

An investigation into the likelihood of  
Ancient Woodland existing on the  
Woodland Trust site at Willesley  
Leicestershire.

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<b>Version</b>	3.0
<b>Date</b>	November 26th 2001

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### Issue and Change Control

Version	Date	By Who	Issued to	Description of Change
1.0	1 February 2001	ICR	Craig Pinder, Andrew Sharkey, Richard Smithers, Dr. Anthony Fletcher	First issue.
2.0	February 2001	ICR		Additional paragraph with detail of ring-dating sample taken February 2001 – see paragraph 2.3.3.
3.0	November 2001	ICR		Appendix V. Ancient trees on Willesley Golf Course and section 2.3.4.
4.0	March 2004	ICR	Rhiannon Harte – National Forest Landshapes project. Eric Porter.	Appendix V footnote. Footnote to section 2.1.1. Additions to Table 1.

## 1. Introduction.

This study paper describes an investigation into the likelihood of Ancient Woodland existing on the Woodland Trust site at Willesley Leicestershire; it is based on field work conducted between December 2000 and February 2001, using evidence from the flora in the field layer and estimates of the ages of large fallen rotting Oak trees from two locations. This is part of the evidence collected to determine if any of the areas on or adjacent to the Woodland Trust site can be classified as Semi-natural Ancient Woodland.

## 2. Description and Assumptions.

### 2.1. **Rotting Oak stumps** in SE boundary woodland (0.22ha at SK337139) and 11 acre wood (SK334141).

There are substantial sections of fallen / cut oak trunks and branches in both the fragment of woodland adjacent to the SE boundary of the Willesley site and inside the SW boundary of 11 acre wood. They appear to be of a similar age structure and were probably felled at the same time; they have been rotting for a considerable time, which is hard to estimate, but for the sake of determining their age assume it is in the order of 50 years: There is evidence that some were cut with a chainsaw at some stage, probably after felling. Both areas contain irregular piles of decayed material and soil which could indicate that further trees were felled; it is estimated that between 5 and 10 oaks lie in each of the 3 sample sites i.e. one in the SE boundary woodland and the 2 sites within 11 acre wood.

#### 2.1.1. **SE boundary woodland<sup>1</sup>.**

Measurement of 3 sample trunk sections gives a circumference between 8 and 10 feet. It was not possible to determine the height above ground when standing, as root bole was not in evidence.

#### 2.1.2. **11-acre wood.**

Similar samples to those in the SE boundary wood were measured. The largest is an almost upright rooted trunk section measuring approximately 11-12 feet. Other horizontal samples measured between 8 and 10 feet.

### 2.2. **Age calculation method.**

The generally accepted average growth rate<sup>1</sup> of many sampled trees is approximately 1" per year. Based on the method of calculating age from the girth at 5 feet from ground level and oak conforming to the standard pattern that a tree in the open of 8' girth is 100 years old, a tree in woodland is 200 years and a tree partly hemmed in or in an avenue is 150 years old. The latter estimate of 150 years was chosen as all of these samples could

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<sup>1</sup> The 2 sections of "plantation" woodland to the SE of Willesley Wood together with the intervening field form part of an additional 40 acres purchased by the Woodland Trust from the National Forest Company in 2002.

have been boundary trees or close to the edge of replanted woodland for most of their life. For example a tree measured at 10' girth would be =  $10 \times 12 \times 1.5 = 180$  years old.

### 2.2.1. Error consideration.

The aging criteria for oak growing on a "good" site is quoted as between 1.5 and 2" per year for the first 60-80 years and 1" thereafter. This would give very different results from the average 1" per year used in 2.2 above. Assuming 1.75" for 70 years, would make the fallen trunks at 10' girth only 150 years old including 50 years since felling and allowing a factor of 1.5 for trees partly hemmed in or in an avenue. This is considered less likely for 2 reasons; firstly the soil is poor shale and clay on coal measures and is often wet; secondly, the overall size and nature of the trunks and branches is that of much larger specimens than living oaks in excess of 100 years old on the site. Therefore, the standard measurement (see 2.2 above) of girth growth is chosen as the best estimate of aging.

## 2.3. Findings.

### 2.3.1. SE boundary woodland.

These trees, cut 50 years ago would be between 150 and 180 years old at time of felling, giving a total of 200 – 230 years. This woodland is known to have been in existence since the early nineteenth century and is marked on the map of Willesley dated 1825 (corrected 1832)<sup>3</sup> as a "plantation". This could confirm continuity of woodland for at least 200 years; the wood contains a sizeable area of bluebells at the centre although the current woodland is neglected secondary growth of hawthorn / birch / sycamore. It is assumed that this woodland is an isolated fragment, preserved because it held trees of value, when the area was mined in the 1940's.

### 2.3.2. 11-acre wood.

These trees, cut 50 years ago would be between 150 and 220 years old at time of felling, giving a total of 200 – 270 years. This site was marked as "Bottom Pasture Piece" on the 1825/1832 map and shaded green (likely to indicate meadow or wood pasture, since known woodland was clearly marked with tree symbols) on the 1810 map. It does not appear as woodland until the Ordnance Survey edition of 1923 (surveyed 1881)<sup>2</sup> when all 11 acres are shown as mixed woodland with an irregular S. boundary enclosed by a double parallel line, possibly indicating the iron railings, of which some evidence still exists. However, the parish map of 1885<sup>2</sup> shows this area as a field with mature boundary trees and 2 clumps of mature deciduous trees, which approximate to the positions of the 2 sample areas of oak. It is likely, therefore that this woodland has only been in existence for some 100 years and that these oak trees being 200 years old were parkland features, boundary trees or contained within an area of wood pasture: Field boundaries can only be accurately determined on the 1885 and 1923 maps but not on the 1810, 1825 or 1859 maps<sup>3</sup>.

A mature living oak was also measured at the 11 acre wood sampling site and was 6'4" in girth, giving an approximate age of 120 years using the same criteria as above.

### **2.3.3. Further Findings February 2001 - Ring Dating.**

A sample section was cut in February 2001 from one of the oaks in 11 acre wood which had a girth measurement of approximately 10'. After cleaning and drying the annular rings were counted to the approximate heart of the tree (accuracy was hindered slightly by rot). The ring count was approximately 175 giving a total age of 225 years (adding 50 since felling). Extrapolating this to the largest stumps of 12' girth would give an age of 260 years. This evidence agrees very closely with the girth measurement aging indicated above therefore corroborates the age of these oaks as between 200 and 260 years.

### **2.3.4. Findings at Willesley Park November 2001.**

Details of measurements taken from trees on Willesley Park in November 2001 are shown in Appendix V. The sampled fallen oaks described herein are of a similar age to some of those standing and it is possible that they were planted as part of the Willesley Hall estate in the eighteenth century.

## **3. Survey Evidence.**

Surveys were conducted on the site at various times between 1979 and 2000. For the purpose of this study we will focus on results of surveys for 11-acre wood within the Willesley site. A list of surveys is attached as Appendix I. Appendix II shows Flowering Plants associated with ancient woodland in Leicestershire and Rutland.

### **3.1. Field Layer Plants.**

Based on a comparison of the species recorded for the site with the indicator species for Leicestershire and Rutland as shown in Appendix II and the Leicestershire Inventory of Ancient Woodland<sup>8</sup> there is little evidence of plants strongly or moderately associated with ancient woodland. There is more evidence of plants with a weaker association with ancient woodland and with secondary woodland, as shown on table 1 below:

**Table 1 – Leicestershire Ancient Woodland Flowering Plants found in 11-acre wood and adjacent “plantations” on the extension acquired in 2002.**

Plants which are strongly associated with ancient woodland.		Plants which are only weakly associated with ancient woodland.	
	Pendulous Sedge (11 acre wood)	Bluebell Dog’s Mercury  Goldilocks Buttercup	Primrose* Ramsons* Remote Sedge Sanicle*
Plants which are moderately associated with ancient woodland.		4. Plants more characteristic of secondary woodland	
Wood Anemone** Wood Sorrel**		Cleavers Common Nettle Elder	

\* = Rare in 11 acre wood.

\*\* = Wood Anemone is particularly scarce but is found (locally abundant) in the plantation adjacent to Willesley Woodside (road) and along the edges of the disused road (see footnote to section 2.1.1) together with bluebells (locally dominant) and Wood Sorrel.

**3.2. Factors affecting the view of Ancient Woodland indicators in North-west Leicestershire.**

Broadening the scope of the study to consider factors other than the flora indicators the results obtained are quite different. The following factors were considered as significant in modifying the view of the woodland under review:

- Willesley lies in the extreme northwest of Leicestershire on the Coal Measures band, which includes parts of Derbyshire: These measures consist of Carboniferous shales and sandstones (in which the coal seams formed) and are overlaid with clay. This geology has provided acidic woodlands<sup>9</sup>, which are different in character from most of the woodland further east in Leicestershire where the soil is more neutral.
- Historically northwest Leicestershire retained some of the few pockets of ancient woodland, which were not cleared for agriculture, due in part to the poor quality of the soil.
- The ancient woodland indicators used by English Nature for the Leicestershire Inventory of Ancient Woodland are those for Lincolnshire and Hertfordshire where more detailed fieldwork has been conducted. These may not necessarily be the most relevant indicators for woodland situated on the poor acidic soil of the coal measures.
- Acidic ancient woodland surveyed on the coal measures<sup>9</sup> does not have a very diverse ground flora and is characterised by a predominance of Silver Birch (*Betula pendula*) with Bracken (*Pteridium aquilinum*), Bluebell (*Hyacinthoides non-scripta*) and Creeping Soft-grass (*Holcus mollis*); in contrast the ancient woodland on the neutral soils is characterised by Woodruff (*Gallium odoratum*),

Yellow Archangel (*Lamiastrum galeobdolon*) and Herb Paris (*Paris quadrifolia*) with a greater diversity.

Willesley is not likely to exhibit many of the characteristic species from the County indicator tables (Appendix II) and is typical of the acidic woodland. Therefore, a simple comparison of survey results with the indicator tables could be misleading.

**3.3. Field, Shrub and Canopy Layer Plants.**

If we broaden the scope to include a wider range of plants and compare them with the species generally characteristic of ancient woodland in lowland Britain the picture is more encouraging as shown in table 2.

**Table 2 – Species generally characteristic of ancient woodland in lowland Britain found in 11-acre wood.**

Hairy Brome Giant Fescue	Holly Field Rose Crab Apple Wild Cherry Redcurrant	Bluebell Remote Sedge Three-veined Sandwort Dog’s Mercury
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Source: survey conducted by Richard Smithers (Woodland Trust) April 1992.

**3.4. Ground Layer Plants.**

There are no generally available indicator lists of Mosses, Lichens etc that indicate the existence of ancient woodland. Investigations into this field are continuing.

**4. Other Evidence.**

**4.1. Names and Features.**

Based on the Leicestershire Inventory, wood names can indicate antiquity of a site. Names with a strong association with antiquity include settlement names, old names for woods (e.g. “grove”) and tree names. No such indicators can be found in the immediate vicinity of the site on the maps obtained.

Irregular shaped boundaries are good indicators of ancient woodland; Willesley clearly shows an irregular shape on both sides of the Saltersford Brook before partial clearance in the 1970’s (See Appendix III)

**4.2. History of the site.**

The history of the site has been characterised by activities consuming wood, which may not have been replaced until the eighteenth or nineteenth century. Mining is recorded on or near the site from at least the early middle ages and there are strong indications that the land was partially cleared for cultivation and mining at this time, as was most of Leicestershire, recorded as one of the least wooded parts of lowland England by the time



of the Domesday Book (1086)<sup>4</sup>. From the middle of the eighteenth century the Industrial Revolution also required wood for construction of the canal and tramway, which crossed the Willesley site. We can construct a picture of a mixed economy and busy community from the Middle Ages not unlike that in operation today. When part of the site was landscaped as part of the Willesley Estate by the Hastings family in the eighteenth century it is possible that amenity planting took place and that remnants of this are still evident today, as they are around Willesley Lake and Willesley Park golf course. Anecdotal evidence from interviews with local residents indicate that the site was heavily overgrown with a dense shrub layer after the Second World War. When the site was acquired by the Woodland Trust in 1991 there was considerable evidence of its use for sporting recreation with pheasant pens and netting, but little or no evidence of woodland management in recent years. Investigation into the structure of the wet woodland on the south side indicates that the Hybrid Poplar (*Populus x euramericana "serotina"*) and possibly the Black Poplar (*Populus nigris sp. Betulifolia*) were planted during the first half of the twentieth century, although the ground alongside Saltersford Brook has been shown as wet on maps over the past 200 years and is therefore ideal for Black Poplar.

### 4.3. Conclusions.

1. There has been some continuity of woodland cover on the Willesley site area for at least 200 years and possibly longer. This is likely to have been in the form of managed remnants of woodland surrounded since early times by agricultural and mining activities. These remnants are now almost totally secondary growth, as a result of partial clearance due to mining or agricultural operations.
2. No direct evidence exists for continuity of woodland since 1600, which would qualify the site as Ancient Woodland.
3. Floral survey and historical evidence would support conclusions 1 and 2, although, ecologically the site exhibits a significant richness of species for the locality which may be important at county and local level.
4. It is possible that the small woodland areas on the SE of the site are at least 200 years old and may be replanted Ancient Woodland. This replanting could have occurred during the parkland landscaping undertaken in the eighteenth century. They are referred to as "plantation" on the 1859 map but this does not preclude them from being replanted ancient woodland.
5. It is likely that the fallen oaks in 11 acre wood are remnants of replanted ancient woodland, and that they are part of the Willesley estate planted for parkland / sporting recreation during the eighteenth century.

### 5.1. Recommendations.

- Further survey work in ground and field layer species would assist in determining whether there are further indicators of ancient woodland present.
- Second opinions on the aging of these tree samples would be welcome.
- If confirmed, it is recommended that action be taken to secure the future of the small woodland areas on the SE of the Woodland Trust site and to link them by planting.
- The future of the 11 acre fallen oaks should be reviewed with the Woodland Trust Conservation Advisor, and possibly English Nature.

## Text References.

1. A Mitchell – Collins Field Guide Trees of Britain and Northern Europe. Also referenced by Rackham – Trees and Woodland in the British Landscape.
2. Source – Ashby-de-la-Zouch Library.
3. Source – originals in Ashby-de-la-Zouch museum, courtesy of Ken Hillier.
4. A Squires and M Jeeves – Leicestershire and Rutland Woodlands Past and Present.
5. C Owen – The Leicestershire and South Derbyshire Coalfield 1200 – 1900.
6. ed. A L Primavesi and P A Evans – Flora of Leicestershire.
7. Leicestershire County Council – Aerial photograph library 1970 and 1991 (See Appendix III and Appendix IV).
8. S Everett & D P Robinson – Leicestershire Inventory of Ancient Woodland. Nature Conservancy Council 1990.
9. ed. A L Primavera & P A Evans – Flora of Leicestershire. Leicestershire Museums publication 89.

**Appendices.**

**Appendix I - Surveys of Willesley Woodland used for this study.**

Date	Type	Author / Source
1979	Ecological Report	PAE – Leics. Museums, Arts and Records Service
May 1992	Higher Plants	S Grover /J Mousley
April 1992	Existing Woodland	R Smithers – Woodland Trust
1998	National Forest Baseline Survey	J Mousley – Vegetation A Fletcher – Lower Plants
2000	Vegetation Survey	S Woodward and Market Bosworth Natural History Society
1992 - 2000	Vegetation Survey	I Retson and J Thickitt – annual review

**Appendix II - Flowering Plants associated with ancient woodland in Leicestershire and Rutland**

1. Plants which are strongly associated with ancient woodland.		3. Plants which are only weakly associated with ancient woodland.	
Alder Buckthorn Birds-nest Orchid Common Cow-wheat Crested Cow-wheat Great Wood-rush Greater Butterfly Orchid Herb Paris Hairy Wood-rush Lilly-of-the-valley Nettle-leaved Bellflower	Pendulous Sedge Purple Small-reed Sessile Oak Small-leaved Lime Thin-spiked Wood-sedge Violet Helleborine Wild Service-tree Wood Melick Wood Vetch Yellow Pimpernel	Bluebell Dog's Mercury Early Dog-violet Early Purple Orchid Goldilocks Buttercup Hairy St. John's-wort Hard Shield Fern	Moschatel Primrose Ramsons Remote Sedge Sanicle Small Teasel Wood Sedge
2. Plants which are moderately associated with ancient woodland.		4. Plants more characteristic of secondary woodland	
Opposite-leaved Golden-saxifrage Smooth-stalked Sedge Toothwort Wood Anemone	Wood Millet Wood Sorrel Wood Speedwell Woodruff Yellow Archangel	Cleavers Common Nettle Cow Parsley Elder	

## Woodland Trust - Willesley Wood.



Source: Leicestershire and Rutland Woodlands Past and Present – Squires and Jeeves.

**Appendix III – Extract from Aerial Photograph August 1970 – Leicestershire County Council.**





**Appendix IV – Extract from Aerial Photograph August 1991 – Leicestershire County Council.**



### Appendix V – Ancient Trees surveyed on Willesley Golf Course November 2001.

In early 2001 Ian Retson was told by a visitor to Willesley Wood that an ancient Sweet Chestnut situated on Willesley Golf Course was the largest tree in the county; after locating it from the road leading from Willesley Woodside to Willesley Church he reported to the Woodland Trust and Ancient Tree Register. The following mail was received from David Alderman of the Tree Register on November 19<sup>th</sup> 2001.

“I took a couple of hours off and made a detour to Willesley Park Golf Club. The club secretary Mr Brown showed me the tree. Wow! It's fantastic! Difficult to measure accurately and the best comparable measurement I made was by taking the tape just below the large low limb on the golf course edge, at about 1.2m, deflecting down to about 1m on the far side, avoiding the biggest burrs (as in attached photo). Here I recorded 10.15m girth with 10.27m by keeping the tape as level as possible at 1.2m (about 33ft 6ins girth). Even by comparing this smaller measurement the tree appears to be the 10th largest Sweet chestnut ever recorded, which puts it within a very elite group of historic trees.

It has a pedestal type base appearing to be made up of a fusion of burrs and a bole that looks pollarded with main limbs that must be at least secondary growth, if the tree is as aged as it looks. I didn't climb into it, but it didn't give the impression of being hollow although this may be incorrect? Sweet chestnut I have seen of 250-450 years of age often show this type of bole forming. It appears to be associated with the gradual growing down of the tree being compensated by adventitious buds produced within burrs on the lower parts of the bole, which are often grazed by livestock, shaded out or can become a dense thicket of basal shoots around the tree. It would be interesting to have some research carried out on these largest of our Sweet chestnut.

Not only was the Sweet chestnut well worth the visit but I couldn't miss the impressive sycamore next to it! With a short bole and huge lower limbs it is typical of many of our largest sycamore. I recorded a girth of 5.79m @1m placing it within the Top 60 in the British Isles and county champion. With extensive cable bracing someone has spent money looking after this tree. Behind this within the copse is quite a fine Horse chestnut 4.48m @1.1m. A bigger tree stood by the Ha-Ha at Lyndon Hall, Leicestershire, and there will be others as big, but this is still a good specimen.

Below this copse at the bottom of the driving range, near the house, stands a most impressive veteran ash tree. With a girth of 5.11m @1.5m it is only beaten in the county by a tree of over 6m at Cotesbach Hall which was a hulk in 1981 and so could well be gone by now. This tree is probably the most vulnerable of all as it has extensive decay within its huge limbs, but hopefully will be retained safely as a wonderful wildlife habitat for many years.

To have four extremely fine specimens, potentially all county champions of their species, practically growing next to each other in a parkland situation is, I think, quite remarkable! Mr Brown was happy for us to record the trees and I shall be writing formally to him with the results of the measuring. He made a request for specific grid references to be left off

any published data to prevent people wandering onto this part of the golf course without permission. This seems a reasonable request, but I have the impression that the Sweet chestnut is already recorded elsewhere as being the oldest tree in the county? Although, maybe the published location is a bit vague? It is larger than any other tree recorded in Leicestershire on the Tree Register, the next biggest being an oak at Donnington Park with a girth of 8.64m.

I'm sorry work commitments meant we couldn't arrange to meet and would like to thank you for bringing this very special tree to our attention via the Woodland Trust.

Best wishes, David

David Alderman  
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From the above measurements if we use the standard growth estimates (see paragraph 2.2), assuming 8 feet of girth = 100 years and a factor of 1.5 for boundary trees we derive the following table:

Tree	Girth in feet	Average age	Min. Age	Max. Age
Sweet Chestnut	33.7	606	404	808
Sycamore	19	342	228	456
Horse Chestnut	14.7	265	176	353
Ash	16.76	302	201	402

**Footnote March 2004.** Anecdotal evidence from local residents of Ashby indicates that there may have been other ancient trees not noted by David Alderman and after several unsuccessful attempts Ian Retson gained permission from the Secretary of Willesley Park Golf Club in December 2003 to survey the course for such trees. This work is partially complete.