



NATIONAL INVENTORY OF WOODLAND AND TREES



ENGLAND

Regional Report for NORTH WEST



Forestry Commission



Forestry Commission

Inventory Report

**NATIONAL INVENTORY OF
WOODLAND AND TREES**



ENGLAND

**Regional Report for
NORTH WEST**

Forestry Commission, Edinburgh

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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 North 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.

INTRODUCTION

This Report presents the results for North 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 With the statistics becoming increasingly out of date the Forestry Commission decided to undertake a new survey: the *National Inventory of Woodland and Trees*.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 North 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 North 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 North West 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 West Region is 96 171 hectares. This represents 6.8% of the land area (Table 1).
- Broadleaved woodland is the dominant forest type representing 43.7% of all woodland. Conifer woodland represents 36.7%, Mixed woodland 10.2% and Open Space within woodlands 6.7% (Table 2).
- The main conifer is Sitka spruce covering 19 841 hectares or 49.6% of all conifer species. The main broadleaved species is oak covering 13 063 hectares or 27.5% of all broadleaved species (Table 3).
- 23 166 hectares or 25% of woodland over 2 hectares is owned by or leased to the Forestry Commission, and 68 166 hectares or 75% of woodland is in Other ownerships (Table 6).
- There are 5 129 woods over 2 hectares within North West Region with a mean wood area of 17.9 hectares (Table 7a). There are a total of 15 672 woods from 0.1 – <2.0 hectares with a mean wood area of 0.3 hectares (Table 14).
- There are 9.2 million live trees and 75.2 thousand dead trees outside woodland in North West Region (Tables 17 and 18).
- Woodland land cover increased by over 16 050 hectares from 5.6% to 6.7% of the land area between 1980 and 1999 (Table 23).
- The area of Broadleaves increased by 41% between 1980 and 1999, with the relative proportion of Broadleaves to Conifers increasing from 46% to 54% (Table 24).

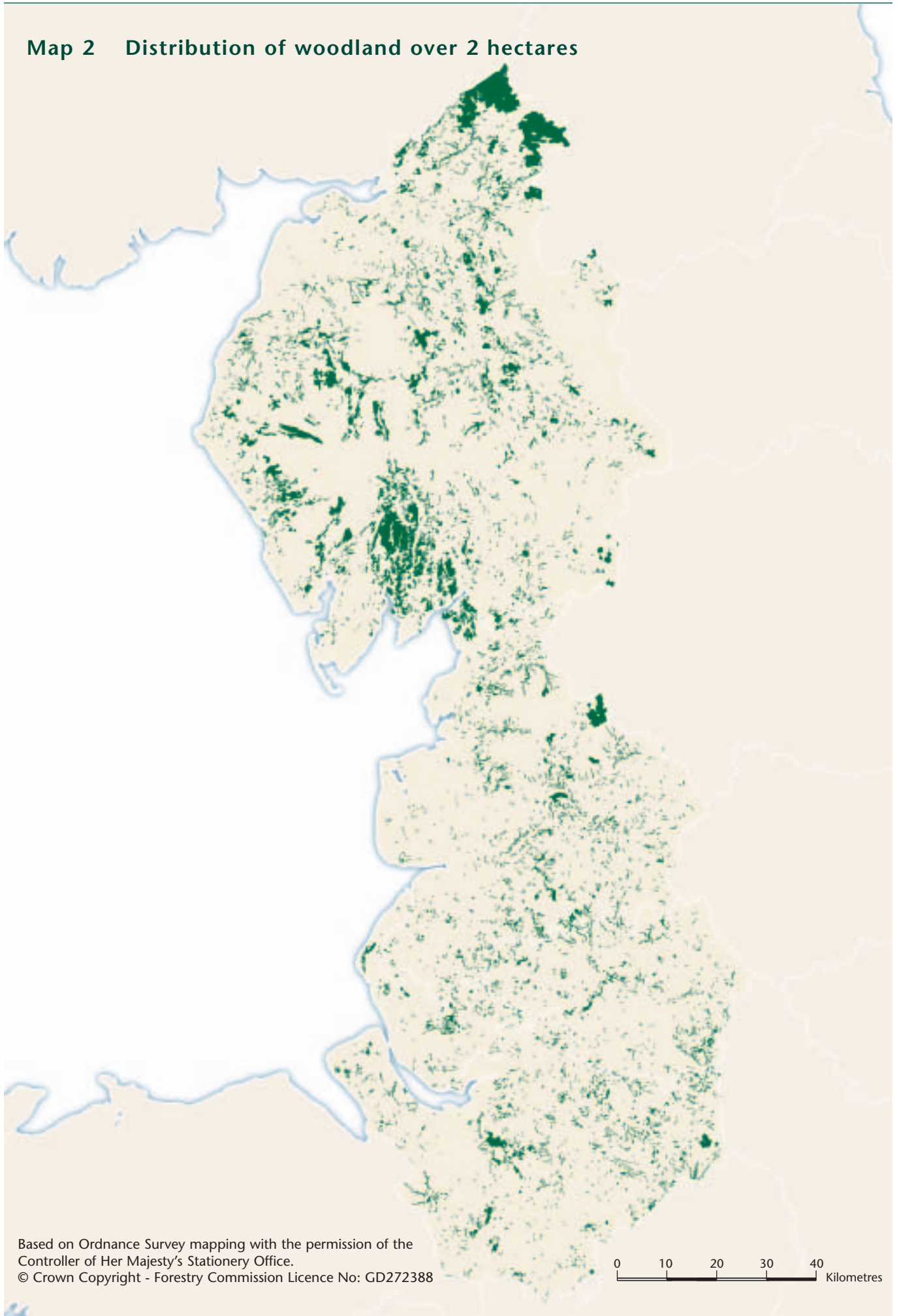
INVENTORY REPORTS

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 North West Region). Country and county reports for Wales, and country and region reports for Scotland are also available.

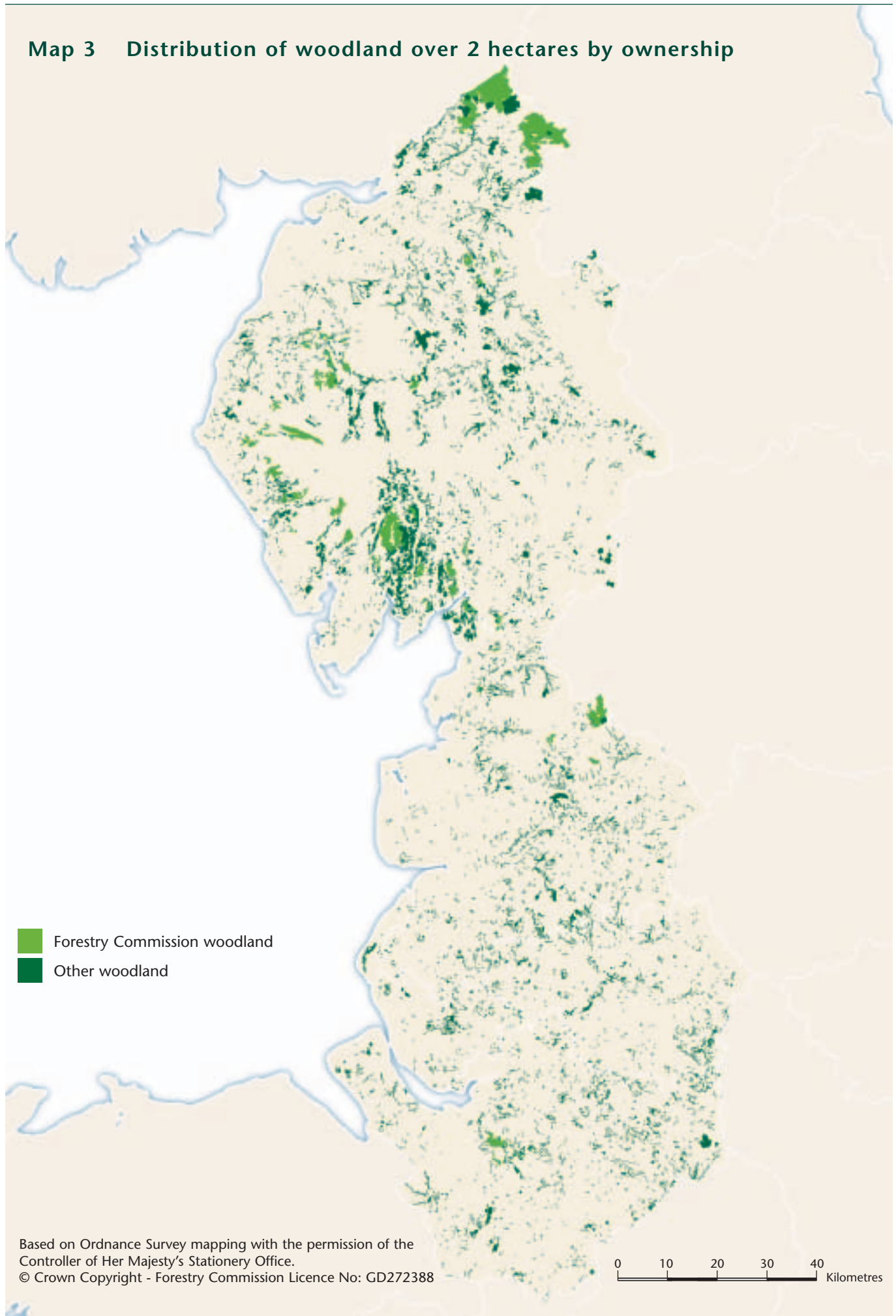
Map 1 Regional and county boundaries



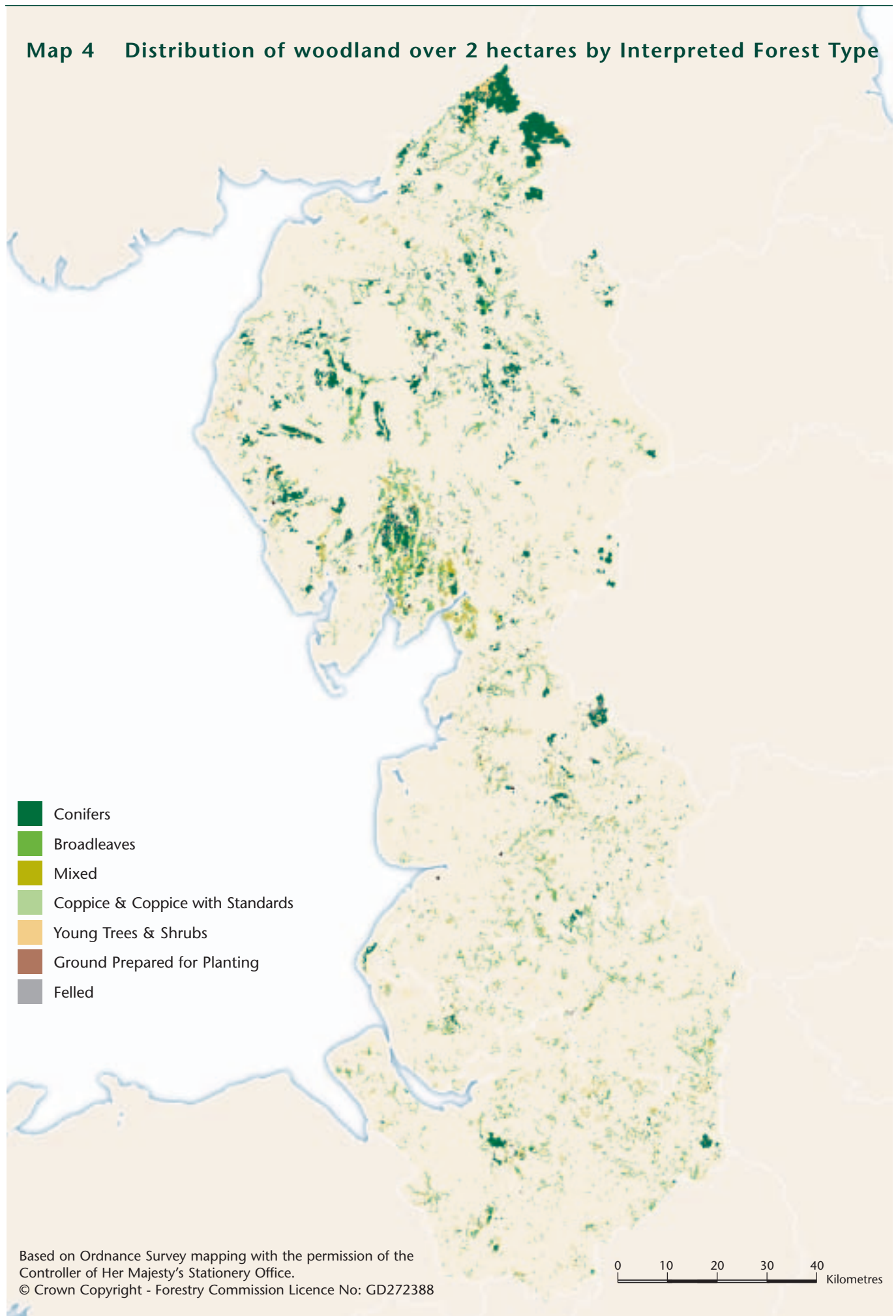
Map 2 Distribution of woodland over 2 hectares



Map 3 Distribution of woodland over 2 hectares by ownership



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



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 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 | 91 332 | 95.0 |
| 0.25 – < 2.00 | 3 813 | 4.0 |
| 0.10 – < 0.25 | 1 026 | 1.1 |
| Total area of woodland | 96 171 | 100.0 |
| % Woodland land cover | 6.8 | |

1. Area of North West Region, including inland water, 1 416 518 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 | 34 785 | 542 | 35 327 | 36.7 |
| Broadleaved | 38 688 | 3 361 | 42 049 | 43.7 |
| Mixed | 8 908 | 877 | 9 785 | 10.2 |
| Coppiced | 82 | 0 | 82 | 0.1 |
| Copp-w-Standards | 25 | 0 | 25 | 0.0 |
| Windblow | 347 | 0 | 347 | 0.4 |
| Felled | 2 078 | 0 | 2 078 | 2.2 |
| Open Space | 6 418 | 59 | 6 477 | 6.7 |
| Total | 91 332 | 4 838 | 96 171 | 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 | 7 601 | 219 | 7 820 | 19.6 | 8.9 | | | | |
| Sitka spruce | | 19 622 | 219 | 19 841 | 49.6 | 22.7 | | | |
| Larch | 5 461 | 256 | 5 717 | 14.3 | 6.5 | | | | |
| Other conifers | 6 118 | 0 | 6 118 | 15.3 | 7.0 | | | | |
| Mixed conifers | 298 | 176 | 474 | 1.2 | 0.5 | | | | |
| Total conifers | | 39 101 | 871 | 39 972 | 100.0 | 45.7 | | | |
| Oak | 11 866 | 1 197 | 13 063 | 27.5 | 14.9 | | | | |
| Beech | 3 606 | 103 | 3 709 | 7.8 | 4.2 | | | | |
| Sycamore | | 5 368 | 103 | 5 471 | 11.5 | 6.3 | | | |
| Ash | 4 223 | 242 | 4 465 | 9.4 | 5.1 | | | | |
| Birch | 9 645 | 539 | 10 184 | 21.4 | 11.6 | | | | |
| Elm | 80 | 0 | 80 | 0.2 | 0.1 | | | | |
| Other broadleaves | | | 6 779 | 906 | 7 685 | 16.2 | 8.8 | | |
| Mixed broadleaves | | | 2 060 | 820 | 2 880 | 6.1 | 3.3 | | |
| Total broadleaves | | | 43 627 | 3 910 | 47 535 | 100.0 | 54.3 | | |
| Total all species† | | | 82 728 | | 4 779 | | 87 508 | | 100.0 |

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

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

† Excludes the 8 662 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 | 3% |
| Sitka spruce | 5% |
| Oak | 7% |
| Birch | 6% |

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 | 533 300 | 2 373 000 | 4 | 168 |
| Narrow Linear Features | 107 600 | 5 735 800 | 53 | 405 |
| Individual Trees | 1 115 400 | 1 115 400 | 1 | 79 |
| Total | | 9 224 200 | | 651 |

1. Land area used to calculate tree density 1 416 518 ha based on digital boundaries used in 1991 Census of Population.

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

| | |
|------------------------|-----|
| Groups | 15% |
| Narrow Linear Features | 16% |
| Individual Trees | 10% |

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 | 2 510 | 492 | 35 |
| Narrow Linear Features | 107 600 | 9 468 | 668 |
| Total | | 9 960 | 703 |

1. Land area used to calculate feature density 1 416 518 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 | 53% |
| Narrow Linear Features | 13% |

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 | 23 166 | 25 |
| Other | 68 166 | 75 |
| Total area of woodland | 91 332 | 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

Forestry Commission
Other ownership

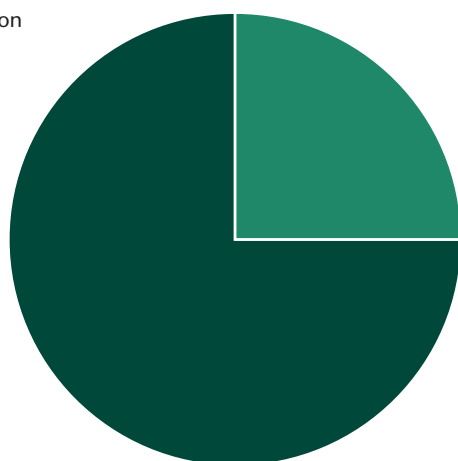


Table 7a Size class distribution of woodland

| Size class (ha) | Number of woods | Total area (ha) | Percent of total area | Mean wood area (ha) |
|-----------------|-----------------|-----------------|-----------------------|---------------------|
| <10 | 3 850 | 16 613 | 18 | 4.3 |
| 10 – <20 | 622 | 8 495 | 9 | 13.7 |
| 20 – <50 | 396 | 11 841 | 13 | 29.9 |
| 50 – <100 | 143 | 9 680 | 11 | 67.7 |
| <100 | 5 011 | 46 629 | 51 | 9.3 |
| 100 – <500 | 105 | 21 789 | 24 | 207.5 |
| 500 and > | 13 | 23 267 | 25 | 1 789.8 |
| All woods | 5 129 | 91 685 | 100 | 17.9 |

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 | 32 | 125 | 0 | 3.9 |
| | O | 4 057 | 17 114 | 19 | 4.2 |
| 10 – <20 | FC | 15 | 232 | 0 | 15.5 |
| | O | 637 | 8 679 | 9 | 13.6 |
| 20 – <50 | FC | 31 | 992 | 1 | 32.0 |
| | O | 400 | 12 000 | 13 | 30.0 |
| 50 – <100 | FC | 15 | 1 050 | 1 | 70.0 |
| | O | 150 | 10 206 | 11 | 68.0 |
| <100 | FC | 93 | 2 399 | 3 | 25.8 |
| | O | 5 244 | 47 998 | 52 | 9.2 |
| 100 – <500 | FC | 27 | 5 789 | 6 | 214.4 |
| | O | 84 | 16 497 | 18 | 196.4 |
| 500 and > | FC | 7 | 15 057 | 16 | 2 151.0 |
| | O | 5 | 3 946 | 4 | 789.2 |
| Total | FC | 127 | 23 244 | 25 | 183.0 |
| | O | 5 333 | 68 441 | 75 | 12.8 |

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 353 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 | 16 523 | 71 | 18 262 | 27 | 34 785 | 38.1 |
| Broadleaved | 2 311 | 10 | 36 378 | 53 | 38 688 | 42.4 |
| Mixed | 880 | 4 | 8 028 | 12 | 8 908 | 9.8 |
| Coppice | 31 | 0 | 50 | 0 | 82 | 0.1 |
| Copp-w-stds | 0 | 0 | 25 | 0 | 25 | 0.0 |
| Windblow | 222 | 1 | 125 | 0 | 347 | 0.4 |
| Felled | 1 508 | 7 | 570 | 1 | 2 078 | 2.3 |
| Open Space | 1 691 | 7 | 4 728 | 7 | 6 418 | 7.0 |
| Total | 23 166 | 100 | 68 166 | 100 | 91 332 | 100.0 |

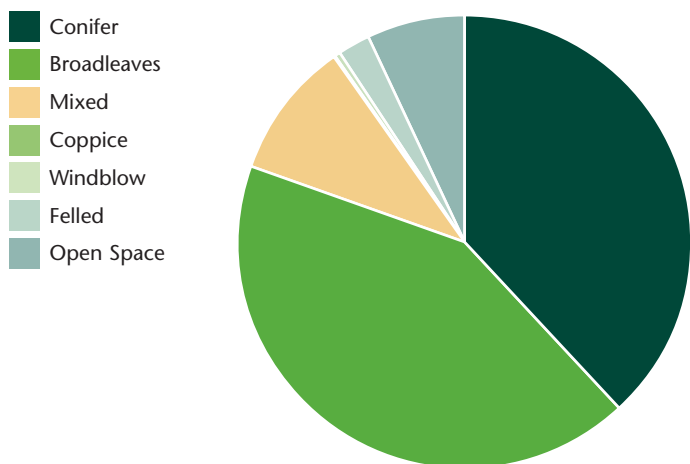
Area of woodland by forest type

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 | 1 023 | 6 | 5 | 4 807 | 22 | 8 | 5 830 | 15 | 7 |
| Corsican pine | 244 | 1 | 1 | 138 | 1 | 0 | 381 | 1 | 0 |
| Lodgepole pine | 728 | 4 | 4 | 662 | 3 | 1 | 1 390 | 4 | 2 |
| Sitka spruce | 11 553 | 67 | 58 | 8 069 | 37 | 13 | 19 622 | 50 | 24 |
| Norway spruce | 892 | 5 | 4 | 3 250 | 15 | 5 | 4 142 | 11 | 5 |
| European larch | 883 | 5 | 4 | 1 245 | 6 | 2 | 2 129 | 5 | 3 |
| Japanese/hybrid larch | 987 | 6 | 5 | 2 345 | 11 | 4 | 3 332 | 9 | 4 |
| Douglas fir | 67 | 0 | 0 | 245 | 1 | 0 | 312 | 1 | 0 |
| Other conifers | 737 | 4 | 4 | 927 | 4 | 1 | 1 664 | 4 | 2 |
| Mixed conifers | 23 | 0 | 0 | 276 | 1 | 0 | 298 | 1 | 0 |
| Total conifers | 17 137 | 100 | 86 | 21 964 | 100 | 35 | 39 101 | 100 | 47 |
| Oak | 754 | 27 | 4 | 11 112 | 27 | 18 | 11 866 | 27 | 14 |
| Beech | 443 | 16 | 2 | 3 163 | 8 | 5 | 3 606 | 8 | 4 |
| Sycamore | 83 | 3 | 0 | 5 286 | 13 | 8 | 5 368 | 12 | 6 |
| Ash | 160 | 6 | 1 | 4 063 | 10 | 6 | 4 223 | 10 | 5 |
| Birch | 797 | 28 | 4 | 8 848 | 22 | 14 | 9 645 | 22 | 12 |
| Poplar | 0 | 0 | 0 | 112 | 0 | 0 | 112 | 0 | 0 |
| Sweet chestnut | 0 | 0 | 0 | 65 | 0 | 0 | 65 | 0 | 0 |
| Elm | 0 | 0 | 0 | 80 | 0 | 0 | 80 | 0 | 0 |
| Other broadleaves | 234 | 8 | 1 | 6 368 | 16 | 10 | 6 602 | 15 | 8 |
| Mixed broadleaves | 327 | 12 | 2 | 1 733 | 4 | 3 | 2 060 | 5 | 2 |
| Total broadleaves | 2 798 | 100 | 14 | 40 829 | 100 | 65 | 43 627 | 100 | 53 |
| Total – all species | 19 936 | | 100 | 62 793 | | 100 | 82 728 | | 100 |
| Felled | 1 508 | | | 570 | | | 2 078 | | |
| Total High Forest | 21 444 | | | 63 363 | | | 84 806 | | |

*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 6 418 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 | 3% |
| Broadleaves | 2% |
| Sitka spruce | 5% |
| Oak | 5% |
| Birch | 6% |
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

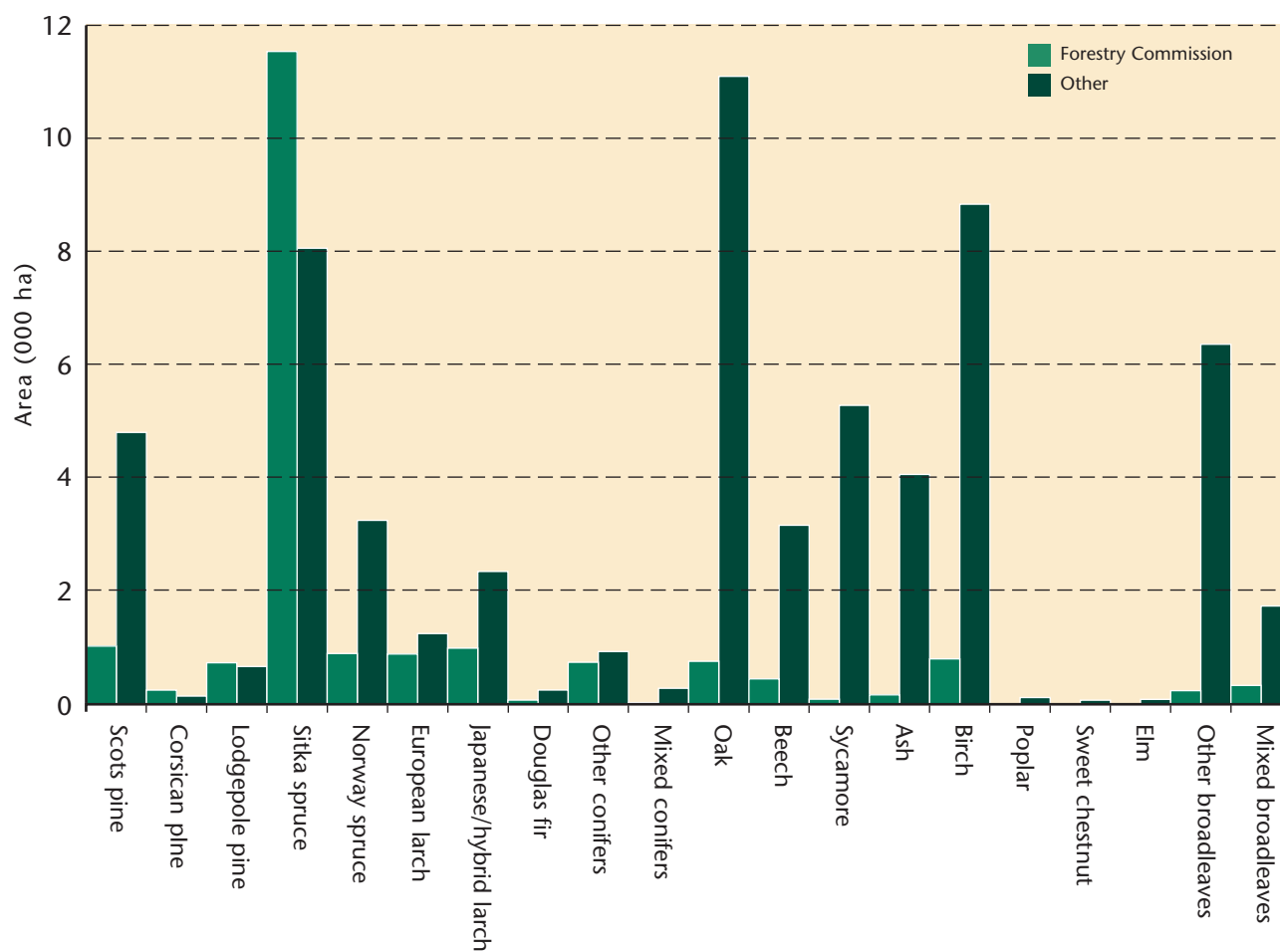


Table 9b Area of High Forest by principal species, ownership and category

| 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 | 987 | 36 | 1 023 | 4 558 | 249 | 4 807 | 5 545 | 285 | 5 830 |
| Corsican pine | 244 | 0 | 244 | 122 | 15 | 138 | 366 | 15 | 381 |
| Lodgepole pine | 638 | 90 | 728 | 591 | 71 | 662 | 1 229 | 161 | 1 390 |
| Sitka spruce | 11 370 | 183 | 11 553 | 7 947 | 122 | 8 069 | 19 317 | 305 | 19 622 |
| Norway spruce | 879 | 13 | 892 | 3 213 | 37 | 3 250 | 4 092 | 51 | 4 142 |
| European larch | 811 | 72 | 883 | 1 241 | 4 | 1 245 | 2 052 | 76 | 2 129 |
| Japanese/hybrid larch | 897 | 90 | 987 | 2 337 | 8 | 2 345 | 3 234 | 98 | 3 332 |
| Douglas fir | 67 | 0 | 67 | 245 | 0 | 245 | 312 | 0 | 312 |
| Other conifers | 494 | 243 | 737 | 329 | 599 | 927 | 823 | 841 | 1 664 |
| Mixed conifers | 18 | 4 | 23 | 183 | 93 | 276 | 201 | 97 | 298 |
| Total conifers | 16 406 | 732 | 17 137 | 20 766 | 1 198 | 21 964 | 37 172 | 1 930 | 39 101 |
| Oak | 551 | 203 | 754 | 6 671 | 4 441 | 11 112 | 7 222 | 4 644 | 11 866 |
| Beech | 423 | 20 | 443 | 1 726 | 1 437 | 3 163 | 2 149 | 1 456 | 3 606 |
| Sycamore | 43 | 39 | 83 | 3 550 | 1 735 | 5 286 | 3 594 | 1 775 | 5 368 |
| Ash | 123 | 37 | 160 | 2 258 | 1 804 | 4 063 | 2 382 | 1 841 | 4 223 |
| Birch | 522 | 274 | 797 | 3 907 | 4 942 | 8 848 | 4 429 | 5 216 | 9 645 |
| Poplar | 0 | 0 | 0 | 112 | 0 | 112 | 112 | 0 | 112 |
| Sweet chestnut | 0 | 0 | 0 | 0 | 65 | 65 | 0 | 65 | 65 |
| Elm | 0 | 0 | 0 | 28 | 53 | 80 | 28 | 53 | 80 |
| Other broadleaves | 32 | 202 | 234 | 2 150 | 4 218 | 6 368 | 2 182 | 4 420 | 6 602 |
| Mixed broadleaves | 130 | 197 | 327 | 780 | 953 | 1 733 | 911 | 1 149 | 2 060 |
| Total broadleaves | 1 826 | 972 | 2 798 | 21 182 | 19 646 | 40 830 | 23 008 | 20 619 | 43 627 |
| Total – all species | 18 232 | 1 704 | 19 936 | 41 948 | 20 844 | 62 793 | 60 180 | 22 549 | 82 728 |

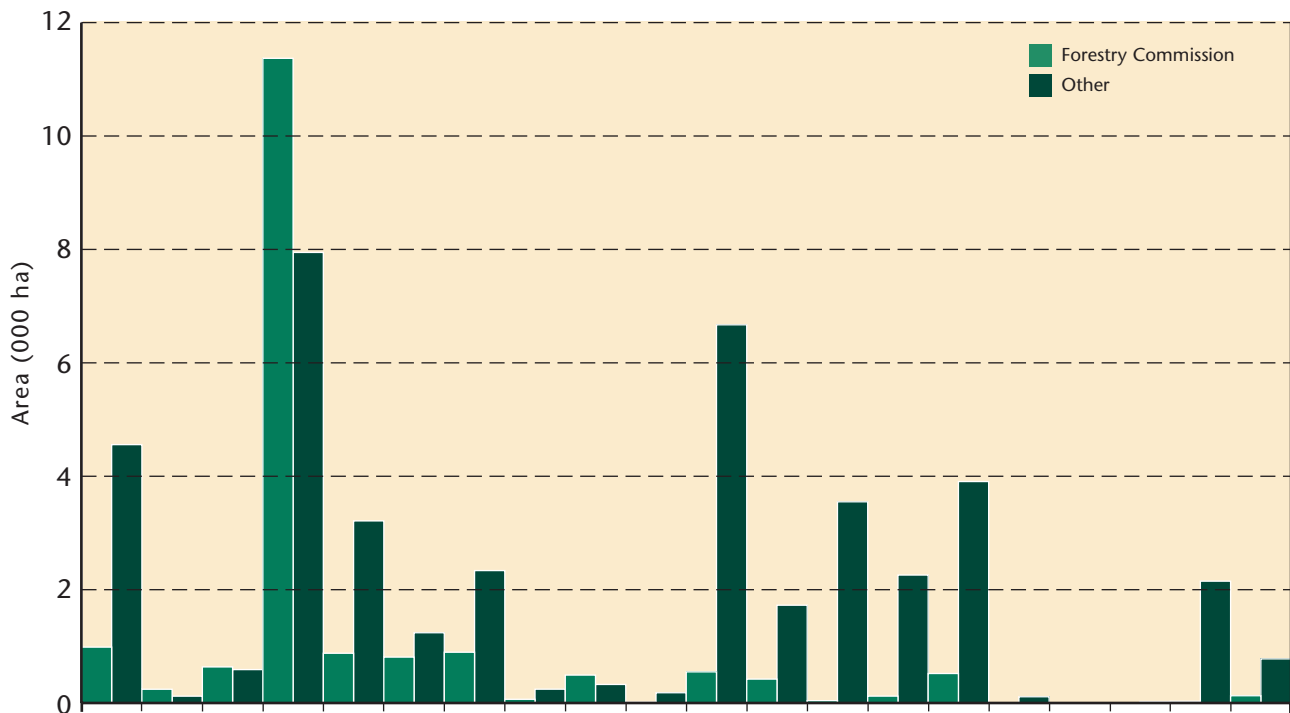
1. The standard errors of the All ownerships area estimates for the most common species or species groups (in all woodland types) are as follows:

| | Category 1* | Category 2* | Total High Forest |
|--------------|-------------|-------------|-------------------|
| Conifers | 3% | 14% | 3% |
| Broadleaves | 4% | 3% | 2% |
| Sitka spruce | 5% | 47% | 5% |
| Oak | 7% | 7% | 5% |
| Birch | 9% | 8% | 6% |

*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

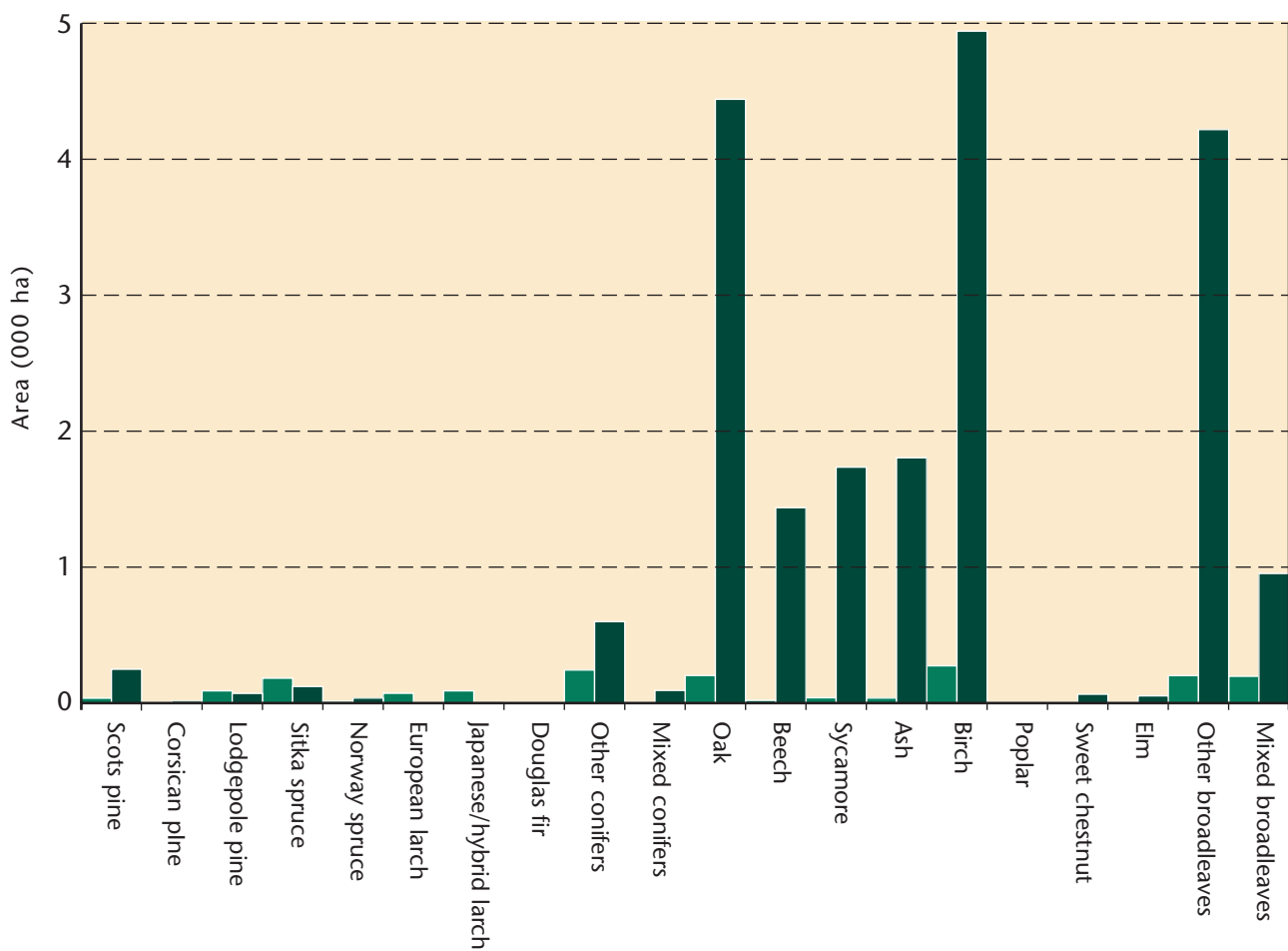
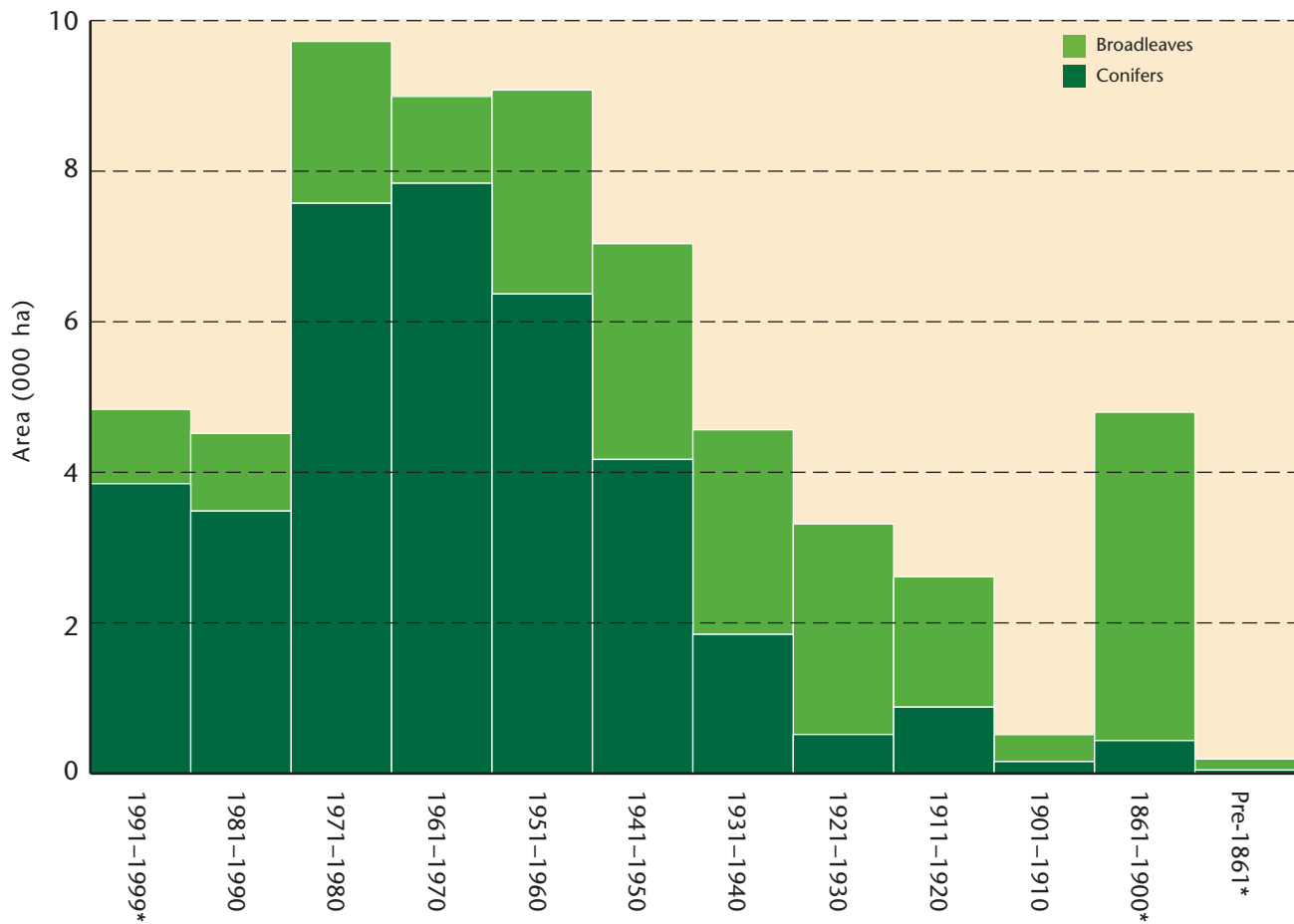


Table 10a High Forest Category 1 - Area by principal species and planting year class

| 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 | 441 | 425 | 711 | 477 | 1 046 | 1 228 | 470 | 168 | 297 | 115 | 120 | 45 | 5 545 |
| Corsican pine | 7 | 75 | 52 | 21 | 55 | 126 | 0 | 11 | 18 | 0 | 0 | 0 | 366 |
| Lodgepole pine | 8 | 0 | 352 | 528 | 307 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 1 229 |
| Sitka spruce | 3 006 | 2 443 | 5 483 | 4 679 | 2 273 | 1 139 | 275 | 19 | 0 | 0 | 0 | 0 | 19 317 |
| Norway spruce | 253 | 267 | 307 | 1 170 | 956 | 603 | 345 | 9 | 11 | 17 | 155 | 0 | 4 092 |
| European larch | 0 | 3 | 108 | 221 | 319 | 297 | 423 | 226 | 394 | 6 | 56 | 0 | 2 052 |
| Japanese/hybrid larch | 92 | 262 | 357 | 472 | 1 161 | 598 | 216 | 76 | 0 | 0 | 0 | 0 | 3 234 |
| Douglas fir | 23 | 0 | 107 | 47 | 55 | 29 | 10 | 0 | 20 | 0 | 21 | 0 | 312 |
| Other conifers | 6 | 9 | 75 | 190 | 169 | 93 | 100 | 9 | 109 | 21 | 41 | 0 | 823 |
| Mixed conifers | 13 | 0 | 21 | 34 | 27 | 22 | 9 | 0 | 32 | 0 | 43 | 0 | 201 |
| Total conifers | 3 849 | 3 485 | 7 573 | 7 839 | 6 369 | 4 171 | 1 848 | 518 | 881 | 158 | 437 | 45 | 37 172 |
| Oak | 332 | 290 | 192 | 82 | 282 | 596 | 660 | 667 | 827 | 301 | 2 938 | 55 | 7 222 |
| Beech | 25 | 44 | 184 | 155 | 285 | 129 | 189 | 187 | 127 | 31 | 708 | 87 | 2 149 |
| Sycamore | 0 | 39 | 244 | 235 | 566 | 563 | 618 | 808 | 210 | 10 | 295 | 5 | 3 594 |
| Ash | 42 | 47 | 118 | 64 | 428 | 365 | 355 | 470 | 232 | 0 | 261 | 0 | 2 382 |
| Birch | 90 | 338 | 770 | 375 | 920 | 758 | 772 | 274 | 102 | 0 | 30 | 0 | 4 429 |
| Poplar | 0 | 29 | 0 | 46 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 112 |
| Sweet chestnut | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Elm | 0 | 0 | 22 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 28 |
| Other broadleaves | 136 | 208 | 444 | 176 | 158 | 377 | 104 | 324 | 197 | 0 | 58 | 0 | 2 182 |
| Mixed broadleaves | 363 | 36 | 176 | 22 | 34 | 78 | 13 | 67 | 36 | 16 | 70 | 0 | 911 |
| Total broadleaves | 987 | 1 031 | 2 151 | 1 154 | 2 709 | 2 866 | 2 717 | 2 797 | 1 732 | 358 | 4 361 | 147 | 23 008 |
| Total – all species | 4 836 | 4 516 | 9 723 | 8 993 | 9 077 | 7 037 | 4 565 | 3 314 | 2 613 | 517 | 4 797 | 192 | 60 180 |

*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



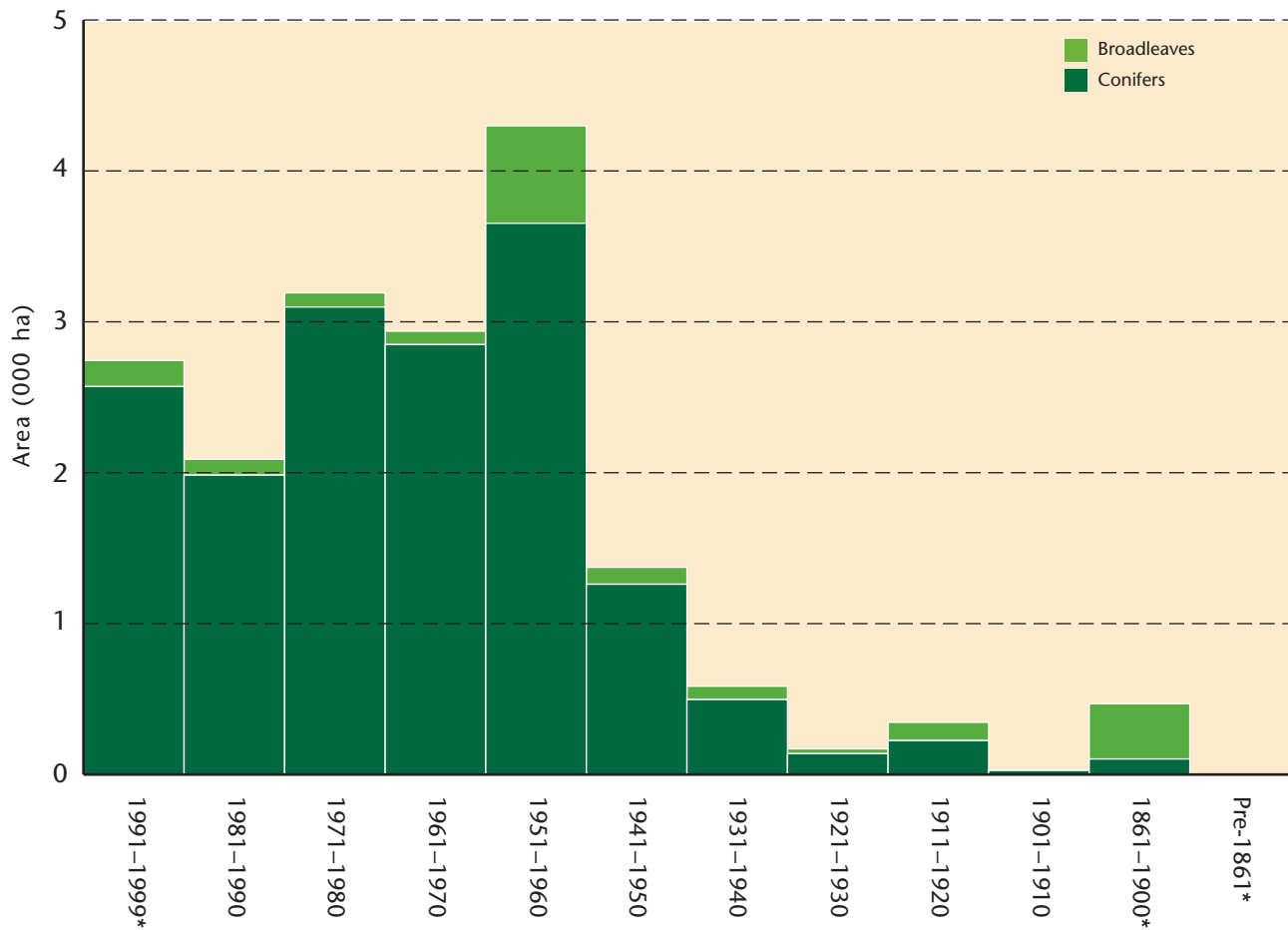
*Most of the planting year classes cover 10 years, 1991-1999 is 9 years, and the classes prior to 1901 are 40 years or more.

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 | 131 | 54 | 114 | 71 | 463 | 30 | 60 | 37 | 0 | 27 | 0 | 0 | 987 |
| Corsican pine | 7 | 75 | 44 | 16 | 46 | 52 | 0 | 4 | 0 | 0 | 0 | 0 | 244 |
| Lodgepole pine | 0 | 0 | 90 | 307 | 241 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 638 |
| Sitka spruce | 2 388 | 1 688 | 2 714 | 2 054 | 1 768 | 574 | 175 | 9 | 0 | 0 | 0 | 0 | 11 370 |
| Norway spruce | 18 | 0 | 15 | 13 | 306 | 360 | 81 | 9 | 0 | 0 | 76 | 0 | 879 |
| European larch | 0 | 0 | 27 | 198 | 157 | 72 | 162 | 43 | 135 | 0 | 18 | 0 | 811 |
| Japanese/hybrid larch | 27 | 157 | 2 | 74 | 480 | 112 | 18 | 27 | 0 | 0 | 0 | 0 | 897 |
| Douglas fir | 0 | 0 | 18 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 67 |
| Other conifers | 0 | 9 | 75 | 102 | 139 | 61 | 0 | 9 | 90 | 0 | 9 | 0 | 494 |
| Mixed conifers | 0 | 0 | 0 | 14 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| Total conifers | 2 571 | 1 984 | 3 098 | 2 849 | 3 653 | 1 261 | 497 | 138 | 225 | 27 | 103 | 0 | 16 406 |
| Oak | 46 | 5 | 0 | 0 | 36 | 26 | 9 | 13 | 69 | 0 | 346 | 0 | 551 |
| Beech | 0 | 7 | 26 | 51 | 247 | 4 | 75 | 4 | 0 | 0 | 9 | 0 | 423 |
| Sycamore | 0 | 0 | 13 | 0 | 12 | 13 | 0 | 0 | 4 | 0 | 0 | 0 | 43 |
| Ash | 0 | 0 | 42 | 0 | 67 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 123 |
| Birch | 19 | 88 | 7 | 31 | 277 | 31 | 4 | 13 | 40 | 0 | 11 | 0 | 522 |
| Poplar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sweet chestnut | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Elm | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other broadleaves | 0 | 4 | 0 | 2 | 7 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| Mixed broadleaves | 108 | 0 | 4 | 4 | 0 | 4 | 0 | 2 | 7 | 0 | 0 | 0 | 130 |
| Total broadleaves | 173 | 105 | 94 | 89 | 646 | 112 | 88 | 32 | 121 | 0 | 366 | 0 | 1 826 |
| Total – all species | 2 744 | 2 088 | 3 191 | 2 938 | 4 299 | 1 373 | 585 | 170 | 346 | 27 | 470 | 0 | 18 232 |

*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



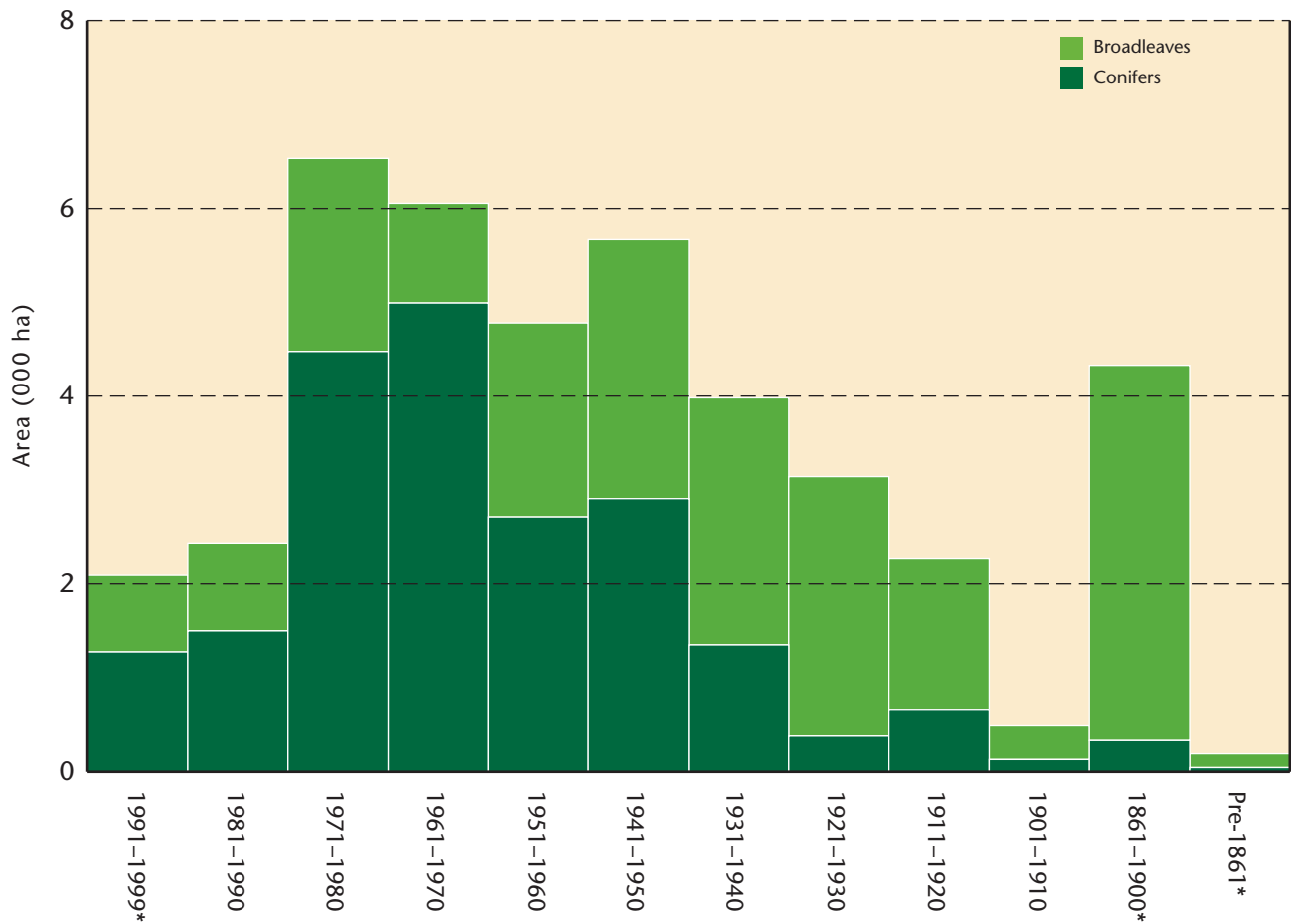
*Most of the planting year classes cover 10 years, 1991-1999 is 9 years, and the classes prior to 1901 are 40 years or more.

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 | 310 | 372 | 597 | 407 | 583 | 1 199 | 410 | 131 | 297 | 88 | 120 | 45 | 4 558 |
| Corsican pine | 0 | 0 | 9 | 5 | 9 | 74 | 0 | 8 | 18 | 0 | 0 | 0 | 122 |
| Lodgepole pine | 8 | 0 | 262 | 221 | 66 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 591 |
| Sitka spruce | 618 | 754 | 2 770 | 2 625 | 505 | 565 | 100 | 10 | 0 | 0 | 0 | 0 | 7 947 |
| Norway spruce | 235 | 267 | 291 | 1 156 | 651 | 243 | 264 | 0 | 11 | 17 | 79 | 0 | 3 213 |
| European larch | 0 | 3 | 81 | 23 | 162 | 225 | 261 | 183 | 259 | 6 | 38 | 0 | 1 241 |
| Japanese/hybrid larch | 65 | 105 | 355 | 397 | 681 | 486 | 198 | 49 | 0 | 0 | 0 | 0 | 2 337 |
| Douglas fir | 23 | 0 | 89 | 47 | 5 | 29 | 10 | 0 | 20 | 0 | 21 | 0 | 245 |
| Other conifers | 6 | 0 | 0 | 88 | 30 | 32 | 100 | 0 | 19 | 21 | 32 | 0 | 329 |
| Mixed conifers | 13 | 0 | 21 | 20 | 23 | 22 | 9 | 0 | 32 | 0 | 43 | 0 | 183 |
| Total conifers | 1 277 | 1 501 | 4 475 | 4 990 | 2 715 | 2 910 | 1 352 | 380 | 656 | 131 | 333 | 45 | 20 766 |
| Oak | 286 | 285 | 192 | 82 | 246 | 570 | 651 | 653 | 758 | 301 | 2 592 | 55 | 6 671 |
| Beech | 25 | 37 | 158 | 103 | 37 | 124 | 114 | 183 | 127 | 31 | 699 | 87 | 1 726 |
| Sycamore | 0 | 39 | 230 | 235 | 555 | 549 | 618 | 808 | 206 | 10 | 295 | 5 | 3 550 |
| Ash | 42 | 47 | 76 | 64 | 361 | 350 | 355 | 470 | 232 | 0 | 261 | 0 | 2 258 |
| Birch | 70 | 250 | 763 | 344 | 643 | 727 | 767 | 261 | 61 | 0 | 19 | 0 | 3 907 |
| Poplar | 0 | 29 | 0 | 46 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 112 |
| Sweet chestnut | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Elm | 0 | 0 | 22 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 28 |
| Other broadleaves | 136 | 204 | 444 | 174 | 149 | 359 | 104 | 324 | 197 | 0 | 58 | 0 | 2 150 |
| Mixed broadleaves | 255 | 36 | 171 | 17 | 34 | 74 | 13 | 65 | 29 | 16 | 70 | 0 | 780 |
| Total broadleaves | 814 | 926 | 2 057 | 1 065 | 2 063 | 2 754 | 2 629 | 2 764 | 1 610 | 358 | 3 995 | 147 | 21 182 |
| Total – all species | 2 092 | 2 427 | 6 532 | 6 055 | 4 778 | 5 664 | 3 981 | 3 144 | 2 267 | 490 | 4 328 | 192 | 41 948 |

*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

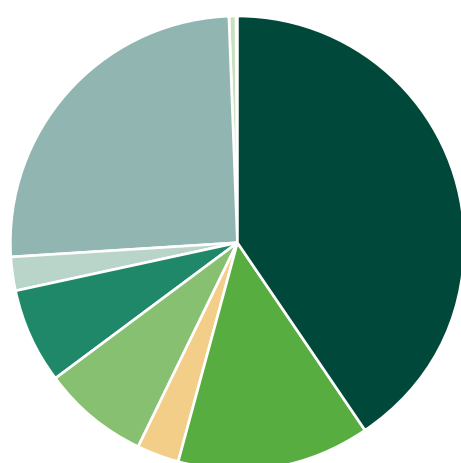


*Most of the planting year classes cover 10 years, 1991-1999 is 9 years, and the classes prior to 1901 are 40 years or more.

Table 11 High Forest: principal species by planting year class

| Planting year class | First | % | Second | % | Third | % |
|---------------------|---------------------|-----------|-------------------|-----------|-------------------|-----------|
| 1991–1999 | Sitka spruce | 58 | Mixed broadleaves | 9 | Scots pine | 8 |
| 1981–1990 | Sitka spruce | 50 | Birch | 11 | Scots pine | 9 |
| 1971–1980 | Sitka spruce | 54 | Birch | 9 | Scots pine | 7 |
| 1961–1970 | Sitka spruce | 44 | Birch | 13 | Norway spruce | 11 |
| 1951–1960 | Sitka spruce | 20 | Birch | 15 | Jap/Hybrid larch | 10 |
| 1941–1950 | Birch | 20 | Other broadleaves | 14 | Scots pine | 11 |
| 1931–1940 | Birch | 24 | Sycamore | 13 | Oak | 12 |
| 1921–1930 | Sycamore | 19 | Oak | 18 | Birch | 15 |
| 1911–1920 | Oak | 30 | Sycamore | 15 | Other broadleaves | 12 |
| 1901–1910 | Oak | 54 | Scots pine | 20 | Beech | 10 |
| 1861–1900 | Oak | 51 | Beech | 12 | Ash | 10 |
| Pre-1861 | Beech | 44 | Oak | 36 | Sycamore | 6 |
| All years | Sitka spruce | 24 | Oak | 14 | Birch | 12 |

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

Ownership type by area

| |
|-----------------------------|
| Personal |
| Business |
| Forestry or timber business |
| Charity |
| Local Authority |
| Other public |
| Forestry Commission |
| Community ownership |
| Unidentified |

Table 12 Ownership type* by area and percentage

| Ownership type | Area (ha) | % |
|------------------------------------|---------------|--------------|
| Personal | 36 978 | 40.5 |
| Business | 12 506 | 13.7 |
| Forestry or timber business | 2 751 | 3.0 |
| Charity | 6 963 | 7.6 |
| Local Authority | 6 248 | 6.8 |
| Other public (not FC) | 2 164 | 2.4 |
| Forestry Commission | 23 166 | 25.4 |
| Community ownership or common land | 458 | 0.5 |
| Unidentified | 97 | 0.1 |
| Total | 91 332 | 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 North West 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 | 13 162 | 3 561 | Area (ha) |
| Wide Linear Features | 2 510 | 1 277 | Area (ha) |
| Wide Linear Features | 2 510 | 492 | Length (km) |
| Narrow Linear Features | 107 600 | 9 468 | Length (km) |
| Narrow Linear Features | 107 600 | 5 735 800 | Number of live trees |
| Groups | 533 300 | 2 373 000 | Number of live trees |
| Individual Trees | 1 115 400 | 1 115 400 | Number of live trees |

1. See Glossary for definitions of feature types.

Table 14 Woodland area by feature type and woodland size

| Feature type | Woodland size (ha) | | Total area (ha) | Number of features | Mean size (ha) |
|----------------------|--------------------|--------------|-----------------|--------------------|----------------|
| | 0.1 – <0.25 | 0.25 – <2.0 | | | |
| Small Woods | 893 | 2 669 | 3 561 | 13 162 | 0.27 |
| Wide Linear Features | 133 | 1 144 | 1 277 | 2 510 | 0.51 |
| Total | 1 026 | 3 813 | 4 838 | 15 672 | 0.31 |

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

| | |
|----------------------|-----|
| Small Woods | 30% |
| Wide Linear Features | 64% |

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 SW* | | 0.25 – <2.0 SW | | 0.1 – <2.0 WLF | | |
| Conifer | 73 | 67 | 402 | 0 | 475 | 67 | 542 |
| Broadleaved | 673 | 67 | 1 536 | 1 085 | 2 209 | 1 152 | 3 361 |
| Mixed | 146 | 0 | 731 | 0 | 877 | 0 | 877 |
| 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 | 59 | 0 | 59 | 59 |
| Total | 893 | 133 | 2 669 | 1 144 | 3 561 | 1 277 | 4 838 |

*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 | 220 | 0 | 220 | 25.2 | 4.6 |
| Spruce | 220 | 0 | 220 | 25.2 | 4.6 |
| Larch | 256 | 0 | 256 | 29.3 | 5.4 |
| Cypress | 0 | 0 | 0 | 0.0 | 0.0 |
| Other conifers | 0 | 0 | 0 | 0.0 | 0.0 |
| Mixed conifers | 110 | 67 | 177 | 20.3 | 3.7 |
| Total conifers | 806 | 67 | 871 | 100.0 | 18.3 |
| Oak | 578 | 619 | 1 197 | 30.6 | 25.0 |
| Beech | 73 | 29 | 102 | 2.6 | 2.1 |
| Sycamore | 73 | 29 | 102 | 2.6 | 2.1 |
| Ash | 183 | 59 | 242 | 6.2 | 5.1 |
| Birch | 256 | 283 | 539 | 13.8 | 11.3 |
| 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 | 110 | 0 | 110 | 2.8 | 2.3 |
| Lime | 0 | 0 | 0 | 0.0 | 0.0 |
| Elm | 0 | 0 | 0 | 0.0 | 0.0 |
| Willow | 37 | 0 | 37 | 0.9 | 0.8 |
| Other broadleaves | 695 | 65 | 760 | 19.4 | 15.9 |
| Mixed broadleaves | 753 | 67 | 820 | 21.0 | 17.2 |
| Total broadleaves | 2 755 | 1 151 | 3 908 | 100.0 | 81.8 |
| Total – all species | 3 561 | 1 219 | 4 779 | | 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 86%
 Oak 58%
 Birch 61%
 Other broadleaves 48%

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 | 3.2 | 11.8 | 33.5 | 50.1 | 12.3 | 0.5 |
| Spruce | 2.4 | 2.3 | 9.4 | 8.8 | 22.9 | 5.6 | 0.2 |
| Larch | 3.2 | 0.8 | 5.5 | 27.5 | 37.0 | 9.1 | 0.4 |
| Cypress | 0.8 | 1.6 | 9.4 | 238.5 | 250.3 | 61.3 | 2.7 |
| Other conifers | 4.7 | 3.9 | 21.9 | 17.3 | 47.8 | 11.7 | 0.5 |
| Total conifers | 12.7 | 11.8 | 58.0 | 325.6 | 408.1 | 100.0 | 4.4 |
| Oak | 163.3 | 43.3 | 106.0 | 289.1 | 601.7 | 6.8 | 6.5 |
| Beech | 29.5 | 9.5 | 66.1 | 168.8 | 273.9 | 3.1 | 3.0 |
| Sycamore | 36.4 | 24.4 | 152.5 | 245.5 | 458.8 | 5.2 | 5.0 |
| Ash | 127.3 | 24.3 | 268.6 | 357.9 | 778.1 | 8.8 | 8.4 |
| Birch | 30.3 | 16.6 | 95.7 | 222.1 | 364.7 | 4.1 | 4.0 |
| Poplar | 2.4 | 0.0 | 19.1 | 367.5 | 389.0 | 4.4 | 4.2 |
| Sweet chestnut | 0.0 | 0.0 | 1.6 | 0.0 | 1.6 | 0.0 | 0.0 |
| Horse chestnut | 7.0 | 0.9 | 1.6 | 0.7 | 10.2 | 0.1 | 0.1 |
| Alder | 19.8 | 18.9 | 152.4 | 376.3 | 567.4 | 6.4 | 6.2 |
| Lime | 0.8 | 1.6 | 0.8 | 3.7 | 6.9 | 0.1 | 0.1 |
| Elm | 1.6 | 0.0 | 2.4 | 5.1 | 9.1 | 0.1 | 0.1 |
| Willow | 23.3 | 22.3 | 250.3 | 370.3 | 666.2 | 7.6 | 7.2 |
| Other broadleaves | 239.6 | 247.7 | 1 198.0 | 3 003.3 | 4 688.6 | 53.2 | 50.8 |
| Total broadleaves | 681.4 | 409.4 | 2 314.9 | 5 410.3 | 8 816.2 | 100.0 | 95.6 |
| Total – all species | 694.1 | 421.2 | 2 373.0 | 5 735.8 | 9 224.2 | | 100.0 |

- Percentages:
Category: species percentage of conifer or broadleaved
Species: percentage of all species
- The standard errors of the total tree number estimates for these feature types are:
Individual Trees 10%
Groups 15%
Narrow Linear Features 16%
- 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 | 0.8 | 0.0 | 0.8 | 50.0 | 1.1 |
| Spruce | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Larch | 0.8 | 0.0 | 0.0 | 0.0 | 0.8 | 50.0 | 1.1 |
| 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 | 0.8 | 0.0 | 0.8 | 0.0 | 1.6 | 100.0 | 2.1 |
| Oak | 1.6 | 0.8 | 0.0 | 0.0 | 2.4 | 3.3 | 3.2 |
| Beech | 0.0 | 0.0 | 3.1 | 2.4 | 5.5 | 7.5 | 7.3 |
| Sycamore | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Ash | 0.8 | 0.0 | 1.6 | 17.8 | 20.2 | 27.4 | 26.9 |
| Birch | 0.8 | 0.0 | 2.4 | 0.0 | 3.2 | 4.3 | 4.3 |
| Poplar | 0.0 | 0.0 | 0.8 | 0.0 | 0.8 | 1.1 | 1.1 |
| Sweet chestnut | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Horse chestnut | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Alder | 0.0 | 0.0 | 3.9 | 3.3 | 7.2 | 9.8 | 9.6 |
| Lime | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Elm | 2.3 | 1.6 | 1.6 | 1.2 | 6.7 | 9.1 | 8.9 |
| Willow | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | 0.8 | 0.8 |
| Other broadleaves | 3.1 | 0.8 | 11.0 | 12.1 | 27.0 | 36.7 | 35.9 |
| Total broadleaves | 8.6 | 3.2 | 24.4 | 37.4 | 73.6 | 100.0 | 97.9 |
| Total – all species | 9.4 | 3.2 | 25.2 | 37.4 | 75.2 | | 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 | 4.8 | 0.0 | 0.0 | 5.6 |
| Spruce | 0.0 | 3.9 | 0.0 | 0.0 | 3.9 |
| Larch | 0.0 | 3.2 | 0.8 | 0.0 | 4.0 |
| Cypress | 2.4 | 0.0 | 0.0 | 0.0 | 2.4 |
| Other conifers | 3.1 | 5.5 | 0.0 | 0.0 | 8.6 |
| Total conifers | 6.3 | 17.4 | 0.8 | 0.0 | 24.5 |
| Oak | 19.1 | 124.6 | 60.5 | 2.3 | 206.5 |
| Beech | 7.9 | 18.1 | 12.9 | 0.0 | 38.9 |
| Sycamore | 18.0 | 33.1 | 9.7 | 0.0 | 60.8 |
| Ash | 34.6 | 98.7 | 16.7 | 1.6 | 151.6 |
| Birch | 11.8 | 28.6 | 6.5 | 0.0 | 46.9 |
| Poplar | 0.0 | 1.6 | 0.8 | 0.0 | 2.4 |
| Sweet chestnut | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Horse chestnut | 3.9 | 3.2 | 0.8 | 0.0 | 7.9 |
| Alder | 11.0 | 27.6 | 0.0 | 0.0 | 38.6 |
| Lime | 2.3 | 0.0 | 0.0 | 0.0 | 2.3 |
| Elm | 0.8 | 0.8 | 0.0 | 0.0 | 1.6 |
| Willow | 30.6 | 15.0 | 0.0 | 0.0 | 45.6 |
| Other broadleaves | 414.8 | 72.5 | 0.0 | 0.0 | 487.3 |
| Total broadleaves | 554.8 | 423.8 | 107.9 | 3.9 | 1 090.4 |
| Total – all species | 561.4 | 441.3 | 108.8 | 3.9 | 1 115.4 |

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 | 11.8 | 0.0 | 0.0 | 11.8 |
| Spruce | 0.8 | 8.6 | 0.0 | 0.0 | 9.4 |
| Larch | 0.0 | 5.5 | 0.0 | 0.0 | 5.5 |
| Cypress | 0.0 | 3.2 | 6.3 | 0.0 | 9.5 |
| Other conifers | 6.3 | 15.7 | 0.0 | 0.0 | 22.0 |
| Total conifers | 7.1 | 44.8 | 6.3 | 0.0 | 58.2 |
| Oak | 23.8 | 64.7 | 16.7 | 0.8 | 106.0 |
| Beech | 16.5 | 34.5 | 14.3 | 0.8 | 66.1 |
| Sycamore | 28.2 | 118.0 | 6.3 | 0.0 | 152.5 |
| Ash | 51.9 | 200.9 | 15.8 | 0.0 | 268.6 |
| Birch | 18.8 | 76.1 | 0.8 | 0.0 | 95.7 |
| Poplar | 1.6 | 11.8 | 5.7 | 0.0 | 19.1 |
| Sweet chestnut | 0.0 | 0.0 | 1.6 | 0.0 | 1.6 |
| Horse chestnut | 0.0 | 1.6 | 0.0 | 0.0 | 1.6 |
| Alder | 36.2 | 116.1 | 0.0 | 0.0 | 152.3 |
| Lime | 0.0 | 0.0 | 0.8 | 0.0 | 0.8 |
| Elm | 0.8 | 1.6 | 0.0 | 0.0 | 2.4 |
| Willow | 202.7 | 47.6 | 0.0 | 0.0 | 250.3 |
| Other broadleaves | 993.0 | 202.6 | 2.4 | 0.0 | 1 198.0 |
| Total broadleaves | 1 373.5 | 875.5 | 64.4 | 1.6 | 2 315.0 |
| Total – all species | 1 380.6 | 920.3 | 70.7 | 1.6 | 2 373.0 |

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 | 0.0 | 9.2 | 24.3 | 0.0 | 33.5 |
| Spruce | 0.0 | 8.8 | 0.0 | 0.0 | 8.8 |
| Larch | 0.0 | 7.7 | 19.8 | 0.0 | 27.5 |
| Cypress | 120.1 | 101.1 | 17.3 | 0.0 | 238.5 |
| Other conifers | 11.2 | 6.1 | 0.0 | 0.0 | 17.3 |
| Total conifers | 131.3 | 132.9 | 61.4 | 0.0 | 325.6 |
| Oak | 75.9 | 160.7 | 52.5 | 0.0 | 289.1 |
| Beech | 36.9 | 105.2 | 26.1 | 0.6 | 168.8 |
| Sycamore | 56.3 | 163.1 | 26.1 | 0.0 | 245.5 |
| Ash | 91.9 | 223.1 | 42.3 | 0.6 | 357.9 |
| Birch | 39.5 | 174.3 | 8.3 | 0.0 | 222.1 |
| Poplar | 47.8 | 175.2 | 144.6 | 0.0 | 367.6 |
| Sweet chestnut | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Horse chestnut | 0.0 | 0.0 | 0.7 | 0.0 | 0.7 |
| Alder | 59.0 | 290.1 | 27.2 | 0.0 | 376.3 |
| Lime | 0.0 | 1.3 | 0.0 | 2.4 | 3.7 |
| Elm | 1.4 | 3.7 | 0.0 | 0.0 | 5.1 |
| Willow | 132.7 | 227.7 | 10.0 | 0.0 | 370.4 |
| Other broadleaves | 2 118.5 | 884.8 | 0.0 | 0.0 | 3 003.3 |
| Total broadleaves | 2 659.9 | 2 409.2 | 337.8 | 3.6 | 5 410.5 |
| Total – all species | 2 791.2 | 2 542.1 | 399.2 | 3.6 | 5 735.8 |

Table 22 Number of Groups by group size

| Number of trees per Group* | Number of Groups (000s) |
|-------------------------------|----------------------------|
| 2 | 122 |
| 3–5 | 220 |
| 6–10 | 112 |
| 11–20 | 60 |
| 21–50 | 17 |
| 51–100 | 2 |
| >100 | 0 |
| Total | 533 |

*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 | 71 816 | 90.8 | 91 332 | 96.0 | 27 |
| 0.25 – <2.0 | 7 279 | 9.2 | 3 813 | 4.0 | -48 |
| Total | 79 095 | | 95 145 | | 20 |
| % Woodland land cover | 5.6 | | 6.7 | | |

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), 1 416 518 hectares, was based on the 1991 Census of Population digital boundaries.
4. Land area used to calculate woodland cover percent (1980), 1 414 084 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 | 5 680 | 6 013 | 6 |
| Corsican pine | 951 | 381 | -60 |
| Lodgepole pine | 2 173 | 1 390 | -36 |
| Sitka spruce | 17 266 | 19 805 | 15 |
| Norway spruce | 4 170 | 4 142 | -1 |
| European larch | 1 698 | 2 129 | 25 |
| Japanese/hybrid larch | 3 878 | 3 588 | -7 |
| Douglas fir | 628 | 312 | -50 |
| Other conifers | 992 | 1 664 | 68 |
| Mixed conifers | 1 955 | 408 | -79 |
| Total conifers | 39 390 | 39 832 | 1 |
| Oak | 6 921 | 12 851 | 86 |
| Beech | 2 711 | 3 709 | 37 |
| Sycamore | 4 874 | 5 397 | 11 |
| Ash | 1 789 | 4 465 | 150 |
| Birch | 7 990 | 10 147 | 27 |
| Poplar | 281 | 112 | -60 |
| Sweet chestnut | 27 | 65 | 140 |
| Elm | 570 | 80 | -86 |
| Other broadleaves | 2 870 | 7 179 | 150 |
| Mixed broadleaves | 5 011 | 2 645 | -47 |
| Total broadleaves | 33 045 | 46 650 | 41 |
| Total all species | 72 435 | 86 482 | 19 |
| Felled | 1 103 | 2 078 | 88 |
| Total High Forest | 73 538 | 88 560 | 20 |

1. Differences in sampling methodology may account for some of the apparent differences.
2. In the 1980 Census the areas assigned to species included any associated open space such as roads and rides. In the Inventory open spaces are separately identified and the overall proportion is 6.7% (Table 2). To obtain meaningful comparisons between the two datasets the 1980 Census data have therefore been reduced by 6.7%.
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

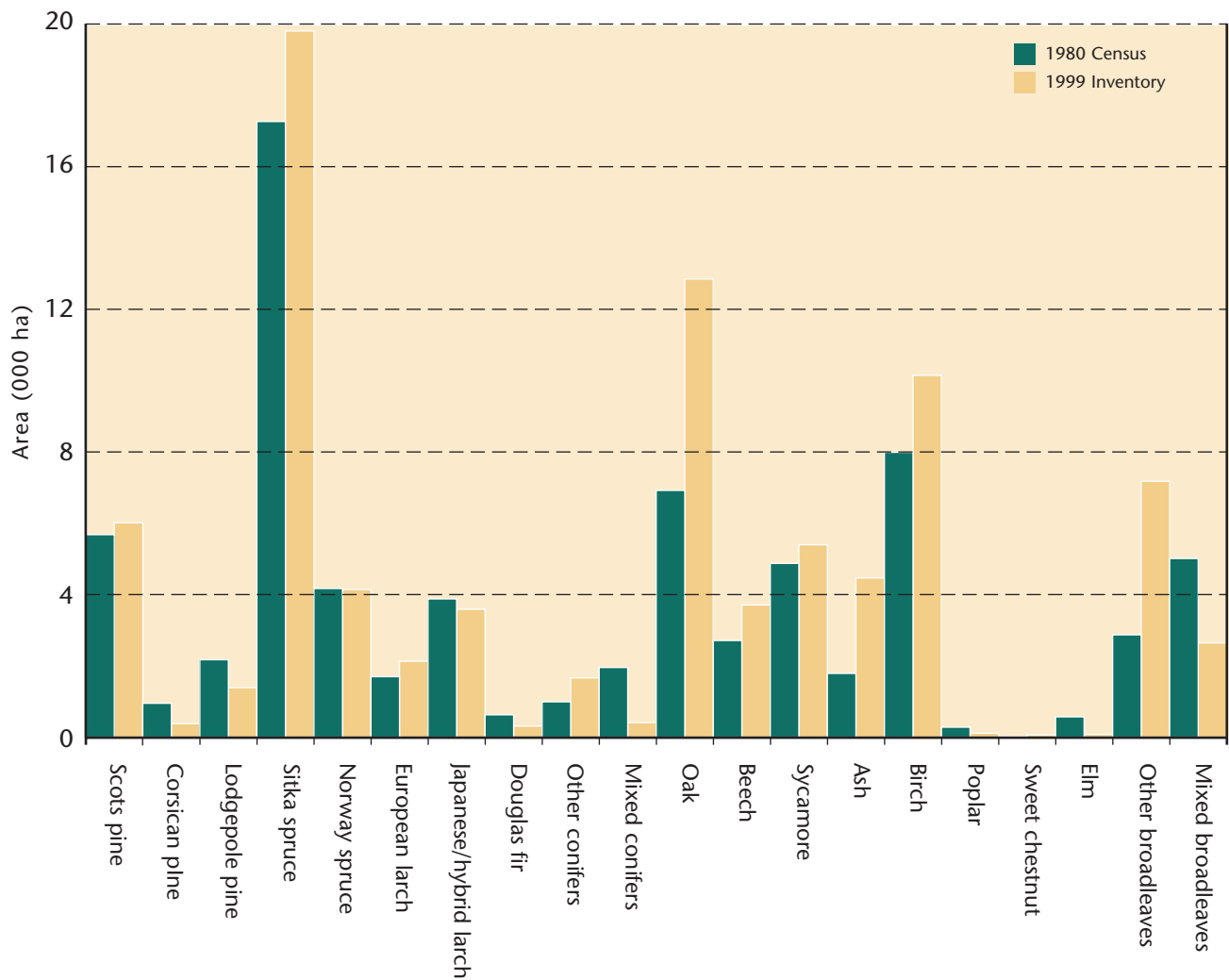


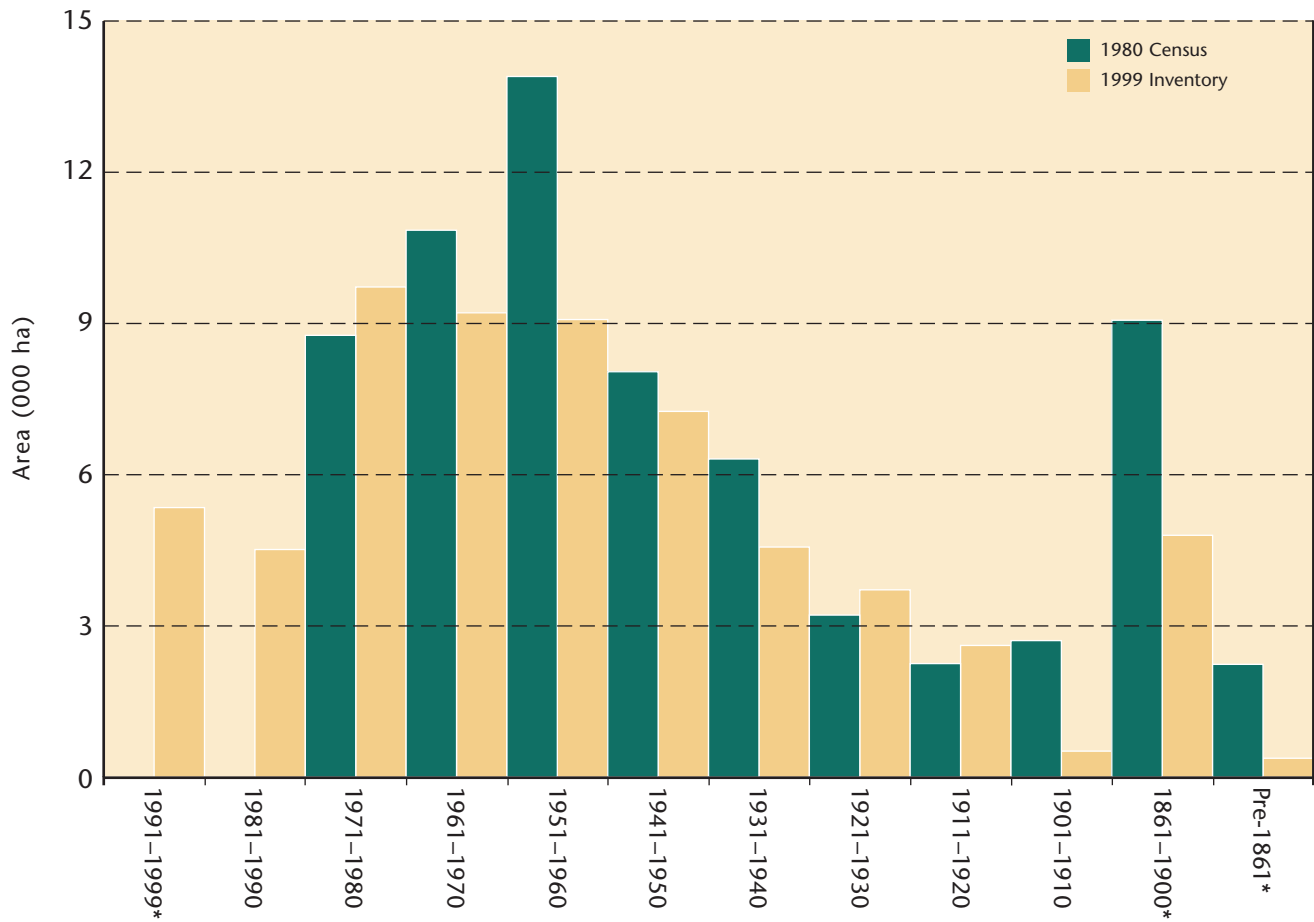
Table 25 Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1999 Inventory

| Planting year class | 1980 Census woodland area (ha) | 1999 Inventory woodland area (ha) | Change (%) |
|-------------------------|--------------------------------|-----------------------------------|------------|
| 1991–1999 | - | 5 348 | .* |
| 1981–1990 | - | 4 516 | .* |
| 1971–1980 | 8 765 | 9 724 | 11 |
| 1961–1970 | 10 850 | 9 212 | -15 |
| 1951–1960 | 13 900 | 9 078 | -35 |
| 1941–1950 | 8 043 | 7 256 | -10 |
| 1931–1940 | 6 312 | 4 565 | -28 |
| 1921–1930 | 3 215 | 3 716 | 16 |
| 1911–1920 | 2 253 | 2 613 | 16 |
| 1901–1910 | 2 709 | 516 | -81 |
| 1861–1900 | 9 064 | 4 798 | -47 |
| Pre-1861 | 2 238 | 375 | -83 |
| Total: all years | 67 350 | 61 717 | -8 |

*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 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 | 820 | 542 | -34 |
| Middle | 1 234 | 213 | -83 |
| Total Individual Trees | 2 054 | 755 | -63 |
| Groups | 2 958 | 1 239 | -58 |
| Linear Features | 3 963 | 3 042 | -23 |
| Total | 8 975 | 5 036 | -44 |

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) | 145.3 | 53.3 | -63 |
| Groups (per km ²) | 35.1 | 2.1 | -94 |
| Linear Features (m per km ²) | 698.7 | 650.1 | -7 |

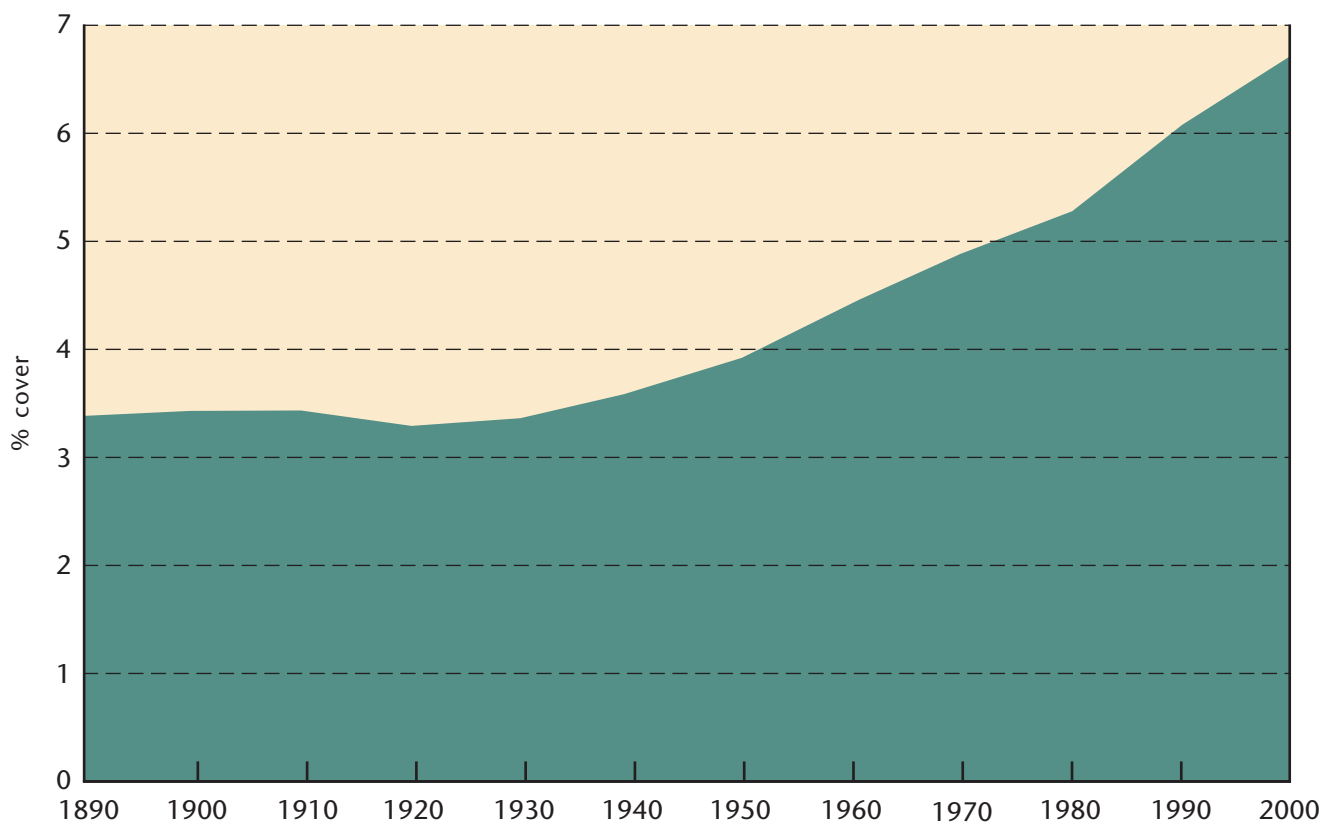
1. The Survey of Small Woodland and Trees did not record information referring to tree features (i.e. Individual trees, Groups and Narrow Linear features) within developed land.
2. In the 1980 Census hazel, hawthorn, blackthorn and goat willow were excluded; the 1999 Inventory figures have been adjusted 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 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.

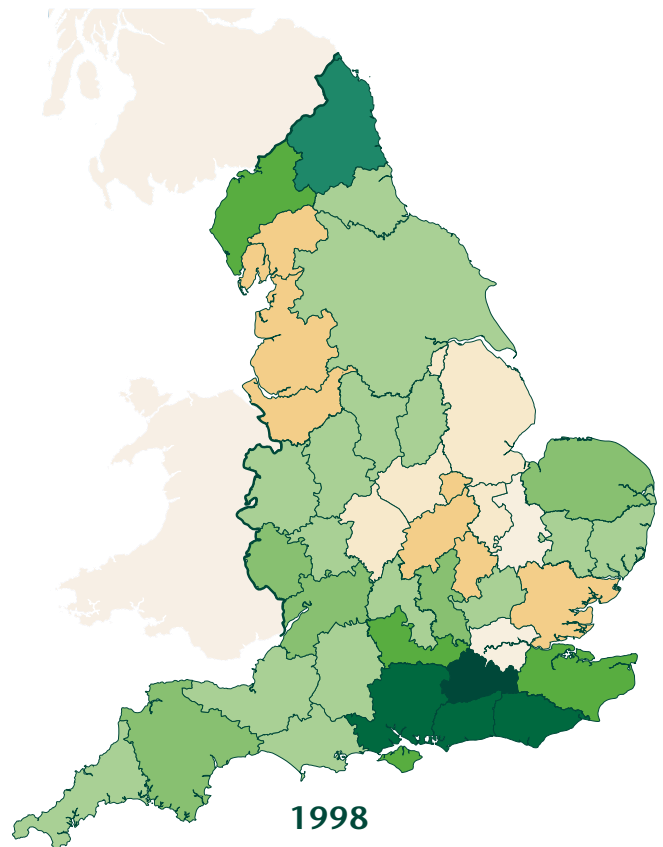
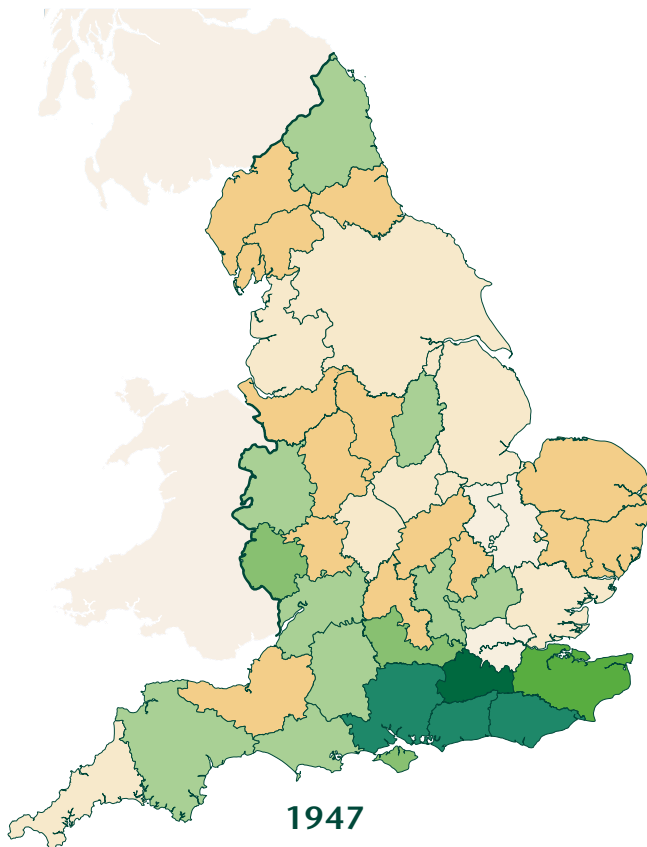
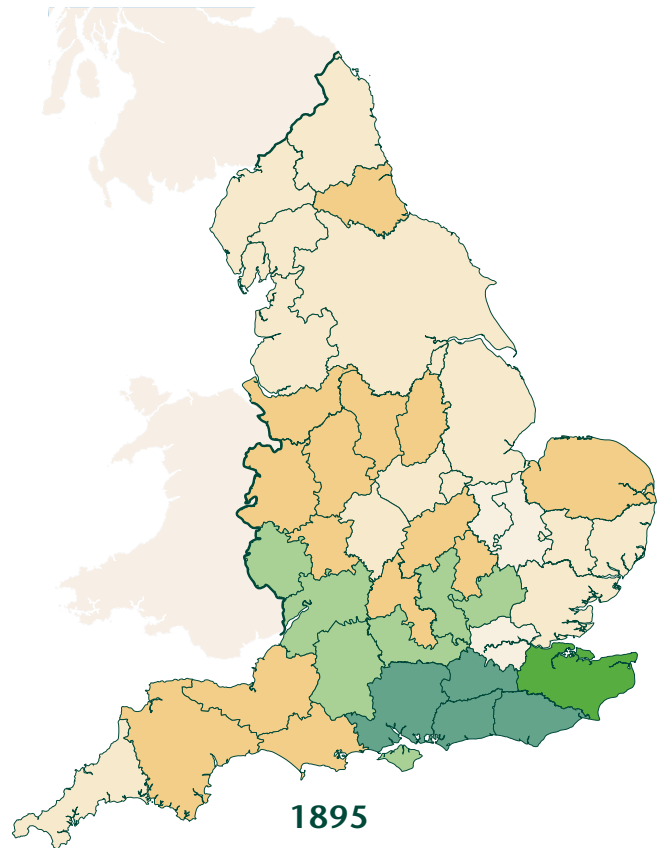
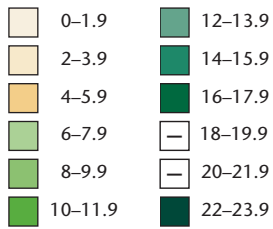
The maps use the old county structure of England, as reported on in 1895 and 1947. The data from these counties could not be re-analysed for different geographic areas. In contrast, the digital woodland map, which forms the basis of the current inventory, can be re-analysed for any geographic area.

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 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 | | |
| Cheshire | 9 442 | 895 | 10 337 | 4.4 |
| Cumbria | 61 753 | 2 829 | 64 582 | 9.5 |
| Greater Manchester | 4 329 | 366 | 4 695 | 3.7 |
| Lancashire | 13 404 | 674 | 14 078 | 4.6 |
| Merseyside | 2 404 | 73 | 2 477 | 3.8 |
| Total | 91 332 | 4 838 | 96 171 | 6.8 |

*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 | |
| Cheshire | 2 032 | 5 742 | 1 624 | 0 | 25 | 0 | 101 | 813 | 10 337 |
| Cumbria | 29 363 | 23 602 | 5 279 | 82 | 0 | 330 | 1 736 | 4 189 | 64 581 |
| Greater Manchester | 366 | 3 501 | 377 | 0 | 0 | 0 | 57 | 394 | 4 695 |
| Lancashire | 3 440 | 7 314 | 2 115 | 0 | 0 | 17 | 184 | 1 008 | 14 078 |
| Merseyside | 127 | 1 890 | 388 | 0 | 0 | 0 | 0 | 73 | 2 478 |
| Total | 35 327 | 42 049 | 9 785 | 82 | 25 | 347 | 2 078 | 6 477 | 96 171 |

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 | | |
| Cheshire | Features | 32.5 | 19.3 | 231.4 | | |
| | Live Trees | 156.8 | 2 404.1 | 231.4 | 2 792.3 | 1198 |
| Cumbria | Features | 421.4 | 54.8 | 726.1 | | |
| | Live Trees | 1 760.8 | 1 537.7 | 726.1 | 4 024.6 | 590 |
| Greater Manchester | Features | 21.4 | 5.3 | 26.9 | | |
| | Live Trees | 91.0 | 417.7 | 26.9 | 535.6 | 417 |
| Lancashire | Features | 58.1 | 26.3 | 113.0 | | |
| | Live Trees | 364.4 | 1 115.0 | 113.0 | 1 592.4 | 519 |
| Merseyside | Features | 0.0 | 1.9 | 17.9 | | |
| | Live Trees | 0.0 | 261.4 | 17.9 | 279.3 | 426 |
| Total | Features | 533.3 | 107.6 | 1 115.4 | | |
| | Live Trees | 2 373.0 | 5 735.8 | 1 115.4 | 9 224.2 | 651 |

*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) |
|--------------------|---------------------------------|-------------------------------|----------------------------------|
| Cheshire | 21 | 2 505 | 1 075 |
| Cumbria | 56 | 4 050 | 594 |
| Greater Manchester | 5 | 744 | 579 |
| Lancashire | 26 | 2 364 | 770 |
| Merseyside | 2 | 297 | 453 |
| Total | 110 | 9 960 | 703 |

*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

£15



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