



NATIONAL INVENTORY OF WOODLAND AND TREES



ENGLAND

County Report for

DERBYSHIRE



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 Derbyshire 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 Derbyshire 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 With the statistics becoming increasingly out of date the Forestry Commission decided to undertake a new survey: the *National Inventory of Woodland and Trees*.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 Derbyshire is 19,513 hectares. This represents 7.4 % of the land area. (Table 1)
- Broadleaved woodland is the dominant forest type representing 68.4 % of all woodland. Conifer woodland represents 16.0 %, Mixed woodland 9.1 % and Open Space within woodlands 6.2 %. (Table 2)
- The main conifer species is pine covering 2,105 hectares or 54.1 % of all conifer species. The main broadleaved species is sycamore covering 2,701 hectares or 18.8 % of all broadleaved species. (Table 3)
- 2,072 hectares or 13 % of woodland over 2 hectares is owned by or leased to the Forestry Commission, and 13,661 hectares or 87 % of woodland is in Other ownership. (Table 6)
- There are a total of 1,150 woods over 2 ha within Derbyshire with a mean wood area of 13.8 hectares. (Table 7a) There are a total of 9,308 woods from 0.1 - <2.0 hectares with a mean wood area of 0.41 hectares. (Table 14)
- There are 4.1 million live trees outside woodland in Derbyshire. (Table 15)
- Woodland land cover increased by over 5,600 hectares from 5.1 % to 7.2 % of the land area between 1980 and 1998. (Table 19)
- The area of broadleaves increased by 43 % between 1980 and 1998, with the relative proportion of broadleaves to conifers increasing from 65 % to 78 %. (Table 20)

INVENTORY REPORTS

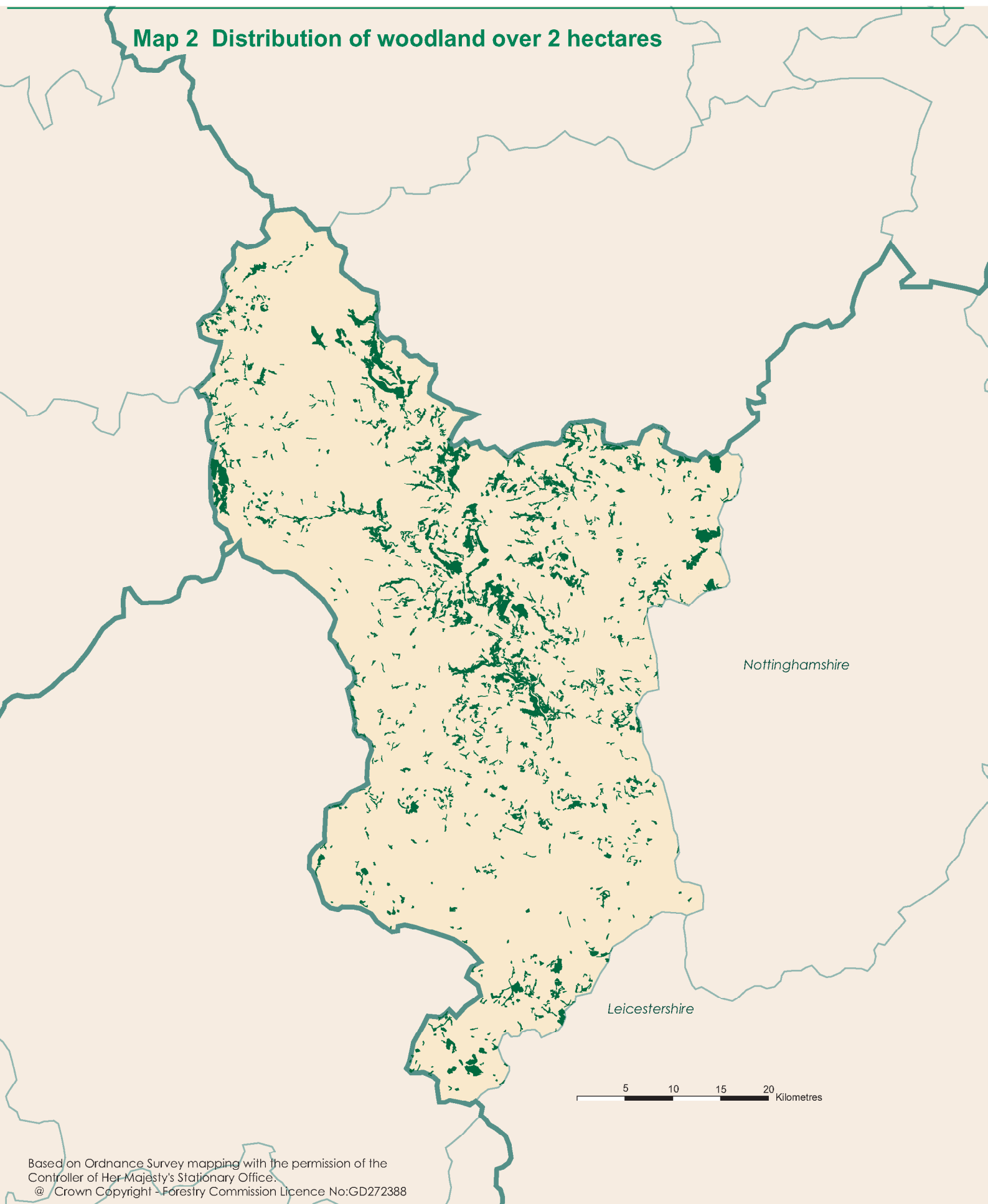
As well as this report for Derbyshire, reports are available for the other counties in the region as shown on the map opposite. Also available are region and county reports for England as well as a report for the country as a whole. Wales and Scotland are also covered by reports.

Map 1 Regional and county boundaries

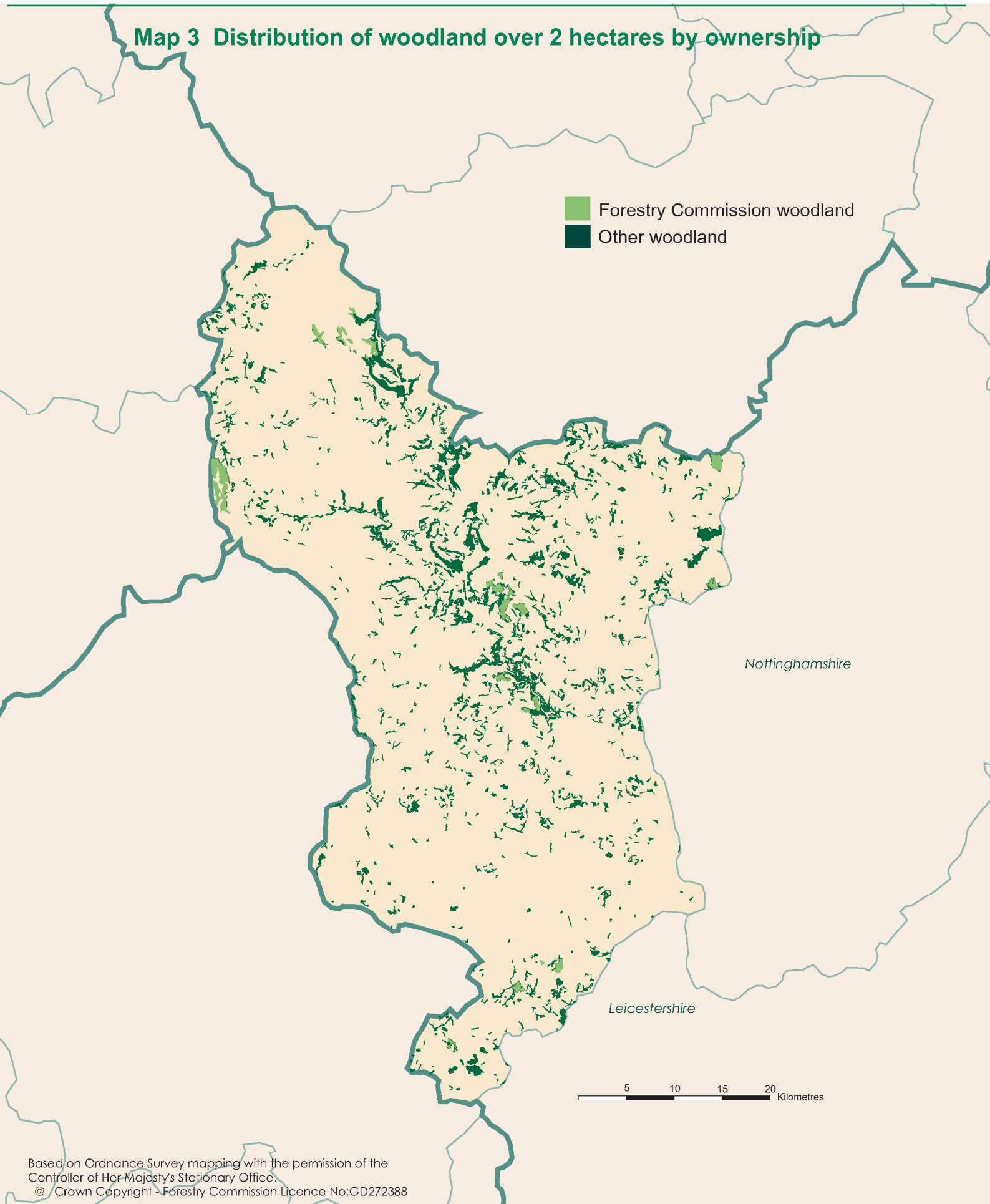


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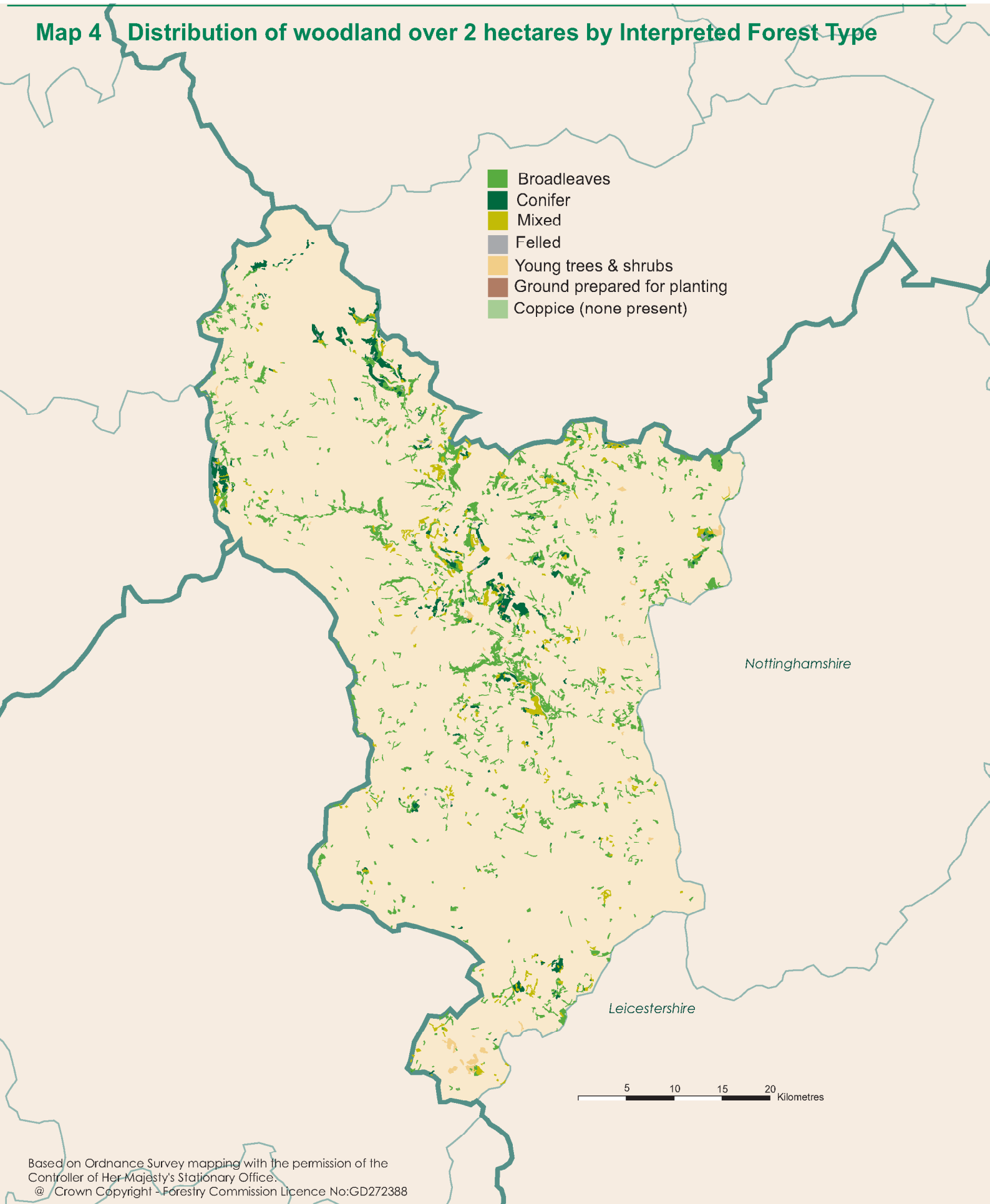
Map 2 Distribution of woodland over 2 hectares



Map 3 Distribution of woodland over 2 hectares by ownership



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



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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 Derbyshire.

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	15,733	80.6
0.25 - < 2.00	3,224	16.5
0.10 - < 0.25	556	2.8
Total area of woodland	19,513	100.0
% Woodland land cover	7.4	

1. Area of Derbyshire, including inland water, 262,858 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	2,758	367	3,125	16.0
Broadleaved	10,217	3,136	13,353	68.4
Mixed	1,744	33	1,777	9.1
Coppiced	21	0	21	0.1
Copp-w-standards	0	0	0	0.0
Windblow	19	0	19	0.1
Felled	0	0	0	0.0
Open Space	974	244	1,218	6.2
Total	15,733	3,779	19,512	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	1,955	150	2,105	54.1	11.5
Sitka spruce	241	0	241	6.2	1.3
Larch	883	0	883	22.7	4.8
Other conifers	292	216	508	13.1	2.8
Mixed conifers	121	33	154	4.0	0.8
Total conifers	3,491	399	3,890	100.0	21.3
Oak	1,933	250	2,183	15.2	11.9
Beech	1,049	27	1,076	7.5	5.9
Sycamore	2,468	233	2,701	18.8	14.8
Ash	1,805	686	2,491	17.3	13.6
Birch	1,451	17	1,468	10.2	8.0
Elm	81	33	114	0.8	0.6
Other broadleaves	1,772	513	2,285	15.9	12.5
Mixed broadleaves	687	1,378	2,065	14.4	11.3
Total broadleaves	11,247	3,137	14,384	100.0	78.7
Total all species***	14,738	3,535	18,273		100.0

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

**Species/group percentage of all species

***Excludes the 1.239ha 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	9%
Broadleaves	4%
Pine	14%
Oak	14%
Sycamore	11%
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	211,100	1,100,800	5	419
Narrow Linear Features	115,500	2,684,800	23	1,021
Individual Trees	374,400	374,400	1	142
Total		4,160,000		1,583

1. Land area used to calculate tree density 262,858ha 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	24%
Narrow Linear Features	19%
Individual Trees	27%
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	3,648	349	133
Narrow Linear Features	115,500	6,166	2,346
Total		6,515	2,479

1. Land area used to calculate tree density 262,858ha 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	71%
Narrow Linear Features	17%
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	2,072	13
Other	13,661	87
Total area of woodland	15,733	100

- 1. Woodland area from aerial photographic interpretation map updated to 31 March 1998
- 2. See Glossary for definitions of ownership types

Woodland area by ownership

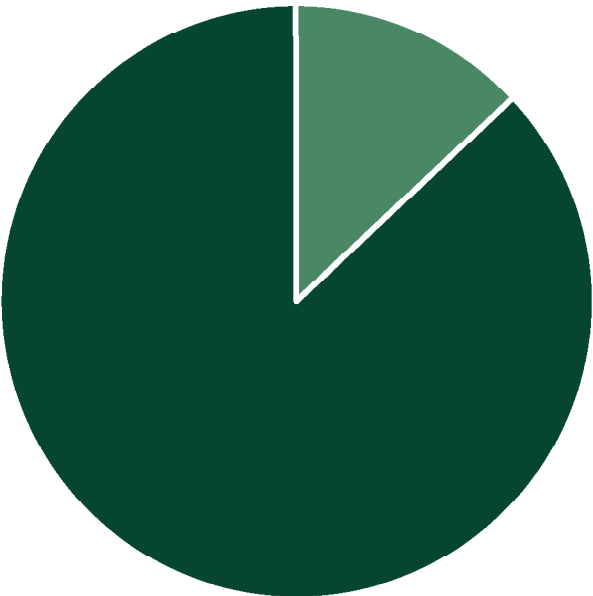
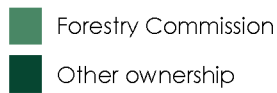


Table 7a Size class distribution of woodland

Size class (ha)	Number of woods	Total area (ha)	Percent of total area	Mean wood area (ha)
<10	860	3,748	24	4.4
10 - <20	149	2,055	13	13.8
20 - <50	83	2,474	16	29.8
50 - <100	37	2,688	17	72.6
<100	1,129	10,964	69	9.7
100 - <500	20	4,419	28	221.0
500 and >	1	518	3	518.1
All woods	1,150	15,901	100	13.8

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	13	55	0	4.2
	O	895	3,846	24	4.3
10 - <20	FC	3	48	0	15.9
	O	148	2,038	13	13.8
20 - <50	FC	5	157	1	31.4
	O	82	2,437	15	29.7
50 - <100	FC	11	807	5	73.4
	O	35	2,545	16	72.7
<100	FC	32	1,067	7	33.3
	O	1,160	10,866	68	9.4
100 - <500	FC	6	1,004	6	167.4
	O	14	2,964	19	211.7
500 and >	FC	0	0	0	0.0
	O	0	0	0	0.0
Total	FC	38	2,072	13	54.5
	O	1,174	13,830	87	11.8

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 169 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 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	1,463	70.6	1,296	9.5	2,758	17.5
Broadleaved	355	17.1	9,862	72.2	10,217	64.9
Mixed	195	9.4	1,548	11.3	1,744	11.1
Coppice	0	0.0	21	0.2	21	0.1
Copp-w-Stds	0	0.0	0	0.0	0	0.0
Windblow	0	0.0	19	0.1	19	0.1
Felled	0	0.0	0	0.0	0	0.0
Open Space	59	2.8	915	6.7	974	6.2
Total	2,072	100.0	13,661	100.0	15,733	100.0

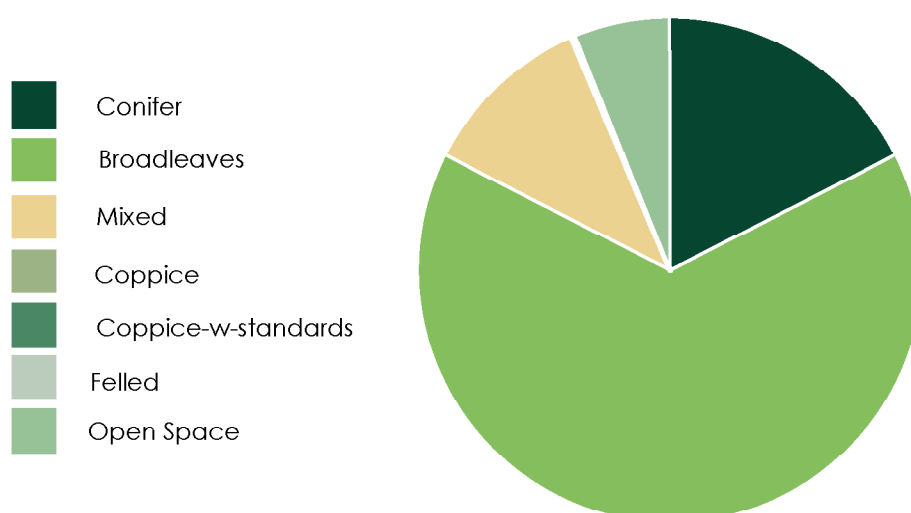
Area of woodland by forest type

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	282	18	14	662	34	5	944	27	6
Corsican pine	363	24	18	220	11	2	583	17	4
Lodgepole pine	422	27	21	5	0	0	428	12	3
Sitka spruce	207	13	10	34	2	0	241	7	2
Norway spruce	0	0	0	164	8	1	164	5	1
European larch	0	0	0	70	4	1	70	2	0
Jap/Hybrid larch	144	9	7	669	34	5	813	23	6
Douglas fir	0	0	0	0	0	0	0	0	0
Other conifers	108	7	5	20	1	0	128	4	1
Mixed conifers	8	1	0	112	6	1	121	3	1
Total conifers	1,535	100	76	1,956	100	15	3,491	100	24
Oak	98	21	5	1,835	17	14	1,933	17	13
Beech	34	7	2	1,015	9	8	1,049	9	7
Sycamore	182	38	9	2,286	21	18	2,468	22	17
Ash	54	11	3	1,752	16	14	1,805	16	12
Birch	77	16	4	1,374	13	11	1,451	13	10
Poplar	0	0	0	252	2	2	252	2	2
Sweet chestnut	0	0	0	0	0	0	0	0	0
Elm	4	1	0	77	1	1	81	1	1
Other broadleaves	17	4	1	1,503	14	12	1,520	14	10
Mixed broadleaves	13	3	1	675	6	5	687	6	5
Total broadleaves	478	100	24	10,768	100	85	11,247	100	76
Total - all species	2,013		100	12,724		100	14,738		100
Felled	0			0			0		
Total High Forest	2,013			12,724			14,738		

*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 974ha 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	9%
Broadleaves	4%
Scots pine	22%
Oak	14%
Sycamore	11%
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

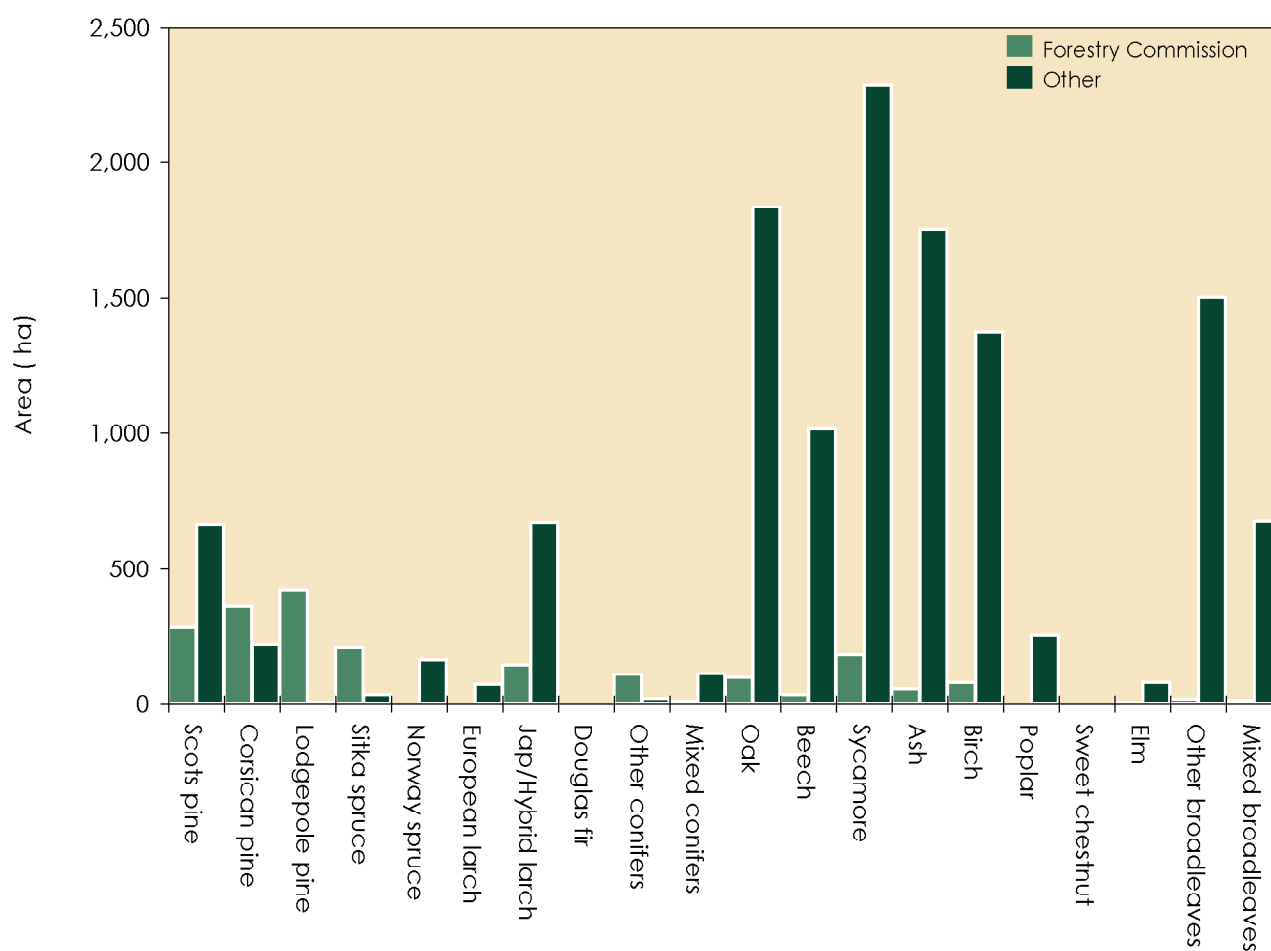


Table 9b Area of High Forest by principal species,ownership and category

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	278	4	282	646	15	662	924	20	944
Corsican pine	363	0	363	220	0	220	583	0	583
Lodgepole pine	346	76	422	5	0	5	351	76	428
Sitka spruce	207	0	207	34	0	34	241	0	241
Norway spruce	0	0	0	148	15	164	148	15	164
European larch	0	0	0	70	0	70	70	0	70
Jap/Hybrid larch	144	0	144	655	14	669	799	14	813
Douglas fir	0	0	0	0	0	0	0	0	0
Other conifers	108	0	108	0	20	20	108	20	128
Mixed conifers	0	8	8	79	33	112	79	41	121
Total conifers	1,446	89	1,535	1,858	98	1,956	3,304	187	3,491
Oak	55	42	98	1,474	362	1,835	1,529	404	1,933
Beech	21	13	34	855	160	1,015	876	173	1,049
Sycamore	169	13	182	1,770	515	2,286	1,939	528	2,468
Ash	49	4	54	1,293	458	1,752	1,343	463	1,805
Birch	25	52	77	352	1,022	1,374	377	1,074	1,451
Poplar	0	0	0	252	0	252	252	0	252
Sweet chestnut	0	0	0	0	0	0	0	0	0
Elm	0	4	4	31	46	77	31	50	81
Other broadleaves	0	17	17	144	1,359	1,503	144	1,376	1,520
Mixed broadleaves	4	8	13	316	358	675	321	367	687
Total broadleaves	325	154	478	6,487	4,281	10,768	6,812	4,435	11,247
Total - all species	1,770	243	2,013	8,345	4,379	12,724	10,116	4,622	14,738

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

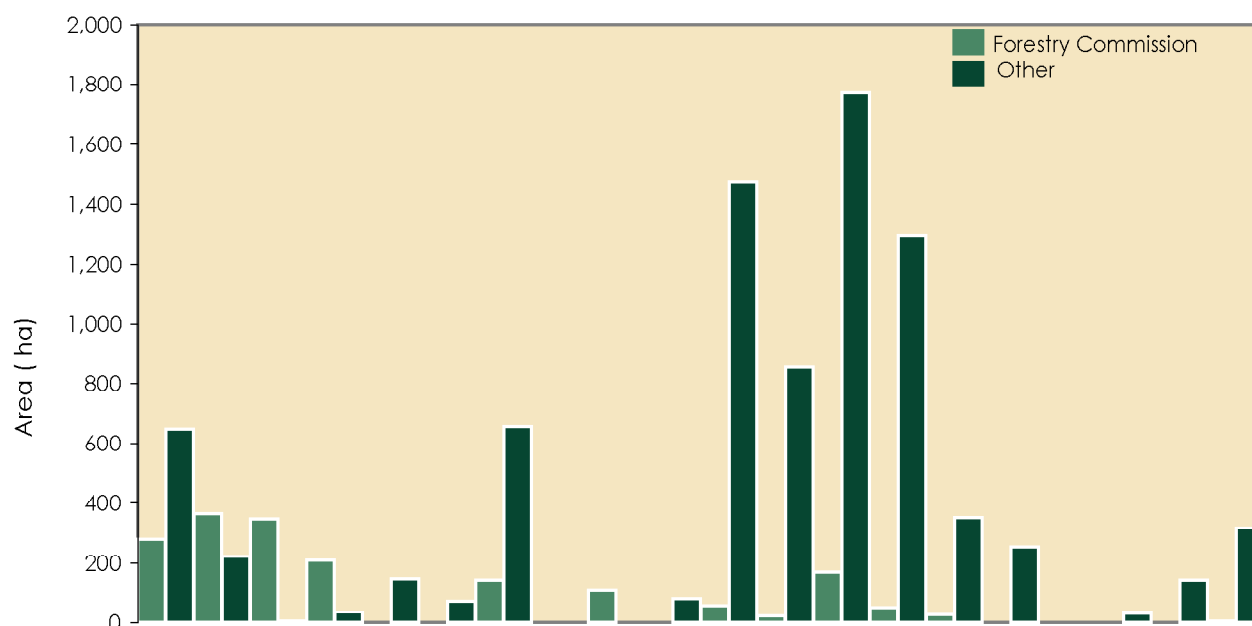
	Category 1*	Category 2*	Total High Forest
Conifers	9%	43%	9%
Broadleaves	6%	7%	4%
Scots pine	22%	45%	22%
Oak	16%	24%	14%
Sycamore	13%	22%	11%

*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

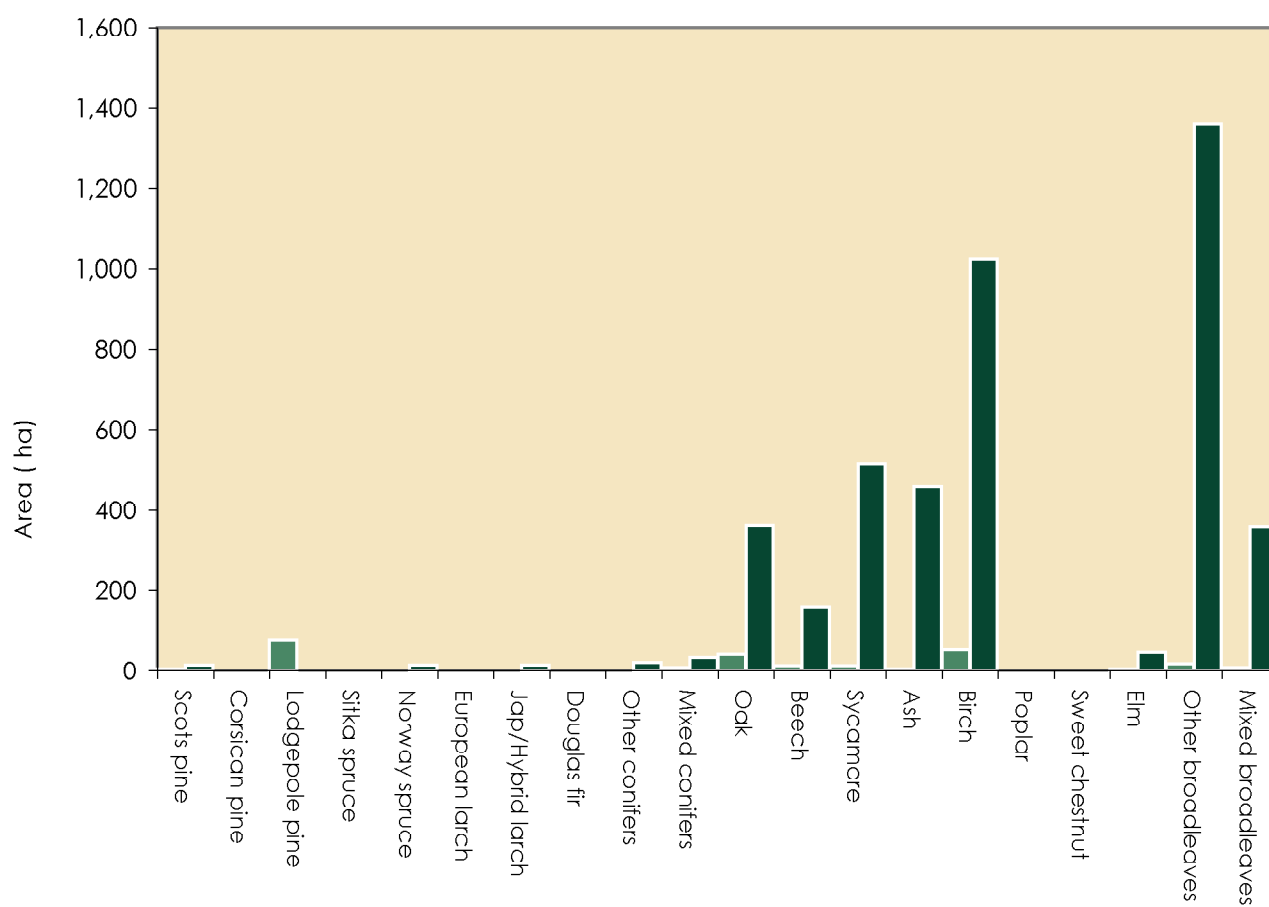
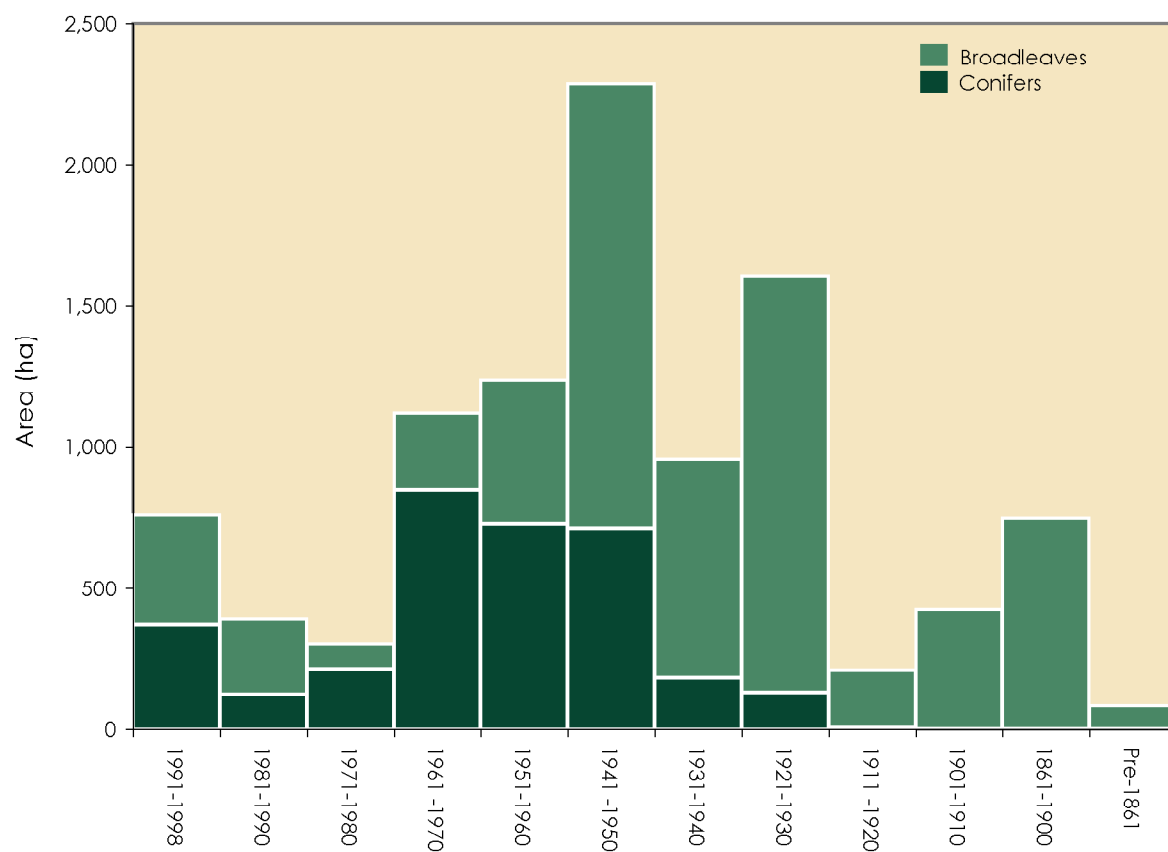


Table 10a High Forest Category 1 - Area by principal species and planting year class

Species	Planting year class*												Total (ha)
	1991-1998	1981-1990	1971-1980	1961-1970	1951-1960	1941-1950	1931-1940	1921-1930	1911-1920	1901-1910	1861-1900	Pre-1861	
Scots pine	11	16	5	80	303	359	117	32	0	0	0	0	924
Corsican pine	0	0	0	298	245	20	13	2	4	0	0	0	583
Lodgepole pine	0	0	77	253	21	0	0	0	0	0	0	0	351
Sitka spruce	115	14	113	0	0	0	0	0	0	0	0	0	241
Norway spruce	136	0	0	0	0	12	0	0	0	0	0	0	148
European larch	0	0	11	0	48	5	5	0	0	0	0	0	70
Jap/Hybrid larch	107	93	0	138	80	278	34	69	0	0	0	0	799
Douglas fir	0	0	0	0	0	0	0	0	0	0	0	0	0
Other conifers	0	0	4	78	25	0	0	0	0	0	0	0	108
Mixed conifers	0	0	0	0	5	37	11	25	0	0	0	0	79
Total conifers	369	123	211	847	728	712	181	129	4	0	0	0	3,304
Oak	102	27	23	0	27	281	32	402	32	115	460	26	1,529
Beech	0	30	8	0	88	93	4	246	96	152	104	55	876
Sycamore	60	0	21	114	113	656	372	388	78	107	30	0	1,939
Ash	58	66	19	11	185	247	238	353	0	13	154	0	1,343
Birch	22	5	0	15	40	146	80	43	0	25	0	0	377
Poplar	0	105	0	85	0	46	15	0	0	0	0	0	252
Sweet chestnut	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	31	0	0	0	0	0	0	0	0	31
Other broadleaves	77	0	8	11	25	4	0	13	0	5	0	0	144
Mixed broadleaves	70	33	10	5	31	101	33	32	0	5	0	0	321
Total broadleaves	390	267	89	273	509	1,574	775	1,477	205	424	748	81	6,812
Total - all species	759	390	300	1,120	1,237	2,286	956	1,606	210	424	748	81	10,116

*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.

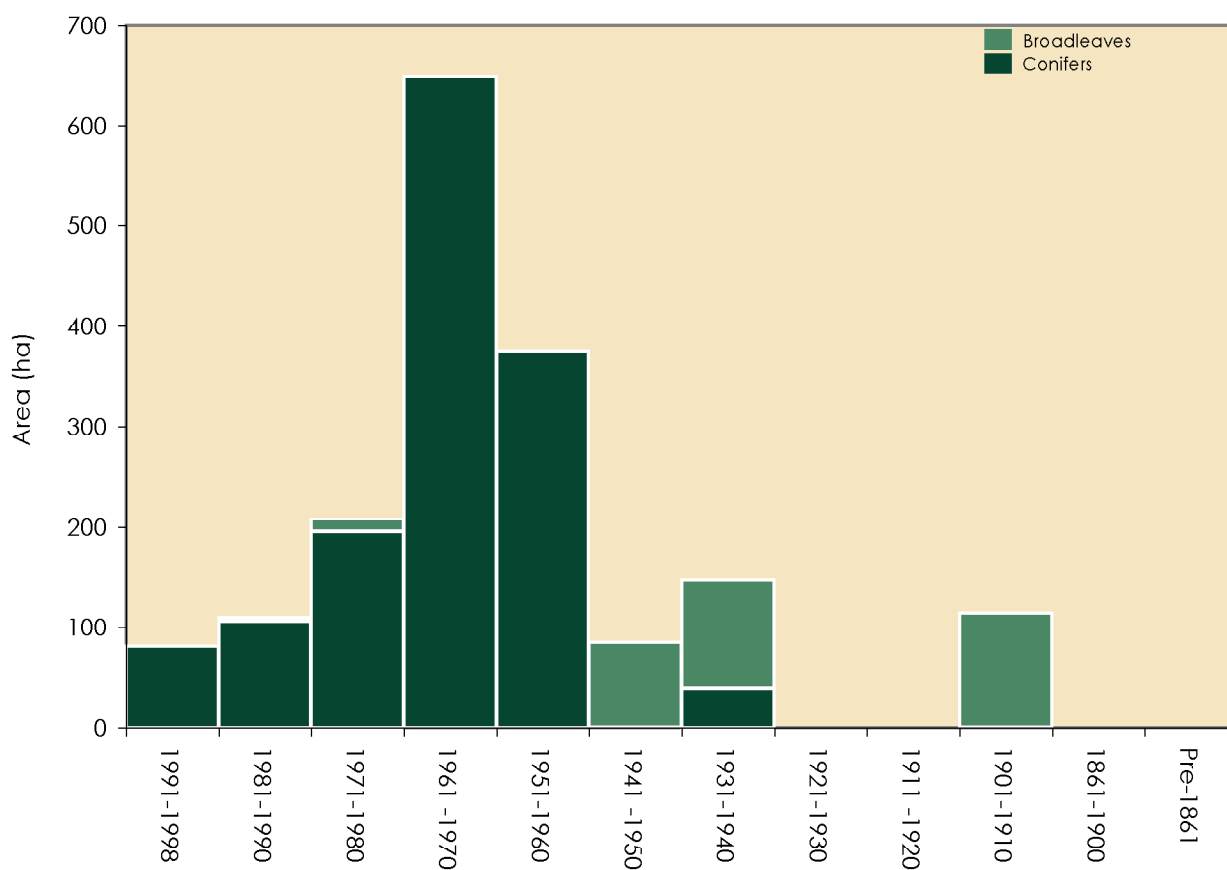
High Forest Category 1 - Area by planting year class

1. Most of the planting year classes cover 10 years, 1991-1998 is 8 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)
	1991-1998	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	80	194	0	4	0	0	0	0	0	278
Corsican pine	0	0	0	231	132	0	0	0	0	0	0	0	363
Lodgepole pine	0	0	77	247	21	0	0	0	0	0	0	0	346
Sitka spruce	81	14	113	0	0	0	0	0	0	0	0	0	207
Norway spruce	0	0	0	0	0	0	0	0	0	0	0	0	0
European larch	0	0	0	0	0	0	0	0	0	0	0	0	0
Jap/Hybrid larch	0	93	0	13	4	0	34	0	0	0	0	0	144
Douglas fir	0	0	0	0	0	0	0	0	0	0	0	0	0
Other conifers	0	0	4	78	25	0	0	0	0	0	0	0	108
Mixed conifers	0	0	0	0	0	0	0	0	0	0	0	0	0
Total conifers	81	106	195	649	376	0	38	0	0	0	0	0	0
Oak	0	0	195	0	0	17	4	0	0	30	0	0	55
Beech	0	4	8	0	0	4	4	0	0	0	0	0	21
Sycamore	0	0	0	0	0	38	72	0	0	59	0	0	169
Ash	0	0	0	0	0	21	28	0	0	0	0	0	49
Birch	0	0	0	0	0	0	0	0	0	25	0	0	25
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	0	0	0	0	0	0	0	0	0
Mixed broadleaves	0	0	0	0	0	4	0	0	0	0	0	0	4
Total broadleaves	0	4	13	0	0	85	109	0	0	114	0	0	325
Total - all species	81	110	207	649	376	85	147	0	0	114	0	0	1,770

*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.

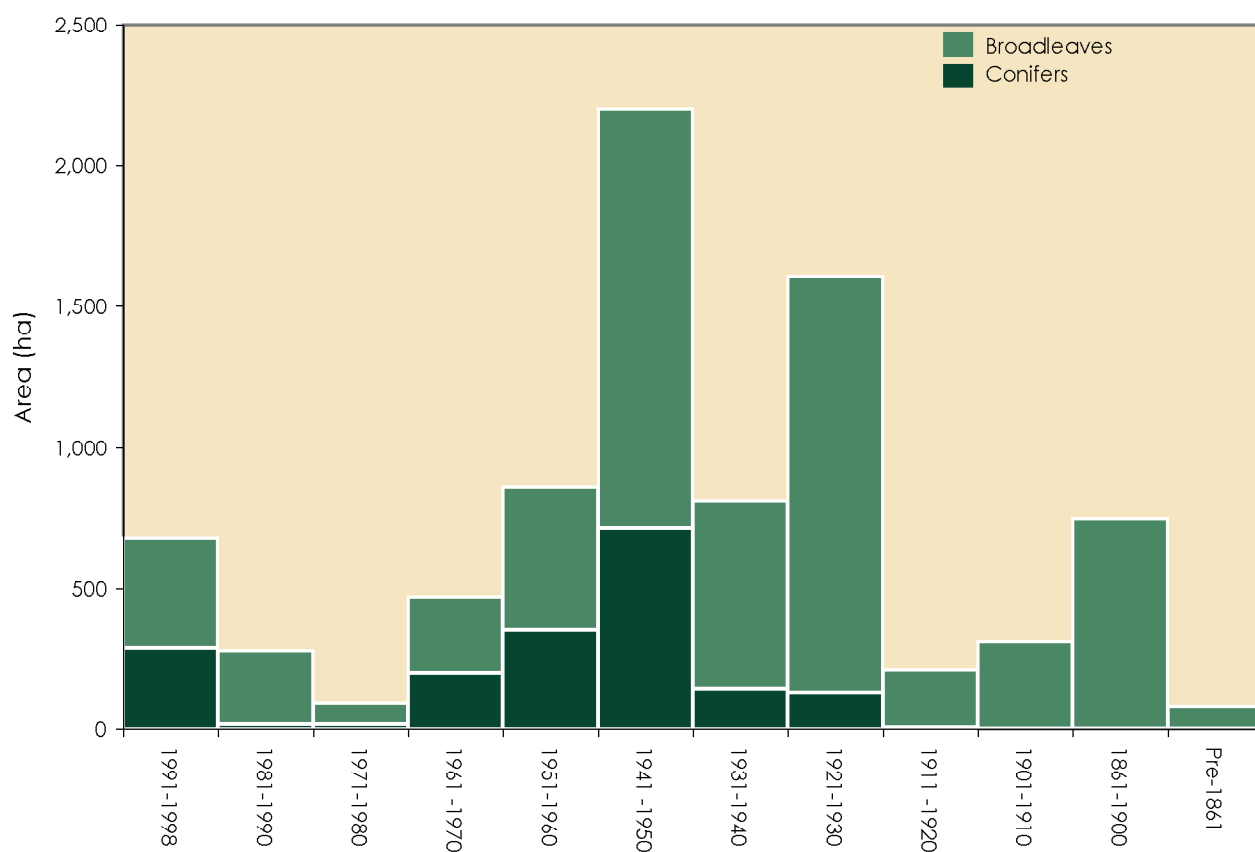
High Forest Category 1 - Forestry Commission: area by planting year class

1. Most of the planting year classes cover 10 years, 1991-1998 is 8 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)
	1991-1998	1981-1990	1971-1980	1961-1970	1951-1960	1941-1950	1931-1940	1921-1930	1911-1920	1901-1910	1861-1900	Pre-1861	
Scots pine	11	16	5	0	109	359	113	32	0	0	0	0	646
Corsican pine	0	0	0	67	113	20	13	2	4	0	0	0	220
Lodgepole pine	0	0	0	5	0	0	0	0	0	0	0	0	5
Sitka spruce	34	0	0	0	0	0	0	0	0	0	0	0	34
Norway spruce	136	0	0	0	0	12	0	0	0	0	0	0	148
European larch	0	0	11	0	48	5	5	0	0	0	0	0	70
Jap/Hybrid larch	107	0	0	125	76	278	0	69	0	0	0	0	655
Douglas fir	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
Mixed conifers	0	0	0	0	5	37	11	25	0	0	0	0	79
Total conifers	288	16	16	198	352	712	143	129	4	0	0	0	1,858
Oak	102	27	19	0	27	264	27	402	32	86	460	26	1,474
Beech	0	25	0	0	88	89	0	246	96	152	104	55	855
Sycamore	60	0	21	114	113	618	300	388	78	48	30	0	1,770
Ash	58	66	19	11	185	225	210	353	0	13	154	0	1,293
Birch	22	5	0	15	40	146	80	43	0	0	0	0	352
Poplar	0	105	0	85	0	46	15	0	0	0	0	0	252
Sweet chestnut	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	31	0	0	0	0	0	0	0	0	31
Other broadleaves	77	0	8	11	25	4	0	13	0	5	0	0	144
Mixed broadleaves	70	33	10	5	31	97	33	32	0	5	0	0	316
Total broadleaves	390	263	76	273	509	1,489	666	1,477	205	310	748	81	6,487
Total - all species	678	279	92	470	860	2,201	809	1,606	210	310	748	81	8,345

*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, 1991-1998 is 8 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	%
1991-98	Norway spruce	15	Oak	15	Sitka spruce	13
1981-90	Poplar	19	Jap/Hybrid larch	17	Ash	15
1971-80	Ash	32	Sitka spruce	17	Other broadleaves	14
1961-70	Birch	17	Lodgepole pine	16	Other broadleaves	15
1951-60	Other broadleaves	16	Birch	14	Scots pine	14
1941-50	Sycamore	26	Other broadleaves	12	Scots pine	11
1931-40	Sycamore	29	Ash	20	Birch	20
1921-30	Sycamore	25	Oak	22	Ash	22
1911-20	Oak	33	Beech	24	Sycamore	19
1901-10	Beech	34	Oak	32	Sycamore	24
1861-1900	Oak	48	Ash	19	Beech	15
Pre 1861	Beech	73	Oak	12	Mixed broadleaves	10
All years	Sycamore	17	Oak	13	Ash	12

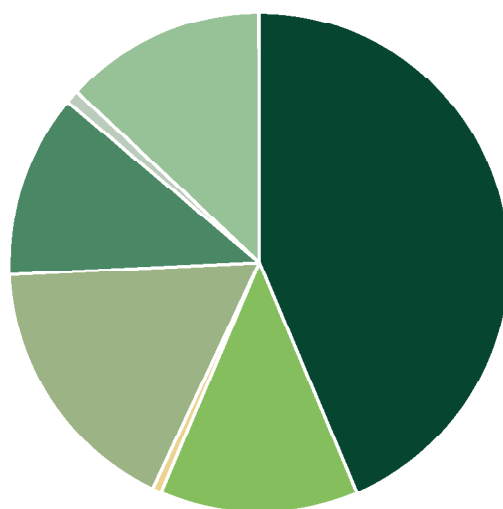
1. Principal species as a percentage of area in the planting year class.

Table 12 Ownership type* by area and percentage

Ownership type	Area (ha)	%
Personal	6,877	43.7
Business	1,996	12.7
Forestry or timber business	70	0.4
Charity	2,713	17.2
Local Authority	1,902	12.1
Other public (not FC)	102	0.6
Forestry Commission	2,072	13.2
Community ownership or common land	0	0.0
Unidentified	0	0.0
Total	15,733	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	5,660	2,806	Area (ha)
Wide Linear Features	3,648	973	Area (ha)
Wide Linear Features	3,648	349	Length (Km)
Narrow Linear Features	115,500	6,166	Length (Km)
Narrow Linear Features	115,500	2,684,800	Number of live trees
Groups	211,100	1,100,800	Number of live trees
Individual Trees	374,400	374,400	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	313	2,494	2,806	5,660	0.50
Wide Linear Features	243	730	973	3,648	0.27
Total	556	3,224	3,779	9,308	0.41

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	3.2	52.3	55.5	54.6	1.3
Spruce	0.4	0.4	0.8	13.4	15.0	14.7	0.4
Larch	0.0	0.0	3.2	12.2	15.4	15.1	0.4
Cypress	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other conifers	0.0	0.0	4.9	10.9	15.8	15.5	0.4
Total conifers	0.4	0.4	12.1	88.8	101.7	100.0	2.4
Oak	28.1	11.5	24.3	128.9	192.8	4.8	4.6
Beech	6.5	0.0	8.1	186.0	200.6	4.9	4.8
Sycamore	18.7	15.3	53.4	232.2	319.6	7.9	7.7
Ash	30.2	14.2	144.0	283.3	471.7	11.6	11.3
Birch	9.2	3.7	53.4	155.6	221.9	5.5	5.3
Poplar	0.0	0.0	0.0	14.6	14.6	0.4	0.4
Sweet chestnut	0.8	0.8	1.6	1.2	4.4	0.1	0.1
Horse chestnut	6.5	12.9	10.5	8.5	38.4	0.9	0.9
Alder	0.0	5.7	25.1	51.1	81.9	2.0	2.0
Lime	0.0	0.0	3.2	23.1	26.3	0.6	0.6
Elm	7.9	1.0	42.9	102.1	153.9	3.8	3.7
Willow	16.0	5.1	104.3	74.2	199.6	4.9	4.8
Other broadleaves	47.7	131.9	617.9	1,335.1	2,132.6	52.5	51.3
Total broadleaves	171.6	202.1	1,088.6	2,596.1	4,058.3	100.0	97.6
Total - all species	172.0	202.5	1,100.8	2,684.8	4,160.0		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	27%
Groups	24%
Narrow Linear Features	19%
- 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	3.6	3.6	100.0	7.7
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	3.6	3.6	100.0	7.7
Oak	0.0	0.0	0.0	3.6	3.6	8.4	7.7
Beech	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sycamore	0.0	0.8	0.0	1.2	2.0	4.7	4.3
Ash	0.0	0.0	0.8	0.0	0.8	1.9	1.7
Birch	0.0	0.0	2.4	12.2	14.6	34.0	31.3
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	1.2	1.2	2.8	2.6
Lime	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Elm	1.6	0.0	4.0	4.9	10.5	24.5	22.5
Willow	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other broadleaves	0.8	0.8	4.9	3.6	10.1	23.5	21.7
Total broadleaves	2.4	1.6	12.1	26.8	42.9	100.0	92.1
Total - all species	2.4	1.6	12.1	30.4	46.6		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	0.0	51.9	3.6	0.0	55.5
Spruce	11.8	3.2	0.0	0.0	15.0
Larch	0.0	15.4	0.0	0.0	15.4
Cypress	0.0	0.0	0.0	0.0	0.0
Other conifers	0.0	15.8	0.0	0.0	15.8
Total conifers	11.8	86.3	3.6	0.0	101.7
Oak	29.5	151.1	7.7	4.5	192.8
Beech	15.4	36.1	108.2	40.9	200.6
Sycamore	79.0	200.1	36.9	3.6	319.6
Ash	116.6	328.4	21.5	5.3	471.8
Birch	96.8	125.1	0.0	0.0	221.9
Poplar	0.0	2.4	12.2	0.0	14.6
Sweet chestnut	2.0	2.4	0.0	0.0	4.4
Horse chestnut	19.4	19.0	0.0	0.0	38.4
Alder	35.6	45.0	1.2	0.0	81.8
Lime	4.9	21.5	0.0	0.0	26.4
Elm	77.0	75.7	1.2	0.0	153.9
Willow	83.0	115.3	1.2	0.0	199.5
Other broadleaves	1,223.4	907.6	0.0	1.6	2,132.6
Total broadleaves	1,782.6	2,029.7	190.1	55.9	4,058.3
Total - all species	1,794.4	2,116.1	193.7	55.9	4,160.0

Table 18 Number of Groups by group size

Number of trees per Group*	Number of Groups (000's)
2	36
3-5	98
6-10	46
11-20	19
21-50	6
51-100	4
>100	1
Total	211

*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 1998 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 1998 Inventory
Table 20:	Comparison of High Forest area by species between 1980 Census and 1998 Inventory
Chart:	Comparison of High Forest area by species between 1980 Census and 1998 Inventory
Table 21:	Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1998 Inventory
Chart:	Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1998 Inventory
Table 22:	Comparison of numbers of live trees outside woodland between 1980 Census and 1998 Inventory
Table 23:	Comparison of density of non-woodland features between 1980 Census and 1998 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 1998 Inventory

Woodland size (ha)	1980 Census woodland area		1998 Inventory woodland area		Change (%)
	(ha)	(%)	(ha)	(%)	(%)
2.0 or more	11,668	87.7	15,733	83.0	35
0.25 - <2.0	1,631	12.3	3,224	17.0	98
Total	13,299		18,957		43
% Woodland land cover	5.1		7.2		

1. Differences in sampling methodology may account for some of the apparent differences.
2. The above figures from the 1998 Inventory exclude woodland between 0.1 and <0.25 ha, thereby matching the scope of the 1980 Census. The 1998 figures above will therefore not match those in the previous sections of the report.
3. Land area used to calculate woodland cover percent (1998), 262,858 ha, was based on the 1991 Census of Population digital boundaries.
4. Land area used to calculate woodland cover percent (1980), 263,096ha, (Ordnance Survey data)

Table 20 Comparison of High Forest area by species between 1980 Census and 1998 Inventory

Species	1980 Census woodland area (ha)	1998 Inventory woodland area (ha)	Change (%)
Scots pine	1,242	1,027	-17
Corsican pine	618	583	-6
Lodgepole pine	562	428	-24
Sitka spruce	253	241	-5
Norway spruce	217	380	75
European larch	327	70	-79
Jap/Hybrid larch	683	813	19
Douglas fir	0	0	0
Other conifers	110	128	17
Mixed conifers	350	154	-56
Total conifers	4,362	3,824	-12
Oak	1,291	2,183	69
Beech	764	1,049	37
Sycamore	1,280	2,701	111
Ash	1,191	2,458	106
Birch	1,547	1,468	-5
Poplar	38	252	572
Sweet chestnut	31	0	-100
Elm	324	114	-65
Other broadleaves	1,061	1,913	80
Mixed broadleaves	510	1,772	247
Total broadleaves	8,036	13,910	73
Total all species	12,398	17,734	43
Felled	74	0	-100
Total High Forest	12,472	17,734	42

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 6.2% (Table 2). To obtain meaningful comparisons between the two datasets the 1980 Census data have therefore been reduced by 6.2%.
3. The above figures from the 1998 Inventory exclude woodland between 0.1 and <0.25 ha, thereby matching the scope of the 1980 Census. The 1998 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 1998 Inventory

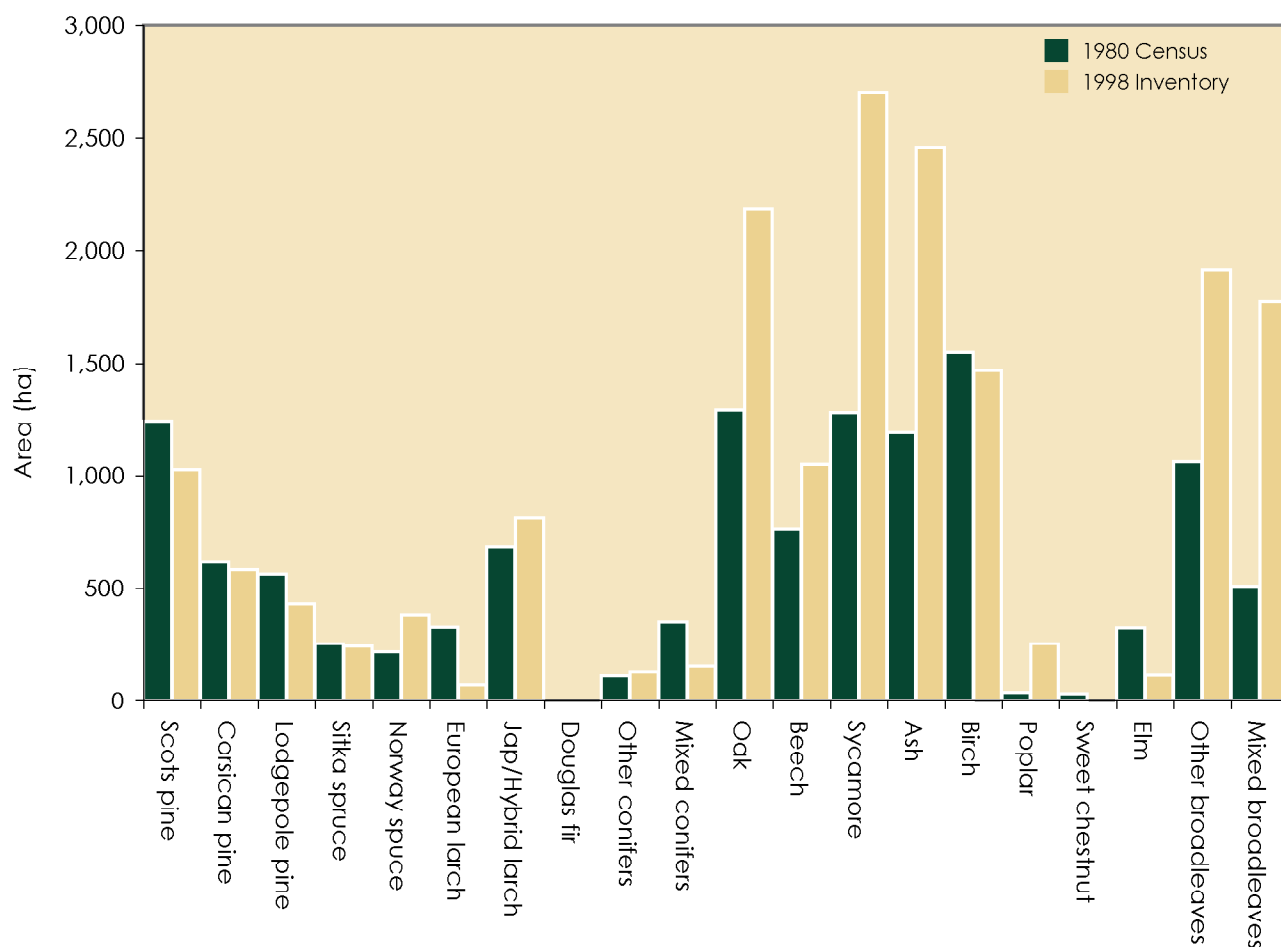


Table 21 Comparison of High Forest Category 1 area by planting year class
between 1980 Census and 1998 Inventory

Planting year class	1980 Census woodland area (ha)	1998 Inventory woodland area (ha)	Change (%)
1991-1998	0	1,625	see note
1981-1990	0	882	see note
1971-1980	779	436	-44
1961-1970	1,650	1,120	-32
1951-1960	1,300	1,237	-5
1941-1950	646	2,452	279
1931-1940	949	956	1
1921-1930	1,684	1,849	10
1911-1920	1,047	442	-58
1901-1910	994	424	-57
1861-1900	1,221	781	-36
Pre 1861	574	81	-86
Total all years	10,844	12,285	13

1. The first two classes, 1991-1998 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.

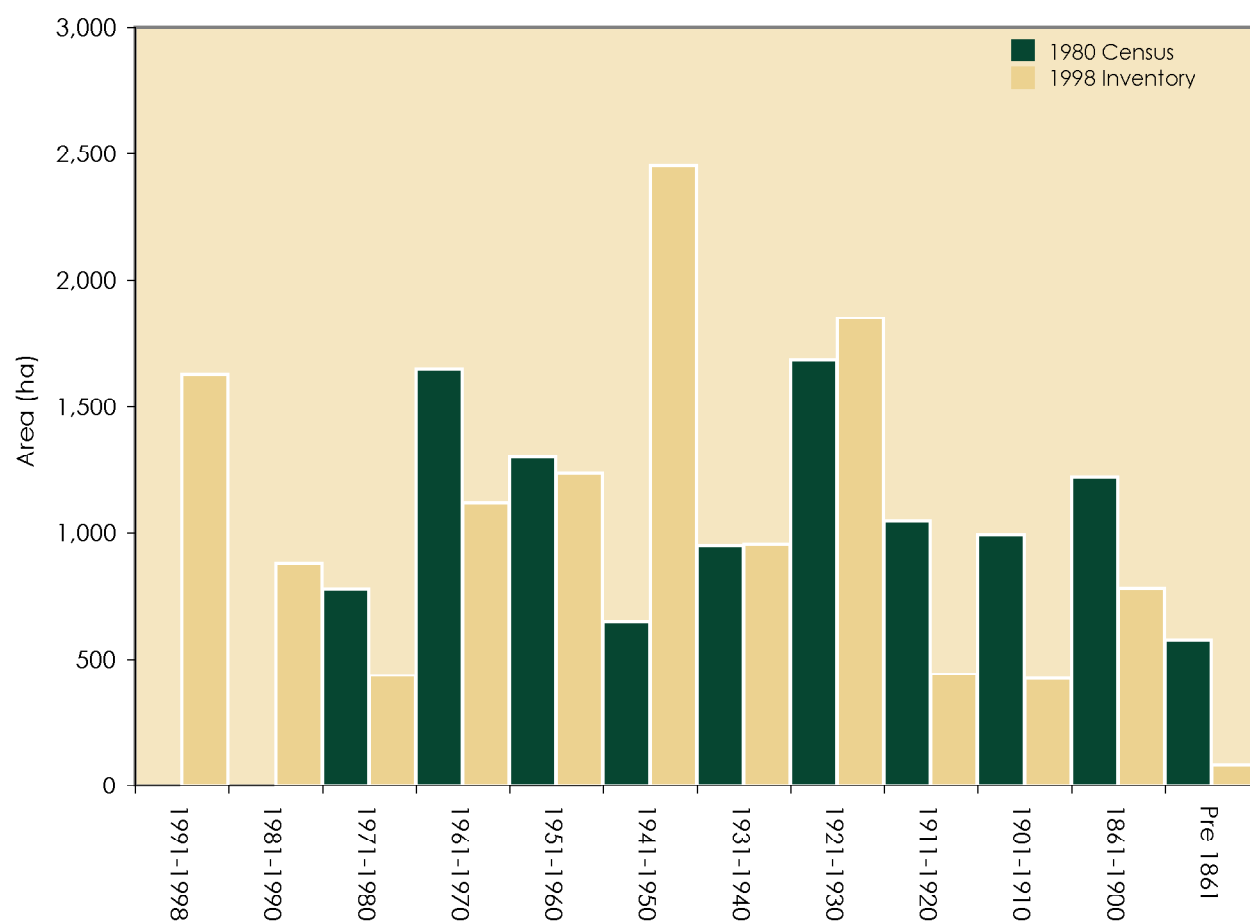
Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1998 Inventory

Table 22 Comparison of numbers of live trees outside woodland
between 1980 Census and 1998 Inventory (000's)

Feature type	1980 Census	1998 Inventory	Change (%)
Boundary Tree	129	158	22
Middle Tree	205	108	-48
Total Individual Trees	334	265	-21
Groups	332	606	82
Linear Features	321	1,604	400
Total	988	2,475	150

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 1998 Inventory figures have been adjusted accordingly.
The 1998 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 1998 Inventory, the two surveys are not directly comparable - 1980 used 7cm diameter at breast height, and 1998 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 1998 Inventory

Feature type	1980 Census	1998 Inventory	Change (%)
Individual Trees (per sq km)	127.0	100.9	-21
Groups (per sq km)	28.6	53.5	87
Linear Features (m per sq km)	148.2	2,248.2	1417

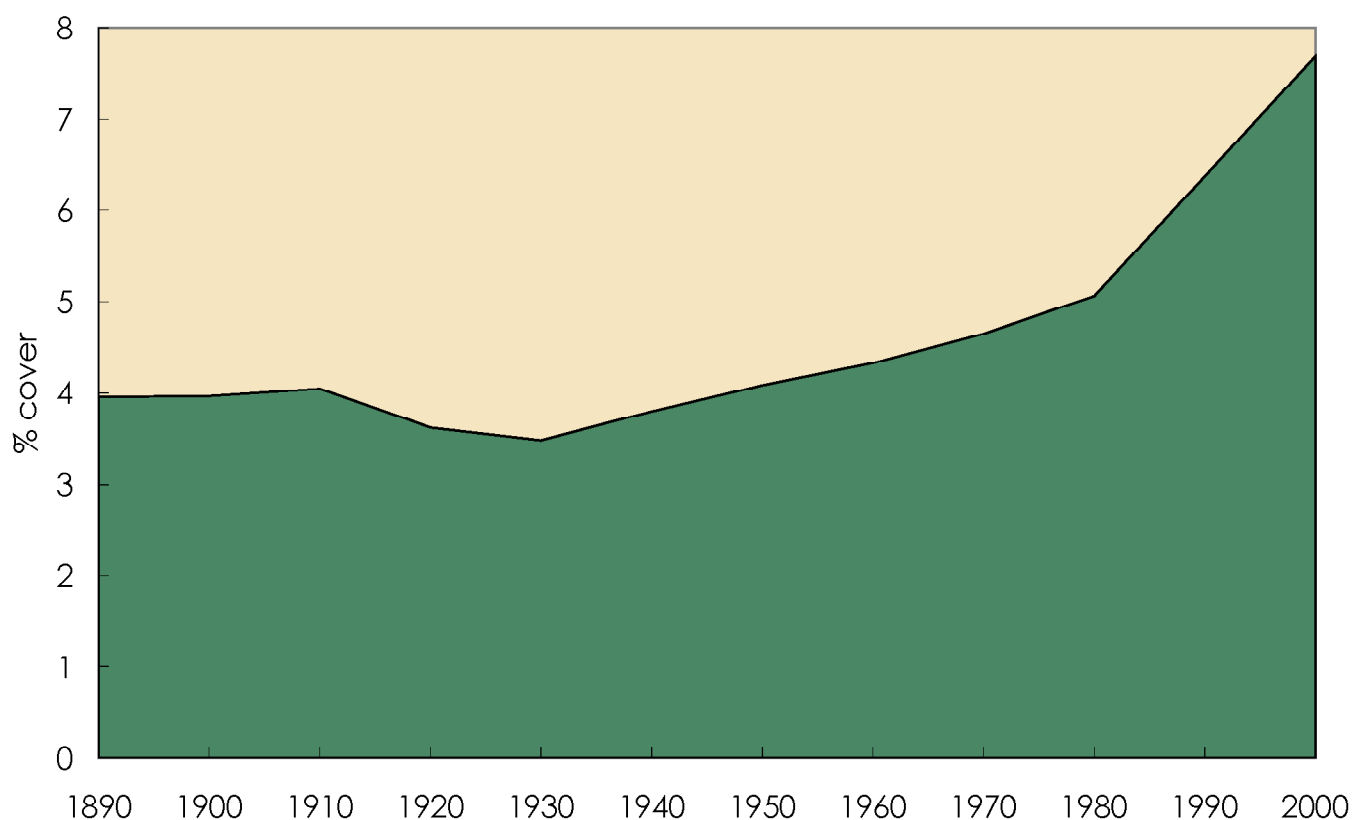
1. The Survey of Small Woodland and Trees did not record information referring to tree features (I.e. Individual trees, Groups and Narrow Linear Features) within developed land.
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The 1998 figures above will therefore not match those in the previous sections of the report.
3. Changes stated in this table are indicative only. Even with adjustments to the 1998 Inventory, the two surveys are not directly comparable - 1980 used 7cm diameter at breast height, and 1998 used 2m height, as minimum criteria for inclusion.
4. See Glossary for definitions of feature type.

WOODLAND COVER

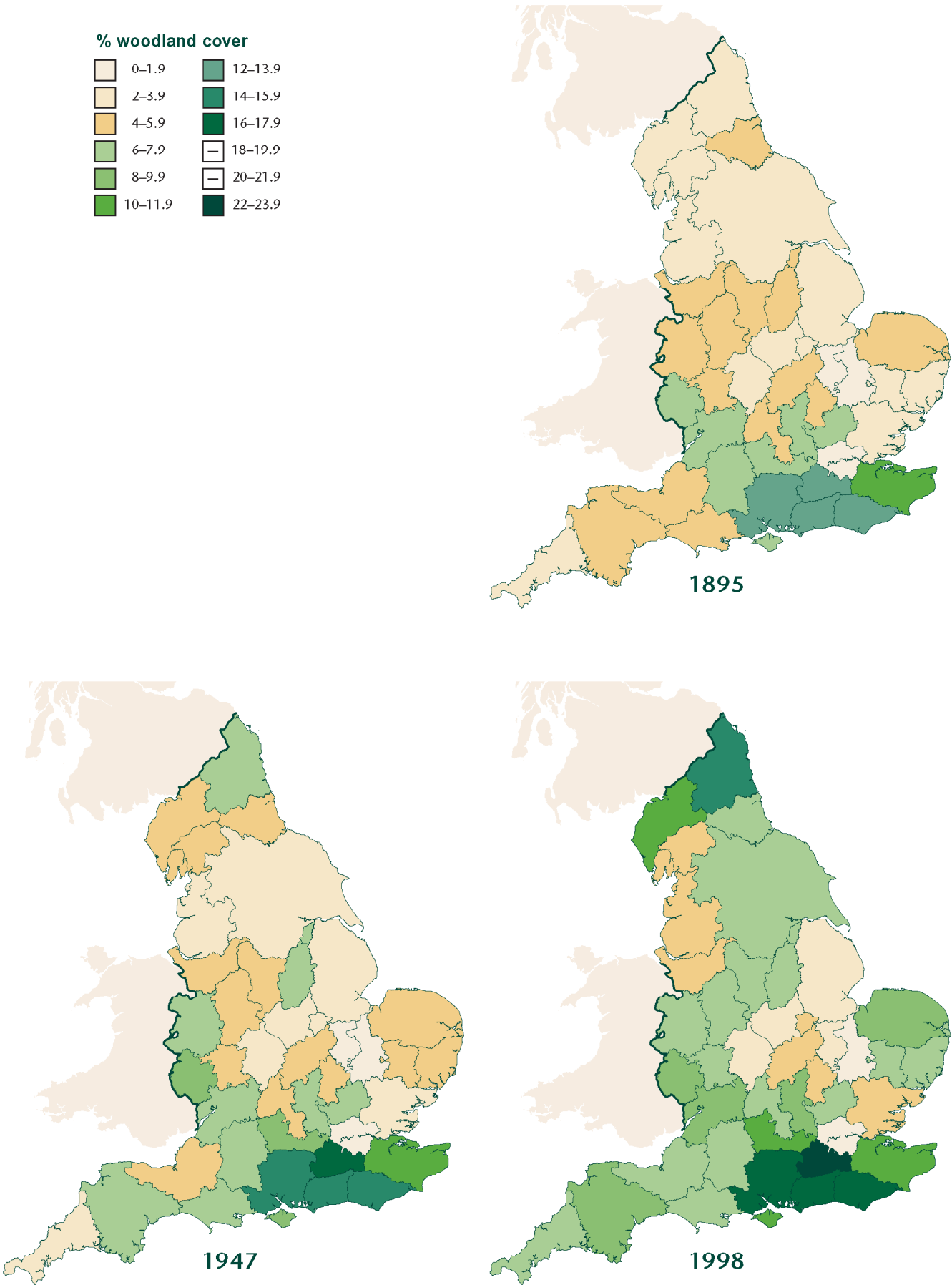
Woodland area data is available from Ministry of Agriculture surveys since 1871, and from Forestry Commission national woodland inventories since 1924. The following chart and maps show the changes in woodland area through time.

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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