



NATIONAL INVENTORY OF WOODLAND AND TREES



ENGLAND

County Report for

BERKSHIRE



Forestry Commission

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First Published 2002

Printed in the United Kingdom

Enquiries regarding this report should be directed to:

Head of Woodland Surveys
Forest Research
Forestry Commission
231 Corstorphine Road
Edinburgh
EH12 7AT

Telephone: 0131 314 6122
Email: woodland.surveys@forestry.gsi.gov.uk

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ACKNOWLEDGEMENTS

The Forestry Commission is grateful to many people who helped in the completion of this survey. In particular, the Forestry Commission would like to thank owners and occupiers of the land selected for sampling.

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 Berkshire 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 Berkshire 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 With the statistics becoming increasingly out of date the Forestry Commission decided to undertake a new survey: the *National Inventory of Woodland and Trees*.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 Berkshire is 18,308 hectares. This represents 14.5% of the land area. (Table 1)
- Broadleaved woodland is the dominant forest type representing 47.0 % of all woodland. Conifer woodland represents 16.9 %, Mixed woodland 18.2 % and Open Space within woodlands 15.9 %. (Table 2)
- The main conifer species is pine covering 3,286 hectares or 69.3 % of all conifer species. The main broadleaved species is oak covering 3,682 hectares or 35.8 % of all broadleaved species. (Table 3)
- 444 hectares or 3 % of woodland over 2 hectares is owned by or leased to the Forestry Commission, and 17,183 hectares or 97 % of woodland is in Other ownership. (Table 6)
- There are a total of 992 woods over 2 ha within Berkshire with a mean wood area of 17.8 hectares. (Table 7a) There are a total of 1,569 woods from 0.1 - <2.0 hectares with a mean wood area of 0.43 hectares. (Table 14)
- There are 1.36 million live trees outside woodland in Berkshire. (Table 15)
- Woodland land cover increased by over 1,200 hectares from 13.5 % to 14.5 % of the land area between 1980 and 1996. (Table 19)
- The area of broadleaves increased by 18% between 1980 and 1996, with the relative proportion of broadleaves to conifers increasing from 64 % to 68 %. (Table 20)

INVENTORY REPORTS

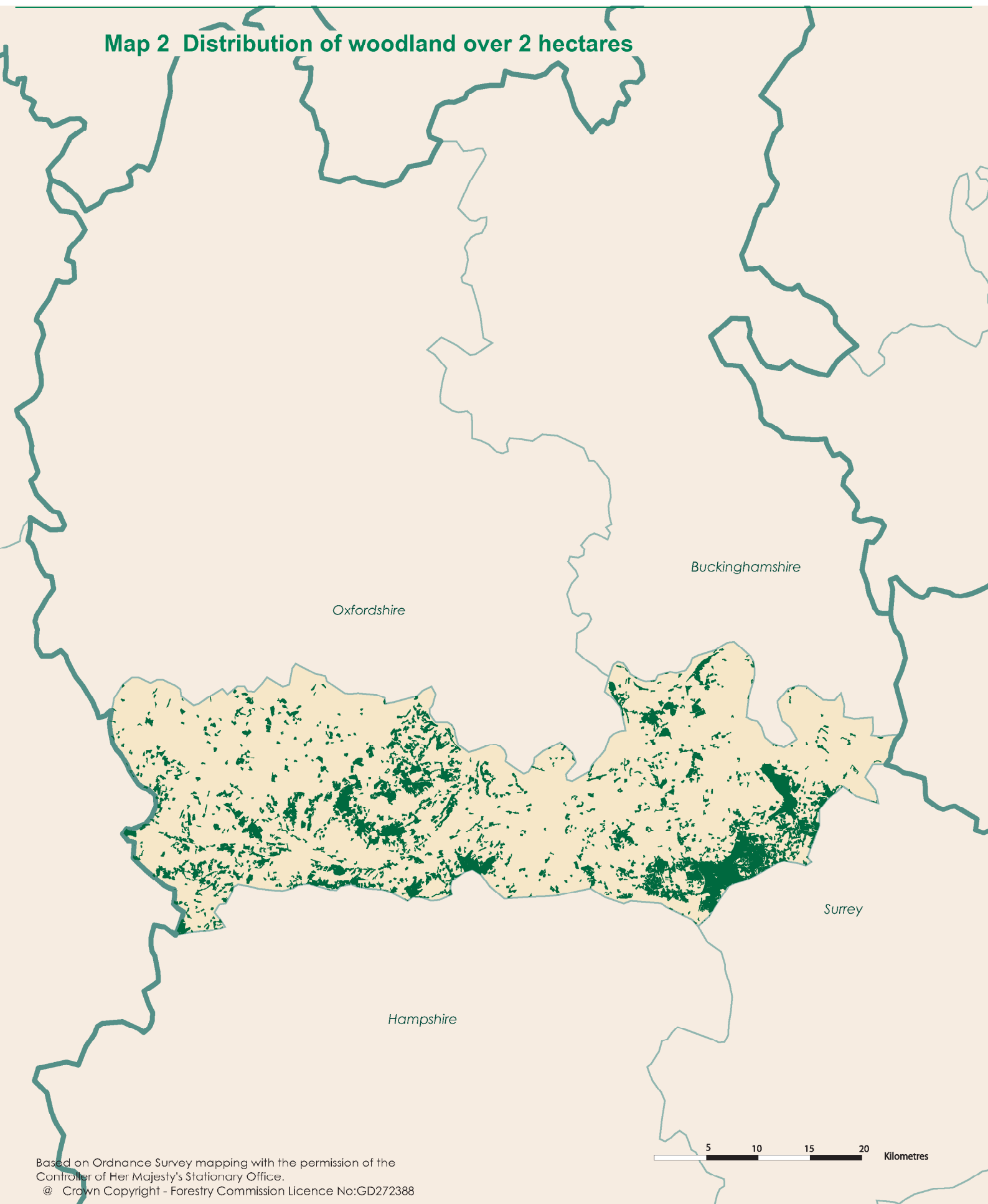
As well as this report for Berkshire, reports are available for the other counties in the region as shown on the map opposite. Also available are region and county reports for England as well as a report for the country as a whole. Wales and Scotland are also covered by reports. Inventory reports can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

Map 1 Regional and county boundaries



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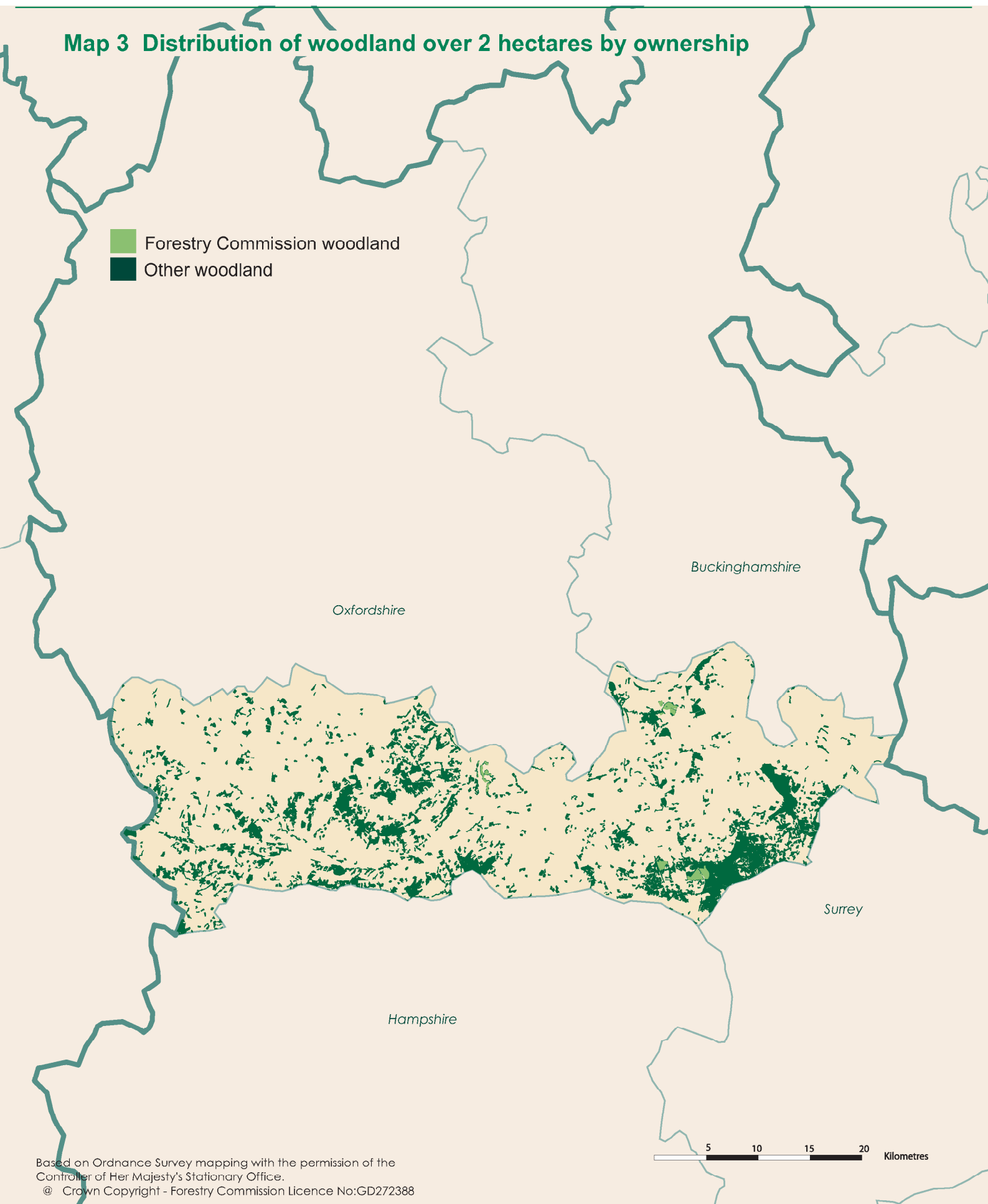
Map 2 Distribution of woodland over 2 hectares



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Map 3 Distribution of woodland over 2 hectares by ownership

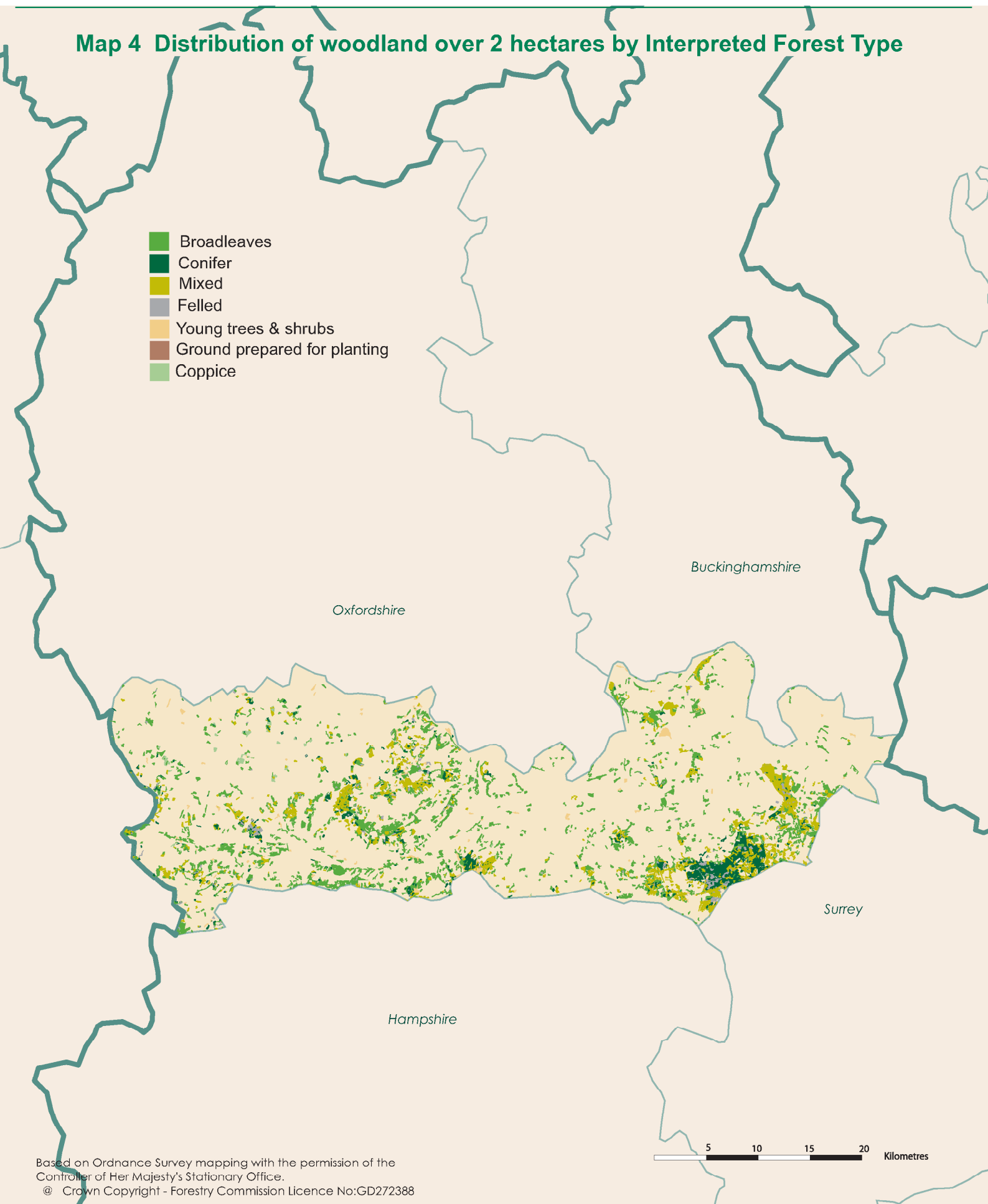
- Forestry Commission woodland
- Other woodland



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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 Berkshire.

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	17,627	96.3
0.25 - < 2.00	609	3.3
0.10 - < 0.25	72	0.4
Total area of woodland	18,308	100.0
% Woodland land cover	14.5	

1. Area of Berkshire, including inland water, 125,879 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	3,091	6	3,097	16.9
Broadleaved	8,075	521	8,596	47.0
Mixed	3,234	97	3,331	18.2
Coppiced	157	0	157	0.9
Copp-w-standards	113	0	113	0.6
Windblow	0	0	0	0.0
Felled	106	0	106	0.6
Open Space	2,850	56	2,906	15.9
Total	17,627	681	18,308	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	3,267	19	3,286	69.3	21.9
Sitka spruce	18	0	18	0.4	0.1
Larch	326	5	331	7.0	2.2
Other conifers	964	24	988	20.8	6.6
Mixed conifers	103	17	120	2.5	0.8
Total conifers	4,679	65	4,744	100.0	31.6
Oak	3,540	142	3,682	35.8	24.5
Beech	686	45	731	7.1	4.9
Sycamore	304	25	329	3.2	2.2
Ash	1,281	64	1,345	13.1	9.0
Birch	1,670	0	1,670	16.2	11.1
Elm	35	6	41	0.4	0.3
Other broadleaves	1,693	97	1,790	17.4	11.9
Mixed broadleaves	512	181	693	6.7	4.6
Total broadleaves	9,721	560	10,281	100.0	68.4
Total all species***	14,400	625	15,025		100.0

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

**Species/group percentage of all species

***Excludes the 3,282ha 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	8%
Broadleaves	4%
Pine	11%
Oak	8%
Birch	13%
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	8,600	100,900	12	80
Narrow Linear Features	11,600	1,249,500	108	993
Individual Trees	15,800	15,800	1	13
Total		1,366,200		1,085

1. Land area used to calculate tree density 125,879ha 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	86%
Narrow Linear Features	96%
Individual Trees	39%
3. Where the standard errors of these summary measures are 10% or less, the confidence intervals will be approximately symmetrical; the true value is expected to be within +/- one standard error for about 68% (or about two-thirds) of all cases, and within +/- two standard errors for about 95% of all cases. Where percentage standard errors are larger, e.g. for less common species or more variable species composition, the confidence intervals will be less symmetrical (and wider).
4. See Glossary for definitions of feature 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	11,600	868	689
Total		868	689

1. Land area used to calculate tree density 125,879ha 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	96%
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	444	3
Other	17,183	97
Total area of woodland	17,627	100

1. Woodland area from aerial photographic interpretation map updated to 31 March 1996
2. See Glossary for definitions of ownership types

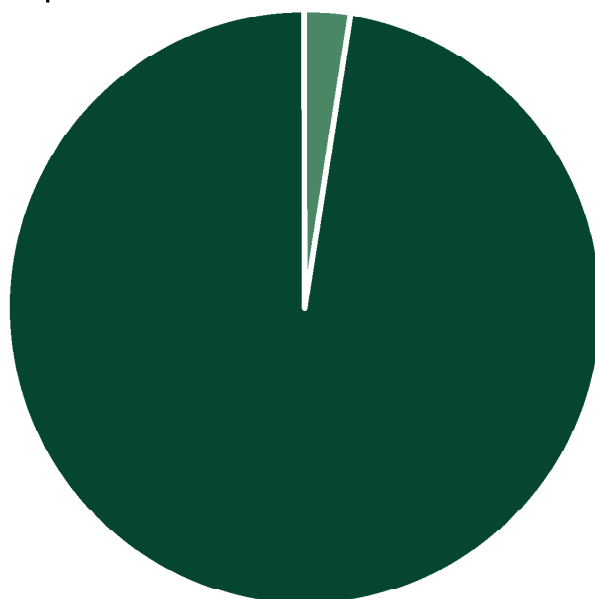
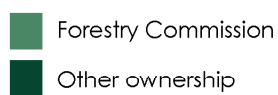
Woodland area by ownership

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	745	3,182	18	4.3
10 - <20	126	1,789	10	14.2
20 - <50	76	2,345	13	30.9
50 - <100	20	1,359	8	68.0
<100	967	8,675	49	9.0
100 - <500	22	4,975	28	226.1
500 and >	3	3,976	23	1325.3
All woods	992	17,627	100	17.8

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	4	15	0	3.8
	O	750	3,191	18	4.3
10 - <20	FC	2	31	0	15.4
	O	127	1,800	10	14.2
20 - <50	FC	0	0	0	0.0
	O	76	2,345	13	30.9
50 - <100	FC	5	398	2	79.6
	O	20	1,359	8	68.0
<100	FC	11	443	3	40.3
	O	973	8,695	49	8.9
100 - <500	FC	0	0	0	0.0
	O	21	4,692	27	223.4
500 and >	FC	0	0	0	0.0
	O	3	3,795	22	1265.0
Total	FC	11	444	3	40.4
	O	997	17,183	97	17.2

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	185	41.7	2,906	16.9	3,091	17.5
Broadleaved	139	31.3	7,936	46.2	8,075	45.8
Mixed	118	26.6	3,116	18.1	3,234	18.3
Coppice	0	0.0	157	0.9	157	0.9
Copp-w-Stds	0	0.0	113	0.7	113	0.6
Windblow	0	0.0	0	0.0	0	0.0
Felled	0	0.0	106	0.6	106	0.6
Open Space	2	0.5	2,849	16.6	2,850	16.2
Total	444	100.0	17,183	100.0	17,627	100.0

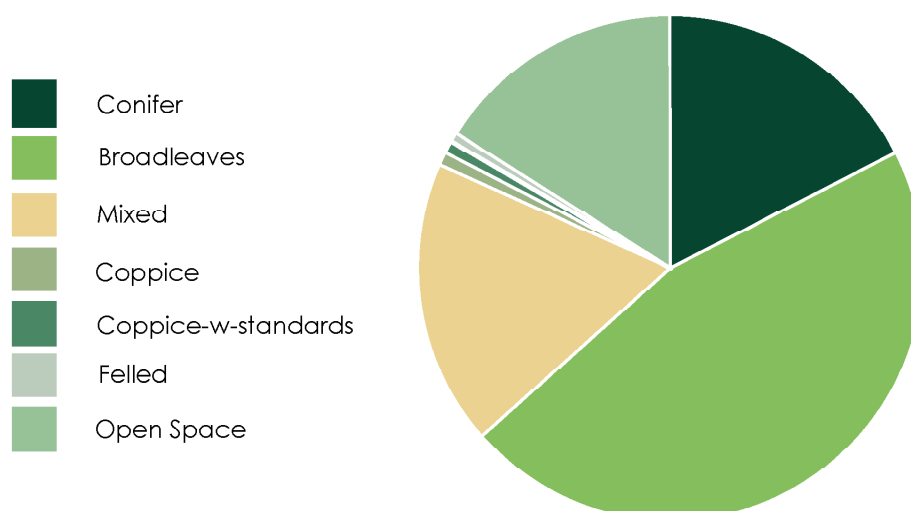
Area of woodland by forest type

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	219	80	50	2,793	63	20	3,011	64	21
Corsican pine	9	3	2	247	6	2	256	5	2
Lodgepole pine	0	0	0	0	0	0	0	0	0
Sitka spruce	0	0	0	18	0	0	18	0	0
Norway spruce	2	1	0	254	6	2	256	5	2
European larch	0	0	0	12	0	0	12	0	0
Jap/Hybrid larch	0	0	0	314	7	2	314	7	2
Douglas fir	0	0	0	296	7	2	296	6	2
Other conifers	45	16	10	367	8	3	412	9	3
Mixed conifers	0	0	0	103	2	1	103	2	1
Total conifers	275	100	62	4,404	100	32	4,679	100	32
Oak	39	23	9	3,501	37	25	3,540	36	25
Beech	0	0	0	686	7	5	686	7	5
Sycamore	0	0	0	304	3	2	304	3	2
Ash	32	19	7	1,250	13	9	1,281	13	9
Birch	67	40	15	1,603	17	11	1,670	17	12
Poplar	2	1	0	330	3	2	332	3	2
Sweet chestnut	2	1	0	242	3	2	244	3	2
Elm	0	0	0	35	0	0	35	0	0
Other broadleaves	21	13	5	1,097	11	8	1,117	11	8
Mixed broadleaves	6	4	1	506	5	4	512	5	4
Total broadleaves	167	100	38	9,554	100	68	9,721	100	68
Total - all species	442		100	13,958		100	14,400		100
Felled	0			106			106		
Total High Forest	442			14,064			14,506		

*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 2,850ha 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	8%
Broadleaves	4%
Scots pine	12%
Oak	8%
Birch	13%
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

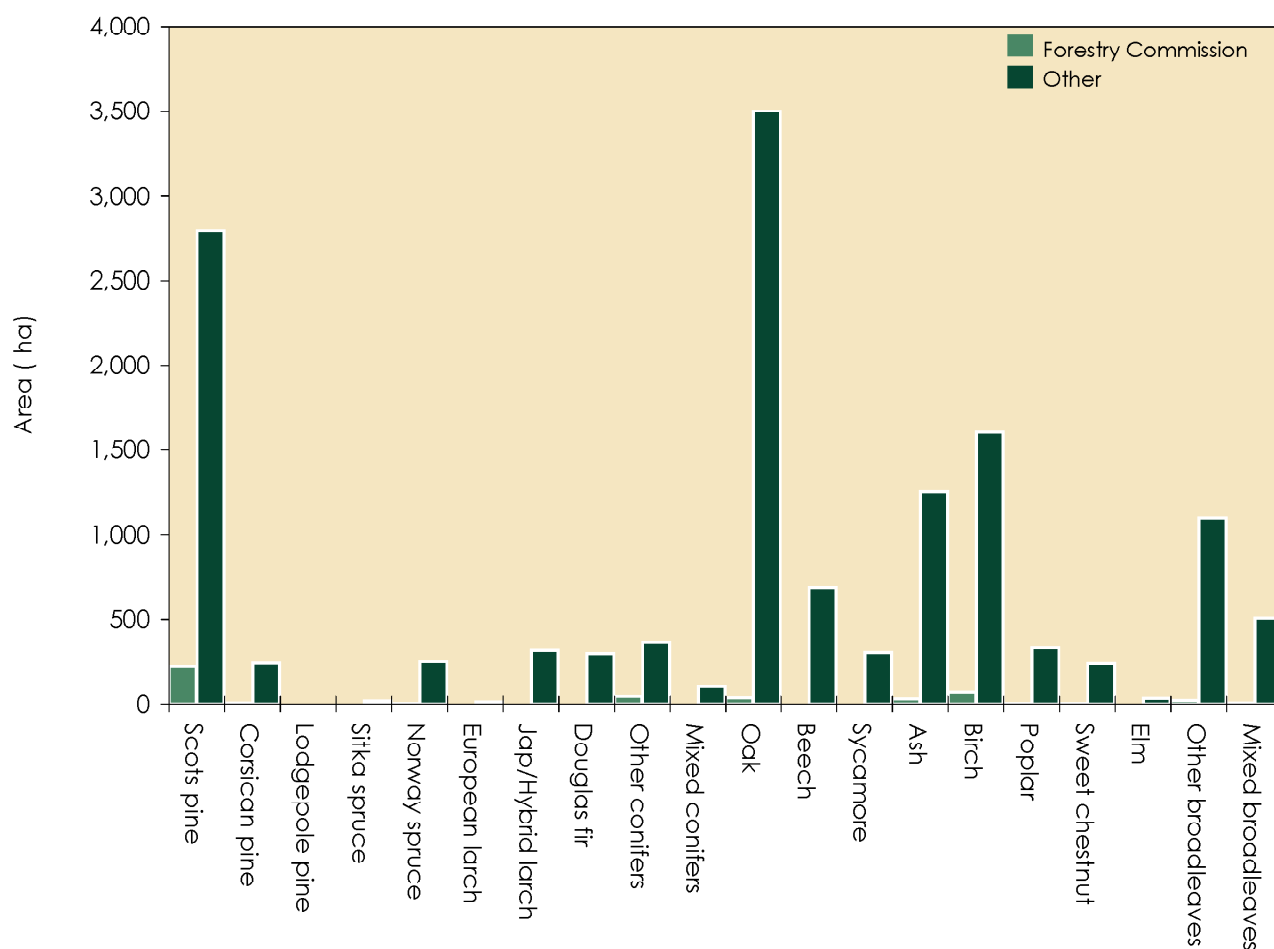


Table 9b Area of High Forest by principal species,ownership and category

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	219	0	219	2,746	47	2,793	2,965	47	3,011
Corsican pine	9	0	9	247	0	247	256	0	256
Lodgepole pine	0	0	0	0	0	0	0	0	0
Sitka spruce	0	0	0	0	18	18	0	18	18
Norway spruce	2	0	2	254	0	254	256	0	256
European larch	0	0	0	3	8	12	3	8	12
Jap/Hybrid larch	0	0	0	273	42	314	273	42	314
Douglas fir	0	0	0	296	0	296	296	0	296
Other conifers	45	0	45	321	46	367	366	46	412
Mixed conifers	0	0	0	103	0	103	103	0	103
Total conifers	275	0	275	4,244	160	4,404	4,519	160	4,679
Oak	39	0	39	3,207	294	3,501	3,246	294	3,540
Beech	0	0	0	682	3	686	682	3	686
Sycamore	0	0	0	233	72	304	233	72	304
Ash	32	0	32	1,192	58	1,250	1,224	58	1,281
Birch	67	0	67	1,156	447	1,603	1,223	447	1,670
Poplar	2	0	2	330	0	330	332	0	332
Sweet chestnut	0	2	2	218	24	242	218	26	244
Elm	0	0	0	29	6	35	29	6	35
Other broadleaves	13	7	21	1,003	94	1,097	1,016	102	1,117
Mixed broadleaves	6	0	6	305	201	506	311	201	512
Total broadleaves	158	9	167	8,355	1,199	9,554	8,514	1,208	9,721
Total - all species	433	9	442	12,599	1,359	13,958	13,032	1,368	14,400

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

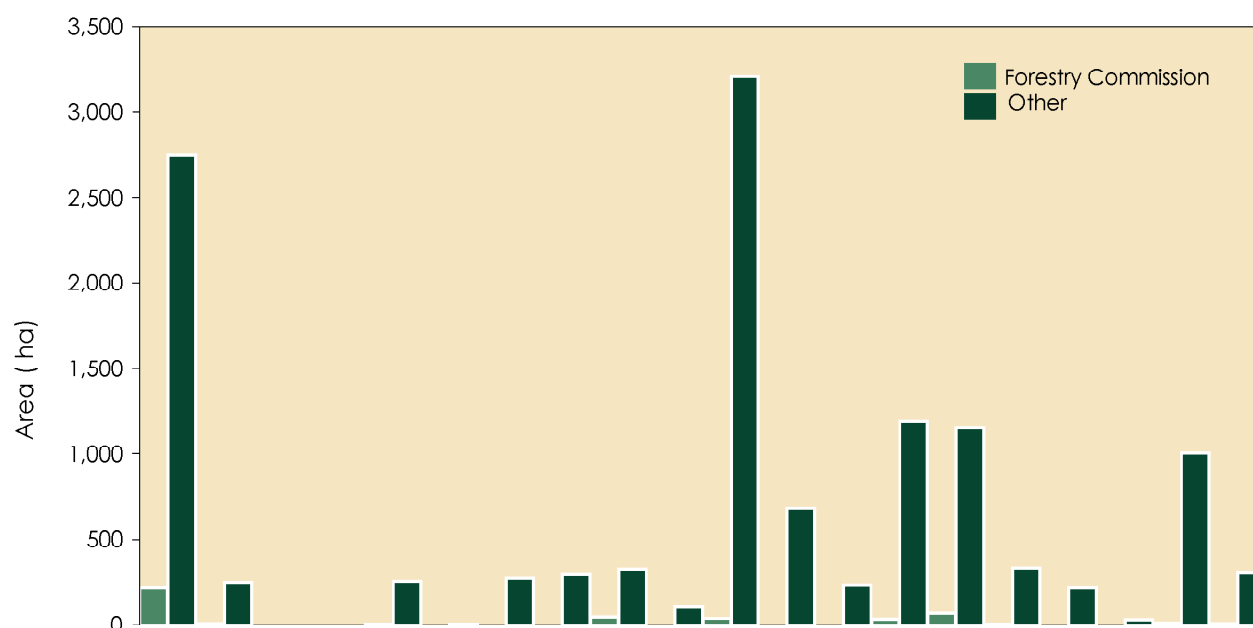
	Category 1*	Category 2*	Total High Forest
Conifers	9%	35%	8%
Broadleaves	4%	12%	4%
Scots pine	12%	60%	12%
Oak	9%	26%	8%
Birch	14%	28%	13%

*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

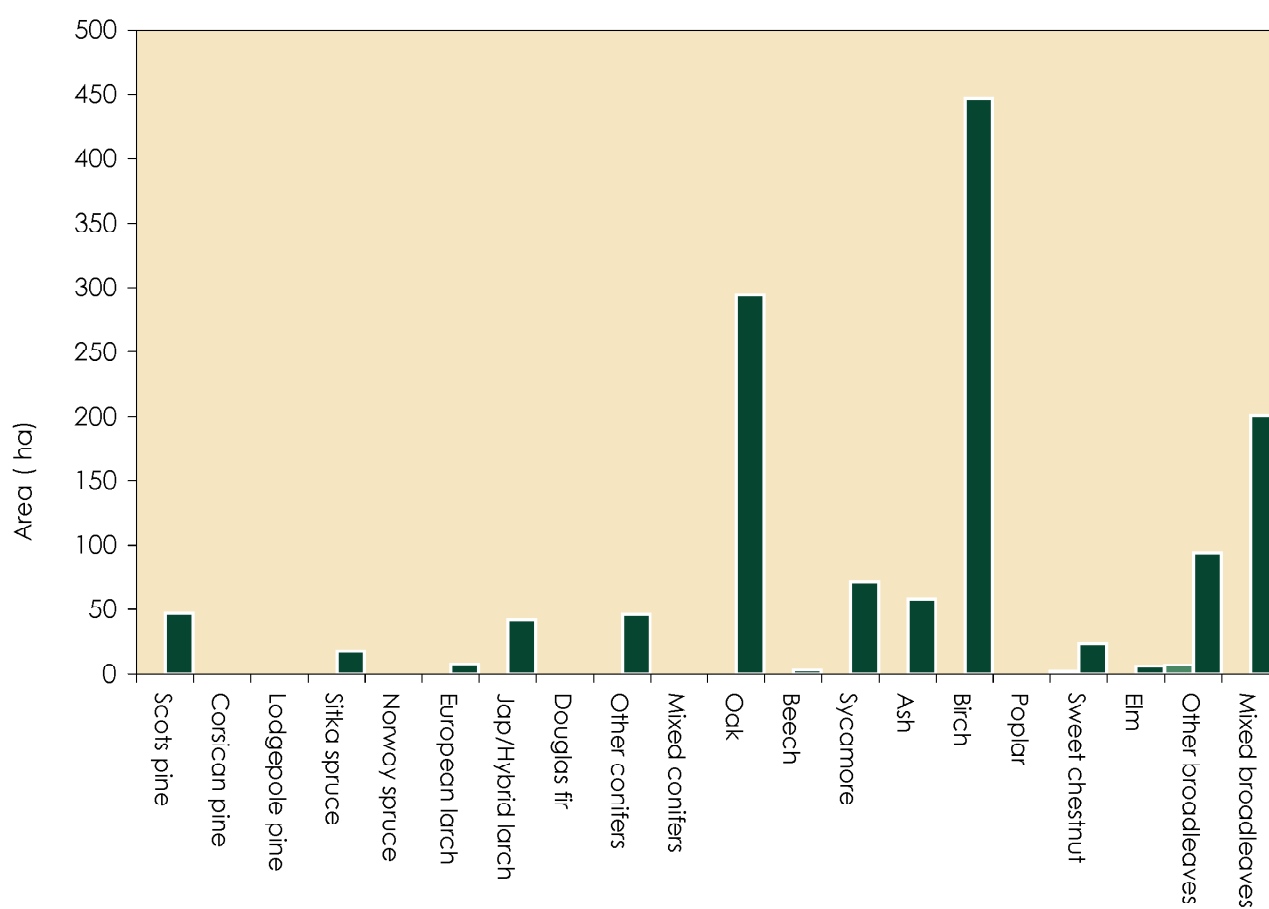
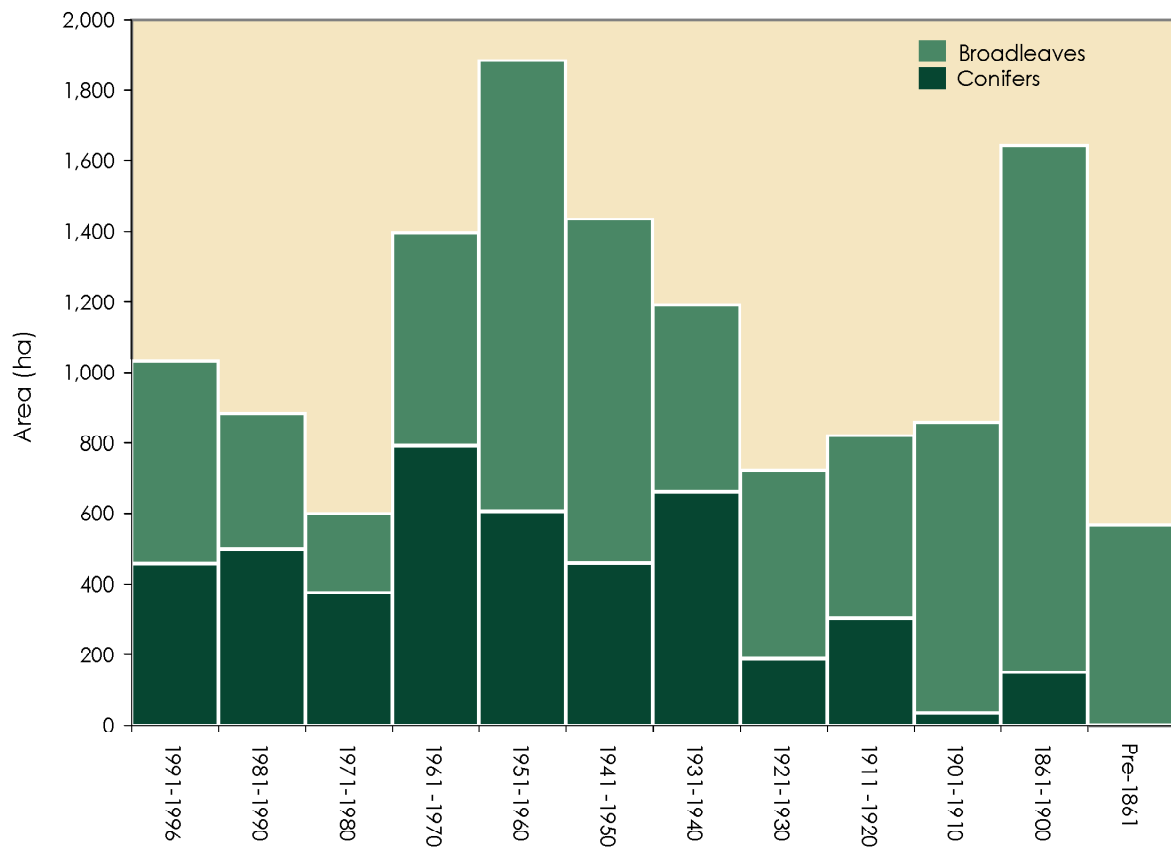


Table 10a High Forest Category 1 - Area by principal species and planting year class

Species	Planting year class*												Total (ha)
	1991-1996	1981-1990	1971-1980	1961-1970	1951-1960	1941-1950	1931-1940	1921-1930	1911-1920	1901-1910	1861-1900	Pre-1861	
Scots pine	235	347	258	339	316	409	514	167	246	13	121	0	2,965
Corsican pine	98	0	33	83	9	12	0	0	21	0	0	0	256
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	38	50	0	30	129	0	8	0	2	0	0	0	256
European larch	0	0	0	0	0	3	0	0	0	0	0	0	3
Jap/Hybrid larch	0	0	58	109	65	0	29	6	6	0	0	0	273
Douglas fir	59	25	0	80	0	23	89	0	8	12	0	0	296
Other conifers	18	77	3	146	86	8	3	6	7	0	10	0	366
Mixed conifers	8	0	20	4	0	4	19	8	12	10	18	0	103
Total conifers	457	499	373	791	606	460	662	187	301	35	148	0	4,519
Oak	133	74	12	44	148	54	48	146	259	697	1,098	533	3,246
Beech	48	4	3	41	23	60	17	99	107	67	189	25	682
Sycamore	0	0	8	34	21	17	106	38	8	0	0	0	233
Ash	162	30	13	138	102	140	140	205	128	38	119	8	1,224
Birch	87	132	105	153	544	176	18	8	0	0	0	0	1,223
Poplar	58	77	28	61	41	67	0	0	0	0	0	0	332
Sweet chestnut	8	0	15	13	20	49	70	0	3	0	39	0	218
Elm	0	0	9	20	0	0	0	0	0	0	0	0	29
Other broadleaves	48	56	27	56	279	379	93	20	10	7	39	0	1,016
Mixed broadleaves	29	13	6	43	100	34	37	18	4	16	11	0	311
Total broadleaves	574	385	227	605	1,278	975	529	536	519	824	1,495	566	8,514
Total - all species	1,031	884	600	1,395	1,884	1,436	1,192	722	820	859	1,643	566	13,032

*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



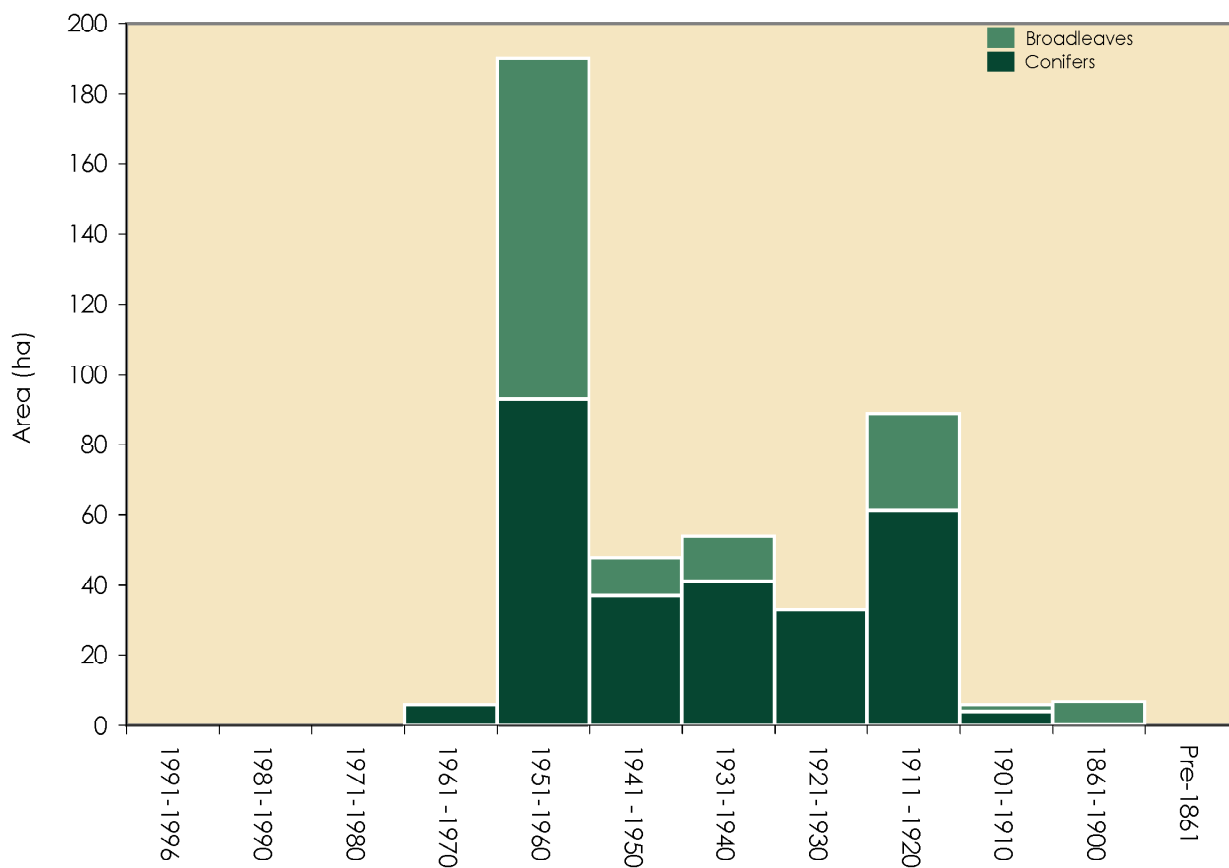
1. Most of the planting year classes cover 10 years, 1991-1996 is 6 years, and the classes prior to 1901 are 40 years or more.

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

Species	Planting year class*												Total (ha)
	1991 - 1996	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	0	45	37	41	33	59	4	0	0	219
Corsican pine	0	0	0	0	9	0	0	0	0	0	0	0	9
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	0	0	0	0	0	2	0	0	0	2
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	0	0	0	0	0	0	0	0	0
Other conifers	0	0	0	6	39	0	0	0	0	0	0	0	45
Mixed conifers	0	0	0	0	0	0	0	0	0	0	0	0	0
Total conifers	0	0	0	6	93	37	41	33	61	4	0	0	275
Oak	0	0	0	0	0	2	0	0	28	2	7	0	39
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	0	19	0	13	0	0	0	0	0	32
Birch	0	0	0	0	67	0	0	0	0	0	0	0	67
Poplar	0	0	0	0	0	2	0	0	0	0	0	0	2
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	6	7	0	0	0	0	0	0	13
Mixed broadleaves	0	0	0	0	6	0	0	0	0	0	0	0	6
Total broadleaves	0	0	0	0	97	11	13	0	28	2	7	0	158
Total - all species	0	0	0	6	190	48	54	33	89	6	7	0	433

*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



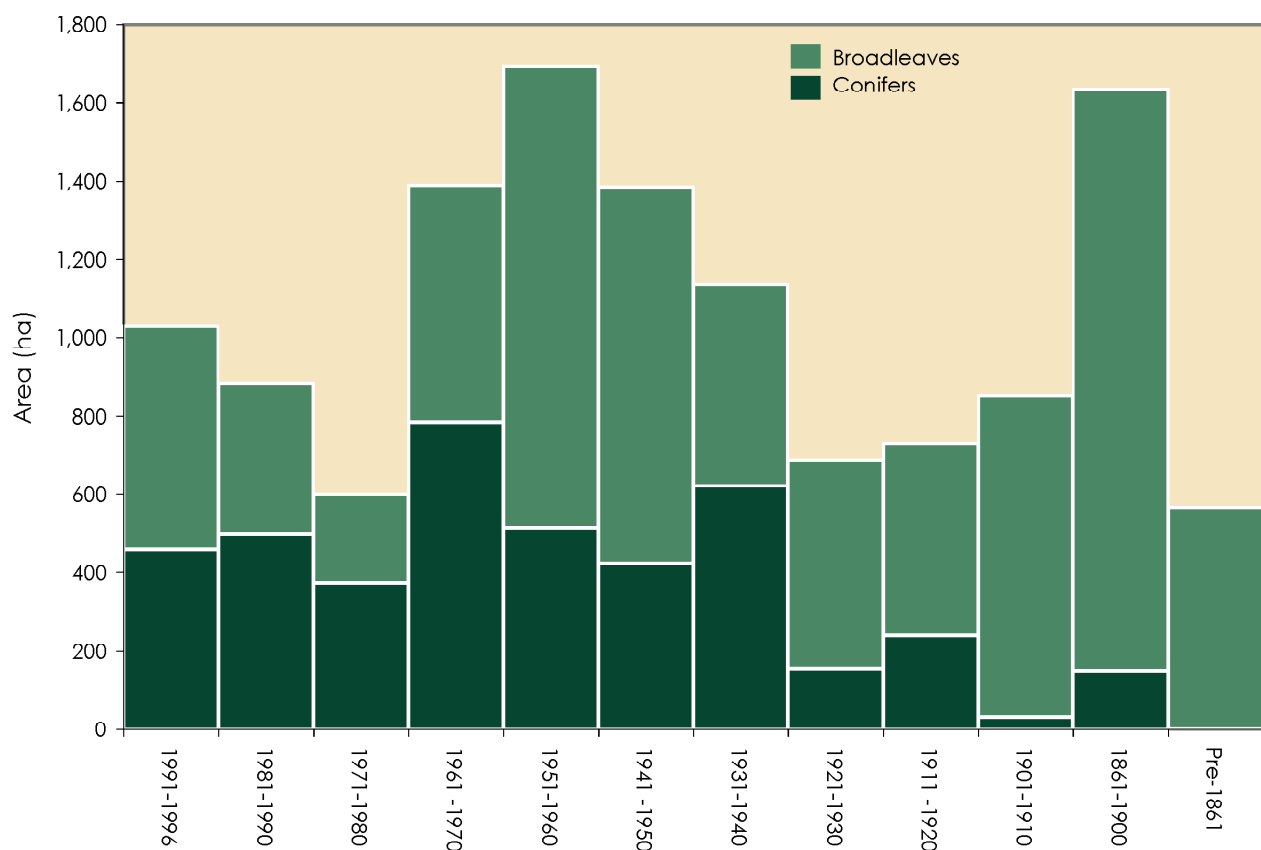
1. Most of the planting year classes cover 10 years, 1991-1996 is 6 years, and the classes prior to 1901 are 40 years or more.

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

Species	Planting year class*												Total (ha)
	1991-1996	1981-1990	1971-1980	1961-1970	1951-1960	1941-1950	1931-1940	1921-1930	1911-1920	1901-1910	1861-1900	Pre-1861	
Scots pine	235	347	258	339	271	372	473	133	187	9	121	0	2,746
Corsican pine	98	0	33	83	0	12	0	0	21	0	0	0	247
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	38	50	0	30	129	0	8	0	0	0	0	0	254
European larch	0	0	0	0	0	3	0	0	0	0	0	0	3
Jap/Hybrid larch	0	0	58	109	65	0	29	6	6	0	0	0	273
Douglas fir	59	25	0	80	0	23	89	0	8	12	0	0	296
Other conifers	18	77	3	141	47	8	3	6	7	0	10	0	321
Mixed conifers	8	0	20	4	0	4	19	8	12	10	18	0	103
Total conifers	457	499	373	785	513	423	621	153	240	31	148	0	4,244
Oak	133	74	12	44	148	52	48	146	231	695	1,091	533	3,207
Beech	48	4	3	41	23	60	17	99	107	67	189	25	682
Sycamore	0	0	8	34	21	17	106	38	8	0	0	0	233
Ash	162	30	13	138	83	140	127	205	128	38	119	8	1,192
Birch	87	132	105	153	477	176	18	8	0	0	0	0	1,156
Poplar	58	77	28	61	41	65	0	0	0	0	0	0	330
Sweet chestnut	8	0	15	13	20	49	70	0	3	0	39	0	218
Elm	0	0	9	20	0	0	0	0	0	0	0	0	29
Other broadleaves	48	56	27	56	273	372	93	20	10	7	39	0	1,003
Mixed broadleaves	29	13	6	43	94	34	37	18	4	16	11	0	305
Total broadleaves	574	385	227	605	1,181	964	516	536	491	822	1,487	566	8,355
Total - all species	1,031	884	600	1,390	1,694	1,387	1,138	689	732	853	1,636	566	12,599

*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, 1991-1996 is 6 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	%
1991-96	Scots pine	21	Ash	15	Oak	12
1981-90	Scots pine	39	Birch	16	Other conifer/Poplar	9
1971-80	Scots pine	36	Birch	16	Other broadleaves	12
1961-70	Scots pine	21	Birch	17	Other conifers	10
1951-60	Birch	34	Scots pine	14	Other broadleaves	13
1941-50	Scots pine	30	Other broadleaves	25	Birch	13
1931-40	Scots pine	37	Ash	10	Mixed broadleaves	9
1921-30	Ash	25	Scots pine / Oak	22	Beech	12
1911-20	Oak	35	Scots pine	27	Ash	16
1901-10	Oak	82	Beech	8	Ash	4
1861-1900	Oak	66	Beech	10	Ash	8
Pre 1861	Oak	93	Beech	4	Other conifers	2
All years	Oak	24	Scots pine	21	Birch	12

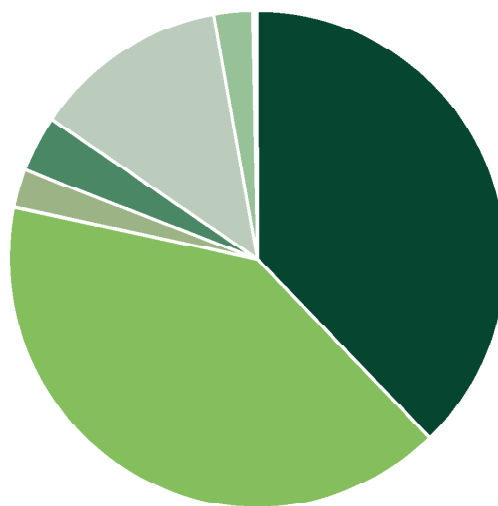
1. Principal species as a percentage of area in the planting year class.

Table 12 Ownership type* by area and percentage

Ownership type	Area (ha)	%
Personal	6,650	37.7
Business	7,153	40.6
Forestry or timber business	0	0.0
Charity	435	2.5
Local Authority	638	3.6
Other public (not FC)	2,250	12.8
Forestry Commission	444	2.5
Community ownership or common land	0	0.0
Unidentified	58	0.3
Total	17,627	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	1,569	681	Area (ha)
Wide Linear Features	0	0	Area (ha)
Wide Linear Features	0	0	Length (Km)
Narrow Linear Features	11,600	868	Length (Km)
Narrow Linear Features	11,600	1,249,500	Number of live trees
Groups	8,600	100,900	Number of live trees
Individual Trees	15,800	15,800	Number of live trees

1. See Glossary for definitions of feature types.

Table 14 Woodland area by feature type and woodland size

Feature type	Woodland size (ha)		Total area (ha)	Number of features	Mean size (ha)
	0.1 - <0.25	0.25 - <2.0			
Small Woods	72	609	681	1,569	0.43
Wide Linear Features	0	0	0	0	0.00
Total	72	609	681	1,569	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	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	5.0	6.5	7.2	23.1	41.8	3.1	3.1
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	12.3	0.0	12.3	0.9	0.9
Birch	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Poplar	0.0	0.7	0.0	0.0	0.7	0.1	0.1
Sweet chestnut	0.0	0.0	0.7	0.0	0.7	0.1	0.1
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	2.2	2.2	0.0	4.4	0.3	0.3
Elm	0.0	0.0	24.5	601.6	626.1	45.8	45.8
Willow	0.0	0.7	0.7	0.0	1.4	0.1	0.1
Other broadleaves	0.0	0.7	53.3	624.8	678.8	49.7	49.7
Total broadleaves	5.0	10.8	100.9	1249.5	1366.3	100.0	100.0
Total - all species	5.0	10.8	100.9	1249.5	1366.3		100.0

1. Percentages

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

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

Individual Trees 39%
 Groups 86%
 Narrow Linear Features 96%

3. See Glossary for definitions of feature types.

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

Species	Feature type				Total dead trees	Percent of total trees	
	Boundary Trees	Middle Trees	Groups	Narrow Linear Features		Category	Species
Pine	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spruce	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Larch	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cypress	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other conifers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total conifers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oak	0.0	1.4	0.0	0.0	1.4	0.5	0.5
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	0.0	266.1	266.1	99.5	99.5
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	1.4	0.0	266.1	267.5	100.0	100.0
Total - all species	0.0	1.4	0.0	266.1	267.5		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	0.0	0.0	0.0	0.0
Spruce	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0	0.0
Total conifers	0.0	0.0	0.0	0.0	0.0
Oak	0.0	31.1	10.8	0.0	41.9
Beech	0.0	0.0	0.0	0.0	0.0
Sycamore	0.0	0.0	0.0	0.0	0.0
Ash	10.1	0.7	1.4	0.0	12.2
Birch	0.0	0.0	0.0	0.0	0.0
Poplar	0.0	0.7	0.0	0.0	0.7
Sweet chestnut	0.0	0.0	0.7	0.0	0.7
Horse chestnut	0.0	0.0	0.0	0.0	0.0
Alder	0.0	0.0	0.0	0.0	0.0
Lime	0.0	2.2	2.2	0.0	4.4
Elm	626.1	0.0	0.0	0.0	626.1
Willow	1.4	0.0	0.0	0.0	1.4
Other broadleaves	667.2	0.0	11.6	0.0	678.8
Total broadleaves	1,304.9	34.7	26.7	0.0	1,366.3
Total - all species	1,304.9	34.7	26.7	0.0	1,366.3

Table 18 Number of Groups by group size

Number of trees per Group*	Number of Groups (000's)
2	1
3-5	2
6-10	1
11-20	3
21-50	1
51-100	1
>100	0
Total	9

*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 1996 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 1996 Inventory
Table 20:	Comparison of High Forest area by species between 1980 Census and 1996 Inventory
Chart:	Comparison of High Forest area by species between 1980 Census and 1996 Inventory
Table 21:	Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1996 Inventory
Chart:	Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1996 Inventory
Table 22:	Comparison of numbers of live trees outside woodland between 1980 Census and 1996 Inventory
Table 23:	Comparison of density of non-woodland features between 1980 Census and 1996 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 1996 Inventory

Woodland size (ha)	1980 Census woodland area		1996 Inventory woodland area		Change (%)
	(ha)	(%)	(ha)	(%)	(%)
2.0 or more	15,798	92.8	17,627	96.7	12
0.25 - <2.0	1,220	7.2	609	3.3	-50
Total	17,018		18,236		7
% Woodland land cover	13.5		14.5		

1. Differences in sampling methodology may account for some of the apparent differences.
2. The above figures from the 1996 Inventory exclude woodland between 0.1 and <0.25 ha, thereby matching the scope of the 1980 Census. The 1996 figures above will therefore not match those in the previous sections of the report.
3. Land area used to calculate woodland cover percent (1996), 125,879 ha, was based on the 1991 Census of Population digital boundaries.
4. Land area used to calculate woodland cover percent (1980), 125,891ha, (Ordnance Survey data)

Table 20 Comparison of High Forest area by species between 1980 Census and 1996 Inventory

Species	1980 Census woodland area (ha)	1996 Inventory woodland area (ha)	Change (%)
Scots pine	2,568	3,030	18
Corsican pine	225	256	14
Lodgepole pine	17	0	-100
Sitka spruce	30	18	-41
Norway spruce	481	256	-47
European larch	343	12	-97
Jap/Hybrid larch	260	319	23
Douglas fir	214	296	39
Other conifers	440	436	-1
Mixed conifers	373	109	-71
Total conifers	4,951	4,732	-4
Oak	2,526	3,666	45
Beech	844	731	-13
Sycamore	377	329	-13
Ash	849	1,341	58
Birch	1,415	1,670	18
Poplar	488	338	-31
Sweet chestnut	210	244	16
Elm	8	41	442
Other broadleaves	977	1,195	22
Mixed broadleaves	946	663	-30
Total broadleaves	8,640	10,218	18
Total all species	13,591	14,950	10
Felled	336	106	-68
Total High Forest	13,926	15,056	8

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 15.9% (Table 2). To obtain meaningful comparisons between the two datasets the 1980 Census data have therefore been reduced by 15.9%.
3. The above figures from the 1996 Inventory exclude woodland between 0.1 and <0.25 ha, thereby matching the scope of the 1980 Census. The 1996 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 1996 Inventory

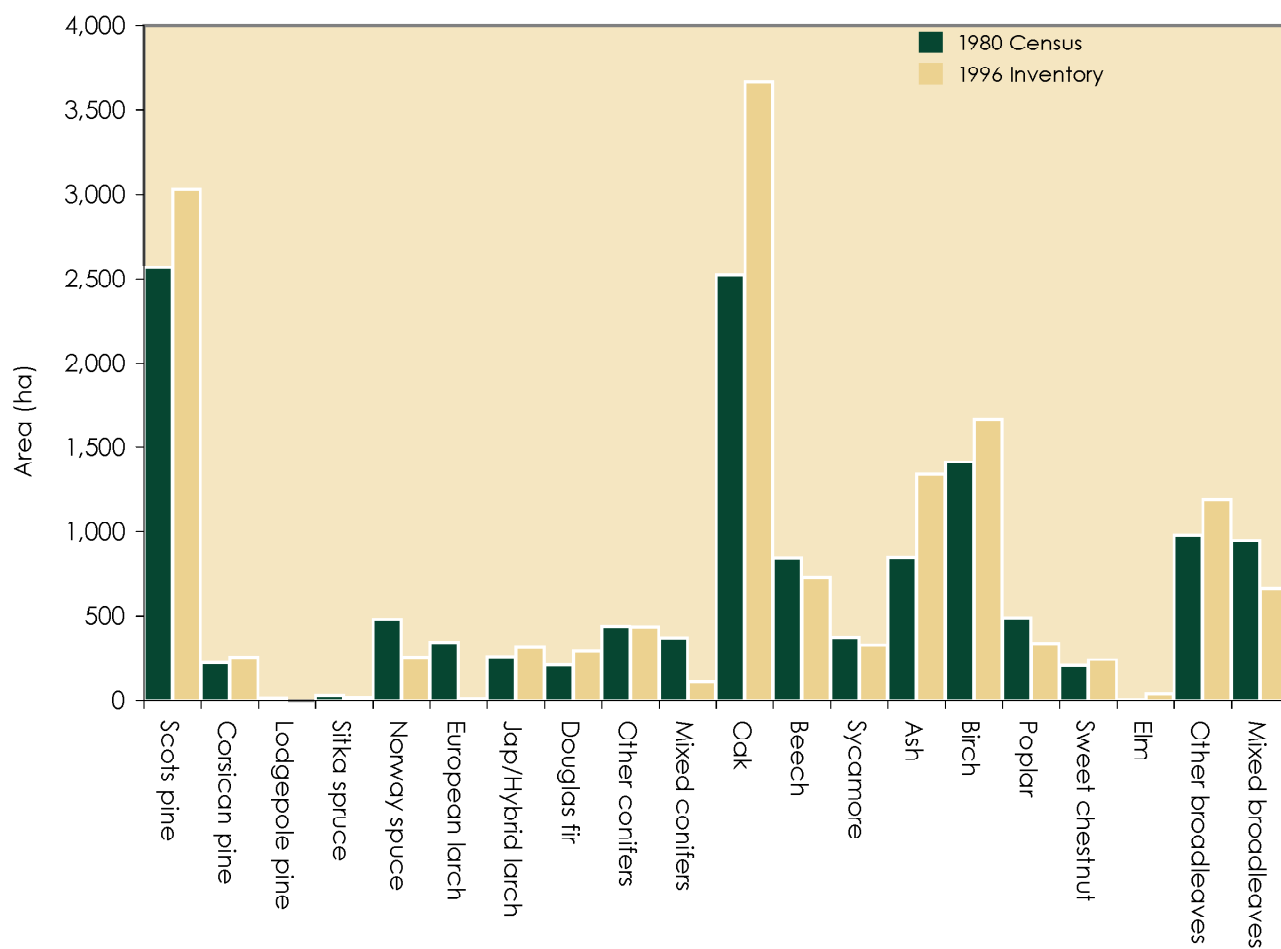


Table 21 Comparison of High Forest Category 1 area by planting year class
between 1980 Census and 1996 Inventory

Planting year class	1980 Census woodland area (ha)	1996 Inventory woodland area (ha)	Change (%)
1991-1996	0	1,082	see note
1981-1990	0	884	see note
1971-1980	623	630	1
1961-1970	1,549	1,440	-7
1951-1960	2,195	1,959	-11
1941-1950	2,191	1,485	-32
1931-1940	1,344	1,191	-11
1921-1930	949	792	-17
1911-1920	607	839	38
1901-1910	718	859	20
1861-1900	2,024	1,659	-18
Pre 1861	589	566	-4
Total all years	12,788	13,386	5

1. The first two classes, 1991-1996 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 1996 Inventory

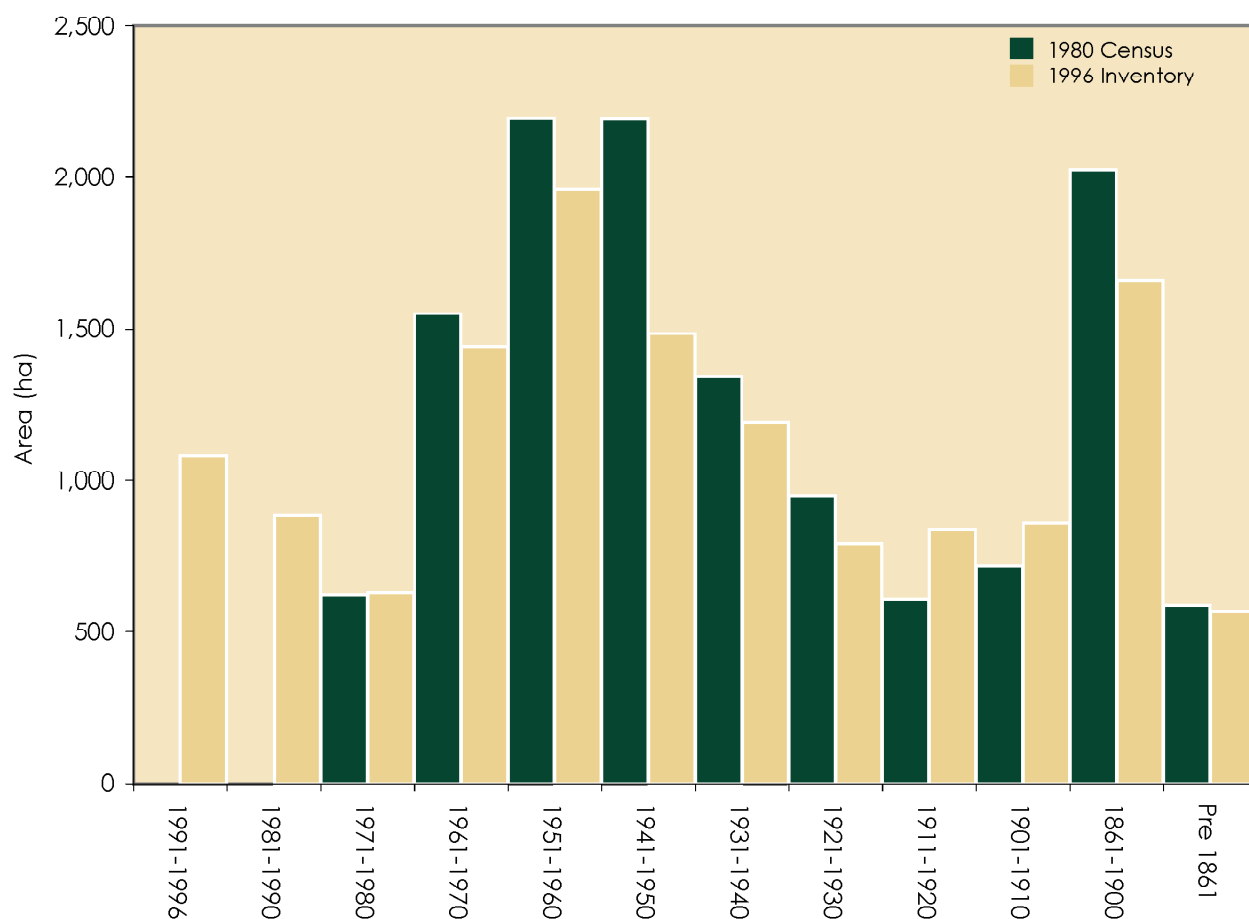


Table 22 Comparison of numbers of live trees outside woodland between 1980 Census and 1996 Inventory (000's)

Feature type	1980 Census	1996 Inventory	Change (%)
Boundary Tree	53	5	-90
Middle Tree	114	11	-91
Total Individual Trees	167	16	-91
Groups	231	69	-70
Linear Features	269	879	227
Total	666	964	45

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 1996 Inventory figures have been adjusted accordingly. The 1996 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 1996 Inventory, the two surveys are not directly comparable - 1980 used 7cm diameter at breast height, and 1996 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 1996 Inventory

Feature type	1980 Census	1996 Inventory	Change (%)
Individual Trees (per sq km)	134.4	12.6	-91
Groups (per sq km)	40.7	6.8	-83
Linear Features (m per sq km)	762.6	689.3	-10

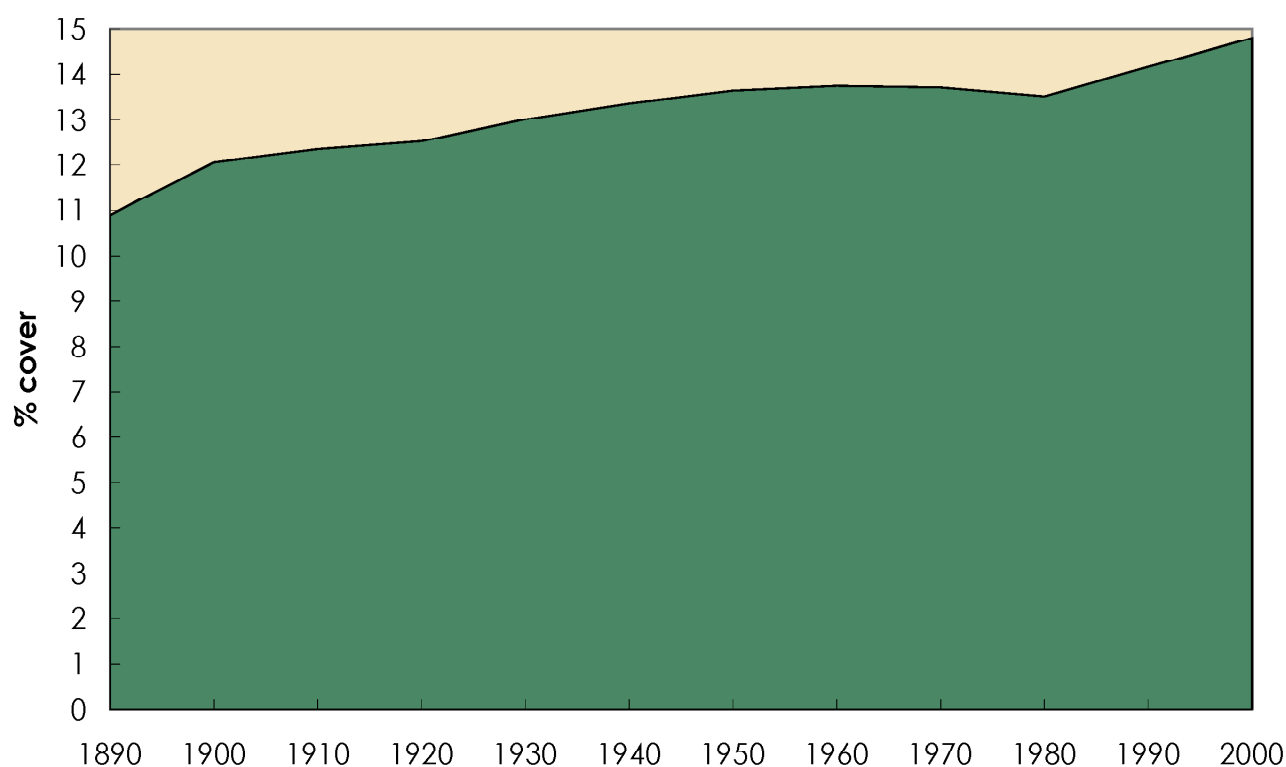
1. The Survey of Small Woodland and Trees did not record information referring to tree features (I.e. Individual trees, Groups and Narrow Linear Features) within developed land.
2. In the 1980 Census hazel, hawthorn, blackthorn and goat willow were excluded, the 1996 Inventory figures have been adjusted accordingly. The 1996 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 1996 Inventory, the two surveys are not directly comparable - 1980 used 7cm diameter at breast height, and 1996 used 2m height, as minimum criteria for inclusion.
4. See Glossary for definitions of feature type.

WOODLAND COVER

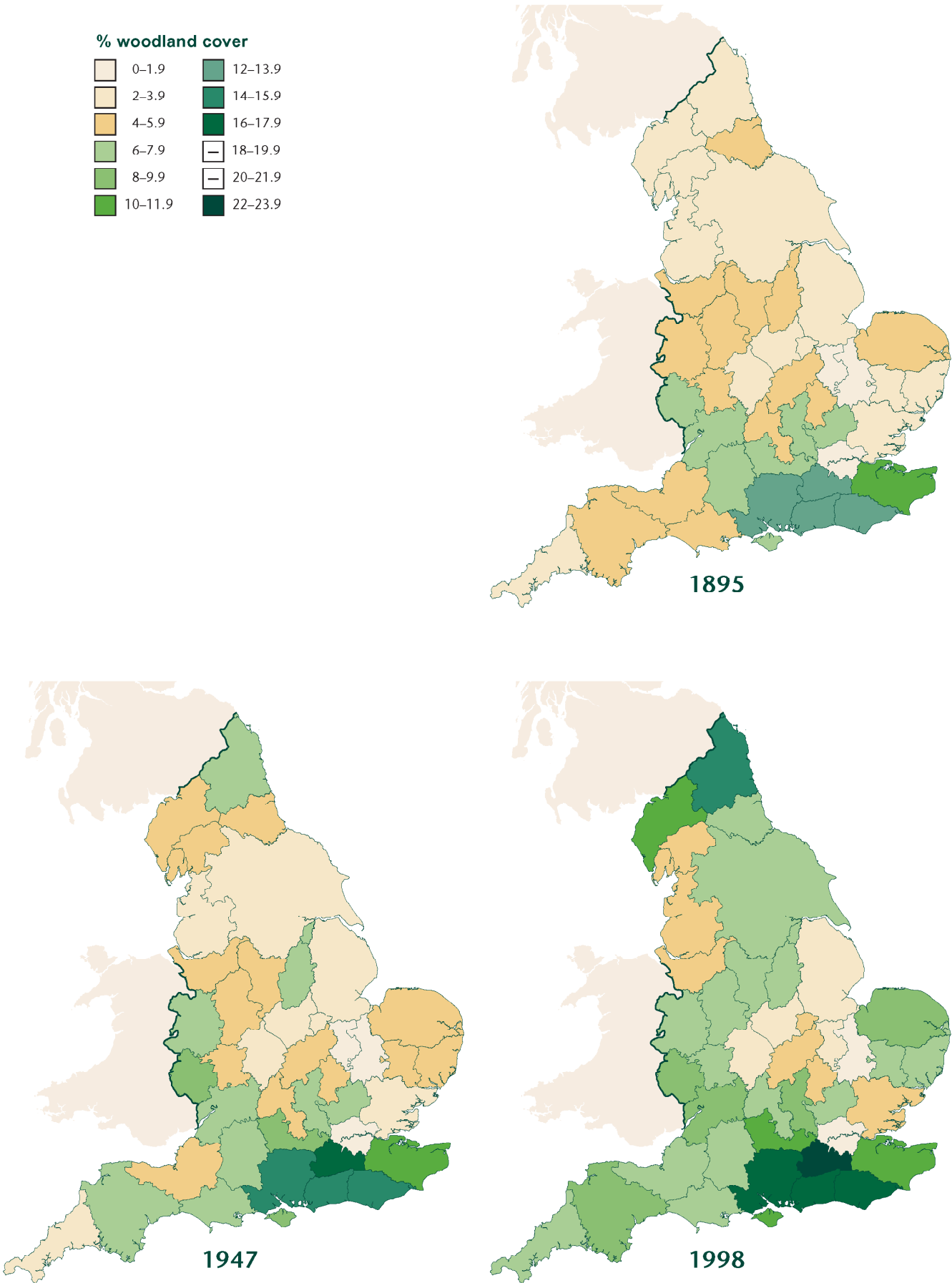
Woodland area data is available from Ministry of Agriculture surveys since 1871, and from Forestry Commission national woodland inventories since 1924. The following chart and maps show the changes in woodland area through time.

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



Forestry Commission
231 Corstorphine Road
Edinburgh
EH12 7AT

www.forestry.gov.uk