

2 – The Project



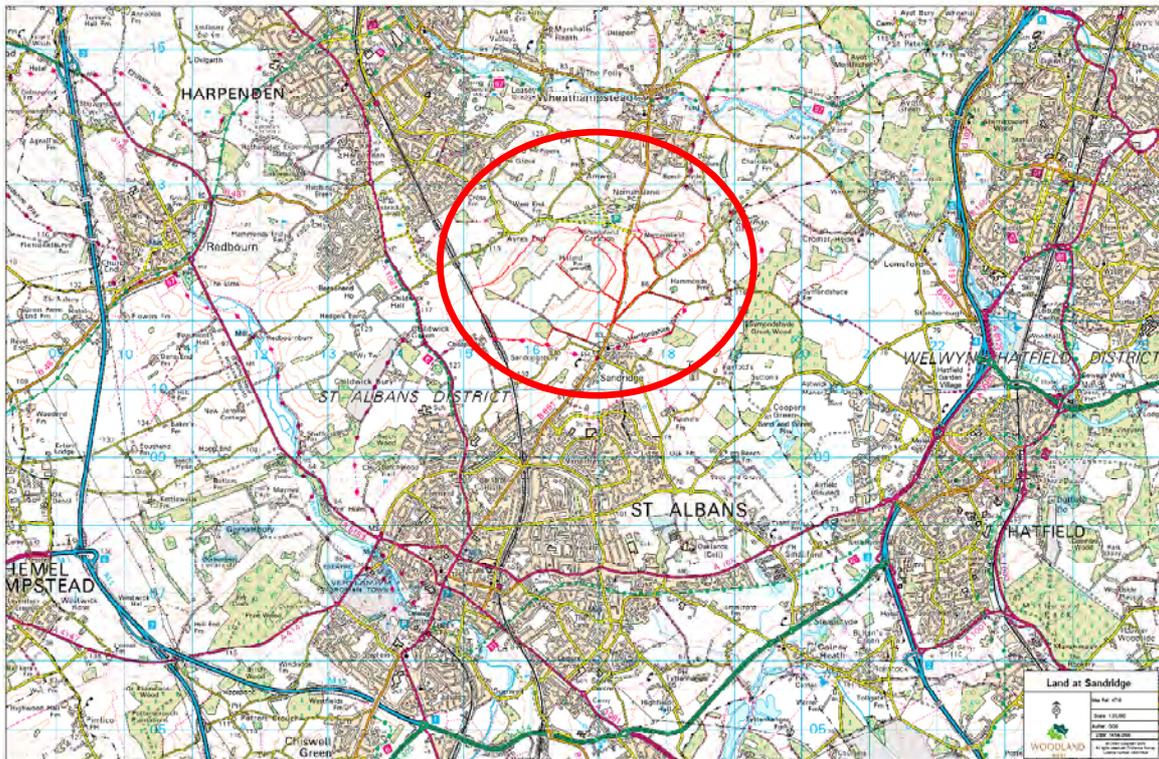
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2.1 Location

2.1.1

The proposed site for Heartwood Forest lies within the London green belt, adjacent and to the north of Sandridge village within the district of St Albans. The site is within close proximity of the villages of Wheathampstead and Harpenden to the north and within 3 miles of St Albans town centre. (See Volume 1, Appendix 1). Grid reference for the centre of the site is TL 168118.

The B651 bisects the land running north south from Wheathampstead to St Albans, and minor country lanes also cross and are adjacent to the site to the east of the B651, (see Volume 1, Appendix 6)



2.1.2

The site is bordered to the north by Nomansland Common (see Volume 1, Appendix 7), designated a county wildlife site extending to 53.2ha, and a significant habitat, comprising lowland acid and neutral grassland and heathland, both local Biodiversity Action Plan (BAP) habitats, and secondary broadleaf woodland. The majority of land use adjacent is arable farming, with some grazing land adjacent along the southern boundary, and to the north west by Nomansland Common. (See Volume 1, Appendix 8)

A section of the western boundary borders the Midland main line railway.

2.1.3 (See also Volume1, Appendix 9)

The site is well-linked to existing public access routes. An established and well-used surfaced bridleway runs through the site from Pound Farm and exits to the north-west. A less formal unsurfaced bridleway also runs across part of the land from Nomansland Common, running east – west, passing north of Nomansland Farm.

The site has good footpath links, and of particular interest are several direct access points from the Hertfordshire Way, a 166 mile long distance circular path, which also links to Sustrans cycle routes from Harpenden and St Albans. Nomansland Common adjacent to the north has public access and includes a well-used car park.

2.2 The existing site

2.2.1 Soils and geology

The predominant soil-type association is Batcombe (582a), described as fine silty over clayey and fine loamy over clayey soils with slowly permeable subsoils and seasonal water logging. This soil type is found across the entire site, except immediately adjacent to both sides of the B651 road and the field directly to the east of the B651. Here the soil type is classified as Charity 2 (571m), described as well-drained flinty fine silty soils in valley bottoms.

2.2.2 Extent and habitats (see section 6 for assessments)

The site for Heartwood Forest extends to 345ha.

Farm business tenancy – A farm business tenancy agreement (FBT) is in place on the site to continue an element of farming until the land is required for planting. Public access is not available over the land covered under the farm business tenancy. The Woodland Trust will take full control and responsibility for 70ha in September every year when the land will be available for planting and public access. The first 70 Ha was available in September 2008. Some land may be offered back to the tenant from this annual 70ha transfer for further cropping in the short-term to



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fit with proposed planting schedules. The proposed FBT surrender areas are shown in Appendix 10.

The majority of the site, approximately 326.7ha is comprised of grade 3 arable land described as being of the Batcombe 582a and Charity 2 571m series.

Some areas presently used for environmental stewardship measures as summarised below as a result of a previous agreements put in place by the current tenant farmer. The agreement and future responsibility for the maintenance of these measures lie with the current tenant and will not transfer to the Woodland Trust.

2700 m in EB1 hedgerow management
8000 m in EB2 hedgerow management
6500 m in EB3 hedgerow management
4.4 ha in 6 M buffer strips
7.02 Ha in field corners (non management)
0.88 Ha in uncropped cultivated field margins
3.0 Ha in wild bird seed mixture

(See also Volume 4 Appendix 1, Phase 1 habitat map – existing habitats)

Ancient Semi-Natural Woodland (ASNW) occupies 17.8 Ha of the land area. It is present as four isolated blocks (see Appendix 10) all of which have grass buffer strips and arable land on the boundaries, with the exception of Langley Wood which shares its south-eastern boundary with grazing land and the eastern boundary with grass strips and a surfaced bridleway.

The ancient woodlands within Heartwood Forest have County Wildlife Site (CWS) status and are significant pockets of semi-natural habitat, being one of the priority habitats within the local and UK Biodiversity Action Plans (BAP).



Fig.2-2 Langley Wood,
Heartwood Forest

Designations:

Ancient Semi-Natural woodland
CWS

Approximately 6065m of ancient hedgerows are present, and contain a mixture of species including hazel, hawthorn, field maple, hornbeam and blackthorn. Some contain remnants of iconic ancient woodland ground flora species such as bluebell and dog's mercury, indicating their presence over a long period, and links over time to ancient woodland

There are no water courses or existing permanent areas of standing water within the proposed Heartwood Forest boundary.

2.2.3 Species

Assessment of species of conservation concern is detailed in section 6. (Full wildlife reports are included in Volume 4 Appendices 1-4)

Within the site for the proposed Heartwood Forest, a number of interesting species occur which would be expected given the location and habitat types present.

Notable species identified through surveys (survey information does not exclude the presence of species not recorded, and is considered a 'snap shot' of sightings at a particular time and place):

- Several active badger setts are present.
- Birds. A total of 36 species were recorded over two visits. Notable species include five red list species (Birds of Conservation Concern list 3) skylark, yellowhammer, song thrush, linnets and bullfinch, and another eight which appear on the amber list.

- A total of 20 different butterfly species were recorded, largely associated with woodland edges. None of the species recorded are considered particularly rare or endangered, and commonly occur in the locality.
- The Ancient Woodlands contain a good range of species, associated with ancient woodland habitat including bluebell, wood anemone, yellow archangel and dog's mercury. Within the farmland conservation areas, species classed as arable weeds were identified, all of which are classed as species of least conservation concern source - The International Union for Conservation of Nature (IUCN) Red List of Threatened Species.

2.2.4 Landscape and topography

The site for Heartwood Forest lies within an undulating rural setting of mixed fields, largely arable with some woodland and hedgerows. The Heartwood Forest site lies between two dry valleys with a flat-topped ridge, and includes some lower lying flat fields. Historically, evidence suggests a long periods of open character, but also periods of high woodland cover, Hertfordshire was perhaps one of the most wooded counties in England at the time of the Domesday book. The current landscape is the result of forest clearance throughout mediaeval times for agriculture. The site is visible from many distant points and also contains some key views outwards, particularly from the ridge slopes overlooking Sandridge village, and through the valley to the north. (A number of panoramic photos are available and are included in Volume 3 Appendix 2)

Part of the site is designated as a landscape conservation area and the whole site is designated as green belt land. The site falls into three landscape character assessment areas as defined by the Hertfordshire Landscape Character Assessment (2001). The site lies close to the Sandridge village conservation area. Landscape and historic landscape context is explored in more detail within section 5.

2.2.5 Public access

Prior to Woodland Trust ownership, public access was limited to two sections of bridleway totalling 2100m, approximately 1200m of which is surfaced, and Langley Wood as part of a countryside stewardship agreement. A footpath also runs adjacent with the B651, accessed from Nomansland Common and Sandridge village.

Langley Wood is considered locally as a key 'hot spot' for local access, and huge numbers of people visit over the end of April when the bluebells are in flower. Consultation events and feedback locally indicates current local use within these areas is predominantly dog walking, horse riding and cycling, with occasional use by walkers linking longer routes throughout the area. The designated public access routes are incorporated into local publications promoting walks in the locality.

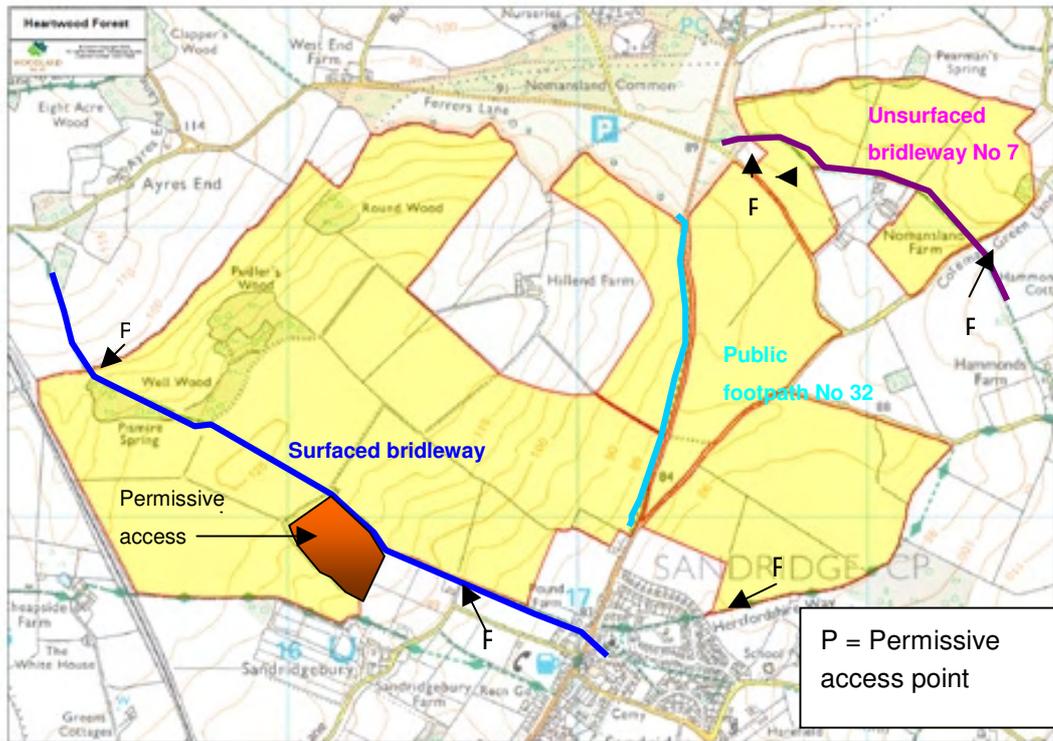


Fig.2- 3 Overview of existing site access, prior to Woodland trust ownership.

2.3 Project aims and objectives

2.3.1

To create England's largest continuous new native forest

The Woodland Trust would like to see a doubling of native woodland in the UK. The UK is one of the least wooded areas in Europe. The total land area for Heartwood Forest is 345ha, we aim to plant approximately 600,000 native broadleaved trees which will require a minimum of 247ha equating to 71% of the land area. Approximately 79ha of open space habitat have been incorporated into the design in the form of wild flowers, paths, rides and glades, where there are limitations to planting and where landscape, views and access are important.

2.3.2

To protect existing ancient woodland and woodland biodiversity

17.8ha of ancient semi-natural woodland are included within the site which exist in three main woods. We will protect these areas through buffering and linking them with new habitat creation.

2.3.3

To create an inspiring place for people and to engage people in the natural world

We believe Heartwood Forest will become, over a number of years, a well-visited site both in terms of physical visits and through creative communication via web-based activity and education resources. The Woodland Trust believes every child should have the chance to plant a tree. We see Heartwood Forest as providing this opportunity for significant numbers of local children.

Physical visits to Heartwood Forest will be a key way of engaging with people and we would like to see a significant number of people choosing Heartwood Forest as a place to visit the countryside in Hertfordshire. The number of people visiting the forest is expected to increase steadily over the first 10 years, through a variety of available access and transport links, and for various quiet recreational activities. Predicted visitor estimation is shown in section 7.3.2

We will achieve this through:

- Creating a large new native forest, involving people in its creation encouraging a long-term feeling of ownership and association locally and within the St Albans district in particular.
- Provide free permissive access on foot to the whole of the site and access to specialist user groups where agreed and appropriate, and enhance this use through on-site interpretation and provision of places of interest.
- To offer information to encourage and support visits through the use of web and other media.
- Offer education opportunities through links with schools, colleges, and through the provision of free access, information provision and web-based resources.
- Offering the chance to plant trees to large numbers of people and schools.
- Through the creation of partnerships with local businesses to ensure they benefit from increased visiting to the area, and to provide refreshments/services to visitors.
- Promoting access via cycling, on foot or by public transport (with the aim that more than 50% of visitors come by these means) and by linking up with footpath and cycling networks.
- By offering volunteering opportunities and building wider support for woodland and tree issues, and eventually we hope there will be local community woodland group established to help care for the site and its visitors.
- Creating partnerships with local education and tourism initiatives and with other green spaces and public amenities to ensure we link in with existing activities and organisations.

Heartwood Forest will be a place people will want to use. Being close to high populations (109,500 within 5km) there is lots of potential for people throughout Hertfordshire to recognise the wood as one of the more desired areas of countryside to visit and become involved in. Heartwood Forest is

accessible in less than 1 hour from the centre of London, and we will promote green and healthy visiting (access by cycling, walking and public transport).

2.3.4

To be a demonstration site –

Heartwood Forest will be a place where we can inspire people about

- Why woodland creation is important (both to public and decision makers).
- What the Woodland Trust is about – woodland creation at the heart of what we do.
- How mass people engagement can be achieved, different ways of involving people and creating new access facilities and the benefits of this in terms of local and national appreciation of woodland.
- Different ways to best create woodland, methods and thinking behind large scale habitat creation.

2.3.5

To secure national and local support –

- We aim to maximise the success of the project by encouraging and engaging with people at a local and national level to secure support of the project. We will do this by ensuring project updates are regularly available to local people and supporters, as well as going through a detailed consultation process. Major decisions will, where possible, be considered in a local context with local peoples' support.

2.4 Implementation

2.4.1

Planting

The tree planting phasing for Heartwood Forest is proposed to be over 10 years. This is important for the following reasons:

- Risk from major drought in any one year, is spread between years, reducing overall risk financially.
- A longer establishment phase will allow for maximising the opportunity for people involvement.

- A longer establishment phase will reduce the impact of change over a longer period, thereby gradually developing the landscape.
- A longer establishment period will allow fine tuning of planting and access as new opportunities present themselves allowing a greater degree of flexibility in the medium term.

Planting year	Number of trees	Net area for woodland creation (ha)
2009/2010	85000	38
2010/2011	85000	38
2011/2012	85000	38
2012/2013	85000	38
2013/2014	45000	20
2014/2015	43000	19
2015/2016	43000	19
2016/2017	43000	19
2017/2018	43000	19
2018/2019	43000	19

Table2 -1. Phasing of planting

Tree species

The density and proportions of different tree species to be planted will vary across the site to give variation and interest both to visitors and wildlife. Planting density will usually be 2250 stems/ha, 2.1m spacing, however this may be reduced in some areas where the proportion of open ground is high, such as group planting and where roundels and groups of small copses are planned. Species selection is based on composition of woodlands in the surrounding area, soil type and wildlife interest and will be based on the following dominant and subdominant species.

In any planting year, shrub species will not make up more than 40% of the overall species planted, and will be concentrated along path/ride edges and boundaries with roads and houses.

Common name	Scientific name	Approximate planting percentage range	Group range
Major tree species			
Common oak	<i>Quercus robur</i>	15 - 40%	50 - 70%
Sessile oak	<i>Quercus petraea</i>	15 - 40%	
Ash	<i>Fraxinus excelsior</i>	15 - 30%	

Common name	Scientific name	Approximate planting percentage range	Group range
Hornbeam	<i>Carpinus betulus</i>	15 - 30%	
Minor tree species			
Field maple	<i>Acer campestre</i>	5 - 15%	20 - 30%
Wild cherry	<i>Prunus avium</i>	5 - 15%	
Silver birch	<i>Betula pendula</i>	5 - 15%	
Aspen	<i>Populus tremula</i>	5 - 10 %	
Mountain ash	<i>Sorbus aucuparia</i>	5 - 10 %	
Small leaved lime	<i>Tilia cordata</i>	5 - 10 %	
Goat willow	<i>Salix caprea</i>	5 - 10 %	
Shrub species			
Hazel	<i>Corylus avellana</i>	5- 10%	10 - 20%
Hawthorn	<i>Crataegus monogyna</i>	2 - 5%	
Blackthorn	<i>Prunus spinosa</i>	2 - 5%	
Guelder rose	<i>Viburnum opulus</i>	1 - 5%	
Dog rose	<i>Rosa canina</i>	1 - 5%	
Spindle	<i>Euonymus europaeus</i>	1 - 5%	
Holly	<i>Ilex aquifolium</i>	1 - 5%	
Crab apple	<i>Malus sylvestris</i>	1 - 5%	

Table 2 -2. Planting species.

2.4.2

Ground preparation

Prior to planting the ground will be prepared using either one, or a combination of the following methods:

- Grass sowing – To create a thick grass sward helping to prevent the establishment of noxious weeds such as creeping thistle and ragwort.
- Wild flowers – To create a visually appealing ground cover which helps prevent the establishment of weeds, particularly where permanent open space is planned between planting, and planting is more 'open'.

- Soil inversion – Top and subsoil is inverted to 'bury' the potential weed seed preventing it growing back, and creating a nutrient poor top layer which helps prevent further weed establishment. This technique can work well with wild flower establishment (working title: "Forest of Flowers"). High potential impact for underground archaeology and requiring further evaluation and mitigation and likely to only be used in very limited areas.
- No preparation – Planting directly into stubble, high potential for weed establishment and therefore high post planting maintenance.

2.4.3

Weeding

All trees planted will require weeding for a minimum of three years to reduce competition for nutrients and moisture immediately around them. We will use the following methods:

- Straw mulching – This would be the preferred option and has a number of environmental benefits. It negates the need for chemical weeding, and from experience on other Woodland Trust planting sites, holds soil moisture better than produced mulch mats and chemical weeding, helping to reduce root exposure through drought conditions. Research conducted by the Woodland Trust would indicate a higher establishment rate and growth rate using this method when compared against other known methods. Straw can be sourced locally and is completely biodegradable.



Fig.2 - 4. Oak sapling mulched with straw.

- Chemical weeding – Application of glyphosate (Round-Up) twice a year for three years at 1m diameter around each tree. Effective weeding can be achieved.

- Interrow mowing – The mowing of vegetation between planting rows. We may consider this where weed control is needed or the vegetation height is considered to be detrimental to tree establishment.

2.4.4

Mammal control

The grazing and browsing effects from rabbits, deer and hares (UK BAP species) can significantly inhibit or prevent the successful establishment of trees. Ongoing advice from mammal groups and the Deer Initiative will be sought. There are a number of options available:

- Protection through the use of 1.2m tubes. This would be effective in the protection of young trees; however the visual impact during the establishment phase would be short-term, significant and negative given quantity of tubes required. The environmental effect of landfill is also a significant and negative effect given they are usually not biodegradable.
- Protection through the use of 60cm sleeves/spiral guards can be effective against rabbits, however hares and deer will still be able to graze new saplings. The environmental effect of landfill is also an issue, given impact significant and negative. Impact on the landscape would be short-term and moderate.
- Deer fencing – Effective at excluding deer, and when combined with rabbit netting can be effective for rabbits and hares, however impact on landscape and internal views/visitor experience likely to be medium-term, significant and moderate.
- Rabbit fencing – Effective for rabbits, and when combined with line wires can offer some protection against hares. Ineffective for deer.
- Deer management groups (DMG's), to look at deer population management over a large area involving different land owners.

2.4.5

Natural regeneration

It is our intention to utilise natural regeneration where it is considered likely that tree establishment will occur reasonably quickly. Research suggests seeding density drops off significantly beyond 40m of the parent seed source; therefore this will be targeted close to existing woodland and extensive hedgerows. (See volume 1 Appendix 22, Forestry Commission research paper on natural colonisation). This will be close to existing woods and extensive hedges. Areas of Heartwood Forest are already showing good potential for natural regeneration, where it is already occurring on areas left uncultivated in 2008.



Fig 2- 5. Natural regeneration (July 2009), south of Puddler's Wood

Where natural regeneration is being used, a stocking density of 2250 stems/ha will be sought after five years, and supplementary planting used where necessary. Naturally regenerating trees will not be subject to weeding, and no species selection will take place except for non-native species. Ground disturbance to improve the establishment rate may be adopted where it is felt appropriate, and rabbit fencing will be used where there is a high damage risk.

2.4.6

Direct seeding

Direct seeding of tree seeds may be adopted to provide a different visual and more naturalistic approach to woodland creation in some areas.

Direct seeding of tree and shrub seed involves preparing a seed bed (similar to grass sowing), and sowing directly into the prepared soil, and can be a very effective method of establishing areas of woodland. A final minimum density of 2250 stems after five years would be sought. Given the random spacing, on-going weed control can be difficult and costly

1.5 Long-term forest management

2.5.1

Following establishment (first 5 years), the woodland planting areas will be allowed to develop without further intervention, allowing for natural self-thinning and species composition to develop over time. Where we may actively manage through thinning/coppicing, the rationale for this would be based on –

- Need to maintain open paths.
- To purposely create a more open feel for security or aesthetic appeal in specific locations.
- Tree safety.
- Local fuel/products requirement where community benefits can be demonstrated.
- Disease control.

Management of existing ancient woodlands will be considered within the long-term management planning process, and is therefore not considered as part of this EIA process.

2.6 Orchards at Heartwood Forest.

2.6.1

Through the initial public consultation, a strong local opinion was to include an orchard. The land proposed for Heartwood Forest has a history of some orchard use in the past.

2.6.2

The location covering 5ha for the orchard has been chosen based on the desire to have it close to the village, and the intention is that it becomes a locally driven project. Planting stock will be chosen using local varieties of fruit, and planted at approximately 10m spacing. (100/ha)

2.7 Meadows at Heartwood Forest

2.7.1

The rationale for creating meadows at Heartwood Forest is: for the following reasons

- Where significant open ground is required for landscape reasons.
- To retain views from the inside, looking out.
- Where open ground is considered important aesthetically for visitors.
- To provide open ground for biodiversity value.
- To protect significant underground archaeology.
- Underground services.

2.7.2

Creation of meadows

There are three main methods which may be used to create meadows at Heartwood Forest.

- Direct seeding – Use of wild flower seed with grass seed, directly into prepared seed beds. Flower species and grass seed would be suitable for the local soil types.
- Hay spreading – Either into existing grass sward or directly onto prepared seed beds. The hay sourced would be from meadows on similar soils and from the East of England, ideally Hertfordshire.
- Soil inversion. (See also 2.4.2) Top and subsoil is inverted to 'bury' potential noxious weed seed, and creating a nutrient poor top layer ideal for sowing wild flower seed. Some good results have been achieved on other Woodland Trust sites.



Fig.6. Example of wild flowers by soil inversion at Londonthorpe, Lincolnshire.



Fig.7 Wild flowers through spreading hay – Fordham Hall, Essex

2.7.3

Long-term management of meadows.

Where open space has been created in the form of meadows and paths, our intention in the long term will be to retain these areas as predominantly open, accepting, where appropriate, up to 20% scrub as an element of the open ground habitat itself. This will be achieved through mechanical means, selecting a cutting regime appropriate for the habitat, and by its intended purpose. In the long term, grazing may be considered an option where it is cost effective, sustainable and appropriate for current use.

2.8 Other Habitats

2.8.1

Hedgerows will be maintained and managed through cutting, and where appropriate, laying, where they are outside the woodland planting areas. Within woodland areas, hedges will be allowed to expand and become integrated within the woodland block.

New hedges and hedgerow trees will be planted where they offer screening which is not offered by the woodland planting, and where they enhance or aid visitor access.

2.8.2

There are currently no water courses or areas of permanent standing water across the site. Following further investigation of soil depth and suitability, a number of ponds may be incorporated of varying size and location.

2.9 Infrastructure

Heartwood Forest will become a well-visited countryside location, with a variety of visitor ages, interests and reasons to visit. The methods of transport will also vary including walking, cycling, horse riding, bus and driving. To manage visitor access, a number of provisions are proposed.

2.9.1 Car Park

Local consultation walks, talks with St Albans City and District Council, Hertfordshire County Council and Sandridge Parish Council confirm the need for a car park. In addition, evidence locally is that the car park at Nomansland Common has no additional capacity at peak visitor times, and a car park at Heartwood Forest may serve to relieve the pressure on existing spaces. Consultation locally also indicates excessive speeding in the 30mph zone through Sandridge village and the car park proposals aim to help reduce vehicle speed in this area. A number of car parking spaces are available within close proximity to the proposed forest (see Volume 1, Appendix 12), however a large proportion of these are privately owned. The options, rationale, specifications and impact are considered in detail in section 7.

2.9.2 Paths

Heartwood Forest will incorporate a number of different path types, to link existing and established entrances from public rights of way, providing both 'through' routes incorporating wider access opportunities, as well as providing an interesting and varied series of routes within the forest to different areas and points of interest catering for people of different abilities and interests. We will not be creating any new designated paths, but will be providing a series of

permissive access routes throughout the site.

- Grass paths – ranging from approximately 20m wide to 40m wide, these will be sown with grass, some including wild flower mixes. These paths will be implemented where high traffic numbers are expected, where multi-use will be permitted, where smaller, informal paths are required and for links between bridlepaths.
- Access for all paths 1. Surfaced paths to facilitate a full range of access abilities. These paths will be approximately 1.2m wide and provide a consistent standard of path. (For specification see Volume 1, Appendix 13)
- Access for all paths 2 – Surfaced paths which facilitate pedestrian access and cycle access. Used to link existing internal and external cycle access routes and provide a limited internal network of routes. (For specification – see Volume 1, Appendix 14)
- Existing paths. All existing paths will be retained as present with the exception of the footpath along the western side of the B651 (No 32) which we would like to see in the future upgraded to a bridleway as part of our long-term access aspirations, making a safe link for horse riders between Sandridge village and Nomansland Common. The surface type and condition of designated public rights of way surfaces are the responsibility of the county council.

2.9.3 Interpretation

The interpretation and information provision plans for Heartwood Forest will be developed over the next 12 months, much of the information will be web-based and in the form of leaflets available locally and downloadable from the internet, however there will be some information and features on-site such as information boards and signs designed to help inform visitors. A full interpretation and engagement plan will be available during 2010, including plans for education material, public participation and on-site information. Interpretation and information provision is considered outside the scope of this EIA, given that significant environmental impact is unlikely to occur, however impacts of visitor use on the site will be considered as part of the on-going process.

2.10 Assessment of impacts through project implementation - significance and effects

There are different methods available to implement the project, discussed above. The different methods are assessed below to assess their potential impact.

Significance – Potential magnitude of impact High (H), Medium/Moderate (M) Low (L)

Effects – Positive (+), neutral (O), negative (-) environmental effect

Impact on -	Method	years 0-10	years 11-40	years 41 +	Explanation
archaeology	Tree planting	See section 4	See section 4	See section 4	Tree root development has the potential to damage significant archaeology.
	Ground preparation – Soil inversion	H-	N/A	N/A	Potentially destructive to archaeology as it involves deep-ploughing techniques.
	Ground preparation - other methods	L O	L O	L O	Little impact compared to current farming practices.
	Weeding	L O	N/A	N/A	
	Mammal control	L -	N/A	N/A	Low/improbable chance of post hitting underground archaeology and permanently damaging it.
	Meadow creation – Soil inversion	H -	N/A	N/A	Where soil inversion techniques are used.
	Meadow creation – other methods	H +	H +	H +	Archaeology preserved in situ.
	Other habitats	M -	L O	L O	Medium significance where large ponds are proposed – would require further discussions with district archaeologist. New hedge planting would need to avoid known archaeology.
	Infrastructure	L O	L O	L O	Specification unlikely to disturb soil below already damaged archaeology contained within plough depth, however all path and car park plans will be developed with further consultation between the Woodland Trust and county/district archaeologists.
	Car park	L O	L O	L O	As infrastructure above.
	Interpretation/ education	M +	M +	M+	Awareness through education of local history/heritage.
Landscape	Tree planting	M O	M O	M O	Gradual change will reduce impact – see section 5.
	Ground preparation for planting – Soil	H +	M O	L O	Wild flowers amongst trees will adapt to tree growth and be less dominant in the

Impact on -	Method	years 0-10	years 11-40	years 41 +	Explanation
	inversion and wild flowers				landscape over time.
	Ground preparation for planting – other methods	L O	L O	L O	
	weeding	L O	NA	NA	
	Mammal control - Tubes	H -	NA	NA	Approximately 600,000 tubes will have short-term, but significant negative impact on landscape.
	Mammal control – deer fencing	M -	M -	NA	Deer fencing would be visible in sensitive areas and to some people a negative impact.
	Meadow creation	H +	H +	H+	Wild flowers would be visible from inside and outside the site, likely to be considered a positive impact. Maintains a mixed and partly open feel.
	Other habitats	L O	L O	L O	Hedges already frequent in landscape. Ponds unlikely to be visible from surrounding landscape.
	Infrastructure	M -	M O	M O	Surfaced paths will be partly visible in early stages.
	Car park	M -	M O	M O	Car park and visitors initially visible. As screening and woodland develops, the impact will be reduced.
	Interpretation/education	M +	M +	M +	Increased awareness of local landscape importance and increased sense of 'place' as project develops.
Flora and Fauna	Tree planting	M + See also section 6	H + See also section 6	H+ See also section 6	Biodiversity value of site will increase. Initial benefit through reduction in intensity of land between and around ancient woodlands and through phased planting, resulting in an increase in undisturbed, long grass habitat between planted trees. Long-term habitat diversification as forest matures will increase benefit.

Impact on -	Method	years 0-10	years 11-40	years 41 +	Explanation
	Ground preparation for planting – Soil inversion and wild flowers	H +	H+	M+	Additional wild flower habitat available, modified over time by tree growth.
	Ground preparation for planting – other methods	M +	M +	M +	Biodiversity benefit from conversion from arable crops to semi-natural habitat.
	Weeding	L 0	NA	NA	Likely to have little impact as short-term biodiversity gains initially through establishment of semi-natural habitat. Chemical use insignificant compared to previous farming practices.
	Mammal control - Tubes	L 0	L 0	L 0	
	Mammal control – deer fencing	M -	M -	NA	Reduced capacity for large mammal movement, e.g. badgers.
	Meadow creation	H +	H +	H+	Habitat diversity through provision of open space. Increased potential accepting some scrub habitat as an intrinsic part of open habitat.
	Other habitats	H +	H+	H+	The creation of ponds is likely to have significant biodiversity benefit, particularly as the baseline is zero.
	Infrastructure – Surfaced paths	L 0	L 0	L 0	Surfacing unlikely to provide a significant habitat. Surfaced paths to be created on ex-arable land, therefore there was little prior biodiversity benefit
	Grass paths and rides	M +	H +	H+	Provides open-space linkages, ride edges will provide scrub and edge habitat, providing habitat diversity. As woodland matures, rides will increase in significance.
	Car park	L 0	L 0	L 0	Surfacing unlikely to provide a significant habitat. Visitor numbers unlikely to increase significantly the chance of animal road traffic accidents given present baseline use.
	Interpretation/education	H +	H+	H+	Increased awareness of natural heritage and environmental protection.

Impact on -	Method	years 0-10	years 11-40	years 41 +	Explanation
Population and access	Tree planting	See section 7	See section 7	See section 7	Opportunities to be involved in the creation of the woodland. Increased opportunity for access and recreation, healthy living.
	Ground preparation for planting – Soil inversion and wild flowers	H+	H +	H+	General overall perception of wild flowers, whilst subjective, is positive.
	Ground preparation for planting – other methods	L 0	L 0	L 0	
	Weeding	L 0	L 0	L 0	
	Mammal control - Tubes	M -	M -	NA	Increased landfill potential. Visually unappealing.
	Mammal control – deer fencing	M -	M -	NA	Potential access limitations through high deer fencing if used.
	Meadow creation	H +	H +	H +	Creation of open space and variety, both internally and within landscape considered beneficial.
	Other habitats	H +	H +	H +	Increase in biodiversity will increase visitor enjoyment and interest.
	Infrastructure – Surfaced paths	H +	H+	H+	Increased reason to visit, other than by car. More variety and access opportunity for all abilities.
	Grass paths and rides	M +	H +	H +	Rides and paths will be of increasing importance for access throughout the site, and to maintain a feeling of openness in places.
	Car park	M +	M +	M+	Little current available car parking capacity. Car park will absorb visitors' cars away from the village, preventing congestion. Increased visitor use should benefit local business. Offers solution to current Nomansland car park capacity during peak times.
	Interpretation/ education	H +	H +	H +	Increased awareness of natural heritage and environmental protection.
Air	Tree planting	See section	See section	See section	Reduction of pollutants and increase in local air quality will increase and forest

Impact on -	Method	years 0-10	years 11-40	years 41 +	Explanation
		8	8	8	matures.
	Ground preparation for planting – Soil inversion and wild flowers	L-	NA	NA	Slight increase in carbon emission from deep ploughing
	Ground preparation for planting – other methods	L 0	L 0	L 0	
	Weeding	L 0	L 0	L 0	
	Meadow creation	M+	M +	M +	
	Other habitats	M +	M +	M +	
	Infrastructure – Surfaced paths	L -	L 0	L 0	Slight increase in carbon emissions during construction, and minimal loss of vegetation
	Grass paths and rides	L +	L +	L +	
	Car park	L -	NA	NA	Some increase in carbon emissions from visitors
Water and soil	Tree planting	See section 8	See section 8	See section 8	Tree planting initially will result in a reduction of applied herbicides and increasing soil stability. As the trees mature a slight dropping of the water table will occur. Flood risk for valley reduced.
	Ground preparation for planting – Soil inversion and wild flowers	M 0	L 0	L 0	For intended use overall impact neutral due to nutrient levels of top soil reduced.
	Ground preparation for planting – other methods	L 0	NA	NA	Little change given previous agricultural practice.
	Weeding - Chemical	L 0	L 0	L 0	Little impact given level of previous herbicide used in farming practice.
	Mammal control - Tubes	NA	NA	NA	
	Mammal control – deer fencing	NA	NA	NA	
	Meadow creation	L +	L +	L+	Reduced herbicide use, some benefit from soil stabilisation.

Impact on -	Method	years 0-10	years 11-40	years 41 +	Explanation
	Other habitats	L 0	L 0	L 0	
	Infrastructure – Surfaced paths	L 0	L 0	L 0	
	Grass paths and rides	L +	L 0	L 0	Reduced herbicide use, some benefit from soil stabilisation. Over time some soil compaction from use well occur, but nothing significant.
	Car park	L -	L -	L -	Possible leaching from surfacing and surface run-off possible, however area effected negligible in terms of site area.

Table2 - 3 - **Assessment of impacts through project implementation**

2.11 Project options

To make an assessment of the project's potential impact based on the top line objectives set by the Woodland Trust, the broad proposals are considered against a number of different habitat creation proposals to evaluate the appropriateness of the proposed scheme. These are also compared against a baseline option of continuing with the current land use, arable farming which is the most likely short- and medium-term use should the Heartwood Forest project not be delivered. Four scenarios are discussed below.

2.11.1

Option A

The Woodland Trust core business is protection of ancient woodland, creating new woodland and involving people in our work through planting trees, visiting and appreciating woodland and our natural heritage. The site for Heartwood Forest was purchased to facilitate these key areas of our work, and therefore we need to maximise, within the parameters of this EIA, the tree-planting potential of the site. The consultation process started with no preset design; however some top line objectives (section 2.3) were set to inform the process and to enable the consultation process, the EIA scoping and subsequent assessment to inform the design, habitat creation and access options. The project design is detailed in section 9, tree cover approximately 75%.

2.11.2

Option B

For the purpose of this EIA, and to help consider the top line impacts, an option of 100% native tree planting will be assessed. This option would be unlikely to be reasonable, practical or appropriate given the impacts identified and is included for comparative purposes only.

2.11.3

Option C

For the purpose of this EIA, and to help consider the top line impacts, an option of 50% native tree planting and 50% open ground in the form of meadows will be assessed, however this option for habitat creation would not satisfy the overall criteria and purpose for the acquisition by the Woodland Trust. The final design should be considered the most appropriate proposal given it demonstrates considerable recognition of potential impacts and looks to maximise the biodiversity and landscape potential, and mitigate against all identified potential negative impacts.

2.11.4

Option D

The ‘do nothing’ scenario considers the likely impact of land use on the environment, in the event of the Heartwood Forest project not being implemented. It is reasonable to assume that in the short to medium term the land use would be predominantly arable farming with the retention of existing ancient woodland, and where future environmental schemes would be available, we should assume that these may be utilised.

Development in the short and medium term would be unlikely; the site for Heartwood Forest does not fall into areas outlined for potential housing within the Local Development Framework (LDF) and is within the London green belt.

There is no reason to assume that public access beyond designated footpaths and bridleways would be permitted in the future under private ownership.

2.11.5 Assessment of options

Proposal	Impact using option A – 75% woodland cover	Impact using option B - 100% woodland cover	Impact using option C – 50% woodland cover	Impact using option D – do nothing
Woodland creation	Opportunity to link and buffer ancient woodland.	Opportunity to link and buffer ancient woodland.	Opportunity to link and buffer ancient woodland.	Ancient woodland will remain isolated,



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Proposal	Impact using option A – 75% woodland cover	Impact using option B - 100% woodland cover	Impact using option C – 50% woodland cover	Impact using option D – do nothing
	<p>Opportunity to create a large continuous woodland with significant biodiversity benefits (including other habitats).</p> <p>Increased soil stabilisation.</p> <p>Significant landscape change, with ability to adapt planting to enhance and fit with landscape character.</p>	<p>Opportunity to create a large continuous woodland, however biodiversity benefits likely to be increased through the provision of open habitats.</p> <p>Increased soil stability.</p> <p>Significant landscape change, with no ability to adapt planting to enhance and fit with landscape character.</p>	<p>Opportunity to create a large continuous woodland with significant biodiversity benefits (including other habitats).</p> <p>Increased soil stability.</p> <p>Significant landscape change, with ability to adapt planting to enhance and fit with landscape character.</p>	<p>however limited protection through provision of buffer strips.</p> <p>Biodiversity value unlikely to increase significantly. Environmental stewardship schemes likely to continue.</p> <p>Neutral impact on soil stability.</p> <p>No significant impact on landscape.</p>



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Proposal	Impact using option A – 75% woodland cover	Impact using option B - 100% woodland cover	Impact using option C – 50% woodland cover	Impact using option D – do nothing
Access provision	<p>A mixture of predominantly native forest with some open space will allow the opportunity to provide a varied visitor experience whilst retaining a woodland feel.</p> <p>Views out of the site, particularly to the south-east/east would be available through provision of sight lines.</p>	<p>100% woodland cover likely to reduce the quality of the overall visitor experience, given reduced opportunity for variety and different experiences. Could be oppressive to some people.</p> <p>Limited opportunity to protect views out of site due to tree cover.</p>	<p>A mixture of predominantly native forest with some open space will allow the opportunity to provide a varied visitor experience however 'wooded' feel may be lost in some areas.</p> <p>Views out of the site, particularly to the south-east/east would be available through provision of sight lines and open space.</p>	<p>Limited access a possibility under different (private) ownership. Unlikely to be new opportunities. Existing rights of way would be maintained.</p> <p>Views obtained from bridleway looking south-east maintained. Additional views unavailable as access unlikely to be permitted.</p>
Provision of open-ground habitat (meadows glades and paths)	<p>Biodiversity benefit of providing mixed habitat increased.</p> <p>Some areas maintained with feeling of openness.</p> <p>Aesthetic benefit of wild flowers.</p>	<p>Biodiversity benefit of providing mixed habitat reduced.</p> <p>Limited or no areas maintained with a feeling of openness.</p> <p>Limited or no aesthetic benefit from wild flowers.</p>	<p>Biodiversity benefit of providing mixed habitat increased.</p> <p>Some areas maintained with feeling of openness.</p> <p>Aesthetic benefit of wild flowers.</p>	<p>Biodiversity opportunities for providing large areas of open ground habitat limited. Predominant habitat arable crops.</p> <p>Openness maintained.</p> <p>No aesthetic benefit of wild flowers.</p>

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Proposal	Impact using option A – 75% woodland cover	Impact using option B - 100% woodland cover	Impact using option C – 50% woodland cover	Impact using option D – do nothing
Car park	<p>Could be provided for forest access and other surrounding countryside access facilities.</p> <p>Opportunities to spread current and new visitor arrivals in locality across a wider area, help address current capacity issues particularly Nomansland Common.</p>	<p>Could be provided for forest access and other surrounding countryside access facilities.</p> <p>Opportunities to spread current and new visitor arrivals in locality across a wider area, help address current capacity issues particularly Nomansland Common.</p>	<p>Could be provided for forest access and other surrounding countryside access facilities.</p> <p>Opportunities to spread current and new visitor arrivals in locality across a wider area, help address current capacity issues particularly Nomansland Common.</p>	<p>Unlikely to be created. Existing parking around villages likely to remain at current capacity.</p>
Provide access links to adjacent and surrounding access areas and rights of way	<p>Impact on Nomansland Common, additional visitors from Heartwood Forest expected to use the common, and visitors from the common likely to use Heartwood Forest. Need to be considered as one access unit.</p> <p>Likely need to consider permanent</p>	<p>As option A.</p> <p>As option A.</p>	<p>As option A.</p> <p>As option A.</p>	<p>No change in impact on Nomansland Common.</p> <p>No need to consider additional access</p>

Proposal	Impact using option A – 75% woodland cover	Impact using option B - 100% woodland cover	Impact using option C – 50% woodland cover	Impact using option D – do nothing
	<p>access points between Nomansland Common and Heartwood Forest in addition to the established. Access via public footpath entrance to the east.</p> <p>Existing public rights of way linked through a variety of new and different routes.</p>	<p>Existing public rights of way linked through predominantly shaded tracks through forest.</p>	<p>Existing public rights of way linked through a variety of new and different routes.</p>	<p>points.</p> <p>Existing rights of way internal and external retained.</p>
Recognition of cultural heritage and past land use	<p>Some loss of old field boundaries, however areas of woodland lost over time replaced.</p> <p>Some potential to damage underground archaeology if no mitigation measures used. Identification of features and appropriate mitigation reduces likelihood to</p>	<p>Significant loss of old field boundaries, however areas wooded back over time replaced.</p> <p>High likelihood of damaging underground archaeology if no mitigation measures used. Identification of features and appropriate mitigation reduces likelihood to negligible.</p>	<p>Limited loss of old field boundaries however some areas of woodland lost over time replaced.</p> <p>Some potential to damage underground archaeology if no mitigation measures used. Identification of features and appropriate mitigation reduces likelihood to negligible.</p>	<p>Current field boundaries, some of which are considered 'old' likely to remain.</p> <p>Future ploughing has the potential over a long period to damage underground archaeology.</p>



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Proposal	Impact using option A – 75% woodland cover	Impact using option B - 100% woodland cover	Impact using option C – 50% woodland cover	Impact using option D – do nothing
	negligible. Archaeological investigations will provide local information reveal new information which would otherwise be unlikely to be sought.	Archaeological investigations will provide local information reveal new information which would otherwise be unlikely to be sought.	Archaeological investigations will provide local information reveal new information which would otherwise be unlikely to be sought.	Archaeology unlikely to be investigated further.

Table 2 - 4. Assessment of proposals against 4 possible scenarios