



**WOODLAND MANAGEMENT PLAN
HANGING BANKS WOOD, WINGERWORTH**

AUGUST 2015

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1. INTRODUCTION

1.1 Background

Absolute Ecology LLP were commissioned to produce a Woodland Management Plan (WMP) for Hanging Banks Woods, Wingerworth, Derbyshire (SK389 666), which was required as a condition of outline planning consent (14/00763/OL) for up to 250 dwellings on arable land to the north.

Specifically, planning condition 15 required a 10 year management plan to be submitted and approved by the LPA, and include details of:

- ⤴ Works required to trees including woodland management and thinning
- ⤴ Works to and impact assessment of vegetation removal/thinning required to implement and maintain footpaths and other access/amenity features
- ⤴ Proposed planting programme within the woodland and buffer to built development
- ⤴ Management of invasive and non-desirable species
- ⤴ Provision of bat and bird boxes and any other enhancements for fauna

This Woodland Management Plan is based on information and data gathered in an ecological walkover survey and arboricultural survey undertaken in May and June 2015 (see *Ecological Walkover Survey: Hanging Banks Woods*, Absolute Ecology, July 2015; and *Hanging Banks, Wingerworth: Woodland Report*, A.C.S. Consulting, July 2015).

The ecological walkover aimed to map the vegetation communities throughout the woodland, provide information on known protected species or potential for protected species to occur, and make an assessment of impacts on the habitats and species present.

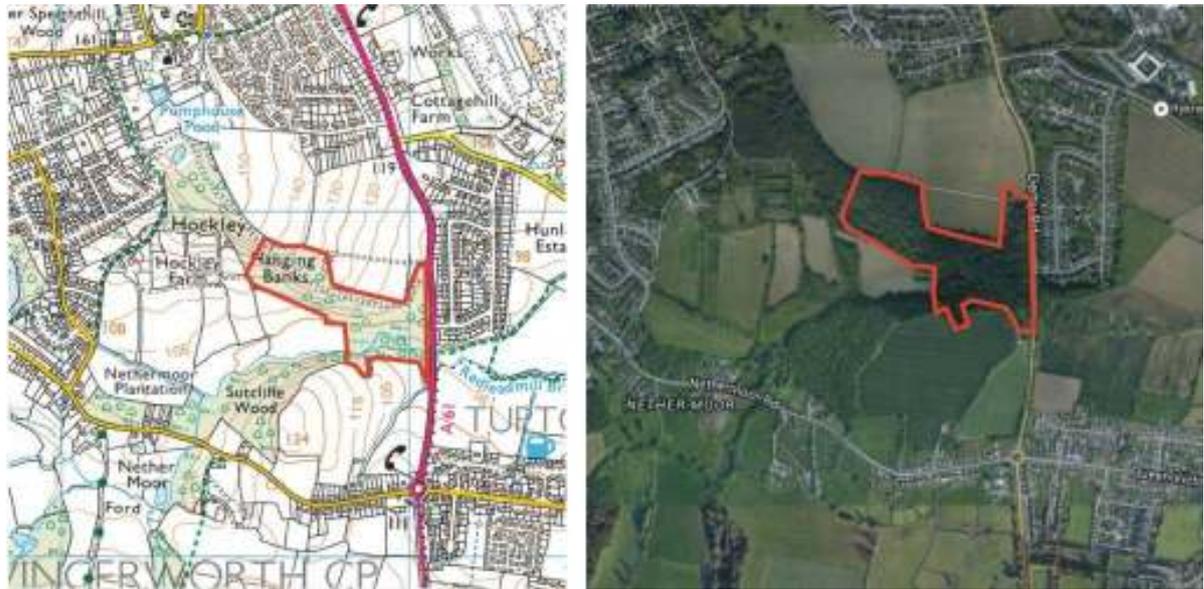
The arboricultural survey aimed to assess the trees on site to identify trees which are undesirable to be retained due to structural defects, and those which could be retained along with measures to ensure long term retention.

1.2 Site Description

Hanging Banks is a semi-natural broadleaved woodland, located to the south of the village of Wingerworth, between the A61 Derby Road and Hockley Lane. The part of the woodland which was included in the survey boundary is approximately 12 hectares and lies over moderate to steep south and east facing slopes. There is a brook (Redleadmill Brook which branches off into Mill Goit) which runs through the woodland at its lowest point. The woodland is adjoined to Sutcliffe Wood which is listed as an Ancient Woodland. Historical maps dating to 1885 show woodland on the site of Hanging Banks. The woodland is surrounded by arable and pasture land, with residential estates beyond.

1.3 Site Location

Figure 1: Location of site (left) and aerial view of site (right); note the boundary for the Woodland



Management Plan is restricted to the eastern half of Hanging Banks woods.

OS Licence 100056180

1.4 Statutory and Non-statutory Designations

Hanging Banks as well as the adjacent Sutcliffe Woods are the subject of a Woodland Tree Preservation Order (TPO) (Reference 29/W5) which was assigned in 1952.

Hanging Banks, although not listed in the Ancient Woodland Inventory, is registered with Derbyshire Wildlife Trust as a Local Wildlife Site (LWS) along with Sutcliffe Woods, due to the presence of ancient semi-natural alder and oak.

2. WOODLAND INFORMATION

2.1 General Character Description

The area of Hanging Banks included in the survey boundary lies on a gentle east facing slope with a steeper south-facing bank. Where Redleadmill Brook and Mill Goit run through the southern part of the woodland, the terrain is flatter and damper. There is a small disused quarry on the southern edge of the woodland.

In general, sycamore *Acer pseudoplatanus* and silver birch *Betula pendula* are the dominant species along the slopes, with pedunculate (English) oak *Quercus robur* abundant in places. The majority of sycamore are of a similar age suggesting the woodland was clearfelled during the Second World War. Sycamore and alder *Alnus glutinosa* dominate the wetter area along the stream corridor. There are also occasional to rarely occurring sessile oak *Quercus petraea*, turkey oak *Quercus cerris*, sweet chestnut *Castanea sativa*, beech *Fagus sylvatica*, ash *Fraxinus sylvatica* and crack willow *Salix fragilis* which are scattered within the woodland.

The understorey tended to be sparse on the slopes of the woodland, with occasional holly *Ilex aquifolium*, yew *Taxus baccata*, hawthorn *Crataegus monogyna*, hazel *Corylus avellana* and rowan *Sorbus aucuparia* occurring but with few areas of continuous understorey. The understorey was more developed and more diverse along the southern section of woodland and stream corridor, with dense areas of hazel coppice, blackthorn *Prunus spinosa*, holly, yew and elder *Sambucus nigra* with occasional honeysuckle *Lonicera periclymenum*.

The ground flora on the slopes included areas dominated to a greater or lesser extent by bramble *Rubus fruticosus* agg., bracken *Pteridium aquilinum* and bluebell *Hyacinthoides non-scripta*. Where the canopy was broken letting light in, and along the paths there were patches of creeping soft-grass *Holcus mollis*, common hemp-nettle *Galeopsis tetrahit*, greater stitch-wort *Stellaria holostea*, climbing corydalis *Ceratocarpus claviculata*, wood millet *Milium effusum* and tufted hair-grass *Deschampsia cespitosa*. Broad-buckler fern *Dryopteris dilatata* was scattered throughout the woodland.

The ground flora in the wetter area of the woodland (the southern part along the stream corridor) was more diverse and included frequent yellow archangel *Lamium galeobdolon*, wood anemone *Anemone nemerosa* and Dog's mercury *Mercurialis perennis*. Wood speedwell *Veronica montana*, ramsons *Allium ursinum*, garlic mustard *Alliaria petiolata*, bluebell, lesser celandine *Ranunculus ficaria*, greater stitchwort and wood avens *Geum urbanum* were also among the plants recorded. Lady fern *Athyrium filix-femina* and remote sedge *Carex remota* were recorded alongside the brook.

2.2 Access and Human Presence

The woodland is used frequently by local dog walkers and families, and the paths are generally clear and well used, entering the woodland near the bus stop on Derby Road and Redleadmill Bridge and at several points along the northern woodland edge. In particular there is a wide path winding from the south-east to the north-west of the woodland. There are a network of smaller, muddy paths along

the stream and going into the adjacent Sutcliffe Wood. There is a telecommunications tower just inside the northern edge of the woodland which is likely to require service access in future.

There are reports of occasional presence of motorbikes in the woodland. The quarry area appears well used by revellers with evidence of a fire and rubbish in this area.

2.3 Age Class

The majority of the woodland is dominated by sycamore of early-maturity in age and in the range of 15 - 18 m tall with stem diameters 350 - 500 mm. The age and woodland structure suggest much of the site was clearfelled during the Second World War, and allowed to redevelop with possibly some planting (e.g. yew which are scattered through the woodland). It is estimated that the majority of the canopy layer is unlikely to exceed 75 years in age, and where scattered understorey shrubs and young trees are able to gain enough light to develop, they appear to range from 5 - 30 years in age.

2.4 Compartment Information and Species Lists

The woodland was divided into compartments where vegetation was noted to change in character or species composition. The changes are likely to be attributed in most part to aspect, slope and soil conditions, but it should be noted that in general, there are zones between compartments which contain characteristics of both areas. These species lists are based on surveys undertaken in May and June, when most woodland species are visible; however, it may be that early-flowering or late-flowering annuals may not have been apparent during the survey visits.

Table 1: Compartments showing estimated abundance of tree and plant species and general description of character (shown on Figure 2).

Compartment	Canopy Layer	Understorey	Ground Flora	General character / description
A	Silver Birch (25 - 75%) Rowan (10%) Sycamore (7 - 50%) Pedunculate oak (8 - 50%) Sessile oak (1 - 5%) Turkey oak (<1%)	Holly Hawthorn Rhododendron Hazel Cherry Yew	Bramble (85%) Bluebell (5%) Bracken (8%) H.Mollis (<2%) Broad-buckler fern (<1%)	This compartment lay at the highest level of the woodland with a gentle east-facing slope and with a steep gradient to the south. The trees were dominated by mature silver birch at the top of the slope, forming a fairly open canopy, with oak and sycamore becoming more dominant on the slope, and a higher, more closed canopy being apparent. The understorey was sparse, and restricted to occasional holly and hawthorn shrubs as well as individual young rowan, hazel and cherry saplings. Several rhododendron bushes were noted along the top boundary fenceline.
B	Silver Birch (20%) Pedunculate	Hawthorn Rowan Rhododendron	Bramble (85%) Bluebell (5%) Bracken (10%)	This area was also a gentle east-facing slope with a sharp drop in gradient to the south. The tree

Compartment	Canopy Layer	Understorey	Ground Flora	General character / description
	oak (50%) Sycamore (30% - mainly on woodland edge and lower slopes)	Elder Holly Hazel Laurel		composition was notably different to A, with pedunculate oak being more dominant than silver birch, and sycamore lining the woodland edge. The canopy was fairly open reflected by a dense covering of bramble scrub at ground level, with bracken and bluebell scattered amongst the bramble. The understorey was sparse, similar in composition and density to compartment A.
C	Sycamore (90%) Silver Birch (5%) Pedunculate oak (5%) Sessile oak (<5%)	Rowan Holly Yew Hazel	Bluebell (75%) Bramble (20%) Broad-buckler fern (5%)	This compartment was level to a gentle east-facing slope. The canopy of the mature sycamores was fairly closed, restricting light to the ground level. The understorey was sparse, restricted to individual yew and hazel and occasional holly and rowan. The ground flora here was dominated by bluebell, with bramble scrub scattered throughout, and occasional ferns.
D	Silver Birch (75%) Sessile oak (15%) Sweet Chestnut (5%) Sycamore (5%)	Honeysuckle Blackthorn (along southern edge) Hazel	Bracken Bramble Bluebell Wood dock Creeping soft-grass Greater stitchwort Wood avens	This compartment was on a steep south-facing slope which was dominated by silver birch with occasional oak. The trees were sparsely distributed and absent in places, and the higher light levels produced a more diverse ground flora with patches dominated by bracken or creeping soft-grass.
E	Pedunculate oak (40%) Silver Birch (30%) Sycamore (30%)		Yorkshire fog (70%) Bracken (20%) Bramble (<5%) Bluebell (<5%) Common hemp-nettle (<5%) Climbing corydalis (<1%)	Moderate south-facing slope with gentle east-facing slope. Canopy completely open near path where silver birch has fallen over path. Oak and silver birch dominate the top of the slope, whilst sycamore is more dominant on the lower slope. No understorey present, additional light has allowed grasses to dominate in areas. Some silver birches near to path are dead and may be unsafe.
F	Sycamore (95%) Pedunculate oak (<4%) Sessile oak (1%) Silver birch (<1%)	Rowan Holly Elder Honeysuckle	Bramble Bluebell Bracken Nettle Wood millet Tufted hair-grass Common hemp-nettle Remote sedge	Mature sycamore dominant with a fairly closed canopy creating a more shaded part of the wood. Understorey sparse, restricted to occasional young rowan and holly and an individual elder. Ground flora dominated by bramble and bluebell beneath the trees, the path was lighter, acting

Compartment	Canopy Layer	Understorey	Ground Flora	General character / description
			Cock's-foot Red campion Annual meadow-grass	like a woodland ride and along the sides of the path the flora was more diverse with a range of grasses and flowering herbs.
G	Sycamore (95%) Ash (5%)	Holly Elder Hawthorn Hazel Wych elm	Bramble Bluebell Tufted hair-grass Wood avens Wood millet Broad-buckler fern	This area of the woodland was fairly level and dominated by mature sycamore with a fairly closed canopy creating a highly shaded area of woodland. The understorey was sparse, with bramble dominating the ground flora.
H	Sycamore (50%) Oak (20%) Alder (15%) Ash (15%)	Hazel Hawthorn	Bramble Bluebell Garlic Mustard Yellow Archangel Wood Anemone Greater Stitchwort Wood avens Watercress Wood speedwell Himalayan Balsalm Dog's Mercury Wood Dock Lesser Celandine Cow Parsley Ramsons Woodrush Ferns	This was a south facing slope running down to the lowest part of the woodland, where the stream meandered through. The soil was noticeably more damp. Although sycamore still dominated the canopy layer, oak, alder and ash also were frequent. The understorey was sparse. The ground flora was generally dominated by bramble, but was much more diverse than in other parts of the woodland. Wood anemone and yellow archangel were abundant near to the stream. Other herbs noted were occasional to rarely occurring. Frequent Himalayan Balsalm was noted along the stream edge.
I	Sycamore (90%) Silver Birch (3%) Pedunculate oak (2%) Rowan (5%)	Hazel Holly Rowan saplings Laurel	Bramble (95%) Bluebell (<5%) Broad-buckler fern (1%) Common male fern (<1%)	This compartment was on the south side of the brook, with a mainly level terrain with a north facing bank along the southern boundary. Mature sycamore formed a closed canopy over hazel coppice. The substrate was damp.
J	Alder (10%) Sycamore (80%) Ash (<5%) Beech (<1%) Pedunculate oak (<5%) Crack willow (<1%)	Holly Hazel Yew Willow Elder	Bramble (50 - 85%) Bluebell (5 - 25%) Remote sedge (<5%) Common male fern (<1%) Lady fern (<1%) Wood sorrel (<1%)	This compartment included part of the stream corridor with a north facing moderate slope on the south side of the stream and included the area of a disused quarry on the southern edge of the woodland. The trees had a more varied and natural age class, indicating this area may not have been felled during wartime as other parts of the woodland appeared to have been. Sycamore was still dominant, but mature alder were frequently occurring along the stream. The understorey was

Compartment	Canopy Layer	Understorey	Ground Flora	General character / description
				dense and diverse. The ground flora was dominated by bluebell on the slopes, with bramble dominating areas where light could penetrate the canopy. The stream banks had frequent ferns and remote sedge.

2.4 National Vegetation Classification

The area of woodland to the north of the stream corridor, in particular the slopes of the woodland were characteristic of W10 *Quercus robur*- *Pteridium aquilinum* - *Rubus fruticosus* woodland. In areas sycamore and silver birch are abundant to dominant, and although wood sorrel was not noted on the upper slopes, some areas had characteristics of both W10e *Acer pseudoplatanus* - *Oxalis acetosella* sub-community and W16 *Quercus spp.* - *Betula spp.* - *Deschampsia flexuosa* woodland.

Compartments H, I and J along the stream corridor had characteristics of W7 *Alnus glutinosa* - *Fraxinus excelsior* - *Lysimachia nemorum* woodland; in places, W7b *Carex remota* - *Cirsium palustre* sub-community could be present.

2.5 Fauna

There were two badger *Meles meles* setts found within the woodland which comprised partially used single entrance 'outlier' setts (see separate Confidential badger map). Evidence of foraging and territory marking ('latrines') were found south of the stream. No main setts were found. It is likely the woodland is used by badgers as part of their wider foraging territory.

The trees within the woodland were generally in good condition and of a similar age class, with little standing dead wood, woodpecker holes, peeling bark or knot holes that are often used by roosting bats. However, not all trees were fully inspected, and there may be bat roosts present within suitable trees in the woodland. It is likely that the woodland is used by local populations of foraging bats, particularly the woodland edges and stream corridor which are likely to be associated with higher numbers of invertebrates. Installing a range of bat boxes is likely to be of great value to bats in this particular woodland.

The woodland appears to support a range of common woodland and urban edge bird species, but the lack of diversity of tree size, age, standing dead wood and understorey is likely to be a limitation to bird foraging and breeding on site. There are a number of make-shift bird boxes within the upper slopes of the woodland which were confirmed to be used by breeding tawny owl *Strix aluco* and are likely to be used by other species; however there is scope for improvement by providing a greater range of bird box types in suitable locations throughout the woodland.

It is likely that the woodland and woodland edge provides habitat to a range of amphibians, small

mammals, invertebrates and potentially reptiles. However, the composition of the woodland (mostly similar age class of healthy sycamore) and distinct lack of dead wood both on the ground and standing, may limit invertebrate diversity which in turn is likely to affect other species. There is scope to enhance the woodland for wildlife by creating wood and brash piles, which mimics a natural woodland where dead trees are both standing and lying on the ground, creating an abundance of micro-habitats and greatly boosting biodiversity.

3. MANAGEMENT OBJECTIVES

3.1 Aims of Management

The outline planning consent requires development of a management plan for the woodland over a ten year period to be implemented prior to the occupation of the 50th property.

As part of the outline planning application, an indicative masterplan was drafted that included play areas, cycleways and official pedestrian footpaths within the woodland, linking Derby Road to the new residential estates and providing a recreational resource for local residents.

The overall objectives of this management plan are:

- ⤴ To promote the long-term sustainability of the woodland habitat through new native planting, targeted management of existing trees and removal of invasive non-native species.
- ⤴ To increase biodiversity and ecological resilience within the woodland by enhancing existing habitats through targeted management and creation of wildlife-friendly features.
- ⤴ To minimise impact of proposed new cycle ways and play areas on the existing flora and fauna.
- ⤴ To help assure safety of woodland users and to provide a resource that can be enjoyed by local residents.
- ⤴ To seed the formation of a local volunteer conservation group to help care for the woodland and to take the management plan forward after ten years has passed.

Whilst it is considered that ten years is not long enough to establish any significant management practises, the prescriptions which will be set out in this management plan, will nonetheless be of benefit to the woodland ecology and may be seen as a grounding for long-term management in the future.

3.2 Potential Constraints

To ensure the prescriptions detailed in this plan are successfully carried out, a detailed funding plan should be created once the management plan has been accepted by the council. It will be up to the developer to ensure the management can be successfully funded over the ten years, and is likely to involve creation of a legally binding scheme that new householders agree to contribute to.

Without long-term management of the woodland (i.e. ten years and beyond), the woodland is likely to become degraded and potentially decrease in diversity in future. Tree safety and regular tree surveys (particularly after storms and high winds) is also important if the woodland is regularly used by local residents. The logistics of long-term management of the woodland should be considered by all parties involved. The formation of a local volunteer conservation group would be of benefit, to ensure practical management tasks continue on a more long-term basis, and to provide a sense of pride and 'ownership' - this can be achieved when people are given a role in taking care of a place, which is important if degradation of the woodland is to be avoided.

Long-term funding is also necessary to consider, to ensure regular arboricultural surveys and any necessary specialist work, and in future this may include grant applications. Again, this may be something that could be organised through a conservation group.

Through the council agreement of this management plan, it is assumed that any specified thinning within the woodland, will not contravene the TPO covering the woodland. Future management of the woodland would need to be in consultation with the Local Planning Authority to ensure the TPO is not contravened.

4. MANAGEMENT PRESCRIPTIONS

4.1 Overview of Prescriptions

For practical purposes, management prescriptions are split into arboricultural, ecological and 'user' measures, although there will be interchangeable benefits arising from management being implemented. The following is a summary of prescriptions which will be covered in more detail in the following sections.

Arboricultural prescriptions (A1 - A5)

- ⤴ Establishment of new planting in four areas identified within the woodland
- ⤴ Establishment of new planting within buffer margin on northern edge of woodland
- ⤴ Removal of trees identified as being hazards to safety
- ⤴ Thinning of sycamore standards and restoration of hazel coppice
- ⤴ Regular survey of trees to ensure safety particularly along paths and cycleways.

Ecological prescriptions (E1 - E6)

- ⤴ Provision of bird and bat boxes throughout the woodland
- ⤴ Creation of habitat log piles throughout the woodland
- ⤴ Removal of invasive non-native rhododendron and laurel shrubs and Himalayan balsam
- ⤴ Bracken control in targeted areas
- ⤴ Survey for badger setts prior to any works within the woodland
- ⤴ Survey for bat roosts / nesting birds prior to any tree works

User prescriptions (U1 - U3)

- ⤴ Creation of cycleways and pathways
- ⤴ Creation of woodland play areas
- ⤴ Formation of a local volunteer group to help manage and care for the woodland on a long-term basis

The following sections provide greater detail to the prescriptions set out above; the timeline for achieving these prescriptions is set out in Appendix 1.

4.2 ARBORICULTURAL PRESCRIPTIONS

A1 Establishment of new planting within woodland

There were four areas identified in the Arboricultural Woodland Report, which are suitable for new planting. These areas are more open than the adjacent woodland, often dominated by bracken on the ground layer, frequently with dense birch which could be thinned in places

to help create space for new trees.

It should be noted, that it is healthy for a woodland to have some areas of open canopy, which would reflect a natural mixed age woodland ecology. Glades and rides are particularly important for many invertebrate species.

The following recommended mix of trees and shrubs reflect the native species that are thriving in that location, and they should be planted to mimic a natural regeneration as shown in Figure 4.

If any thinning is found to be necessary, it should be undertaken in Year 10, retaining the trees with the healthiest growth.

Planted saplings should have protective tubular tree guards with regular weeding around the trees to encourage healthy development. Saplings should be of local provenance.

Locations for the following specific recommendations are shown on Figure 3.

- A1.1** Open area on south facing bank of woodland in Compartment A which has dense bracken and bramble ground layer. Target removal of mature sycamore. Plant minimum of 20 pedunculate oaks, 10 sessile oaks, 20 rowan, 10 hawthorn, 10 hazel. Undertake annual bracken control and weeding of sycamore seedlings in this area to promote growth of native saplings.
- A1.2** Open area on south facing bank of woodland in Compartment A which was considered suitable to be opened out and replanted. Target removal of mature sycamore. Plant minimum of 30 pedunculate oaks, 10 rowan, 10 hawthorn, 20 hazel. Undertake weeding of sycamore seedlings in this area to promote growth of native saplings.
- A1.3** Open area on lower south facing bank of woodland in Compartment B which was considered suitable to be thinned, opened out and replanted, also allowing some retention of open canopy and some natural succession. Mature oaks should be retained. Appropriate thinning of the dense birch should be undertaken, and remove sycamore in this area. Plant minimum of 20 sessile oaks, 20 pedunculate oaks, 20 hazel, 10 honeysuckle. Undertake annual bracken control and weeding of sycamore seedlings in this area to promote growth of native saplings.
- A1.4** Open area where tree has naturally fallen, and some dead birches stand near to the footpath in Compartment D (on edge of C/E). This area should be made safe (see section A3.3). Remove dead birch trees and mature sycamore on the bank, and create log piles with felled wood. It is proposed that the existing grassy open area is retained as an open glade, but any areas where sycamore and birch are removed, could be replanted with a low density of 50% pedunculate and 50% sessile oak. Undertake annual bracken control and weeding of sycamore seedlings.

A2 Establishment of new planting within buffer margin

New planting along the northern margins of the woodland edge is to be established to reduce massing and site impact when viewed from public vantage points to the east. This buffer zone will be at least 10 m wide between the woodland and southern boundary of the development, and will serve to enhance and protect the woodland edge ecology, and encourage people to use provided footpaths into the woodland.

Native shrubs will be planted using a natural layout pattern as suggested in Figure 4, within 5 m from the existing woodland edge. The native planting mix should comprise 30% blackthorn, 30% hawthorn, 15% rowan, 15% hazel, 5% wych elm and 5% cherry with native honeysuckle. There will then be at least a 5 m strip between the shrub layer planting and the development boundary where an appropriate native grass and wildflower mix will be sown. All planting should use native seeds and shrubs of local provenance.

Shrubs will be planted with tree guards to protect the young stems from rabbit or deer grazing damage.

The grassland strip should be mown or strimmed annually in early August to encourage development of wild flowers. Ideally, grass cuttings should be left in place, and turned at least twice over the following week to allow seeds to fall into the soil - then the cuttings should be removed to minimise nutrients entering the grassland, which will encourage wild flowers. The cuttings should then be piled into a compost heap which can provide further habitat.

A width of 5 m should be left unplanted with shrubs on the section next to the telecommunications mast, to allow future vehicular access to the mast.

A3 Removal / work to trees identified as hazard to safety

All wood from felled or managed trees should stay on site and be used to create further habitat (see E2).

Where safe to do so, tree work should be undertaken between September and February to avoid disturbing nesting birds. If not possible, a prior check for nesting birds (and bats) should be undertaken by an ecological consultant (see E5.2).

A3.1 Collapsed rowan tree (Compartment A) requires removing from the hung-up state and the adjacent trees it has fallen into and caused to collapse. The hung-up stem needs making safe. Indications it fell in the last 5 years, and now has new vertical growth.

A3.2 Fully mature sweet chestnut in decline (Compartment B). Twin stemmed with defective stem union. Bark damage and woodpecker holes. Leave as a song post at 10 - 12 m to increase the standing wood diversity. Work to make safe must check for bat roost / nesting bird presence first.

A3.3 Standing dead wood birch (Compartment C) with significant injury cracks in the dead wood.

Remove as close to footpath.

A3.4 Partially collapsed rowan (Compartment F) which is partially dead. Large cavity at ground level and on stem coalescence of decay. Leave as standing dead wood at 6 m final coronet cut.

A3.5 Collapsed birch (Compartment F) needs making safe. Polypore on stem, collapsed into adjacent specimens. Leave as a stump at 6 m with the remainder as a habitat pile.

A4 Thinning of sycamore standards and restoration of hazel coppice

It would be of benefit to thin a proportion of the sycamore standards in Compartment I, to allow more light to reach the hazel coppice and the woodland floor.

Standards should be removed in Year 1 to achieve a canopy cover of approximately 20 % in this area.

Coppicing of the hazel could begin in rotation with a view to continuing beyond the 10 years of this management plan. The area could be progressively coppiced in Years 2 and 3, and repeated in Years 9 and 10.

Rods from the coppiced hazel could be offered to local green woodcrafts people or community groups, or retained on site to form habitat piles.

A5 Regular survey of trees by an arboriculturist

An arboricultural consultant should undertake regular surveys of the woodland to check tree health and identify any particular trees which require remedial work or removal to ensure safety of the woodland users.

A5.1 Baseline survey of the woodland should be undertaken every two to three years. This should be undertaken by a Level 3 arboricultural surveyor.

A5.2 Supplementary surveys in between baseline surveys, certainly following winds in excess of Force 7/8. This should be undertaken by a Level 1 or 2 arboricultural surveyor.

4.3 ECOLOGICAL PRESCRIPTIONS

E1 Provision of bird and bat boxes throughout the woodland

E1.1 Bat boxes should be installed on trees by (or under instruction of) an ecological consultant to ensure the most suitable locations are chosen. Mature, healthy trees should be chosen, with a lack of lower branches which may clutter access to the bat box and they should be sited away from pathways. 1 - 3 bat boxes may be installed on the same tree at different aspects (east / south / west) to provide a range of conditions within the boxes. There should be some bat boxes on the woodland edges as well as inside the woodland including along the stream corridor. Bat boxes should be fixed at least 4 m high.

It is recommended that Schwegler boxes are used due to their construction of 'woodcrete', a

breathable blend of sawdust, clay and concrete which lasts for 20 - 25 years.

It is recommended that the following minimum numbers of bat boxes are installed throughout the woodland:

- ✧ x 10 Schwegler 2FN bat boxes (suitable for noctules and larger woodland bat species)
- ✧ x 10 Schwegler 2F bat boxes (suitable for smaller species such as pipistrelles)
- ✧ x 3 Schwegler 1FS bat boxes (suitable for maternity colonies of woodland species)
- ✧ x 2 Schwegler 1FW bat box (suitable for hibernation)

E1.2 A range of bird boxes should be installed by (or under instruction of) an ecological consultant to ensure the most appropriate locations are chosen. Bird boxes should be positioned away from cycleways or pathways, throughout the woodland. A variety of heights appropriate to the bird box type should be chosen to benefit different species and should mostly be located near understorey scrub to provide cover and food for both the emerging adults and fledglings.

It is recommended that as a minimum, the following bird boxes are installed throughout the woodland:

- ✧ x 20 Schwegler 1B nest box (32 mm entrance): 2 - 6 m height
- ✧ x 5 Schwegler 1N deep nest box (extra predator protection and favoured by robins): 1 - 1.5 m height in shady, damp areas
- ✧ x 5 No.5 Schwegler Owl Box: 4 - 6 m height

E2 Creation of habitat log piles throughout the woodland

Habitat piles should be created as and when work is undertaken to the trees. All wood from management work to the trees should remain on site, and be used to create log piles throughout the woodland and woodland edges, and within the northern buffer zone, to provide shelter, hibernacula and food for invertebrates, amphibians, reptiles and birds.

Brash should be chipped and used to lay in muddy areas on footpaths and/or as a mulch in the woodland play areas. The rhododendron or laurel which is due to be removed (see E3) should be chipped and re-used in this way.

E3 Removal of invasive non-native rhododendron and laurel shrubs and Himalayan balsam

The occurrence of rhododendron and laurel is scattered in compartments A and B, and Himalayan balsam were noted in Compartment H/I (although compartment J should also be checked along the stream corridor) - all these invasives are currently occurring at a low level so that eradication should be possible within the scope of this 10 year management plan.

E3.1 Rhododendron and laurel shrubs should be removed by cutting all of the branches and

applying approved herbicide directly to cuts made in the stumps. Any small seedlings should be hand pulled. The cut branches should be chipped and used as mulch on pathways or play areas. This should be completed in Year 1 with follow up surveys in Year 2 and 3 and Years 9 and 10 to identify and remove any new shrubs which have appeared.

E3.2 Himalayan Balsam should be removed by pulling out the mature plants between June and July before they set seed. A second 'pulling' session may be needed in late August - September to remove any late germinating plants. This should be completed in Year 1 and 2 with follow up surveys in Year 3 - 7 and 10 to identify and remove any new plants which have appeared.

E4 Bracken control

Bracken brings some benefits to the woodland by providing shade and cover which can benefit flowering species such as bluebell and climbing corydalis, both of which are found at Hanging Banks. It also reduces erosion on banks and slopes, and provides food for a range of invertebrates including moths and butterflies.

The main problem with bracken presence within the woodland is that, apart from out-shading intolerant woodland flora, the leaf litter contains chemicals which inhibit seed germination and seedling growth, which can stop natural regeneration of trees and understorey, and therefore affect the long-term sustainability of the woodland.

It is therefore recommended that annual bracken cutting is targeted in patches where the bracken is the dominant ground cover, but not on the steeper banks.

Compartments A, B, D and E were most notable for high bracken presence and should be targeted for control.

A minimum area of 100 m² (10 m x 10 m) in each compartment should be chosen, where the slope is less than 8 degrees and where bracken is dominant.

Bracken should also be controlled in areas where new tree planting is proposed (see A1).

The bracken fronds should be cut in mid-June and repeated in late July - early August. This should be repeated in the same locations in Years 1 - 4.

During bracken control, any sycamore seedlings noted to be regenerating should also be pulled or cut.

E5 Badger Survey

Prior to any works to create / maintain cycleways, footpaths and woodland play areas, tree planting or removal, an updated badger survey should be carried out by an ecological consultant in the area of work to check for any new or existing setts which may be affected by the works.

Where active badger setts exist, the following work must not be undertaken without a licence:

- Hand digging / tools within 10 m (including tree planting)
- Light machinery within 20 m (including chainsaws and other electric hand tools)
- Heavy machinery within 30 m (including mini - diggers and other vehicles)

Where necessary, the consultant would advise on the course of action, depending on whether the action could be changed to accommodate the badger sett, or whether a licence would be required.

E6 Bat and Nesting Bird Survey

E6.1 An assessment of trees for roosting bats should be undertaken prior to removal of any mature trees to identify any features which are potentially suitable for roosting bats. Features that may be used by roosting bats include knot and rot holes, woodpecker holes, peeling bark and dense ivy.

For trees assessed to be of moderate to high potential for bats, survey should take the form of several emergence / dawn surveys between May and September, or if safe to do so, by climbing endoscope inspection.

If the tree requires urgent removal for health and safety, and the appropriate surveys cannot be undertaken, the tree should be soft-felled, and any limbs containing features suitable for roosting bats checked by a consultant once on the ground.

E6.2 Generally tree works should take place outside of the bird breeding season (i.e. between September and February), but if any urgent work is required between March and August, a check for nesting birds should be undertaken by an ecological consultant immediately prior to the work taking place. Any active birds nests found must remain untouched until chicks have fledged.

4.4 USER PRESCRIPTIONS

U1 Creation of cycleways and pathways

To minimise impact on the ground flora, cycleways and pathways should aim to follow the network of existing well used paths in the woodland. There is an existing wide pathway which runs from the south-east to the north-west of the woodland which is suitable to follow as a basis for the cycleway.

Currently the paths are on existing ground; it is recommended that use of geo-textile, geo-web and geo-grid products are laid down to form a suitable path to allow cycling. The geo-grid is laid down with suitable material laid on top; a reinforced sand or grass track may be used (see Appendix 3 & 4). This should be in consultation with an arboriculturist to ensure that existing tree roots are not damaged.

A badger survey will need to be carried out immediately prior to implementation (see E5).

A detailed Method Statement of implementation should be prepared for the cycleways and pathways.

U2 Creation of woodland play areas

A number of woodland play areas are planned along the main cycle way. These should be located in open areas which are largely devoid of mature trees, and where the ground flora is dominated by bracken or bramble, to minimise damage or disturbance to the trees and spring flora such as bluebells.

Some minor tree felling may be required; specimen native trees (particularly oak) should be retained, and non-natives (sycamore) and quick growing trees (birch) targeted for removal where it is necessary.

The play areas should be at least 30 m from the existing badger outlier setts (see Confidential Badger map for locations).

A badger survey will need to be carried out immediately prior to implementation (see E5).

A detailed Method Statement of implementation should be prepared for the play areas, with overview of an arboricultural consultant and appointment of an arboricultural Clerk of Works during works.

U3 Formation of a local conservation volunteer group

This is a recommended measure which will be ongoing throughout the span of the initial ten years of management, with a view to taking on some aspects of woodland management in future.

It will require advertisement within the woodland and local estates to appeal for interested volunteers to form a group to take on some practical management tasks in the woodland.

Tasks that volunteers may be able to help with include identification and removal of invasive species (Himalayan balsam, rhododendron, laurel), coppicing of the hazel, maintenance of footpaths, maintenance/replacement of bird and bat boxes (NB. bat boxes must be checked by a licensed bat worker prior to cleaning or replacement) and fund raising / grant applications to initiate a longer-term management plan and future tree works.

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APPENDIX 2: FIGURES

Figure 2: Woodland Compartments

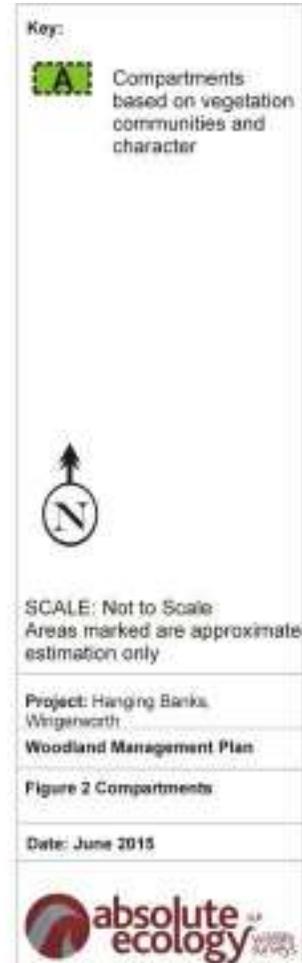
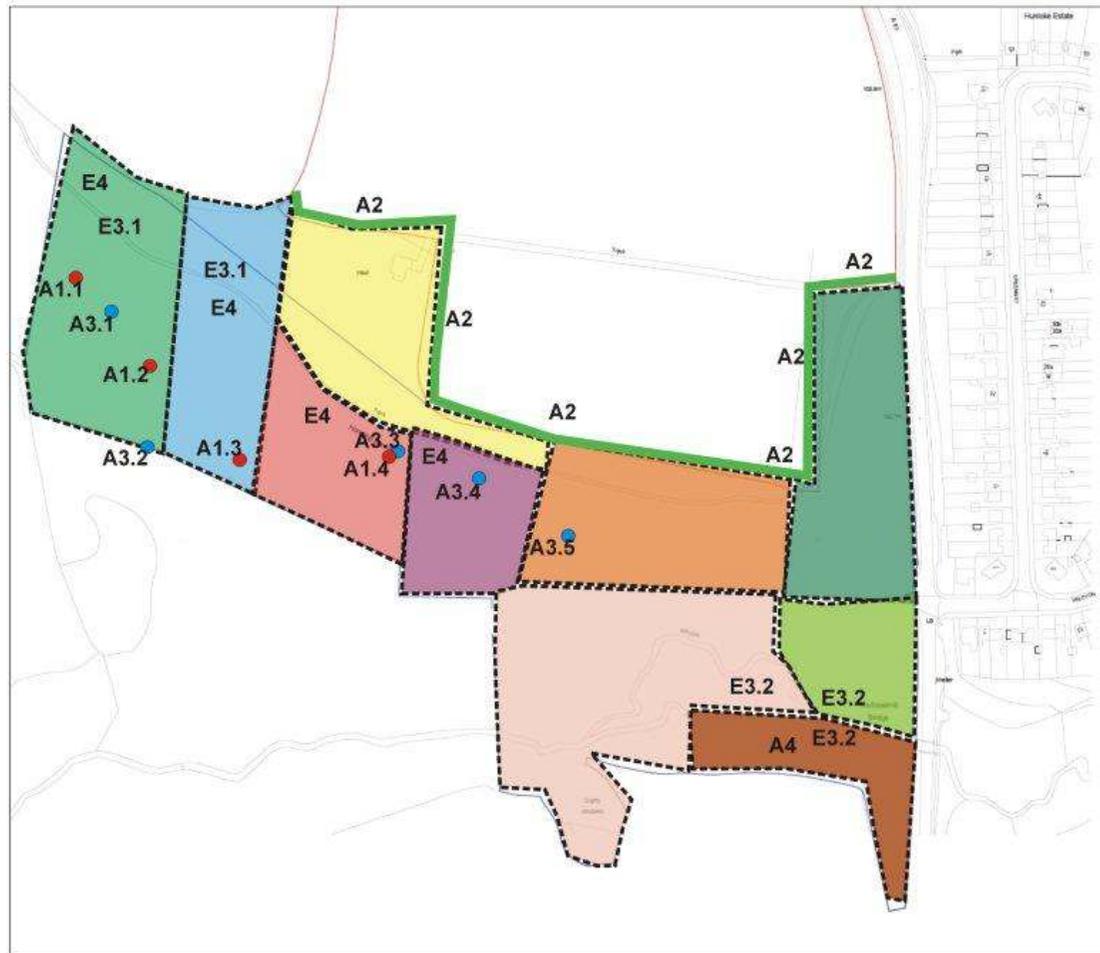


Figure 3: Management map



Key:

- Areas for replanting
- Trees which require removal
- ▬ New planting buffer



Project: Hanging Banks, Wingerworth

Woodland Management Plan

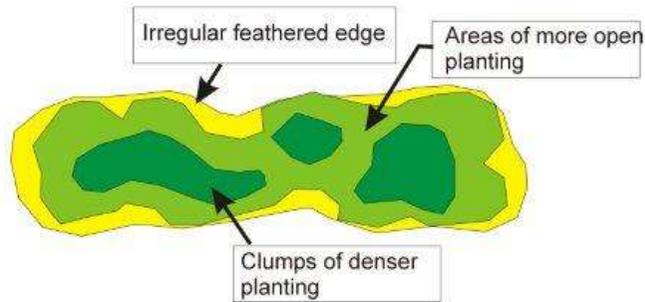
Figure 3: Map of management prescriptions

Date: June 2015



Figure 4: Planting guide

SHRUB PLANTING IN WOODLAND EDGE BUFFER ZONE



This pattern can be repeated throughout the buffer zone, inverted or mirrored as appropriate to create naturalistic open glades and areas of denser planting.

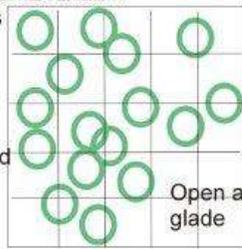
Key:

TREE PLANTING IN WOODLAND

Semi-natural woodland

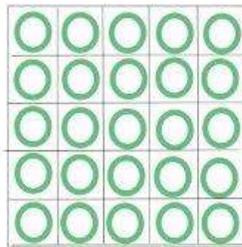
Edges generally lower density but some random denser areas

Open or feathered edges



Open area - glade

Traditional planting layout



Planting in a regular grid like this is not acceptable

Typical woodland planting areas (not to scale) showing denser planting concentrated towards the centre with more widely (but still varied) spacing feathering out to the edge. Plants to be positioned at random centres, including approximately 3% of the mix planted in small groups in the same planting pit or positioned very close together. Only small groups of the same species type to be planted in the same pit.

Project: Hanging Banks, Wingerworth

Woodland Management Plan

Figure 4: Planting guide

Date: August 2015