National Inventory of Woodland and Trees

England

County Report for

Dorest

Forestry Commission

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Woodland Surveys Branch of Forest Research was responsible for carrying out the survey and analysing the data. A large number of Forestry Commission and contract staff were involved in the survey from its inception.

Preparation of the digital cartography for Dorset was carried out by Graham Bull, Woodland Survey Officer, and Woodland GIS Officers Chris Brown, Robert Beck and Esther Whitton. Data processing and analysis was carried out by Woodland Data Officers Justin Gilbert and Shona Cameron.

The authors of this Report are Steve Smith (Head of Woodland Surveys) and Justin Gilbert (Woodland Data Officer) of Forest Research.

INTRODUCTION

This report presents the results for Dorset from the Forestry Commission National Inventory of Woodland and Trees (NIWT).

The Inventory consists of two separate surveys -

- The Main Woodland Survey (MWS) covering woodlands of 2 hectares and over
- The Survey of Small Woodland and Trees (SSWT) covering Small Woods, Groups of Trees, Linear Features and Individual Trees.

BACKGROUND

Since 1924 the Forestry Commission has carried out a number of national woodland surveys at intervals of between 15 and 20 years. The previous survey was carried out between 1979 and 1982. With the statistics becoming increasingly out of date the Forestry Commission decided to undertake a new survey: the *National Inventory of Woodland and Trees*.

The survey fieldwork for Great Britain was completed in July 2000. Work began in Scotland in 1994, followed by Southern England, Wales and Northern England.

SURVEY METHODS

Main Woodland Survey

In England, Woodland Surveys derived a digital map of all woodland showing Interpreted Forest Types from 1:25 000 scale aerial photography. This provided the basis for the sampling.

The digital map gives the extent of all woodland over 2 hectares and this was updated as survey work progressed. The maps on pages 4-6 show: overall woodland cover; woodland by ownership; and woodland by Interpreted Forest Type, respectively. The total area of woodland was obtained from the digital map with ground sampling undertaken to evaluate a wide range of woodland information such as species, age and stocking.

From the digital map the area of each woodland was recorded and this information was used to determine the intensity at which any selected woodland would be sampled. The overall sampling scheme was as follows:

- 2.0ha - <100ha : every fifth wood
- 100ha - <500ha : two woods in five
- 500ha and larger : all woods

1 hectare square plots were used to sample the selected woodlands on the ground. This was a change of practice from all previous Census surveys, where whole woods have been selected for survey. For each of the three bands of woodland area a different sampling grid was used with the density of the squares being reduced as the woodlands increase in size. The overall aim was to sample 1% of the woodland in each size class.

Survey of Small Woodland and Trees

The land area of England was stratified into coastal and inland 1 km x 1 km squares and a random sample of 1 km^2 plots were then selected, representing around 1% of the land area. 1:25 000 scale aerial photos were then used to identify features in each sample square. Each 1 km^2 was then divided into 16 parts, and two of these were selected at random for field data collection. Data was collected on Small Woodlands (0.10 - <2.00 ha), Linear Features, Groups and Individual Trees. The survey did not collect information from areas of developed land of 2 hectares or more.

MAIN POINTS FROM THE SURVEY RESULTS

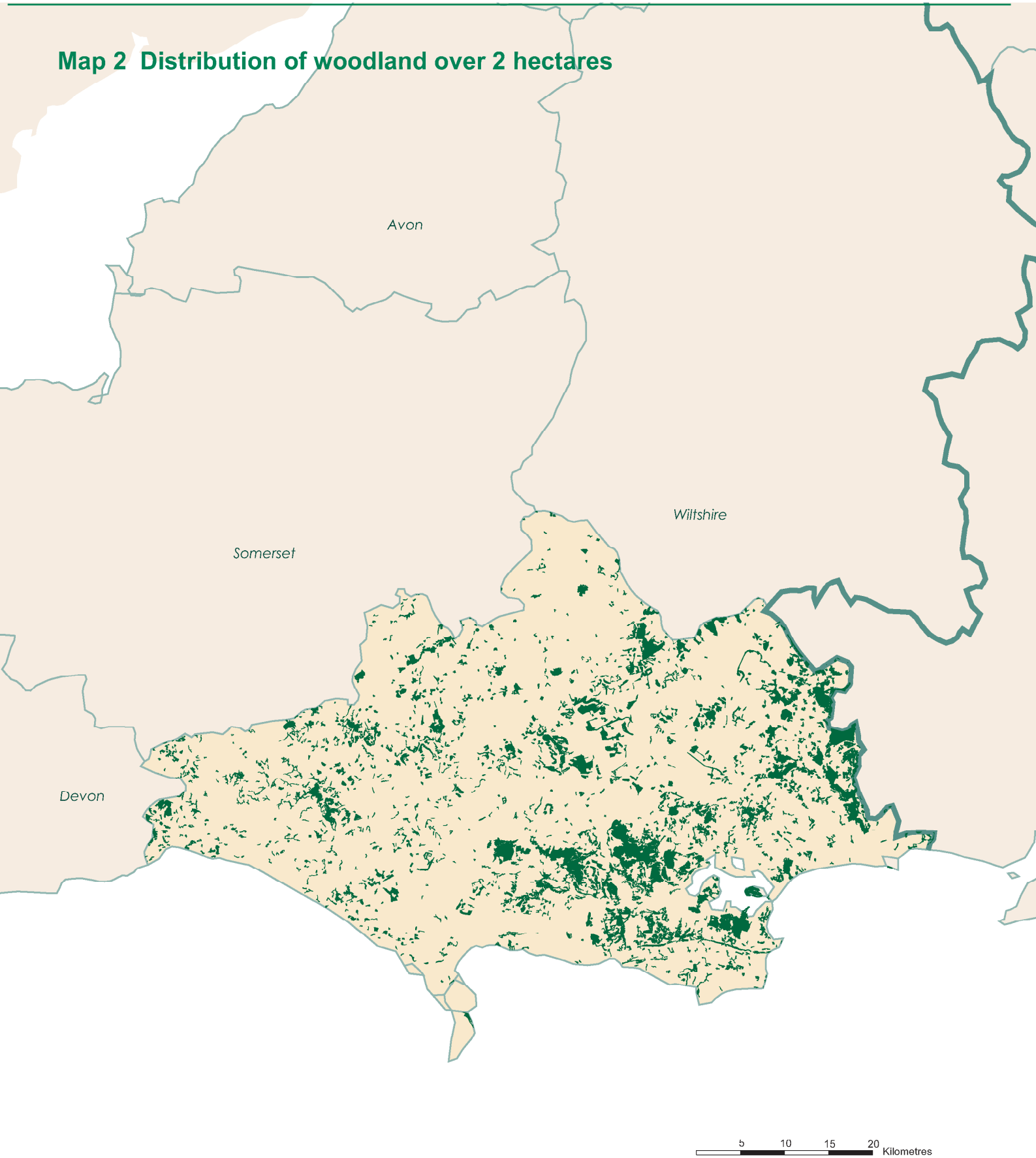
- The total area of woodland of 0.1 hectares and over in Dorset is 28,758 hectares. This represents 10.8 % of the land area. (Table 1)
- Broadleaved woodland is the dominant forest type representing 48.1 % of all woodland. Conifer woodland represents 30.0 %, Mixed woodland 15.0 % and Open Space within woodlands 4.9 %. (Table 2)
- The main conifer species is pine covering 6,378 hectares or 60.4 % of all conifer species. The main broadleaved species is oak covering 3,545 hectares or 21.9 % of all broadleaved species. (Table 3)
- 6,512 hectares or 23 % of woodland over 2 hectares is owned by or leased to the Forestry Commission, and 21,589 hectares or 77 % of woodland is in Other ownership. (Table 6)
- There are a total of 1,625 woods over 2 ha within Dorset with a mean wood area of 17.3 hectares. (Table 7a) There are a total of 1,360 woods from 0.1 - <2.0 hectares with a mean wood area of 0.48 hectares. (Table 14)
- There are 1.6 million live trees outside woodland in Dorset. (Table 15)
- Woodland land cover increased by over 3,600 hectares from 9.4 % to 10.8 % of the land area between 1980 and 1997. (Table 19)
- The area of broadleaves increased by 31 % between 1980 and 1997, with the relative proportion of broadleaves to conifers increasing from 55 % to 60 %. (Table 20)

INVENTORY REPORTS

As well as this report for Dorset, reports are available for the other counties in the region as shown on the map opposite. Also available are region and county reports for England as well as a report for the country as a whole. Wales and Scotland are also covered by reports.

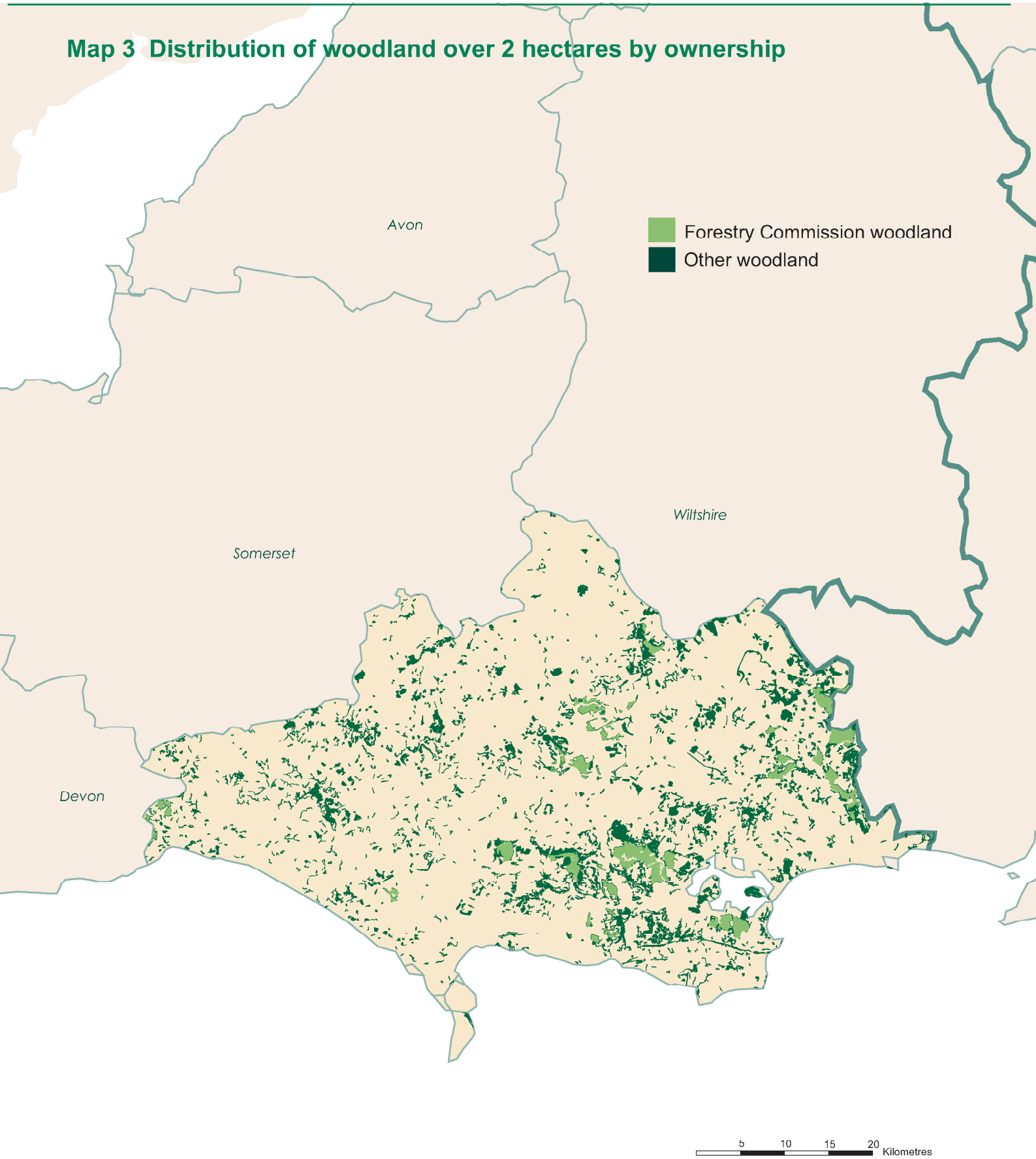
Map 1 Regional and county boundaries

Map 2 Distribution of woodland over 2 hectares

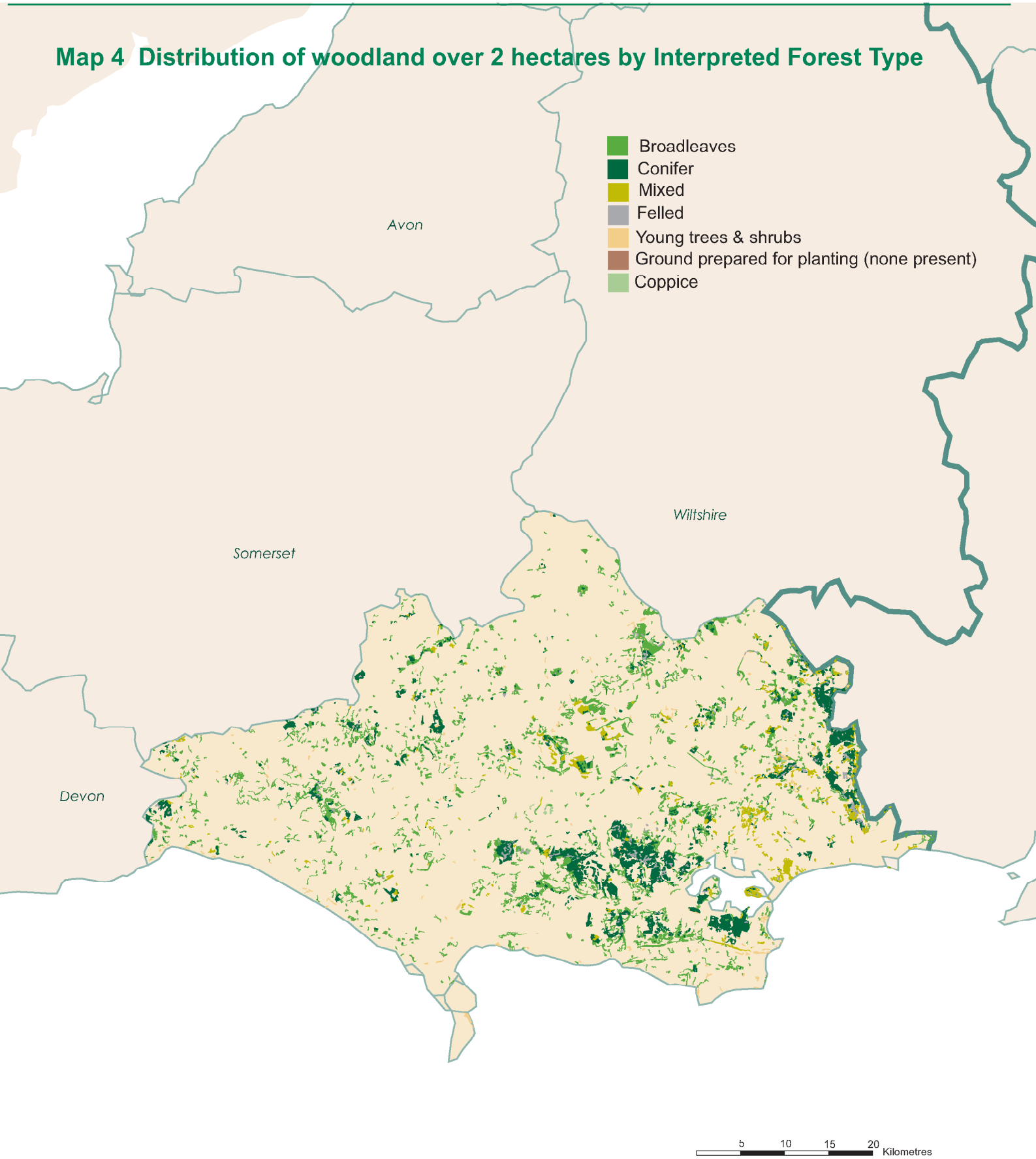


Reference Date 31 March 1997

Map 3 Distribution of woodland over 2 hectares by ownership



Map 4 Distribution of woodland over 2 hectares by Interpreted Forest Type



SUMMARY RESULTS FROM THE NATIONAL INVENTORY OF WOODLAND AND TREES (NIWT)

Both the Main Woodland Survey and the Survey of Small Woodland and Trees contributed to the estimate of woodland area for Dorset.

Tables 1-3 show the combined woodland area from the Main Woodland Survey and the Survey of Small Woodland and Trees.

Tables 4 and 5 summarise the numbers of live trees outside woodland, and the lengths of Linear Features from the Survey of Small Woodland and Trees.

Table 1:	Woodland area by woodland size class
Table 2:	Woodland area by forest type and woodland size
Table 3:	Woodland area by principal species and woodland size
Table 4:	Numbers of live trees outside woodland by feature type
Table 5:	Lengths of Linear Features

Note: *The figures in many of the tables may not add due to rounding*

Table 1 Woodland area by woodland size class

Woodland size (ha)	Woodland area (ha)	% of Woodland area
2.00 and over	28,101	97.7
0.25 - < 2.00	591	2.1
0.10 - < 0.25	66	0.2
Total area of woodland	**28,758**	**100.0**
% Woodland land cover	**10.8**	

1. Area of Dorset, including inland water, 265,274 ha based on digital boundaries used in the 1991 Census of Population

Table 2 Woodland area by forest type and woodland size

Forest type	Woodland size (ha)		Total area (ha)	Percentage of total area
	2.0 and over	0.1 - <2.0		
Conifer	8,615	5	8,620	30.0
Broadleaved	13,390	440	13,830	48.1
Mixed	4,101	207	4,308	15.0
Coppiced	309	0	309	1.1
Copp-w-standards	73	0	73	0.3
Windblow	0	0	0	0.0
Felled	199	0	199	0.7
Open Space	1,412	5	1,417	4.9
Total	**28,101**	**657**	**28,758**	**100**

1. See Glossary for definitions of forest types.

Table 3 Woodland area by principal species and woodland size

Species/Groups	Woodland size (ha)		Total area	Percentage of total area	
	2.0 and over	0.1 -<2.0	(ha)	Category*	Species**
Pine	6,373	5	6,378	60.4	23.8
Sitka spruce	8	0	8	0.1	0.0
Larch	591	52	643	6.1	2.4
Other conifers	3,267	26	3,293	31.2	12.3
Mixed conifers	235	0	235	2.2	0.9
Total conifers	**10,474**	**83**	**10,557**	**100.0**	**39.5**
Oak	3,488	57	3,545	21.9	13.2
Beech	2,349	192	2,541	15.7	9.5
Sycamore	859	88	947	5.8	3.5
Ash	3,169	85	3,254	20.1	12.2
Birch	1,493	0	1,493	9.2	5.6
Elm	0	26	26	0.2	0.1
Other broadleaves	2,056	111	2,167	13.4	8.1
Mixed broadleaves	2,218	10	2,228	13.8	8.3
Total broadleaves	**15,633**	**570**	**16,203**	**100.0**	**60.5**
Total all species* **	**26,107**	**652**	**26,759**		**100.0**

*Category - species/group percentage of conifer or broadleaved category
**Species/group percentage of all species

***Excludes the 1,998ha of Coppice, Felled and Open space areas which were included in Table 2

1. The standard errors of the area estimates for woodland of 2 ha and over for the most common species or species groups are as follows

Conifers	6%
Broadleaves	4%
Pine	8%
Oak	10%
Ash	10%

2. Where the standard errors of these summary measures are 10% or less, the confidence intervals will be approximately symmetrical; the true value is expected to be within +/- one standard error for about 68% (or about two-thirds) of all cases, and within +/- two standard errors for about 95% of all cases. Where percentage standard errors are larger , e.g. for less common species or more variable species composition, the confidence intervals will be less symmetrical (and wider).

Table 4 Numbers of live trees outside woodland by feature type

Feature type	Total number of features	Total number of live trees	Mean number of trees per feature	Tree density (per sq km)
Groups	31,400	530,700	17	200
Narrow Linear Features	9,400	1,041,000	111	392
Individual Trees	78,800	78,800	1	30
Total		**1,650,500**		**622**

1. Land area used to calculate tree density 265,274 ha based on digital boundaries used in 1991 Census of Population

2. The standard errors of the live tree number estimates for these feature types are:

Groups	43%
Narrow Linear Features	54%
Individual Trees	20%

3. Where the standard errors of these summary measures are 10% or less, the confidence intervals will be approximately symmetrical; the true value is expected to be within +/- one standard error for about 68% (or about two-thirds) of all cases, and within +/- two standard errors for about 95% of all cases. Where percentage standard errors are larger , e.g. for less common species or more variable species composition, the confidence intervals will be less symmetrical (and wider).

4. See Glossary for definitions of feature types .

Table 5 Lengths of Linear Features

Feature type	Total number of features	Total length of features (km)	Density of features (m per sq km)
Wide Linear Features	323	18	7
Narrow Linear Features	9,400	809	305
Total		**827**	**312**

1. Land area used to calculate tree density 265,274 ha based on digital boundaries used in 1991 Census of Population

2. The standard errors of the length estimates for these feature types are:

Wide Linear Features	98%
Narrow Linear Features	39%

3. Where the standard errors of these summary measures are 10% or less, the confidence intervals will be approximately symmetrical; the true value is expected to be within +/- one standard error for about 68% (or about two-thirds) of all cases, and within +/- two standard errors for about 95% of all cases. Where percentage standard errors are larger , e.g. for less common species or more variable species composition, the confidence intervals will be less symmetrical (and wider).

4. See Glossary for definitions of feature type .

RESULTS FROM THE MAIN WOODLAND SURVEY (MWS)

Survey Method

Woods were selected from the digital map of woodland of 2 hectares and over, then sampled using a random grid of 1 hectare sample plots. The density of sample plots was reduced as the sampled woodland increase in size, the general aim being to sample 1% of the woodland area. The ground sampling evaluated a wide range of data such as species, age and stocking.

Note: The figures in many of the tables may not add due to rounding

Table 6 Summary of woodland area by ownership

Ownership	ha	% woodland
Forestry Commission	6,512	23
Other	21,589	77
Total area of woodland	**28,101**	**100**

1. Woodland area from aerial photographic interpretation map updated to 31 March 1997

2. See Glossary for definitions of ownership types

Woodland area by ownership

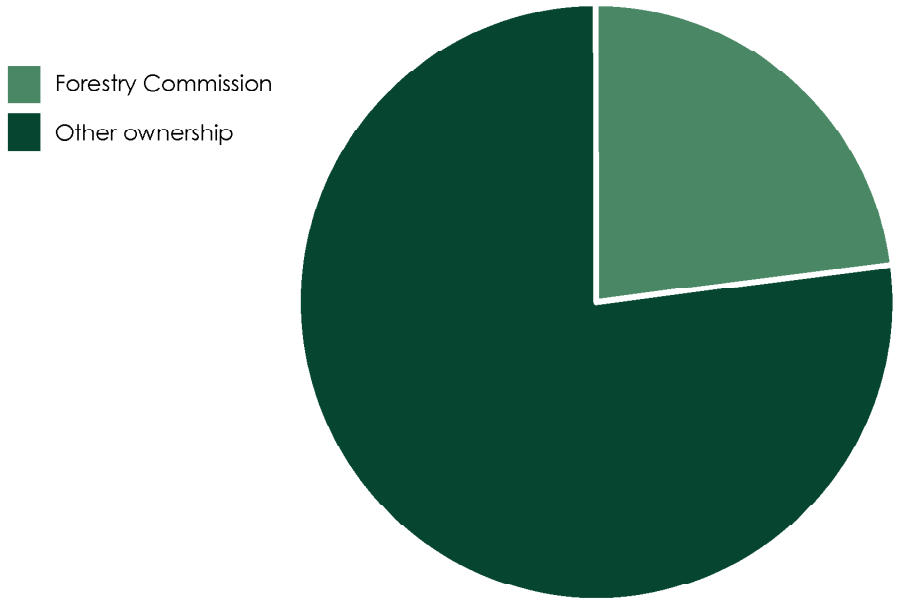


Table 7a Size class distribution of woodland

Size class (ha)	Number of woods	Total area (ha)	Percent of total area	Mean wood area (ha)
<10	1,227	5,311	19	4.3
10 - <20	190	2,663	9	14.0
20 - <50	121	3,698	13	30.6
50 - <100	45	2,989	11	66.4
<100	**1,583**	**14,662**	**52**	**9.3**
100 - <500	**37**	**8,507**	**30**	**229.9**
500 and >	**5**	**4,980**	**18**	**996.0**
All woods	**1,625**	**28,149**	**100**	**17.3**

Table 7b Size class distribution of woodland by ownership units

Size class (ha)	FC or Other	Number of woods	Total area (ha)	Percent of total area	Mean wood area (ha)
<10	FC	26	113	0	4.3
	O	1,320	5,498	20	4.2
10 - <20	FC	5	73	0	14.5
	O	203	2,848	10	14.0
20 - <50	FC	11	385	1	35.0
	O	134	4,014	14	30.0
50 - <100	FC	7	461	2	65.9
	O	45	3,052	11	67.8
<100	FC	49	1,031	4	21.0
	O	1,702	15,412	55	9.0
100 - <500	FC	16	3,859	14	241.2
	O	31	6,226	22	200.8
500 and >	FC	2	1,621	6	810.5
	O	0	0	0	0.0
Total	**FC**	**67**	**6,512**	**23**	**97.2**
	O	**1,733**	**21,637**	**77**	**12.5**

1. Table 7a and 7b are based solely on the digital woodland map. The other MWS tables are derived from the field sample data

2. The total area in Tables 7a and 7b is 48 hectares more than recorded in Table 6. This is mainly due to the field samples recording some land in other land uses not differentiated from woodland in the digital map

3. The data available from the digital map enable the identification of woodlands according to their ownerships, Forestry Commission or Other. The entries in table 7b cannot be added to derive table 7a as some woods may consist of both Forestry Commission and Other ownership(s)

   For example, the Forestry Commission may own most of a large wood with some parts in Other ownership(s). In Table 7a the whole area would be treated as one wood and the area allocated to one size category. In Table 7b each of the ownership units would be allocated to the size category for that unit. Dividing woods by ownership can occasionaly generate part woods of less than 2 hectares

Table 8 Area of woodland by forest type and ownership

Forest type	Forestry Commission		Other		All ownerships	
	ha	%	ha	%	ha	%
Conifer	3,083	47.3	5,532	25.6	8,615	30.7
Broadleaved	1,291	19.8	12,100	56.0	13,390	47.6
Mixed	1,587	24.4	2,514	11.6	4,101	14.6
Coppice	84	1.3	225	1.0	309	1.1
Copp-w-Stds	0	0.0	73	0.3	73	0.3
Windblow	0	0.0	0	0.0	0	0.0
Felled	133	2.0	66	0.3	199	0.7
Open Space	334	5.1	1,078	5.0	1,412	5.0
Total	**6,512**	**100.0**	**21,589**	**100.0**	**28,101**	**100.0**

Area of woodland by forest type

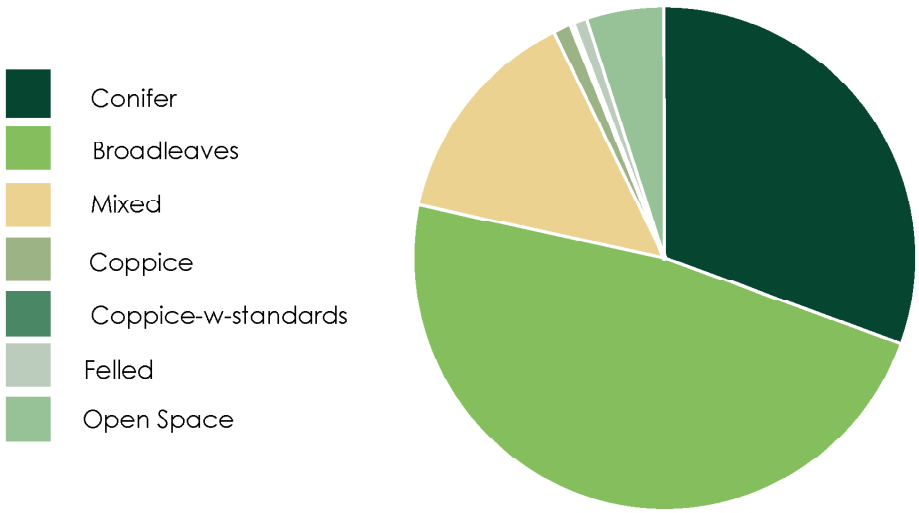


Table 9a Area of High Forest by principal species and ownership

Species	Forestry Commission			Other			All ownerships		
	area (ha)	cat* %	spp** %	area (ha)	cat* %	spp** %	area (ha)	cat* %	spp** %
Scots pine	980	25	16	2,816	43	14	3,796	36	14
Corsican pine	1,834	47	31	743	11	4	2,577	25	10
Lodgepole pine	0	0	0	0	0	0	0	0	0
Sitka spruce	0	0	0	8	0	0	8	0	0
Norway spruce	269	7	5	921	14	5	1,191	11	5
European larch	20	1	0	442	7	2	462	4	2
Jap/Hybrid larch	10	0	0	119	2	1	129	1	0
Douglas fir	387	10	6	479	7	2	866	8	3
Other conifers	410	10	7	800	12	4	1,210	12	5
Mixed conifers	6	0	0	229	3	1	235	2	1
Total conifers	**3,917**	**100**	**66**	**6,557**	**100**	**33**	**10,474**	**100**	**40**
Oak	313	15	5	3,175	23	16	3,488	22	13
Beech	752	37	13	1,596	12	8	2,349	15	9
Sycamore	0	0	0	859	6	4	859	5	3
Ash	81	4	1	3,088	23	15	3,169	20	12
Birch	602	29	10	891	7	4	1,493	10	6
Poplar	0	0	0	57	0	0	57	0	0
Sweet chestnut	14	1	0	221	2	1	234	1	1
Elm	0	0	0	0	0	0	0	0	0
Other broadleaves	209	10	4	1,556	11	8	1,765	11	7
Mixed broadleaves	74	4	1	2,145	16	11	2,218	14	8
Total broadleaves	**2,044**	**100**	**34**	**13,588**	**100**	**67**	**15,633**	**100**	**60**
Total - all species	**5,961**		**100**	**20,146**		**100**	**26,107**		**100**
Felled	**133**			**66**			**199**		
Total High Forest	**6,094**			**20,212**			**26,306**		

*cat : species percentage of Conifer or Broadleaved in the ownership category
**spp : percentage of all species in the ownership category

1. In addition to the areas shown there are 1,412 ha of other areas integral to the woodland not stocked with tree species.

2. The standard errors of the all ownerships area estimates for the most common species or species groups are as follows;

Conifers	6%
Broadleaves	4%
Scots pine	11%
Oak	10%
Ash	10%

3. Mixtures: where possible the species in mixtures have been separately recorded. Where this has not been possible they were described as 'Mixed conifers' or 'Mixed broadleaves'.

4. Confidence Intervals: where the standard errors of these summary measures are 10% or less, the confidence Intervals will be approximately symmetrical; the true value is expected to be within +/- one standard error for about 68% (or about two-thirds) of all cases, and within +/- two standard errors for about 95% of all cases. Where percentage standard errors are larger , e.g. for less common species or more variable species composition, the confidence intervals will be less symmetrical (and wider).

Area of High Forest by principal species and ownership

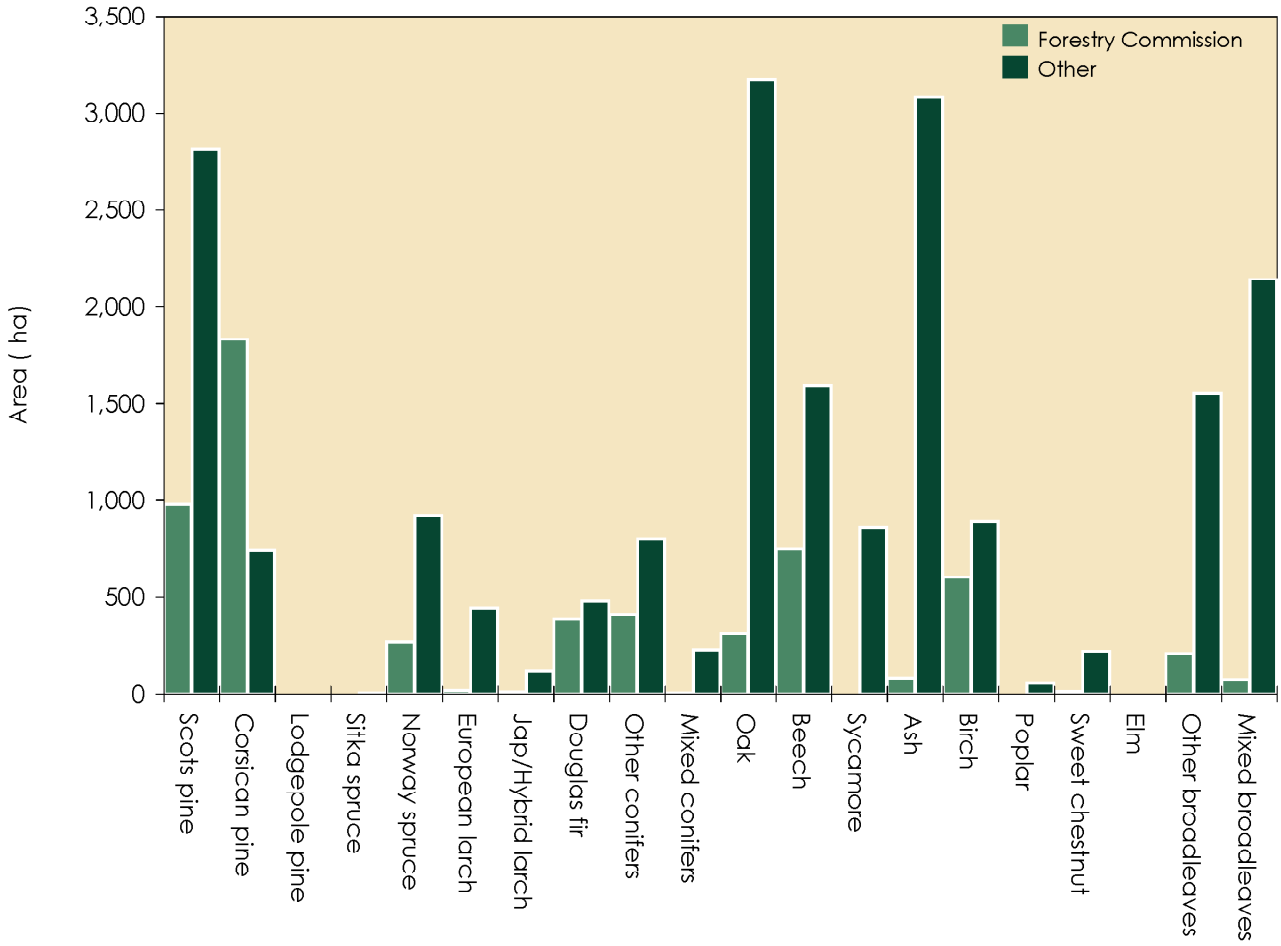


Table 9b Area of High Forest by principal species,ownership and category

Species	Forestry Commission			Other			All ownerships		
	cat. 1	cat. 2	Total (ha)	cat. 1	cat. 2	Total (ha)	cat. 1	cat. 2	Total (ha)
Scots pine	918	62	980	2,662	154	2,816	3,580	217	3,796
Corsican pine	1,834	0	1,834	743	0	743	2,577	0	2,577
Lodgepole pine	0	0	0	0	0	0	0	0	0
Sitka spruce	0	0	0	8	0	8	8	0	8
Norway spruce	269	0	269	921	0	921	1,191	0	1,191
European larch	20	0	20	442	0	442	462	0	462
Jap/Hybrid larch	10	0	10	119	0	119	129	0	129
Douglas fir	387	0	387	479	0	479	866	0	866
Other conifers	410	0	410	565	235	800	975	235	1,210
Mixed conifers	6	0	6	206	23	229	212	23	235
Total conifers	**3,855**	**62**	**3,917**	**6,145**	**412**	**6,557**	**10,000**	**474**	**10,474**
Oak	310	3	313	2,891	284	3,175	3,201	287	3,488
Beech	722	30	752	1,516	80	1,596	2,238	110	2,349
Sycamore	0	0	0	808	51	859	808	51	859
Ash	81	0	81	2,919	168	3,088	3,000	168	3,169
Birch	189	413	602	417	475	891	606	888	1,493
Poplar	0	0	0	57	0	57	57	0	57
Sweet chestnut	14	0	14	209	11	221	223	11	234
Elm	0	0	0	0	0	0	0	0	0
Other broadleaves	41	168	209	429	1,127	1,556	470	1,295	1,765
Mixed broadleaves	74	0	74	1,361	784	2,145	1,434	784	2,218
Total broadleaves	**1,430**	**615**	**2,044**	**10,607**	**2,981**	**13,588**	**12,037**	**3,596**	**15,633**
Total - all species	**5,284**	**677**	**5,961**	**16,753**	**3,393**	**20,146**	**22,037**	**4,070**	**26,107**

1. The standard errors of the all ownerships area estimates for the most common species or species groups (in all woodland types) are as follows

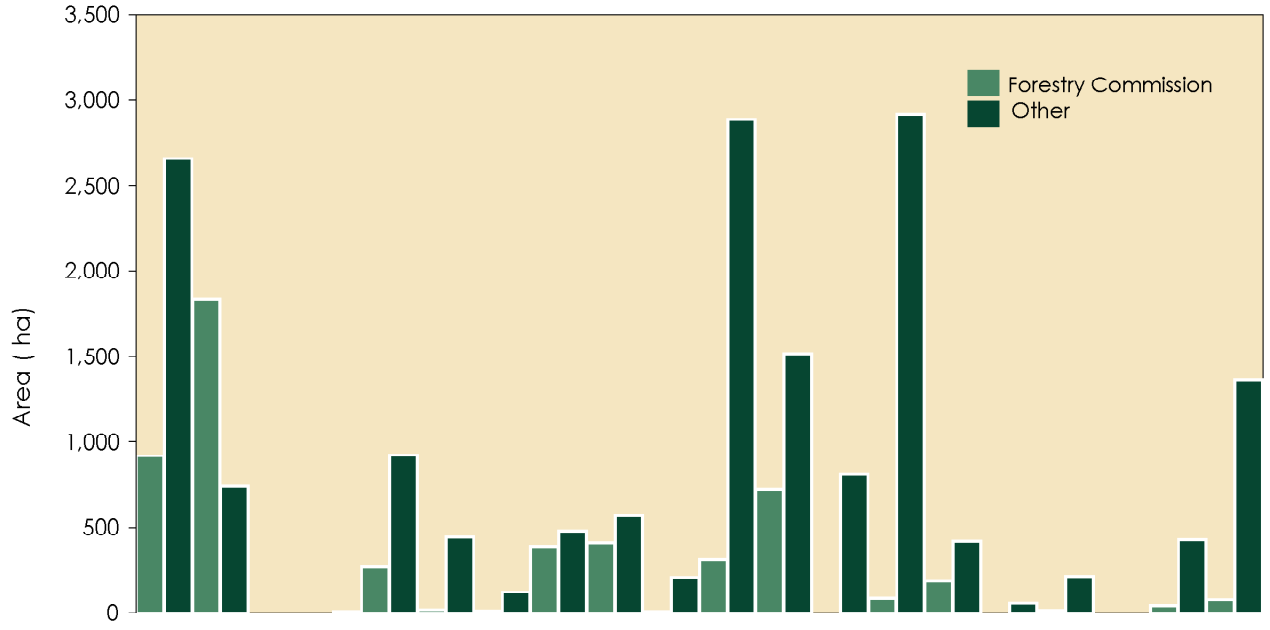
	Category 1*	Category 2*	Total High Forest
Conifers	5%	37%	6%
Broadleaves	4%	7%	4%
Scots pine	11%	49%	11%
Oak	10%	43%	10%
Ash	10%	32%	10%

*See Glossary for Category 1 and Category 2 descriptions

2. Where the standard errors of these summary measures are 10% or less, the confidence intervals will be approximately symmetrical; the the true value is expected to be within +/- one standard error for about 68% (or about two-thirds) of all cases, and within +/- two standard errors for about 95% of all cases. Where percentage standard errors are larger , e.g. for less common species or more variable species composition, the confidence intervals will be less symmetrical (and wider).

3. Where possible the species in mixtures have been separately recorded. Where this has not been possible they were described as 'Mixed conifers' or 'Mixed broadleaves'.

High Forest Category 1 - Area by principal species and ownership



High Forest Category 2 - Area by principal species and ownership

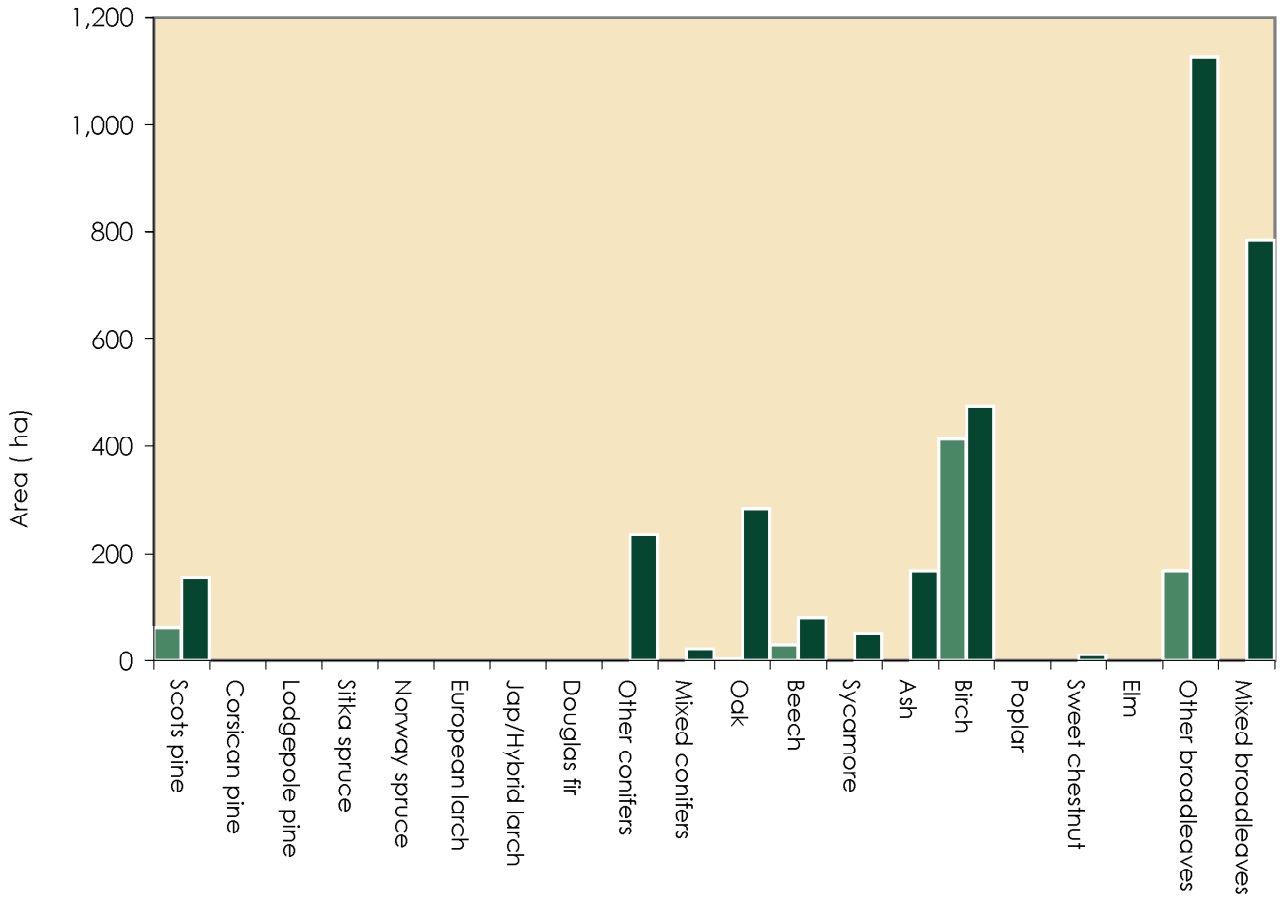
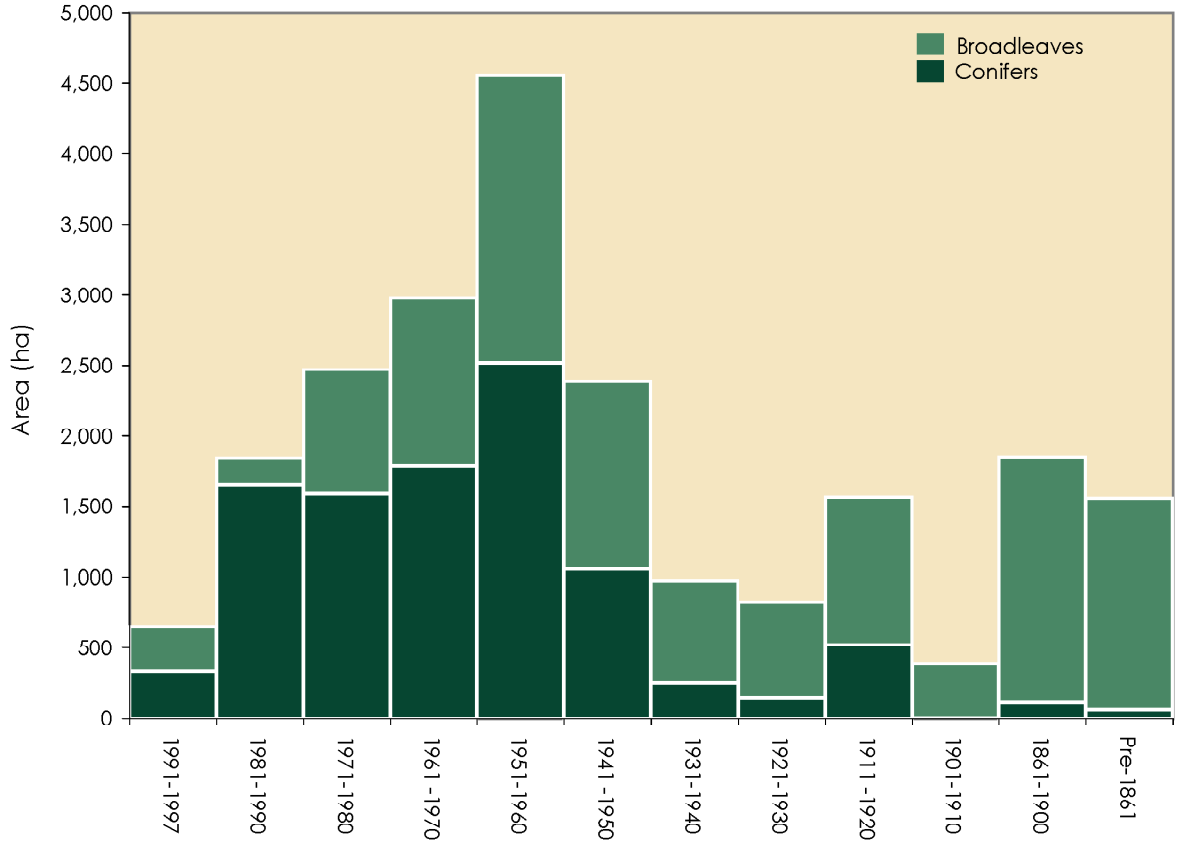


Table 10a High Forest Category 1 - Area by principal species and planting year class

Species	Planting year class*												Total (ha)
	1991-1997	1981-1990	1971-1980	1961 - 1970	1951-1960	1941 - 1950	1931-1940	1921-1930	1911 - 1920	1901-1910	1861-1900	Pre-1861	
Scots pine	161	548	391	476	754	577	66	139	364	0	62	43	3,580
Corsican pine	125	459	631	253	948	30	114	0	0	0	17	0	2,577
Lodgepole pine	0	0	0	0	0	0	0	0	0	0	0	0	0
Sitka spruce	0	0	0	8	0	0	0	0	0	0	0	0	8
Norway spruce	0	173	269	429	114	205	0	0	0	0	0	0	1,191
European larch	0	14	120	60	121	92	56	0	0	0	0	0	462
Jap/Hybrid larch	0	0	0	95	10	24	0	0	0	0	0	0	129
Douglas fir	41	196	17	234	372	7	0	0	0	0	0	0	866
Other conifers	0	241	160	179	165	34	0	0	152	0	30	16	975
Mixed conifers	0	24	0	55	34	81	11	0	0	0	6	0	212
Total conifers	**326**	**1,654**	**1,588**	**1,787**	**2,518**	**1,051**	**248**	**139**	**516**	**0**	**115**	**59**	**10,000**
Oak	92	0	119	85	246	152	142	366	177	226	1,125	469	3,201
Beech	10	0	204	270	552	443	62	60	0	33	65	538	2,238
Sycamore	37	0	39	88	264	128	57	0	161	0	33	0	808
Ash	120	88	248	190	667	175	423	201	225	119	269	274	3,000
Birch	29	72	161	190	91	43	18	0	0	0	0	0	606
Poplar	0	0	0	57	0	0	0	0	0	0	0	0	57
Sweet chestnut	7	0	0	31	13	83	0	0	56	10	18	5	223
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other broadleaves	27	0	44	93	12	57	9	39	32	0	114	40	470
Mixed broadleaves	0	27	69	183	193	254	16	17	397	0	106	173	1,434
Total broadleaves	**324**	**187**	**885**	**1,188**	**2,039**	**1,337**	**728**	**683**	**1,049**	**389**	**1,731**	**1,498**	**12,037**
Total - all species	**650**	**1,841**	**2,473**	**2,975**	**4,556**	**2,388**	**976**	**821**	**1,565**	**389**	**1,845**	**1,557**	**22,037**

*Age determined from records where these were available. Where records were not available or were clearly inaccurate age-class was assigned by reference to similar crops of known age in the locality.

High Forest Category 1 - Area by planting year class



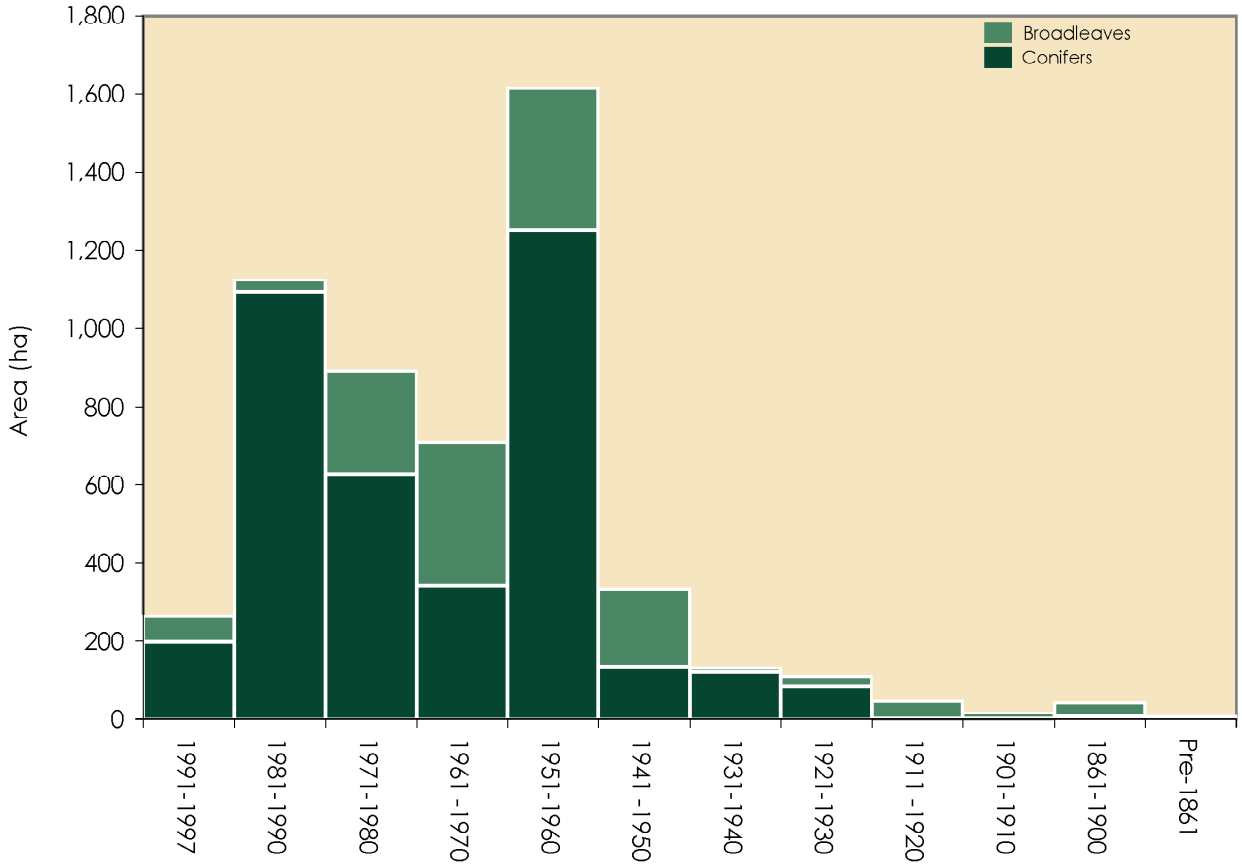
1. Most of the planting year classes cover 10 years, 1991-1997 is 7 years, and the classes prior to 1901 are 40 years or more.

Table 10b High Forest Category 1 - Forestry Commission : area by principal species and planting year classes

Species	Planting year class*												Total (ha)
	1991-1997	1981-1990	1971-1980	1961 - 1970	1951-1960	1941 - 1950	1931-1940	1921-1930	1911 - 1920	1901-1910	1861-1900	Pre-1861	
Scots pine	30	309	115	118	199	54	7	84	0	0	0	3	918
Corsican pine	125	402	357	54	751	30	114	0	0	0	0	0	1,834
Lodgepole pine	0	0	0	0	0	0	0	0	0	0	0	0	0
Sitka spruce	0	0	0	0	0	0	0	0	0	0	0	0	0
Norway spruce	0	0	115	0	114	41	0	0	0	0	0	0	269
European larch	0	14	0	0	7	0	0	0	0	0	0	0	20
Jap/Hybrid larch	0	0	0	0	10	0	0	0	0	0	0	0	10
Douglas fir	41	128	0	128	84	7	0	0	0	0	0	0	387
Other conifers	0	241	41	41	88	0	0	0	0	0	0	0	410
Mixed conifers	0	0	0	0	0	0	0	0	0	0	6	0	6
Total conifers	**196**	**1,093**	**627**	**340**	**1,252**	**132**	**121**	**84**	**0**	**0**	**6**	**3**	**0**
Oak	24	0	115	27	51	20	0	24	14	17	20	0	310
Beech	0	0	72	212	282	149	0	0	0	0	3	3	722
Sycamore	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	0	0	0	54	7	20	0	0	0	0	0	0	81
Birch	24	27	71	41	17	0	10	0	0	0	0	0	189
Poplar	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweet chestnut	7	0	0	3	0	3	0	0	0	0	0	0	14
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other broadleaves	13	0	6	20	0	0	0	0	0	0	0	0	41
Mixed broadleaves	0	3	0	10	7	7	0	0	34	0	13	0	74
Total broadleaves	**68**	**30**	**264**	**367**	**363**	**200**	**10**	**24**	**47**	**17**	**36**	**3**	**1,430**
Total - all species	**263**	**1,124**	**891**	**708**	**1,615**	**332**	**131**	**107**	**47**	**17**	**42**	**7**	**5,284**

*Age determined from records where these were available. Where records were not available or were clearly inaccurate age-class was assigned by reference to similar crops of known age in the locality.

High Forest Category 1 - Forestry Commission: area by planting year class



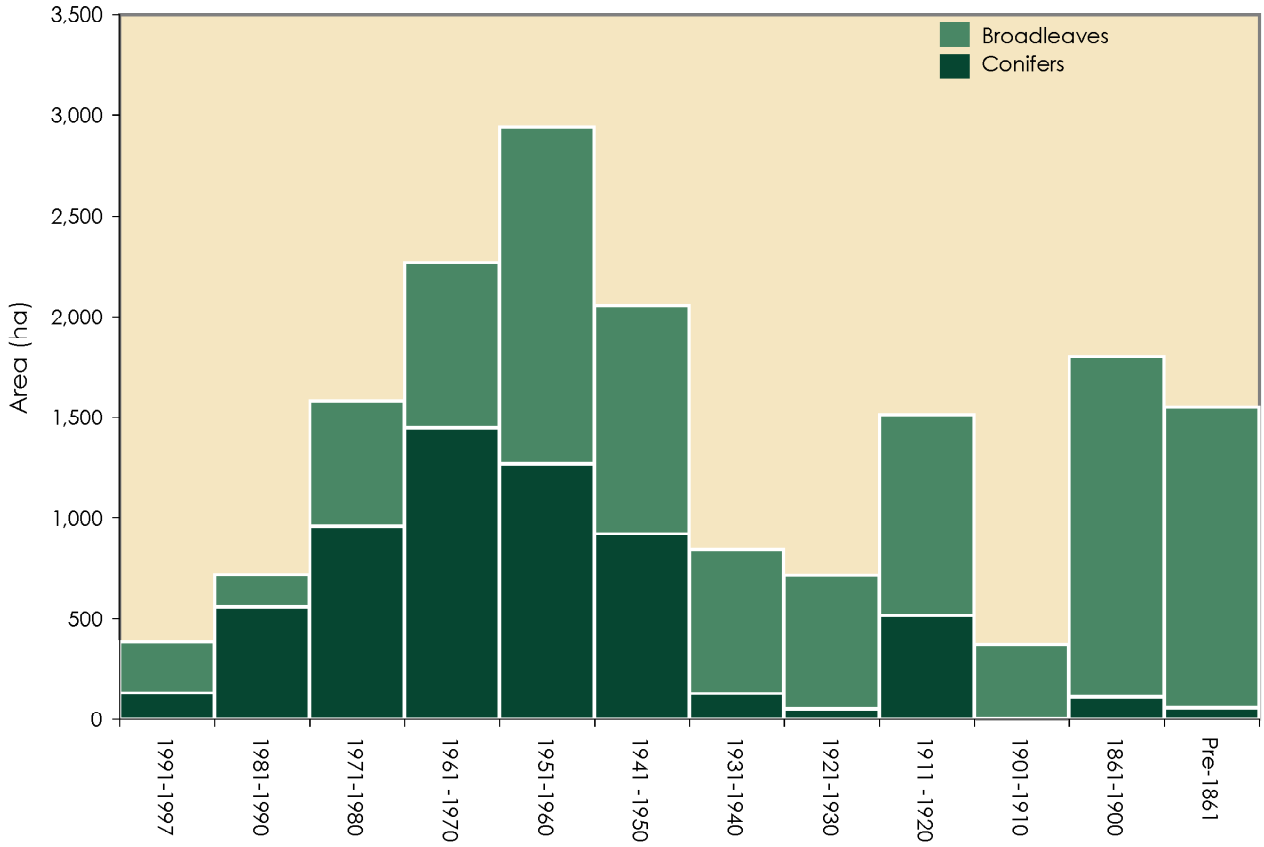
1. Most of the planting year classes cover 10 years, 1991-1997 is 7 years, and the classes prior to 1901 are 40 years or more.

Table 10c High Forest Category 1 - Other ownership: area by principal species and planting year classes

Species	Planting year class*												Total (ha)
	1991-1997	1981-1990	1971-1980	1961 - 1970	1951-1960	1941 - 1950	1931-1940	1921-1930	1911 - 1920	1901-1910	1861-1900	Pre-1861	
Scots pine	130	239	276	358	555	523	60	55	364	0	62	40	2,662
Corsican pine	0	56	274	199	197	0	0	0	0	0	17	0	743
Lodgepole pine	0	0	0	0	0	0	0	0	0	0	0	0	0
Sitka spruce	0	0	0	8	0	0	0	0	0	0	0	0	8
Norway spruce	0	173	154	429	0	165	0	0	0	0	0	0	921
European larch	0	0	120	60	114	92	56	0	0	0	0	0	442
Jap/Hybrid larch	0	0	0	95	0	24	0	0	0	0	0	0	119
Douglas fir	0	69	17	105	288	0	0	0	0	0	0	0	479
Other conifers	0	0	119	138	77	34	0	0	152	0	30	16	565
Mixed conifers	0	24	0	55	34	81	11	0	0	0	0	0	206
Total conifers	**130**	**561**	**960**	**1,447**	**1,266**	**919**	**127**	**55**	**516**	**0**	**109**	**56**	**6,145**
Oak	69	0	5	58	196	132	142	342	164	209	1,105	469	2,891
Beech	10	0	133	58	270	294	62	60	0	33	62	534	1,516
Sycamore	37	0	39	88	264	128	57	0	161	0	33	0	808
Ash	120	88	248	136	660	154	423	201	225	119	269	274	2,919
Birch	6	45	90	150	74	43	8	0	0	0	0	0	417
Poplar	0	0	0	57	0	0	0	0	0	0	0	0	57
Sweet chestnut	0	0	0	27	13	80	0	0	56	10	18	5	209
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other broadleaves	14	0	38	73	12	57	9	39	32	0	114	40	429
Mixed broadleaves	0	24	69	173	187	247	16	17	363	0	93	173	1,361
Total broadleaves	**256**	**157**	**621**	**821**	**1,675**	**1,138**	**718**	**659**	**1,001**	**372**	**1,695**	**1,495**	**10,607**
Total - all species	**387**	**718**	**1,582**	**2,267**	**2,941**	**2,056**	**845**	**714**	**1,517**	**372**	**1,804**	**1,551**	**16,753**

*Age determined from records where these were available. Where records were not available or were clearly inaccurate age-class was assigned by reference to similar crops of known age in the locality.

High Forest Category 1 - Other Ownership: area by planting year class



1. Most of the planting year classes cover 10 years, 1991-1997 is 7 years, and the classes prior to 1901 are 40 years or more.

Table 11 High Forest : principal species by planting year class

Planting year class	First	%	Second	%	Third	%
1991-97	Mixed broadleaves	19	Scots pine	19	Corsican pine	14
1981-90	Scots pine	27	Corsican pine	22	Other conifers	12
1971-80	Corsican pine	20	Scots pine	12	Mixed broadleaves	12
1961-70	Birch	16	Scots pine	12	Norway spruce	11
1951-60	Corsican pine	18	Scots pine	18	Ash	14
1941-50	Scots pine	18	Other broadleaves	14	Beech	14
1931-40	Ash	39	Oak	13	Scots pine	11
1921-30	Oak	41	Ash	23	Scots pine	16
1911-20	Mixed broadleaves	23	Scots pine	21	Oak	14
1901-10	Oak	52	Ash	27	Mixed broadleaves	10
1861-1900	Oak	60	Ash	15	Other broadleaves	7
Pre 1861	Beech	29	Oak	26	Ash	17
All years	**Scots pine**	**14**	**Oak**	**13**	**Ash**	**12**

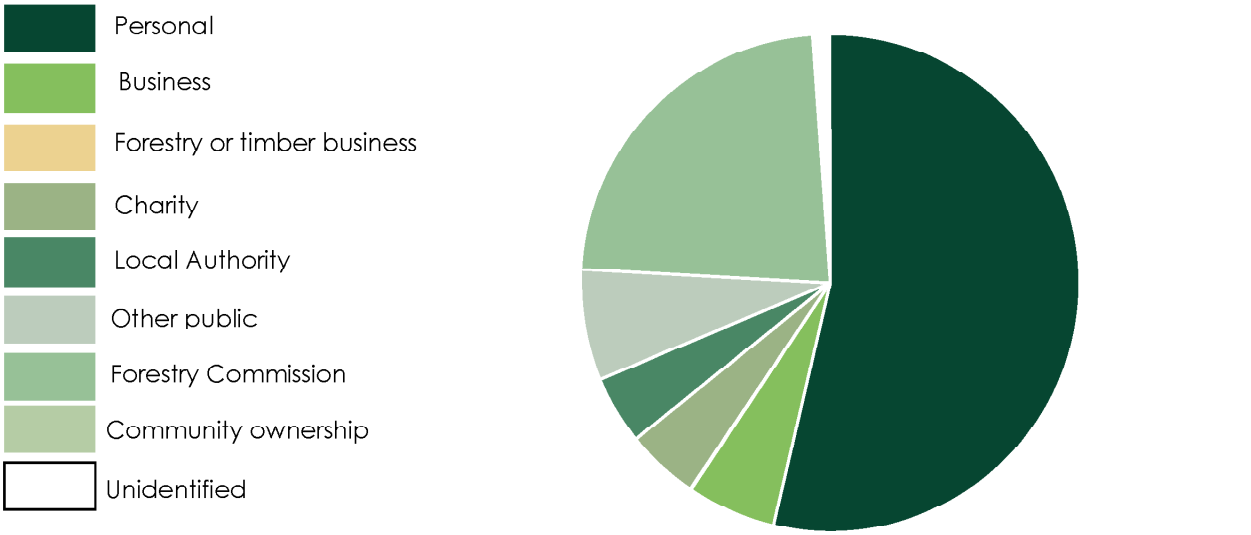
1. Principal species as a percentage of area in the planting year class.

Table 12 Ownership type* by area and percentage

Ownership type	Area (ha)	%
Personal	15,104	53.7
Business	1,563	5.6
Forestry or timber business	0	0.0
Charity	1,365	4.9
Local Authority	1,211	4.3
Other public (not FC)	2,052	7.3
Forestry Commission	6,512	23.2
Community ownership or common land	0	0.0
Unidentified	294	1.0
Total	**28,101**	**100.0**

* This table is produced from data contributed on a voluntary basis by owners or their representatives.

Ownership type by area



RESULTS FROM THE SURVEY OF SMALL WOODLAND AND TREES (SSWT)

Survey Method

The land area of England was stratified into coastal and inland 1 km x 1 km squares and a random sample of 1 km^2 plots were then selected, representing around 1% of the land area. 1:25 000 scale aerial photos were then used to identify features in each sample square. Each 1 km^2 was then divided into 16 parts, and two of these were selected at random for field data collection. Data was collected on Small Woodlands (0.10 - <2.00 ha), Linear Features, Groups and Individual Trees. The survey did not collect information from areas of developed land of 2 hectares or more.

Note: The figures in many of the tables may not add due to rounding

Table 13 Summary of information from the Survey of Small Woodlands and Trees

Feature type	Number of features	Total	Unit
Small Woods	1,037	622	Area (ha)
Wide Linear Features	323	35	Area (ha)
Wide Linear Features	323	18	Length (Km)
Narrow Linear Features	9,400	809	Length (Km)
Narrow Linear Features	9,400	1,041,000	Number of live trees
Groups	31,400	530,700	Number of live trees
Individual Trees	78,800	78,800	Number of live trees

1. See Glossary for definitions of feature types.

Table 14 Woodland area by feature type and woodland size

Feature type	Woodland size (ha)		Total area (ha)	Number of features	Mean size (ha)
	0.1 - <0.25	0.25 - <2.0			
Small Woods	31	591	622	1,037	0.60
Wide Linear Features	35	0	35	323	0.11
Total	**66**	**591**	**657**	**1,360**	**0.48**

1. See Glossary for definitions of feature types.

Table 15 Numbers of live trees outside woodland by species and feature type (000's trees)

Species	Feature type				Total live trees	Percent of total trees	
	Boundary Trees	Middle Trees	Groups	Narrow Linear Features		Category	Species
Pine	0.0	0.0	0.0	39.7	39.7	95.9	2.4
Spruce	0.0	0.8	0.0	0.3	1.1	2.7	0.1
Larch	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cypress	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other conifers	0.0	0.0	0.0	0.6	0.6	1.4	0.0
Total conifers	**0.0**	**0.8**	**0.0**	**40.6**	**41.4**	**100.0**	**2.5**
Oak	21.2	6.8	15.3	19.7	63.0	3.9	3.8
Beech	0.0	0.0	14.4	32.6	47.0	2.9	2.8
Sycamore	0.0	0.8	0.0	0.0	0.8	0.0	0.0
Ash	21.2	1.7	83.1	32.6	138.6	8.6	8.4
Birch	2.5	3.4	0.0	1.9	7.8	0.5	0.5
Poplar	0.0	0.0	0.8	0.0	0.8	0.0	0.0
Sweet chestnut	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Horse chestnut	0.0	0.0	0.8	0.0	0.8	0.0	0.0
Alder	0.0	0.0	0.0	9.7	9.7	0.6	0.6
Lime	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Elm	1.7	0.0	99.2	8.7	109.6	6.8	6.6
Willow	0.0	2.5	17.8	11.9	32.2	2.0	2.0
Other broadleaves	11.9	4.2	299.3	883.3	1198.7	74.5	72.6
Total broadleaves	**58.5**	**19.5**	**530.7**	**1000.4**	**1609.0**	**100.0**	**97.5**
Total - all species	**58.5**	**20.3**	**530.7**	**1041.0**	**1650.5**		**100.0**

1. Percentages

   Category : species percentage of conifer or broadleaved.
   Species : percentage of all species.

2. The standard errors of the total tree number estimates for these feature types are:

Individual Trees	20%
Groups	43%
Narrow Linear Features	54%

3. See Glossary for definitions of feature types.

Table 16 Numbers of dead trees outside woodland by species and feature type (000's trees)

Species	Feature type				Total dead trees	Percent of total trees	
	Boundary Trees	Middle Trees	Groups	Narrow Linear Features		Category	Species
Pine	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spruce	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Larch	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cypress	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other conifers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total conifers	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Oak	0.8	0.0	0.0	0.6	1.4	8.2	8.2
Beech	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sycamore	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ash	0.0	0.8	0.0	0.0	0.8	4.7	4.7
Birch	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Poplar	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sweet chestnut	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Horse chestnut	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alder	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lime	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Elm	0.0	0.0	14.4	0.3	14.7	86.0	86.0
Willow	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other broadleaves	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total broadleaves	**0.8**	**0.8**	**14.4**	**1.0**	**17.1**	**100.0**	**100.0**
Total - all species	**0.8**	**0.8**	**14.4**	**1.0**	**17.1**		**100.0**

1. See Glossary for definitions of feature types.

Table 17 Numbers of live trees outside woodland by species and height band (000's trees)

Species	Height band (m)				Total live trees
	2-5	5-15	15-20	>20	
Pine	39.4	0.3	0.0	0.0	39.7
Spruce	0.0	1.2	0.0	0.0	1.2
Larch	0.0	0.0	0.0	0.0	0.0
Cypress	0.0	0.0	0.0	0.0	0.0
Other conifers	0.6	0.0	0.0	0.0	0.6
Total conifers	**40.0**	**1.5**	**0.0**	**0.0**	**41.5**
Oak	6.6	22.3	22.8	11.2	62.9
Beech	9.2	37.5	0.3	0.0	47.0
Sycamore	0.0	0.0	0.8	0.0	0.8
Ash	74.6	38.7	19.2	6.1	138.6
Birch	3.4	4.5	0.0	0.0	7.9
Poplar	0.8	0.0	0.0	0.0	0.8
Sweet chestnut	0.0	0.0	0.0	0.0	0.0
Horse chestnut	0.8	0.0	0.0	0.0	0.8
Alder	0.0	0.0	9.7	0.0	9.7
Lime	0.0	0.0	0.0	0.0	0.0
Elm	23.7	85.9	0.0	0.0	109.6
Willow	14.4	7.7	6.9	3.2	32.2
Other broadleaves	501.2	697.4	0.0	0.0	1,198.6
Total broadleaves	**634.7**	**894.0**	**59.7**	**20.6**	**1,608.9**
Total - all species	**674.8**	**895.5**	**59.8**	**20.6**	**1,650.5**

Table 18 Number of Groups by group size

Number of trees per Group*	Number of Groups (000's)
2	3
3-5	3
6-10	6
11-20	8
21-50	7
51-100	3
>100	2
Total	**31**

*The size of the group is determined by the total number of trees, live plus dead.

COMPARISON OF RESULTS WITH THE 1980 CENSUS AND PREVIOUS SURVEYS

Survey Method

The 1980 Census and 1997 Inventory were undertaken using very different sampling methods.

Inventory practice and technology have moved on since the 1980 Census; this has led to changes in sampling methodology, scope and woodland definitions. For example, the Main Woodland Survey used the digital woodland map, created from aerial photos as a basis for sampling whereas the 1980 Census relied only on the woodland shown on the 1:50,000 Ordnance Survey map. Also in contrast to the 1980 Census, the Survey of Small Woodland and Trees did not record information within developed land e.g. residential or industrial areas of 2 or more hectares.

Where possible adjustments have been made to both the 1980 Census and the Inventory to achieve the nearest available comparison. The apparent changes indicated in the following tables and charts should therefore be treated with caution, particularly where areas are small.

Table 19:	Comparison of woodland area between 1980 Census and 1997 Inventory
Table 20:	Comparison of High Forest area by species between 1980 Census and 1997 Inventory
Chart:	Comparison of High Forest area by species between 1980 Census and 1997 Inventory
Table 21:	Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1997 Inventory
Chart:	Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1997 Inventory
Table 22:	Comparison of numbers of live trees outside woodland between 1980 Census and 1997 Inventory
Table 23:	Comparison of density of non-woodland features between 1980 Census and 1997 Inventory

Woodland cover

Chart	Change in woodland cover through time (1890 – 2000)
Maps:	Woodland by county through time (1895 – 1998)

Note: The figures in many of the tables may not add due to rounding

Table 19 Comparison of woodland area between 1980 Census and 1997 Inventory

Woodland size (ha)	1980 Census woodland area		1997 Inventory woodland area		Change (%)
	(ha)	(%)	(ha)	(%)	(%)
2.0 or more	22,999	91.8	28,101	97.9	22
0.25 - <2.0	2,063	8.2	591	2.1	-71
Total	**25,062**		**28,692**		**14**
% Woodland land cover	**9.4**		**10.8**		

1. Differences in sampling methodology may account for some of the apparent differences.

2. The above figures from the 1997 Inventory exclude woodland between 0.1 and <0.25 ha, thereby matching the scope of the 1980 Census. The 1997 figures above will therefore not match those in the previous sections of the report.

3. Land area used to calculate woodland cover percent (1997), 265,274 ha, was based on the 1991 Census of Population digital boundaries.

4. Land area used to calculate woodland cover percent (1980), 265,380 ha, (Ordnance Survey data)

Table 20 Comparison of High Forest area by species between 1980 Census and 1997 Inventory

Species	1980 Census woodland area (ha)	1997 Inventory woodland area (ha)	Change (%)
Scots pine	2,328	3,801	63
Corsican pine	2,994	2,577	-14
Lodgepole pine	178	0	-100
Sitka spruce	167	8	-95
Norway spuce	1,455	1,191	-18
European larch	159	462	191
Jap/Hybrid larch	509	181	-64
Douglas fir	1,008	866	-14
Other conifers	718	1,236	72
Mixed conifers	487	235	-52
Total conifers	**10,002**	**10,557**	**6**
Oak	3,978	3,545	-11
Beech	1,901	2,541	34
Sycamore	1,294	942	-27
Ash	2,292	3,210	40
Birch	334	1,493	347
Poplar	147	57	-61
Sweet chestnut	126	234	85
Elm	48	26	-46
Other broadleaves	1,476	1,858	26
Mixed broadleaves	680	2,228	228
Total broadleaves	**12,277**	**16,134**	**31**
Total all species	**22,278**	**26,691**	**20**
Felled	**726**	**199**	**-73**
Total High Forest	**23,005**	**26,890**	**17**

1. Differences in sampling methodology may account for some of the apparent differences.

2. In the 1980 Census the areas assigned to species included any associated open space such as roads and rides. In the Inventory open spaces are separately identified and the overall proportion is 4.9% (Table 2). To obtain meaningful comparisons between the two datasets the 1980 Census data have therefore been reduced by 4.9%.

3. The above figures from the 1997 Inventory exclude woodland between 0.1 and <0.25 ha, thereby matching the scope of the 1980 Census.
The 1997 figures above will therefore not match those in the previous sections of the report.

4. The 1980 figures include scrub to enable comparison

Comparison of High Forest area by species between 1980 Census and 1997 Inventory

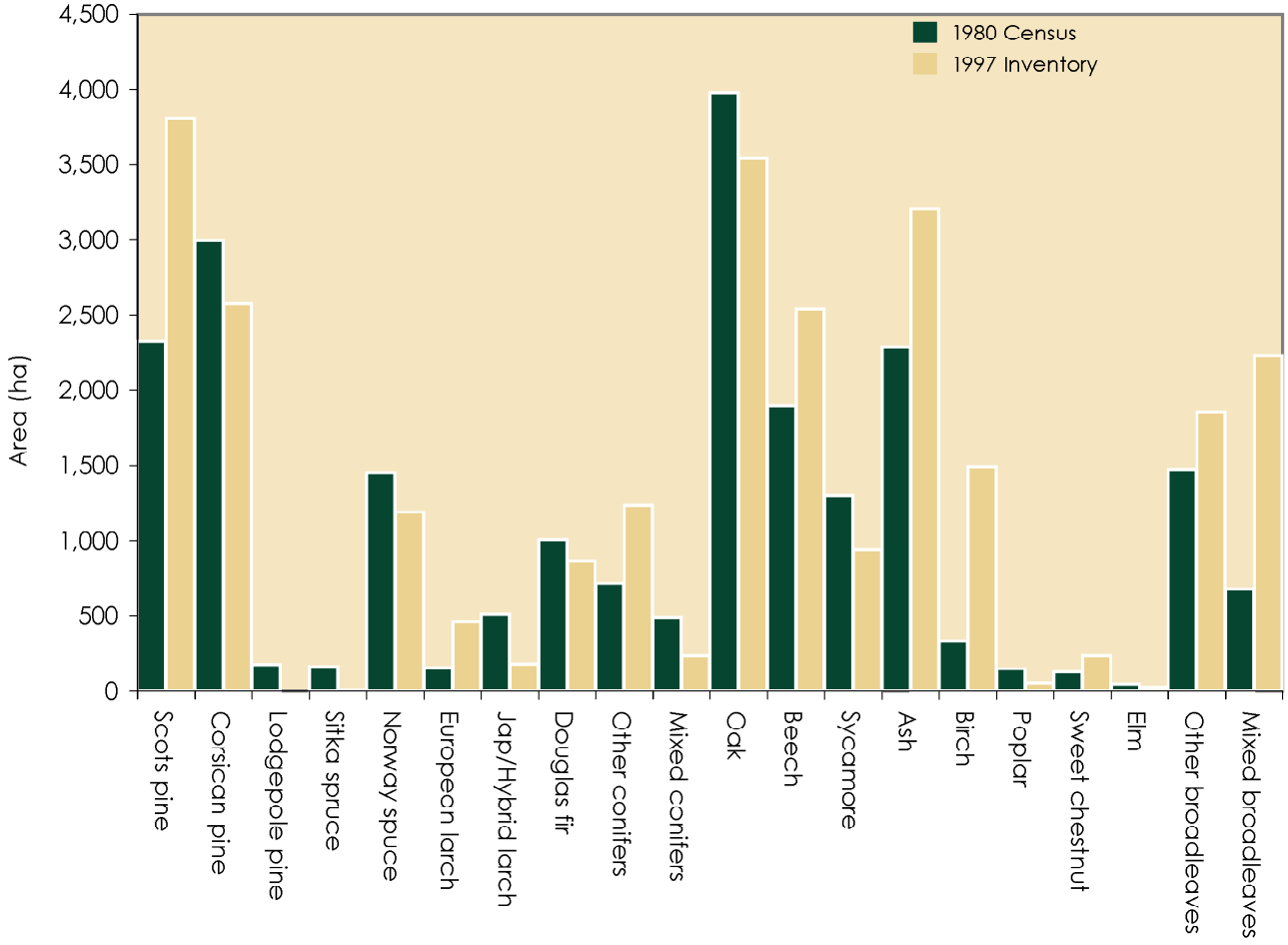


Table 21 Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1997 Inventory

Planting year class	1980 Census woodland area (ha)	1997 Inventory woodland area (ha)	Change (%)
1991-1997	0	888	see note
1981-1990	0	1,841	see note
1971-1980	2,004	2,499	25
1961-1970	3,260	2,975	-9
1951-1960	4,582	4,588	0
1941-1950	1,931	2,388	24
1931-1940	2,113	976	-54
1921-1930	837	822	-2
1911-1920	1,171	1,586	35
1901-1910	107	389	262
1861-1900	2,666	1,919	-28
Pre 1861	1,098	1,557	42
Total all years	**19,769**	**22,428**	**13**

1. The first two classes, 1991-1997 and 1981-1990, cover the period since the 1980 Census and no comparison is therefore available.

2. The definition of High Forest Category 1 in the Inventory does not fully coincide with High Forest as defined in the 1980 Census.

Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1997 Inventory

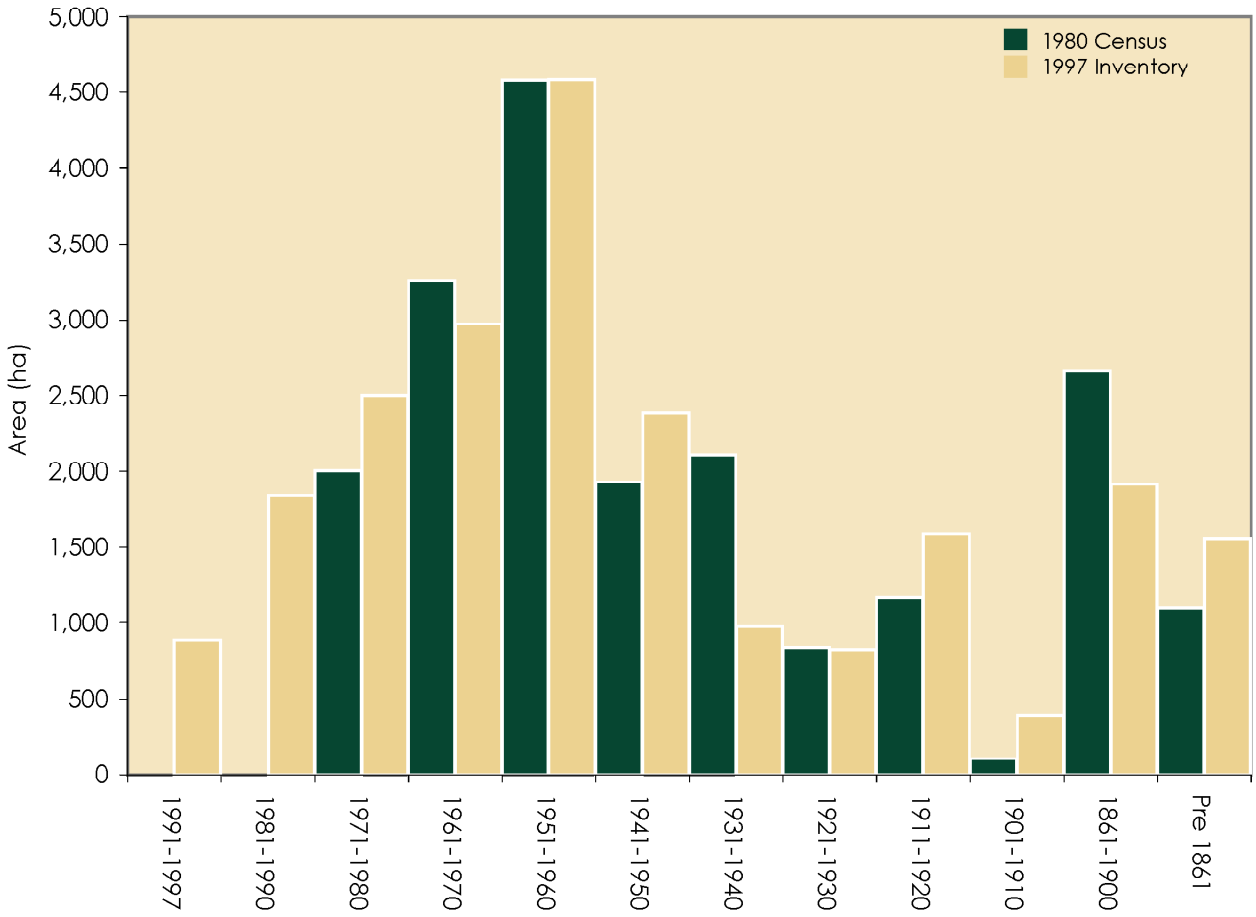


Table 22 Comparison of numbers of live trees outside woodland between 1980 Census and 1997 Inventory (000's)

Feature type	1980 Census	1997 Inventory	Change (%)
Boundary Tree	63	58	-8
Middle Tree	103	16	-84
Total Individual Trees	167	75	-55
Groups	264	369	40
Linear Features	304	320	5
Total	**736**	**763**	**4**

1. The Survey of Small Woodland and Trees did not record information referring to tree features (I.e. Individual trees, Groups and Narrow Linear Features) within developed land.

2. In the 1980 Census hazel, hawthorn, blackthorn and goat willow were excluded, the 1997 Inventory figures have been adjusted accordingly. The 1997 figures above will therefore not match those in the previous sections of the report.

3. Changes stated in this table are indicative only. Even with adjustments to the 1997 Inventory, the two surveys are not directly comparable - 1980 used 7cm diameter at breast height, and 1997 used 2m height, as minimum criteria for inclusion.

4. See Glossary for definitions of feature type.

Table 23 Comparison of density of non-woodland features between 1980 Census and 1997 Inventory

Feature type	1980 Census	1997 Inventory	Change (%)
Individual Trees (per sq km)	62.8	28.1	-55
Groups (per sq km)	21.5	10.6	-51
Linear Features (m per sq km)	478.6	305.1	-36

1. The Survey of Small Woodland and Trees did not record information referring to tree features (I.e. Individual trees, Groups and Narrow Linear Features) within developed land.

2. In the 1980 Census hazel, hawthorn, blackthorn and goat willow were excluded, the 1997 Inventory figures have been adjusted accordingly. The 1997 figures above will therefore not match those in the previous sections of the report.

3. Changes stated in this table are indicative only. Even with adjustments to the 1997 Inventory, the two surveys are not directly comparable - 1980 used 7cm diameter at breast height, and 1997 used 2m height, as minimum criteria for inclusion.

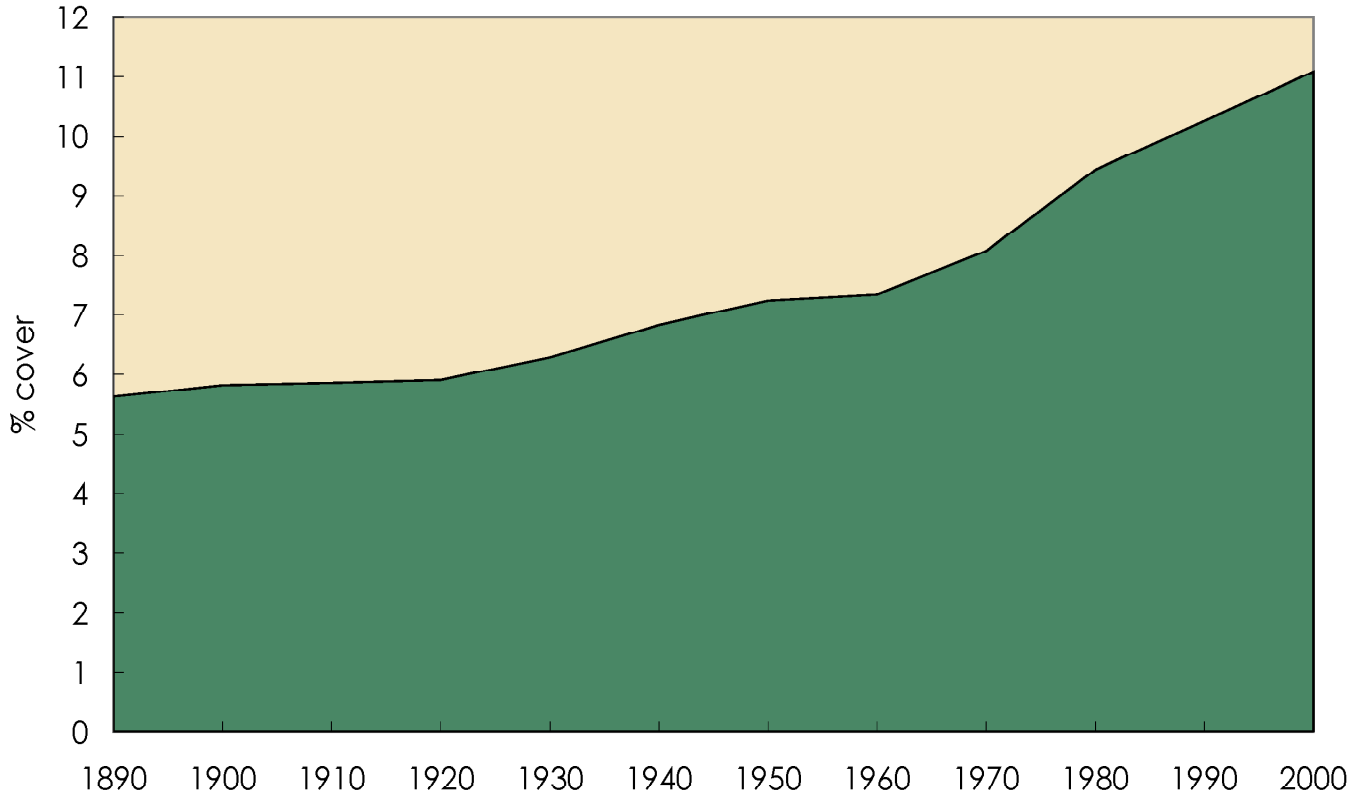
4. See Glossary for definitions of feature type.

WOODLAND COVER

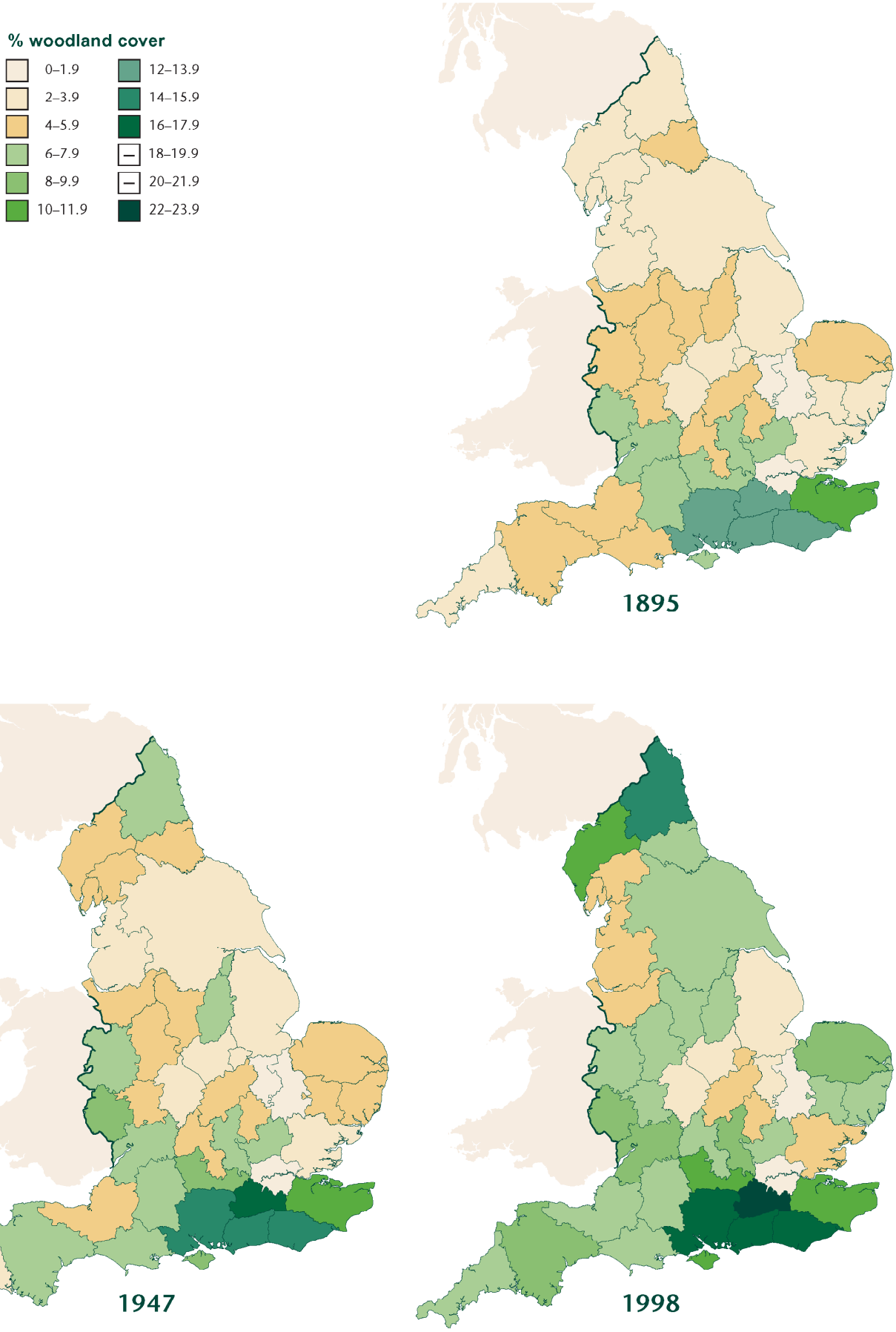
Woodland area data is available from Ministry of Agriculture surveys since 1871, and from Forestry Commission national woodland inventories since 1924. The following chart and maps show the changes in woodland area through time.

The maps use the old County structure data of England, as reported on in 1895 and 1947. The data from these counties could not be re-worked for different geographic areas. In contrast, the digital woodland map, which forms the basis of the current inventory, can be analysed for any geographic area.

Change in county woodland cover through time (1890 – 2000)



Map 5 Woodland Cover in England by County through time (1895–1998)



GLOSSARY

Woodland

In the United Kingdom woodland is defined as land with a minimum area of 0.1 ha under stands of trees with, or the potential to achieve, tree crown cover of more than 20%. Areas of open space integral to the woodland are also included. Orchards and urban woodland between 0.1 and 2 ha are excluded. Intervening land-classes such as roads, rivers or pipelines are disregarded if less than 50m in extent. 'Scrubby' vegetation is not Included as a separate category but as Conifer, Broadleaved or Mixed tree types. There is additional information on the quality of woodland within the inventory database.

Woodland of 2 ha and over, and with a minimum width of 50m, is included in the Main Woodland Survey; other woodland and trees are assessed in the Survey of Small Woodland and Trees.

Interpreted Forest Types

The woodland map derived from aerial photographs is differentiated into Interpreted Forest Types (IFTs) which are: Conifer, Broadleaved, Mixed, Coppice, Coppice-with-Standards, Shrubs, Young Trees, Ground Prepared for Planting and Felled. Note that forest types (see below) based on ground survey data are used for reporting purposes because they are more reliable.

High Forest

All woodland except stands managed as Coppice or Coppice-with-Standards with, or with the potential to achieve a tree cover of more than 20%. Two categories of High Forest are recognised:

- **High Forest Category 1**
  Stands which are, or could become, capable of producing wood of a size and quality suitable for sawlogs.

- **High Forest Category 2**
  Stands of lower quality than High Forest Category 1.

Mixtures

Where possible the species in mixtures have been separately recorded. Where this has not been possible they were described as 'Mixed conifers' or 'Mixed broadleaves'.

Forest Types

- **Conifer**

  Woodland containing more than 80% by area of coniferous species.

- **Broadleaved**

  Woodland containing more than 80% by area of broadleaved species.

- **Mixed**

  A combination of broadleaved and coniferous species where each category occupies at least 20% of the canopy (see note on mixtures above.)

- **Coppice**

  Crops of marketable broadleaved species that have at least 2 stems per stool and are either being worked or are capable of being worked on rotation. With the exception of hazel coppice more than half the stems should be capable of producing 1m timber lengths of good form.

- **Coppice with Standards**

  Two-storey stands where the overstorey consists of at least 25 stems per ha that are older than the understorey of worked coppice by at least one coppice rotation.

- **Felled**

  Woodland areas that have been felled or stands where the stocking has been reduced to less than 20% and where it is expected that these areas will be replanted.

- **Windblow**

  Areas of blown woodland which remain uncleared and not regenerated.

- **Open Space**

  Areas within a woodland that are not covered by trees but are integral to the woodland such as open areas, streamsides, deer glades, rides and forest roads.

Ownership types

- **Other Ownership**

  Woodland other than that owned by, or leased to, the Forestry Commission

  - Personal

  types of private occupation, e.g. individuals, private family trusts and family partnerships.

  - Private forestry or timber business

  owned by wood processing industry. This category does not include forest management companies.

  - Other private business

  occupiers, e.g. companies, partnerships, syndicates and pension funds.

  - Local Authority

  Region, County, District or other Council

  - **Other public bodies (not FC)**

  Government department/agency, nationalised industry, etc.

  - Charitable organisations

  organisations funded by voluntary public subscription, e.g. National Trust, churches and colleges.

- Community ownership or common land

the common property of all members of the community.

- **Forestry Commission**

Land owned by or land leased to the Forestry Commission

Feature types

- **Small Wood**

A woodland with an area of 0.1 ha or over but less than 2 ha.

- **Group**

A group containing two or more trees with an area less than 0.1ha.

- **Individual Tree**

A tree the crown of which has no contact with any other tree crown and which is at least 2m tall. Two types of individual tree are recognised:

- Boundary Tree (an Individual Tree on any boundary)

- Middle Tree (an Individual Tree not on a boundary)

- **Linear Feature**

A feature with a length of 25 m or more, and one which is at least four times as long as it is broad. It can be up to 50m wide or as narrow as a single line of trees. Two types of Linear Features are recognised:

- Narrow Linear Features (with a width of 16 m or less)
- Wide Linear Features (with a width greater than 16 m)

NOTES

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