



NATIONAL INVENTORY OF WOODLAND AND TREES



ENGLAND

County Report for

BEDFORDSHIRE



Forestry Commission

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Enquiries regarding this report should be directed to:

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

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

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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 Bedfordshire was carried out by Graham Bull, Woodland Survey Officer, and Woodland GIS Officers Chris Brown, Robert Beck and Esther Whitton. Data processing and analysis was carried out by Woodland Data Officers Justin Gilbert and Shona Cameron.

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

INTRODUCTION

This report presents the results for Bedfordshire from the Forestry Commission National Inventory of Woodland and Trees (NIWT).

The Inventory consists of two separate surveys -

- The Main Woodland Survey (MWS) covering woodlands of 2 hectares and over
- The Survey of Small Woodland and Trees (SSWT) covering Small Woods, Groups of Trees, Linear Features and Individual Trees.

BACKGROUND

Since 1924 the Forestry Commission has carried out a number of national woodland surveys at intervals of between 15 and 20 years. The previous survey was carried out between 1979 and 1982. With the statistics becoming increasingly out of date the Forestry Commission decided to undertake a new survey: the *National Inventory of Woodland and Trees*.

The survey fieldwork for Great Britain was completed in July 2000. Work began in Scotland in 1994, followed by Southern England, Wales and Northern England.

SURVEY METHODS

Main Woodland Survey

In England, Woodland Surveys derived a digital map of all woodland showing Interpreted Forest Types from 1:25 000 scale aerial photography. This provided the basis for the sampling.

The digital map gives the extent of all woodland over 2 hectares and this was updated as survey work progressed. The maps on pages 4-6 show: overall woodland cover; woodland by ownership; and woodland by Interpreted Forest Type, respectively. The total area of woodland was obtained from the digital map with ground sampling undertaken to evaluate a wide range of woodland information such as species, age and stocking.

From the digital map the area of each woodland was recorded and this information was used to determine the intensity at which any selected woodland would be sampled. The overall sampling scheme was as follows:

- 2.0ha - <100ha : every fifth wood
- 100ha - <500ha : two woods in five
- 500ha and larger : all woods

1 hectare square plots were used to sample the selected woodlands on the ground. This was a change of practice from all previous Census surveys, where whole woods have been selected for survey. For each of the three bands of woodland area a different sampling grid was used with the density of the squares being reduced as the woodlands increase in size. The overall aim was to sample 1% of the woodland in each size class.

Survey of Small Woodland and Trees

The land area of England was stratified into coastal and inland 1 km x 1 km squares and a random sample of 1 km² plots were then selected, representing around 1% of the land area. 1:25 000 scale aerial photos were then used to identify features in each sample square. Each 1 km² was then divided into 16 parts, and two of these were selected at random for field data collection. Data was collected on Small Woodlands (0.10 - <2.00 ha), Linear Features, Groups and Individual Trees. The survey did not collect information from areas of developed land of 2 hectares or more.

MAIN POINTS FROM THE SURVEY RESULTS

- The total area of woodland of 0.1 hectares and over in Bedfordshire is 7,655 hectares. This represents 6.2% of the land area. (Table 1)
- Broadleaved woodland is the dominant forest type representing 62.0 % of all woodland. Conifer woodland represents 25.9 %, Mixed woodland 5.9 % and Open Space within woodlands 6.0 %. (Table 2)
- The main conifer species is pine covering 1,157 hectares or 53.0 % of all conifer species. The main broadleaved species is oak covering 1,726 hectares or 34.6 % of all broadleaved species. (Table 3)
- 761 hectares or 11 % of woodland over 2 hectares is owned by or leased to the Forestry Commission, and 5,868 hectares or 89 % of woodland is in Other ownership. (Table 6)
- There are a total of 467 woods over 2 ha within Bedfordshire with a mean wood area of 14.4 hectares. (Table 7a) There are a total of 1,856 woods from 0.1 - <2.0 hectares with a mean wood area of 0.55 hectares. (Table 14)
- There are 175.3 thousand live trees outside woodland in Bedfordshire. (Table 15)
- Woodland land cover increased by over 1300 hectares from 5.0 % to 6.1 % of the land area between 1980 and 1998. (Table 19)
- The area of broadleaves increased by 28% between 1980 and 1998, with the relative proportion of broadleaves to conifers remaining at 69 %. (Table 20)

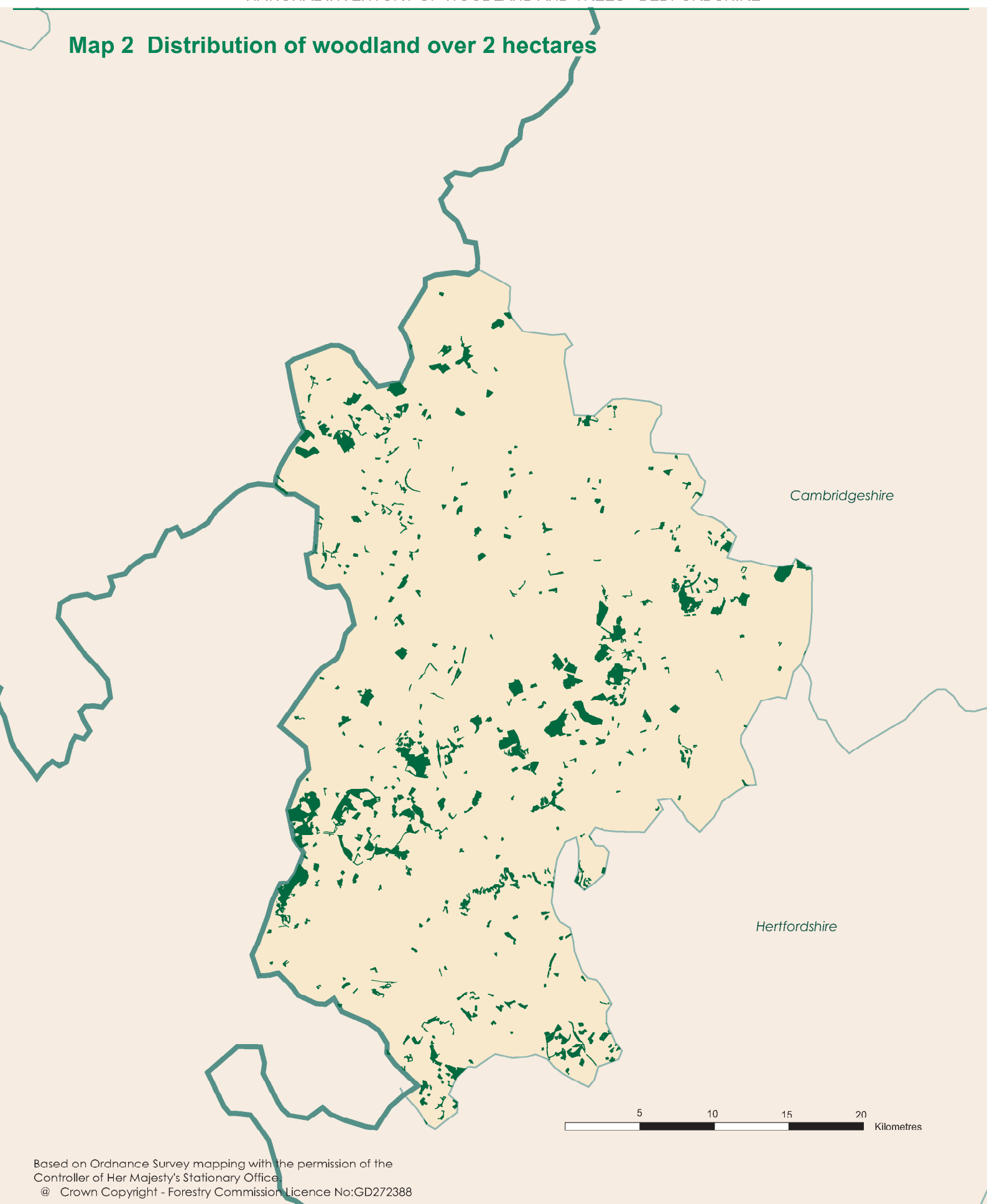
INVENTORY REPORTS

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

Map 1 Regional and county boundaries



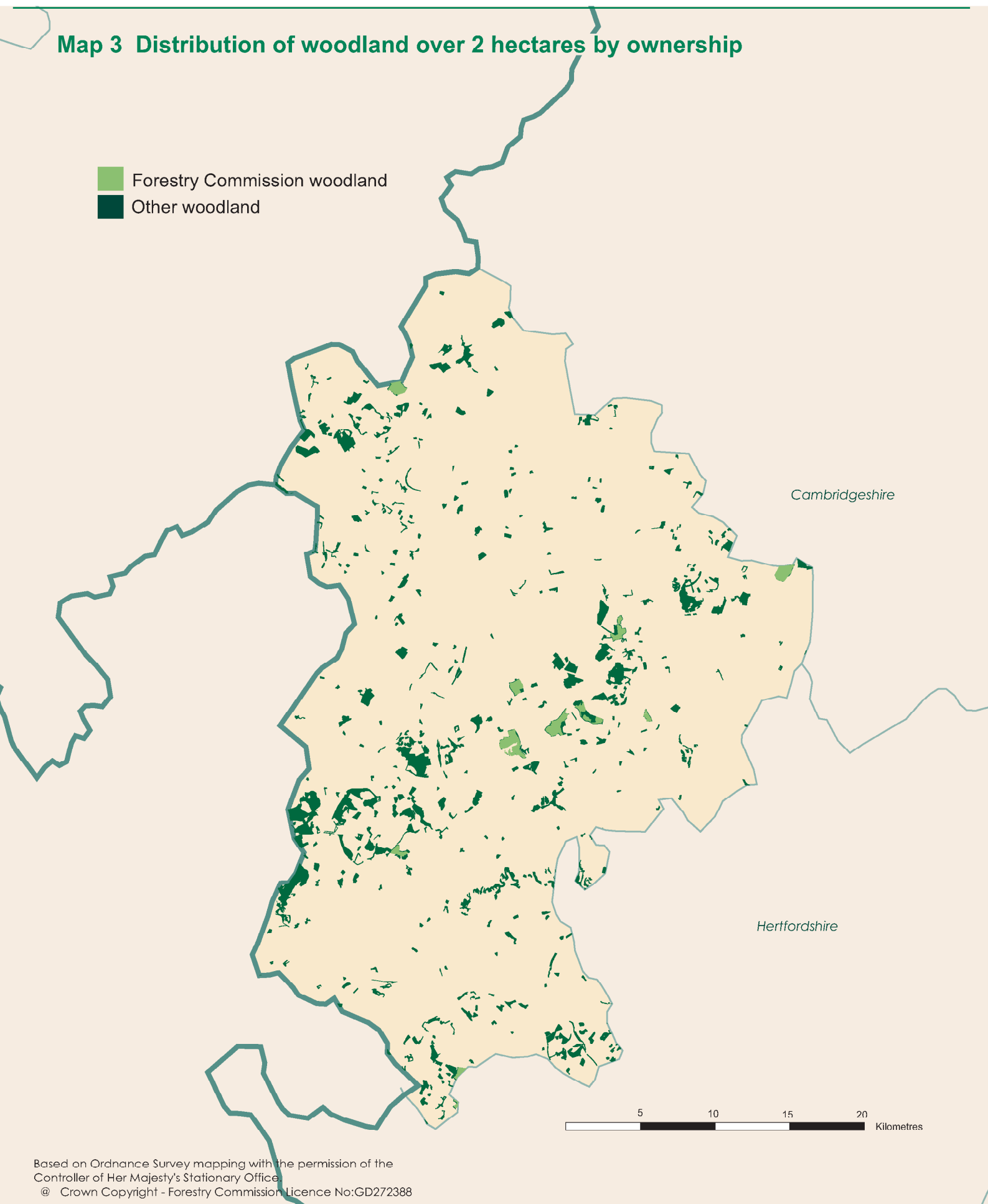
Map 2 Distribution of woodland over 2 hectares



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Map 3 Distribution of woodland over 2 hectares by ownership

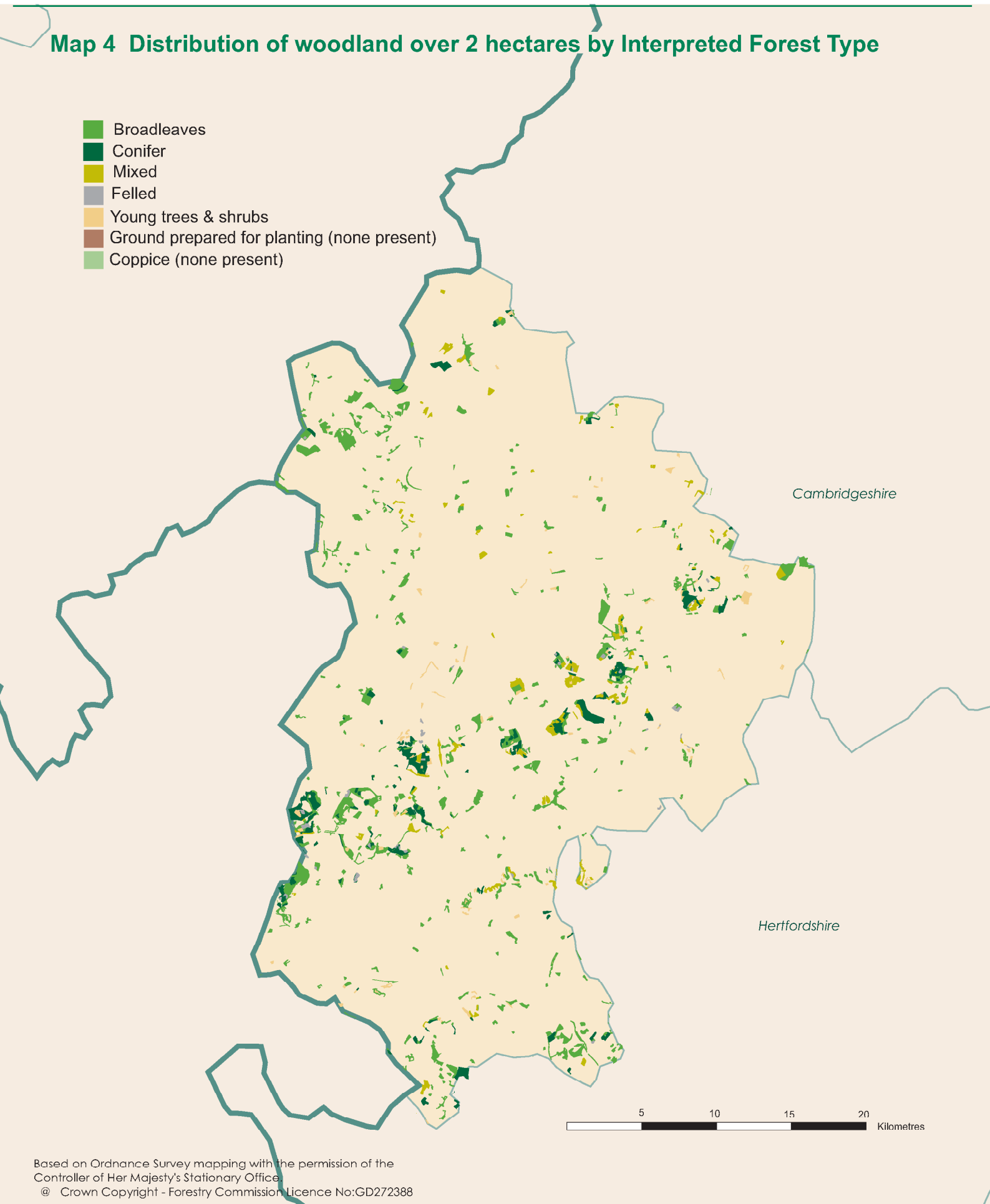
- Forestry Commission woodland
- Other woodland



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

- Broadleaves
- Conifer
- Mixed
- Felled
- Young trees & shrubs
- Ground prepared for planting (none present)
- Coppice (none present)



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SUMMARY RESULTS FROM THE NATIONAL INVENTORY OF WOODLAND AND TREES (NIWT)

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

Tables 1-3 show the combined woodland area from the Main Woodland Survey and the Survey of Small Woodland and Trees.

Tables 4 and 5 summarise the numbers of live trees outside woodland, and the lengths of Linear Features from the Survey of Small Woodland and Trees.

| | |
|----------|--|
| Table 1: | Woodland area by woodland size class |
| Table 2: | Woodland area by forest type and woodland size |
| Table 3: | Woodland area by principal species and woodland size |
| Table 4: | Numbers of live trees outside woodland by feature type |
| Table 5: | Lengths of Linear Features |

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

Table 1 Woodland area by woodland size class

| Woodland size (ha) | Woodland area (ha) | % of Woodland area |
|-------------------------------|--------------------|--------------------|
| 2.00 and over | 6,629 | 86.6 |
| 0.25 - < 2.00 | 938 | 12.3 |
| 0.10 - < 0.25 | 88 | 1.1 |
| Total area of woodland | 7,655 | 100.0 |
| % Woodland land cover | 6.2 | |

1. Area of Bedfordshire, including inland water, 123,557 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 | 1,875 | 108 | 1,983 | 25.9 |
| Broadleaved | 3,946 | 797 | 4,743 | 62.0 |
| Mixed | 356 | 93 | 449 | 5.9 |
| Coppiced | 0 | 0 | 0 | 0.0 |
| Copp-w-standards | 0 | 24 | 24 | 0.3 |
| Windblow | 0 | 0 | 0 | 0.0 |
| Felled | 0 | 0 | 0 | 0.0 |
| Open Space | 452 | 5 | 457 | 6.0 |
| Total | 6,629 | 1,026 | 7,655 | 100 |

1. See Glossary for definitions of forest types.

Table 3 Woodland area by principal species and woodland size

| Species/Groups | Woodland size (ha) | | Total area (ha) | Percentage of total area | |
|-----------------------------|--------------------|------------|--------------------|--------------------------|--------------|
| | 2.0 and over | 0.1 -<2.0 | | Category* | Species** |
| Pine | 1,081 | 76 | 1,157 | 53.0 | 16.1 |
| Sitka spruce | 0 | 0 | 0 | 0.0 | 0.0 |
| Larch | 488 | 15 | 503 | 23.0 | 7.0 |
| Other conifers | 442 | 59 | 501 | 23.0 | 7.0 |
| Mixed conifers | 21 | 0 | 21 | 1.0 | 0.3 |
| Total conifers | 2,033 | 150 | 2,183 | 100.0 | 30.4 |
| Oak | 1,545 | 181 | 1,726 | 34.6 | 24.1 |
| Beech | 191 | 20 | 211 | 4.2 | 2.9 |
| Sycamore | 193 | 29 | 222 | 4.4 | 3.1 |
| Ash | 1,060 | 90 | 1,150 | 23.0 | 16.0 |
| Birch | 162 | 2 | 164 | 3.3 | 2.3 |
| Elm | 97 | 12 | 109 | 2.2 | 1.5 |
| Other broadleaves | 755 | 295 | 1,050 | 21.0 | 14.6 |
| Mixed broadleaves | 142 | 217 | 359 | 7.2 | 5.0 |
| Total broadleaves | 4,144 | 846 | 4,990 | 100.0 | 69.6 |
| Total all species*** | 6,177 | 996 | 7,173 | | 100.0 |

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

**Species/group percentage of all species

***Excludes the 482ha of Coppice, Felled and Open space areas which were included in Table 2

1. The standard errors of the area estimates for woodland of 2 ha and over for the most common species or species groups are as follows

| | |
|-------------|-----|
| Conifers | 12% |
| Broadleaves | 6% |
| Pine | 17% |
| Oak | 12% |
| Ash | 13% |
2. Where the standard errors of these summary measures are 10% or less, the confidence intervals will be approximately symmetrical; the true value is expected to be within +/- one standard error for about 68% (or about two-thirds) of all cases, and within +/- two standard errors for about 95% of all cases. Where percentage standard errors are larger, e.g. for less common species or more variable species composition, the confidence intervals will be less symmetrical (and wider).

Table 4 Numbers of live trees outside woodland by feature type

| Feature type | Total number of features | Total number of live trees | Mean number of trees per feature | Tree density (per sq km) |
|------------------------|--------------------------|----------------------------|----------------------------------|--------------------------|
| Groups | 800 | 14,000 | 18 | 11 |
| Narrow Linear Features | 2,800 | 133,200 | 48 | 108 |
| Individual Trees | 28,000 | 28,000 | 1 | 23 |
| Total | | 175,200 | | 142 |

1. Land area used to calculate feature density 123,557ha 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 | 96% |
| Narrow Linear Features | 61% |
| Individual Trees | 26% |
3. Where the standard errors of these summary measures are 10% or less, the confidence intervals will be approximately symmetrical; the true value is expected to be within +/- one standard error for about 68% (or about two-thirds) of all cases, and within +/- two standard errors for about 95% of all cases. Where percentage standard errors are larger, e.g. for less common species or more variable species composition, the confidence intervals will be less symmetrical (and wider).
4. See Glossary for definitions of feature types.

Table 5 Lengths of Linear Features

| Feature type | Total number of features | Total length of features (km) | Density of features (m per sq km) |
|------------------------|--------------------------|-------------------------------|-----------------------------------|
| Wide Linear Features | 0 | 0 | 0 |
| Narrow Linear Features | 2,800 | 246 | 199 |
| Total | | 246 | 199 |

1. Land area used to calculate feature density 123,557ha based on digital boundaries used in 1991 Census of Population
2. The standard errors of the length estimates for these feature types are:

| | |
|------------------------|-----|
| Wide Linear Features | - |
| Narrow Linear Features | 38% |
3. Where the standard errors of these summary measures are 10% or less, the confidence intervals will be approximately symmetrical; the true value is expected to be within +/- one standard error for about 68% (or about two-thirds) of all cases, and within +/- two standard errors for about 95% of all cases. Where percentage standard errors are larger, e.g. for less common species or more variable species composition, the confidence intervals will be less symmetrical (and wider).
4. See Glossary for definitions of feature type.

RESULTS FROM THE MAIN WOODLAND SURVEY (MWS)

Survey Method

Woods were selected from the digital map of woodland of 2 hectares and over, then sampled using a random grid of 1 hectare sample plots. The density of sample plots was reduced as the sampled woodland increase in size, the general aim being to sample 1% of the woodland area. The ground sampling evaluated a wide range of data such as species, age and stocking.

| | |
|------------|--|
| Table 6: | Summary of woodland area by ownership |
| Chart: | Woodland area by ownership |
| Table 7a: | Size class distribution of woodland |
| Table 7b: | Size class distribution of woodland by ownership units |
| Table 8: | Area of woodland by forest type and ownership |
| Chart: | Area of woodland by forest type |
| Table 9a: | Area of High Forest by principal species and ownership |
| Graph: | Area of High Forest by principal species and ownership |
| Table 9b: | Area of High Forest by principal species, ownership and category |
| Graph: | High Forest Category 1 |
| | Area by principal species and ownership |
| Graph: | High Forest Category 2 |
| | Area by principal species and ownership |
| Table 10a: | High Forest Category 1 |
| | Area by principal species and planting year class |
| Graph: | High Forest Category 1 |
| | Area by planting year class |
| Table 10b: | High Forest Category 1 |
| | Forestry Commission: area by principal species and planting year class |
| Graph: | High Forest Category 1 |
| | Forestry Commission - area by planting year class |
| Table 10c: | High Forest Category 1 |
| | Other ownership: area by principal species and planting year class |
| Graph: | High Forest Category 1 |
| | Other ownership: area by planting year class |
| Table 11: | High Forest: principal species by planting year class |
| Table 12: | Ownership type by area and percentage |
| Chart: | Ownership type by area |

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

Table 6 Summary of woodland area by ownership

| Ownership | ha | % woodland |
|------------------------|-------|------------|
| Forestry Commission | 761 | 11 |
| Other | 5,868 | 89 |
| Total area of woodland | 6,629 | 100 |

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

Woodland area by ownership

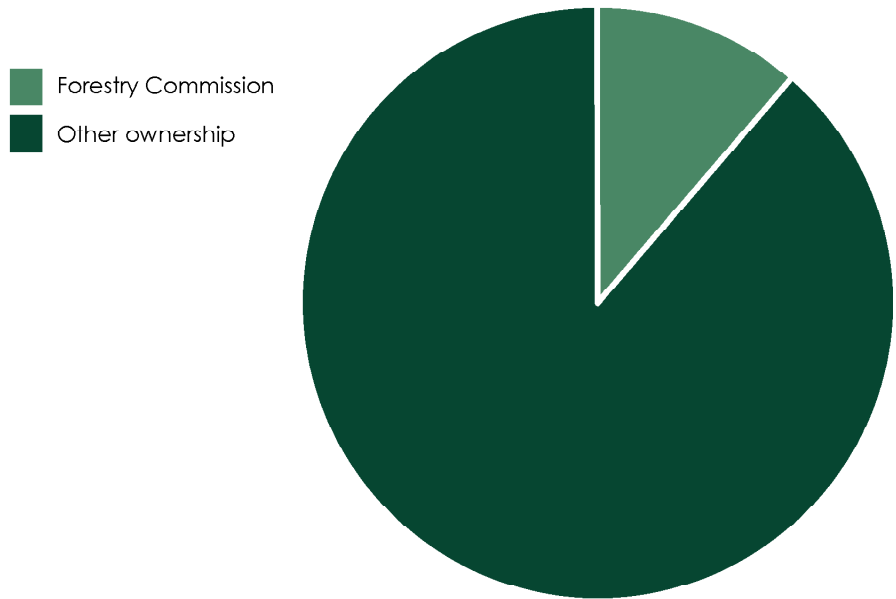


Table 7a Size class distribution of woodland

| Size class (ha) | Number of woods | Total area (ha) | Percent of total area | Mean wood area (ha) |
|----------------------|-----------------|-----------------|-----------------------|---------------------|
| <10 | 342 | 1,443 | 22 | 4.3 |
| 10 - <20 | 58 | 831 | 13 | 14.3 |
| 20 - <50 | 41 | 1,362 | 20 | 33.2 |
| 50 - <100 | 14 | 973 | 15 | 69.5 |
| <100 | 455 | 4,609 | 69 | 10.3 |
| 100 - <500 | 12 | 2,036 | 31 | 169.7 |
| 500 and > | 0 | 0 | 0 | 0.0 |
| All woods | 467 | 6,645 | 100 | 14.4 |

Table 7b Size class distribution of woodland by ownership units

| Size class (ha) | FC or Other | Number of woods | Total area (ha) | Percent of total area | Mean wood area (ha) |
|-----------------|-------------|-----------------|-----------------|-----------------------|---------------------|
| <10 | FC | 2 | 12 | 0 | 6.1 |
| | O | 358 | 1,492 | 22 | 4.2 |
| 10 - <20 | FC | 1 | 14 | 0 | 13.5 |
| | O | 60 | 865 | 13 | 14.4 |
| 20 - <50 | FC | 3 | 114 | 2 | 38.2 |
| | O | 42 | 1,401 | 21 | 33.4 |
| 50 - <100 | FC | 5 | 360 | 5 | 72.1 |
| | O | 11 | 725 | 11 | 65.9 |
| <100 | FC | 11 | 501 | 8 | 45.5 |
| | O | 471 | 4,482 | 67 | 9.5 |
| 100 - <500 | FC | 2 | 260 | 4 | 130.2 |
| | O | 7 | 1,401 | 21 | 200.2 |
| 500 and > | FC | 0 | 0 | 0 | 0.0 |
| | O | 0 | 0 | 0 | 0.0 |
| Total | FC | 13 | 761 | 11 | 58.5 |
| | O | 478 | 5,884 | 89 | 12.3 |

1. Table 7a and 7b are based solely on the digital woodland map. The other MWS tables are derived from the field sample data
2. The total area in Tables 7a and 7b is 16 hectares more than recorded in Table 6. This is mainly due to the field samples recording some land in other land uses not differentiated from woodland in the digital map
3. The data available from the digital map enable the identification of woodlands according to their ownerships, Forestry Commission or Other. The entries in table 7b cannot be added to derive table 7a as some woods may consist of both Forestry Commission and Other ownership(s)

For example, the Forestry Commission may own most of a large wood with some parts in Other ownership(s). In Table 7a the whole area would be treated as one wood and the area allocated to one size category. In Table 7b each of the ownership units would be allocated to the size category for that unit. Dividing woods by ownership can occasionally generate part woods of less than 2 hectares

Table 8 Area of woodland by forest type and ownership

| Forest type | Forestry Commission | | Other | | All ownerships | |
|--------------|---------------------|--------------|--------------|--------------|----------------|--------------|
| | ha | % | ha | % | ha | % |
| Conifer | 301 | 39.6 | 1,574 | 26.8 | 1,875 | 28.3 |
| Broadleaved | 381 | 50.1 | 3,566 | 60.8 | 3,946 | 59.5 |
| Mixed | 79 | 10.4 | 276 | 4.7 | 356 | 5.4 |
| Coppice | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Copp-w-Stds | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Windblow | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Felled | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Open Space | 0 | 0.0 | 452 | 7.7 | 452 | 6.8 |
| Total | 761 | 100.0 | 5,868 | 100.0 | 6,629 | 100.0 |

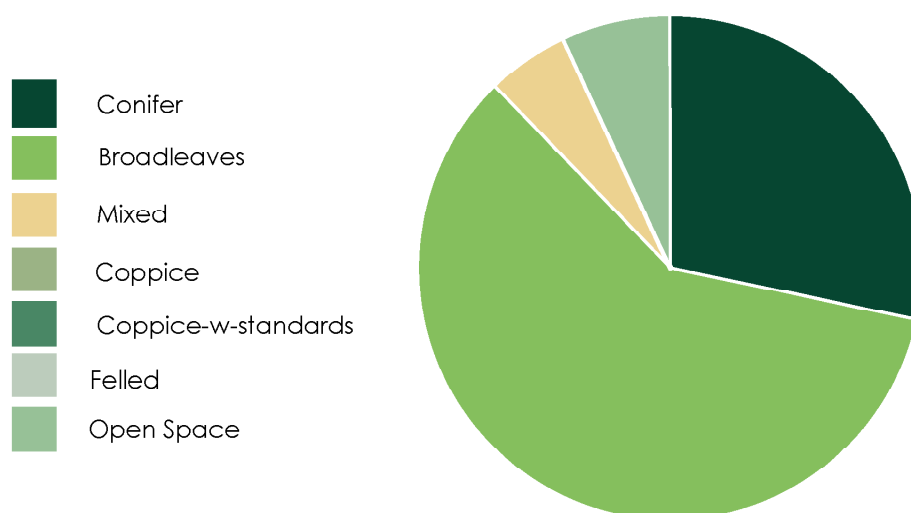
Area of woodland by forest type

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 | 29 | 8 | 4 | 669 | 40 | 12 | 698 | 34 | 11 |
| Corsican pine | 169 | 47 | 22 | 214 | 13 | 4 | 383 | 19 | 6 |
| Lodgepole pine | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sitka spruce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Norway spruce | 51 | 14 | 7 | 214 | 13 | 4 | 265 | 13 | 4 |
| European larch | 0 | 0 | 0 | 47 | 3 | 1 | 47 | 2 | 1 |
| Jap/Hybrid larch | 0 | 0 | 0 | 441 | 26 | 8 | 441 | 22 | 7 |
| Douglas fir | 42 | 12 | 6 | 40 | 2 | 1 | 82 | 4 | 1 |
| Other conifers | 65 | 18 | 9 | 30 | 2 | 1 | 95 | 5 | 2 |
| Mixed conifers | 0 | 0 | 0 | 21 | 1 | 0 | 21 | 1 | 0 |
| Total conifers | 356 | 100 | 47 | 1,677 | 100 | 31 | 2,033 | 100 | 33 |
| Oak | 186 | 46 | 24 | 1,359 | 36 | 25 | 1,545 | 37 | 25 |
| Beech | 8 | 2 | 1 | 183 | 5 | 3 | 191 | 5 | 3 |
| Sycamore | 0 | 0 | 0 | 193 | 5 | 4 | 193 | 5 | 3 |
| Ash | 75 | 19 | 10 | 984 | 26 | 18 | 1,060 | 26 | 17 |
| Birch | 17 | 4 | 2 | 145 | 4 | 3 | 162 | 4 | 3 |
| Poplar | 59 | 15 | 8 | 210 | 6 | 4 | 269 | 6 | 4 |
| Sweet chestnut | 0 | 0 | 0 | 77 | 2 | 1 | 77 | 2 | 1 |
| Elm | 8 | 2 | 1 | 89 | 2 | 2 | 97 | 2 | 2 |
| Other broadleaves | 36 | 9 | 5 | 373 | 10 | 7 | 409 | 10 | 7 |
| Mixed broadleaves | 17 | 4 | 2 | 125 | 3 | 2 | 142 | 3 | 2 |
| Total broadleaves | 405 | 100 | 53 | 3,738 | 100 | 69 | 4,144 | 100 | 67 |
| Total - all species | 761 | | 100 | 5,415 | | 100 | 6,177 | | 100 |
| Felled | 0 | | | 0 | | | 0 | | |
| Total High Forest | 761 | | | 5,415 | | | 6,177 | | |

*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 452 ha 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 | 12% |
| Broadleaves | 6% |
| Scots pine | 19% |
| Oak | 12% |
| Ash | 13% |
3. Mixtures: where possible the species in mixtures have been separately recorded. Where this has not been possible they were described as 'Mixed conifers' or 'Mixed broadleaves'.
4. Confidence Intervals: where the standard errors of these summary measures are 10% or less, the confidence intervals will be approximately symmetrical; the true value is expected to be within +/- one standard error for about 68% (or about two-thirds) of all cases, and within +/- two standard errors for about 95% of all cases. Where percentage standard errors are larger, e.g. for less common species or more variable species composition, the confidence intervals will be less symmetrical (and wider).

Area of High Forest by principal species and ownership

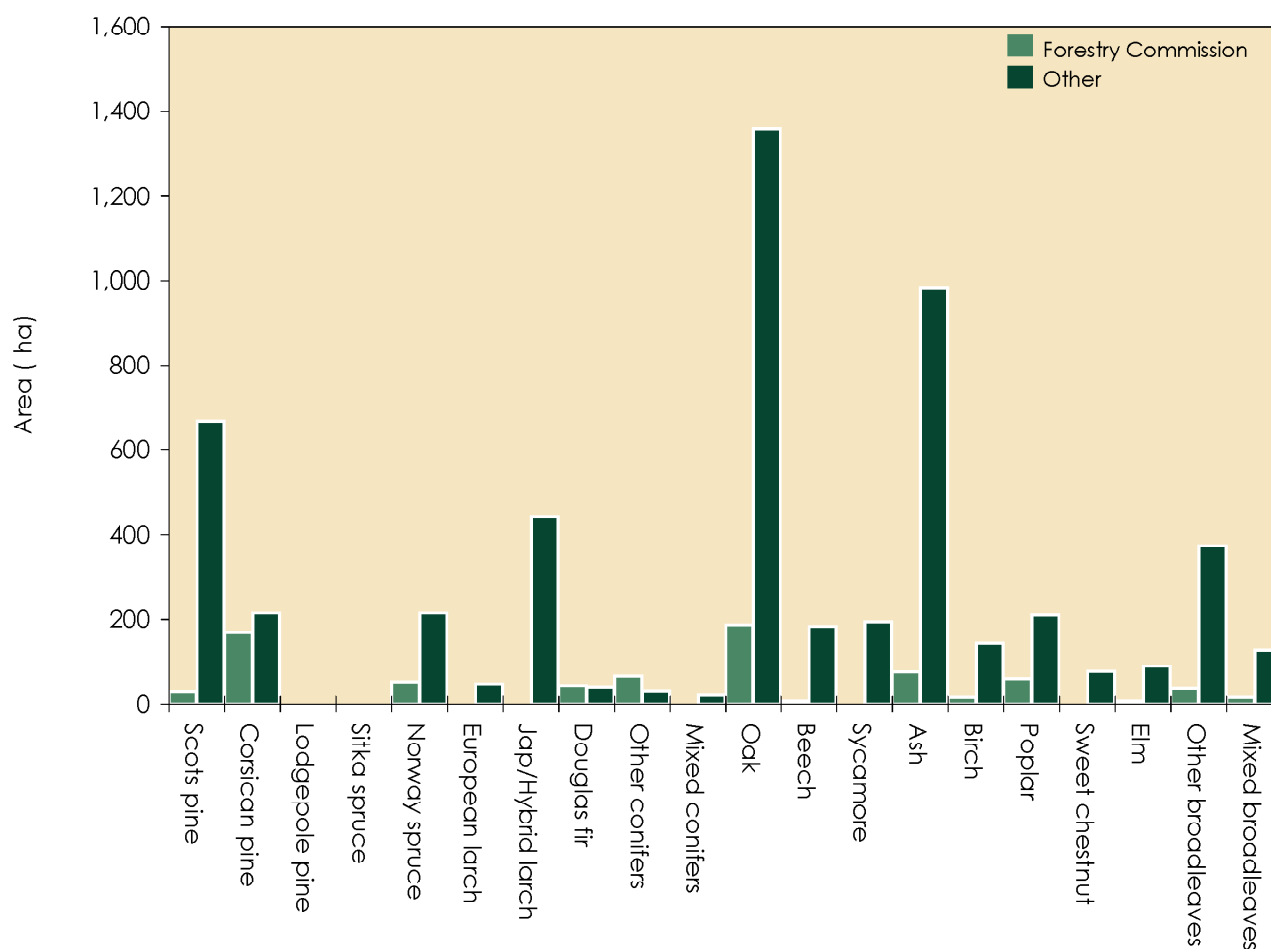


Table 9b Area of High Forest by principal species,ownership and category

| Species | Forestry Commission | | | Other | | | All ownerships | | |
|----------------------------|---------------------|-----------|------------|--------------|------------|--------------|----------------|------------|--------------|
| | cat. 1 | cat. 2 | Total (ha) | cat. 1 | cat. 2 | Total (ha) | cat. 1 | cat. 2 | Total (ha) |
| Scots pine | 29 | 0 | 29 | 669 | 0 | 669 | 698 | 0 | 698 |
| Corsican pine | 169 | 0 | 169 | 214 | 0 | 214 | 383 | 0 | 383 |
| Lodgepole pine | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sitka spruce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Norway spruce | 51 | 0 | 51 | 214 | 0 | 214 | 265 | 0 | 265 |
| European larch | 0 | 0 | 0 | 47 | 0 | 47 | 47 | 0 | 47 |
| Jap/Hybrid larch | 0 | 0 | 0 | 441 | 0 | 441 | 441 | 0 | 441 |
| Douglas fir | 42 | 0 | 42 | 40 | 0 | 40 | 82 | 0 | 82 |
| Other conifers | 65 | 0 | 65 | 26 | 4 | 30 | 91 | 4 | 95 |
| Mixed conifers | 0 | 0 | 0 | 21 | 0 | 21 | 21 | 0 | 21 |
| Total conifers | 356 | 0 | 356 | 1,673 | 4 | 1,677 | 2,029 | 4 | 2,033 |
| Oak | 186 | 0 | 186 | 1,359 | 0 | 1,359 | 1,545 | 0 | 1,545 |
| Beech | 8 | 0 | 8 | 183 | 0 | 183 | 191 | 0 | 191 |
| Sycamore | 0 | 0 | 0 | 193 | 0 | 193 | 193 | 0 | 193 |
| Ash | 47 | 28 | 75 | 965 | 20 | 984 | 1,012 | 48 | 1,060 |
| Birch | 17 | 0 | 17 | 137 | 8 | 145 | 154 | 8 | 162 |
| Poplar | 59 | 0 | 59 | 210 | 0 | 210 | 269 | 0 | 269 |
| Sweet chestnut | 0 | 0 | 0 | 77 | 0 | 77 | 77 | 0 | 77 |
| Elm | 8 | 0 | 8 | 43 | 47 | 89 | 50 | 47 | 97 |
| Other broadleaves | 36 | 0 | 36 | 222 | 151 | 373 | 258 | 151 | 409 |
| Mixed broadleaves | 17 | 0 | 17 | 121 | 4 | 125 | 138 | 4 | 142 |
| Total broadleaves | 377 | 28 | 405 | 3,509 | 230 | 3,738 | 3,886 | 258 | 4,144 |
| Total - all species | 733 | 28 | 761 | 5,182 | 234 | 5,415 | 5,915 | 262 | 6,177 |

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

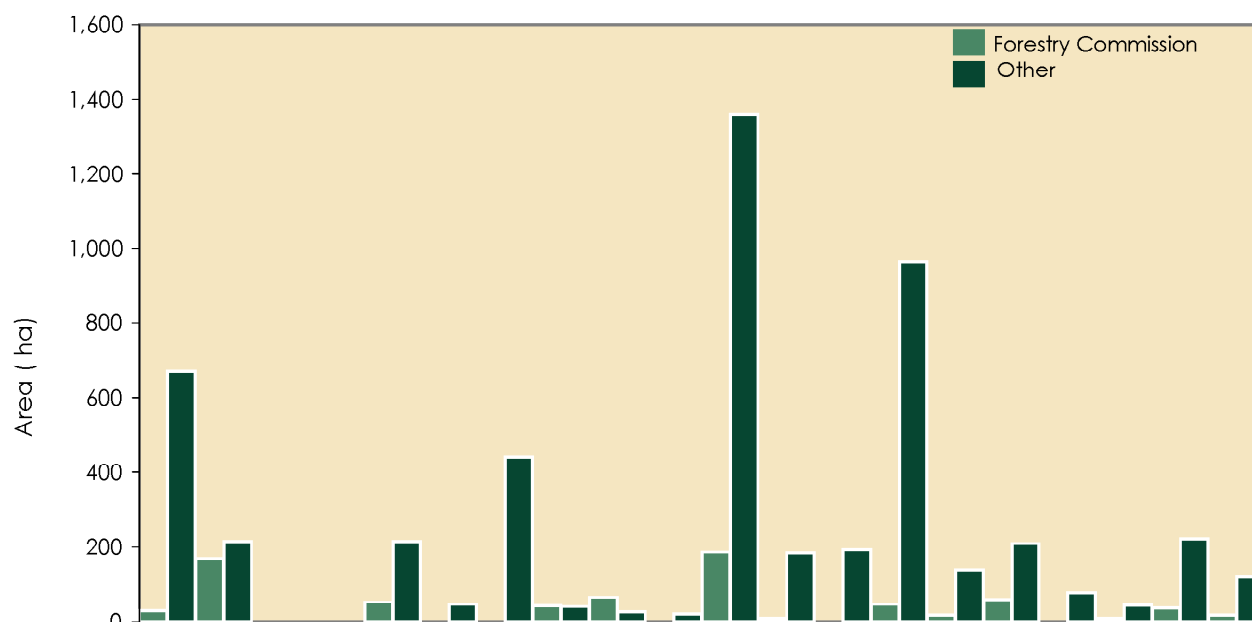
| | Category 1* | Category 2* | Total High Forest |
|-------------|-------------|-------------|-------------------|
| Conifers | 12% | - | 12% |
| Broadleaves | 6% | 32% | 6% |
| Scots pine | 19% | - | 19% |
| Oak | 12% | - | 12% |
| Ash | 13% | 42% | 13% |

*See Glossary for Category 1 and Category 2 descriptions

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

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

High Forest Category 1 - Area by principal species and ownership



High Forest Category 2 - Area by principal species and ownership

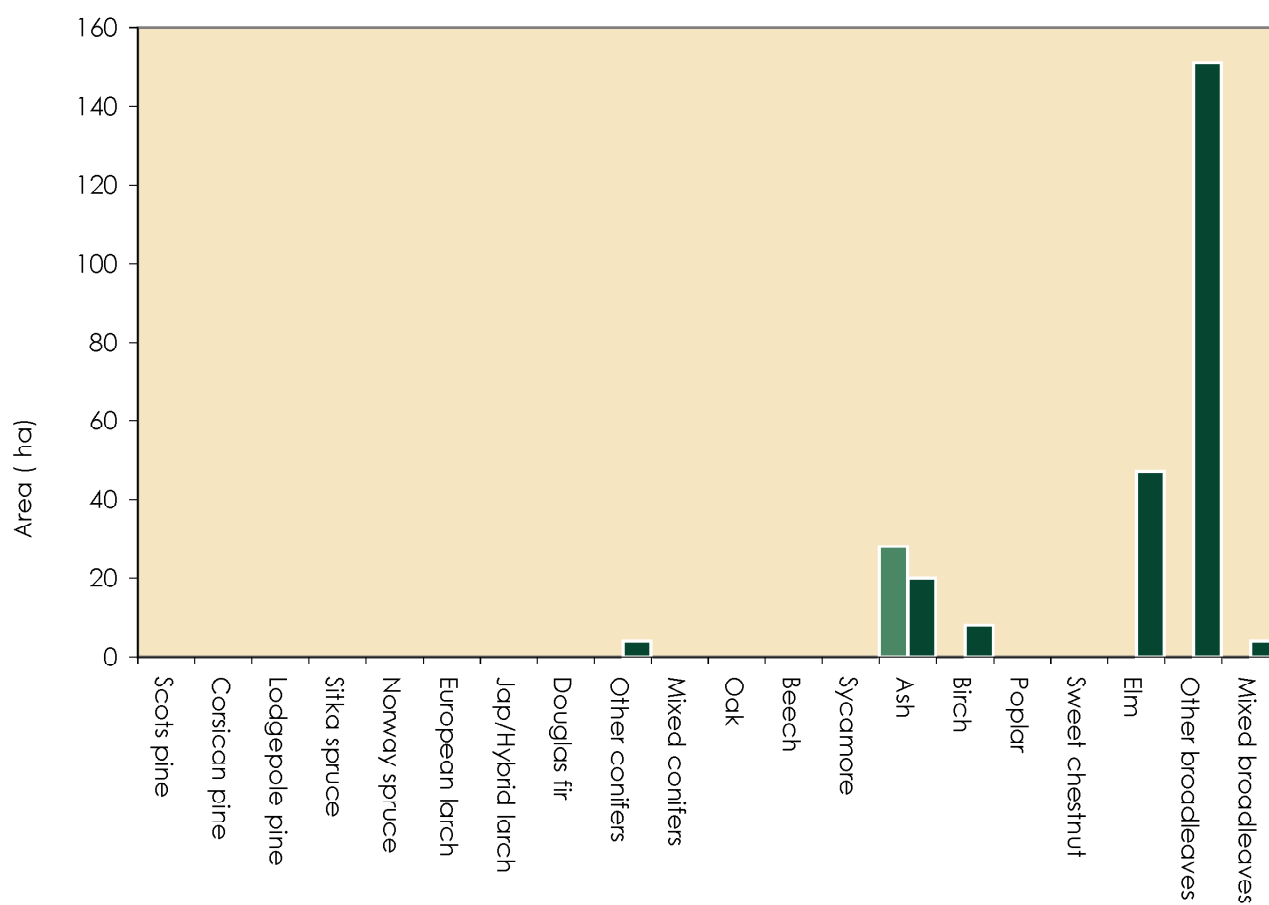
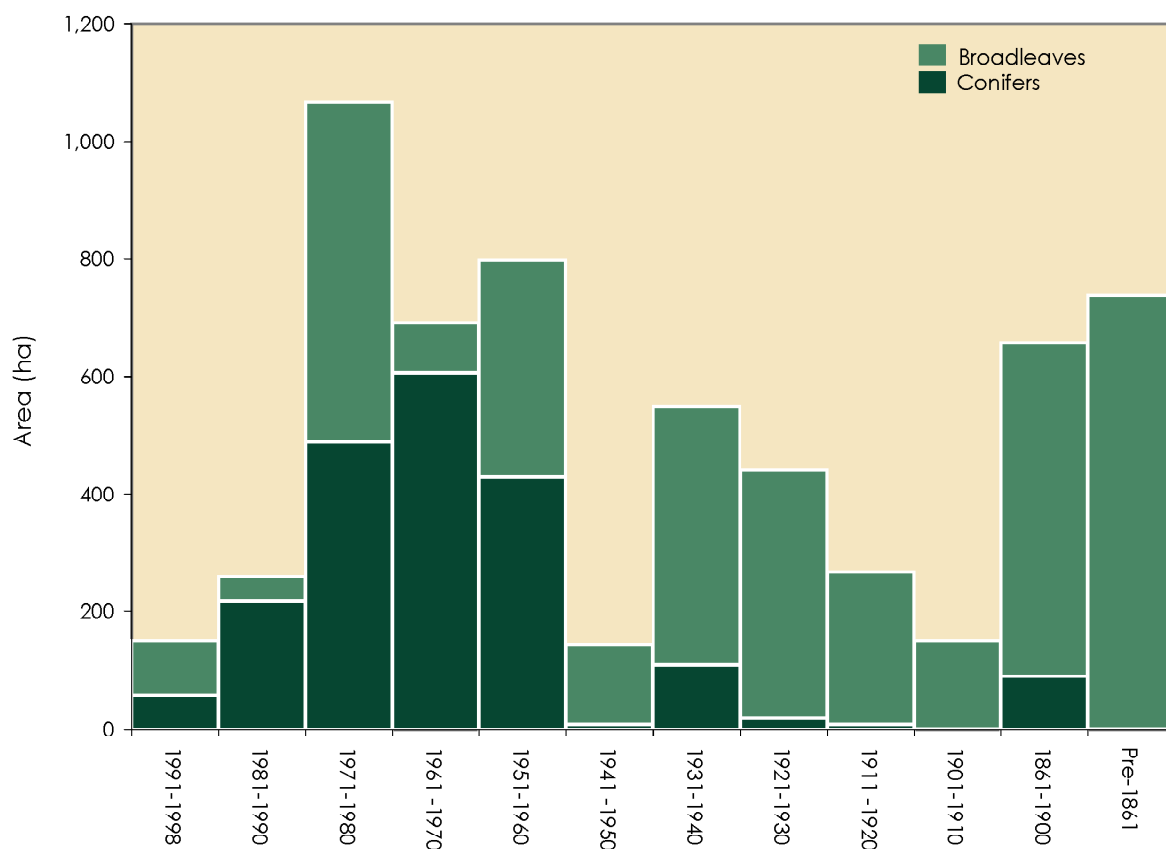


Table 10a High Forest Category 1 - Area by principal species and planting year class

| Species | Planting year class* | | | | | | | | | | | | Total (ha) |
|----------------------------|----------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|--------------|
| | 1991-1998 | 1981-1990 | 1971-1980 | 1961-1970 | 1951-1960 | 1941-1950 | 1931-1940 | 1921-1930 | 1911-1920 | 1901-1910 | 1861-1900 | Pre-1861 | |
| Scots pine | 0 | 20 | 208 | 27 | 327 | 4 | 39 | 0 | 4 | 0 | 70 | 0 | 698 |
| Corsican pine | 57 | 108 | 70 | 135 | 0 | 4 | 0 | 8 | 0 | 0 | 0 | 0 | 383 |
| Lodgepole pine | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sitka spruce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Norway spruce | 0 | 21 | 153 | 80 | 0 | 0 | 6 | 6 | 0 | 0 | 0 | 0 | 265 |
| European larch | 0 | 4 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 |
| Jap/Hybrid larch | 0 | 64 | 36 | 304 | 8 | 0 | 21 | 0 | 0 | 0 | 8 | 0 | 441 |
| Douglas fir | 0 | 0 | 0 | 8 | 34 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 82 |
| Other conifers | 0 | 0 | 14 | 52 | 17 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 91 |
| Mixed conifers | 0 | 0 | 7 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 11 | 0 | 21 |
| Total conifers | 57 | 217 | 488 | 605 | 429 | 8 | 109 | 18 | 8 | 0 | 89 | 0 | 2,029 |
| Oak | 60 | 16 | 67 | 10 | 16 | 12 | 14 | 209 | 185 | 76 | 291 | 587 | 1,545 |
| Beech | 8 | 0 | 42 | 16 | 12 | 39 | 0 | 3 | 0 | 3 | 27 | 40 | 191 |
| Sycamore | 0 | 4 | 62 | 4 | 0 | 25 | 16 | 65 | 0 | 0 | 17 | 0 | 193 |
| Ash | 0 | 8 | 121 | 4 | 73 | 31 | 305 | 126 | 44 | 43 | 183 | 75 | 1,012 |
| Birch | 8 | 0 | 18 | 35 | 89 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 154 |
| Poplar | 0 | 0 | 98 | 0 | 87 | 8 | 53 | 0 | 24 | 0 | 0 | 0 | 269 |
| Sweet chestnut | 12 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 25 | 36 | 77 |
| Elm | 0 | 0 | 43 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 50 |
| Other broadleaves | 0 | 8 | 82 | 3 | 72 | 0 | 43 | 8 | 0 | 24 | 17 | 0 | 258 |
| Mixed broadleaves | 4 | 7 | 45 | 14 | 21 | 10 | 7 | 11 | 7 | 4 | 8 | 0 | 138 |
| Total broadleaves | 93 | 43 | 579 | 87 | 369 | 136 | 440 | 423 | 260 | 150 | 569 | 738 | 3,886 |
| Total - all species | 150 | 260 | 1,067 | 692 | 797 | 144 | 549 | 441 | 268 | 150 | 658 | 738 | 5,915 |

*Age determined from records where these were available. Where records were not available or were clearly inaccurate age-class was assigned by reference to similar crops of known age in the locality.

High Forest Category 1 - Area by planting year class

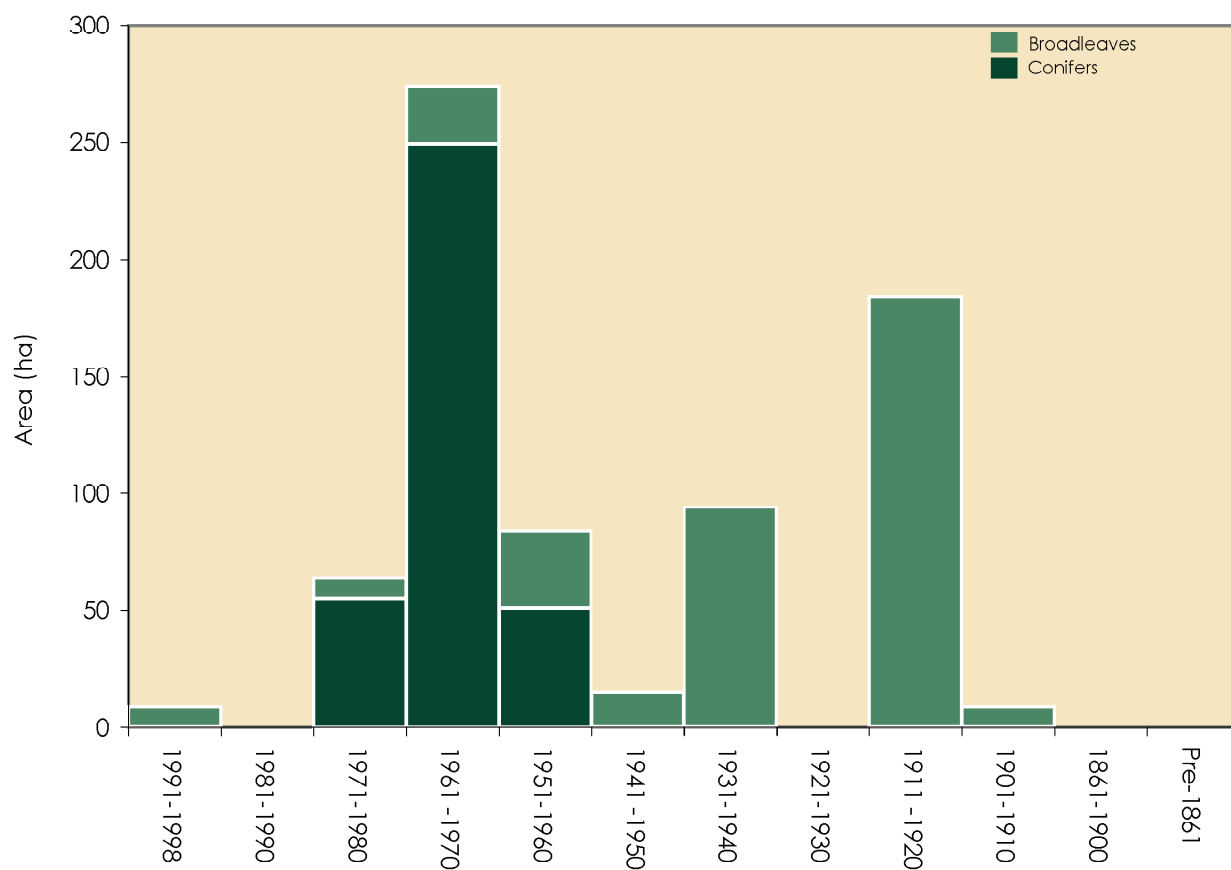


1. Most of the planting year classes cover 10 years, 1991-1998 is 8 years, and the classes prior to 1901 are 40 years or more.

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

| Species | Planting year class* | | | | | | | | | | | | Total (ha) |
|----------------------------|----------------------|-----------|-----------|------------|-----------|-----------|-----------|-----------|------------|-----------|-----------|----------|------------|
| | 1991-1998 | 1981-1990 | 1971-1980 | 1961-1970 | 1951-1960 | 1941-1950 | 1931-1940 | 1921-1930 | 1911-1920 | 1901-1910 | 1861-1900 | Pre-1861 | |
| Scots pine | 0 | 0 | 21 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 |
| Corsican pine | 0 | 0 | 34 | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 169 |
| Lodgepole pine | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sitka spruce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Norway spruce | 0 | 0 | 0 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| European larch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jap/Hybrid larch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Douglas fir | 0 | 0 | 0 | 8 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| Other conifers | 0 | 0 | 0 | 48 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 65 |
| Mixed conifers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total conifers | 0 | 0 | 55 | 249 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 356 |
| Oak | 4 | 0 | 0 | 4 | 0 | 0 | 9 | 0 | 160 | 9 | 0 | 0 | 186 |
| Beech | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Sycamore | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ash | 0 | 0 | 0 | 4 | 9 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 47 |
| Birch | 4 | 0 | 0 | 4 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| Poplar | 0 | 0 | 0 | 0 | 8 | 8 | 20 | 0 | 24 | 0 | 0 | 0 | 59 |
| Sweet chestnut | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Elm | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Other broadleaves | 0 | 0 | 0 | 0 | 4 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 36 |
| Mixed broadleaves | 0 | 0 | 9 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| Total broadleaves | 9 | 0 | 9 | 25 | 33 | 15 | 94 | 0 | 184 | 9 | 0 | 0 | 377 |
| Total - all species | 9 | 0 | 64 | 274 | 84 | 15 | 94 | 0 | 184 | 9 | 0 | 0 | 733 |

*Age determined from records where these were available. Where records were not available or were clearly inaccurate age-class was assigned by reference to similar crops of known age in the locality.

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

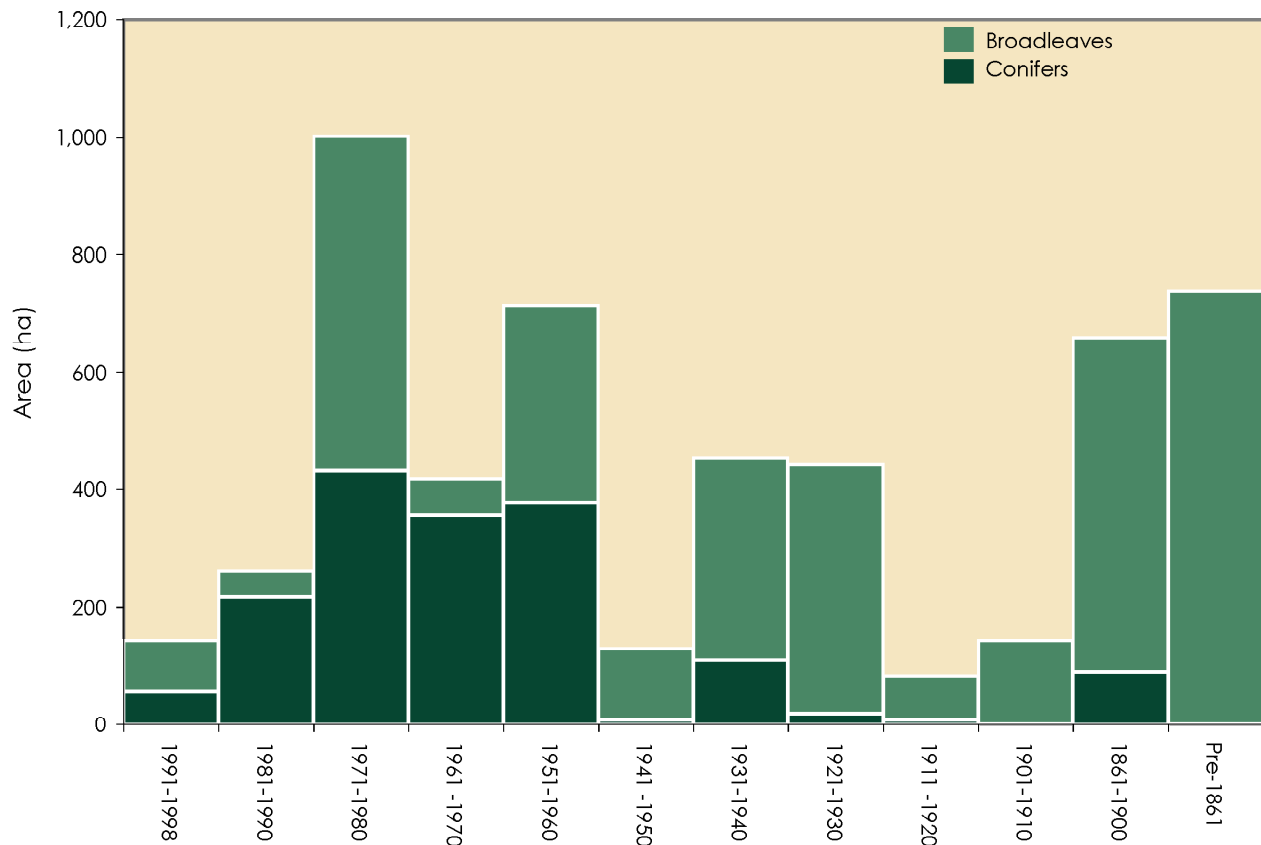
1. Most of the planting year classes cover 10 years, 1991-1998 is 8 years, and the classes prior to 1901 are 40 years or more.

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

| Species | Planting year class* | | | | | | | | | | | | Total (ha) |
|----------------------------|----------------------|------------|--------------|------------|------------|------------|------------|------------|-----------|------------|------------|------------|--------------|
| | 1991-1998 | 1981-1990 | 1971-1980 | 1961-1970 | 1951-1960 | 1941-1950 | 1931-1940 | 1921-1930 | 1911-1920 | 1901-1910 | 1861-1900 | Pre-1861 | |
| Scots pine | 0 | 20 | 186 | 19 | 327 | 4 | 39 | 0 | 4 | 0 | 70 | 0 | 669 |
| Corsican pine | 57 | 108 | 36 | 0 | 0 | 4 | 0 | 8 | 0 | 0 | 0 | 0 | 214 |
| Lodgepole pine | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Silka spruce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Norway spruce | 0 | 21 | 153 | 29 | 0 | 0 | 6 | 6 | 0 | 0 | 0 | 0 | 214 |
| European larch | 0 | 4 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 |
| Jap/Hybrid larch | 0 | 64 | 36 | 304 | 8 | 0 | 21 | 0 | 0 | 0 | 8 | 0 | 441 |
| Douglas fir | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 40 |
| Other conifers | 0 | 0 | 14 | 4 | 0 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 26 |
| Mixed conifers | 0 | 0 | 7 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 11 | 0 | 21 |
| Total conifers | 57 | 217 | 432 | 356 | 377 | 8 | 109 | 18 | 8 | 0 | 89 | 0 | 1,673 |
| Oak | 56 | 16 | 67 | 6 | 16 | 12 | 6 | 209 | 25 | 67 | 291 | 587 | 1,359 |
| Beech | 8 | 0 | 42 | 8 | 12 | 39 | 0 | 3 | 0 | 3 | 27 | 40 | 183 |
| Sycamore | 0 | 4 | 62 | 4 | 0 | 25 | 16 | 65 | 0 | 0 | 17 | 0 | 193 |
| Ash | 0 | 8 | 121 | 0 | 64 | 31 | 271 | 126 | 44 | 43 | 183 | 75 | 965 |
| Birch | 4 | 0 | 18 | 31 | 80 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 137 |
| Poplar | 0 | 0 | 98 | 0 | 79 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 210 |
| Sweet chestnut | 12 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 25 | 36 | 77 |
| Elm | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| Other broadleaves | 0 | 8 | 82 | 3 | 68 | 0 | 11 | 8 | 0 | 24 | 17 | 0 | 222 |
| Mixed broadleaves | 4 | 7 | 37 | 10 | 16 | 10 | 7 | 11 | 7 | 4 | 8 | 0 | 121 |
| Total broadleaves | 85 | 43 | 570 | 62 | 336 | 121 | 346 | 423 | 75 | 142 | 569 | 738 | 3,509 |
| Total - all species | 142 | 260 | 1,003 | 418 | 713 | 129 | 455 | 441 | 84 | 142 | 658 | 738 | 5,182 |

*Age determined from records where these were available. Where records were not available or were clearly inaccurate age-class was assigned by reference to similar crops of known age in the locality.

High Forest Category 1 - Other Ownership: area by planting year class



1. Most of the planting year classes cover 10 years, 1991-1998 is 8 years, and the classes prior to 1901 are 40 years or more.

Table 11 High Forest : principal species by planting year class

| Planting year class | First | % | Second | % | Third | % |
|---------------------|-------------------|-----------|-------------------|-----------|-------------------|-----------|
| 1991-98 | Oak | 40 | Corsican pine | 38 | Sweet chestnut | 8 |
| 1981-90 | Corsican pine | 36 | Jap/Hybrid larch | 22 | Elm | 12 |
| 1971-80 | Scots pine | 19 | Norway spruce | 14 | Ash | 11 |
| 1961-70 | Jap/Hybrid larch | 44 | Corsican pine | 19 | Norway spruce | 11 |
| 1951-60 | Scots pine | 40 | Birch | 12 | Poplars | 11 |
| 1941-50 | Other broadleaves | 25 | Ash | 22 | Beech | 18 |
| 1931-40 | Ash | 56 | Other broadleaves | 9 | Poplars | 9 |
| 1921-30 | Oak | 40 | Ash | 24 | Other broadleaves | 17 |
| 1911-20 | Oak | 69 | Ash | 16 | Poplars | 9 |
| 1901-10 | Oak | 51 | Ash | 29 | Other broadleaves | 17 |
| 1861-1900 | Oak | 44 | Ash | 28 | Scots pine | 10 |
| Pre 1861 | Oak | 80 | Ash | 10 | Beech | 5 |
| All years | Oak | 25 | Ash | 17 | Scots pine | 11 |

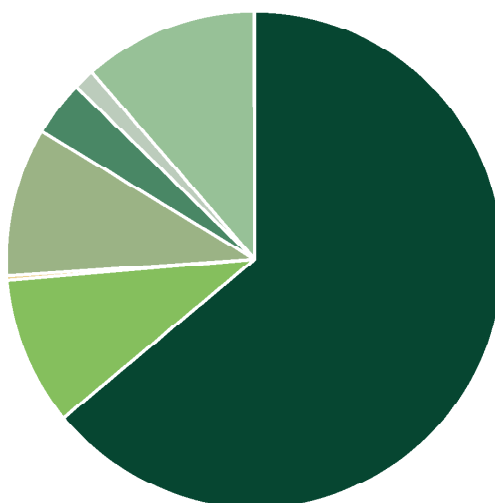
1. Principal species as a percentage of area in the planting year class.

Table 12 Ownership type* by area and percentage

| Ownership type | Area (ha) | % |
|------------------------------------|--------------|--------------|
| Personal | 4,227 | 63.8 |
| Business | 651 | 9.8 |
| Forestry or timber business | 27 | 0.4 |
| Charity | 646 | 9.7 |
| Local Authority | 236 | 3.6 |
| Other public (not FC) | 81 | 1.2 |
| Forestry Commission | 761 | 11.5 |
| Community ownership or common land | 0 | 0.0 |
| Unidentified | 0 | 0.0 |
| Total | 6,629 | 100.0 |

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

Ownership type by area



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

Survey Method

The land area of England was stratified into coastal and inland 1 km x 1 km squares and a random sample of 1 km² plots were then selected, representing around 1% of the land area. 1:25 000 scale aerial photos were then used to identify features in each sample square. Each 1 km² was then divided into 16 parts, and two of these were selected at random for field data collection. Data was collected on Small Woodlands (0.10 - <2.00 ha), Linear Features, Groups and Individual Trees. The survey did not collect information from areas of developed land of 2 hectares or more.

| | |
|------------|--|
| Table 13: | Summary of information from the Survey of Small Woodland and Trees |
| Table 14: | Woodland area by feature type and woodland size |
| Table 15: | Numbers of live trees outside woodland by species and feature type |
| Table 16 : | Numbers of dead trees outside woodland by species and feature type |
| Table 17: | Numbers of live trees outside woodland by species and height band |
| Table 18: | Numbers of Groups by group size |

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

Table 13 Summary of information from the Survey of Small Woodlands and Trees

| Feature type | Number of features | Total | Unit |
|------------------------|--------------------|---------|----------------------|
| Small Woods | 1,856 | 1,026 | Area (ha) |
| Wide Linear Features | 0 | 0 | Area (ha) |
| Wide Linear Features | 0 | 0 | Length (Km) |
| Narrow Linear Features | 2,800 | 246 | Length (Km) |
| Narrow Linear Features | 2,800 | 133,200 | Number of live trees |
| Groups | 800 | 14,000 | Number of live trees |
| Individual Trees | 28,000 | 28,000 | 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 | 88 | 938 | 1,026 | 1,856 | 0.55 |
| Wide Linear Features | 0 | 0 | 0 | 0 | 0.00 |
| Total | 88 | 938 | 1,026 | 1,856 | 0.55 |

1. See Glossary for definitions of feature types.

Table 15 Numbers of live trees outside woodland by species and feature type (000's trees)

| Species | Feature type | | | | Total live trees | Percent of total trees | |
|---------------------|----------------|--------------|--------|------------------------|------------------|------------------------|---------|
| | Boundary Trees | Middle Trees | Groups | Narrow Linear Features | | Category | Species |
| Pine | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Spruce | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Larch | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cypress | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other conifers | 0.0 | 0.0 | 0.0 | 3.9 | 3.9 | 0.0 | 2.2 |
| Total conifers | 0.0 | 0.0 | 0.0 | 3.9 | 3.9 | 0.0 | 2.2 |
| Oak | 9.9 | 0.0 | 2.5 | 10.6 | 23.0 | 13.4 | 13.1 |
| Beech | 0.0 | 0.0 | 0.0 | 2.2 | 2.2 | 1.3 | 1.3 |
| Sycamore | 2.5 | 0.0 | 0.0 | 6.7 | 9.2 | 5.4 | 5.2 |
| Ash | 9.1 | 1.6 | 8.2 | 7.3 | 26.2 | 15.3 | 14.9 |
| 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 | 1.1 | 1.1 | 0.6 | 0.6 |
| Alder | 0.8 | 0.0 | 0.0 | 0.0 | 0.8 | 0.5 | 0.5 |
| Lime | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Elm | 0.8 | 0.0 | 0.0 | 0.0 | 0.8 | 0.5 | 0.5 |
| Willow | 0.0 | 0.0 | 0.0 | 15.7 | 15.7 | 9.2 | 9.0 |
| Other broadleaves | 3.3 | 0.0 | 3.3 | 85.7 | 92.3 | 53.9 | 52.7 |
| Total broadleaves | 26.4 | 1.6 | 14.0 | 129.3 | 171.3 | 100.0 | 97.7 |
| Total - all species | 26.4 | 1.6 | 14.0 | 133.2 | 175.3 | | 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 | 26% |
| Groups | 96% |
| Narrow Linear Features | 61% |
- See Glossary for definitions of feature types.

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

| Species | Feature type | | | | Total dead trees | Percent of total trees | |
|----------------------------|----------------|--------------|------------|------------------------|------------------|------------------------|--------------|
| | Boundary Trees | Middle Trees | Groups | Narrow Linear Features | | Category | Species |
| Pine | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Spruce | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Larch | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cypress | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other conifers | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total conifers | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Oak | 1.6 | 0.0 | 0.0 | 0.0 | 1.6 | 39.0 | 39.0 |
| 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 | 0.0 | 0.0 | 0.0 | 0.8 | 19.5 | 19.5 |
| Birch | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Poplar | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sweet chestnut | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Horse chestnut | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Alder | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lime | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Elm | 1.6 | 0.0 | 0.0 | 0.0 | 1.6 | 39.0 | 39.0 |
| Willow | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other broadleaves | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total broadleaves | 4.1 | 0.0 | 0.0 | 0.0 | 4.1 | 100.0 | 100.0 |
| Total - all species | 4.1 | 0.0 | 0.0 | 0.0 | 4.1 | | 100.0 |

1. See Glossary for definitions of feature types.

Table 17 Numbers of live trees outside woodland by species and height band (000's trees)

| Species | Height band (m) | | | | Total live trees |
|----------------------------|-----------------|-------------|-------------|------------|------------------|
| | 2-5 | 5-15 | 15-20 | >20 | |
| Pine | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Spruce | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Larch | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cypress | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other conifers | 0.0 | 0.0 | 3.9 | 0.0 | 3.9 |
| Total conifers | 0.0 | 0.0 | 3.9 | 0.0 | 3.9 |
| Oak | 0.8 | 6.9 | 14.5 | 0.8 | 23.0 |
| Beech | 0.0 | 2.2 | 0.0 | 0.0 | 2.2 |
| Sycamore | 1.6 | 6.7 | 0.8 | 0.0 | 9.1 |
| Ash | 4.1 | 13.0 | 8.3 | 0.8 | 26.2 |
| 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 | 1.1 | 0.0 | 1.1 |
| Alder | 0.8 | 0.0 | 0.0 | 0.0 | 0.8 |
| Lime | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Elm | 0.8 | 0.0 | 0.0 | 0.0 | 0.8 |
| Willow | 0.6 | 12.9 | 2.2 | 0.0 | 15.7 |
| Other broadleaves | 41.9 | 50.3 | 0.0 | 0.0 | 92.2 |
| Total broadleaves | 50.7 | 92.0 | 26.9 | 1.6 | 171.1 |
| Total - all species | 50.7 | 92.0 | 30.9 | 1.6 | 175.3 |

Table 18 Number of Groups by group size

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

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

COMPARISON OF RESULTS WITH THE 1980 CENSUS AND PREVIOUS SURVEYS

Survey Method

The 1980 Census and 1998 Inventory were undertaken using very different sampling methods.

Inventory practice and technology have moved on since the 1980 Census; this has led to changes in sampling methodology, scope and woodland definitions were required. For example, the Main Woodland Survey used the digital woodland map, created from aerial photos as a basis for sampling whereas the 1980 Census relied only on the woodland shown on the 1:50,000 Ordnance Survey map. Also in contrast to the 1980 Census, the Survey of Small Woodland and Trees did not record information within developed land e.g. residential or industrial areas of 2 or more hectares.

Where possible adjustments have been made to both the 1980 Census and the Inventory to achieve the nearest available comparison. The apparent changes indicated in the following tables and charts should therefore be treated with caution, particularly where areas are small.

| | |
|-----------|---|
| Table 19: | Comparison of woodland area between 1980 Census and 1998 Inventory |
| Table 20: | Comparison of High Forest area by species between 1980 Census and 1998 Inventory |
| Chart: | Comparison of High Forest area by species between 1980 Census and 1998 Inventory |
| Table 21: | Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1998 Inventory |
| Chart: | Comparison of High Forest Category 1 area by planting year class between 1980 Census and 1998 Inventory |
| Table 22: | Comparison of numbers of live trees outside woodland between 1980 Census and 1998 Inventory |
| Table 23: | Comparison of density of non-woodland features between 1980 Census and 1998 Inventory |

Woodland cover

| | |
|-------|---|
| Chart | Change in woodland cover through time (1890 – 2000) |
| Maps: | Woodland by county through time (1895 – 1998) |

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

Table 19 Comparison of woodland area between 1980 Census and 1998 Inventory

| Woodland size (ha) | 1980 Census woodland area | | 1998 Inventory woodland area | | Change (%) |
|------------------------------|------------------------------|------|---------------------------------|------|---------------|
| | (ha) | (%) | (ha) | (%) | (%) |
| 2.0 or more | 5,815 | 94.0 | 6,629 | 87.6 | 14 |
| 0.25 - <2.0 | 369 | 6.0 | 938 | 12.4 | 154 |
| Total | 6,184 | | 7,567 | | 22 |
| % Woodland land cover | 5.0 | | 6.1 | | |

1. Differences in sampling methodology may account for some of the apparent differences.
2. The above figures from the 1998 Inventory exclude woodland between 0.1 and <0.25 ha, thereby matching the scope of the 1980 Census. The 1998 figures above will therefore not match those in the previous sections of the report.
3. Land area used to calculate woodland cover percent (1998), 123,557 ha, was based on the 1991 Census of Population digital boundaries.
4. Land area used to calculate woodland cover percent (1980), 123,467ha, (Ordnance Survey data)

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

| Species | 1980 Census woodland area (ha) | 1998 Inventory woodland area (ha) | Change (%) |
|--------------------------|--------------------------------|-----------------------------------|-------------|
| Scots pine | 762 | 715 | -6 |
| Corsican pine | 254 | 437 | 72 |
| Lodgepole pine | 0 | 0 | 0 |
| Sitka spruce | 1 | 0 | -100 |
| Norway spruce | 336 | 299 | -11 |
| European larch | 159 | 47 | -70 |
| Jap/Hybrid larch | 30 | 456 | 1415 |
| Douglas fir | 52 | 82 | 59 |
| Other conifers | 87 | 107 | 24 |
| Mixed conifers | 21 | 21 | 2 |
| Total conifers | 1,700 | 2,164 | 27 |
| Oak | 1,261 | 1,721 | 36 |
| Beech | 138 | 203 | 47 |
| Sycamore | 159 | 220 | 38 |
| Ash | 979 | 1,141 | 17 |
| Birch | 227 | 164 | -28 |
| Poplar | 341 | 298 | -13 |
| Sweet chestnut | 183 | 136 | -26 |
| Elm | 46 | 107 | 132 |
| Other broadleaves | 446 | 595 | 33 |
| Mixed broadleaves | 72 | 337 | 365 |
| Total broadleaves | 3,852 | 4,922 | 28 |
| Total all species | 5,552 | 7,086 | 28 |
| Felled | 245 | 0 | -100 |
| Total High Forest | 5,798 | 7,086 | 22 |

1. Differences in sampling methodology may account for some of the apparent differences.
2. In the 1980 Census the areas assigned to species included any associated open space such as roads and rides. In the Inventory open spaces are separately identified and the overall proportion is 6.0% (Table 2). To obtain meaningful comparisons between the two datasets the 1980 Census data have therefore been reduced by 6.0%.
3. The above figures from the 1998 Inventory exclude woodland between 0.1 and <0.25 ha, thereby matching the scope of the 1980 Census. The 1998 figures above will therefore not match those in the previous sections of the report.
4. The 1980 figures include scrub to enable comparison

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

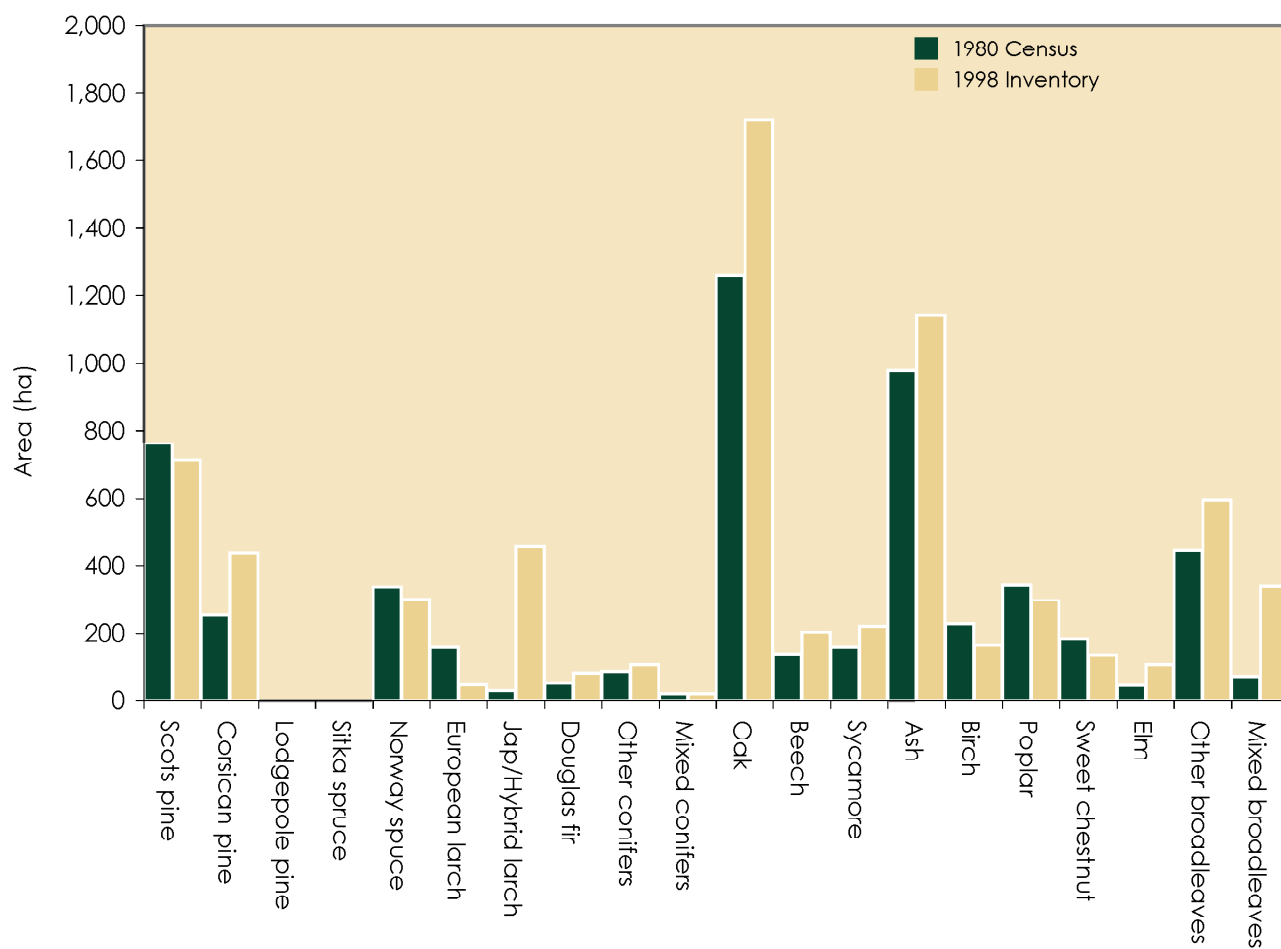


Table 21 Comparison of High Forest Category 1 area by planting year class
between 1980 Census and 1998 Inventory

| Planting year class | 1980 Census woodland area (ha) | 1998 Inventory woodland area (ha) | Change (%) |
|------------------------|--------------------------------|-----------------------------------|------------|
| 1991-1998 | 0 | 323 | see note |
| 1981-1990 | 0 | 502 | see note |
| 1971-1980 | 442 | 1,167 | 164 |
| 1961-1970 | 652 | 709 | 9 |
| 1951-1960 | 633 | 798 | 26 |
| 1941-1950 | 586 | 198 | -66 |
| 1931-1940 | 457 | 573 | 25 |
| 1921-1930 | 566 | 441 | -22 |
| 1911-1920 | 200 | 268 | 34 |
| 1901-1910 | 392 | 160 | -59 |
| 1861-1900 | 730 | 682 | -7 |
| Pre 1861 | 384 | 767 | 100 |
| Total all years | 5,041 | 6,588 | 31 |

1. The first two classes, 1991-1998 and 1981-1990, cover the period since the 1980 Census and no comparison is therefore available.
2. The definition of High Forest Category 1 in the Inventory does not fully coincide with High Forest as defined in the 1980 Census.

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

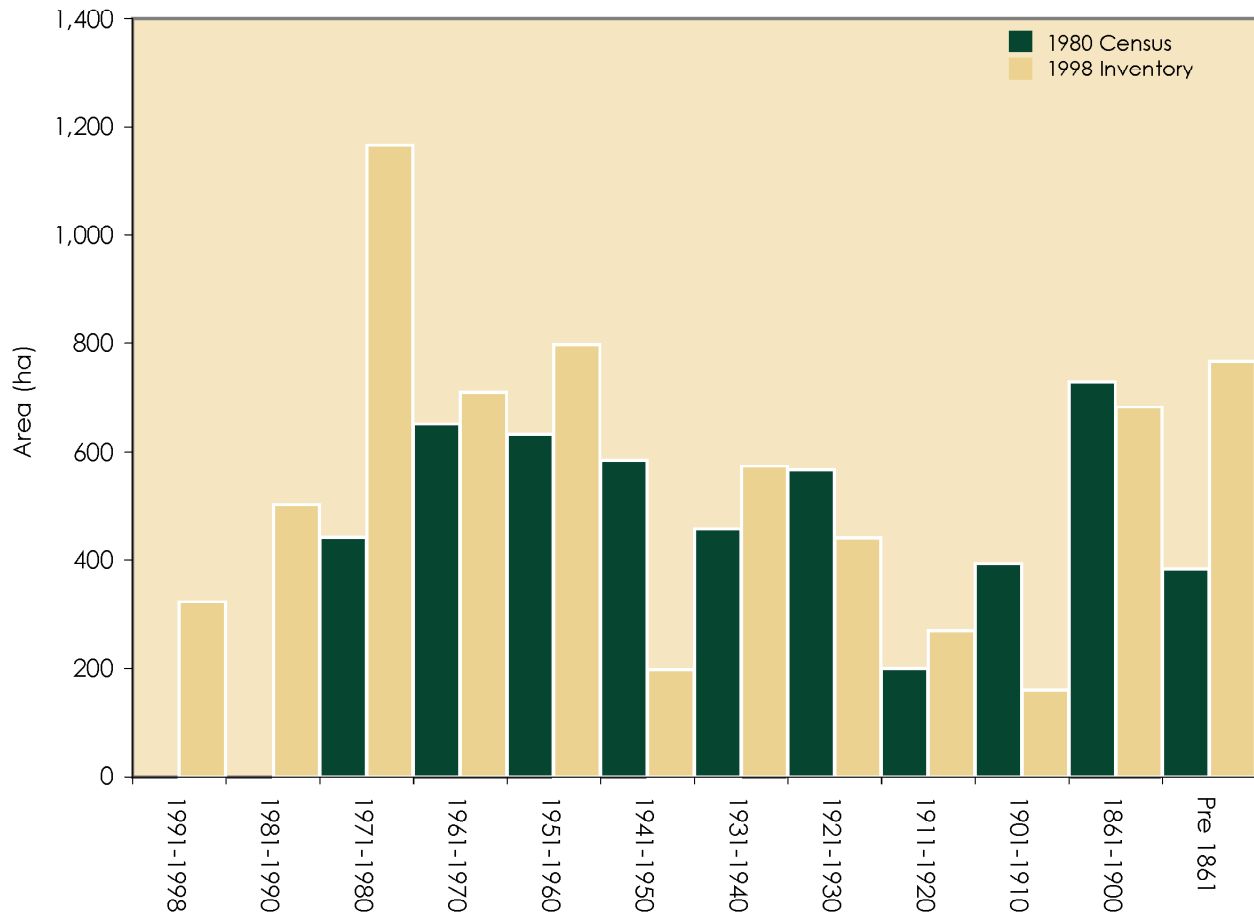


Table 22 Comparison of numbers of live trees outside woodland
between 1980 Census and 1998 Inventory (000's)

Tables 22 and 23 have been excluded from this report. The Survey of Small Woodland and trees does not record information referring to tree features (i.e. Individual trees, Groups and Narrow Linear Features) within developed land. In this respect the survey differs markedly from the 1980 Census. Bedfordshire included a substantial proportion of developed land making comparison inappropriate.

Table 23 Comparison of density of non-woodland features between 1980
Census and 1998 Inventory

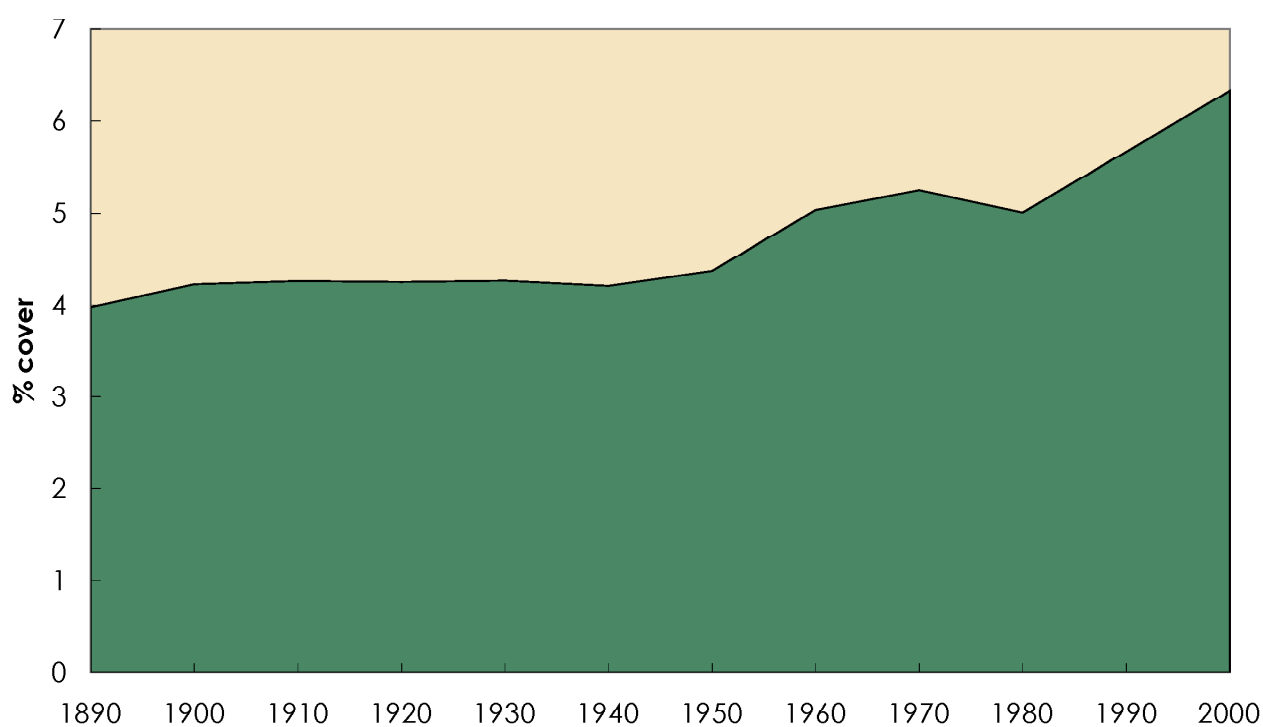
Tables 22 and 23 have been excluded from this report. The Survey of Small Woodland and trees does not record information referring to tree features (i.e. Individual trees, Groups and Narrow Linear Features) within developed land. In this respect the survey differs markedly from the 1980 Census. Bedfordshire included a substantial proportion of developed land making comparison inappropriate.

WOODLAND COVER

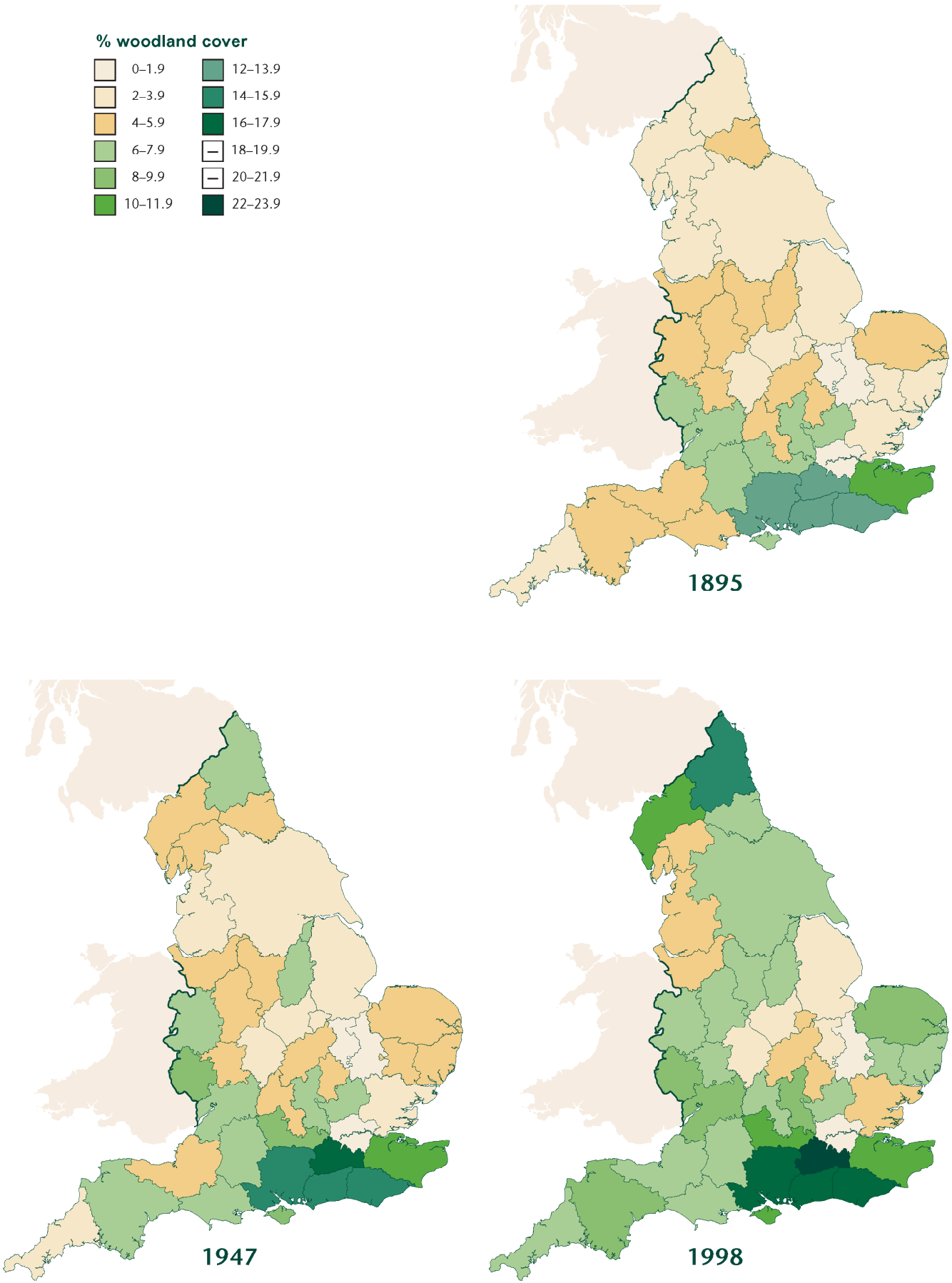
Woodland area data is available from Ministry of Agriculture surveys since 1871, and from Forestry Commission national woodland inventories since 1924. The following chart and maps show the changes in woodland area through time.

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

Change in county woodland cover through time (1890 – 2000)



Map 5 Woodland Cover in England by County through time (1895–1998)



GLOSSARY

Woodland

In the United Kingdom woodland is defined as land with a minimum area of 0.1 ha under stands of trees with, or the potential to achieve, tree crown cover of more than 20%. Areas of open space integral to the woodland are also included. Orchards and urban woodland between 0.1 and 2 ha are excluded. Intervening land-classes such as roads, rivers or pipelines are disregarded if less than 50m in extent. 'Scrubby' vegetation is not Included as a separate category but as Conifer, Broadleaved or Mixed tree types. There is additional information on the quality of woodland within the inventory database.

Woodland of 2 ha and over, and with a minimum width of 50m, is included in the Main Woodland Survey; other woodland and trees are assessed in the Survey of Small Woodland and Trees.

Interpreted Forest Types

The woodland map derived from aerial photographs is differentiated into Interpreted Forest Types (IFTs) which are: Conifer, Broadleaved, Mixed, Coppice, Coppice-with-Standards, Shrubs, Young Trees, Ground Prepared for Planting and Felled. Note that forest types (see below) based on ground survey data are used for reporting purposes because they are more reliable.

High Forest

All woodland except stands managed as Coppice or Coppice-with-Standards with, or with the potential to achieve a tree cover of more than 20%. Two categories of High Forest are recognised:

- **High Forest Category 1**
Stands which are, or could become, capable of producing wood of a size and quality suitable for sawlogs.
- **High Forest Category 2**
Stands of lower quality than High Forest Category 1.

Mixtures

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

Forest Types

- **Conifer**
Woodland containing more than 80% by area of coniferous species.
- **Broadleaved**
Woodland containing more than 80% by area of broadleaved species.
- **Mixed**
A combination of broadleaved and coniferous species where each category occupies at least 20% of the canopy (see note on mixtures above.)

- **Coppice**

Crops of marketable broadleaved species that have at least 2 stems per stool and are either being worked or are capable of being worked on rotation. With the exception of hazel coppice more than half the stems should be capable of producing 1m timber lengths of good form.

- **Coppice with Standards**

Two-storey stands where the overstorey consists of at least 25 stems per ha that are older than the understorey of worked coppice by at least one coppice rotation.

- **Felled**

Woodland areas that have been felled or stands where the stocking has been reduced to less than 20% and where it is expected that these areas will be replanted.

- **Windblow**

Areas of blown woodland which remain uncleared and not regenerated.

- **Open Space**

Areas within a woodland that are not covered by trees but are integral to the woodland such as open areas, streamsides, deer glades, rides and forest roads.

Ownership types

- **Other Ownership**

Woodland other than that owned by, or leased to, the Forestry Commission

- **Personal**

types of private occupation, e.g. individuals, private family trusts and family partnerships.

- **Private forestry or timber business**

owned by wood processing industry. This category does not include forest management companies.

- **Other private business**

occupiers, e.g. companies, partnerships, syndicates and pension funds.

- **Local Authority**

Region, County, District or other Council

- **Other public bodies (not FC)**

Government department/agency, nationalised industry, etc.

- **Charitable organisations**

organisations funded by voluntary public subscription, e.g. National Trust, churches and colleges.

- Community ownership or common land

the common property of all members of the community.

- **Forestry Commission**

Land owned by or land leased to the Forestry Commission

Feature types

- **Small Wood**

A woodland with an area of 0.1 ha or over but less than 2 ha.

- **Group**

A group containing two or more trees with an area less than 0.1ha.

- **Individual Tree**

A tree the crown of which has no contact with any other tree crown and which is at least 2m tall. Two types of individual tree are recognised:

- Boundary Tree (an Individual Tree on any boundary)
- Middle Tree (an Individual Tree not on a boundary)

- **Linear Feature**

A feature with a length of 25 m or more, and one which is at least four times as long as it is broad. It can be up to 50m wide or as narrow as a single line of trees. Two types of Linear Features are recognised:

- Narrow Linear Features (with a width of 1.6 m or less)
- Wide Linear Features (with a width greater than 1.6 m)

NOTES



Forestry Commission
231 Corstorphine Road
Edinburgh
EH12 7AT

www.forestry.gov.uk