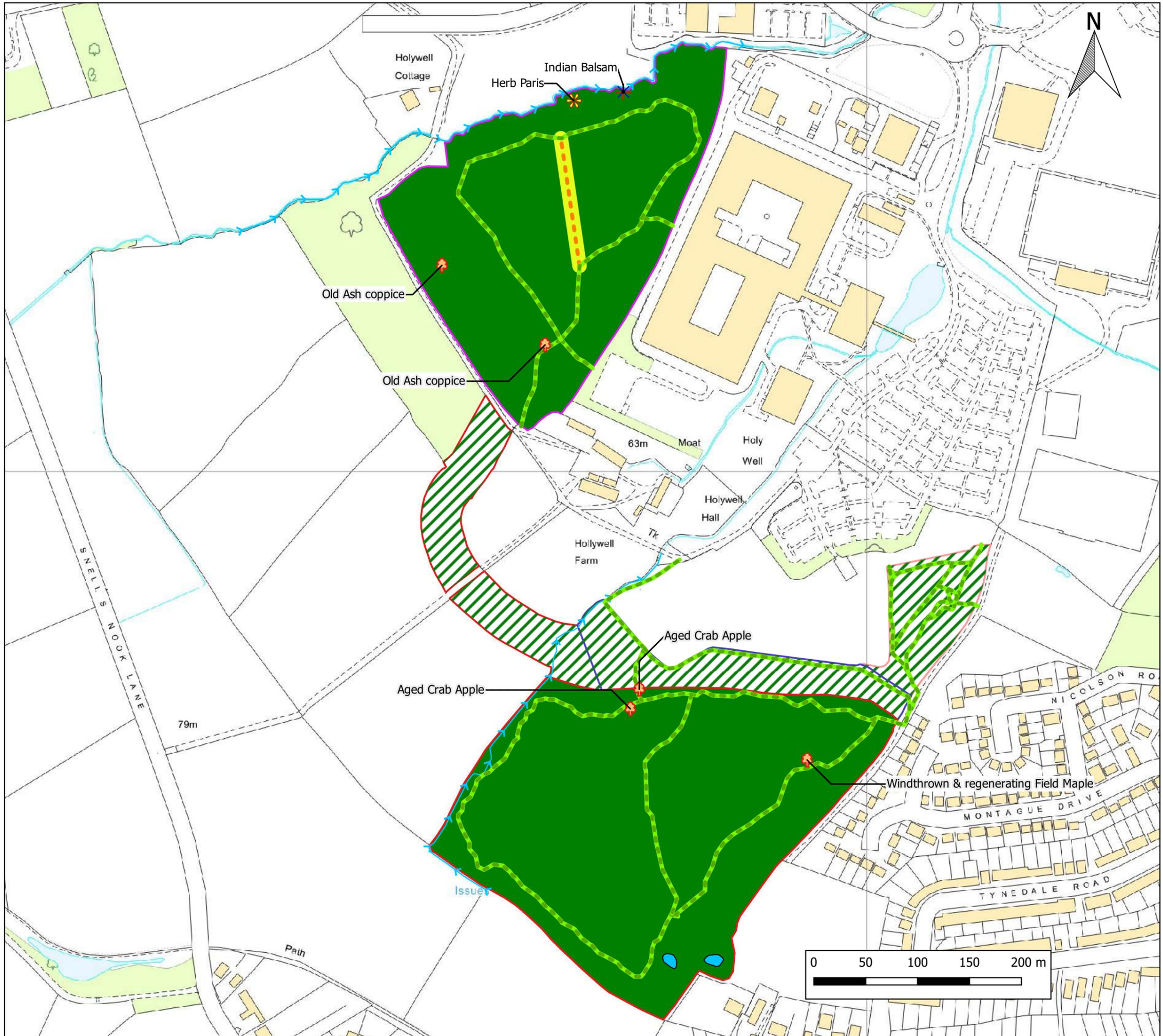
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Woodland Management Plan

Woodlands & Designations Plan

Figure 2 **8474-E-02** 28/9/2018



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- ### Legend
- Ancient Semi-Natural Woodland & Designated Local Wildlife Site
 - Young Plantation Woodland - Broadleaved
 - Burleigh Wood (8.5ha)
 - Holywell Wood (6.6ha)
 - Horseshoe Wood (1.3ha)
 - Burleigh Wood Extension (1.2ha)
 - Carbon Offset Woodland (0.9ha)
 - Trees of Interest
 - Notable Plants
 - Invasive Non-native Plants
 - Pond
 - Stream
 - Woodland Paths
 - Woodland Ride

rev	date	description	drn	chkd
A	26.09.2018	Amend wood names	NJL	NJL
-	31.07.2018	First Draft	NJL	NJL

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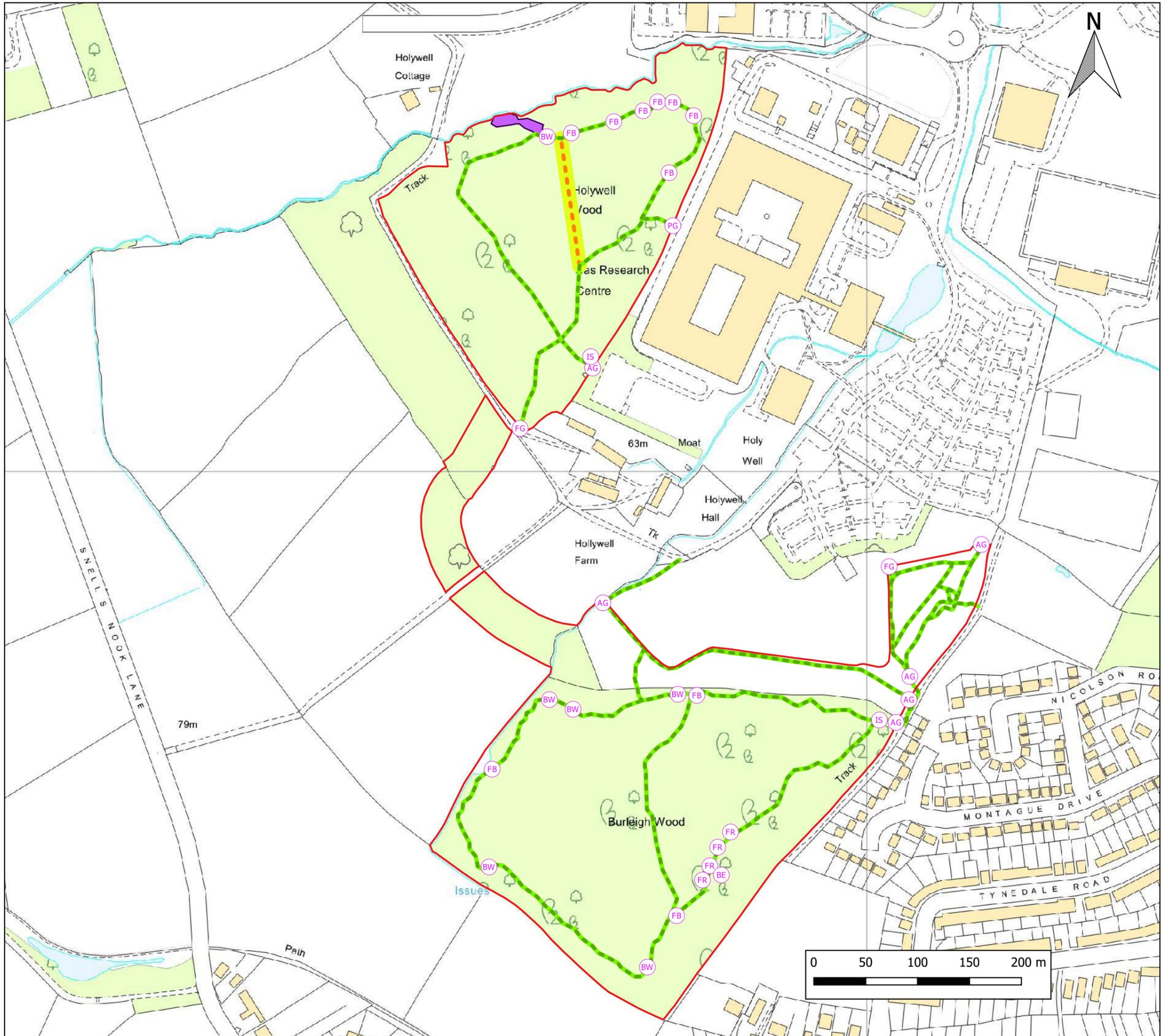
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Woodland Management Plan

Features Plan

Figure 3 **8474-E-03** 26/9/2018



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Legend

- Management Plan Area
- Woodland Ride
- Woodland Paths
- Forest School Area
- Infrastructure
 - AG Access Gate (Pedestrian)
 - BE Bench
 - BW Boardwalk
 - FB Footbridge
 - FG Field Gate (small vehicle)
 - FR Fence Rail
 - IS Interpretation Sign

rev	date	description	drn	chkd
A	26.09.2018	Amend woodland names	NJL	NJL
-	30.07.2018	First Draft	NJL	NJL

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Woodland Management Plan

Access & Infrastructure Plan

Figure 4 **8474-E-04** 26/9/2018

Ref. (Mark on map)	Author (Name & Job Title)	Date	Management Activity	Any additional comments
1				
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3				
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9				
10				

Ref. (Mark on map)	Author (Name & Job Title)	Date	Management Activity	Any additional comments
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Ref. (Mark on map)	Author (Name & Job Title)	Date	Management Activity	Any additional comments
1				
2				
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 - Invasive Non-native Plants
 - Pond
 - Stream
 - Woodland Paths
 - Woodland Ride

rev	date	description	drn	chkd
A	26.09.2018	Amend wood name	NJL	NJL
-	31.07.2018	First Draft	NJL	NJL

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Woodland Management Plan
Management Recording Plan

Figure 5 **8474-E-05** 26/9/2018