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National Inventory of Woodland and Trees

of Woodland and Trees

England

Regional Report for South West

Forestry Commission

Forestry Commission

National Inventory of Woodland and Trees

England

Regional Report for South West

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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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 South West Region was carried out by Graham Bull, Woodland Survey Officer, and Woodland GIS Officers Chris Brown, Robert Beck and Esther Whitton. Data processing and analysis were carried out by Woodland Data Officers Justin Gilbert and Shona Mackintosh.

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

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INTRODUCTION

This Report presents the results for South West Region 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 With the statistics becoming increasingly out of date the Forestry Commission decided to undertake a new survey: the *National Inventory of Woodland and Trees*.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 South West Region, 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 in South West Region 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:

- 2.0 ha – <100 ha : every fifth wood
- 100 ha – <500 ha : two woods in five
- 500 ha 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 had 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 South West Region was stratified into coastal and inland 1 km x 1 km squares. A random sample of the 1 km^2 plots was then selected, representing around 1% of the land area. 1:25 000 scale aerial photos were then used to identify features in each sample square. Each 1 km^2 was then divided into 16 parts, and two of these were selected at random for field data collection. Data was collected on Small Woods (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 South West Region is 212 022 hectares. This represents 8.9% of the land area (Table 1).

- Broadleaved woodland is the dominant forest type representing 56.7% of all woodland. Conifer woodland represents 22.8%, Mixed woodland 14.2% and Open Space within woodlands 4.8% (Table 2).

- The main conifer is pine covering 12 631 hectares or 21% of all conifer species. The main broadleaved species is oak covering 26 411 hectares or 19% of all broadleaved species species (Table 3).

- 35 900 hectares or 17% of woodland over 2 hectares is owned by or leased to the Forestry Commission, and 169 710 hectares or 83% of woodland is in Other ownerships (Table 6).

- There are 11 903 woods over 2 hectares within South West Region with a mean wood area of 17.4 hectares (Table 7a). There are a total of 15 397 woods from 0.1 – <2.0 hectares with a mean wood area of 0.4 hectares (Table 14).

- There are 20.6 million live trees and 276.6 thousand dead trees outside woodland in South West Region (Tables 17 and 18).

- Woodland land cover increased by over 36 900 hectares from 7.3% to 8.9% of the land area between 1980 and 1997 (Table 23).

- The area of Broadleaves increased by 44% between 1980 and 1997, with the relative proportion of Broadleaves to Conifers increasing from 60% to 69% (Table 24).

INVENTORY REPORTS

In addition to the Inventory Reports for England and the English Regions, further information is available by county (as shown on the map opposite for South West Region). Country and county reports for Wales, and country and region reports for Scotland are also available.

Map 1   Regional and county boundaries

WEST MIDLANDS

WALES

Gloucestershire

Avon

Wiltshire

Somerset

S O U T H   W E S T

Devon

Dorset

Cornwall

Isles of Scilly

0   1   2   3
km

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0   20   40   60   80   100
Kilometres

Map 2   Distribution of woodland over 2 hectares

Isles of Scilly

0   1   2   3   km

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0   20   40   60   80   100
Kilometres
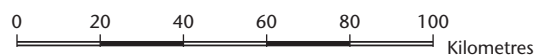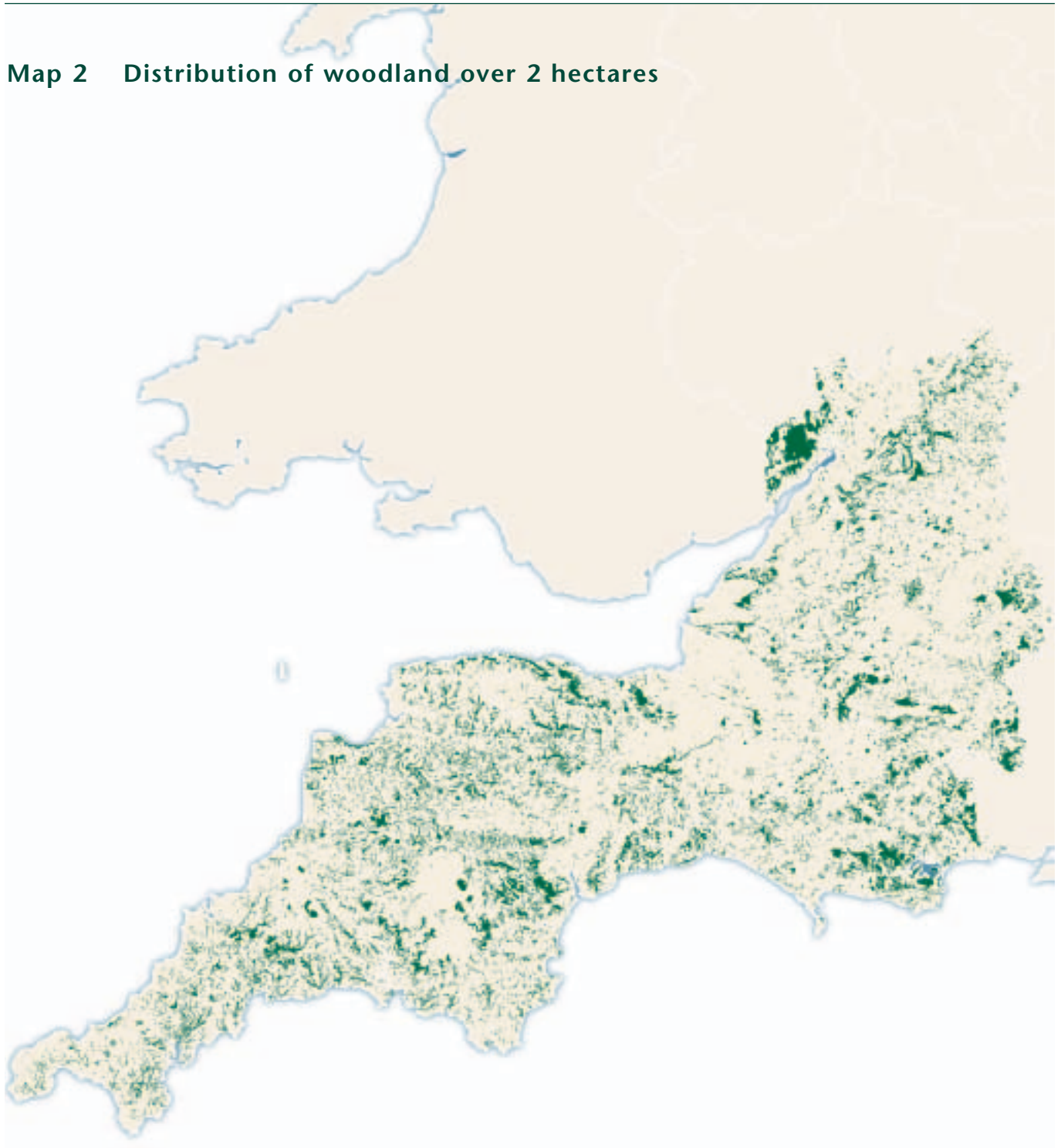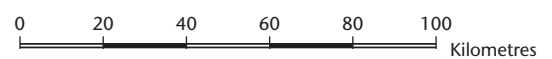
Map 3   Distribution of woodland over 2 hectares by ownership
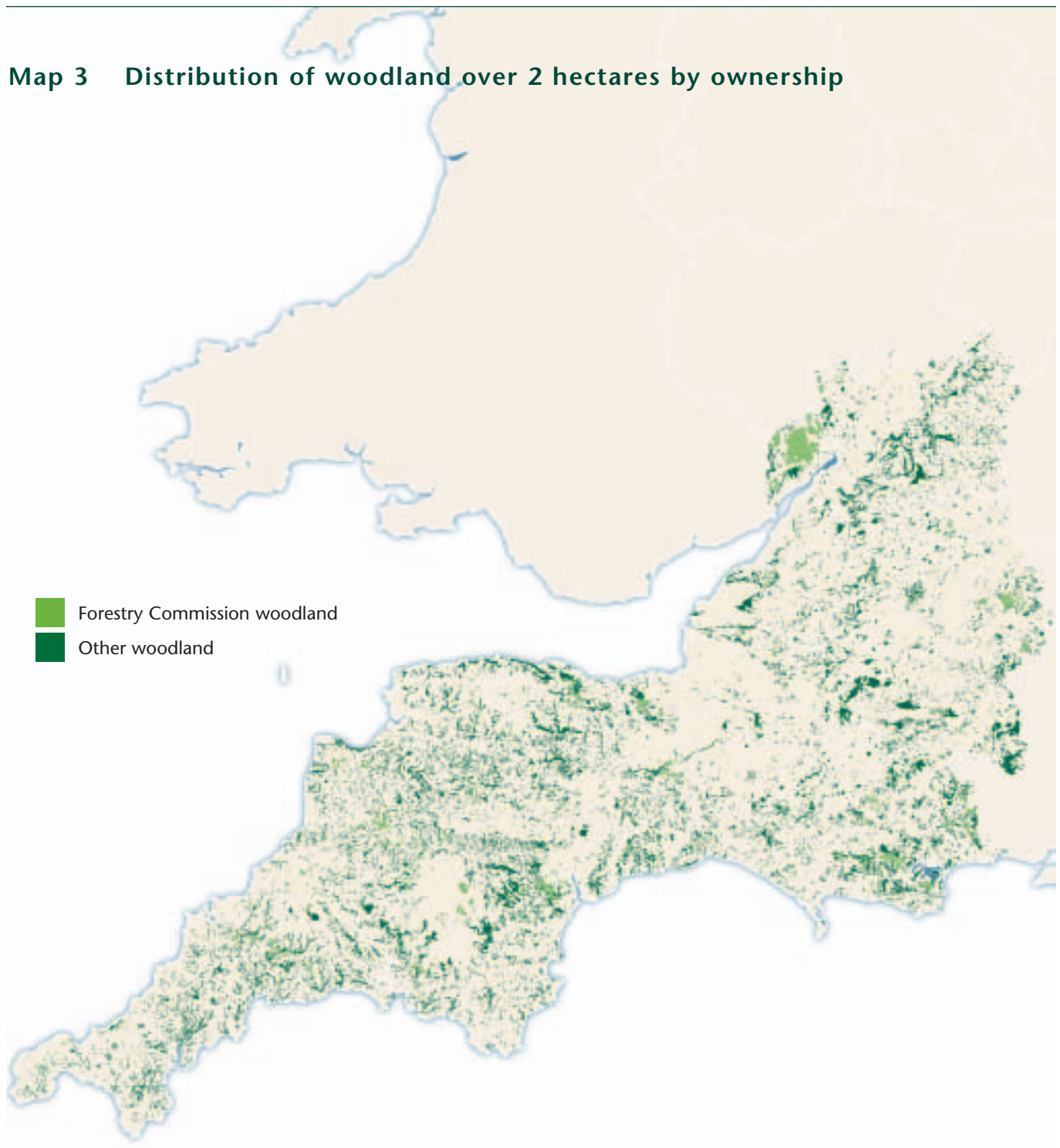
Forestry Commission woodland

Other woodland

Isles of Scilly

0   1   2   3 km

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0   20   40   60   80   100
Kilometres
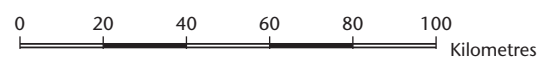
Map 4   Distribution of woodland over 2 hectares by Interpreted Forest Type
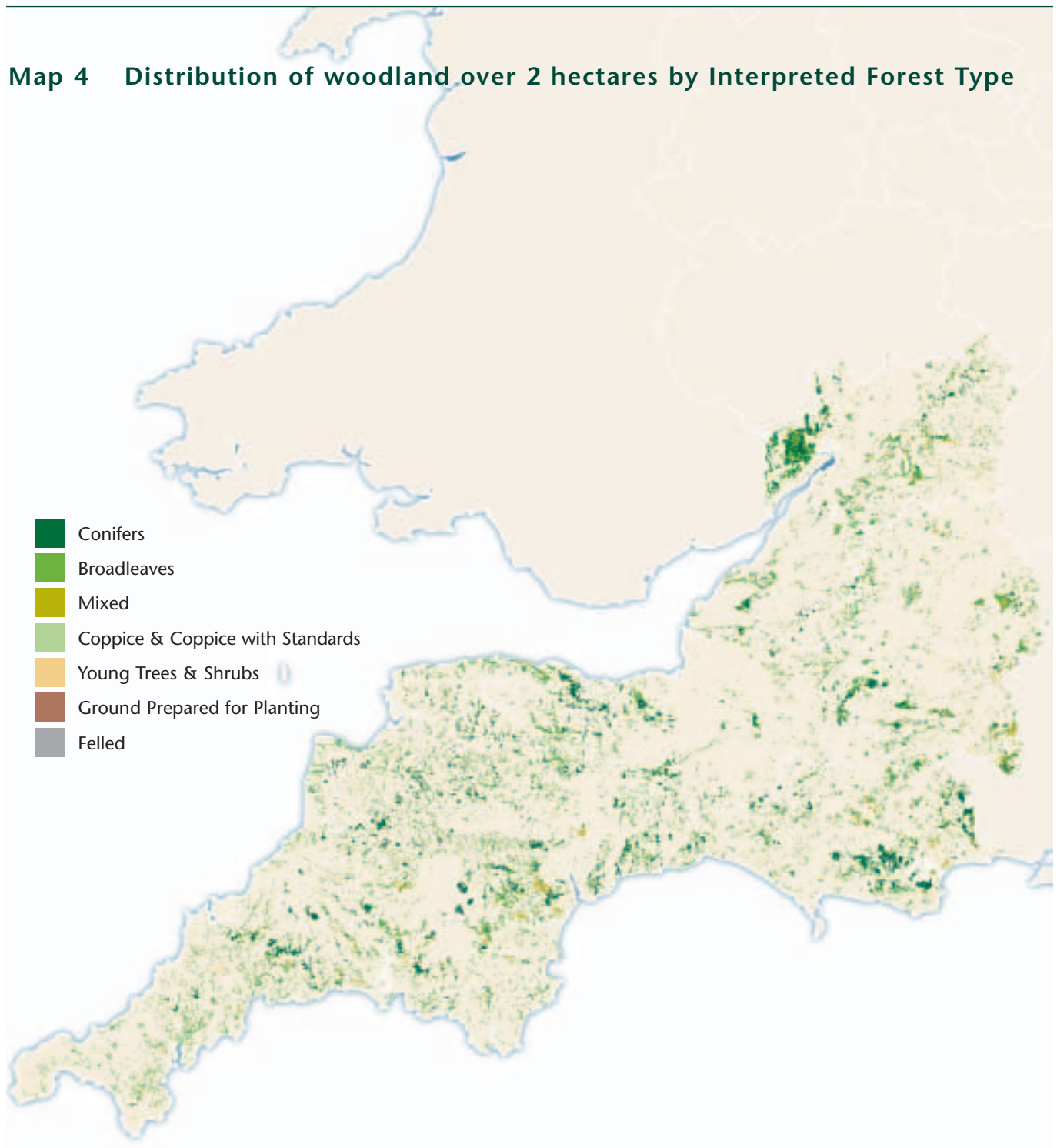
Conifers

Broadleaves

Mixed

Coppice & Coppice with Standards

Young Trees & Shrubs

Ground Prepared for Planting

Felled

Isles of Scilly

0   1   2   3   km

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0   20   40   60   80   100
Kilometres
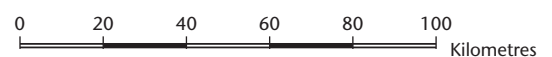
SUMMARY RESULTS FROM THE NATIONAL INVENTORY OF WOODLAND AND TREES (NIWT)

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

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)	% Woodland area
2.00 and over	205 610	97.0
0.25 – < 2.00	5 874	2.8
0.10 – < 0.25	538	0.3
Total area of woodland	**212 022**	**100.0**
% Woodland land cover	**8.9**	

1.   Area of South West Region, including inland water, 2 384 083 ha based on digital boundaries used in the 1991 Census of Population.

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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	48 026	319	48 345	22.8
Broadleaved	115 961	4 233	120 194	56.7
Mixed	28 378	1 827	30 205	14.2
Coppiced	1 093	0	1 093	0.5
Copp-w-Standards	805	0	805	0.4
Windblow	0	0	0	0.0
Felled	1 180	0	1 180	0.6
Open Space	10 168	33	10 201	4.8
Total	**205 610**	**6 412**	**212 022**	**100.0**

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	12 425	206	12 631	20.8	6.4
Sitka spruce	6 319	0	6 319	10.4	3.2
Larch	9 790	541	10 331	17.0	5.2
Other conifers	27 282	204	27 486	45.2	13.8
Mixed conifers	4 055	0	4 055	6.7	2.0
Total conifers	**59 870**	**952**	**60 822**	**100.0**	**30.6**
Oak	25 867	544	26 411	19.1	13.3
Beech	13 778	1 379	15 157	11.0	7.6
Sycamore	5 507	758	6 265	4.5	3.2
Ash	18 938	699	19 637	14.2	9.9
Birch	5 949	0	5 949	4.3	3.0
Elm	310	255	565	0.4	0.3
Other broadleaves	12 096	1 647	13 743	10.0	6.9
Mixed broadleaves	50 049	145	50 194	36.4	25.3
Total broadleaves	**132 495**	**5 427**	**137 922**	**100.0**	**69.4**
Total all species†	**192 365**	**6 379**	**198 744**		**100.0**

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

† Excludes the 13 279 ha of Coppice, Felled and Open Space areas, which were included in Table 2.

1.   The standard errors of the total area estimates for the most common species or species groups are as follows:

Conifers	2%
Broadleaves	2%
Pine	6%
Oak	4%
Ash	4%

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	500 500	5 055 200	10	212
Narrow Linear Features	188 400	14 729 500	78	618
Individual Trees	790 200	790 200	1	33
Total		20 574 900		863

1. Land area used to calculate tree density 2 384 083 ha based on digital boundaries used in 1991 Census of Population.

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

    Groups   11%
    Narrow Linear Features   15%
    Individual Trees   9%

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	8 766	10 565	443
Narrow Linear Features	188 400	14 777	620
Total		25 342	1 063

1. Land area used to calculate feature density 2 384 083 ha based on digital boundaries used in 1991 Census of Population.

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

    Wide Linear Features   36%
    Narrow Linear Features   12%

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.

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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 the sample plots was reduced as the sampled woodlands increased in size, the general aim being to sample 1% of 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	35 900	17
Other	169 710	83
Total area of woodland	**205 610**	**100**

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

2.   See Glossary for definitions of ownership types.

Woodland area by ownership

- Forestry Commission
- Other ownership
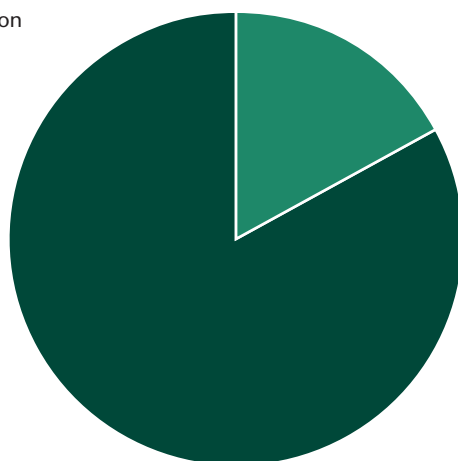
Table 7a Size class distribution of woodland

Size class (ha)	Number of woods	Total area (ha)	Percent of total area	Mean wood area (ha)
<10	8 843	38 257	19	4.3
10 – <20	1 428	19 802	10	13.9
20 – <50	972	30 044	15	30.9
50 – <100	356	24 618	12	69.2
<100	11 599	112 721	55	9.7
100 – <500	262	52 644	25	200.9
500 and >	42	41 297	20	983.3
All woods	**11 903**	**206 661**	**100**	**17.4**

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	112	547	0	4.9
	O	9 541	40 018	19	4.2
10 – <20	FC	49	683	0	13.9
	O	1 480	20 576	10	13.9
20 – <50	FC	103	3 320	2	32.2
	O	989	30 460	15	30.8
50 – <100	FC	55	3 740	2	68.0
	O	342	23 602	11	69.0
<100	FC	319	8 290	4	26.0
	O	12 352	114 656	55	9.3
100 – <500	FC	73	14 085	7	192.9
	O	211	40 685	20	192.8
500 and >	FC	11	13 527	7	1 229.8
	O	21	15 418	7	734.2
Total	**FC**	**403**	**35 902**	**17**	**89.1**
	O	**12 584**	**170 759**	**83**	**13.6**

1. Tables 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 1 051 hectares more than that recorded in Tables 1 and 3. 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	17 786	49.5	30 240	17.8	48 026	23.4
Broadleaved	8 974	25.0	106 987	63.0	115 961	56.4
Mixed	6 020	16.8	22 358	13.2	28 378	13.8
Coppice*	84	0.2	1 009	0.6	1 093	0.5
Copp-w-stds	0	0.0	805	0.5	805	0.4
Windblow	0	0.0	0	0.0	0	0.0
Felled	775	2.2	405	0.2	1 180	0.6
Open Space	2 262	6.3	7 906	4.7	10 168	5.0
Total	**35 900**	**100.0**	**169 710**	**100.0**	**205 610**	**100.0**

* South West Region has 35 ha Short Rotation Coppice

Area of woodland by forest type

- Conifer
- Broadleaves
- Mixed
- Coppice*
- Coppice-w-stds
- Felled
- Open Space
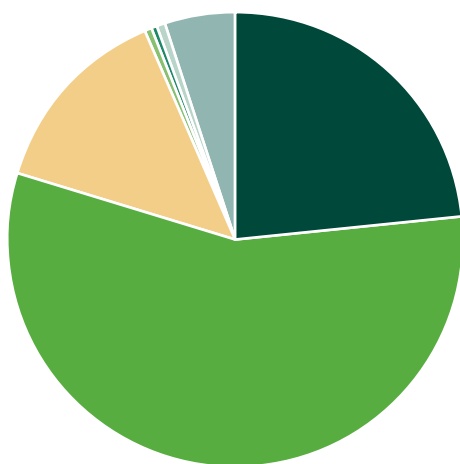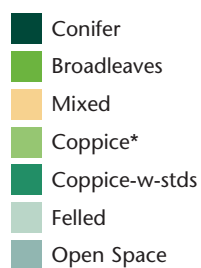
Table 9a Area of High Forest by principal species and ownership

Species	Forestry Commission			Other			All ownerships		
	area (ha)	cat* %	spp† %	area (ha)	cat* %	spp† %	area (ha)	cat* %	spp† %
Scots pine	1 950	9	6	5 713	15	4	7 663	13	4
Corsican pine	2 910	14	9	1 813	5	1	4 723	8	2
Lodgepole pine	39	0	0	0	0	0	39	0	0
Sitka spruce	3 947	19	12	2 371	6	1	6 319	11	3
Norway spruce	2 787	13	9	5 106	13	3	7 893	13	4
European larch	519	3	2	2 716	7	2	3 234	5	2
Japanese/hybrid larch	1 687	8	5	4 870	12	3	6 556	11	3
Douglas fir	4 771	23	15	8 904	23	6	13 675	23	7
Other conifers	1 262	6	4	4 452	11	3	5 714	10	3
Mixed conifers	801	4	2	3 254	8	2	4 055	7	2
Total conifers	**20 672**	**100**	**63**	**39 198**	**100**	**25**	**59 870**	**100**	**31**
Oak	3 067	25	9	22 799	19	14	25 867	20	13
Beech	2 689	22	8	11 089	9	7	13 778	10	7
Sycamore	404	3	1	5 103	4	3	5 507	4	3
Ash	1 338	11	4	17 600	15	11	18 938	14	10
Birch	1 668	14	5	4 280	4	3	5 949	4	3
Poplar	74	1	0	1 246	1	1	1 319	1	1
Sweet chestnut	307	3	1	1 145	1	1	1 452	1	1
Elm	13	0	0	297	0	0	310	0	0
Other broadleaves	759	6	2	8 566	7	5	9 325	7	5
Mixed broadleaves	1 788	15	5	48 261	40	30	50 049	38	26
Total broadleaves	**12 108**	**100**	**37**	**120 387**	**100**	**75**	**132 495**	**100**	**69**
Total – all species	**32 780**		**100**	**159 585**		**100**	**192 365**		**100**
Felled	**775**			**405**			**1 180**		
Total High Forest	**33 555**			**159 990**			**193 545**		

*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 10 168 hectares 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			2%
Broadleaves		1%
Douglas fir		6%
Oak			4%
Ash			4%

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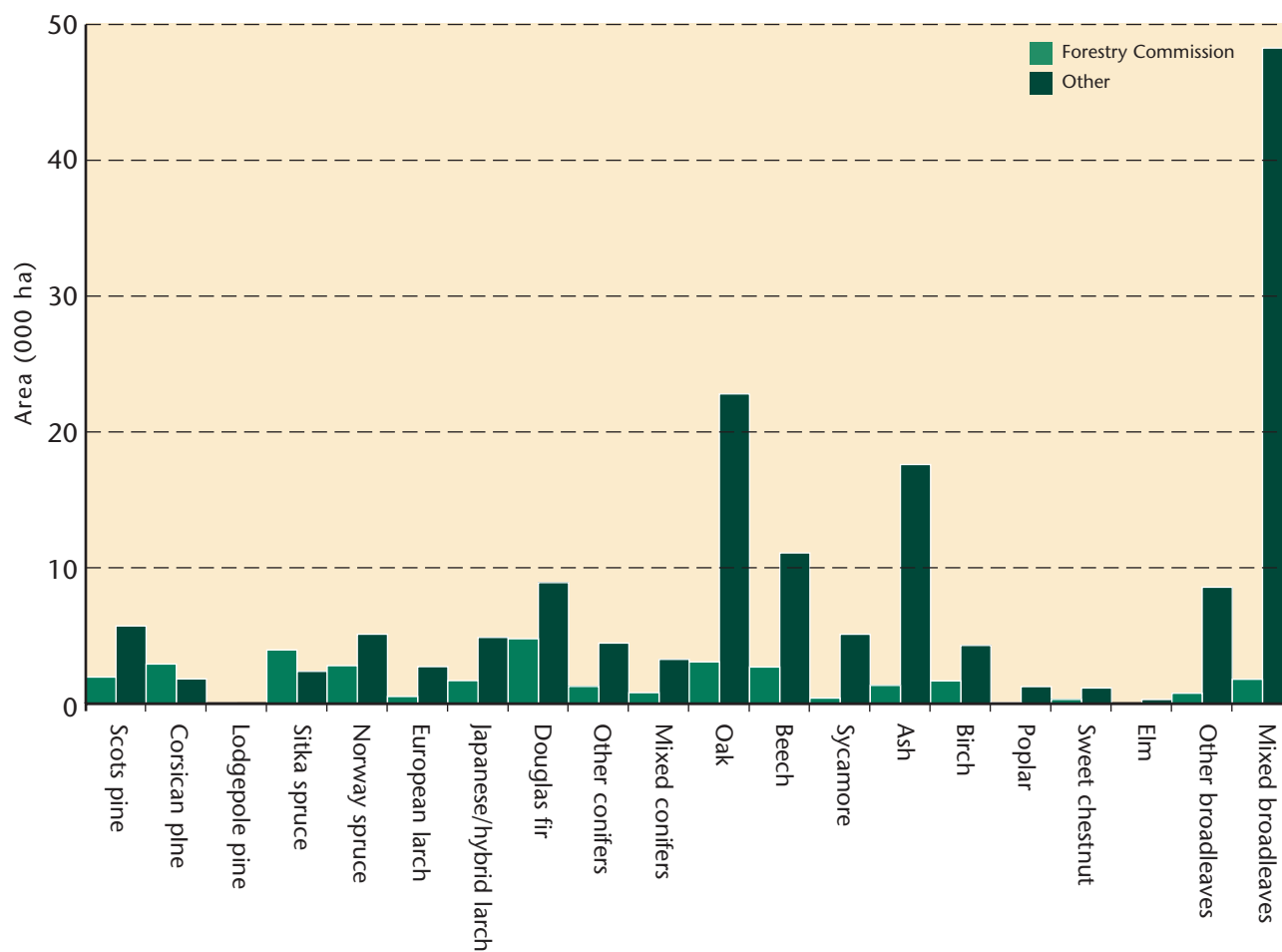
Table 9b Area of High Forest by principal species, ownership and category

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	1 888	62	1 950	5 530	183	5 713	7 419	245	7 663
Corsican pine	2 910	0	2 910	1 793	20	1 813	4 703	20	4 723
Lodgepole pine	31	8	39	0	0	0	31	8	39
Sitka spruce	3 942	5	3 947	2 371	0	2 371	6 313	5	6 319
Norway spruce	2 712	74	2 787	5 075	31	5 106	7 788	105	7 893
European larch	519	0	519	2 712	4	2 716	3 230	4	3 234
Japanese/hybrid larch	1 687	0	1 687	4 855	15	4 870	6 542	15	6 556
Douglas fir	4 766	5	4 771	8 899	5	8 904	13 666	10	13 675
Other conifers	1 238	24	1 262	4 065	387	4 452	5 303	410	5 714
Mixed conifers	791	10	801	3 132	122	3 254	3 923	132	4 055
Total conifers	**20 485**	**187**	**20 672**	**38 433**	**766**	**39 198**	**58 917**	**953**	**59 870**
Oak	2 908	159	3 067	20 898	1 902	22 799	23 806	2 061	25 867
Beech	2 577	112	2 689	10 305	784	11 089	12 882	895	13 778
Sycamore	327	77	404	4 393	710	5 103	4 720	787	5 507
Ash	1 167	170	1 338	15 740	1 860	17 600	16 908	2 030	18 938
Birch	857	812	1 668	2 473	1 807	4 280	3 330	2 619	5 949
Poplar	74	0	74	1 246	0	1 246	1 319	0	1 319
Sweet chestnut	302	5	307	1 049	96	1 145	1 352	101	1 452
Elm	0	13	13	56	241	297	56	254	310
Other broadleaves	296	463	759	2 619	5 947	8 566	2 916	6 410	9 325
Mixed broadleaves	1 007	781	1 788	38 314	9 947	48 261	39 321	10 728	50 049
Total broadleaves	**9 516**	**2 592**	**12 108**	**97 094**	**23 293**	**120 387**	**106 610**	**25 885**	**132 495**
Total – all species	**30 001**	**2 779**	**32 780**	**135 526**	**24 059**	**159 585**	**165 527**	**26 838**	**192 365**

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	2%	22%	2%	
Broadleaves	1%	3%	1%	
Douglas fir	6%	71%	6%	
Oak	4%	16%	4%	*See Glossary for Category 1
Ash	5%	12%	4%	and Category 2 descriptions.

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

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

High Forest Category 1 - Area by principal species and ownership

High Forest Category 2 - Area by principal species and ownership

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

Species	Planting year class*												Total (ha)
	1991 –1997	1981 –1990	1971 –1980	1961 –1970	1951 –1960	1941 –1950	1931 –1940	1921 –1930	1911 –1920	1901 –1910	1861 –1900	pre - 1861	
Scots pine	200	671	1 148	1 328	1 533	840	339	471	679	0	165	43	7 419
Corsican pine	279	579	1 123	962	1 303	208	144	35	11	6	53	0	4 703
Lodgepole pine	0	0	0	21	10	0	0	0	0	0	0	0	31
Sitka spruce	805	941	1 830	1 224	769	628	116	0	0	0	0	0	6 313
Norway spruce	448	620	1 854	2 347	1 648	615	167	60	9	0	21	0	7 788
European larch	23	112	415	906	809	747	141	73	4	0	0	0	3 230
Japanese/hybrid larch	396	527	1 143	1 674	1 588	596	266	42	245	0	68	0	6 542
Douglas fir	1 345	1 859	1 808	3 676	3 396	956	258	52	128	0	161	26	13 666
Other conifers	116	947	931	1 230	859	415	78	189	215	27	107	195	5 303
Mixed conifers	39	260	570	795	698	902	125	167	182	0	64	120	3 923
Total conifers	**3 651**	**6 516**	**10 820**	**14 161**	**12 612**	**5 906**	**1 634**	**1 090**	**1 472**	**33**	**639**	**383**	**58 917**
Oak	556	325	567	632	2 135	1 970	1 864	2 237	2 463	722	7 502	2 831	23 806
Beech	126	207	531	1 654	1 899	1 370	665	777	950	493	2 570	1 641	12 882
Sycamore	120	154	335	680	1 100	920	264	211	505	154	277	0	4 720
Ash	336	492	1 210	1 971	3 346	2 443	1 972	1 462	1 298	417	1 537	424	16 908
Birch	128	491	404	913	545	405	266	96	11	0	0	72	3 330
Poplar	28	0	266	514	145	204	72	47	43	0	0	0	1 319
Sweet chestnut	108	32	0	71	38	242	317	82	128	36	209	89	1 352
Elm	0	5	13	0	0	39	0	0	0	0	0	0	56
Other broadleaves	151	175	133	378	529	506	270	303	119	15	218	119	2 916
Mixed broadleaves	906	391	467	1 023	940	4 385	4 929	7 599	8 893	2 485	3 664	3 638	39 321
Total broadleaves	**2 460**	**2 272**	**3 926**	**7 836**	**10 675**	**12 484**	**10 618**	**12 814**	**14 412**	**4 322**	**15 976**	**8 814**	**106 610**
Total – all species	**6 111**	**8 788**	**14 746**	**21 997**	**23 287**	**18 390**	**12 253**	**13 904**	**15 884**	**4 355**	**16 615**	**9 198**	**165 527**

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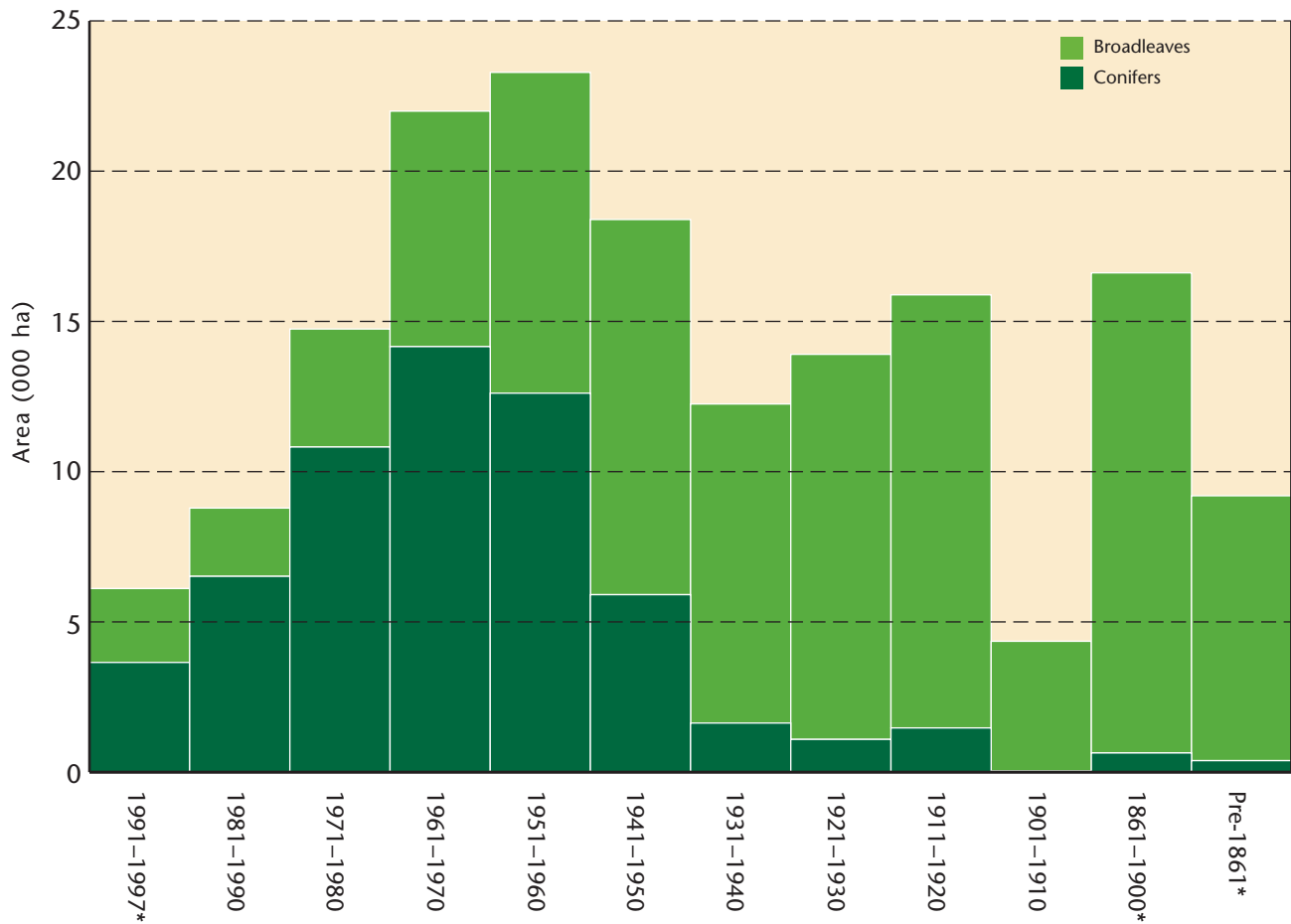
*Most of the planting year classes cover 10 years, 1991–1997 is 7 years, and the classes prior to 1901 are 40 years or more.

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

Species	Planting year class*												Total (ha)
	1991 –1997	1981 –1990	1971 –1980	1961 –1970	1951 –1960	1941 –1950	1931 –1940	1921 –1930	1911 –1920	1901 –1910	1861 –1900	pre - 1861	
Scots pine	55	313	268	410	515	97	61	156	0	0	10	3	1 888
Corsican pine	165	450	593	695	801	49	116	35	0	6	0	0	2 910
Lodgepole pine	0	0	0	21	10	0	0	0	0	0	0	0	31
Sitka spruce	638	789	984	555	485	384	107	0	0	0	0	0	3 942
Norway spruce	199	31	453	1 037	617	220	130	21	0	0	5	0	2 712
European larch	10	14	17	98	103	189	15	73	0	0	0	0	519
Japanese/hybrid larch	367	57	175	422	400	235	32	0	0	0	0	0	1 687
Douglas fir	333	495	826	1 659	1 023	374	42	10	5	0	0	0	4 766
Other conifers	0	241	296	270	249	102	19	62	0	0	0	2	1 238
Mixed conifers	0	0	262	209	159	94	31	30	0	0	6	0	791
Total conifers	**1 766**	**2 390**	**3 872**	**5 375**	**4 360**	**1 744**	**553**	**387**	**5**	**6**	**20**	**5**	**20 485**
Oak	174	92	173	80	281	279	288	380	259	36	415	450	2 908
Beech	8	46	126	487	809	335	143	183	140	64	56	180	2 577
Sycamore	16	0	4	114	142	51	0	0	0	0	0	0	327
Ash	0	31	33	210	296	204	59	159	0	1	174	0	1 167
Birch	90	316	146	88	141	0	22	48	5	0	0	0	857
Poplar	0	0	0	0	8	0	29	37	0	0	0	0	74
Sweet chestnut	31	5	0	3	25	95	87	46	0	0	10	0	302
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other broadleaves	24	5	21	52	58	41	4	85	0	0	8	0	296
Mixed broadleaves	17	54	13	10	96	296	37	97	172	0	103	113	1 007
Total broadleaves	**359**	**549**	**517**	**1 045**	**1 855**	**1 300**	**668**	**1 036**	**576**	**101**	**765**	**743**	**9 516**
Total – all species	**2 125**	**2 939**	**4 389**	**6 421**	**6 216**	**3 044**	**1 221**	**1 424**	**581**	**107**	**785**	**748**	**30 001**

*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

25

Area (000 ha)

Broadleaves
Conifers

1991–1997*
1981–1990
1971–1980
1961–1970
1951–1960
1941–1950
1931–1940
1921–1930
1911–1920
1901–1910
1861–1900*
Pre-1861*

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

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

Species	Planting year class*												Total (ha)
	1991 –1997	1981 –1990	1971 –1980	1961 –1970	1951 –1960	1941 –1950	1931 –1940	1921 –1930	1911 –1920	1901 –1910	1861 –1900	pre - 1861	
Scots pine	145	358	881	918	1 018	743	278	315	679	0	156	40	5 530
Corsican pine	114	129	530	267	503	158	28	0	11	0	53	0	1 793
Lodgepole pine	0	0	0	0	0	0	0	0	0	0	0	0	0
Sitka spruce	166	152	846	670	284	244	9	0	0	0	0	0	2 371
Norway spruce	249	589	1 401	1 309	1 031	395	37	39	9	0	16	0	5 075
European larch	14	99	398	808	706	557	126	0	4	0	0	0	2 712
Japanese/hybrid larch	29	471	968	1 252	1 188	361	234	42	245	0	68	0	4 855
Douglas fir	1 013	1 364	983	2 017	2 373	582	216	43	123	0	161	26	8 899
Other conifers	116	706	635	960	611	312	59	127	215	27	107	193	4 065
Mixed conifers	39	260	308	586	540	808	94	137	182	0	58	120	3 132
Total conifers	**1 884**	**4 126**	**6 948**	**8 786**	**8 251**	**4 162**	**1 081**	**703**	**1 467**	**27**	**618**	**378**	**38 433**
Oak	382	233	394	552	1 854	1 692	1 577	1 856	2 204	687	7 087	2 381	20 898
Beech	118	161	406	1 166	1 090	1 035	522	594	810	429	2 514	1 461	10 305
Sycamore	104	154	331	566	958	869	264	211	505	154	277	0	4 393
Ash	336	461	1 177	1 761	3 051	2 239	1 913	1 303	1 298	416	1 363	424	15 740
Birch	38	174	258	825	404	405	244	47	6	0	0	72	2 473
Poplar	28	0	266	514	137	204	44	10	43	0	0	0	1 246
Sweet chestnut	78	27	0	67	13	146	230	35	128	36	199	89	1 049
Elm	0	5	13	0	0	39	0	0	0	0	0	0	56
Other broadleaves	127	170	112	326	471	465	266	218	119	15	210	119	2 619
Mixed broadleaves	890	337	454	1 013	844	4 089	4 892	7 502	8 722	2 485	3 562	3 525	38 314
Total broadleaves	**2 101**	**1 722**	**3 409**	**6 790**	**8 820**	**11 184**	**9 951**	**11 777**	**13 836**	**4 221**	**15 211**	**8 071**	**97 094**
Total – all species	**3 986**	**5 848**	**10 357**	**15 576**	**17 071**	**15 346**	**11 032**	**12 480**	**15 303**	**4 248**	**15 830**	**8 449**	**135 526**

*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

*Most of the planting year classes cover 10 years, 1991–1997 is 7 years, and the classes prior to 1901 are 40 years or more.
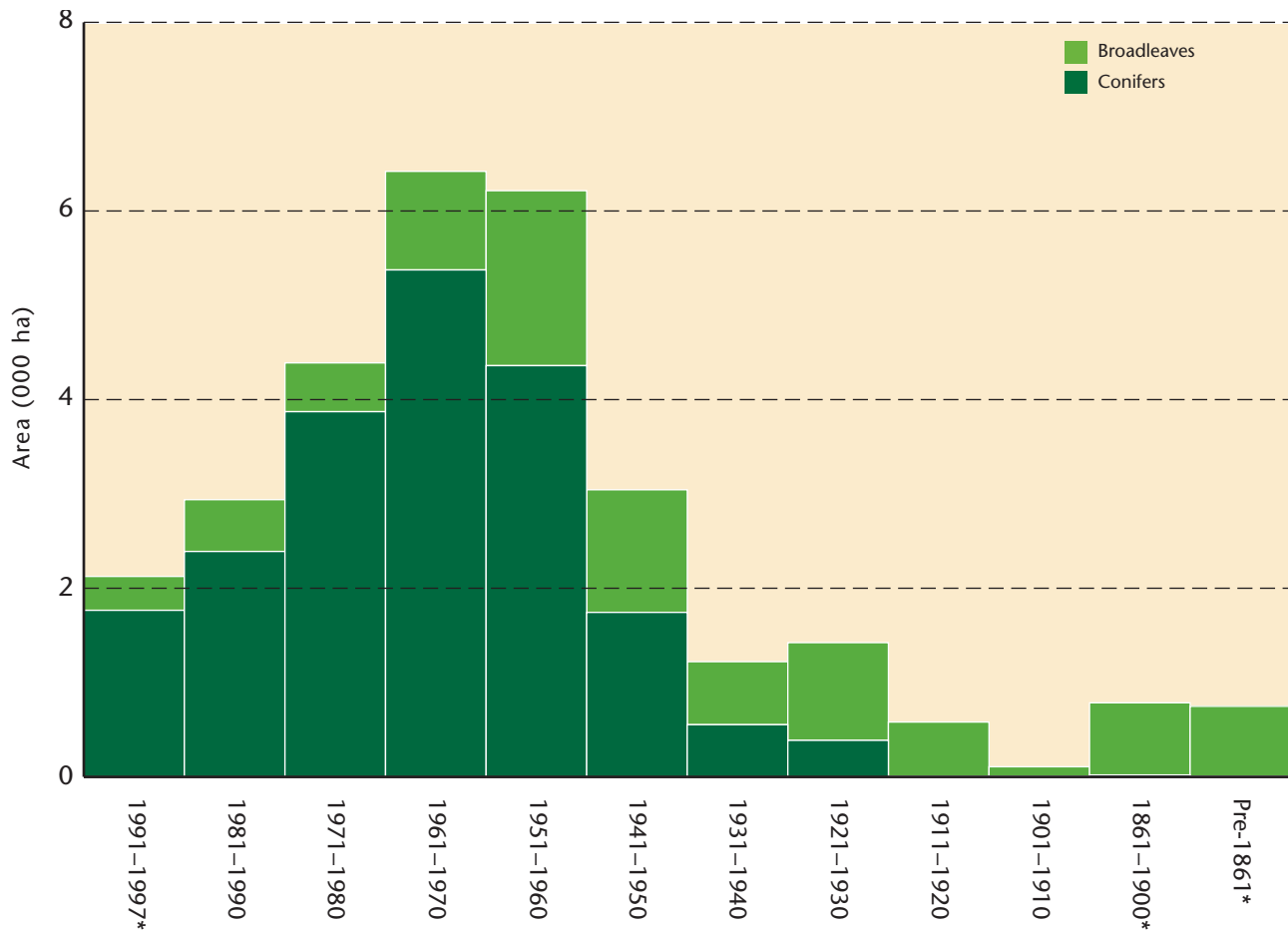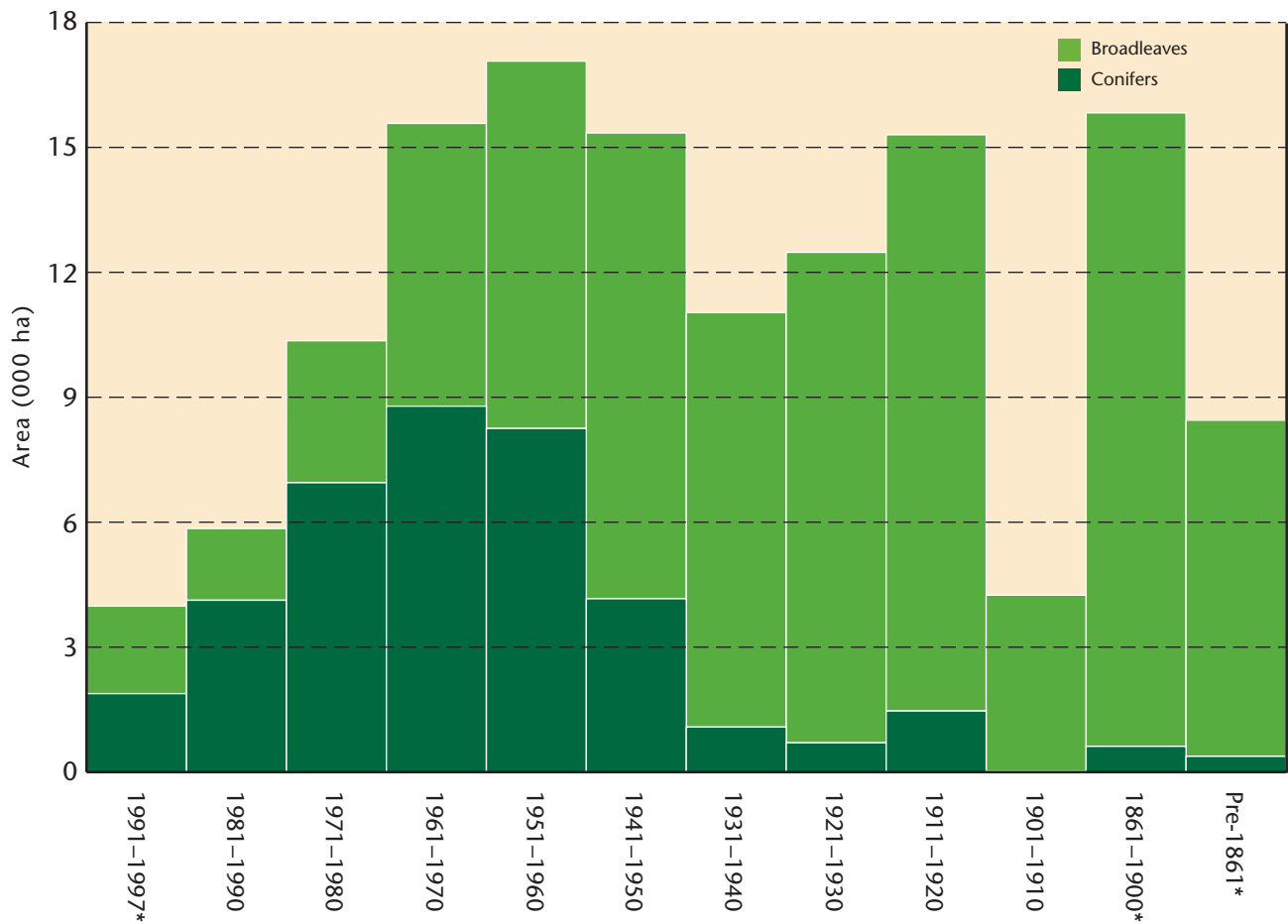
Table 11 High Forest: principal species by planting year class

Planting year class	First	%	Second	%	Third	%
1991–1997	Douglas fir	22	Mixed broadleaves	15	Sitka spruce	13
1981–1990	Douglas fir	21	Other conifers	11	Sitka spruce	11
1971–1980	Norway spruce	12	Sitka spruce	12	Douglas fir	12
1961–1970	Douglas fir	17	Norway spruce	11	Ash	9
1951–1960	Douglas fir	15	Ash	14	Oak	9
1941–1950	Mixed broadleaves	24	Ash	13	Oak	11
1931–1940	Mixed broadleaves	40	Ash	16	Oak	15
1921–1930	Mixed broadleaves	55	Oak	16	Ash	10
1911–1920	Mixed broadleaves	56	Oak	16	Ash	8
1901–1910	Mixed broadleaves	57	Oak	16	Beech	11
1861–1900	Oak	45	Mixed broadleaves	22	Beech	15
Pre-1861	Mixed broadleaves	40	Oak	31	Beech	18
All years	**Mixed broadleaves**	**26**	**Oak**	**13**	**Ash**	**10**

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

Ownership type by area

- Personal
- Business
- Charity
- Local Authority
- Other public
- Forestry Commission
- Community ownership
- Unidentified
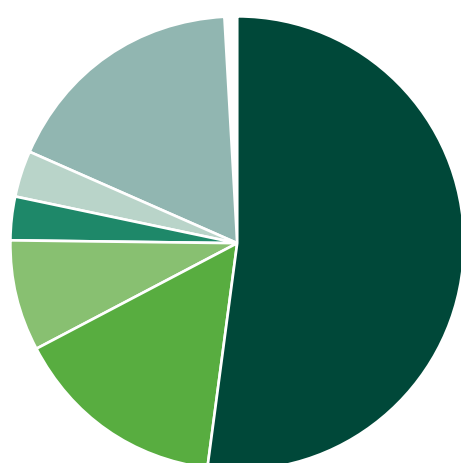
Table 12 Ownership type* by area and percentage

Ownership type	Area (ha)	%
Personal	107 218	52.1
Business	31 221	15.2
Forestry or timber business	0	0.0
Charity	16 214	7.9
Local Authority	6 350	3.1
Other public (not FC)	6 868	3.3
Forestry Commission	35 900	17.5
Community ownership or common land	130	0.1
Unidentified	1 709	0.8
Total	**205 610**	**100.0**

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

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

Survey method

The land area of South West Region was stratified into coastal and inland 1 km x 1 km squares. A random sample of the 1 km^2 plots was then selected, representing around 1% of the land area. 1:25 000 scale aerial photos were then used to identify features in each sample square. Each 1 km^2 was then divided into 16 parts, and two of these were selected at random for field data collection. Data was collected on Small Woods (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:   Woodland area by forest type, woodland size and feature type
Table 16:   Woodland area by species and feature type
Table 17:   Numbers of live trees outside woodland by species and feature type
Table 18:   Numbers of dead trees outside woodland by species and feature type
Table 19:   Numbers of live Individual Trees by species and height band
Table 20:   Numbers of live trees in Groups by species and height band
Table 21:   Numbers of live trees in Narrow Linear Features by species and height band
Table 22:   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 Woodland and Trees

Feature type	Number of features	Total	Unit
Small Woods	6 631	3 979	Area (ha)
Wide Linear Features	8 766	2 433	Area (ha)
Wide Linear Features	8 766	10 565	Length (km)
Narrow Linear Features	188 400	14 777	Length (km)
Narrow Linear Features	188 400	14 729 500	Number of live trees
Groups	500 500	5 055 200	Number of live trees
Individual Trees	790 200	790 200	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) 0.1 – <0.25	0.25 – <2.0	Total area (ha)	Number of features	Mean size (ha)
Small Woods	199	3 780	3 979	6 631	0.60
Wide Linear Features	340	2 094	2 433	8 766	0.28
Total	539	5 874	6 412	15 397	0.42

1.　　The standard errors of the total area estimates for these feature types are:

　　Small Woods　　　　　　　　39%
　　Wide Linear Features　　　　39%

2.　　See Glossary for definitions of feature types.

Table 15 Woodland area by forest type, woodland size and feature type

Forest type	Woodland size class (ha) 0.1 – <0.25 SW*	WLF†	0.25 – <2.0 SW	WLF	0.1 – <2.0 SW	WLF	Total area (ha) SW + WLF
Conifer	0	0	33	286	33	286	319
Broadleaved	199	244	2 387	1 403	2 586	1 647	4 233
Mixed	0	96	1 326	405	1 326	501	1 827
Coppiced	0	0	0	0	0	0	0
Copp-w-stds	0	0	0	0	0	0	0
Windblow	0	0	0	0	0	0	0
Felled	0	0	0	0	0	0	0
Open Space	0	0	33	0	33	0	33
Total	199	340	3 780	2 094	3 979	2 433	6 412

*SW - Small Woods, †WLF - Wide Linear Features.

1.　　See Glossary for definitions of forest type and feature type.

Reference Date 31 March 1997

Table 16 Woodland area by species and feature type

Species	Feature type		Total area (ha)	Percent of total area	
	Small Wood	Wide Linear Feature		Category	Species
Pine	33	173	206	21.6	3.2
Spruce	0	0	0	0.0	0.0
Larch	332	209	541	56.8	8.5
Cypress	0	0	0	0.0	0.0
Other conifers	166	39	205	21.5	3.2
Mixed conifers	0	0	0	0.0	0.0
Total conifers	**531**	**421**	**952**	**100.0**	**14.9**
Oak	365	179	544	10.0	8.5
Beech	1 227	152	1 379	25.4	21.6
Sycamore	563	194	757	13.9	11.9
Ash	398	302	700	12.9	11.0
Birch	0	0	0	0.0	0.0
Poplar	0	0	0	0.0	0.0
Sweet chestnut	0	17	17	0.3	0.3
Horse chestnut	0	0	0	0.0	0.0
Alder	199	234	433	8.0	6.8
Lime	33	0	33	0.6	0.5
Elm	166	89	255	4.7	4.0
Willow	199	239	438	8.1	6.9
Other broadleaves	199	527	726	13.4	11.4
Mixed broadleaves	66	79	145	2.7	2.3
Total broadleaves	**3 415**	**2 012**	**5 427**	**100.0**	**85.1**
Total – all species	**3 946**	**2 433**	**6 379**		**100.0**

1.   Percentages:

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

2.   The standard errors of the total area estimates for the most common species/groups are:

Larch   58%
Beech   70%
Sycamore   52%
Ash   37%

3.   See Glossary for definitions of feature types.

Table 17 Numbers of live trees outside woodland by species and feature type (000s trees)

Species	Feature type				Total live trees	Percent of total trees	
	Boundary Trees	Middle Trees	Groups	Narrow Linear Features		Category	Species
Pine	7.9	12.6	100.6	453.5	574.6	54.1	2.8
Spruce	0.8	0.8	6.7	31.4	39.7	3.7	0.2
Larch	0.0	0.0	35.5	176.3	211.8	20.0	1.0
Cypress	0.8	1.7	46.3	123.4	172.2	16.2	0.8
Other conifers	1.6	2.4	21.2	38.1	63.3	6.0	0.3
Total conifers	**11.1**	**17.5**	**210.3**	**822.6**	**1 061.6**	**100.0**	**5.2**
Oak	168.4	55.2	320.0	869.0	1 412.6	7.2	6.9
Beech	13.4	11.5	149.8	1 097.8	1 272.5	6.5	6.2
Sycamore	21.0	3.4	509.3	590.1	1 123.8	5.8	5.5
Ash	138.3	18.7	693.6	1 180.3	2 030.9	10.4	9.9
Birch	10.6	11.3	63.2	306.1	391.2	2.0	1.9
Poplar	5.7	0.8	21.4	9.4	37.3	0.2	0.2
Sweet chestnut	0.8	1.6	0.0	0.0	2.4	0.0	0.0
Horse chestnut	21.9	2.5	1.7	1.6	27.7	0.1	0.1
Alder	3.2	2.5	68.8	434.6	509.1	2.6	2.5
Lime	4.0	2.4	6.4	33.5	46.3	0.2	0.2
Elm	24.1	0.0	583.6	1 176.2	1 783.9	9.1	8.7
Willow	16.7	12.5	794.9	1 774.6	2 598.7	13.3	12.6
Other broadleaves	141.6	69.3	1 632.1	6 433.6	8 276.6	42.4	40.2
Total broadleaves	**569.7**	**191.7**	**4 844.9**	**13 906.9**	**19 513.0**	**100.0**	**94.8**
Total – all species	**580.8**	**209.2**	**5 055.2**	**14 729.5**	**20 574.9**		**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   9%
   Groups   11%
   Narrow Linear Features   15%

3.   See Glossary for definitions of feature types.

Table 18 Numbers of dead trees outside woodland by species and feature type (000s of trees)

Species	Feature type				Total dead trees	Percent of total trees	
	Boundary Trees	Middle Trees	Groups	Narrow Linear Features		Category	Species
Pine	0.8	0.8	0.8	1.2	3.6	46.2	1.3
Spruce	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Larch	0.0	0.0	1.7	0.0	1.7	21.8	0.6
Cypress	0.0	0.0	2.5	0.0	2.5	32.1	0.9
Other conifers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total conifers	**0.8**	**0.8**	**5.0**	**1.2**	**7.8**	**100.0**	**2.8**
Oak	1.7	0.0	0.8	0.6	3.1	1.2	1.1
Beech	0.8	0.0	0.0	0.5	1.3	0.5	0.5
Sycamore	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ash	0.0	0.8	0.0	0.0	0.8	0.3	0.3
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	0.8	0.0	0.0	0.0	0.8	0.3	0.3
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	14.8	0.0	106.9	128.1	249.8	92.9	90.3
Willow	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other broadleaves	0.0	1.6	1.7	9.8	13.1	4.9	4.7
Total broadleaves	**18.1**	**2.4**	**109.3**	**139.0**	**268.9**	**100.0**	**97.2**
Total – all species	**18.9**	**3.2**	**114.3**	**140.2**	**276.6**		**100.0**

1.   See Glossary for definitions of feature types.

Table 19 Numbers of live Individual Trees by species and height band (000s trees)

Species	Height band (m)				Total live trees
	2–5	5–15	15–20	>20	
Pine	0.0	7.0	2.4	0.0	9.4
Spruce	0.0	1.7	0.0	0.0	1.7
Larch	0.0	0.0	0.0	0.0	0.0
Cypress	0.0	2.4	0.0	0.0	2.4
Other conifers	2.4	4.9	5.5	2.3	15.1
Total conifers	**2.4**	**16.0**	**7.9**	**2.3**	**28.6**
Oak	34.7	94.4	73.8	20.6	223.5
Beech	12.3	5.6	5.4	1.6	24.9
Sycamore	3.3	15.4	5.7	0.0	24.4
Ash	22.9	92.9	37.4	3.9	157.1
Birch	10.7	11.3	0.0	0.0	22.0
Poplar	0.8	4.1	0.8	0.8	6.5
Sweet chestnut	0.8	0.0	0.8	0.8	2.4
Horse chestnut	22.8	0.8	0.8	0.0	24.4
Alder	1.6	4.1	0.0	0.0	5.7
Lime	1.6	1.7	2.4	0.8	6.5
Elm	8.9	12.8	1.6	0.8	24.1
Willow	6.6	17.8	4.8	0.0	29.2
Other broadleaves	123.3	82.8	4.8	0.0	210.9
Total broadleaves	**250.3**	**343.7**	**138.3**	**29.3**	**761.6**
Total – all species	**252.7**	**359.7**	**146.2**	**31.5**	**790.2**

Table 20 Numbers of live trees in Groups by species and height band (000s trees)

Species	Height band (m)				Total live trees
	2–5	5–15	15–20	>20	
Pine	11.5	67.8	7.8	13.6	100.7
Spruce	4.1	2.5	0.0	0.0	6.6
Larch	0.8	34.7	0.0	0.0	35.5
Cypress	9.0	34.9	2.4	0.0	46.3
Other conifers	3.4	9.9	4.7	3.2	21.2
Total conifers	**28.8**	**149.8**	**14.9**	**16.8**	**210.3**
Oak	42.6	179.4	81.2	16.7	319.9
Beech	9.7	94.7	26.7	18.7	149.8
Sycamore	12.4	409.3	87.6	0.0	509.3
Ash	139.2	438.3	111.2	4.8	693.5
Birch	4.9	53.5	4.9	0.0	63.3
Poplar	11.9	1.7	7.8	0.0	21.4
Sweet chestnut	0.0	0.0	0.0	0.0	0.0
Horse chestnut	1.7	0.0	0.0	0.0	1.7
Alder	2.4	45.5	20.9	0.0	68.8
Lime	0.0	4.9	1.6	0.0	6.5
Elm	76.6	506.2	0.8	0.0	583.6
Willow	107.1	656.7	31.1	0.0	794.9
Other broadleaves	854.6	773.5	3.1	0.8	1 632.0
Total broadleaves	**1 263.1**	**3 163.7**	**376.9**	**41.0**	**4 844.7**
Total – all species	**1 291.9**	**3 313.5**	**391.8**	**57.8**	**5 055.2**

Table 21 Numbers of live trees in Narrow Linear Features by species and height band (000s trees)

Species	Height band (m)				Total live trees
	2–5	5–15	15–20	>20	
Pine	365.0	45.5	22.3	20.6	453.4
Spruce	11.4	19.4	0.6	0.0	31.4
Larch	161.9	14.1	0.3	0.0	176.3
Cypress	96.2	27.2	0.0	0.0	123.4
Other conifers	9.2	20.6	8.3	0.0	38.1
Total conifers	**643.7**	**126.8**	**31.5**	**20.6**	**822.6**
Oak	40.2	581.3	229.8	17.7	869.0
Beech	151.8	776.9	161.1	8.0	1 097.8
Sycamore	28.7	421.2	140.2	0.0	590.1
Ash	95.4	880.1	190.4	14.4	1 180.3
Birch	10.8	276.6	18.7	0.0	306.1
Poplar	0.0	6.9	2.5	0.0	9.4
Sweet chestnut	0.0	0.0	0.0	0.0	0.0
Horse chestnut	0.0	0.3	1.2	0.0	1.5
Alder	2.9	394.4	37.4	0.0	434.7
Lime	0.0	10.6	13.9	8.9	33.4
Elm	112.1	1 026.3	37.8	0.0	1 176.2
Willow	124.6	1 580.9	65.9	3.2	1 774.6
Other broadleaves	4 037.0	2 351.6	45.0	0.0	6 433.6
Total broadleaves	**4 603.5**	**8 307.1**	**943.9**	**52.2**	**13 906.7**
Total – all species	**5 247.2**	**8 433.9**	**975.4**	**72.8**	**14 729.5**

Table 22 Number of Groups by group size

Number of trees per Group*	Number of Groups (000s)
2	46
3–5	138
6–10	115
11–20	109
21–50	67
51–100	23
>100	3
Total	**500**

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

COMPARISON OF RESULTS WITH THE 1980 CENSUS AND PREVIOUS SURVEYS

Survey method

The 1980 Census and 1997 Inventory were undertaken using very different sampling methods. Inventory practice and technology have moved on since the 1980 Census; this has lead to changes in sampling methodology, scope and woodland definitions. For example, the Main Woodland Survey used the digital woodland map, created from aerial photographs 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 23:	Comparison of woodland area between 1980 Census and 1997 Inventory
Table 24:	Comparison of High Forest area by species between 1980 Census and 1997 Inventory
Chart:	Comparison of High Forest area by species between 1980 Census and 1997 Inventory
Table 25:	Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1997 Inventory
Chart:	Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1997 Inventory
Table 26:	Comparison of numbers of live trees outside woodland between 1980 Census and 1997 Inventory
Table 27:	Comparison of density of non-woodland features between 1980 Census and 1997 Inventory

Woodland Cover

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

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

Table 23 Comparison of woodland area between 1980 Census and 1997 Inventory

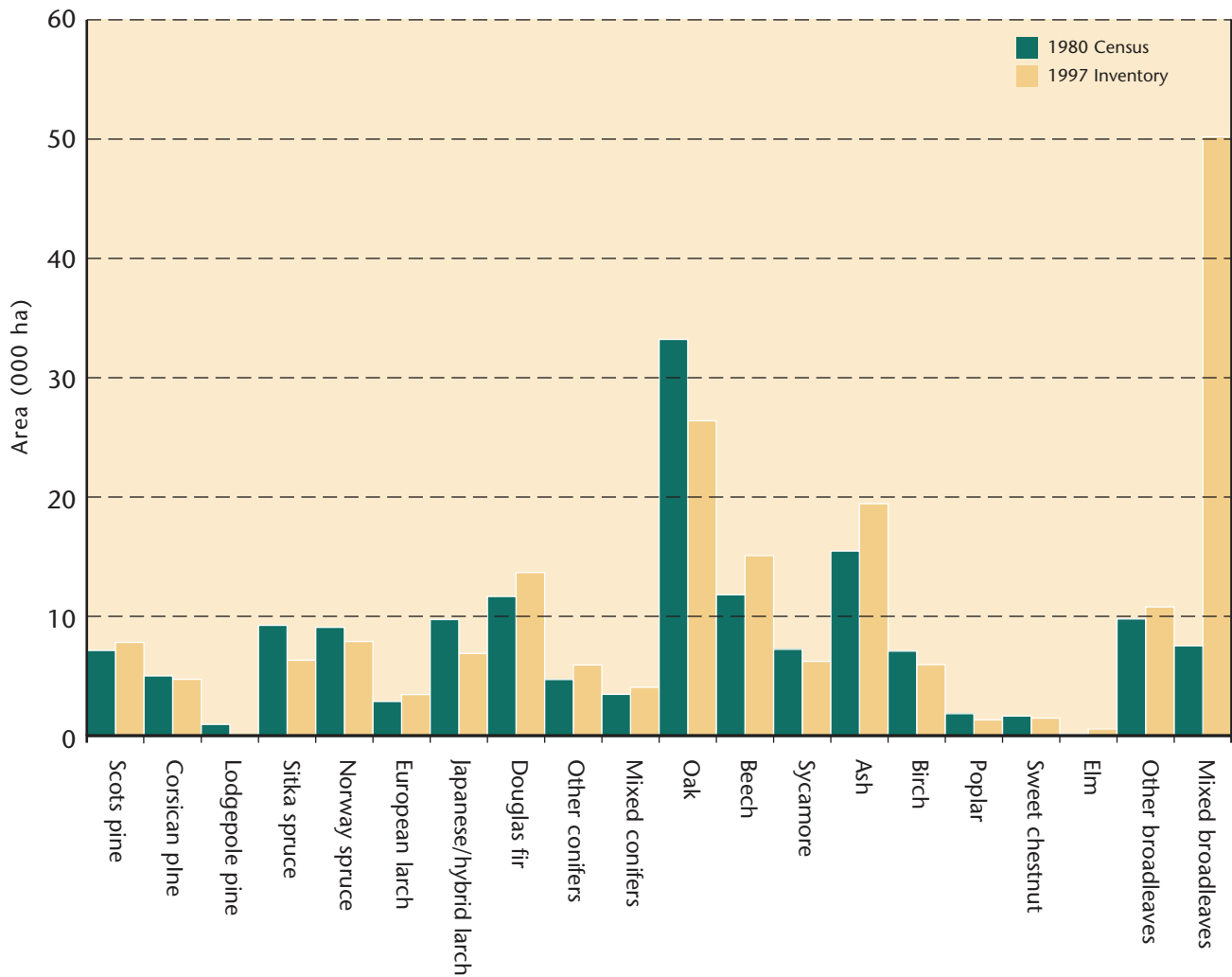| Woodland size (ha)	1980 Census woodland area		1997 Inventory woodland area		Change (%)
	(ha)	(%)	(ha)	(%)	(%)
2.0 or more	160 191	91.8	205 610	97.2	28
0.25 – <2.0	14 358	8.2	5 874	2.8	-59
Total	174 549		211 484		21
% Woodland land cover	7.3		8.9		

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

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

3.   Land area used to calculate woodland cover percent (1997), 2 384 083 hectares, was based on the 1991 Census of Population digital boundaries.

4.   Land area used to calculate woodland cover percent (1980), 2 384 870 hectares, (Ordnance Survey data)

Table 24 Comparison of High Forest area by species between 1980 Census and 1997 Inventory

Species	1980 Census woodland area (ha)	1997 Inventory woodland area (ha)	Change (%)
Scots pine	7 138	7 817	10
Corsican pine	5 006	4 723	-6
Lodgepole pine	942	39	-96
Sitka spruce	9 247	6 319	-32
Norway spuce	9 079	7 893	-13
European larch	2 864	3 443	20
Japanese/hybrid larch	9 730	6 888	-29
Douglas fir	11 662	13 675	17
Other conifers	4 704	5 918	26
Mixed conifers	3 463	4 055	17
Total conifers	**63 835**	**60 770**	**-5**
Oak	33 212	26 389	-21
Beech	11 809	15 096	28
Sycamore	7 237	6 227	-14
Ash	15 471	19 439	26
Birch	7 084	5 949	-16
Poplar	1 843	1 319	-28
Sweet chestnut	1 641	1 469	-10
Elm	129	565	340
Other broadleaves	9 783	10 788	10
Mixed broadleaves	7 531	50 194	566
Total broadleaves	**95 740**	**137 435**	**44**
Total – all species	**159 575**	**198 205**	**24**
Felled	**4 070**	**1 180**	**-71**
Total High Forest	**163 645**	**199 385**	**22**

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

2. In the 1980 Census the areas assigned to species included any associated open space such as roads and rides. In the Inventory open spaces are separately identified and the overall proportion is 4.8% (Table 2). To obtain meaningful comparisons between the two datasets the 1980 Census data have therefore been reduced by 4.8%.

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

4. The 1980 figures include scrub to enable comparison.

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

Table 25 Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1997 Inventory

Planting year class	1980 Census woodland area (ha)	1997 Inventory woodland area (ha)	Change (%)
1991–1997	-	7 636	-*
1981–1990	-	8 788	-*
1971–1980	12 603	15 380	22
1961–1970	27 183	22 079	-19
1951–1960	23 936	23 668	-1
1941–1950	15 482	18 424	19
1931–1940	11 149	12 350	11
1921–1930	10 357	13 904	34
1911–1920	4 928	16 302	231
1901–1910	5 396	4 382	-19
1861–1900	19 392	17 079	-12
Pre-1861	7 527	9 197	22
Total: all years	**137 953**	**169 189**	**23**

*These classes cover the period since the 1980 Census therefore no comparison can be made.

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

Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1997 Inventory
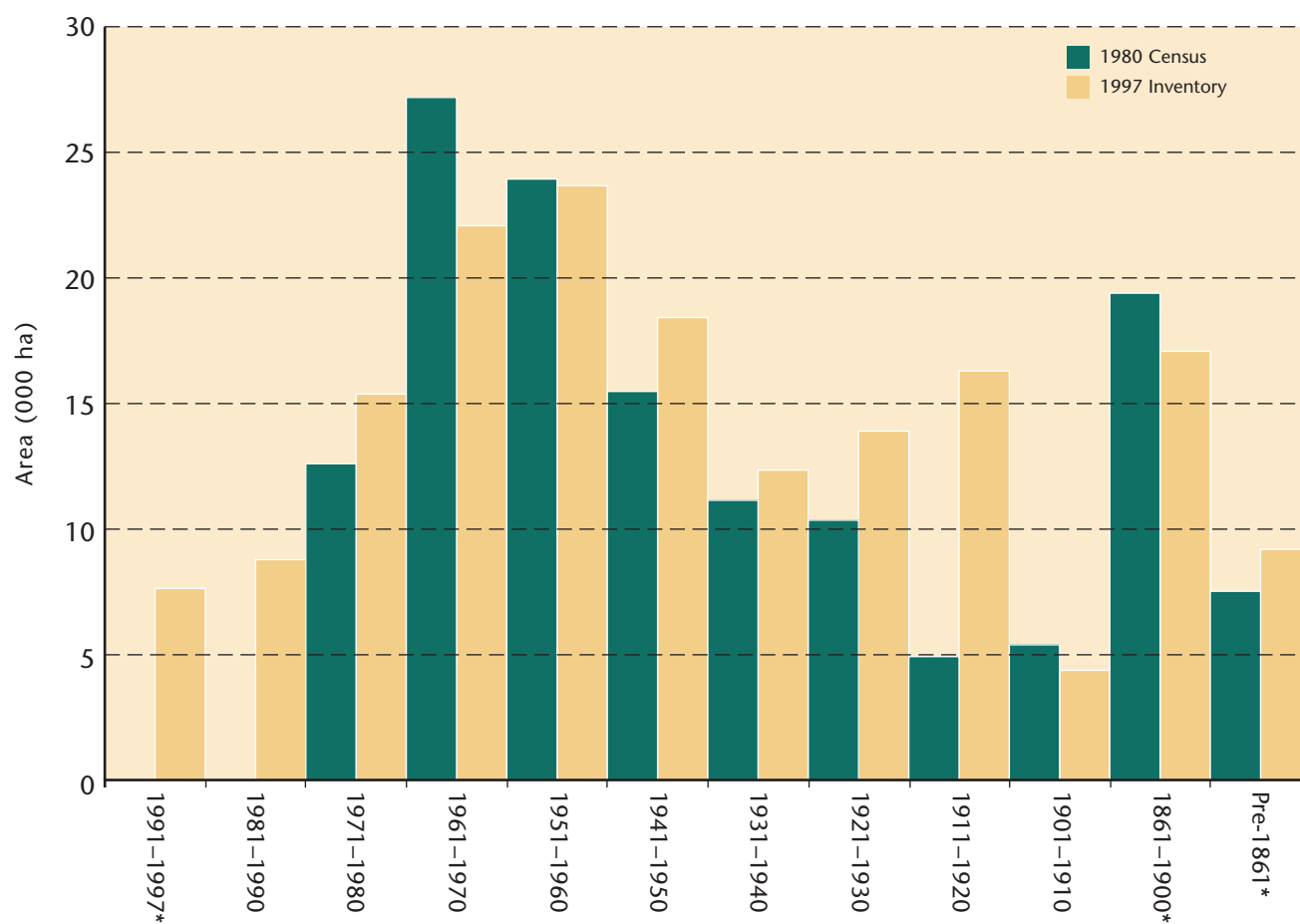
*Most of the planting year classes cover 10 years, 1991–1997 is 7 years, and the classes prior to 1901 are 40 years or more.

Table 26 Comparison of numbers of live trees outside woodland between 1980 Census and 1997 Inventory (000s trees)

Feature type	1980 Census	1997 Inventory	Change (%)
Boundary Tree	1 483	546	-63
Middle Tree	924	186	-80
Total Individual Trees	**2 407**	**732**	**-70**
Groups	6 726	3 898	-42
Linear Features	5 818	9 390	61
Total	14 951	14 020	-6

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

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

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

4. See Glossary for definitions of feature types.

Table 27 Comparison of density of non-woodland features between 1980 Census and 1997 Inventory

| Feature type	1980 Census	1997 Inventory	Change (%)
Individual Trees (per km^2)	100.9	30.7	-70
Groups (per km^2)	49.9	17.8	-64
Linear Features (m per km^2)	537.1	606.9	13

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

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

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

4.   See Glossary for definitions of feature types.

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 of England, as reported on in 1895 and 1947. The data from these counties could not be re-analysed for different geographic areas. In contrast, the digital woodland map, which forms the basis of the current inventory, can be re-analysed for any geographic area.
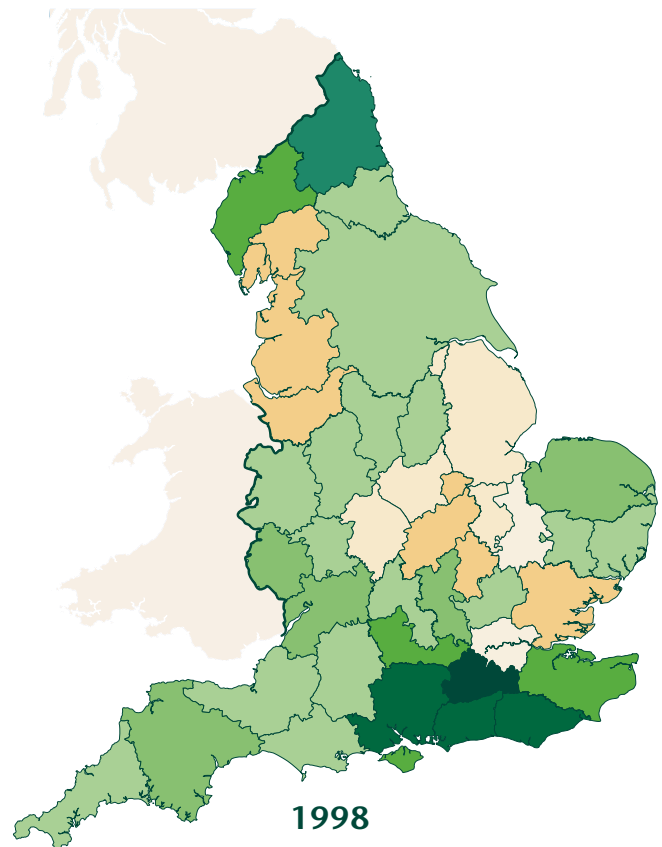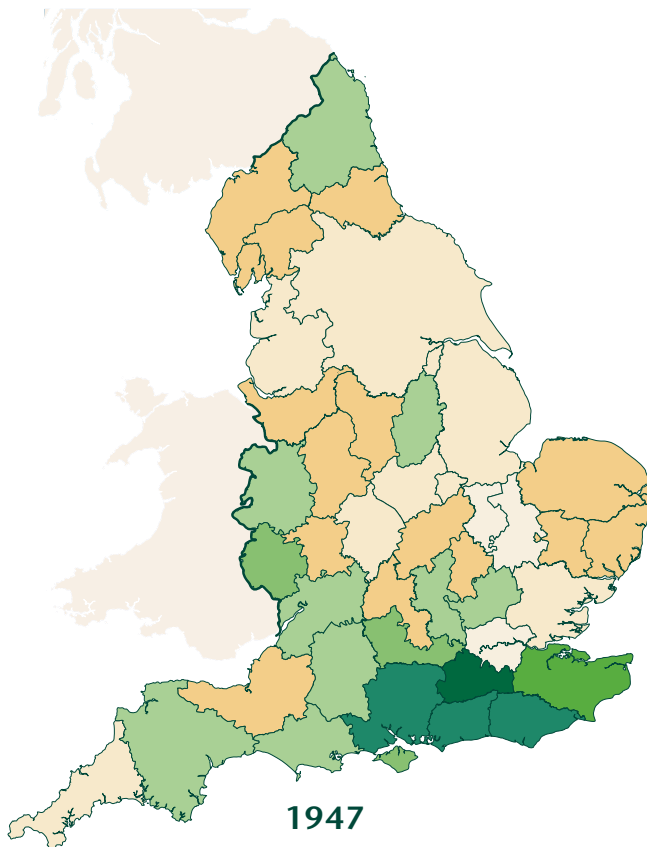
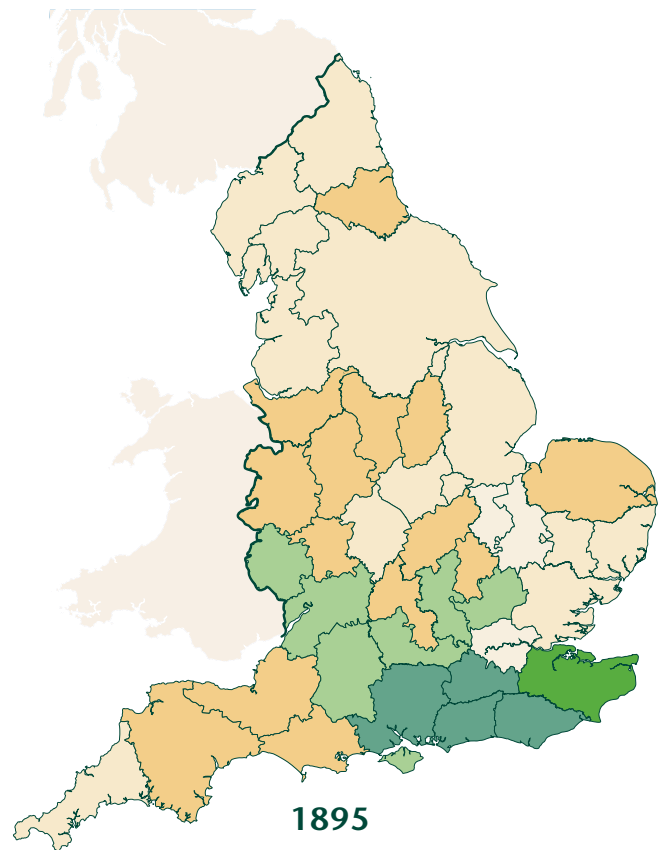**Change in woodland cover through time (1890–2000)**
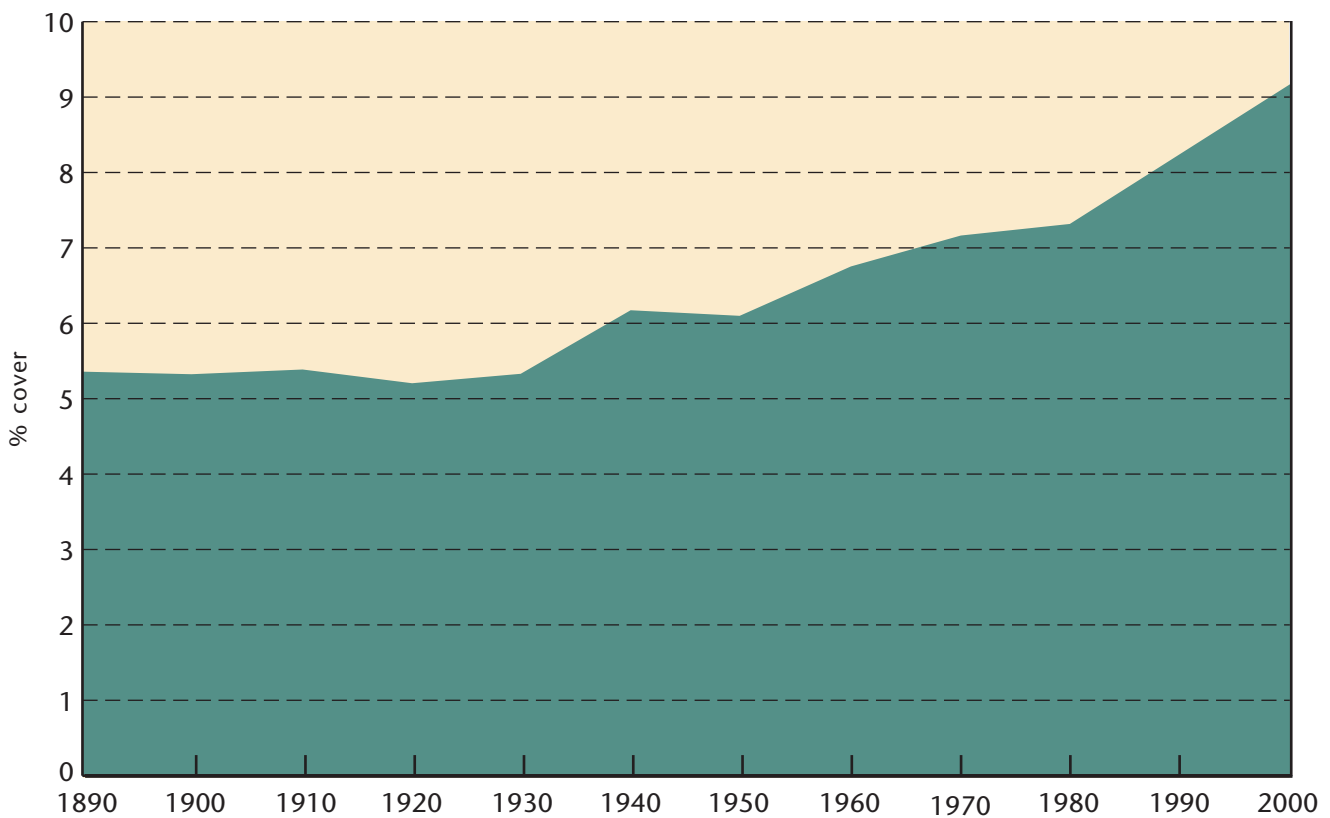
Map 5   Woodland cover by county through time (1895–1998)

% woodland cover

0–1.9	12–13.9
2–3.9	14–15.9
4–5.9	16–17.9
6–7.9	18–19.9
8–9.9	20–21.9
10–11.9	22–23.9

1895

1947

1998

49

APPENDICES

The following tables summarise the results of the Main Woodland Survey and the Survey of Small Woodland and Trees by county in South West Region. Full reports of the results are available separately.

Appendix 1   Summary of woodland area by county and woodland size
Appendix 2   Summary of woodland area by county and forest type
Appendix 3   Summary of live trees outside woodland by county and feature type
Appendix 4   Summary of number and length of Linear Features by county

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

APPENDIX 1

Summary of woodland area by county and woodland size

County*	Woodland size (ha)†		Total area (ha)	Woodland cover (%)
	2.0 or more	0.1 – <2.0		
Avon	7 906	458	8 364	6.3
Cornwall	26 771	98	26 869	7.5
Devon	64 188	2 473	66 661	9.9
Dorset	28 101	657	28 758	10.8
Gloucestershire	28 746	1 006	29 752	11.2
Somerset	23 273	1 017	24 290	7.0
Wiltshire	26 624	702	27 326	7.9
Total	**205 610**	**6 412**	**212 022**	**8.9**

*Areas of counties used to derive woodland cover % based on digital boundaries used in 1991 Census of Population.

†Area of woodland blocks of 2.0 ha and over derived from the Main Woodland Survey. Area of woodland blocks 0.1– < 2.0 ha derived from the Survey of Small Woodland and Trees.

APPENDIX 2

Summary of woodland area by county and forest type

County	Forest type								Total
	Conifer	Broad-leaved	Mixed	Coppice	Coppice-w-stds	Wind-blow	Felled	Open Space	
Avon	866	5 569	1 820	0	0	0	20	89	8 364
Cornwall	5 096	17 758	2 739	291	271	0	59	657	26 869
Devon	16 792	39 417	8 788	140	64	0	451	1 008	66 661
Dorset	8 620	13 829	4 308	309	73	0	199	1 417	28 758
Gloucestershire	6 526	14 825	4 813	209	120	0	75	3 185	29 752
Somerset	6 715	13 623	3 068	25	0	0	242	619	24 290
Wiltshire	3 729	15 171	4 669	119	277	0	135	3 225	27 326
Total	**48 345**	**120 194**	**30 205**	**1 093**	**805**	**0**	**1 180**	**10 201**	**212 022**

1.   See Glossary for definitions of forest types.

APPENDIX 3

Summary of live trees outside woodland by county and feature type (000s trees and features)

County*	Total number	Feature type			Total live trees	Tree density (per km²)
		Groups	Narrow Linear Feature	Individual Trees		
Avon	Features	7.4	5.0	79.5		
	Live Trees	47.6	252.7	79.5	379.8	285
Cornwall	Features	96.4	4.9	59.6		
	Live Trees	1 022.4	186.7	59.6	1 268.7	356
Devon	Features	155.1	58.9	123.3		
	Live Trees	1 589.5	5 918.9	123.3	7 631.7	1137
Dorset	Features	31.4	9.4	78.8		
	Live Trees	530.7	1 041.0	78.8	1 650.5	622
Gloucestershire	Features	109.5	54.3	236.8		
	Live Trees	600.3	2 183.3	236.8	3 020.4	1138
Somerset	Features	89.2	39.4	110.5		
	Live Trees	1 155.1	3 785.3	110.5	5 050.9	1463
Wiltshire	Features	11.5	16.6	101.4		
	Live Trees	109.6	1 361.6	101.4	1 572.6	452
Total	**Features**	**500.5**	**188.5**	**789.9**		
	Live Trees	**5 055.2**	**14 729.5**	**789.9**	**20 574.6**	**863**

*Areas of counties used to derive tree density per km² based on digital boundaries used in 1991 Census of Population.

1.   See Glossary for definitions of feature types

APPENDIX 4

Summary of number and length of Linear Features by county

County*	Total number of features (000s)	Total length of features (km)	Density (m per km²)
Avon	6	385	289
Cornwall	5	295	83
Devon	63	5 659	843
Dorset	10	827	312
Goucestershire	55	3 870	1 458
Somerset	41	3 290	953
Wiltshire	17	1 508	434
Total	**197**	**15 833**	**664**

*Areas of counties used to derive length per km² based on digital boundaries used in 1991 Census of Population.

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 with 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 50 m 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 50 m, 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 1 m 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 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 0.1 ha.

• **Individual Tree**

A tree with a crown that 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 a 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 50 m wide or as narrow as a single line of trees. Two types of Linear Feature are recognised:

- Narrow Linear Features (with a width of 16 m or less).

- Wide Linear Features (with a width greater than 16 m).

NOTES

NOTES