ENGLISH NATURE

The ancient woodland inventory database and digital boundary project

An update of recent developments

working today
for nature tomorrow

The ancient woodland inventory database and digital boundary project:

an update of recent developments

Christine Reid
Hannah Iles
James Isaacs

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1.   Introduction

English Nature's Ancient Woodland Inventory has proved a very useful tool for promoting nature conservation by influencing policy, planning and management of these special sites. This document summarises the range of inventory products currently available, and goes on to look at new developments which will expand the uses to which the inventory data can be put.

Geographic Information Systems (GIS)[1] allow the comparison and analysis of different spatial data sets. To make the ancient woodland boundaries available for use on a GIS, they have been *digitised*. This project has been developed through joint working between English Nature and the Forestry Authority (now Forestry Commission), with the help of local authorities.

This document outlines the methods used to digitise the (approximately) 22,000 boundaries of ancient woodland in England. The potential benefits and limitations of the digital boundaries are discussed. We hope that this information will be of value to potential users of the data set and others undertaking similar digitisation projects.

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[1]Terms in *italics* are explained in the Glossary

2. Background to the Ancient Woodland Inventory

2.1 What is ancient woodland?

Land that has had a continuous woodland cover since at least 1600AD is known as ancient woodland. Ancient semi-natural woodland is that which retains a native tree and shrub cover that has not been planted, although it may have been managed by coppicing or felling and allowed to regenerate naturally. Replanted ancient woodland has had the original native tree cover felled and replaced by planting, often with conifers and usually this century.

Ancient woodland is the most important woodland for nature conservation in England due to the diversity of the plants and animals it supports, its undisturbed streams and soils, and the links that this gives us to the landscapes of the past. Ancient woodlands are an irreplaceable asset. It is essential that as much as possible of the remaining ancient woodland area is protected and sympathetically managed.

England has just over 201,000 hectares of ancient woodland that is classified as semi-natural, and a further 148,000 hectares that has been replanted. In total, ancient woodland covers about 2.6% of England's land area.

2.2 What is the Ancient Woodland Inventory?

The ancient woodland inventory project was set up in the 1981 by the Nature Conservancy Council to identify all woodland in Britain which had existed since at least 1600 AD. Only sites over 2 hectares (on the 1930s base maps used in the project) are included on the inventory (also see Section 3.3). Provisional inventories for each English county are available from English Nature. They are classed as "provisional" because they are under a constant system of review and update. Similar inventories for Wales and Scotland are available from our sister agencies the Countryside Council for Wales and Scottish Natural Heritage (respectively).

The inventory is used extensively by conservation bodies, ecological and planning consultants, the Forestry Commission, education and research establishments, and local authorities for a range of policy, research, planning and woodland management purposes.

2.3 Identifying ancient woodland

We determined whether or not a wood was ancient and either semi-natural or replanted by:
- its presence on, or absence from, old maps (e.g. Ordnance Survey 1st Edition - surveyed 1805-1873; scale 1:63 360, and early estate maps) or documents;
- information about it's name, shape, relief, internal boundaries;
- it's location relative to other features (such as parish boundaries);
- ground survey information (flora and historical features such as wood banks);
- and aerial photography interpretation.

Information was also collected on ancient woodland ownership by public bodies or organisations, and on any nature conservation status or designation that the wood might have. Ancient woodland cleared since the production of the early *OS* maps is also recorded on the inventory.

2.4   Format of the inventory

Currently the inventory consists of the following:
- a series of paper 'fact sheets' (one for each site) which record the location of the woodland, its boundary and area, and the evidence to show that it is ancient. Ownership details and conservation designation status is also marked on annotated maps on these sheets;
- a customised computer database ("Ancient Woodland Inventory on *TENIS*[2]") which holds records of all ancient woodland sites and the information from the fact sheets, excluding the maps.

2.5   Distribution of the inventory

The inventory information is distributed to any interested users. In principle, users may receive any of the following:
- a county report available for each English county, containing background information to the inventory methods, information specific to ancient woods in that county, and a set of maps of the ancient woodlands, hand-drawn on OS 1:50000 backdrop maps (Figure 1);
- a report from the database with the site specific information (Figures 2 and 3);
- database information on computer disk.

Depending on the nature of the request, the response time may vary, and a charge may be made to cover the cost of handling the data.

Further information about the ancient woodland inventory is contained in the following reports and papers (Section 2.6), and potential users are encouraged to consult these before making specific requests to English Nature. (Also see Section 4.2).

2.6   Further information: inventory general

English Nature (1981 - 1997) *Inventories of ancient woodland: County reports* English Nature, Peterborough (Appendix 1 gives most recent issue dates for each county report).

Isaac DE and Reid CM (1996) *Amendments to the ancient woodland inventory for England, July 1994 - February 1996* English Nature Research Report No. 177 English Nature, Peterborough.

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[2]The English Nature Information System (TENIS) was developed recently to provide a recording, storage and analysis system for SSSI data and other nature conservation data sets - one of which is the Ancient Woodland Inventory.

Isaac DE and Reid CM (1997) *Amendments to the ancient woodland inventory for England, February 1996 - February 1997* English Nature Research Report No. 222 English Nature, Peterborough.

Isaacs J (1998) *Amendments to the ancient woodland inventory for England, February 1997 - February 1998* English Nature Research Report No. 277 English Nature, Peterborough.

Kirby KJ, Peterken GF, Spencer JW and Walker GJ (1984) *Inventories of Ancient Semi-natural Woodland* Focus on Nature Conservation No. 6 Nature Conservancy Council, Peterborough.

Reid CM (1997) *Guidelines for identifying ancient woodland* English Nature booklet (8pp) English Nature, Peterborough.

Spencer JW and Kirby KJ (1992) An inventory of ancient woodland for England and Wales *Biological Conservation* **62(2)**: 77-93.

Thomas RC and Phillips PM (1994) *Ancient woodland inventory England: Amendments to county reports up to June 1994.* English Nature Research Report No. 72 English Nature, Peterborough.

Figure 1   **Extract of a map from a county Ancient Woodland Inventory report**

Legend

☐   Ancient semi-natural woodland

▨   Ancient replanted woodland

▩   Woodland cleared since the production of the 1st Series OS 1:25,000 maps (1891- 1928)

Figure 2   **Extract from a database report showing basic inventory information**

Table 1

Ancient woodland sites information listed by Tenkm, Parish Name and Grid Reference

Report produced on   28/Aug/97

County   SURREY

Ten km square   SU83

Parish Name   FRENSHAM

1	2	3	4	5	6	7	8	9	10	11
845395	HALES COPSE		3.00	3.00	3.00	0.00	0.00	GOOD	POOR	SHAONB.
846385	LOW WOOD		3.00	3.00	3.00	0.00	0.00	UNKNOWN	POOR	SHAONB.
861391	JUMPS ROAD COPSE		8.00	7.00	7.00	0.00	1.00	UNKNOWN	GOOD	REV1-NAME/AREAS/INFORMATION QUALITY.SHAONB.GRUBBED URBAN.
878392	COOMBE RIDGE WOOD		4.00	4.00	4.00	0.00	0.00	UNKNOWN	POOR	SHAONB.
881385	HYDE COPSE		6.00	6.00	5.00	1.00	0.00	UNKNOWN	GOOD	AREAS/INFORMATION QUALITY.SHAONB.GRUBBED AGRIC.

Parish Name   HASLEMERE

1	2	3	4	5	6	7	8	9	10	11
872359	WOODCOCK BOTTOM WOOD	NATIONAL TRUST	5.00	5.00	5.00	0.00	0.00	UNKNOWN	POOR	SHAONB.
873327	WOOLMER HILL WOOD		3.00	3.00	3.00	0.00	0.00	UNKNOWN	UNKNOW	
880337	GREEN LEA WOOD		8.00	8.00	3.00	5.00	0.00	UNKNOWN	GOOD	AREAS/INFORMATION QUALITY.SHAONB.
884338	POLECAT WOOD	NATIONAL TRUST	7.00	7.00	7.00	0.00	0.00	UNKNOWN	POOR	
894342	COOMBSWELL COPSE 1		7.00	6.00	6.00	0.00	1.00	UNKNOWN	GOOD	AREAS/INFORMATION QUALITY.SHAONB.GRUBBED URBAN.
896334	BUNCH LANE WOODLAND		6.00	6.00	5.00	1.00	0.00	UNKNOWN	GOOD	NAME/AREAS/INFORMATION QUALITY
897343	COOMBESWELL COPSE 2		9.00	9.00	9.00	0.00	0.00	UNKNOWN	GOOD	REV1 - AREAS/INFORMATION QUALITY.SHAONB.

Figure 3   Extract from a data-base report showing woods with conservation status

10km sq.	Site Name	Grid Ref	Conservation Status	Total Cons Area	Cons Area2	Remarks
SU83			Total	30	30	
SU84	"Frensham Priory Wood"	855421	SSSI	6	6	SHAONB. Thursley, Hankley & Frensham Commons SSSI
SU84			Total	6	6	
SU93	Barfold Copse/Home Wood	924320	RSPB RES	1	1	REV1 - Areas/information quality. SHAONB
	Great Copse	961340	PNR	9	9	REV1 - Areas. SHAONB. Surrey Bird Club. REV2 - SBC changed to PNR for ENSIS
	Brookland Copse/+	975350	SSSI	4	4	SHAONB. Chiddingfold Forest SSSI. Revision = SSSI Name
	"Sharham Land Wood"	980358	SSSI	5	5	SHAONB. Chiddingfold Forest SSSI. Revision = SSSI Name
	Pignuts Copse	985357	SSSI	5	2	Chiddingfold Forest SSSI. Revision = SSSI Name
	Durfold & Fisherland Woods	986325	WT RES	18	0	WT reserve (18ha) 'Durfold Wood'
	Birchen Copse	989354	SSSI	5	5	Chiddingfold Forest SSSI. Revision = SSSI Name
	Dunns Copse	990361	SSSI	13	4	Chiddingfold Forest SSSI. Revision = SSSI Name
	Cowpasture Hanger	990364	SSSI	5	5	Chiddingfold Forest SSSI. Revision = SSSI Name
	Wetwood Rough	991357	SSSI	3	3	Chiddingfold Forest SSSI. Revision = SSSI Name
SU93			Total	68	38	
SU94	Will Reeds	902405	SSSI	3	3	SHAONB. Thursley, Hankley & Frensham Commons SSSI
	Coldharbour Wood	921406	SSSI	2	2	SHAONB. Thursley, Hankley & Frensham Commons SSSI
	"Forked Pond Wood"	921417	SSSI	7	7	SHAONB. Thursley, Hankley & Frensham Commons SSSI
	Bagmoor Wood	925426	SSSI	8	8	SHAONB. Thursley, Hankley & Frensham Commons SSSI
	Eashing Moor Copse	943433	SSSI	4	4	SHAONB. Charterhouse to Eashing SSSI
	Slowley Copse	955444	SSSI	10	10	Charterhouse to Eashing SSSI

3. The digitisation project

3.1 Background

English Nature, after discussion with others, considered that digitisation of the ancient woodland boundaries would improve the accessibility and applications of the inventory data. A combined project was therefore initiated in 1995 to 'capture' all ancient woodland boundaries. The *Forestry Authority* agreed to *digitise* the boundaries (as part of the National Inventory of Woodlands and Trees) and English Nature agreed to validate them against the inventory database and map records. In a few cases, local authorities had already captured their ancient woodland boundaries and were willing to contribute these data to the project.

3.2 Methods

Digitisation
The Forestry Authority (England National Office in Cambridge) digitised the ancient woodland boundaries from the 1:50 000 maps in the inventory county reports. For some counties 1:25000 maps of ancient woodland were used where they were available. Where the local authorities were willing to allow use of their data, these were incorporated into the project thus avoiding duplication of effort and resources. The data capture differentiated between semi-natural ancient woodland and replanted ancient woodland, but cleared ancient woodland, as defined on the inventory county report maps, was not included in the capture process.

Validation
English Nature has been responsible for checking the digital boundaries from both the Forestry Authority and local authorities. The hard copy data was checked against the original data set and maps held at English Nature. Where amendments were necessary (approximately 40% of all boundaries, usually due to the scale at which boundaries were captured) these were marked up and returned to the Forestry Authority for correction. The boundaries were then considered to be an accurate representation of the ancient woodland resource as depicted on the inventory.

Data transfer
When the boundaries had been corrected by the Forestry Authority, the digital data was split into 50x50km 'tiles' and were loaded into English Nature's main GIS system.

Attribution
Attribution is the process of attaching textual information to the digital boundaries. Each ancient woodland boundary is assigned with its own unique identification number in *TENIS*. This number was placed within each digital woodland boundary using the GIS, and the data was run through an *attribution* process to assign each boundary with information stored on the inventory database (eg grid reference, site area etc). A link could then be made to *TENIS* through the unique identification number to retrieve further ancient woodland inventory information such as site name, ownership and designation status.

Final product

The finished data set (available summer 1999) is held in 50x50km 'tiles', or 'quadrants', based on the Ordnance Survey 100km grid system. There are 75 quadrants which contain ancient woodland. Each quadrant contains two files: one containing *polygons* showing the total area of ancient woodland; the other containing polygons split into the semi-natural and replanted components. The data has been broken up in such a way that the quadrant edges do not cut through any part of any site (ie a site will lie in whichever quadrant the majority of its area is held). The data will be held on English Nature's GIS system with an intelligent link to *TENIS*, whereby reporting and *interrogation* from the geographic database will be possible.

Data storage, management and distribution

Once the project is completed English Nature will be responsible for maintaining the data set by incorporating updates and amendments, and informing other users of these. English Nature will continue to distribute ancient woodland inventory data (including the digital boundaries on *CD-ROM*) to external partners and other interested parties.

Technical specifications for the project can be found in Appendix 2.

3.3 Limitations of the data and user issues

Size threshold

The data covers only ancient woodland sites which were greater than 2 hectares in size on the original 1:25,000 base maps (mostly dating from the 1930s). Some sites on the inventory are now less than 2 hectares because part of the original small wood may have been grubbed up since the 1930s base maps were produced, leaving a remnant less than 2 hectares. In addition, the area measurement techniques were less precise when the original inventory was produced, so some smaller sites may have been added accidentally, and some woods only slightly over 2 ha may have been missed.

Cleared ancient woodland

The ancient woodland inventory records semi-natural ancient woodland, replanted ancient woodland and ancient woodland which has been cleared since early this century. The digitisation process does not include the boundaries of the cleared areas.

Scale

The digital boundaries were produced from 1:25 000 scale maps. The boundaries will therefore only be precisely comparable with other boundaries produced at this scale. Comparisons with data at 1:10 000 or 1:50 000 scale, for example, will be less accurate.

Accuracy of records

The ancient woodland inventory boundaries are regarded as provisional. Methods used to compile the original inventory (largely using map and aerial photograph evidence, supplemented with field evidence where available) did not allow for extensive ground-truthing, although there is a continual process of revision as new information is brought to our attention.

The records from the ancient woodland inventory database, which are attached to the digital site boundaries, cover information such as designation status (eg SSSI), public ownership information (eg Forest Enterprise, Woodland Trust etc), and whether there has been any woodland clearance at a site since the early part of this century. We endeavour to keep this information as up-to-date as possible, but cannot guarantee that it is always accurate.

Area measurements

The original ancient woodland inventory areas were hand-measured using a dot-grid overlay. The digitally measured areas will be much more accurate. However, the *TENIS* database information gives details of woodland area under different ownerships and designations where they exist for individual sites. Because the ownership and designation boundaries have not been digitised, some discrepancies will arise on the database between the area figures and the total. We will explore how this should be dealt with in future.

Format

The digital boundaries are likely to be supplied on a *CD-ROM* covering all the quadrants in England, and not on an individual site or quadrant basis. Users will need to have a compatible GIS (*Mapinfo*) in order to import the data, or one that accepts *DXF* data. Ordnance Survey back- drop maps will not be provided with this product for copyright reasons.

Updates

The database and boundaries will be under a constant process of revision. It is likely that once a year an updated database and set of boundaries will be produced. It is the responsibility of the data holder to ensure that the correct version of the database and boundaries are being used.

Copyright

The ancient woodland inventory database and digital boundaries are the property of English Nature. English Nature should therefore be acknowledged in any work using this data. The data must not be sold to other parties. We can only verify the accuracy (within the caveats outlined above) of ancient woodland inventory data obtained directly from English Nature. English Nature accepts no responsibility for any legal action arising from the use of this data.

In addition, because the information is based on Ordnance Survey map data the following statement should be added to any work produced using this data: *"Based upon the Ordnance Survey 1:25000 map with the permission of the controller of Her Majesty's Stationery Office © Crown Copyright © English Nature 1999".*

3.4   Revisions - a request for information

If you have information which suggests that either the digital boundaries or the database information is incorrect or needs to be revised, please contact English Nature, so that the accuracy of the inventory can be maintained (see Figure 4).

Figure 4 **A copy of the form you would be requested to complete regarding inventory revisions**

Proposed alterations to the Ancient Woodland Inventory

1. Name of wood

2. County

3. National Grid Reference (eg SP640297)

4. Is this wood a new addition to the inventory? YES (see below) / NO (go on to 6.)
Remember - only continuous woodland blocks over 2 hectares in size can be included
Please give the following details if known (areas in hectares please):

- total area..
- semi-natural area..
- replanted area..
- area cleared this century...........................reason (agriculture/ urban/ mineral)...................
- conservation status (eg SSSI, nature reserve etc)..
- owner (public bodies only)..

5. Please state why you think this wood should be added to the inventory? (eg historical evidence, field survey evidence) Continue overleaf if necessary

6. Alterations to an existing inventory wood
 What has changed? (✔ those which apply, and give new details, where known - areas in hectares please)

- total area..
- semi-natural area..
- replanted area..
- area cleared this century..................reason (agriculture/ urban/ mineral)
- conservation status (eg SSSI, nature reserve etc)..
- owner (public bodies only)..

7. Please state why you think these alterations are necessary (eg mistake in provisional inventory, new historical evidence, new field survey evidence) Continue overleaf if necessary

8. Please include a sketch map of the affected area (or annotate copy of AWI report maps)

Name.. Address...Date....................

Thank you for returning this form to Christine Reid, English Nature, Northminster House Peterborough PE1 1UA Tel 01733 455242 Fax 01733 568834 e-mail: chris.reid@english-nature.org.uk

4. Uses and benefits of the digital data

4.1 Uses and benefits

There are numerous potential benefits and uses of digitising the ancient woodland boundaries. The project has helped improve the accuracy of the inventory. For example, every ancient woodland site has been checked to uncover any anomalies in the original data set boundaries, and the area of the woodland and its component types (semi-natural or replanted) can now be remeasured digitally. In addition, the digitisation project has allowed the backlog of map amendments to be incorporated onto the digital maps data set.

One of the key advantages of the digital ancient woodland boundaries is that they can be combined with other datasets and boundaries using a GIS. English Nature has recently commissioned a project looking at some of this potential (Box 1). The reading list (Section 4.2) includes projects which have used the ancient woodland inventory for nature conservation research and policy.

Box 1   Project to combine Forestry Commission and Countryside Agency GIS based datasets

Objective

To demonstrate how a variety of GIS based woodland datasets can be integrated to improve our ability to respond to requests for advice under the UK Biodiversity Action Plan on reversing woodland fragmentation through the development of "Habitat Networks".

This will be delivered by:

● assembling relevant GIS datasets, identifying and documenting any problems with combining them for a defined pilot area (eg 100km x 100km tile).

● Investigating the usefulness of the analyses (below) which aim to improve our ability to target woodland expansion in appropriate areas and estimate areas of different Biodiversity Action Plan (BAP) habitat types.

● Produce recommendations on the feasibility and value of extending this approach more widely, within the framework of data capture, management and access set through the National Biodiversity Network.

Data set integration and reporting

The main data sets which will be used are:

• Forestry Commission Inventory (digital boundaries of all woods > 2ha);

• Forestry Commission Woodland Grant Scheme boundaries;

• Countryside Agency Ancient woodland boundaries and SSSI boundaries;

• woodland National Vegetation Classification types - point locations;

• Forestry Commission field sample points.

The GIS datasets will be integrated in a number of ways to test their value as a means of:

i.   identifying priority areas for establishing 'habitat networks';

ii.   using linked all-woodland/ancient woodland inventories to provide a framework for landscape scale monitoring of BAP targets and favourable conservation status;

iii. estimating over/under representation of semi-natural woodlands within the current SSSI network;

iv.   identifying areas that would benefit from inclusion in the Woodland Grant Schemes as a means of delivering BAP targets;

v.   estimating the total area of different BAP woodland habitat types within broad regions.

The results from this study are due in autumn 1999.

4.2　Further information: inventory uses

Buckley P and Fraser S (1998) *Locating new lowland woods: Final report* English Nature Research Report No. 283 English Nature, Peterborough.

Jefferson R, Robertson H, Wilkinson M, Reid CM, Mitchell-Jones T, Michael N and Polley M (1998) *Prime Biodiversity Areas: Definition, identification and uses* English Nature Research Report No. 290 English Nature, Peterborough.

Jerram R (1999) The Forest of Bowland: the potential for creating new native woodland in *Creating native woodland in upland England* English Nature Research Report No. 239, English Nature, Peterborough.

Kirby KJ and Reid CM (1997) *Preliminary nature conservation objectives for Natural Areas: Woodland and Forestry* English Nature Research Report No. 239, English Nature, Peterborough.

Kirby KJ, Reid CM, Isaac D and Thomas RC (1998) The Ancient Woodland Inventory in England and its uses, Chapter 26 in *The Ecological History of European Forests* Ed Kirby KJ and Watkins C. CAB International, Wallingford.

Kirby KJ and Thomas RC (1994) Habitat fragmentation of ancient woodland in England. In JW Dover ed. *Fragmentation in agricultural landscapes*, pp 71-78. Preston, Myerscough College.

Radford E (1998) *The restoration of replanted ancient woodland* English Nature Research Report No. 269, English Nature, Peterborough.

Reid CM (1997) *Local authorities and the protection and management of ancient woodland* English Nature Research Report No. 250, English Nature, Peterborough.

Reid CM, Kirby KJ and Cooke R (1996) *A preliminary assessment of woodland conservation in England by Natural Areas* English Nature Research Report No. 239, English Nature, Peterborough.

Thomas RC, Kirby KJ and Reid CM (1997) The conservation of a fragmented ecosystem within a cultural landscape - the case of ancient woodland in England *Biological conservation* **82** 243-252.

Glossary of terms/ abbreviations

Attribution The process of attaching textual records to geographic data (lines/ points/ areas).

CD-ROM Compact Disc - Read Only Memory. A data medium which can hold up to 650MB of electronic information. Once written to the CD, data cannot be changed or deleted.

Digital Mapping Cartography using computers, covers all aspects from data capture (*digitising*), designing maps and plotting.

Digitising The term for the process of inputting line and point data into a *digital mapping* or *GIS* package.

DXF Data Exchange Format. A common electronic format for data which allows data to be transferred from one computer package to another.

Forestry Authority The Forestry Authority. A branch of the Forestry Commission responsible for policy making, implementation of regulations and distributing grants.

GIS Geographic Information System. A computer package designed to create, manipulate, analyse and display all types of geographically or spatially referenced data. A GIS allows complex spatial operations that are very difficult to do otherwise.

Interrogation Retrieval and querying of statistics/*attributes* from a database.

Mapinfo Desktop mapping software. Principally used for spatial queries (*GIS* applications) it can also be used for *digitising* and *digital mapping*.

OS Ordnance Survey of Great Britain and Northern Ireland

TENIS The English Nature Information System. English Nature's in-house database including SSSI details, the Ancient Woodland Inventory etc.

Appendix 1 Current editions of county inventory reports

Date	Counties
1986	Cornwall, Devon, Herefordshire, London, Somerset, South Yorkshire, Worcestershire.
1987	Bedfordshire, Cambridgeshire, Cleveland, Durham, Isle of Wight, Tyne & Wear, Wiltshire.
1988	Avon, Cheshire, Dorset, Greater Manchester & Merseyside, Hertfordshire, Lincolnshire, Northamptonshire, Northumberland, Shropshire.
1989	East Sussex, Humberside, Warwickshire, West Midlands, West Sussex.
1990	Leicestershire, Nottinghamshire.
1991	Gloucester.
1992	Derbyshire, Essex, Norfolk, Suffolk.
1993	Staffordshire.
1994	Cumbria, Hampshire, Kent, Lancashire, North Yorkshire (Part 1-3), West Yorkshire.
1995	Berkshire, Buckinghamshire, Oxfordshire.
1997	Surrey

Appendix 2   Technical specifications

Digitising by Forestry Authority
The digital mapping system used by the Forestry Authority to collect data was a Laser-Scan system running on a VMS Digital Alpha platform.

The boundaries and other information were digitised on separate layers including: 50x50km tile boundary; ancient semi-natural woodland boundaries, ancient replanted woodland boundaries, ancient semi-natural woodland id numbers; ancient replanted woodland id numbers.

The tile boundaries are not displayed in the final Mapinfo version of the files.

Data transfer - Forestry Authority to English Nature
English Nature's main digital mapping/GIS package is an Intergraph system running on a SCO UNIX server and UNIX and NT workstations. The common data format between Laser-Scan and Intergraph was Data Exchange Format (*DXF*).

Data attribution
After the data was imported into Intergraph, the site id numbers and the grid references were down-loaded from TENIS. The grid reference was used to place the site id in its correct geographical location. The id numbers were then copied and pasted onto separate layers.

A computer script was written to:
*   check the boundary data for errors (lines not joined to each other), allowing necessary corrections to be made;
*   build a database of information relating to each ancient wood and attach this textual information to the relevant wood via the unique id;
*   create a graphics file of boundaries made up of lines with each line attached to the database (_dgn);
*   create a graphics file of boundaries made up of polygons/regions (xdgn), which is used when plotting the boundaries.

The checked and attributed files were then translated into Mapinfo format via an automated script allowing bulk transfer.

The boundaries then underwent another check to ensure each wood had its correct id number, essential to link the boundaries with the Ancient Woodland Inventory database.