



NATIONAL INVENTORY OF WOODLAND AND TREES



ENGLAND

County Report for

OXFORDSHIRE



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 Oxfordshire 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 Oxfordshire 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 With the statistics becoming increasingly out of date the Forestry Commission decided to undertake a new survey: the *National Inventory of Woodland and Trees*.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 km² 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 km² 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 Oxfordshire is 18,235 hectares. This represents 7.0% of the land area. (Table 1)
- Broadleaved woodland is the dominant forest type representing 59.0 % of all woodland. Conifer woodland represents 6.4 %, Mixed woodland 16.1 % and Open Space within woodlands 18.0 %. (Table 2)
- The main conifer species is pine covering 732 hectares or 28.9 % of all conifer species. The main broadleaved species is oak covering 3,303 hectares or 26.8 % of all broadleaved species. (Table 3)
- 629 hectares or 4 % of woodland over 2 hectares is owned by or leased to the Forestry Commission, and 16,244 hectares or 96 % of woodland is in Other ownership. (Table 6)
- There are a total of 1,143 woods over 2 ha within Oxfordshire with a mean wood area of 14.8 hectares. (Table 7a) There are a total of 3,138 woods from 0.1 - <2.0 hectares with a mean wood area of 0.43 hectares. (Table 14)
- There are 1.4 million live trees outside woodland in Oxfordshire. (Table 15)
- Woodland land cover increased by over 2,700 hectares from 5.9 % to 6.9 % of the land area between 1980 and 1997. (Table 19)
- The area of broadleaves increased by 36% between 1980 and 1997, with the relative proportion of broadleaves to conifers increasing from 74 % to 83 %. (Table 20)

INVENTORY REPORTS

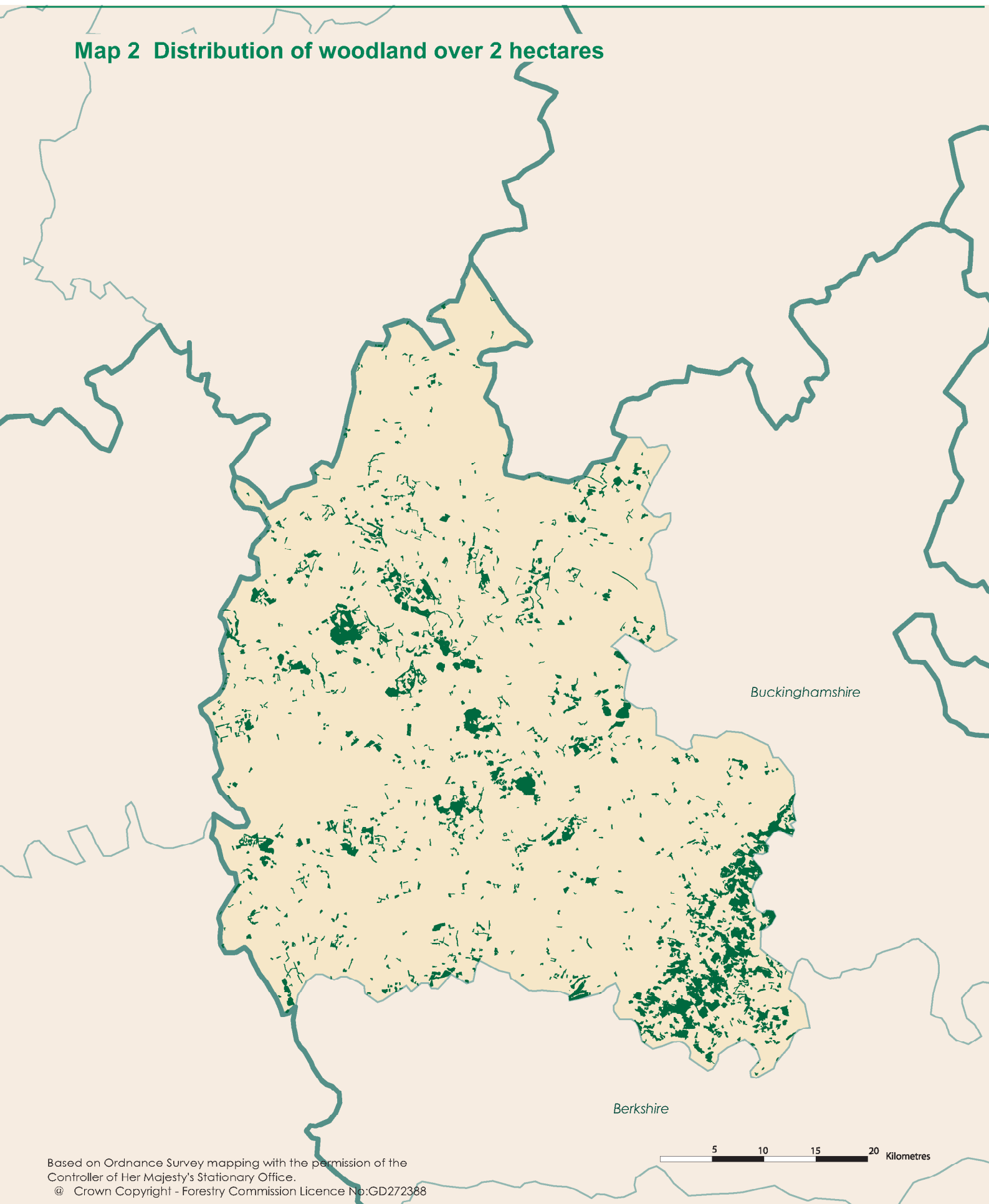
As well as this report for Oxfordshire, reports are available for the other counties in the region as shown on the map opposite. Also available are region and county reports for England as well as a report for the country as a whole. Wales and Scotland are also covered by reports. Inventory reports can also be viewed or downloaded from the website at www.forestry.gov.uk/inventory.

Map 1 Regional and county boundaries



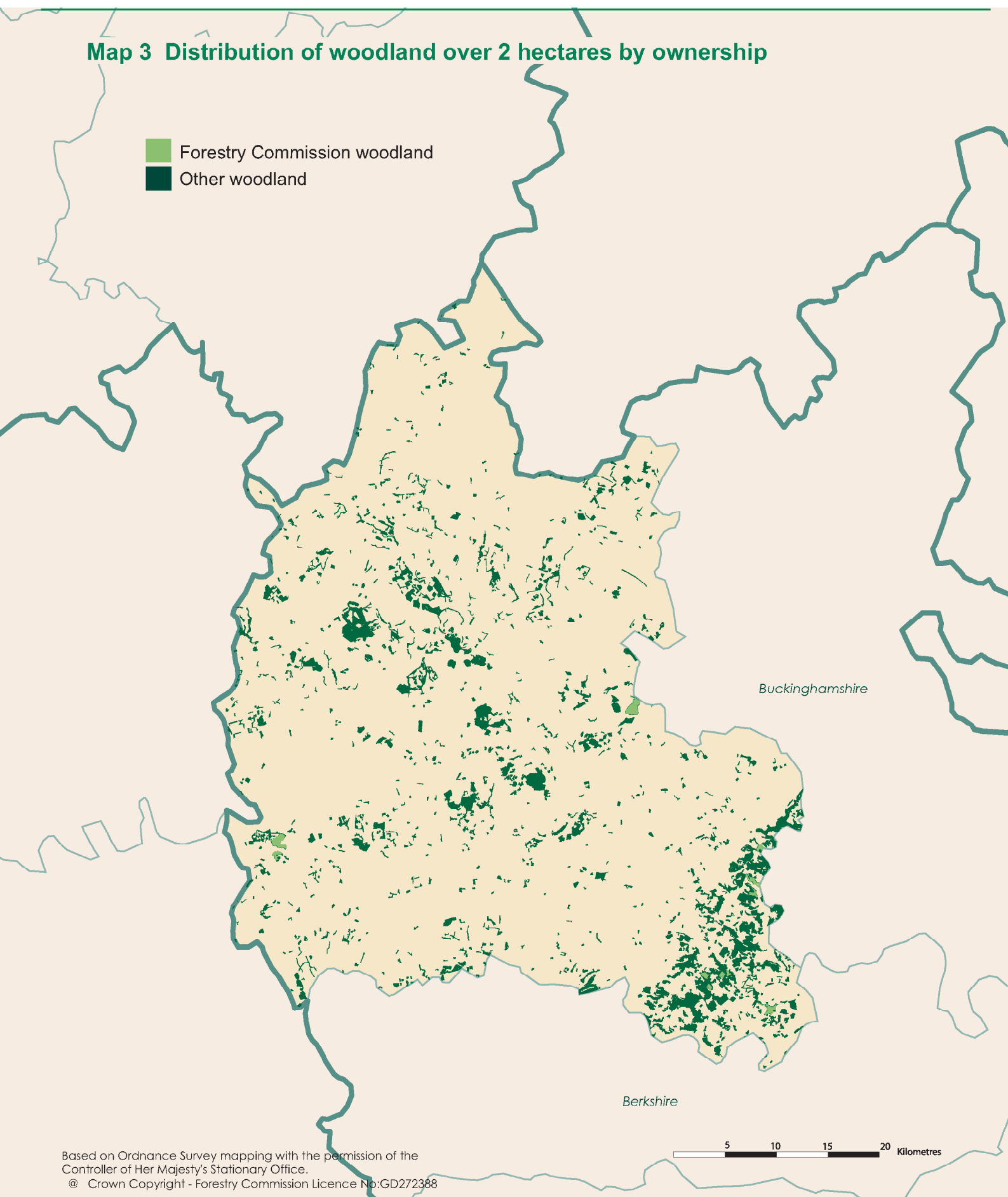
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Map 2 Distribution of woodland over 2 hectares



Map 3 Distribution of woodland over 2 hectares by ownership

- Forestry Commission woodland
- Other woodland

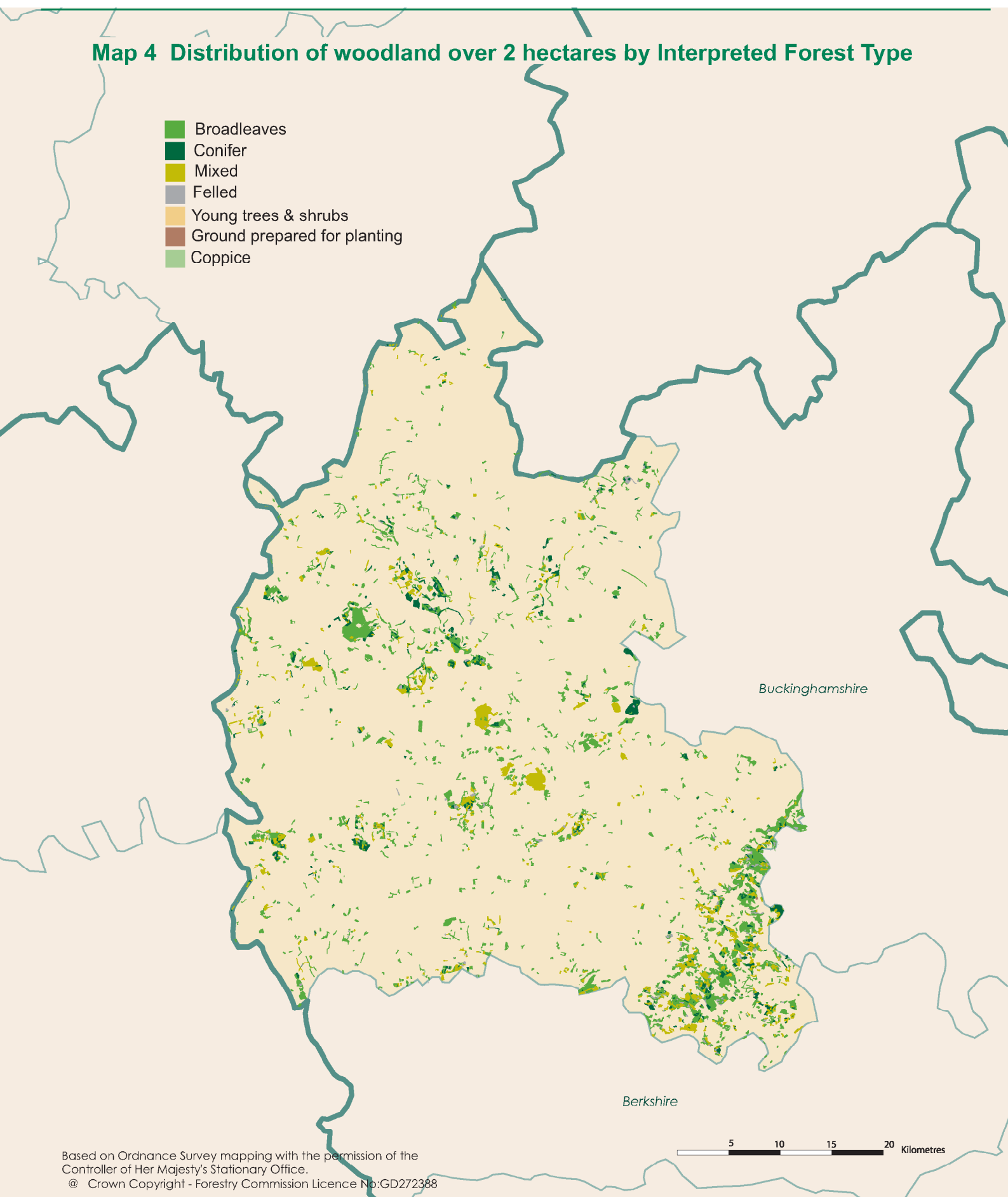


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5 10 15 20 Kilometres

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

- Broadleaves
- Conifer
- Mixed
- Felled
- Young trees & shrubs
- Ground prepared for planting
- Coppice



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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 Oxfordshire.

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	16,873	92.5
0.25 - < 2.00	1,218	6.7
0.10 - < 0.25	144	0.8
Total area of woodland	18,235	100.0
% Woodland land cover	7.0	

1. Area of Oxfordshire, including inland water, 260,595 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	1,148	13	1,161	6.4
Broadleaved	9,723	1,043	10,766	59.0
Mixed	2,743	194	2,937	16.1
Coppiced	0	0	0	0.0
Copp-w-standards	0	0	0	0.0
Windblow	0	0	0	0.0
Felled	85	0	85	0.5
Open Space	3,173	113	3,286	18.0
Total	16,873	1,362	18,235	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 (ha)	Percentage of total area	
	2.0 and over	0.1 -<2.0		Category*	Species**
Pine	694	38	732	28.9	4.9
Sitka spruce	0	0	0	0.0	0.0
Larch	688	10	698	27.6	4.7
Other conifers	689	48	737	29.1	5.0
Mixed conifers	330	34	364	14.4	2.4
Total conifers	2,400	130	2,530	100.0	17.0
Oak	3,019	284	3,303	26.8	22.2
Beech	2,616	90	2,706	21.9	18.2
Sycamore	746	50	796	6.5	5.4
Ash	2,356	128	2,484	20.1	16.7
Birch	378	0	378	3.1	2.5
Elm	29	13	42	0.3	0.3
Other broadleaves	1,088	193	1,281	10.4	8.6
Mixed broadleaves	981	361	1,342	10.9	9.0
Total broadleaves	11,214	1,119	12,333	100.0	83.0
Total all species***	13,614	1,249	14,863		100.0

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

**Species/group percentage of all species

***Excludes the 3,371 ha 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	10%
Broadleaves	3%
Pine	22%
Oak	9%
Beech	12%
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	31,700	314,400	10	121
Narrow Linear Features	9,100	1,092,800	120	419
Individual Trees	46,700	46,700	1	18
Total		1,453,900		558

1. Land area used to calculate tree density 260,595 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	40%
Narrow Linear Features	49%
Individual Trees	32%
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	0	0	0
Narrow Linear Features	9,100	1,304	500
Total		1,304	500

1. Land area used to calculate tree density 260,595 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	-
Narrow Linear Features	36%
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.

Table 6:	Summary of woodland area by ownership
Chart:	Woodland area by ownership
Table 7a:	Size class distribution of woodland
Table 7b:	Size class distribution of woodland by ownership units
Table 8:	Area of woodland by forest type and ownership
Chart:	Area of woodland by forest type
Table 9a:	Area of High Forest by principal species and ownership
Graph:	Area of High Forest by principal species and ownership
Table 9b:	Area of High Forest by principal species, ownership and category
Graph:	High Forest Category 1 Area by principal species and ownership
Graph:	High Forest Category 2 Area by principal species and ownership
Table 10a:	High Forest Category 1 Area by principal species and planting year class
Graph:	High Forest Category 1 Area by planting year class
Table 10b:	High Forest Category 1 Forestry Commission: area by principal species and planting year class
Graph:	High Forest Category 1 Forestry Commission - area by planting year class
Table 10c:	High Forest Category 1 Other ownership: area by principal species and planting year class
Graph:	High Forest Category 1 Other ownership: area by planting year class
Table 11:	High Forest: principal species by planting year class
Table 12:	Ownership type by area and percentage
Chart:	Ownership type by area

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	629	4
Other	16,244	96
Total area of woodland	16,873	100

1. Woodland area from aerial photographic interpretation map updated to 31 March 1997
2. See Glossary for definitions of ownership types

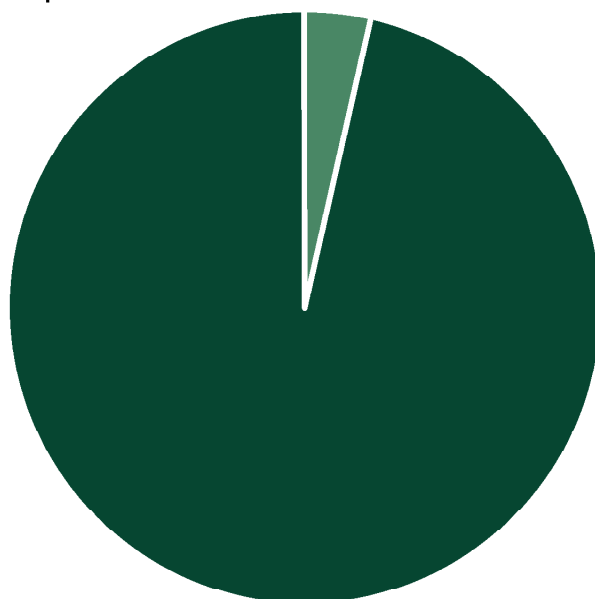
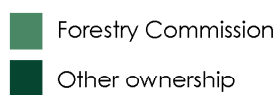
Woodland area by ownership

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	877	3,749	22	4.3
10 - <20	139	1,936	11	13.9
20 - <50	71	2,348	14	33.1
50 - <100	31	2,095	12	67.6
<100	1,118	10,127	60	9.1
100 - <500	22	4,380	26	199.1
500 and >	3	2,366	14	788.6
All woods	1,143	16,873	100	14.8

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	2	8	0	4.0
	O	889	3,785	22	4.3
10 - <20	FC	1	19	0	19.0
	O	140	1,948	12	13.9
20 - <50	FC	6	203	1	33.8
	O	72	2,396	14	33.3
50 - <100	FC	2	138	1	69.2
	O	29	1,959	12	67.6
<100	FC	11	368	2	33.5
	O	1,130	10,088	60	8.9
100 - <500	FC	2	260	2	130.1
	O	20	3,901	23	195.0
500 and >	FC	0	0	0	0.0
	O	3	2,256	13	751.9
Total	FC	13	629	4	48.4
	O	1,153	16,244	96	14.1

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 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 occasionally 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	262	41.7	886	5.5	1,148	6.8
Broadleaved	124	19.7	9,600	59.1	9,723	57.6
Mixed	243	38.6	2,499	15.4	2,743	16.3
Coppice	0	0.0	0	0.0	0	0.0
Copp-w-Stds	0	0.0	0	0.0	0	0.0
Windblow	0	0.0	0	0.0	0	0.0
Felled	0	0.0	85	0.5	85	0.5
Open Space	0	0.0	3,173	19.5	3,173	18.8
Total	629	100.0	16,244	100.0	16,873	100.0

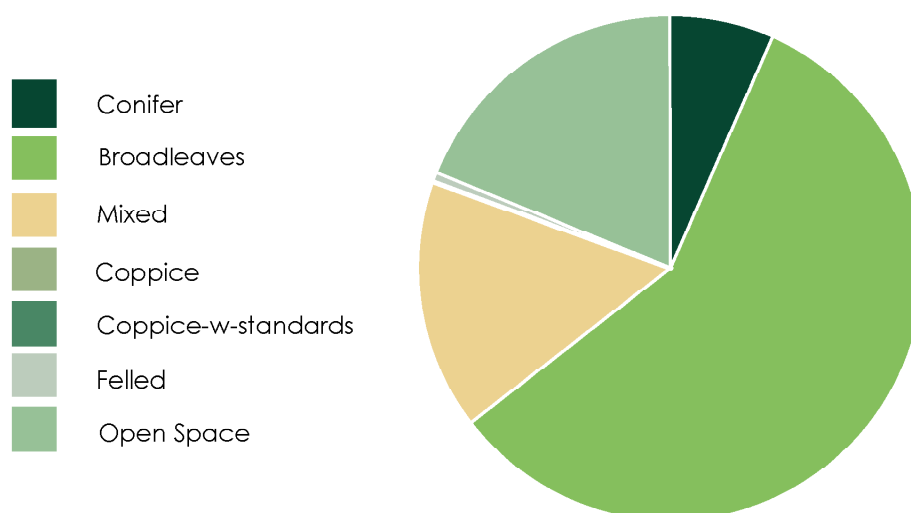
Area of woodland by forest type

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	154	38	24	329	16	3	483	20	4
Corsican pine	0	0	0	211	11	2	211	9	2
Lodgepole pine	0	0	0	0	0	0	0	0	0
Sitka spruce	0	0	0	0	0	0	0	0	0
Norway spruce	140	35	22	156	8	1	296	12	2
European larch	0	0	0	0	0	0	0	0	0
Jap/Hybrid larch	0	0	0	688	34	5	688	29	5
Douglas fir	72	18	11	51	3	0	122	5	1
Other conifers	40	10	6	231	12	2	271	11	2
Mixed conifers	0	0	0	330	17	3	330	14	2
Total conifers	405	100	64	1,995	100	15	2,400	100	18
Oak	120	54	19	2,899	26	22	3,019	27	22
Beech	0	0	0	2,616	24	20	2,616	23	19
Sycamore	0	0	0	746	7	6	746	7	5
Ash	16	7	3	2,340	21	18	2,356	21	17
Birch	64	29	10	315	3	2	378	3	3
Poplar	0	0	0	296	3	2	296	3	2
Sweet chestnut	0	0	0	32	0	0	32	0	0
Elm	0	0	0	29	0	0	29	0	0
Other broadleaves	4	2	1	756	7	6	760	7	6
Mixed broadleaves	20	9	3	961	9	7	981	9	7
Total broadleaves	224	100	36	10,991	100	85	11,214	100	82
Total - all species	629		100	12,985		100	13,614		100
Felled	0			85			85		
Total High Forest	629			13,070			13,699		

*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 3,173 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	10%
Broadleaves	3%
Jap/Hybrid larch	22%
Oak	7%
Beech	12%
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

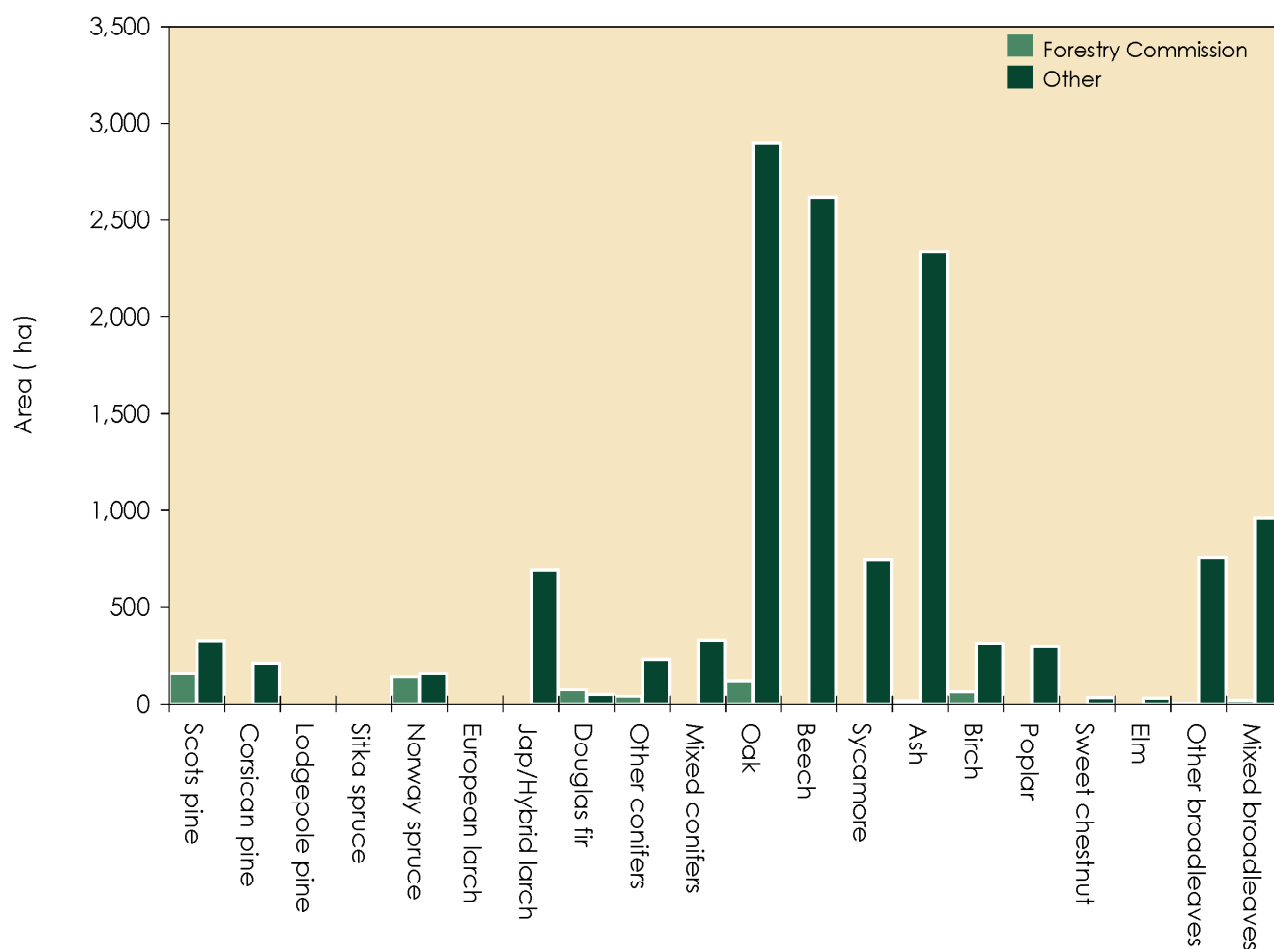


Table 9b Area of High Forest by principal species,ownership and category

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	154	0	154	317	11	329	471	317	483
Corsican pine	0	0	0	211	0	211	211	211	211
Lodgepole pine	0	0	0	0	0	0	0	0	0
Sitka spruce	0	0	0	0	0	0	0	0	0
Norway spruce	140	0	140	150	7	156	289	150	296
European larch	0	0	0	0	0	0	0	0	0
Jap/Hybrid larch	0	0	0	679	9	688	679	679	688
Douglas fir	72	0	72	51	0	51	122	51	122
Other conifers	40	0	40	204	27	231	244	204	271
Mixed conifers	0	0	0	311	19	330	311	311	330
Total conifers	405	0	405	1,922	73	1,995	2,327	1,922	2,400
Oak	120	0	120	2,517	382	2,899	2,637	2,517	3,019
Beech	0	0	0	2,570	47	2,616	2,570	2,570	2,616
Sycamore	0	0	0	697	49	746	697	697	746
Ash	16	0	16	2,095	245	2,340	2,111	2,095	2,356
Birch	64	0	64	296	19	315	360	296	378
Poplar	0	0	0	296	0	296	296	296	296
Sweet chestnut	0	0	0	32	0	32	32	32	32
Elm	0	0	0	4	25	29	4	4	29
Other broadleaves	4	0	4	661	95	756	665	661	760
Mixed broadleaves	20	0	20	641	320	961	661	641	981
Total broadleaves	224	0	224	9,808	1,182	10,991	10,032	9,808	11,214
Total - all species	629	0	629	11,730	1,255	12,985	12,359	11,730	13,614

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

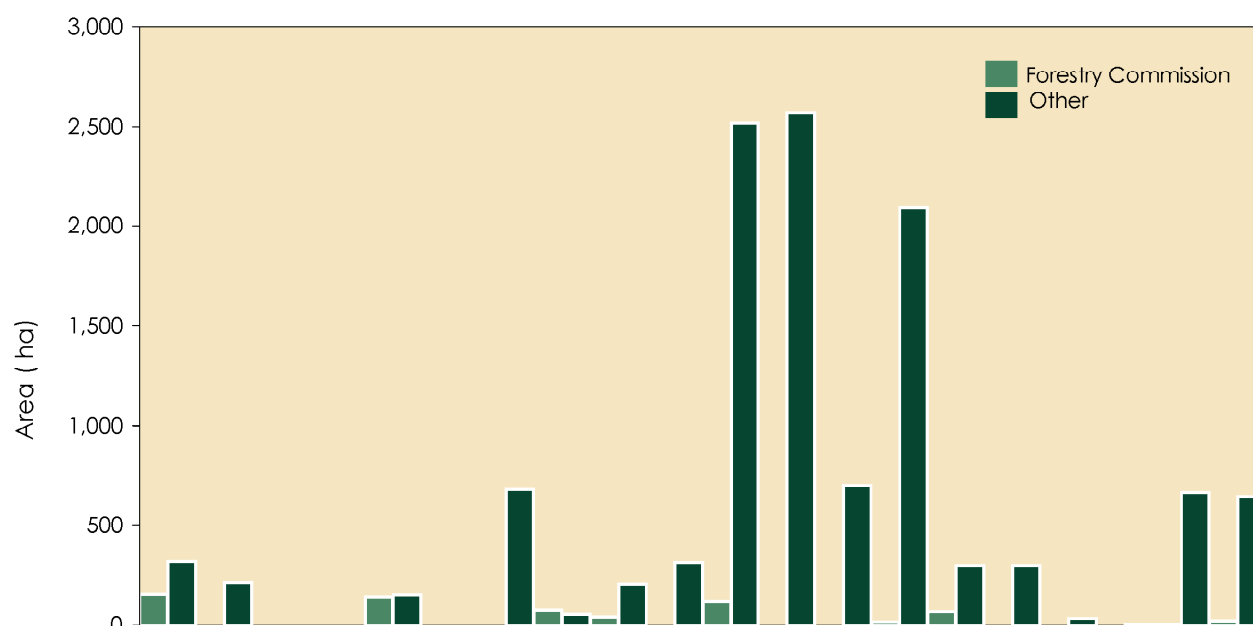
	Category 1*	Category 2*	Total High Forest
Conifers	10%	50%	10%
Broadleaves	4%	12%	3%
Jap/Hybrid larch	22%	-	22%
Oak	9%	33%	9%
Beech	12%	-	12%

*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 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

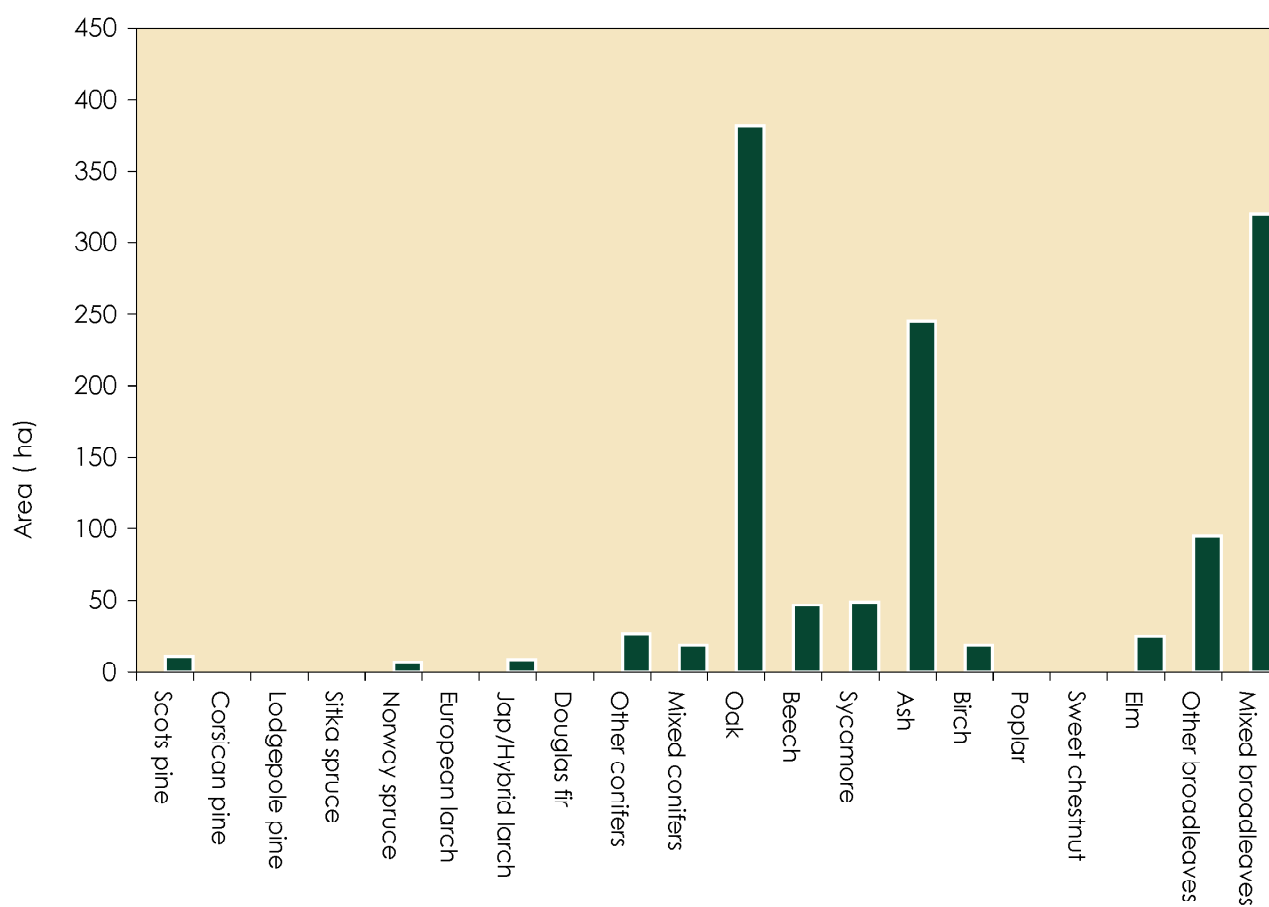
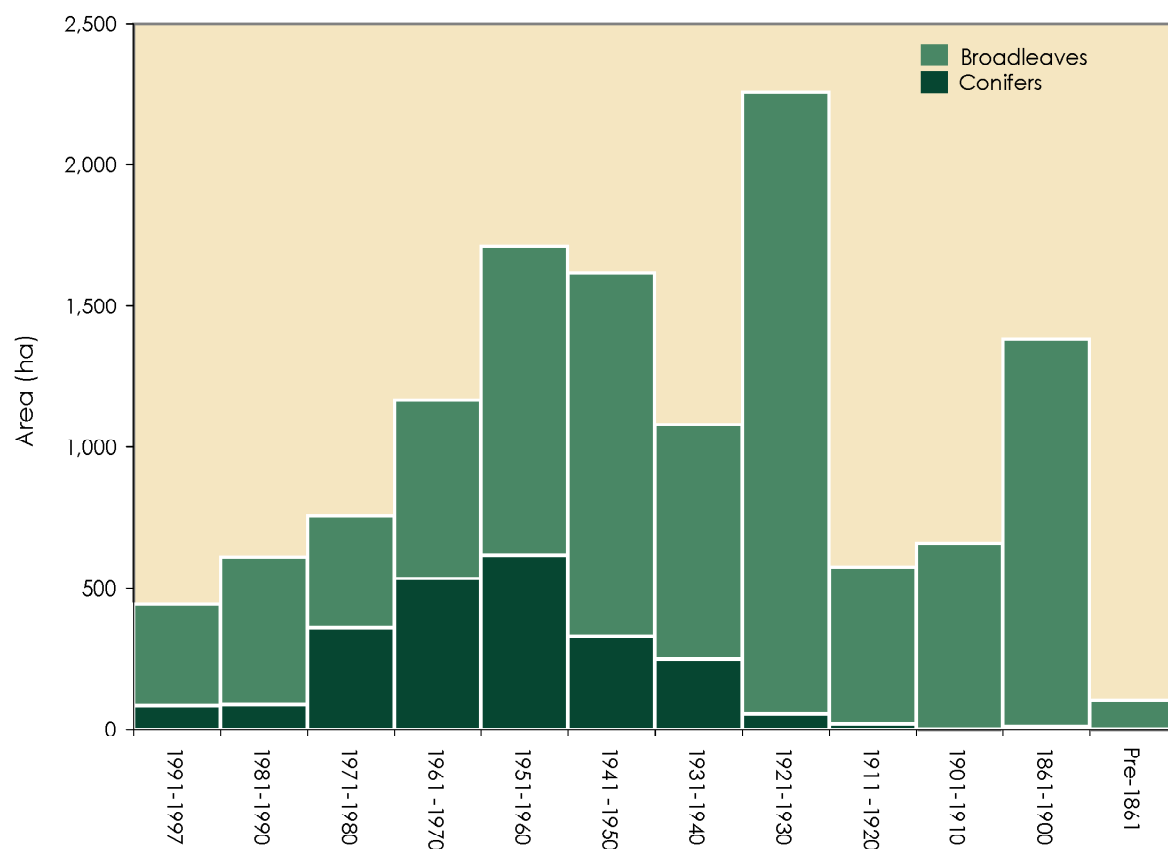


Table 10a High Forest Category 1 - Area by principal species and planting year class

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	0	14	73	217	60	57	19	13	19	0	0	0	471
Corsican pine	0	0	150	24	27	5	0	5	0	0	0	0	211
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	53	43	150	29	14	0	0	0	0	0	0	289
European larch	0	0	0	0	0	0	0	0	0	0	0	0	0
Jap/Hybrid larch	54	19	66	22	329	62	117	10	0	0	0	0	679
Douglas fir	0	0	0	46	77	0	0	0	0	0	0	0	122
Other conifers	0	0	28	50	80	68	10	0	0	0	9	0	244
Mixed conifers	27	0	0	22	13	123	99	26	0	0	0	0	311
Total conifers	81	86	359	532	614	329	244	54	19	0	8	0	2,327
Oak	47	114	30	98	266	251	88	223	212	389	860	57	2,637
Beech	28	35	53	47	109	218	168	1,295	154	202	260	0	2,570
Sycamore	4	44	44	28	139	132	182	65	0	14	9	37	697
Ash	87	86	22	134	358	342	292	536	187	28	37	0	2,111
Birch	54	60	4	140	18	52	28	4	0	0	0	0	360
Poplar	0	19	4	90	33	98	0	53	0	0	0	0	296
Sweet chestnut	0	4	0	0	11	0	0	0	0	0	17	0	32
Elm	0	0	0	0	4	0	0	0	0	0	0	0	4
Other broadleaves	42	138	144	10	86	174	57	4	0	0	4	9	665
Mixed broadleaves	100	26	96	88	74	21	22	23	0	23	188	0	661
Total broadleaves	361	525	398	635	1,096	1,288	836	2,203	554	657	1,376	103	10,032
Total - all species	442	611	757	1,167	1,710	1,617	1,081	2,257	573	657	1,384	103	12,359

*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



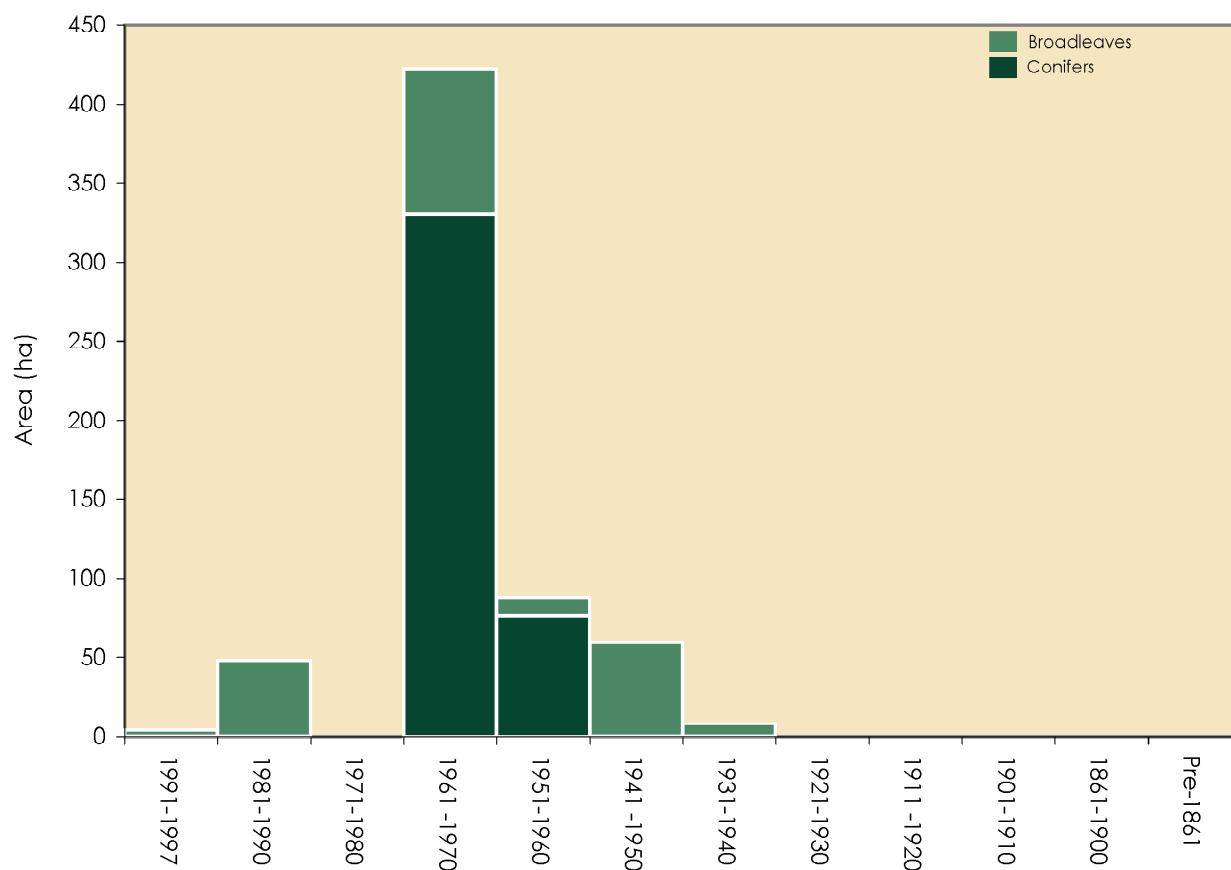
1. Most of the planting year classes cover 10 years, 1991-1997 is 7 years, and the classes prior to 1901 are 40 years or more.

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	0	0	0	154	0	0	0	0	0	0	0	0	154
Corsican pine	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	140	0	0	0	0	0	0	0	0	140
European larch	0	0	0	0	0	0	0	0	0	0	0	0	0
Jap/Hybrid larch	0	0	0	0	0	0	0	0	0	0	0	0	0
Douglas fir	0	0	0	0	72	0	0	0	0	0	0	0	72
Other conifers	0	0	0	36	4	0	0	0	0	0	0	0	40
Mixed conifers	0	0	0	0	0	0	0	0	0	0	0	0	0
Total conifers	0	0	0	330	76	0	0	0	0	0	0	0	405
Oak	0	16	0	44	0	52	8	0	0	0	0	0	120
Beech	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
Ash	0	0	0	8	0	8	0	0	0	0	0	0	16
Birch	4	32	0	28	0	0	0	0	0	0	0	0	64
Poplar	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
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other broadleaves	0	0	0	0	4	0	0	0	0	0	0	0	4
Mixed broadleaves	0	0	0	12	8	0	0	0	0	0	0	0	20
Total broadleaves	4	48	0	92	12	60	8	0	0	0	0	0	224
Total - all species	4	48	0	421	88	60	8	0	0	0	0	0	629

*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



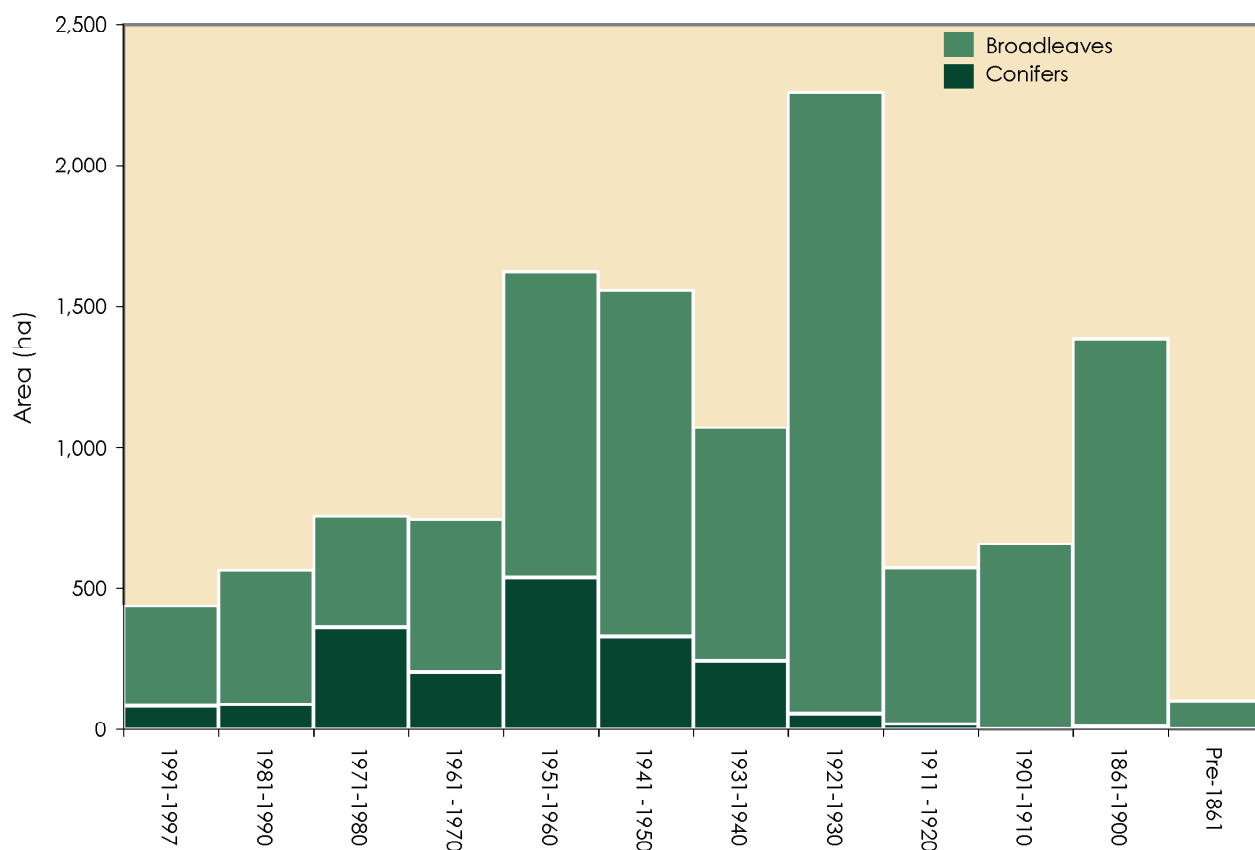
1. Most of the planting year classes cover 10 years, 1991-1997 is 7 years, and the classes prior to 1901 are 40 years or more.

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	0	14	73	63	60	57	19	13	19	0	0	0	317
Corsican pine	0	0	150	24	27	5	0	5	0	0	0	0	211
Lodgepole pine	0	0	0	0	0	0	0	0	0	0	0	0	0
Silka spruce	0	0	0	0	0	0	0	0	0	0	0	0	0
Norway spruce	0	53	43	10	29	14	0	0	0	0	0	0	150
European larch	0	0	0	0	0	0	0	0	0	0	0	0	0
Jap/Hybrid larch	54	19	66	22	329	62	117	10	0	0	0	0	679
Douglas fir	0	0	0	46	5	0	0	0	0	0	0	0	51
Other conifers	0	0	28	14	76	68	10	0	0	0	9	0	204
Mixed conifers	27	0	0	22	13	123	99	26	0	0	0	0	311
Total conifers	81	86	359	202	538	329	244	54	19	0	8	0	1,922
Oak	47	98	30	54	266	199	81	223	212	389	860	57	2,517
Beech	28	35	53	47	109	218	168	1,295	154	202	260	0	2,570
Sycamore	4	44	44	28	139	132	182	65	0	14	9	37	697
Ash	87	86	22	126	358	334	292	536	187	28	37	0	2,095
Birch	50	28	4	112	18	52	28	4	0	0	0	0	296
Poplar	0	19	4	90	33	98	0	53	0	0	0	0	296
Sweet chestnut	0	4	0	0	11	0	0	0	0	0	17	0	32
Elm	0	0	0	0	4	0	0	0	0	0	0	0	4
Other broadleaves	42	138	144	10	82	174	57	4	0	0	4	9	661
Mixed broadleaves	100	26	96	76	66	21	22	23	0	23	188	0	641
Total broadleaves	357	477	398	543	1,084	1,228	828	2,203	554	657	1,376	103	9,808
Total - all species	438	564	757	745	1,622	1,557	1,073	2,257	573	657	1,384	103	11,730

*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	23	Ash	20	JL/HL / Birch	12
1981-90	Other broadleaves	22	Oak	19	Ash	14
1971-80	Corsican pine	19	Other broadleaves	18	Mixed broadleaves	12
1961-70	Scots pine	17	Norway spruce	12	Birch	11
1951-60	Oak	26	Ash	20	Jap/Hybrid larch	14
1941-50	Ash	23	Oak	15	Beech	13
1931-40	Ash	26	Sycamore	16	Beech	15
1921-30	Beech	53	Ash	24	Oak	9
1911-20	Oak	37	Ash	33	Beech	27
1901-10	Oak	59	Beech	31	Ash	4
1861-1900	Oak	62	Beech	19	Mixed broadleaves	14
Pre 1861	Oak	55	Sycamore	36	Other broadleaves	9
All years	Oak	22	Beech	19	Ash	17

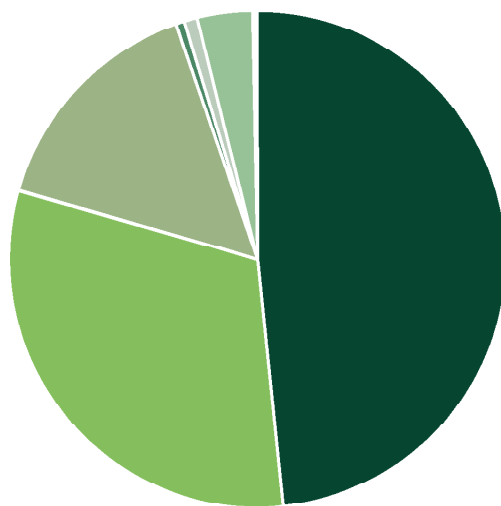
1. Principal species as a percentage of area in the planting year class.
2. JL/HL - Jap/Hybrid larch

Table 12 Ownership type* by area and percentage

Ownership type	Area (ha)	%
Personal	8,157	48.3
Business	5,238	31.0
Forestry or timber business	0	0.0
Charity	2,582	15.3
Local Authority	108	0.6
Other public (not FC)	113	0.7
Forestry Commission	629	3.7
Community ownership or common land	0	0.0
Unidentified	46	0.3
Total	16,873	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 km² 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 km² 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.

Table 13:	Summary of information from the Survey of Small Woodland and Trees
Table 14:	Woodland area by feature type and woodland size
Table 15:	Numbers of live trees outside woodland by species and feature type
Table 16 :	Numbers of dead trees outside woodland by species and feature type
Table 17:	Numbers of live trees outside woodland by species and height band
Table 18:	Numbers of Groups by group size

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	3,138	1,362	Area (ha)
Wide Linear Features	0	0	Area (ha)
Wide Linear Features	0	0	Length (Km)
Narrow Linear Features	9,100	1,304	Length (Km)
Narrow Linear Features	9,100	1,092,800	Number of live trees
Groups	31,700	314,400	Number of live trees
Individual Trees	46,700	46,700	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	144	1,218	1,362	3,138	0.43
Wide Linear Features	0	0	0	0	0.00
Total	144	1,218	1,362	3,138	0.43

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	5.0	5.0	30.9	47.9	88.8	86.6	6.1
Spruce	0.0	0.0	0.0	4.6	4.6	4.5	0.3
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	9.1	9.1	8.9	0.6
Total conifers	5.0	5.0	30.9	61.6	102.5	100.0	7.1
Oak	9.2	3.3	23.3	54.8	90.6	6.7	6.2
Beech	0.0	0.0	0.0	22.8	22.8	1.7	1.6
Sycamore	0.0	0.0	5.8	399.3	405.1	30.0	27.9
Ash	9.2	0.0	64.2	74.1	147.5	10.9	10.1
Birch	0.0	0.8	20.8	31.9	53.5	4.0	3.7
Poplar	0.0	0.0	19.2	2.3	21.5	1.6	1.5
Sweet chestnut	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Horse chestnut	0.0	0.0	8.3	6.8	15.1	1.1	1.0
Alder	0.0	0.0	5.0	0.0	5.0	0.4	0.3
Lime	0.0	0.0	24.2	0.0	24.2	1.8	1.7
Elm	0.0	0.0	15.0	107.2	122.2	9.0	8.4
Willow	0.8	0.0	18.3	0.0	19.1	1.4	1.3
Other broadleaves	12.5	0.8	79.2	332.0	424.5	31.4	29.2
Total broadleaves	31.7	5.0	283.5	1,031.2	1,351.1	100.0	92.9
Total - all species	36.7	10.0	314.4	1,092.8	1,453.9		100.0

- Percentages

Category : species percentage of conifer or broadleaved.
Species : percentage of all species.
- The standard errors of the total tree number estimates for these feature types are:

Individual Trees	32%
Groups	40%
Narrow Linear Features	49%
- 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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0	0.0	0.0	0.0
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	6.7	53.6	60.3	100.0	100.0
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	0.0	0.0	6.7	53.6	60.3	100.0	100.0
Total - all species	0.0	0.0	6.7	53.6	60.3		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	47.9	29.2	10.8	0.8	88.7
Spruce	4.6	0.0	0.0	0.0	4.6
Larch	0.0	0.0	0.0	0.0	0.0
Cypress	0.0	0.0	0.0	0.0	0.0
Other conifers	0.0	9.1	0.0	0.0	9.1
Total conifers	52.5	38.3	10.8	0.8	102.4
Oak	51.7	30.0	8.1	0.8	90.6
Beech	13.7	0.0	8.0	1.1	22.8
Sycamore	386.1	17.9	1.1	0.0	405.1
Ash	53.1	67.2	27.2	0.0	147.5
Birch	33.7	20.0	0.0	0.0	53.7
Poplar	0.0	21.5	0.0	0.0	21.5
Sweet chestnut	0.0	0.0	0.0	0.0	0.0
Horse chestnut	0.0	9.6	5.6	0.0	15.2
Alder	0.0	5.0	0.0	0.0	5.0
Lime	22.5	1.7	0.0	0.0	24.2
Elm	113.1	9.1	0.0	0.0	122.2
Willow	15.8	2.5	0.8	0.0	19.1
Other broadleaves	408.9	15.6	0.0	0.0	424.5
Total broadleaves	1,098.6	200.1	50.8	1.9	1,351.4
Total - all species	1,151.1	238.2	61.7	2.8	1,453.9

Table 18 Number of Groups by group size

Number of trees per Group*	Number of Groups (000's)
2	1
3-5	6
6-10	8
11-20	8
21-50	8
51-100	1
>100	0
Total	32

*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	14,186	92.3	16,873	93.3	19
0.25 - <2.0	1,183	7.7	1,218	6.7	3
Total	15,369		18,091		18
% Woodland land cover	5.9		6.9		

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), 260,595 ha, was based on the 1991 Census of Population digital boundaries.
4. Land area used to calculate woodland cover percent (1980), 260,793 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	392	521	33
Corsican pine	310	211	-32
Lodgepole pine	7	0	-100
Sitka spruce	7	0	-100
Norway spruce	455	296	-35
European larch	509	0	-100
Jap/Hybrid larch	467	698	49
Douglas fir	280	122	-56
Other conifers	304	319	5
Mixed conifers	394	343	-13
Total conifers	3,126	2,510	-20
Oak	1,795	3,270	82
Beech	3,105	2,706	-13
Sycamore	669	796	19
Ash	1,288	2,476	92
Birch	188	378	101
Poplar	380	309	-19
Sweet chestnut	30	32	5
Elm	46	42	-9
Other broadleaves	556	917	65
Mixed broadleaves	917	1,283	40
Total broadleaves	8,973	12,209	36
Total all species	12,099	14,719	22
Felled	334	85	-75
Total High Forest	12,433	14,804	19

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 18.0% (Table 2). To obtain meaningful comparisons between the two datasets the 1980 Census data have therefore been reduced by 18.0%.
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

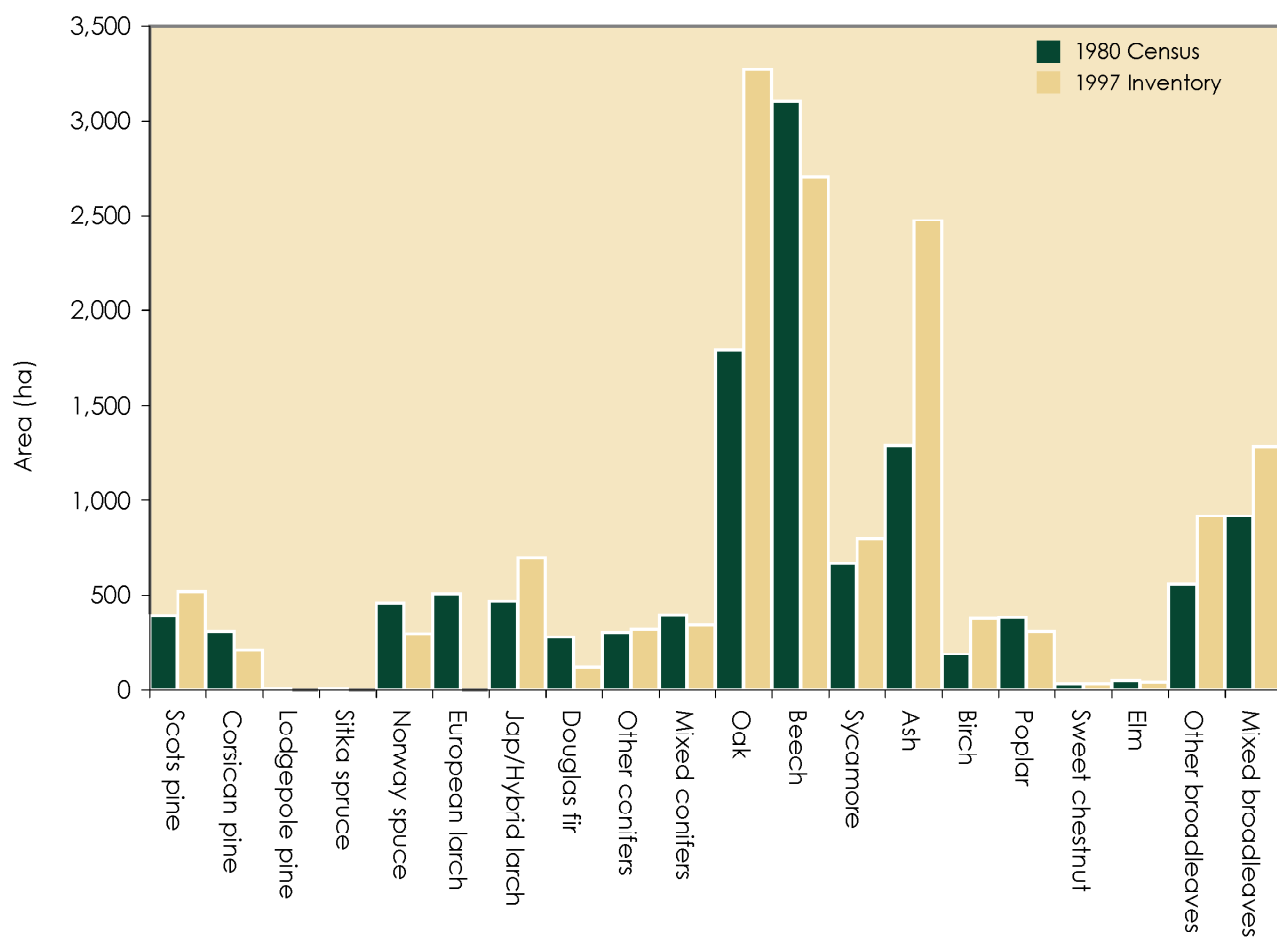


Table 21 Comparison of High Forest Category 1 area by planting year class
between 1980 Census and 1997 Inventory

Planting year class	1980 Census woodland area (ha)	1997 Inventory woodland area (ha)	Change (%)
1991-1997	0	544	see note
1981-1990	0	611	see note
1971-1980	498	817	64
1961-1970	1,918	1,255	-35
1951-1960	2,051	1,861	-9
1941-1950	1,070	1,717	60
1931-1940	1,097	1,080	-2
1921-1930	761	2,395	215
1911-1920	582	611	5
1901-1910	2,085	657	-68
1861-1900	988	1,415	43
Pre 1861	527	103	-80
Total all years	11,577	13,066	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

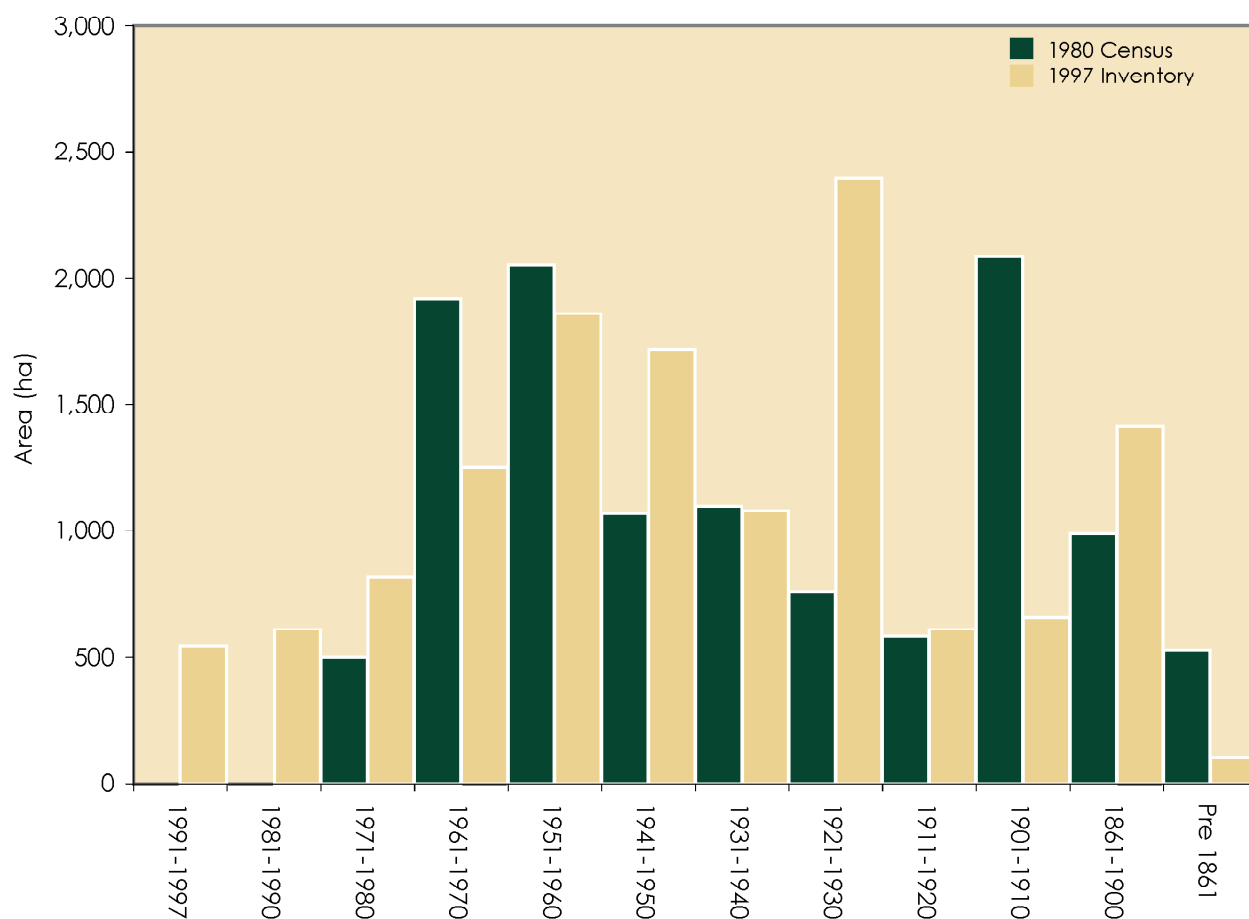


Table 22 Comparison of numbers of live trees outside woodland between 1980 Census and 1997 Inventory (000's)

Feature type	1980 Census	1997 Inventory	Change (%)
Boundary Tree	101	32	-69
Middle Tree	118	9	-92
Total Individual Trees	219	41	-81
Groups	269	263	-2
Linear Features	829	785	-5
Total	1,317	1,088	-17

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)	83.9	15.7	-81
Groups (per sq km)	29.2	12.2	-58
Linear Features (m per sq km)	740.1	500.4	-32

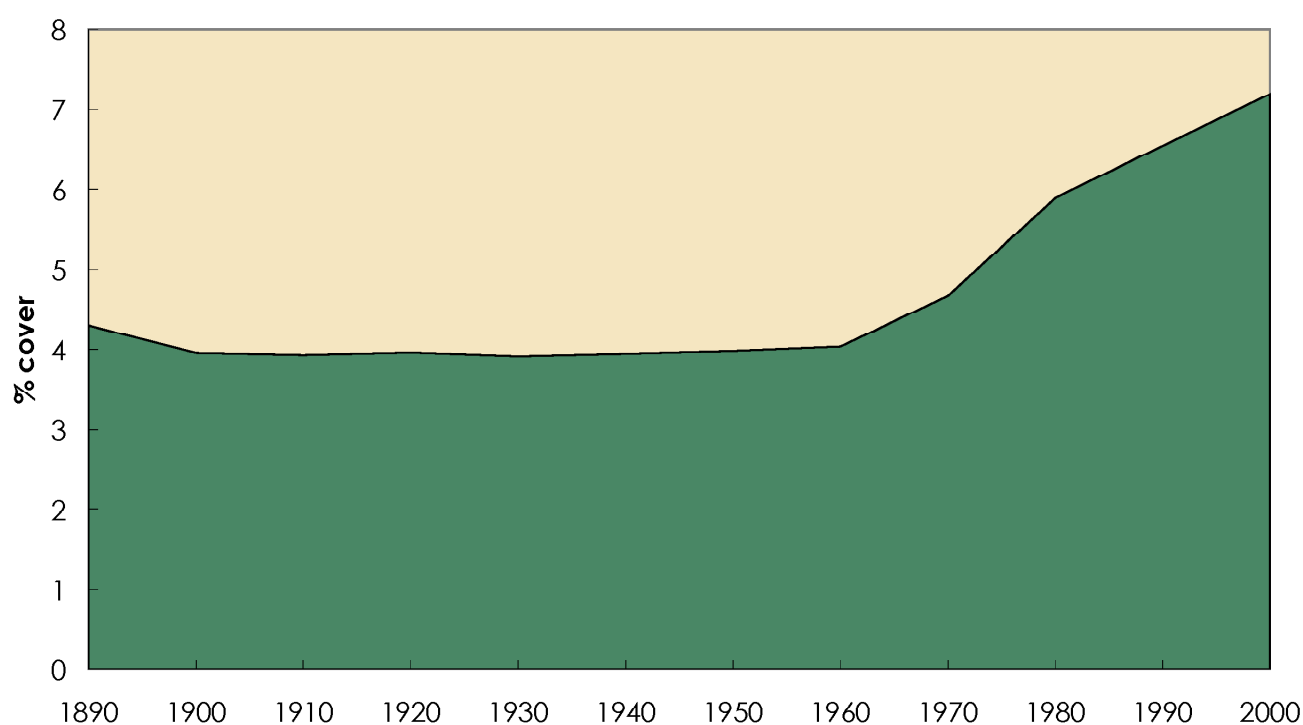
1. The Survey of Small Woodland and Trees did not record information referring to tree features (I.e. Individual trees, Groups and Narrow Linear Features) within developed land.
2. In the 1980 Census hazel, hawthorn, blackthorn and goat willow were excluded, the 1997 Inventory figures have been adjusted 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

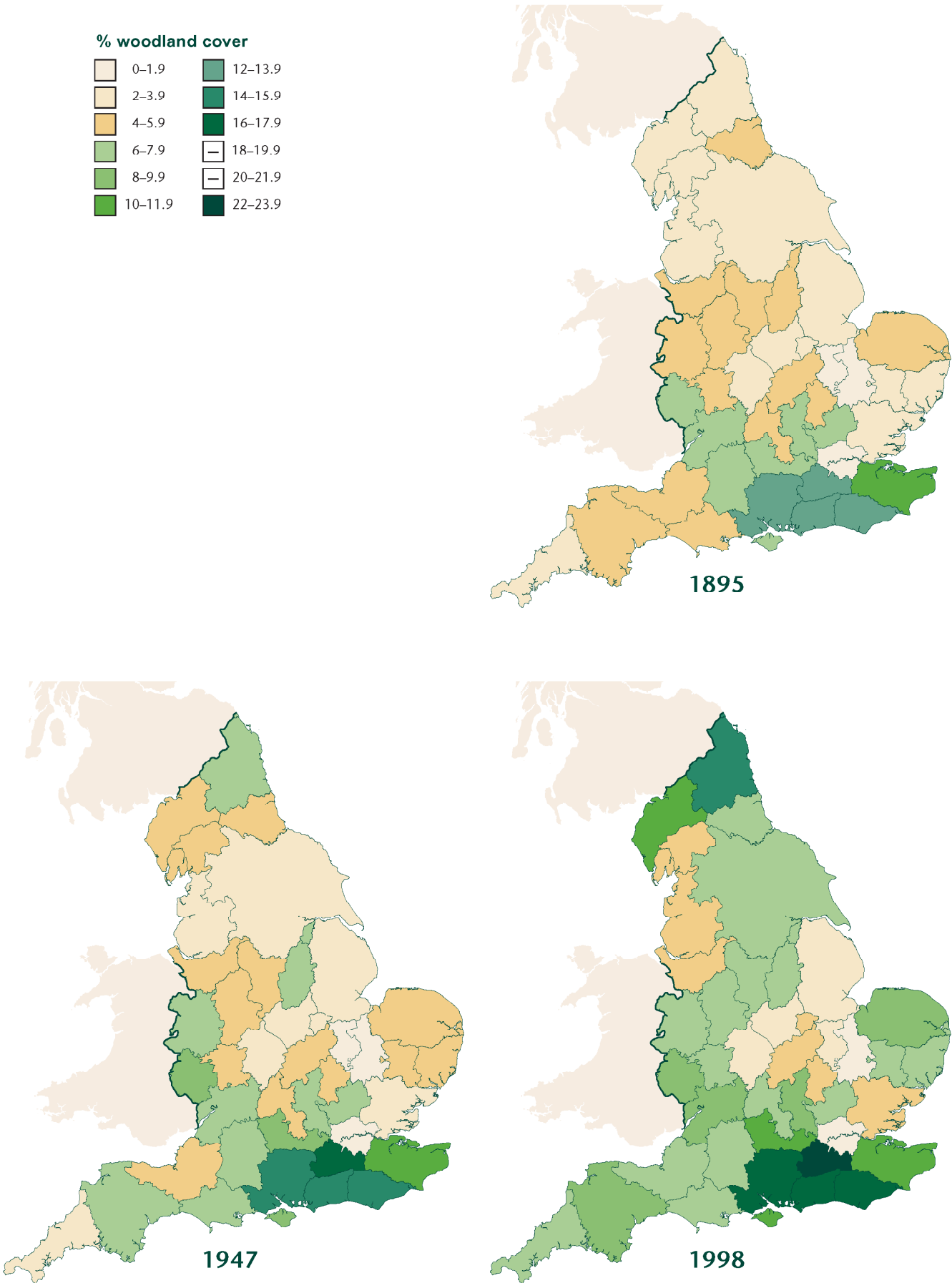
Woodland area data is available from Ministry of Agriculture surveys since 1871, and from Forestry Commission national woodland inventories since 1924. The following chart and maps show the changes in woodland area through time.

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 1.6 m or less)
- Wide Linear Features (with a width greater than 1.6 m)

NOTES



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