



NATIONAL INVENTORY OF WOODLAND AND TREES



ENGLAND

Regional Report for NORTH EAST



Forestry Commission



Forestry Commission

Inventory Report

NATIONAL INVENTORY OF WOODLAND AND TREES



ENGLAND

**Regional Report for
NORTH EAST**

Forestry Commission, Edinburgh

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First published 2002

ISBN 0 85538 545 6

Printed in the United Kingdom
FCIR201/PPD(KMA)/LTHPT-1500/JAN02

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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 North East 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.

INTRODUCTION

This Report presents the results for North East 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 With the statistics becoming increasingly out of date the Forestry Commission decided to undertake a new survey: the *National Inventory of Woodland and Trees*.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 North East 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 North East 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 North East Region was stratified into coastal and inland 1 km x 1 km squares. A random sample of the 1 km² 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 km² 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 North East Region is 102 867 hectares. This represents 12% of the land area (Table 1).
- Conifer woodland is the dominant forest type representing 64.5% of all woodland. Broadleaved woodland represents 21.1%, Mixed woodland 5.1% and Open Space within woodlands 4.2% (Table 2).
- The main conifer species is Sitka spruce covering 43 347 hectares or 63% of all conifer species. The main broadleaved species is oak covering 4 966 hectares or 20% of all broadleaved species species (Table 3).
- 51 480 hectares or 51% of woodland over 2 hectares is owned by or leased to the Forestry Commission, and 49 374 hectares or 49% of woodland is in Other ownerships (Table 6).
- There are 3 332 woods over 2 hectares within North East Region with a mean wood area of 30.5 hectares (Table 7a). There are a total of 1 636 woods from 0.1 – <2.0 hectares with a mean wood area of 1.2 hectares (Table 14).
- There are 391.4 thousand live trees and 9.3 thousand dead trees outside woodland in North East Region (Tables 17 and 18).
- Woodland land cover increased by over 8 100 hectares from 11.0% to 12.0% of the land area between 1980 and 1999 (Table 23).
- The area of Broadleaves increased by 51% between 1980 and 1999, with the relative proportion of Broadleaves to Conifers increasing from 18% to 26% (Table 24).

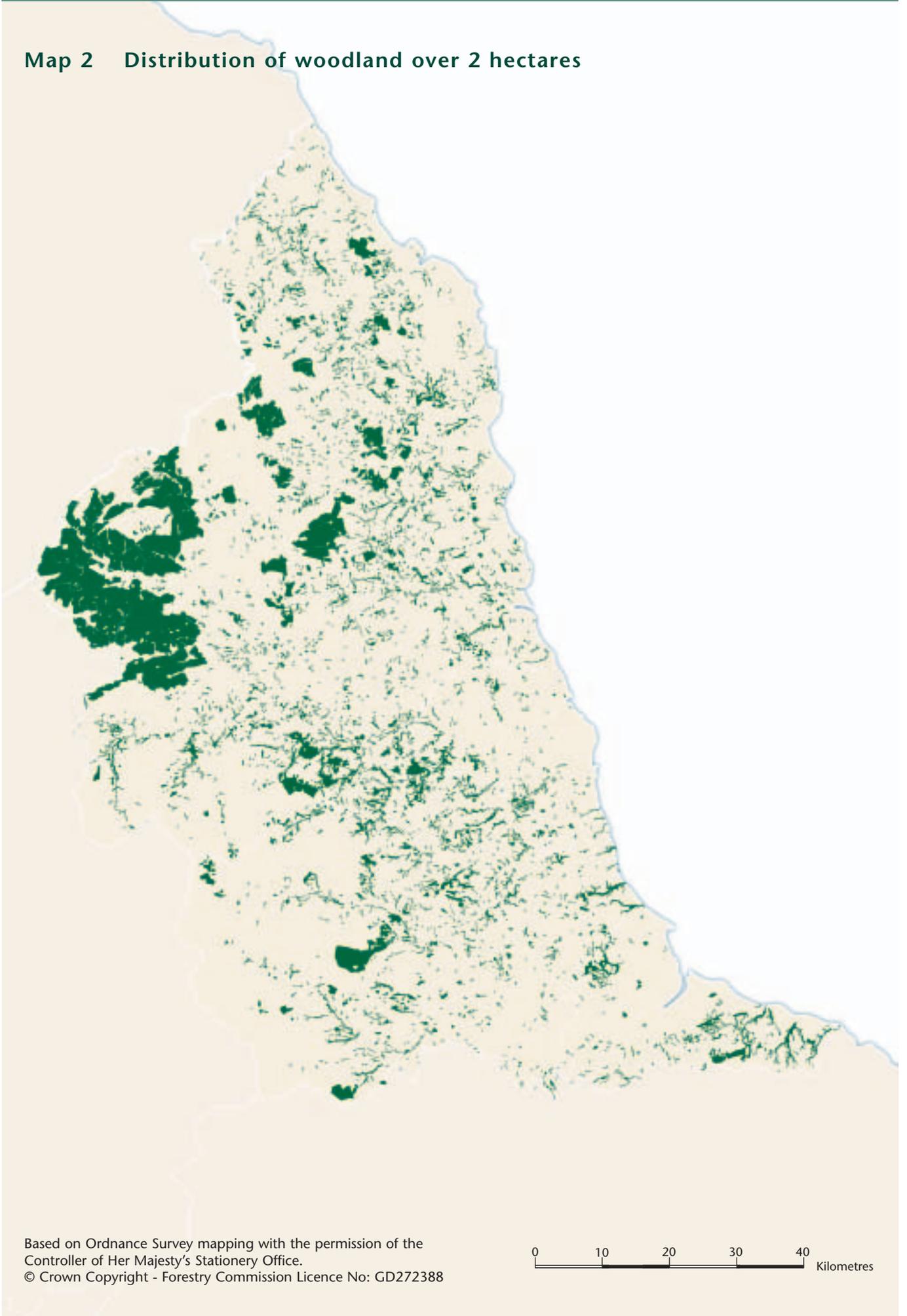
INVENTORY REPORTS

For North East Region, reports are available for the counties as shown on the map opposite. Also available are region and county reports for other parts of England as well as a report for the country as a whole. Wales and Scotland are also covered by reports.

Map 1 Regional and county boundaries



Map 2 Distribution of woodland over 2 hectares

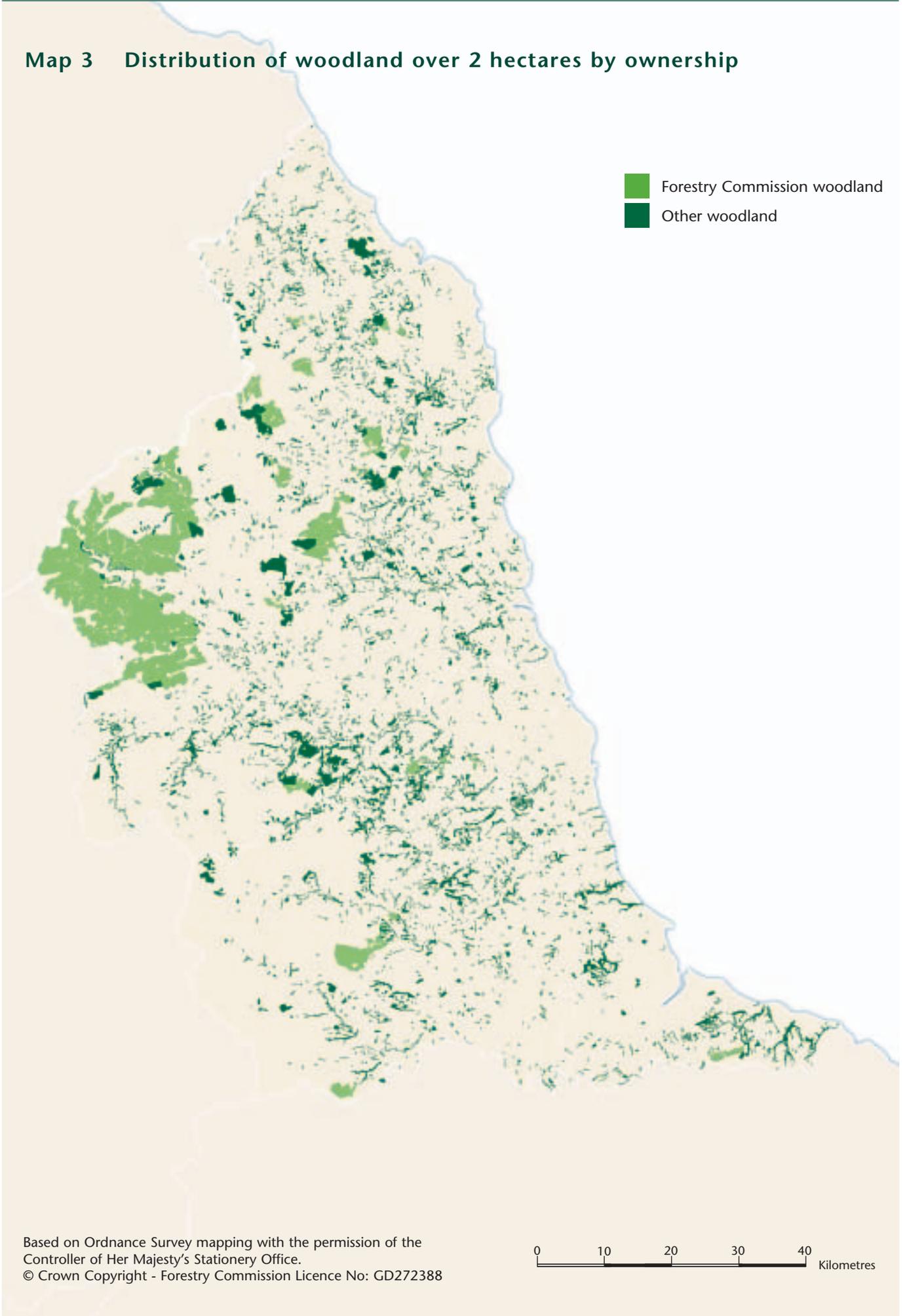


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0 10 20 30 40 Kilometres

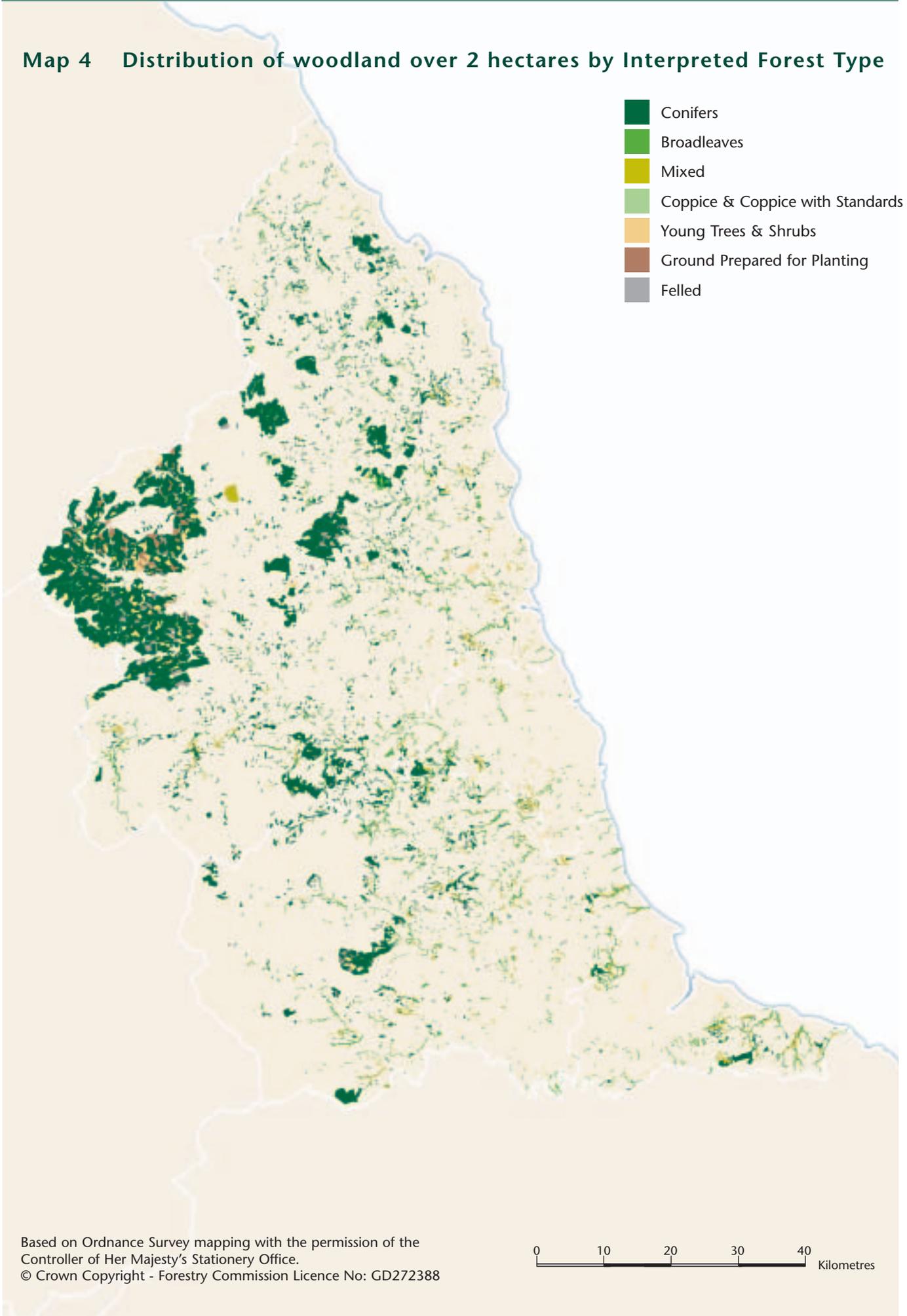
Map 3 Distribution of woodland over 2 hectares by ownership

- Forestry Commission woodland
- Other woodland



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



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0 10 20 30 40 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 North East 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	100 854	98.0
0.25 – < 2.00	2 013	2.0
0.10 – < 0.25	0	0.0
Total area of woodland	102 867	100.0
% Woodland land cover	12.0	

1. Area of North East Region, including inland water, 859 186 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	64 441	1 898	66 339	64.5
Broadleaved	21 613	115	21 728	21.1
Mixed	5 241	0	5 241	5.1
Coppiced	0	0	0	0.0
Copp-w-Standards	0	0	0	0.0
Windblow	426	0	426	0.4
Felled	4 838	0	4 838	4.7
Open Space	4 294	0	4 294	4.2
Total	100 854	2 013	102 867	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	13 884	348	14 232	20.6	15.2
Sitka spruce	42 588	759	43 347	62.6	46.2
Larch	4 643	316	4 959	7.2	5.3
Other conifers	6 132	0	6 132	8.9	6.5
Mixed conifers	106	443	549	0.8	0.6
Total conifers	67 353	1 866	69 219	100.0	73.8
Oak	4 966	0	4 966	20.3	5.3
Beech	2 851	0	2 851	11.6	3.0
Sycamore	4 645	22	4 667	19.0	5.0
Ash	3 351	19	3 370	13.7	3.6
Birch	4 218	32	4 250	17.3	4.5
Elm	100	0	100	0.4	0.1
Other broadleaves	2 824	56	2 880	11.7	3.1
Mixed broadleaves	1 412	19	1 431	5.8	1.5
Total broadleaves	24 368	148	24 516	100.0	26.2
Total all species†	91 721	2 013	93 735		100.0

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

** Species - species/group percentage of all species.

† Excludes the 9 132 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	3%
Broadleaves	4%
Pine	6%
Sitka spruce	3%
Oak	8%

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	30 900	140 500	5	16
Narrow Linear Features	2 100	37 400	18	4
Individual Trees	213 500	213 500	1	25
Total		391 400		46

1. Land area used to calculate tree density 859 186 ha based on digital boundaries used in 1991 Census of Population.
2. The standard errors of the live tree number estimates for these feature types are:

Groups	40%
Narrow Linear Features	88%
Individual Trees	16%
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	371	51	6
Narrow Linear Features	2 100	118	14
Total		169	20

1. Land area used to calculate feature density 859 186 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	99%
Narrow Linear Features	85%
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.

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	51 480	51
Other	49 374	49
Total area of woodland	100 854	100

1. Woodland area from aerial photographic interpretation map updated to 31 March 1999.
2. See Glossary for definitions of ownership types.

Woodland area by ownership

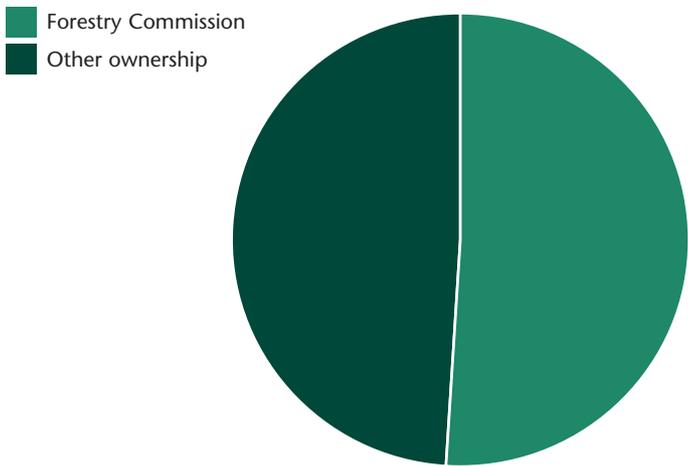


Table 7a Size class distribution of woodland

Size class (ha)	Number of woods	Total area (ha)	Percent of total area	Mean wood area (ha)
<10	2 421	10 494	10	4.3
10 – <20	460	6 400	6	13.9
20 – <50	268	8 125	8	30.3
50 – <100	102	7 339	7	72.0
2 – <100	3 251	32 361	32	10.0
100 – <500	65	13 206	13	203.2
500 and >	16	56 104	55	3 506.5
All woods	3 332	101 671	100	30.5

Table 7b Size class distribution of woodland by ownership units

Size class (ha)	FC or Other	Number of woods	Total area (ha)	Percent of total area	Mean wood area (ha)
<10	FC	26	101	0	5.3
	O	2 579	10 804	11	4.4
10 – <20	FC	17	249	0	14.6
	O	465	6 444	6	13.9
20 – <50	FC	19	630	1	33.2
	O	276	8 386	8	30.4
50 – <100	FC	13	962	1	74.0
	O	95	6 866	7	72.3
<100	FC	75	1 943	2	28.6
	O	3 415	32 499	32	9.8
100 – <500	FC	16	3 902	4	243.9
	O	58	12 140	12	209.3
500 and >	FC	9	45 808	45	5 089.8
	O	6	5 379	5	896.4
Total	FC	100	51 653	51	555.4
	O	3 479	50 018	49	14.8

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 817 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	23 267	47.1	41 174	80.0	64 441	63.9
Broadleaved	19 681	39.9	1 932	3.8	21 613	21.4
Mixed	4 789	9.7	452	0.9	5 241	5.2
Coppice	0	0.0	0	0.0	0	0.0
Copp-w-stds	0	0.0	0	0.0	0	0.0
Windblow	116	0.2	310	0.6	426	0.4
Felled	190	0.4	4 648	9.0	4 838	4.8
Open Space	1 331	2.7	2 963	5.8	4 294	4.3
Total	49 374	100.0	51 480	100.0	100 854	100.0

Area of woodland by forest type

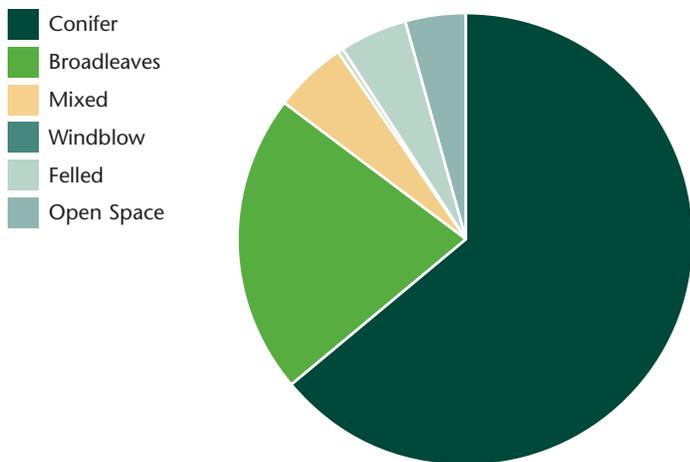


Table 9a Area of High Forest by principal species and ownership

Species	Forestry Commission			Other			All ownerships		
	area (ha)	cat* %	spp† %	area (ha)	cat* %	spp† %	area (ha)	cat* %	spp† %
Scots pine	2 784	7	6	7 718	30	16	10 502	16	11
Corsican pine	171	0	0	502	2	1	673	1	1
Lodgepole pine	1 955	5	4	754	3	2	2 709	4	3
Sitka spruce	33 397	80	76	9 191	36	19	42 588	63	46
Norway spruce	2 181	5	5	2 702	11	6	4 883	7	5
European larch	156	0	0	946	4	2	1 102	2	1
Japanese/hybrid larch	780	2	2	2 761	11	6	3 541	5	4
Douglas fir	200	0	0	732	3	2	933	1	1
Other conifers	130	0	0	186	1	0	316	0	0
Mixed conifers	16	0	0	90	0	0	106	0	0
Total conifers	41 771	100	95	25 582	100	53	67 353	100	73
Oak	74	4	0	4 892	22	10	4 966	20	5
Beech	150	7	0	2 701	12	6	2 851	12	3
Sycamore	152	7	0	4 493	20	9	4 645	19	5
Ash	26	1	0	3 325	15	7	3 351	14	4
Birch	695	33	2	3 524	16	7	4 218	17	5
Poplar	0	0	0	180	1	0	180	1	0
Sweet chestnut	0	0	0	16	0	0	16	0	0
Elm	0	0	0	100	0	0	100	0	0
Other broadleaves	192	9	0	2 436	11	5	2 628	11	3
Mixed broadleaves	808	39	2	604	3	1	1 412	6	2
Total broadleaves	2 097	100	5	22 271	100	47	24 368	100	27
Total – all species	43 868		100	47 853		100	91 721		100
Felled	4 648			190			4 838		
Total High Forest	48 516			48 043			96 559		

*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 4 294 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	4%
Scots pine	7%
Sitka spruce	3%
Oak	8%
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

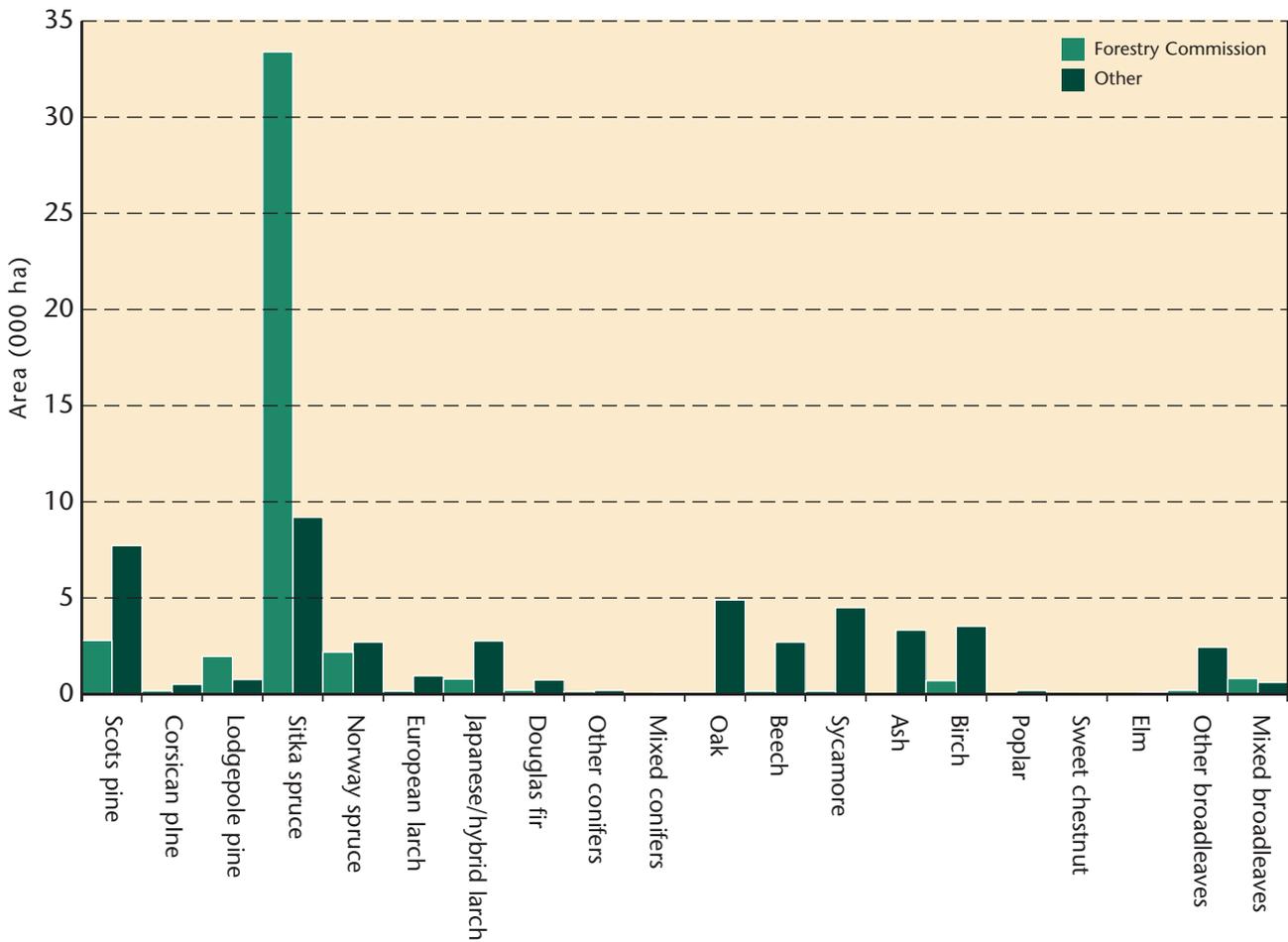


Table 9b Area of High Forest by principal species, ownership and category

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	2 734	50	2 784	7 464	254	7 718	10 199	303	10 502
Corsican pine	171	0	171	485	17	502	656	17	673
Lodgepole pine	1 577	378	1 955	581	173	754	2 158	552	2 709
Sitka spruce	32 321	1 076	33 397	9 153	39	9 191	41 473	1 115	42 588
Norway spruce	2 049	132	2 181	2 667	34	2 702	4 716	166	4,883
European larch	54	102	156	868	78	946	922	180	1 102
Japanese/hybrid larch	780	0	780	2 761	0	2 761	3 541	0	3 541
Douglas fir	200	0	200	724	8	732	924	8	933
Other conifers	120	10	130	129	57	186	249	67	316
Mixed conifers	11	5	16	85	5	90	96	10	106
Total conifers	40 018	1 754	41 771	24 917	665	25 582	64 934	2 419	67 353
Oak	61	13	74	3 836	1 056	4 892	3 897	1 069	4 966
Beech	136	15	150	2 399	303	2 701	2 534	317	2 851
Sycamore	136	16	152	3 791	702	4 493	3 927	718	4 645
Ash	26	0	26	2 618	707	3 325	2 645	707	3 351
Birch	203	492	695	1 383	2 141	3 524	1 585	2 633	4 218
Poplar	0	0	0	148	32	180	148	32	180
Sweet chestnut	0	0	0	9	7	16	9	7	16
Elm	0	0	0	60	39	100	60	39	100
Other broadleaves	64	127	192	962	1 474	2 436	1 026	1 601	2 628
Mixed broadleaves	65	743	808	334	270	604	399	1 013	1 412
Total broadleaves	691	1 406	2 097	15 541	6 730	22 271	16 232	8 136	24 368
Total – all species	40 709	3 160	43 868	40 458	7 395	47 853	81 167	10 555	91 721

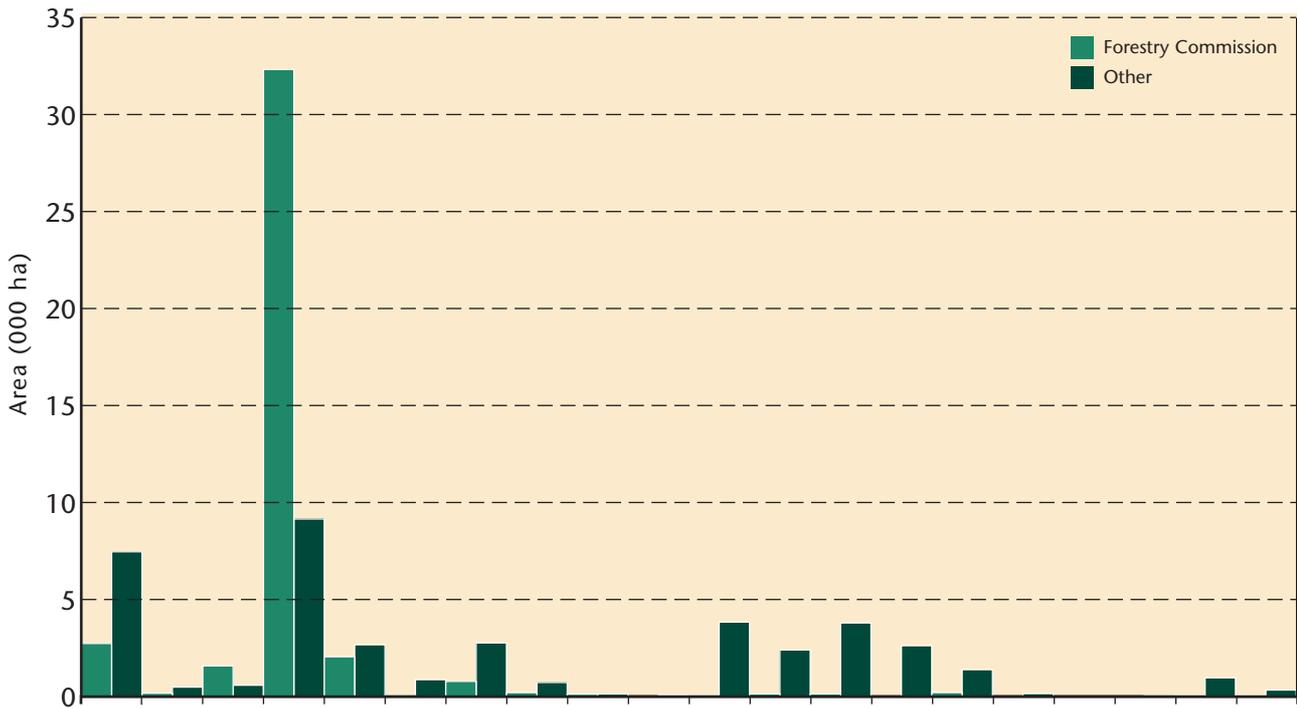
1. The standard errors of the All ownerships area estimates for the most common species or species groups (in all woodland types) are as follows:

	Category 1*	Category 2*	Total High Forest
Conifers	2%	14%	2%
Broadleaves	5%	6%	4%
Scots pine	7%	35%	7%
Sitka spruce	3%	24%	3%
Oak	9%	15%	8%

*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

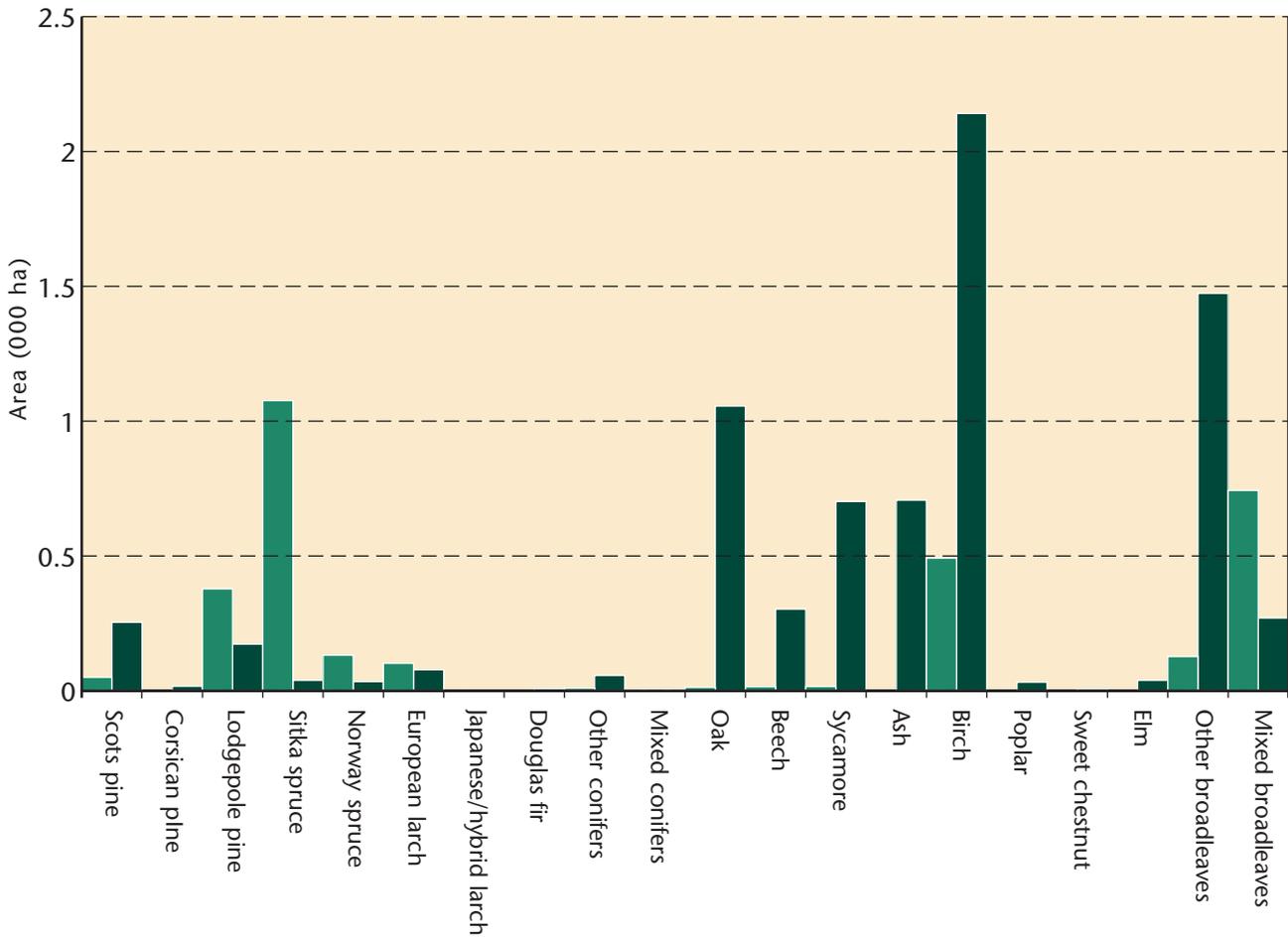
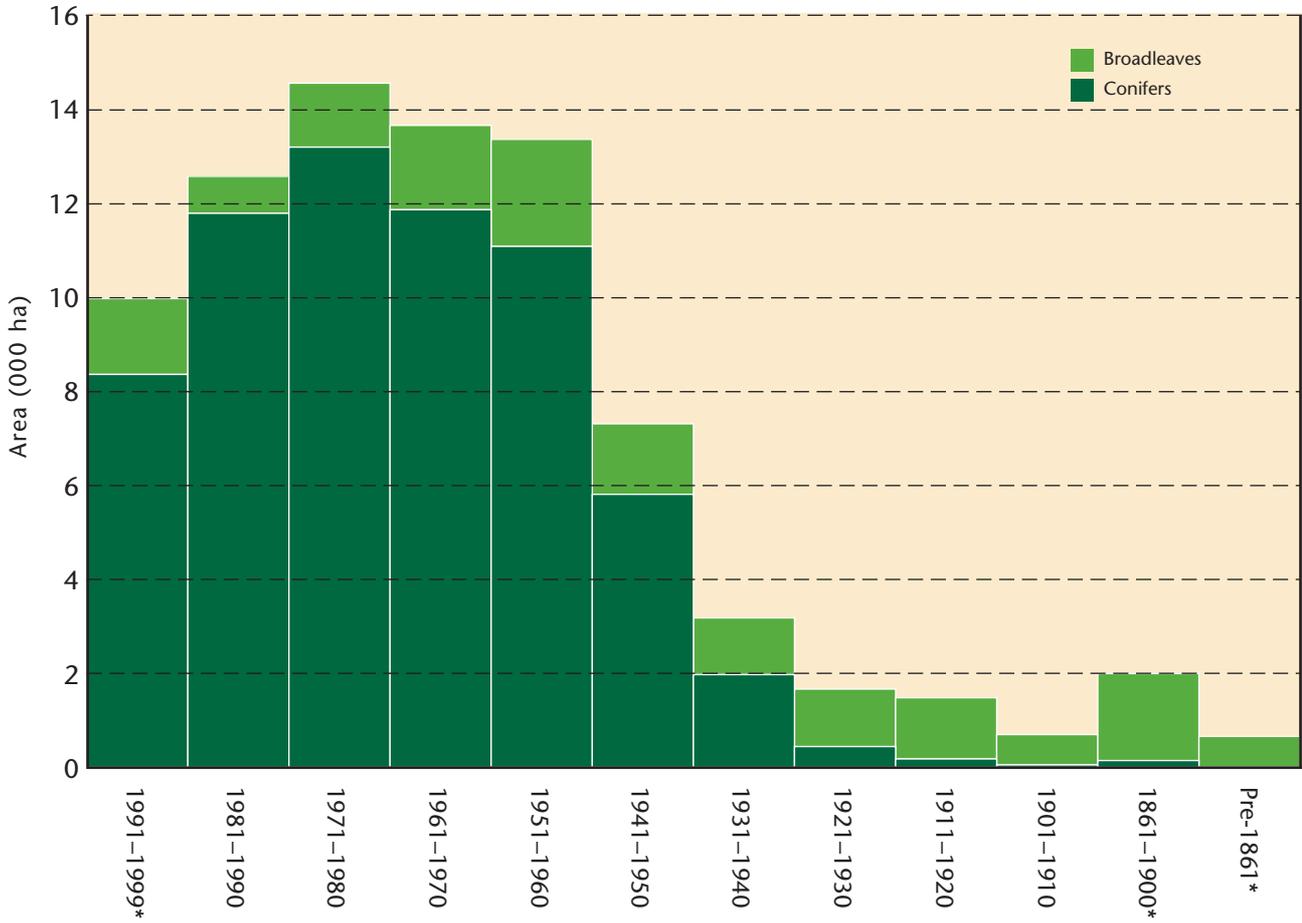


Table 10a High Forest Category 1 - Area by principal species and planting year class

Species	Planting year class*												Total (ha)
	1991 -1999	1981 -1990	1971 -1980	1961 -1970	1951 -1960	1941 -1950	1931 -1940	1921 -1930	1911 -1920	1901 -1910	1861 -1900	pre - 1861	
Scots pine	842	1 047	2 064	1 898	1 860	1 764	405	155	91	25	47	0	10 199
Corsican pine	56	26	273	89	3	82	29	94	5	0	0	0	656
Lodgepole pine	7	180	386	862	717	5	0	0	0	0	0	0	2 158
Sitka spruce	7 059	9 924	8 556	6 641	6 408	2 259	559	13	0	0	54	0	41 473
Norway spruce	119	204	1 005	929	959	851	595	19	16	0	20	0	4 716
European larch	61	52	107	190	268	167	51	5	0	0	22	0	922
Japanese/hybrid larch	170	246	662	843	680	539	251	97	43	8	0	0	3 541
Douglas fir	49	53	75	334	141	126	67	57	22	0	0	0	924
Other conifers	5	66	71	63	30	0	13	0	0	1	0	0	249
Mixed conifers	0	0	8	24	26	20	3	0	0	15	0	0	96
Total conifers	8 367	11 799	13 208	11 875	11 094	5 813	1 972	440	176	49	142	0	64 934
Oak	448	155	163	86	150	319	174	408	572	319	953	151	3 897
Beech	22	23	88	186	294	150	78	234	428	123	502	407	2 534
Sycamore	223	233	415	449	748	471	610	404	30	51	240	54	3 927
Ash	207	169	236	440	510	321	236	116	214	40	113	44	2 645
Birch	302	68	329	352	241	197	43	0	5	49	0	0	1 585
Poplar	0	6	42	73	27	0	0	0	0	0	0	0	148
Sweet chestnut	0	0	0	0	0	9	0	0	0	0	0	0	9
Elm	57	3	0	0	0	0	0	0	0	0	0	0	60
Other broadleaves	313	119	40	161	202	0	28	46	51	58	8	0	1 026
Mixed broadleaves	43	10	51	49	109	35	40	14	5	7	36	0	399
Total broadleaves	1 615	787	1 363	1 796	2 280	1 502	1 209	1 224	1 304	646	1 852	656	16 232
Total – all species	9 982	12 586	14 571	13 671	13 374	7 315	3 180	1 664	1 480	695	1 994	656	81 167

*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



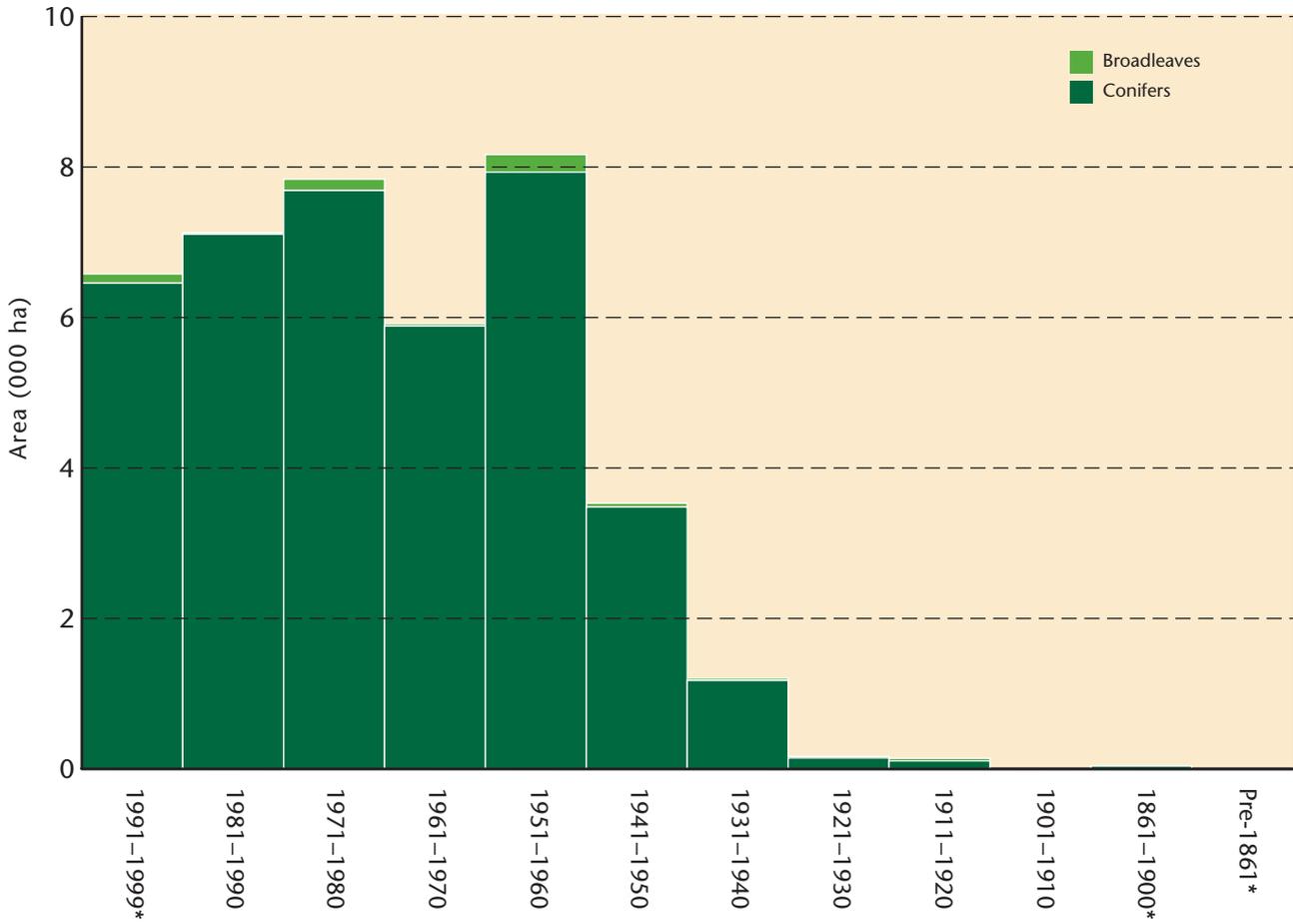
*Most of the planting year classes cover 10 years, 1991-1999 is 9 years, and the classes prior to 1901 are 40 years or more.

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

Species	Planting year class*												Total (ha)
	1991 -1999	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	76	644	407	723	355	58	107	91	0	38	0	2 734
Corsican pine	0	6	116	0	0	49	0	0	0	0	0	0	171
Lodgepole pine	0	0	220	722	629	5	0	0	0	0	0	0	1 577
Sitka spruce	6 103	6 782	6 479	4 590	5 825	2 129	412	0	0	0	0	0	32 321
Norway spruce	38	31	93	54	494	717	586	19	16	0	0	0	2 049
European larch	0	10	0	0	0	23	21	0	0	0	0	0	54
Japanese/hybrid larch	80	91	113	49	240	168	39	0	0	0	0	0	780
Douglas fir	0	49	18	15	5	35	59	19	0	0	0	0	200
Other conifers	0	62	3	49	5	0	0	0	0	1	0	0	120
Mixed conifers	0	0	0	0	11	0	0	0	0	0	0	0	11
Total conifers	6 456	7 107	7 687	5 886	7 932	3 482	1 176	146	107	1	38	0	40 018
Oak	11	5	0	0	5	15	8	17	0	0	0	0	61
Beech	0	0	16	0	50	34	0	2	34	0	0	0	136
Sycamore	0	0	0	0	136	0	0	0	0	0	0	0	136
Ash	11	0	16	0	0	0	0	0	0	0	0	0	26
Birch	32	15	101	32	19	0	3	0	0	0	0	0	203
Poplar	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweet chestnut	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other broadleaves	64	0	0	0	0	0	0	0	0	0	0	0	64
Mixed broadleaves	5	0	18	0	23	0	18	0	0	0	0	0	65
Total broadleaves	123	20	151	32	233	49	30	20	34	0	0	0	691
Total – all species	6 580	7 127	7 838	5 918	8 165	3 531	1 206	166	141	1	38	0	40 709

*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



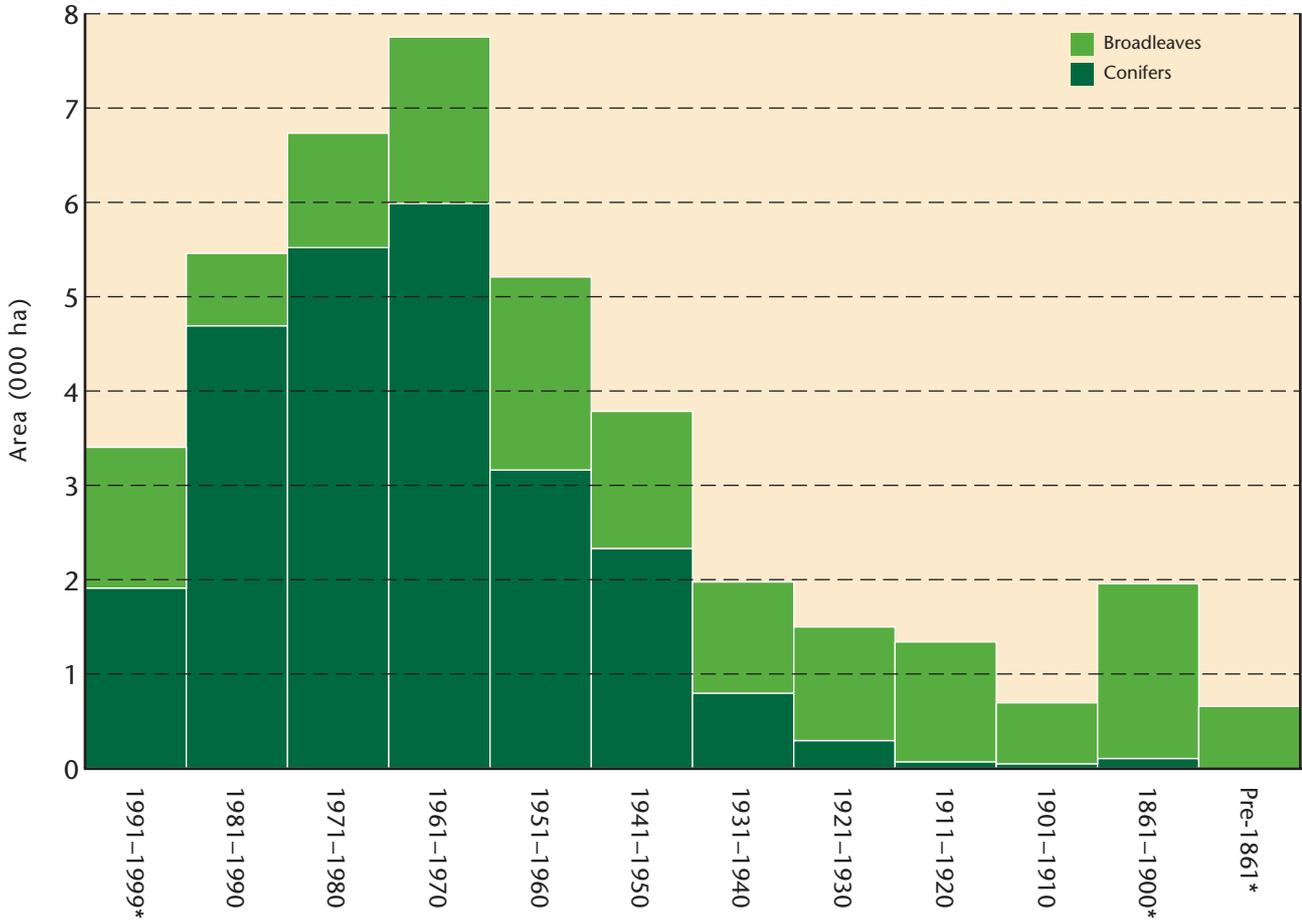
*Most of the planting year classes cover 10 years, 1991-1999 is 9 years, and the classes prior to 1901 are 40 years or more.

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

Species	Planting year class*												Total (ha)
	1991 -1999	1981 -1990	1971 -1980	1961 -1970	1951 -1960	1941 -1950	1931 -1940	1921 -1930	1911 -1920	1901 -1910	1861 -1900	pre - 1861	
Scots pine	607	972	1 420	1 491	1 137	1 409	346	48	0	25	9	0	7 464
Corsican pine	56	20	156	89	3	33	29	94	5	0	0	0	485
Lodgepole pine	7	180	166	140	88	0	0	0	0	0	0	0	581
Sitka spruce	956	3 142	2 077	2 051	583	130	146	13	0	0	54	0	9 153
Norway spruce	81	173	912	875	465	134	8	0	0	0	20	0	2 667
European larch	61	42	107	190	268	143	29	5	0	0	22	0	868
Japanese/hybrid larch	90	155	550	794	440	372	212	97	43	8	0	0	2 761
Douglas fir	49	5	56	319	136	91	8	38	22	0	0	0	724
Other conifers	5	4	68	14	25	0	13	0	0	0	0	0	129
Mixed conifers	0	0	8	24	15	20	3	0	0	15	0	0	85
Total conifers	1 911	4 692	5 521	5 989	3 162	2 331	796	294	69	48	104	0	24 917
Oak	438	150	163	86	146	304	165	391	572	319	953	151	3 836
Beech	22	23	72	186	244	116	78	232	394	123	502	407	2 399
Sycamore	223	233	415	449	612	471	610	404	30	51	240	54	3 791
Ash	196	169	220	440	510	321	236	116	214	40	113	44	2 618
Birch	270	53	228	320	222	197	40	0	5	49	0	0	1 383
Poplar	0	6	42	73	27	0	0	0	0	0	0	0	148
Sweet chestnut	0	0	0	0	0	9	0	0	0	0	0	0	9
Elm	57	3	0	0	0	0	0	0	0	0	0	0	60
Other broadleaves	249	119	40	161	202	0	28	46	51	58	8	0	962
Mixed broadleaves	38	10	33	49	86	35	21	14	5	7	36	0	334
Total broadleaves	1 492	767	1 212	1 764	2 047	1 453	1 179	1 204	1 270	646	1 852	656	15 541
Total – all species	3 402	5 459	6 733	7 753	5 209	3 784	1 974	1 498	1 339	694	1 957	656	40 458

*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

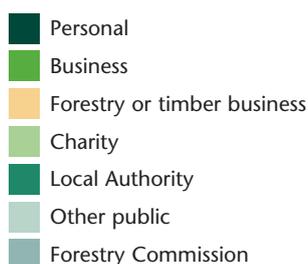
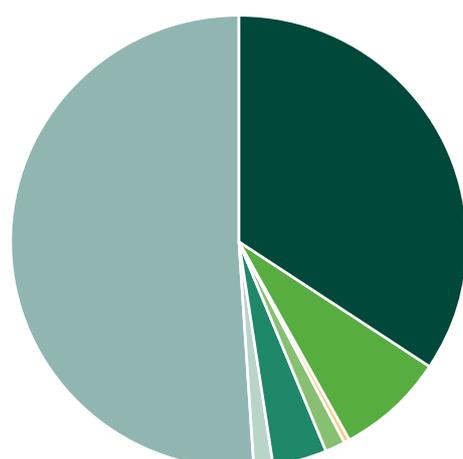


*Most of the planting year classes cover 10 years, 1991-1999 is 9 years, and the classes prior to 1901 are 40 years or more.

Table 11 High Forest: principal species by planting year class

Planting year class	First	%	Second	%	Third	%
1991–1999	Sitka spruce	65	Scots pine	8	Mixed broadleaves	7
1981–1990	Sitka spruce	75	Scots pine	8	Birch	4
1971–1980	Sitka spruce	56	Scots pine	13	Norway spruce	6
1961–1970	Sitka spruce	44	Scots pine	12	Birch	7
1951–1960	Sitka spruce	44	Scots pine	13	Norway spruce	7
1941–1950	Sitka spruce	29	Scots pine	21	Norway spruce	10
1931–1940	Sycamore	17	Sitka spruce	16	Norway spruce	15
1921–1930	Oak	24	Sycamore	23	Beech	14
1911–1920	Oak	39	Beech	24	Ash	13
1901–1910	Oak	48	Beech	15	Other broadleaves	8
1861–1900	Oak	49	Beech	21	Sycamore	14
Pre-1861	Beech	56	Oak	27	Sycamore	8
All years	Sitka spruce	46	Scots pine	11	Oak	5

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

Ownership type by area

Table 12 Ownership type* by area and percentage

Ownership type	Area (ha)	%
Personal	34 576	34
Business	7 742	8
Forestry or timber business	402	0
Charity	1 428	1
Local Authority	3 859	4
Other public (not FC)	1 367	1
Forestry Commission	51 480	51
Community ownership or common land	0	0
Unidentified	0	0
Total	100 854	100

*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 North East Region was stratified into coastal and inland 1 km x 1 km squares. A random sample of the 1 km² 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 km² 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	1 265	1 898	Area (ha)
Wide Linear Features	371	115	Area (ha)
Wide Linear Features	371	51	Length (km)
Narrow Linear Features	2 100	118	Length (km)
Narrow Linear Features	2 100	37 400	Number of live trees
Groups	30 900	140 500	Number of live trees
Individual Trees	213 500	213 500	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	0	1 898	1 898	1 265	1.50
Wide Linear Features	0	115	115	371	0.31
Total	0	2 013	2 013	1 636	1.23

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

Small Woods 99%
 Wide Linear Features 99%

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)						Total area (ha) SW + WLF
	0.1 – <0.25		0.25 – <2.0		0.1 – <2.0		
	SW*	WLF†	SW	WLF	SW	WLF	
Conifer	0	0	1 898	0	1 898	0	1 898
Broadleaved	0	0	0	115	0	115	115
Mixed	0	0	0	0	0	0	0
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	0	0	0	0	0
Total	0	0	1 898	115	1 898	115	2 013

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

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

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	348	0	348	18.6	17.3
Spruce	759	0	759	40.7	37.7
Larch	316	0	316	16.9	15.7
Cypress	0	0	0	0.0	0.0
Other conifers	0	0	0	0.0	0.0
Mixed conifers	443	0	443	23.7	22.0
Total conifers	1 866	0	1 866	100.0	92.6
Oak	0	0	0	0.0	0.0
Beech	0	0	0	0.0	0.0
Sycamore	0	22	22	14.9	1.1
Ash	0	19	19	12.8	0.9
Birch	32	0	32	21.6	1.6
Poplar	0	0	0	0.0	0.0
Sweet chestnut	0	0	0	0.0	0.0
Horse chestnut	0	0	0	0.0	0.0
Alder	0	56	56	37.8	2.8
Lime	0	0	0	0.0	0.0
Elm	0	0	0	0.0	0.0
Willow	0	0	0	0.0	0.0
Other broadleaves	0	0	0	0.0	0.0
Mixed broadleaves	0	19	19	12.8	0.9
Total broadleaves	32	115	148	100.0	7.4
Total – all species	1 898	115	2 013		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:

Pine 99%
 Spruce 99%
 Other conifers 99%
 Alder 98%

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	1.6	0.0	0.0	1.5	3.1	25.2	0.8
Spruce	0.0	0.0	4.0	3.3	7.3	59.3	1.9
Larch	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cypress	1.9	0.0	0.0	0.0	1.9	15.4	0.5
Other conifers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total conifers	3.5	0.0	4.0	4.8	12.3	100.0	3.1
Oak	34.1	7.3	2.5	0.0	43.9	11.6	11.2
Beech	2.4	0.0	2.4	0.0	4.8	1.3	1.2
Sycamore	9.6	6.5	12.9	3.2	32.2	8.5	8.2
Ash	73.2	5.6	25.7	2.6	107.1	28.3	27.4
Birch	2.7	2.5	8.2	0.0	13.4	3.5	3.4
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	1.6	0.8	3.3	4.1	9.8	2.6	2.5
Lime	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Elm	0.0	0.0	0.0	1.5	1.5	0.4	0.4
Willow	3.8	1.9	16.4	8.5	30.6	8.1	7.8
Other broadleaves	38.7	19.2	65.2	12.6	135.7	35.8	34.7
Total broadleaves	166.1	43.8	136.5	32.6	379.0	100.0	96.8
Total – all species	169.6	43.8	140.5	37.4	391.4		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 16%
 Groups 40%
 Narrow Linear Features 88%

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	0.0	0.0	0.0	0.4	0.4	100.0	4.3
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	0.4	0.4	100.0	4.3
Oak	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beech	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sycamore	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ash	0.8	0.8	0.0	0.0	1.6	17.8	17.2
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	0.8	0.0	0.0	0.0	0.8	8.9	8.6
Lime	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Elm	0.0	0.0	0.0	0.4	0.4	4.4	4.3
Willow	0.0	0.0	0.0	0.4	0.4	4.4	4.3
Other broadleaves	0.8	2.5	2.5	0.0	5.8	64.4	62.4
Total broadleaves	2.4	3.3	2.5	0.7	9.0	100.0	96.8
Total – all species	2.4	3.3	2.5	1.1	9.3		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	0.8	0.8	0.0	0.0	1.6
Spruce	0.0	0.0	0.0	0.0	0.0
Larch	0.0	0.0	0.0	0.0	0.0
Cypress	1.9	0.0	0.0	0.0	1.9
Other conifers	0.0	0.0	0.0	0.0	0.0
Total conifers	2.7	0.8	0.0	0.0	3.5
Oak	11.5	26.7	3.3	0.0	41.5
Beech	0.0	1.6	0.8	0.0	2.4
Sycamore	3.2	11.2	1.6	0.0	16.0
Ash	31.6	42.3	4.9	0.0	78.8
Birch	4.4	0.8	0.0	0.0	5.2
Poplar	0.0	0.0	0.0	0.0	0.0
Sweet chestnut	0.0	0.0	0.0	0.0	0.0
Horse chestnut	0.0	0.0	0.0	0.0	0.0
Alder	0.8	1.6	0.0	0.0	2.4
Lime	0.0	0.0	0.0	0.0	0.0
Elm	0.0	0.0	0.0	0.0	0.0
Willow	2.5	3.2	0.0	0.0	5.7
Other broadleaves	53.1	4.9	0.0	0.0	58.0
Total broadleaves	107.1	92.3	10.6	0.0	210.0
Total – all species	109.7	93.2	10.6	0.0	213.5

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	0.0	0.0	0.0	0.0	0.0
Spruce	4.0	0.0	0.0	0.0	4.0
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	4.0	0.0	0.0	0.0	4.0
Oak	0.0	0.0	2.5	0.0	2.5
Beech	0.0	2.4	0.0	0.0	2.4
Sycamore	4.8	8.1	0.0	0.0	12.9
Ash	12.8	8.9	4.1	0.0	25.8
Birch	6.5	1.6	0.0	0.0	8.1
Poplar	0.0	0.0	0.0	0.0	0.0
Sweet chestnut	0.0	0.0	0.0	0.0	0.0
Horse chestnut	0.0	0.0	0.0	0.0	0.0
Alder	0.0	3.3	0.0	0.0	3.3
Lime	0.0	0.0	0.0	0.0	0.0
Elm	0.0	0.0	0.0	0.0	0.0
Willow	16.4	0.0	0.0	0.0	16.4
Other broadleaves	48.9	16.4	0.0	0.0	65.3
Total broadleaves	89.4	40.7	6.6	0.0	136.7
Total – all species	93.4	40.7	6.6	0.0	140.5

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	0.4	1.1	0.0	0.0	1.5
Spruce	0.4	3.0	0.0	0.0	3.4
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	0.8	4.1	0.0	0.0	4.9
Oak	0.0	0.0	0.0	0.0	0.0
Beech	0.0	0.0	0.0	0.0	0.0
Sycamore	0.4	1.0	1.9	0.0	3.3
Ash	0.0	0.7	1.9	0.0	2.6
Birch	0.0	0.0	0.0	0.0	0.0
Poplar	0.0	0.0	0.0	0.0	0.0
Sweet chestnut	0.0	0.0	0.0	0.0	0.0
Horse chestnut	0.0	0.0	0.0	0.0	0.0
Alder	0.0	4.1	0.0	0.0	4.1
Lime	0.0	0.0	0.0	0.0	0.0
Elm	0.4	1.1	0.0	0.0	1.5
Willow	1.5	7.1	0.0	0.0	8.6
Other broadleaves	4.8	7.8	0.0	0.0	12.6
Total broadleaves	7.1	21.8	3.8	0.0	32.7
Total – all species	7.9	25.9	3.8	0.0	37.4

Table 22 Number of Groups by group size

Number of trees per Group*	Number of Groups (000s)
2	3
3-5	16
6-10	5
11-20	6
21-50	0
51-100	0
>100	0
Total	31

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

COMPARISON OF RESULTS WITH THE 1980 CENSUS AND PREVIOUS SURVEYS

Survey method

The 1980 Census and 1999 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 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 1999 Inventory
Table 24:	Comparison of High Forest area by species between 1980 Census and 1999 Inventory
Chart:	Comparison of High Forest area by species between 1980 Census and 1999 Inventory
Table 25:	Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1999 Inventory
Chart:	Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1999 Inventory
Table 26:	Comparison of numbers of live trees outside woodland between 1980 Census and 1999 Inventory
Table 27:	Comparison of density of non-woodland features between 1980 Census and 1999 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 1999 Inventory

Woodland size (ha)	1980 Census woodland area		1999 Inventory woodland area		Change (%)
	(ha)	(%)	(ha)	(%)	(%)
2.0 or more	90 485	95.5	100 854	98.0	11
0.25 – <2.0	4 270	4.5	2 013	2.0	-53
Total	94 755		102 867		9
% Woodland land cover	11.0		12.0		

1. Differences in sampling methodology may account for some of the apparent differences.
2. The above figures from the 1999 Inventory exclude woodland between 0.1 and <0.25 hectares, thereby matching the scope of the 1980 Census. These 1999 figures will therefore not match those in the previous sections of the report.
3. Land area used to calculate woodland cover percent (1999), 859 186 hectares, was based on the 1991 Census of Population digital boundaries.
4. Land area used to calculate woodland cover percent (1980), 859 069 hectares, (Ordnance Survey data)

Table 24 Comparison of High Forest area by species between 1980 Census and 1999 Inventory

Species	1980 Census woodland area (ha)	1999 Inventory woodland area (ha)	Change (%)
Scots pine	11 390	10 850	-5
Corsican pine	738	673	-9
Lodgepole pine	6 185	2 709	-56
Sitka spruce	35 992	43 347	20
Norway spruce	9 227	4 883	-47
European larch	1 719	1 102	-36
Japanese/hybrid larch	3 232	3 857	19
Douglas fir	920	933	1
Other conifers	655	316	-52
Mixed conifers	3 227	549	-83
Total conifers	73 284	69 219	-6
Oak	2 373	4 966	109
Beech	1 182	2 851	141
Sycamore	2 491	4 667	87
Ash	1 189	3 370	183
Birch	2 922	4 250	45
Poplar	151	180	19
Sweet chestnut	0	16	-
Elm	695	100	-86
Other broadleaves	1 801	2 684	49
Mixed broadleaves	3 433	1 431	-58
Total broadleaves	16 237	24 515	51
Total – all species	89 521	93 734	5
Felled	1 249	4 838	287
Total High Forest	90 771	98 572	9

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 4.2% (Table 2). To obtain meaningful comparisons between the two datasets the 1980 Census data have therefore been reduced by 4.2%.
3. The above figures from the 1999 Inventory exclude woodland between 0.1 and <0.25 ha, thereby matching the scope of the 1980 Census. The 1999 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 1999 Inventory

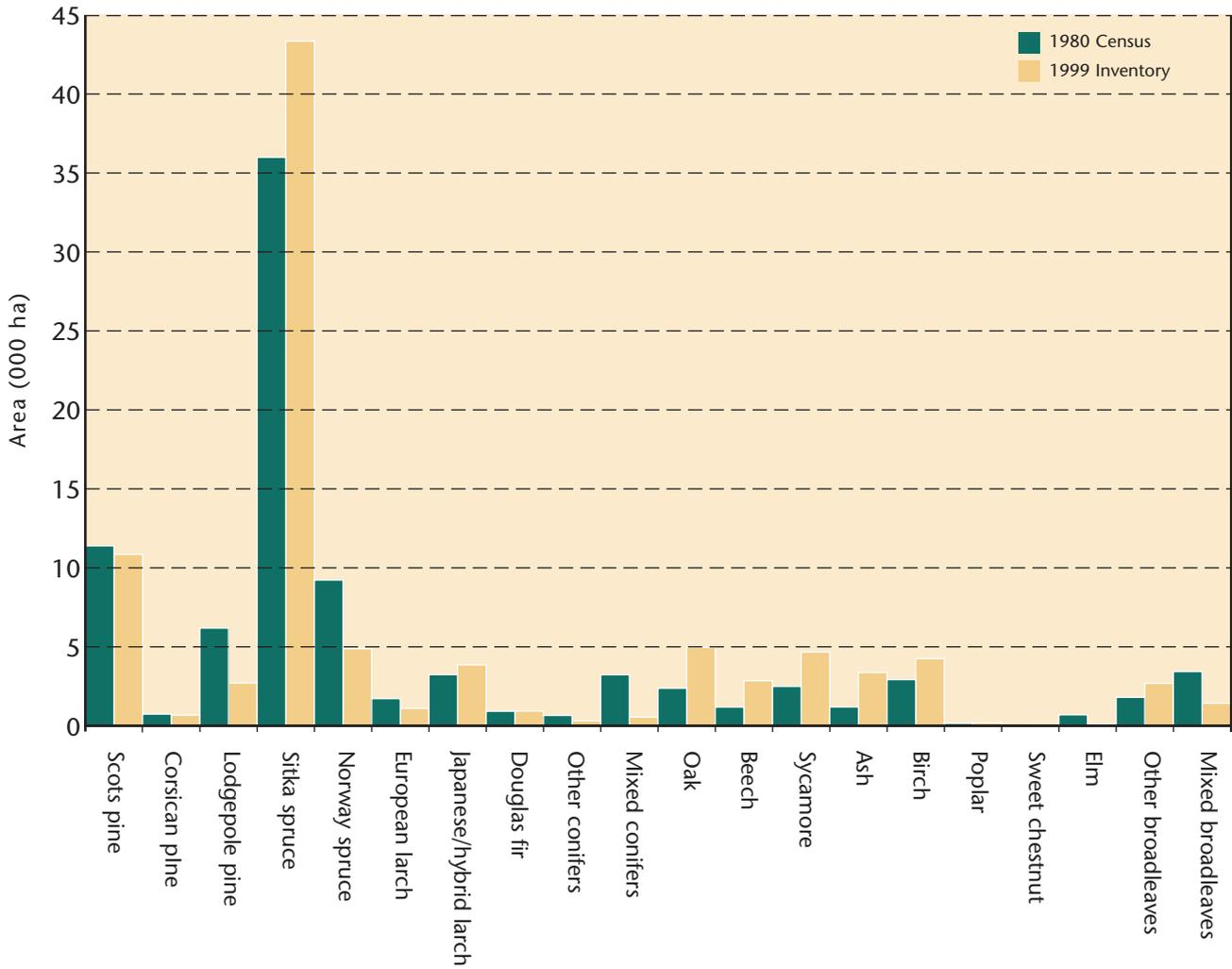


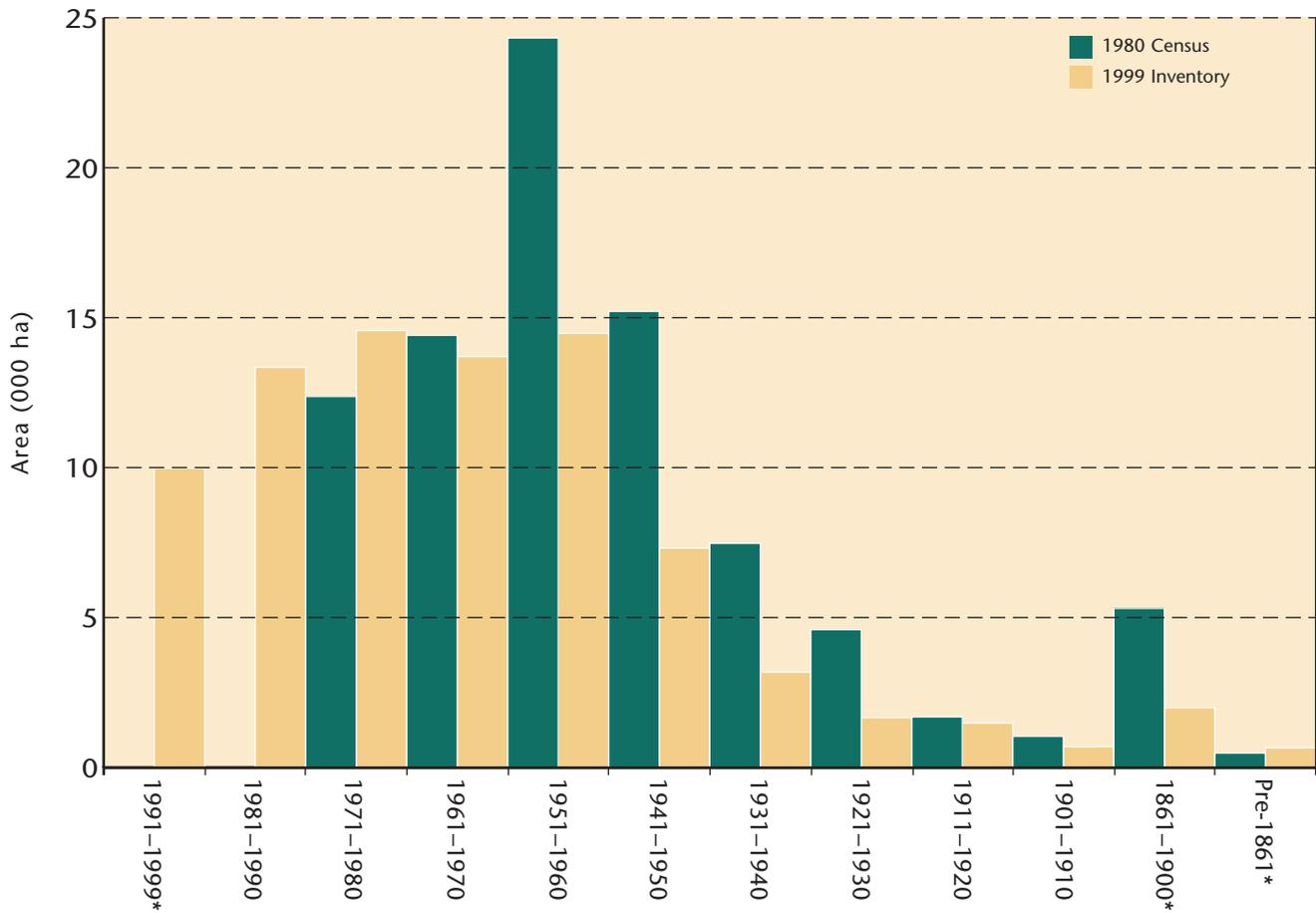
Table 25 Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1999 Inventory

Planting year class	1980 Census woodland area (ha)	1999 Inventory woodland area (ha)	Change (%)
1991–1999	-	9 982	-*
1981–1990	-	13 345	-*
1971–1980	12 373	14 571	18
1961–1970	14 410	13 703	-5
1951–1960	24 327	14 481	-40
1941–1950	15 211	7 315	-52
1931–1940	7 474	3 181	-57
1921–1930	4 595	1 664	-64
1911–1920	1 688	1 480	-12
1901–1910	1 040	695	-33
1861–1900	5 307	1 994	-62
Pre-1861	480	656	37
Total: all years	86 906	83 067	-4

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

1. The comparison cannot be made on an 'All High Forest' basis as information in the 1980 Census for planting year classes was not reported for stands with timber potential lower than Category 1.
2. 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 1999 Inventory



*Most of the planting year classes cover 10 years, 1991-1999 is 9 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 1999 Inventory (000s trees)

Feature type	1980 Census	1999 Inventory	Change (%)
Boundary Tree	193	143	-26
Middle Tree	121	29	-76
Total Individual Trees	313	172	-45
Groups	399	75	-81
Linear Features	411	25	-94
Total	1 124	272	-76

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 1999 Inventory figures have been adjusted accordingly. The 1999 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 1999 Inventory, the two surveys are not directly comparable - 1980 used 7cm diameter at breast height and 1999 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 1999 Inventory

Feature type	1980 Census	1999 Inventory	Change (%)
Individual Trees (per km ²)	36.5	20.0	-45
Groups (per km ²)	7.2	2.2	-69
Linear Features (m per km ²)	178.1	13.7	-92

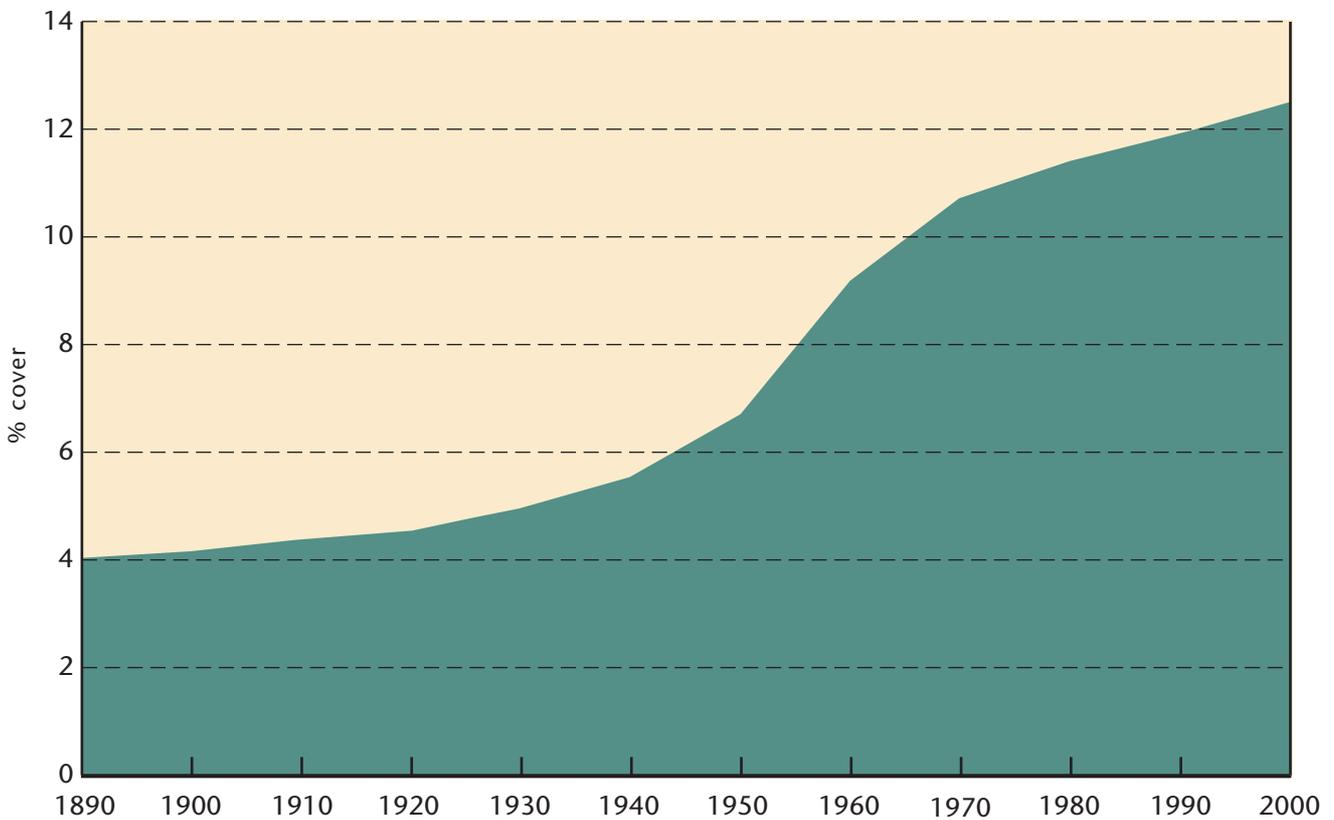
1. The Survey of Small Woodland and Trees did not record information referring to tree features (i.e. Individual trees, Groups and Narrow Linear features) within developed land.
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3. Changes stated in this table are indicative only. Even with adjustments to the 1999 Inventory, the two surveys are not directly comparable - 1980 used 7 cm diameter at breast height and 1999 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.

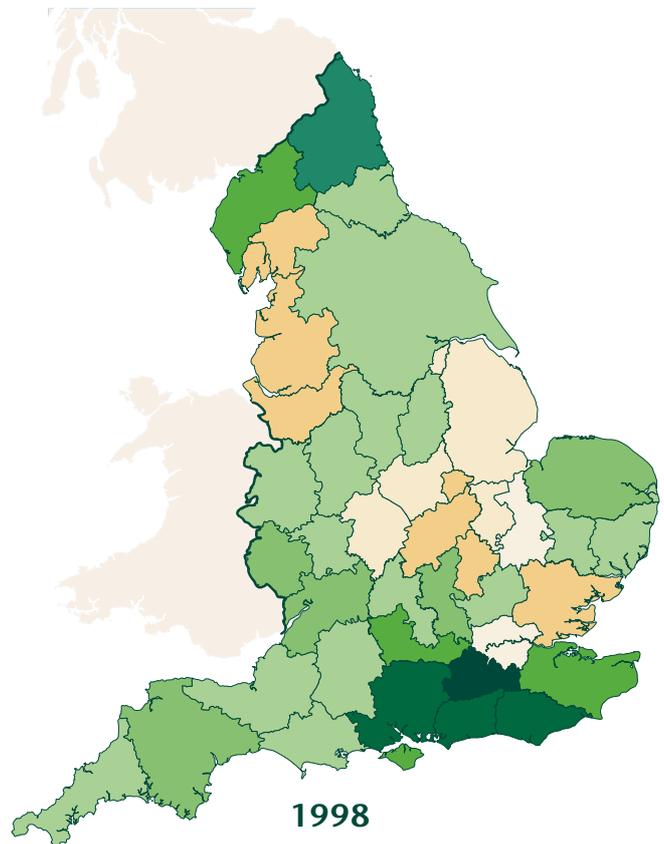
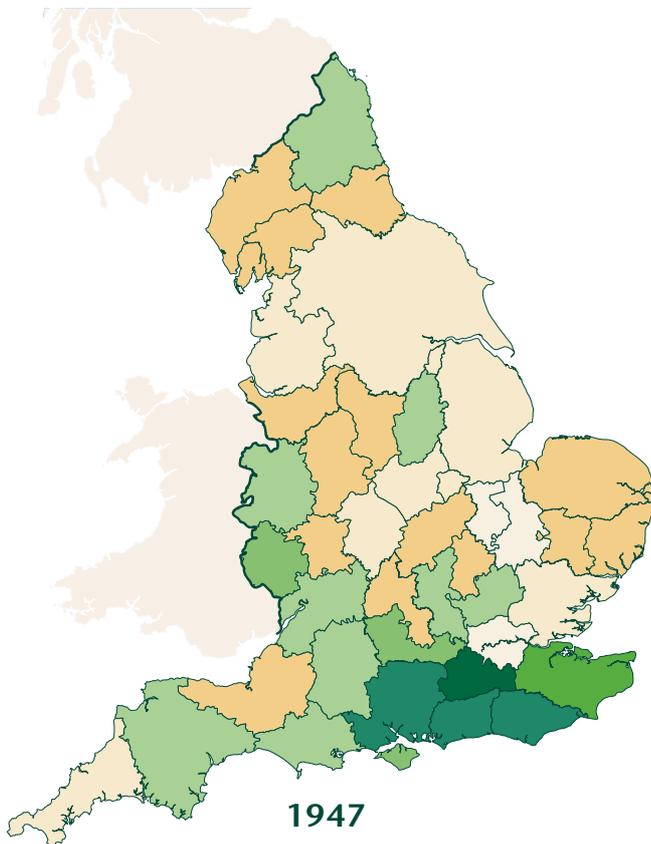
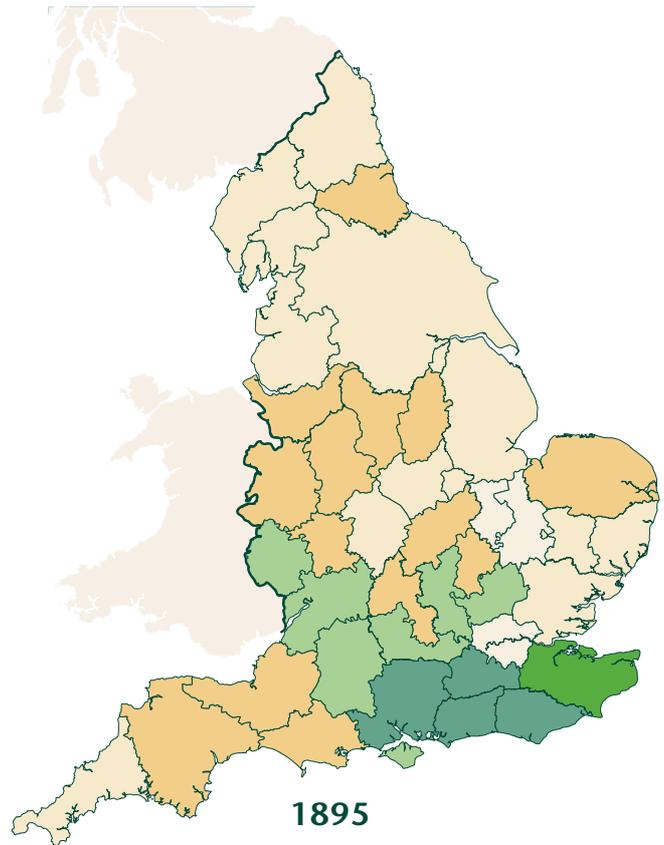
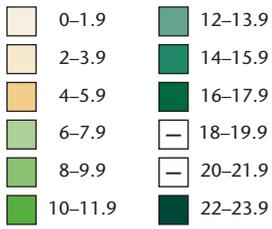
The maps use the old county structure of England, as reported on in 1895 and 1947. The data from these counties could not be re-analysed for different geographic areas. In contrast, the digital woodland map, which forms the basis of the current inventory, can be re-analysed for any geographic area.

Change in woodland cover through time (1890–2000)



Map 5 Woodland cover by county through time (1895–1998)

% woodland cover



APPENDICES

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

- 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		
Cleveland	3 746	44	3 790	6.4
Durham	15 104	436	15 540	6.4
Northumberland	79 308	1 337	80 645	16.0
Tyne and Wear	2 696	196	2 892	5.4
Total	100 854	2 013	102 867	12.0

*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	
Cleveland	1 013	2 068	586	0	0	0	0	124	3 791
Durham	6 702	7 176	1 347	0	0	0	19	296	15 540
Northumberland	57 836	10 728	3 001	0	0	426	4 819	3 835	80 645
Tyne and Wear	788	1 756	308	0	0	0	0	40	2 892
Total	66 339	21 728	5 242	0	0	426	4 838	4 295	102 868

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 km ²)
		Groups	Narrow Linear Feature	Individual Trees		
Cleveland	Features	0.0	0.0	8.6		
	Live Trees	0.0	0.0	8.6	8.6	14
Durham	Features	9.6	0.6	84.7		
	Live Trees	48.7	4.3	84.7	137.7	57
Northumberland	Features	21.3	1.5	118.8		
	Live Trees	91.8	33.1	118.8	243.7	48
Tyne and Wear	Features	0.0	0.0	1.4		
	Live Trees	0.0	0.0	1.4	1.4	3
Total	Features	30.9	2.1	213.5		
	Live Trees	140.5	37.4	213.5	391.4	46

*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 km ²)
Cleveland	0.0	0	0
Durham	0.6	19	8
Northumberland	372.5	150	30
Tyne and Wear	0.0	0	0
Total	373.1	168.9	20

* 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



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