



# Standing timber volume for coniferous trees in Britain

National Forest Inventory Report

## Summary

The National Forest Inventory provides a record of the size and distribution of forests and woodlands in Great Britain and information on key forest attributes. This Inventory Report provides estimates of the standing timber volume in living coniferous trees within forests and woodlands in Great Britain, including estimates for England, Scotland and Wales, broken down by Forestry Commission and Private sector ownership.

- Total standing coniferous volume in all forests and woodlands in Great Britain is estimated to be 336 million m<sup>3</sup>. For England this is 87 million m<sup>3</sup>; for Scotland 212 million m<sup>3</sup>; and for Wales 37 million m<sup>3</sup>.
- Total standing coniferous volume on the Forestry Commission estate is estimated to be 125 million m<sup>3</sup>.
- Total standing coniferous volume on the Private sector estate is estimated to be 211 million m<sup>3</sup>.
- Sitka spruce accounts for approximately half of total standing coniferous volume.
- Trees aged between 20 and 60 years account for 83% of total standing coniferous volume.
- More than 76% of total standing coniferous volume is contained within trees ranging from 15–40 cm in diameter at breast height (DBH), with the highest concentration (36%) in the 20–30 cm size class.

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## Introduction

National forest inventories are carried out by the Forestry Commission to provide accurate, up-to-date information about the size, distribution, composition and condition of the forests and woodlands in Great Britain (GB). This information is essential for developing and monitoring policies and guidance to support sustainable forest management.

The current National Forest Inventory, which began in 2009 (the first cycle due for completion in 2014), is a multi-purpose operation that has involved the production of a forest and woodland map for GB and a continuing programme of field surveys of the mapped forest and woodland areas. Information and data collected by the National Forest Inventory will be used for a number of purposes, including estimates and 25-year forecasts of forest metrics such as:

- Standing volume
- Timber availability
- Tree growth and Increment
- Carbon storage
- Biomass

Estimates of aspects of the biodiversity and social value of forests and woodlands will also be provided by the Inventory.

This Inventory Report sets out the results (as at 31 March 2011) for standing coniferous volume for all forests and woodlands in GB. Results for standing broadleaved volume will be published in 2013; further information on this and other National Forest Inventory outputs is available from [www.forestry.gov.uk/inventory](http://www.forestry.gov.uk/inventory).

### Standing coniferous volume

The last direct estimate of standing coniferous volume in GB was published in 1982 (Forestry Commission Bulletin 63: *Census of woodland and trees*). This new report, in addition to providing the latest overall estimates of total volume, gives a breakdown of volume by species group, age class and size class, and by country and National Forest Inventory region (see map on page 9).

The assessment of standing coniferous volume is the baseline for the Forestry Commission forecast of softwood availability, which is published every five years. The 'Production forecast' covers softwood availability from the Forestry Commission (GB), the Forest Service, an agency within the Department of Agriculture and Rural Development in Northern Ireland, and potential softwood availability from the Private sector (UK wide). The next forecast will be published later in 2012.

**Standing coniferous volume** is defined as the live stemwood and useable branchwood of conifers up to 7 cm top diameter. It excludes roots, below-ground stump material, small branches, foliage and deadwood. For private sector woodland only, it also excludes standing volume in trees in woodlands of less than 0.5 hectare in extent. See Glossary for further explanation of the terms used in this report.

# How standing volume is estimated

Estimates of total standing timber volume are determined by:

- Woodland area.
- Woodland characteristics (e.g. age, yield class) within this area.
- Number and size of trees.

The estimates of standing volume in this report have been derived separately for the Forestry Commission estate and for the Private sector estate. They are based on the same principles but use different data sources. For the Forestry Commission estate, information on woodland area and woodland characteristics has been extracted from the Forestry Commission's long-established Sub-compartment database. For the Private sector estate, the estimates were derived from results obtained to date from the National Forest Inventory.

## Sub-compartment database

The Sub-compartment database (SCDB) is a record of all land managed by the Forestry Commission. Each stand of trees is represented spatially, together with information on individual stand characteristics (for example species, planting year, spacing and yield class) which is periodically updated. As new surveys of stands are conducted (e.g. for operational purposes), survey results are also recorded against the stands. In addition, the SCDB contains details of how the stands are being managed – in particular, the planned frequency and type of thinning operations and a 'due date' for felling.

## National Forest Inventory

The National Forest Inventory is composed of two elements: a woodland map and a field survey. The woodland map covers all forests and woodlands over 0.5 hectares with a minimum of 20% canopy cover (or the potential to achieve it), including new planting, clearfelled sites and restocked sites. It is based upon 25 cm resolution colour aerial photography for England and Scotland and 40 cm resolution aerial photography for Wales. The map was validated and updated using satellite imagery (available up to 2009), which gave an independent crosscheck of woodland present. Satellite imagery was also used to identify areas of recently felled forests and woodland. Particular attention was paid to identifying areas of woodland loss verified as being due to the establishment of windfarms or the restoration of habitats.

Field survey work is used to refine the map-based estimates of woodland and clearfelled areas and to measure detailed aspects of the forest. Field surveys were carried out between 2009 and 2012 to estimate standing volume (and other forest metrics). This involved the ground surveying of one-hectare

sample squares that were partially or entirely covered by forest, including clearfelled areas, according to the woodland map. Further details of the mapping work and the derivation of forested areas can be found in the 2010 Woodland Area reports at [www.forestry.gov.uk/inventory](http://www.forestry.gov.uk/inventory).

## Estimates for the Forestry Commission estate

Information from the SCDB was used to estimate standing volume at the reference date of 31 March 2011 on a stand-by-stand basis. This was then aggregated to produce the estimated total across a defined geographic area for particular types of stand (classified, for example, by species, tree age or tree size class). For each stand, if an operational survey had been carried out close to the reference date, information from that survey was used to estimate standing volume. Otherwise, an estimate was made of the state of the stand, normally involving the application of standard Forestry Commission growth and yield models that take into account the past management of the stand. Estimated standing volume is an output of this stand modelling process.

Because the resulting estimates are based on a full record of data from the SCDB, there is no sampling error involved in the estimation process, therefore no sampling standard error is calculated. However, the nature of the estimation process within each individual stand does introduce estimation error, with variable contributions from stand to stand, due to the type, age and accuracy of the information held in the SCDB. These estimation errors have not been quantified in this report.

## Estimates for the Private Sector estate

Forests on the National Forest Inventory woodland map were first separated into Forestry Commission estate and Private sector estate holdings using Forestry Commission spatial records of management boundaries. Estimates of standing volume on the Private sector estate used a woodland area obtained from the map updated to 31 March 2011 (scheduled for publication in May 2012). This map contained a larger area (around 2.2 million hectares) of Private sector woodland than has been estimated by previous forest inventories.

For the field survey work, initial effort was directed towards Private sector sites that, according to the map, contained areas of coniferous woodland. 4036 sample squares were surveyed and the resulting data used to produce the results in this report. These sample squares represent a sub-sample of a planned 15 000 statistically representative squares covering all GB woodland that will be surveyed during this first cycle of the National Forest Inventory survey (due for completion in 2014).

At each sample square, the forest was stratified into different woodland types or stands, where information on species, age, management and a range of other parameters was collected. An average of around two stands per square was found, resulting in 8052 stands being assessed. Within each stand, field-based computer systems were used to locate two or three 100 m<sup>2</sup> (0.01 hectare) circular plots, within which all trees of greater than or equal to 4 cm diameter at breast height (DBH) were mapped, species identified and diameters measured. A total of 228311 trees were measured. For 59334 of these trees, additional measurements of tree height and crown dimensions were taken. The resulting data were used to estimate the standing volume of the trees. All squares were marked on the ground with metal pegs and GPS data of their location recorded for checking and future measurement. At least 3% were re-measured by an independent quality assurance team to ensure standards. Further details of the methodology will be available in documents to be released when the Forestry Commission Production forecast is published.

The results for individual surveyed squares were aggregated and scaled up to the areas identified by the woodland map, using standard statistical survey methodology, to produce the estimates in this report. Along with these estimates, associated sampling standard errors have also been calculated and reported. The sampling standard error will account for random variation arising from the selection of the sample, and random measurement errors, but not from any systematic biases in the field measurements. However, because of the quality assurance process it is thought unlikely that any substantial biases of this nature are present in the survey data. The sources of error that are not accounted for in the reported standard errors will be those deriving from use of empirical models to estimate standing volumes from the recorded survey data and, in some cases, the use of Forestry Commission growth and yield models (where these are used to project the results from an earlier survey to 31 March 2011 – the reference date used for the figures in this report).

## Results for standing volume

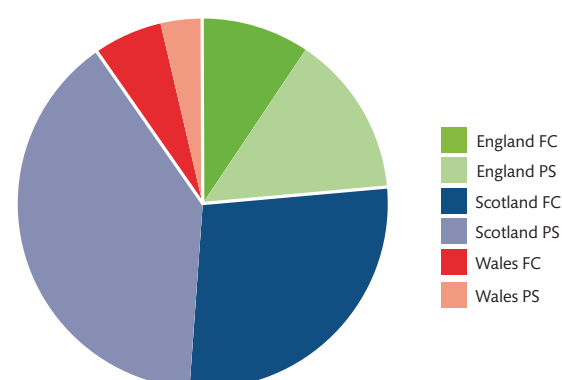
Table 1 gives total coniferous stocked area for GB broken down by country and principal species (see Glossary for definition of stocked area). Figure 1 illustrates total stocked area by country. Tables 2–5 and Figures 2–5 give estimates of standing coniferous volume for GB and by country, broken down by principal species, age class and size class (mean stand DBH).

The figures in the tables have been independently rounded, so may not add to the totals shown. Sampling standard errors (SE) attached to Private sector estimates are expressed in relative terms (%) to the right of the relevant estimate.

**Table 1** Stocked area by principal species for GB and countries.

Principal species	FC	Private sector		Total
	000 ha	000 ha	SE%	
England				
All conifers	127.5	192.6	2	320.1
Sitka spruce	47.8	33.5	8	81.3
Scots pine	16.6	49.9	6	66.5
Corsican pine	27.1	15.8	11	42.9
Norway spruce	6.9	22.1	8	29.0
Larches	10.1	33.9	6	44.0
Douglas fir	9.8	15.6	10	25.4
Lodgepole pine	4.5	3.6	20	8.1
Other conifers	4.8	19.2	9	23.9
Scotland				
All conifers	374.1	532.1	1	906.2
Sitka spruce	229.3	294.0	2	523.3
Scots pine	45.1	126.0	4	171.1
Corsican pine	1.6	1.4	41	3.0
Norway spruce	10.9	15.0	12	25.9
Larches	26.4	42.0	7	68.4
Douglas fir	5.4	5.1	19	10.5
Lodgepole pine	52.1	42.0	7	94.1
Other conifers	3.3	6.4	19	9.8
Wales				
All conifers	81.4	49.7	4	131.1
Sitka spruce	49.5	28.0	8	77.5
Scots pine	2.0	1.7	48	3.7
Corsican pine	1.9	0.8	41	2.7
Norway spruce	5.2	1.6	35	6.8
Larches	12.3	8.6	16	21.0
Douglas fir	5.0	4.6	23	9.5
Lodgepole pine	2.6	1.6	30	4.2
Other conifers	2.9	2.9	26	5.7
Great Britain				
All conifers	583.0	774.4	1	1 357.4
Sitka spruce	326.6	355.5	2	682.1
Scots pine	63.7	177.5	3	241.3
Corsican pine	30.6	18.0	10	48.6
Norway spruce	23.0	38.6	7	61.6
Larches	48.8	84.5	4	133.3
Douglas fir	20.1	25.3	8	45.4
Lodgepole pine	59.1	47.2	7	106.4
Other conifers	11.0	28.4	8	39.4

**Figure 1** Stocked area by country.



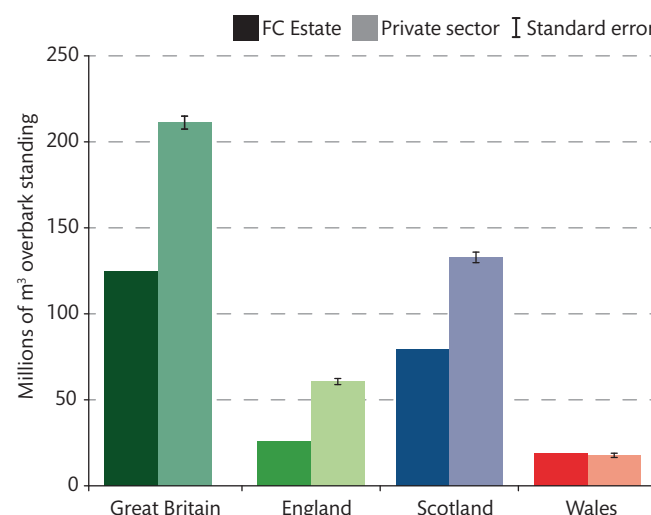
**Table 2** Standing coniferous timber volume (overbark standing) for GB and countries.

Country	FC	Private sector		Total
	000 m <sup>3</sup>	000 m <sup>3</sup>	SE%	
England	26 148	60 621	3	86 769
Scotland	79 558	132 827	2	212 385
Wales	18 868	17 720	7	36 588
<b>Great Britain</b>	<b>124 575</b>	<b>211 167</b>	<b>2</b>	<b>335 742</b>

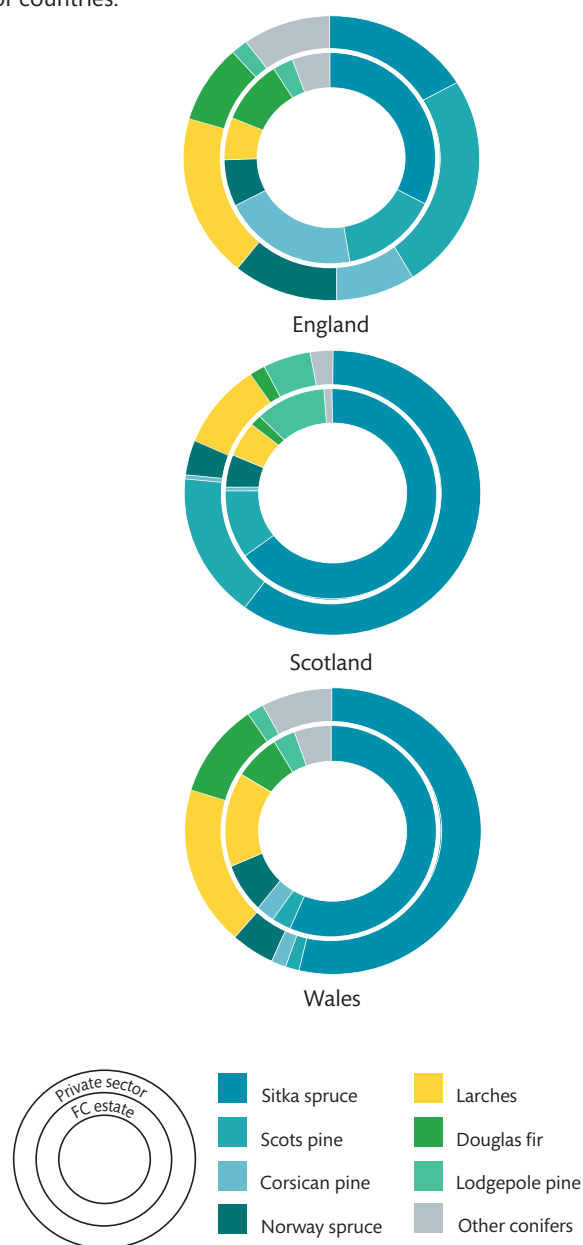
**Table 3** Standing coniferous timber volume (overbark standing) by principal species for GB and countries.

Principal species	FC	Private sector		Total
	000 m³	000 m³	SE%	
England				
All conifers	26 148	60 621	3	86 769
Sitka spruce	8 481	9 840	10	18 322
Scots pine	3 896	15 012	7	18 908
Corsican pine	5 359	5 047	11	10 406
Norway spruce	1 759	7 127	10	8 886
Larches	1 710	11 112	7	12 823
Douglas fir	2 595	5 631	12	8 225
Lodgepole pine	800	1 107	25	1 908
Other conifers	1 547	5 963	10	7 510
Scotland				
All conifers	79 558	132 827	2	212 385
Sitka spruce	51 641	79 930	3	131 571
Scots pine	8 540	22 419	6	30 959
Corsican pine	349	349	50	697
Norway spruce	3 482	5 032	14	8 514
Larches	4 764	12 656	8	17 420
Douglas fir	1 386	2 308	23	3 694
Lodgepole pine	8 391	6 955	10	15 346
Other conifers	1 006	3 244	32	4 251
Wales				
All conifers	18 868	17 720	7	36 588
Sitka spruce	10 643	9 477	12	20 120
Scots pine	494	301	45	795
Corsican pine	602	252	42	854
Norway spruce	1 437	907	42	2 345
Larches	2 760	3 119	20	5 879
Douglas fir	1 251	1 885	26	3 135
Lodgepole pine	607	424	36	1 031
Other conifers	1 073	1 340	39	2 413
Great Britain				
All conifers	124 575	211 167	2	335 742
Sitka spruce	70 766	99 247	3	170 012
Scots pine	12 930	37 732	4	50 662
Corsican pine	6 309	5 648	11	11 958
Norway spruce	6 678	13 067	8	19 745
Larches	9 235	26 887	5	36 122
Douglas fir	5 232	9 823	10	15 055
Lodgepole pine	9 798	8 486	9	18 285
Other conifers	3 627	10 547	12	14 174

**Figure 2** Standing coniferous timber volume for GB and countries.



**Figure 3** Standing coniferous timber volume by principal species for countries.



Notes: Circles sizes are illustrative and are not sized by relative volume.

Table 4 Standing conifer volume by age class for GB and countries.

Age class (years)	FC	Private sector		Total
	000 m³	000 m³	SE%	
England				
0-20	747	809	15	1 556
21-40	7 256	13 117	7	20 373
41-60	12 424	33 402	5	45 827
61-80	4 091	9 760	11	13 850
81-100	1 358	1 969	29	3 327
100+	272	1 564	28	1 836
Total	26 148	60 621	3	86 769
Scotland				
0-20	1 158	4 650	10	5 808
21-40	31 560	74 444	4	106 004
41-60	35 882	40 386	6	76 267
61-80	7 935	6 708	14	14 644
81-100	1 913	2 526	23	4 438
100+	1 111	4 113	26	5 224
Total	79 559	132 827	2	212 385
Wales				
0-20	563	308	42	872
21-40	5 022	7 605	12	12 628
41-60	10 303	8 278	15	18 581
61-80	2 676	39	106	2 716
81-100	284	1 143	41	1 427
100+	19	346	55	365
Total	18 868	17 720	7	36 588

Age class (years)	FC	Private sector		Total
	000 m³	000 m³	SE%	
Great Britain				
0-20	2 469	5 767	9	8 236
21-40	43 838	95 166	4	139 005
41-60	58 609	82 067	4	140 675
61-80	14 702	16 507	9	31 210
81-100	3 555	5 637	17	9 192
100+	1 402	6 023	20	7 425
Total	124 575	211 167	2	335 743

Figure 4b Standing coniferous timber volume by age class for GB.

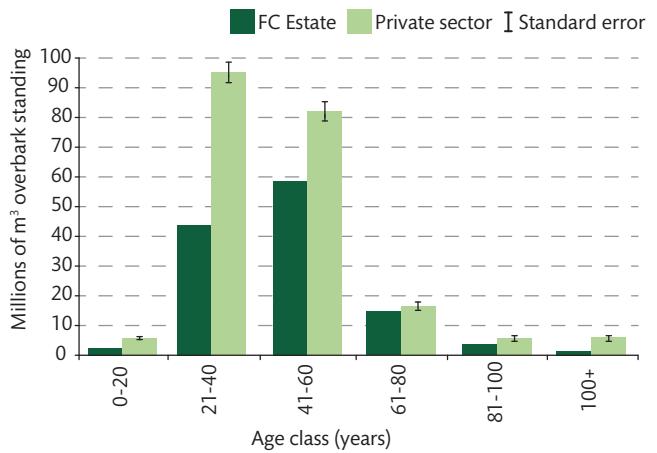


Figure 4a Standing coniferous timber volume by age class for countries.

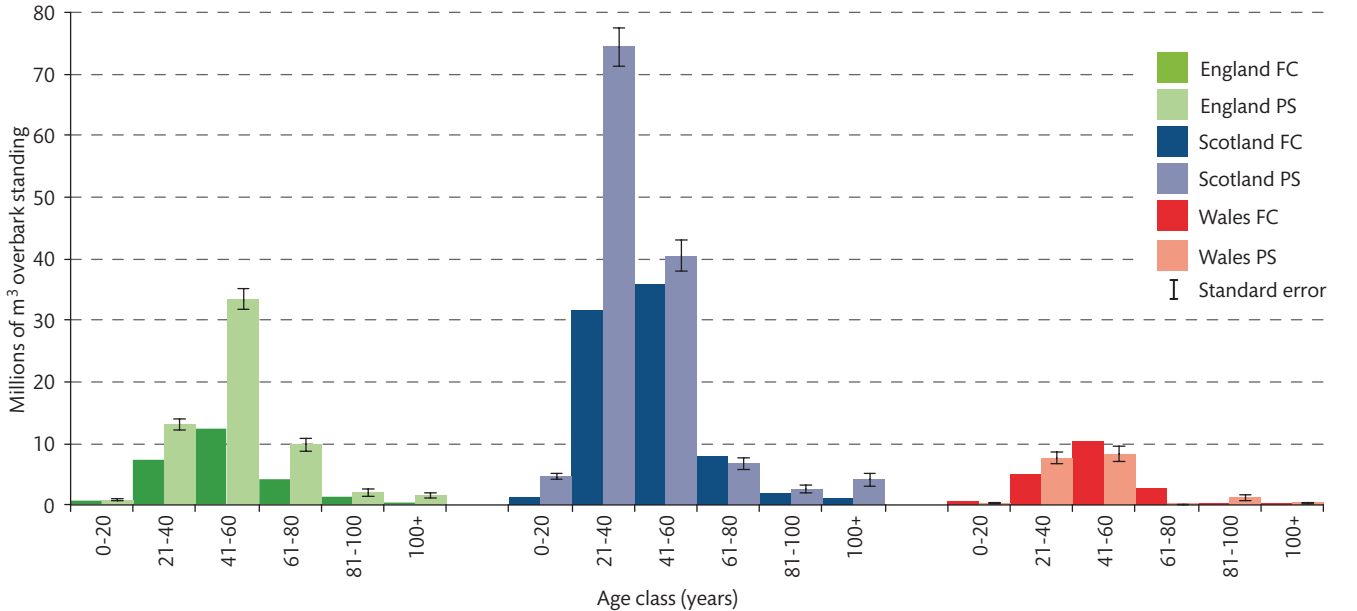




Table 5 Standing coniferous timber volume by size class for GB and countries.

Mean stand DBH (cm)	FC	Private sector		Total
	000 m³	000 m³	SE%	
England				
0-7	0	8	28	8
7-10	133	259	16	392
10-15	2378	2018	10	4396
15-20	4854	5203	9	10057
20-30	6836	16606	6	23441
30-40	5833	18770	6	24603
40-60	5260	14189	8	19448
60-80	687	1672	18	2359
100+	168	1896	29	2064
Total	26148	60621	3	86769
Scotland				
0-7	0	18	28	18
7-10	412	1194	9	1606
10-15	10395	10063	7	20459
15-20	28434	29499	6	57933
20-30	27956	54947	5	82903
30-40	7845	21137	9	28983
40-60	4191	11764	10	15955
60-80	292	2388	21	2679
100+	33	1816	51	1849
Total	79559	132827	2	212385
Wales				
0-7	0	0	83	0
7-10	121	64	33	185
10-15	1764	883	23	2647
15-20	4231	2084	20	6316
20-30	7994	6568	14	14562
30-40	2711	5095	18	7806
40-60	1899	2353	26	4252
60-80	104	481	106	585
100+	43	191	90	235
Total	18868	17720	7	36588

Mean stand DBH (cm)	FC	Private sector		Total
	000 m³	000 m³	SE%	
Great Britain				
0-7	0	26	21	27
7-10	666	1518	8	2184
10-15	14538	12964	6	27502
15-20	37519	36786	5	74305
20-30	42786	78121	4	120907
30-40	16389	45003	5	61392
40-60	11349	28306	6	39655
60-80	1083	4540	17	5623
100+	244	3903	28	4148
Total	124575	211167	2	335743

Figure 5b Standing coniferous timber volume by size class for GB.

DBH class (cm)	FC Estate	Private sector	Standard error (approx.)
0-7	0	0.5	0.5
7-10	0.5	1.5	1.5
10-15	14	11	3
15-20	37	37	4
20-30	43	75	5
30-40	16	45	6
40-60	11	28	7
60-80	1	4	1
80+	0	3	1

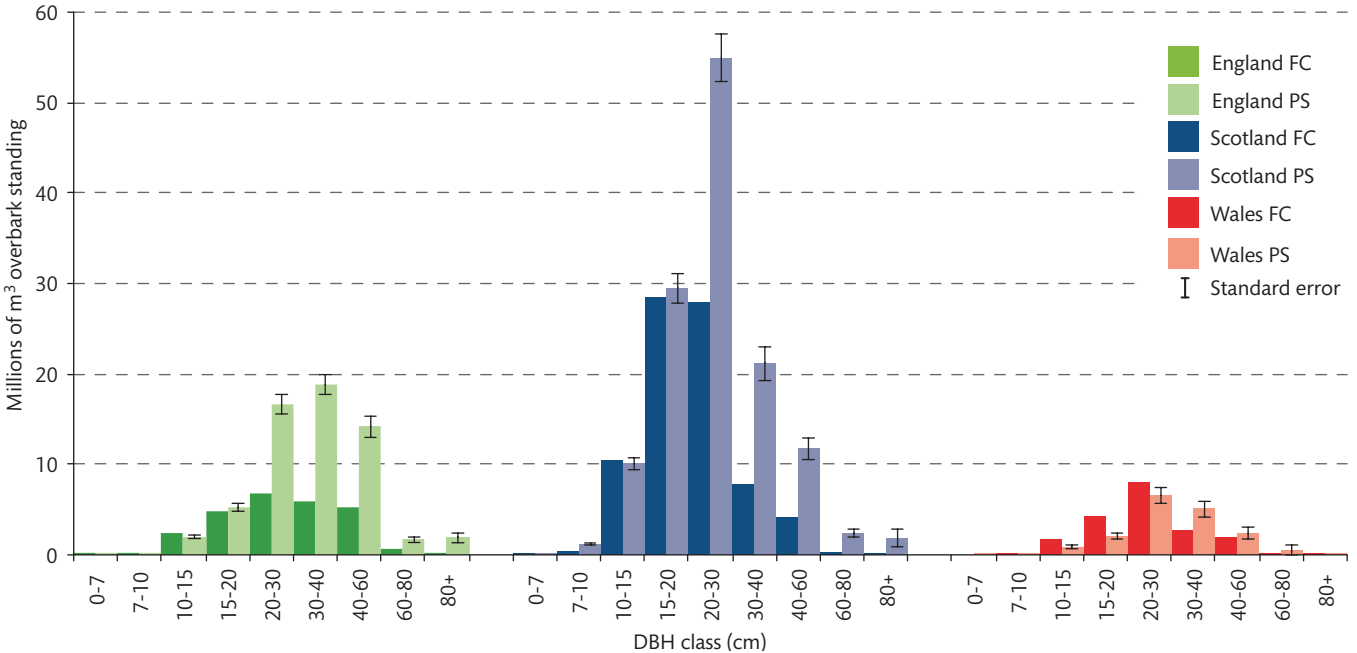
Note: By definition trees less than 7 cm DBH possess no standing volume. However, because this category represents stands of trees with a mean DBH in this range, it may include some individual trees with a greater than 7 cm DBH, which explains the presence of the non-zero standing volume in the 0-7 cm DBH category for the Private sector.

Figure 5b Standing coniferous timber volume by size class for GB.



Note: By definition trees less than 7 cm DBH possess no standing volume. However, because this category represents stands of trees with a mean DBH in this range, it may include some individual trees with a greater than 7 cm DBH, which explains the presence of the non-zero standing volume in the 0-7 cm DBH category for the Private sector.

Figure 5a Standing coniferous timber volume by size class for countries.



Tables 6–10 provide details of the estimates of stocked areas and standing volumes at National Forest Inventory region level (see map opposite), from which the aggregated estimates at country and GB level (Tables 1–5) have been derived. Note that estimates at the regional level for the private sector are less precise in relative terms than those at country and GB level, as indicated by higher relative standard errors.

Particularly high standard errors indicate very low precision of the estimates they relate to.

The figures in the tables have been independently rounded, so may not add to the totals shown. Sampling standard errors (SE) attached to Private sector estimates are expressed in relative terms (%) to the right of the relevant estimate.

**Table 6** Stocked area by age class for National Forest Inventory regions. England.

Age class (years)	FC	Private sector		Total
	000 ha	000 ha	SE%	
North West England				
0-20	3.9	3.2	24	7.1
21-40	5.5	6.7	16	12.2
41-60	3.5	8.8	13	12.3
61-80	0.8	2.4	29	3.2
81-100	0.2	0.0	78	0.2
100+	0.1	0.0	-	0.1
Total	14.0	21.2	7	35.1
North East England				
0-20	12.9	3.4	29	16.3
21-40	12.4	9.3	16	21.7
41-60	9.1	7.4	19	16.5
61-80	2.7	1.6	39	4.3
81-100	0.1	0.4	94	0.5
100+	0.0	0.0	-	0.0
Total	37.3	22.0	7	59.3
Yorkshire and Humber				
0-20	2.8	2.3	19	5.2
21-40	3.1	7.0	12	10.1
41-60	5.2	9.5	10	14.7
61-80	1.3	2.2	21	3.5
81-100	0.6	0.0	96	0.6
100+	0.0	0.2	55	0.2
Total	13.1	21.2	5	34.3
East Midlands				
0-20	1.1	0.8	51	1.9
21-40	1.9	2.1	28	4.0
41-60	3.1	5.4	20	8.5
61-80	1.2	1.0	35	2.2
81-100	0.4	0.0	-	0.4
100+	0.0	1.1	49	1.2
Total	7.6	10.4	12	18.1

Age class (years)	FC	Private sector		Total
	000 ha	000 ha	SE%	
East England				
0-20	5.0	1.6	40	6.5
21-40	6.5	5.1	19	11.6
41-60	3.6	11.3	14	14.9
61-80	1.3	2.2	37	3.4
81-100	1.1	0.1	58	1.2
100+	0.1	0.3	90	0.4
Total	17.6	20.4	9	38.0
South East and London				
0-20	2.2	3.4	34	5.7
21-40	2.0	11.1	11	13.1
41-60	4.9	18.5	9	23.5
61-80	1.7	4.0	17	5.7
81-100	0.6	0.8	52	1.4
100+	0.3	1.1	32	1.5
Total	11.8	39.0	5	50.8
South West England				
0-20	4.2	5.1	21	9.3
21-40	4.8	9.2	13	13.9
41-60	7.1	18.0	9	25.2
61-80	1.7	5.7	17	7.5
81-100	0.5	1.3	36	1.8
100+	0.1	1.1	43	1.2
Total	18.3	40.5	5	58.8
West Midlands				
0-20	1.7	2.9	37	4.6
21-40	2.2	3.1	28	5.3
41-60	3.2	8.5	17	11.8
61-80	0.5	3.2	29	3.7
81-100	0.2	0.1	49	0.3
100+	0.0	0.0	-	0.0
Total	7.9	17.8	9	25.7



Table 6 (continued) Scotland.

Age class (years)	FC	Private sector		Total
	000 ha	000 ha	SE%	
North Scotland				
0-20	8.3	23.1	12	31.4
21-40	28.4	42.1	8	70.5
41-60	21.0	11.9	17	33.0
61-80	4.4	0.5	55	4.9
81-100	1.2	0.9	65	2.1
100+	1.6	0.7	68	2.3
Total	65.0	79.1	3	144.1
North East Scotland				
0-20	10.1	34.9	8	44.9
21-40	9.6	33.5	9	43.1
41-60	19.7	37.6	9	57.3
61-80	8.1	9.0	19	17.1
81-100	1.8	3.4	34	5.3
100+	0.6	6.6	23	7.1
Total	49.8	125.0	2	174.8
East Scotland				
0-20	3.2	15.8	16	19.0
21-40	9.2	24.1	9	33.3
41-60	12.3	10.5	14	22.9
61-80	2.0	2.1	30	4.1
81-100	0.7	0.6	61	1.3
100+	0.4	0.6	52	1.0
Total	27.9	53.7	5	81.6
South Scotland				
0-20	33.2	59.7	6	92.9
21-40	53.4	80.5	6	134.0
41-60	25.8	21.8	12	47.6
61-80	2.3	3.4	29	5.7
81-100	0.3	0.8	53	1.1
100+	0.1	0.8	35	0.9
Total	115.2	167.0	2	282.2
West Scotland				
0-20	21.1	20.4	12	41.5
21-40	55.7	68.6	6	124.3
41-60	32.6	15.5	15	48.1
61-80	5.2	1.0	53	6.2
81-100	1.1	0.7	67	1.8
100+	0.5	1.1	57	1.6
Total	116.3	107.3	2	223.6

Table 6 (continued) Wales.

Age class (years)	FC	Private sector		Total
	000 ha	000 ha	SE%	
Wales				
0-20	24.9	8.2	16	33.1
21-40	24.5	22.7	10	47.2
41-60	25.5	15.3	12	40.8
61-80	5.8	0.1	107	5.9
81-100	0.6	2.2	39	2.8
100+	0.0	1.2	48	1.3
Total	81.4	49.7	4	131.1

### The National Forest Inventory regions.

The Wales area is treated as both a country and a region in the Inventory.



**Table 7** Stocked area by size class for National Forest Inventory regions. England.

Mean stand DBH (cm)	FC	Private sector		Total
	000 ha	000 ha	SE%	
North West England				
0-7	2.5	1.9	30	4.4
7-10	0.8	0.9	46	1.7
10-15	3.7	1.9	26	5.6
15-20	3.3	2.5	24	5.8
20-30	2.1	6.2	15	8.3
30-40	0.8	4.7	16	5.5
40-60	0.7	3.0	23	3.7
60-80	0.0	0.0	77	0.1
80+	0.0	0.0	-	0.0
Total	14.0	21.2	7	35.1
North East England				
0-7	9.9	1.7	48	11.6
7-10	1.8	1.3	40	3.1
10-15	9.1	2.8	28	11.9
15-20	9.4	4.1	22	13.6
20-30	4.9	5.9	18	10.8
30-40	0.9	4.4	22	5.4
40-60	1.1	1.4	27	2.4
60-80	0.0	0.1	52	0.2
80+	0.0	0.3	70	0.3
Total	37.3	22.0	7	59.3
Yorkshire and Humber				
0-7	1.3	1.0	33	2.2
7-10	1.0	0.8	26	1.8
10-15	1.6	2.2	19	3.8
15-20	1.6	4.0	17	5.6
20-30	2.8	6.8	10	9.6
30-40	3.1	4.0	15	7.1
40-60	1.5	1.9	18	3.4
60-80	0.1	0.3	44	0.4
80+	0.0	0.2	81	0.3
Total	13.1	21.2	5	34.3
East Midlands				
0-7	0.5	0.0	105	0.5
7-10	0.3	0.2	48	0.6
10-15	0.6	0.9	44	1.5
15-20	0.7	1.5	33	2.2
20-30	1.9	3.1	26	5.0
30-40	1.8	3.3	24	5.1
40-60	1.7	1.2	45	2.9
60-80	0.0	0.2	93	0.2
80+	0.0	0.0	0	0.0
Total	7.6	10.4	12	18.1

Size	FC	Private sector		Total
	000 ha	000 ha	SE%	
East England				
0-7	1.8	0.2	38	2.0
7-10	0.6	0.2	72	0.8
10-15	3.4	2.1	32	5.6
15-20	2.1	1.4	33	3.5
20-30	3.9	5.6	20	9.5
30-40	2.6	6.9	17	9.5
40-60	2.6	3.4	22	6.0
60-80	0.4	0.1	110	0.5
80+	0.0	0.6	90	0.6
Total	17.6	20.4	9	38.0
South East and London				
0-7	0.8	1.0	39	1.8
7-10	0.3	2.9	38	3.2
10-15	1.8	2.7	19	4.5
15-20	0.7	5.4	15	6.0
20-30	2.3	11.0	11	13.2
30-40	3.3	8.7	12	12.0
40-60	2.3	6.2	15	8.5
60-80	0.3	0.7	30	0.9
80+	0.1	0.5	41	0.6
Total	11.8	39.0	5	50.8
South West England				
0-7	1.8	1.8	40	3.6
7-10	1.1	2.6	25	3.6
10-15	2.0	3.8	20	5.8
15-20	1.4	3.0	20	4.4
20-30	3.4	9.0	12	12.4
30-40	4.3	11.6	11	15.9
40-60	3.6	6.3	14	9.9
60-80	0.6	1.4	36	1.9
80+	0.2	1.0	47	1.2
Total	18.3	40.5	5	58.8
West Midlands				
0-7	0.7	1.0	59	1.7
7-10	0.5	0.1	95	0.6
10-15	0.6	1.4	64	2.0
15-20	0.4	1.7	35	2.1
20-30	1.3	2.5	31	3.7
30-40	2.4	5.5	16	7.9
40-60	1.7	4.9	21	6.6
60-80	0.2	0.4	71	0.7
80+	0.1	0.1	110	0.2
Total	7.9	17.8	9	25.7

Table 7 (continued) Scotland.

Mean stand DBH (cm)	FC	Private sector		Total
	000 ha	000 ha	SE%	
North Scotland				
0-7	5.0	12.9	16	17.9
7-10	4.3	7.3	20	11.5
10-15	23.9	21.5	10	45.4
15-20	15.1	20.8	10	35.9
20-30	10.0	11.3	16	21.2
30-40	4.9	3.0	33	7.9
40-60	1.8	2.2	34	4.0
60-80	0.1	0.1	101	0.2
80+	0.0	0.0	93	0.0
Total	65.0	79.1	3	144.1
North East Scotland				
0-7	6.3	17.6	9	23.9
7-10	2.6	12.7	15	15.3
10-15	7.8	18.0	11	25.8
15-20	7.7	14.0	15	21.7
20-30	12.5	28.6	9	41.1
30-40	8.6	18.3	12	26.9
40-60	4.2	12.2	15	16.3
60-80	0.1	1.9	38	2.0
80+	0.0	1.7	43	1.7
Total	49.8	125.0	2	174.8
East Scotland				
0-7	2.0	4.9	19	6.9
7-10	1.4	6.4	35	7.8
10-15	6.8	6.0	17	12.8
15-20	6.1	11.7	12	17.8
20-30	5.1	13.9	10	19.0
30-40	4.2	6.2	17	10.5
40-60	2.1	3.9	20	6.0
60-80	0.1	0.4	46	0.5
80+	0.0	0.2	85	0.2
Total	27.9	53.7	5	81.6
South Scotland				
0-7	22.4	32.4	8	54.8
7-10	6.1	15.5	13	21.6
10-15	22.2	19.5	12	41.7
15-20	37.9	34.2	9	72.1
20-30	19.4	47.8	7	67.2
30-40	4.8	12.9	14	17.7
40-60	2.3	3.4	23	5.7
60-80	0.1	1.1	41	1.3
80+	0.0	0.2	89	0.2
Total	115.2	167.0	2	282.2

Table 7 (continued) Scotland.

Mean stand DBH (cm)	FC	Private sector		Total
	000 ha	000 ha	SE%	
West Scotland				
0-7	13.8	8.1	19	21.9
7-10	5.3	11.6	15	17.0
10-15	31.5	24.4	9	55.8
15-20	37.3	25.6	9	62.9
20-30	24.4	29.4	9	53.7
30-40	2.6	5.0	23	7.6
40-60	1.3	2.7	30	3.9
60-80	0.1	0.1	78	0.3
80+	0.0	0.4	93	0.4
Total	116.3	107.3	2	223.6

Table 7 (continued) Wales.

Mean stand DBH (cm)	FC	Private sector		Total
	000 ha	000 ha	SE%	
Wales				
0-7	13.2	2.9	28	16.1
7-10	5.7	3.2	25	8.9
10-15	16.3	7.0	17	23.3
15-20	15.4	8.4	17	23.8
20-30	18.0	14.1	13	32.1
30-40	7.3	9.1	16	16.4
40-60	5.2	4.6	24	9.7
60-80	0.2	0.4	95	0.6
80+	0.1	0.2	90	0.2
Total	81.4	49.7	4	131.1

**Table 8** Standing coniferous timber volume by size class for National Forest Inventory regions. England.

Mean stand DBH (cm)	FC	Private sector		Total
	000 m³	000 m³	SE%	
North West England				
0-7	0	2	49	2
7-10	17	23	46	40
10-15	416	216	31	632
15-20	924	585	26	1 509
20-30	886	2 416	18	3 302
30-40	286	1 947	19	2 234
40-60	222	1 150	22	1 372
60-80	15	76	85	91
80+	7	0	-	7
Total	2 775	6 414	6	9 189
North East England				
0-7	0	2	57	2
7-10	35	46	41	81
10-15	1 021	339	30	1 361
15-20	2 701	1 086	25	3 788
20-30	2 162	2 356	19	4 517
30-40	284	1 868	24	2 153
40-60	369	1 005	31	1 374
60-80	16	115	51	131
80+	0	383	68	383
Total	6 589	7 200	9	13 789
Yorkshire and Humber				
0-7	0	2	61	2
7-10	20	21	33	42
10-15	158	271	22	429
15-20	262	823	19	1 085
20-30	531	2 479	13	3 009
30-40	776	1 442	16	2 218
40-60	489	1 081	20	1 571
60-80	32	132	44	163
80+	3	62	61	66
Total	2 271	6 312	6	8 584
East Midlands				
0-7	0	0	-	0
7-10	7	4	53	11
10-15	51	69	53	119
15-20	136	204	32	340
20-30	467	808	25	1 275
30-40	523	996	23	1 519
40-60	587	488	64	1 075
60-80	6	65	93	71
80+	4	0	-	4
Total	1 780	2 635	16	4 415

Mean stand DBH (cm)	FC	Private sector		Total
	000 m³	000 m³	SE%	
East England				
0-7	0	1	106	1
7-10	12	6	72	18
10-15	294	154	34	449
15-20	333	367	38	699
20-30	801	1 246	19	2 046
30-40	777	1 875	17	2 652
40-60	898	1 025	24	1 924
60-80	157	56	110	213
80+	1	83	90	84
Total	3 272	4 813	9	8 085
South East and London				
0-7	0	1	77	1
7-10	7	81	37	88
10-15	172	346	21	518
15-20	133	1 163	17	1 296
20-30	734	3 378	12	4 112
30-40	1 169	2 944	12	4 113
40-60	780	3 075	16	3 854
60-80	101	384	31	485
80+	35	390	44	426
Total	3 132	11 761	6	14 893
South West England				
0-7	0	0	89	0
7-10	22	73	24	95
10-15	191	490	21	681
15-20	280	625	19	905
20-30	966	2 827	13	3 793
30-40	1 303	4 803	12	6 106
40-60	1 313	3 433	16	4 746
60-80	259	608	31	866
80+	82	891	50	973
Total	4 416	13 750	6	18 166
West Midlands				
0-7	0	1	85	1
7-10	12	5	95	17
10-15	75	133	59	208
15-20	84	351	41	436
20-30	289	1 096	35	1 385
30-40	713	2 895	17	3 608
40-60	601	2 931	26	3 532
60-80	102	237	67	339
80+	36	86	110	122
Total	1 913	7 735	12	9 648

Note: By definition trees less than 7 cm DBH possess no standing volume. However, because this category represents stands of trees with a mean DBH in this range, it may include some individual trees with a greater than 7 cm DBH, which explains the presence of the non-zero standing volume in the 0-7 cm DBH category for the Private sector.

Table 8 (continued) Scotland.

Mean stand DBH (cm)	FC	Private sector		Total
	000 m³	000 m³	SE%	
North Scotland				
0-7	0	5	52	5
7-10	98	202	23	301
10-15	2 658	2 814	12	5 472
15-20	3 856	5 296	13	9 152
20-30	3 323	3 875	17	7 198
30-40	1 278	1 468	37	2 746
40-60	636	1 140	39	1 776
60-80	53	27	101	80
80+	17	4	93	21
Total	11 918	14 831	6	26 749
North East Scotland				
0-7	0	4	71	4
7-10	53	210	15	263
10-15	871	1 319	19	2 190
15-20	1 826	3 238	17	5 064
20-30	3 133	9 048	11	12 181
30-40	2 330	6 416	13	8 747
40-60	1 427	5 227	16	6 654
60-80	58	898	34	956
80+	5	524	88	529
Total	9 704	26 884	5	36 588
East Scotland				
0-7	0	1	53	1
7-10	27	136	37	162
10-15	805	624	18	1 428
15-20	1 550	2 831	13	4 381
20-30	1 454	5 735	13	7 189
30-40	1 160	2 996	18	4 155
40-60	735	2 557	22	3 291
60-80	56	329	40	385
80+	1	264	85	265
Total	5 787	15 471	5	21 258
South Scotland				
0-7	0	3	43	3
7-10	123	377	15	500
10-15	2 407	2 310	16	4 717
15-20	10 685	10 356	10	21 042
20-30	8 015	22 738	8	30 753
30-40	1 546	6 613	17	8 159
40-60	826	1 752	24	2 578
60-80	58	1 019	37	1 078
80+	9	232	99	242
Total	23 671	45 400	4	69 070
West Scotland				
0-7	0	5	58	5
7-10	111	270	22	381
10-15	3 655	2 997	12	6 652
15-20	10 517	7 778	11	18 295
20-30	12 032	13 550	10	25 582
30-40	1 531	3 645	27	5 176
40-60	567	1 089	33	1 656
60-80	66	114	75	180
80+	1	793	93	794
Total	28 480	30 241	6	58 721

Table 8 (continued) Wales.

Mean stand DBH (cm)	FC	Private sector		Total
	000 m³	000 m³	SE%	
Wales				
0-7	0	0	83	0
7-10	121	64	33	185
10-15	1 764	883	23	2 647
15-20	4 231	2 084	20	6 316
20-30	7 994	6 568	14	14 562
30-40	2 711	5 095	18	7 806
40-60	1 899	2 353	26	4 252
60-80	104	481	106	585
80+	43	191	90	235
Total	18 868	17 720	7	36 588

**Table 9** Standing coniferous timber volume by principal species for National Forest Inventory regions. England.

Principal species	FC	Private sector		Total
	000 m³	000 m³	SE%	
North West England				
All conifers	2 775	6 414	8	9 189
Sitka spruce	1 915	2 864	17	4 780
Scots pine	148	716	20	865
Corsican pine	79	87	100	166
Norway spruce	77	675	28	752
Larches	287	1 692	17	1 979
Douglas fir	96	25	66	121
Lodgepole pine	115	246	62	362
Other conifers	57	170	65	226
North East England				
All conifers	6 589	7 200	9	13 789
Sitka spruce	4 806	2 081	21	6 887
Scots pine	362	2 164	18	2 526
Corsican pine	56	59	85	115
Norway spruce	634	875	39	1 509
Larches	208	1 297	27	1 505
Douglas fir	64	212	53	276
Lodgepole pine	384	362	48	746
Other conifers	73	170	49	243
Yorkshire and Humber				
All conifers	2 271	6 312	6	8 584
Sitka spruce	633	1 881	18	2 515
Scots pine	646	1 206	14	1 852
Corsican pine	118	304	39	422
Norway spruce	92	538	21	630
Larches	441	1 573	12	2 014
Douglas fir	83	228	42	310
Lodgepole pine	167	342	32	509
Other conifers	91	223	28	315
East Midlands				
All conifers	1 780	2 635	16	4 415
Sitka spruce	64	6	110	69
Scots pine	470	1 515	26	1 985
Corsican pine	941	411	34	1 353
Norway spruce	75	268	36	343
Larches	48	319	26	367
Douglas fir	20	68	81	88
Lodgepole pine	65	0	-	65
Other conifers	97	47	60	145

Principal species	FC	Private sector		Total
	000 m³	000 m³	SE%	
East England				
All conifers	3 272	4 813	9	8 085
Sitka spruce	0	35	68	35
Scots pine	754	1 931	16	2 685
Corsican pine	2 252	1 304	23	3 556
Norway spruce	15	372	33	387
Larches	34	603	25	637
Douglas fir	117	240	38	357
Lodgepole pine	4	0	-	4
Other conifers	97	326	32	423
South East and London				
All conifers	3 132	11 761	6	14 893
Sitka spruce	13	228	44	241
Scots pine	873	4 150	13	5 023
Corsican pine	841	1 282	21	2 124
Norway spruce	273	1 362	15	1 635
Larches	134	1 669	14	1 802
Douglas fir	497	904	23	1 401
Lodgepole pine	5	20	107	25
Other conifers	495	2 129	17	2 624
South West England				
All conifers	4 416	13 750	6	18 166
Sitka spruce	955	2 374	21	3 329
Scots pine	337	1 406	19	1 743
Corsican pine	667	716	29	1 383
Norway spruce	458	1 743	18	2 201
Larches	350	2 474	14	2 824
Douglas fir	1 138	3 215	18	4 353
Lodgepole pine	32	8	105	41
Other conifers	478	1 951	18	2 429
West Midlands				
All conifers	1 913	7 735	12	9 648
Sitka spruce	95	370	70	465
Scots pine	305	1 923	28	2 228
Corsican pine	404	883	33	1 287
Norway spruce	135	1 295	33	1 430
Larches	209	1 486	24	1 694
Douglas fir	580	739	37	1 319
Lodgepole pine	27	129	74	156
Other conifers	158	946	30	1 105

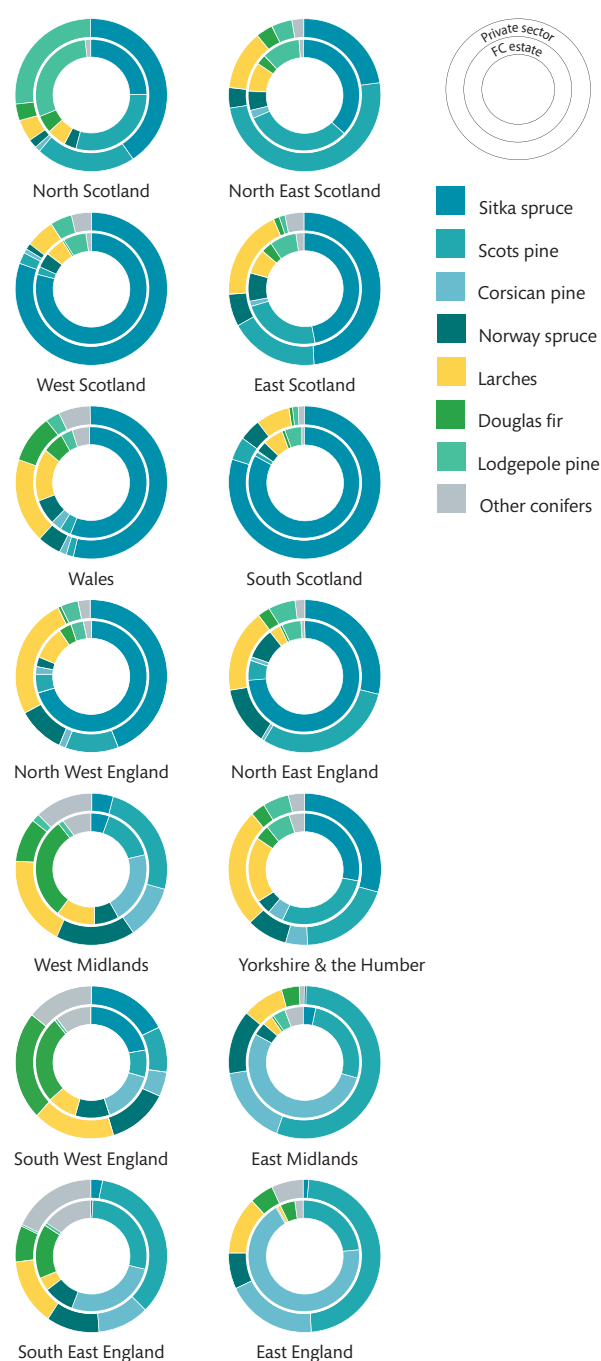
Table 9 (continued) Scotland.

Principal species	FC	Private sector		Total
	000 m³	000 m³	SE%	
North Scotland				
All conifers	11 918	14 831	6	26 749
Sitka spruce	2 966	5 888	12	8 854
Scots pine	3 482	3 081	20	6 563
Corsican pine	9	128	108	137
Norway spruce	404	296	57	699
Larches	708	912	29	1 620
Douglas fir	569	861	44	1 430
Lodgepole pine	3 614	3 635	13	7 249
Other conifers	166	0	–	166
North East Scotland				
All conifers	9 704	26 884	5	36 588
Sitka spruce	3 577	5 922	15	9 499
Scots pine	3 024	13 393	7	16 417
Corsican pine	209	0	–	209
Norway spruce	576	1 240	32	1 816
Larches	787	3 422	18	4 209
Douglas fir	275	928	38	1 203
Lodgepole pine	1 117	1 211	28	2 328
Other conifers	140	678	69	818
East Scotland				
All conifers	5 787	15 471	5	21 258
Sitka spruce	2 723	7 359	11	10 082
Scots pine	1 223	3 001	14	4 224
Corsican pine	79	0	–	79
Norway spruce	432	978	22	1 410
Larches	379	3 066	17	3 446
Douglas fir	166	228	33	394
Lodgepole pine	666	176	41	842
Other conifers	119	636	44	755
South Scotland				
All conifers	23 671	45 400	4	69 070
Sitka spruce	19 683	36 401	5	56 084
Scots pine	271	2 117	21	2 388
Corsican pine	34	41	70	75
Norway spruce	814	2 157	22	2 970
Larches	1 334	3 312	16	4 647
Douglas fir	201	282	37	483
Lodgepole pine	1 160	609	33	1 769
Other conifers	174	558	34	731
West Scotland				
All conifers	28 479	30 241	6	58 720
Sitka spruce	22 692	24 359	6	47 051
Scots pine	540	827	33	1 367
Corsican pine	18	180	58	197
Norway spruce	1 257	361	65	1 618
Larches	1 555	1 943	21	3 499
Douglas fir	175	10	84	185
Lodgepole pine	1 834	1 324	24	3 158
Other conifers	408	1 372	63	1 781

Table 9 (continued) Wales.

Principal species	FC	Private sector		Total
	000 m³	000 m³	SE%	
Wales				
All conifers	18 868	17 720	7	36 588
Sitka spruce	10 643	9 477	12	20 120
Scots pine	494	301	45	795
Corsican pine	602	252	42	854
Norway spruce	1 437	907	42	2 345
Larches	2 760	3 119	20	5 879
Douglas fir	1 251	1 885	26	3 135
Lodgepole pine	607	424	36	1 031
Other conifers	1 073	1 340	39	2 413

Figure 6 Standing coniferous timber volume by principal species for National Forest Inventory regions.





**Table 10** Standing volume by age class for National Forest Inventory regions. England.

Age (years)	FC	Private sector		Total
	000 m³	000 m³	SE%	
North West England				
0-20	63	78	42	140
21-40	1 096	1 774	21	2 870
41-60	1 222	3 875	15	5 096
61-80	279	685	30	964
81-100	99	2	75	101
100+	16	0	-	16
Total	2 775	6 414	8	9 189
North East England				
0-20	97	67	30	164
21-40	2 346	2 713	18	5 060
41-60	2 989	3 410	19	6 399
61-80	1 096	797	42	1 893
81-100	48	213	94	261
100+	12	0	-	12
Total	6 589	7 200	9	13 789
Yorkshire and Humber				
0-20	63	76	32	139
21-40	496	1 679	16	2 175
41-60	1 151	3 521	11	4 672
61-80	390	997	22	1 387
81-100	165	2	96	167
100+	6	38	58	44
Total	2 271	6 312	6	8 584
East Midlands				
0-20	26	47	73	74
21-40	337	310	35	647
41-60	873	1 525	20	2 398
61-80	407	280	34	687
81-100	129	0	-	129
100+	7	473	67	480
Total	1 780	2 635	16	4 415

Age (years)	FC	Private sector		Total
	000 m³	000 m³	SE%	
East England				
0-20	206	70	45	277
21-40	1 132	1 201	22	2 333
41-60	1 090	2 905	14	3 995
61-80	441	453	35	894
81-100	380	29	58	409
100+	24	154	90	177
Total	3 272	4 813	9	8 085
South East and London				
0-20	94	105	36	199
21-40	326	2 345	12	2 671
41-60	1 564	6 291	9	7 856
61-80	688	1 935	19	2 603
81-100	290	506	61	796
100+	189	580	35	768
Total	3 132	11 761	6	14 893
South West England				
0-20	131	213	28	344
21-40	1 008	2 060	16	3 068
41-60	2 447	7 452	10	9 899
61-80	637	2 593	19	3 230
81-100	177	1 111	39	1 288
100+	17	320	49	338
Total	4 416	13 750	6	18 166
West Midlands				
0-20	67	152	52	219
21-40	514	1 035	37	1 549
41-60	1 089	4 422	18	5 511
61-80	173	2 019	34	2 192
81-100	70	106	54	176
100+	1	0	-	1
Total	1 913	7 735	12	9 648

Table 10 (continued) Scotland.

Age (years)	FC	Private sector		Total
	000 m³	000 m³	SE%	
North Scotland				
0-20	115	575	34	690
21-40	3 725	9 077	10	12 802
41-60	5 634	4 670	19	10 305
61-80	1 374	290	59	1 664
81-100	509	181	71	690
100+	561	38	88	599
Total	11 918	14 831	6	26 749
North East Scotland				
0-20	178	629	20	807
21-40	1 476	6 428	13	7 904
41-60	5 020	13 541	10	18 560
61-80	2 360	3 347	21	5 707
81-100	485	1 108	33	1 593
100+	185	1 831	35	2 016
Total	9 704	26 884	5	36 588
East Scotland				
0-20	54	700	21	754
21-40	1 493	7 358	11	8 851
41-60	3 257	5 221	15	8 478
61-80	661	1 213	35	1 874
81-100	200	339	59	539
100+	122	640	51	762
Total	5 787	15 471	5	21 258
South Scotland				
0-20	453	1 917	17	2 370
21-40	12 764	31 352	7	44 115
41-60	9 397	9 547	14	18 944
61-80	909	1 416	29	2 325
81-100	117	547	53	664
100+	31	622	38	653
Total	23 671	45 400	4	69 070
West Scotland				
0-20	358	830	24	1 188
21-40	12 102	20 229	8	32 331
41-60	12 574	7 407	16	19 981
61-80	2 631	443	52	3 074
81-100	602	351	74	953
100+	212	982	78	1 194
Total	28 480	30 241	6	58 721

Table 10 (continued) Wales.

Age (years)	FC	Private sector		Total
	000 m³	000 m³	SE%	
Wales				
0-20	563	308	42	872
21-40	5 022	7 605	12	12 628
41-60	10 303	8 278	15	18 581
61-80	2 676	39	106	2 716
81-100	284	1 143	41	1 427
100+	19	346	55	365
Total	18 868	17 720	7	36 588

## What the results tell us

The results show that there is more standing coniferous volume in forests and woodlands in Great Britain than could have been inferred from previous evaluations of the softwood timber resource (for example, the 2005 Production forecast). Estimates of standing volume on the Forestry Commission estate are consistent with previously reported areas and age classes. However, there is an overall increase in total standing volume, and this is thought to be largely due to increases in woodland area, stocked area and number of trees per hectare.

The revised estimates of woodland area, stocked area and number of trees per hectare are due to more accurate information arising from the improved methodology used in the current National Forest Inventory. It may also be in part due to the size of trees increasing as they have grown and matured, but that factor needs to be set against felling activity in the intervening period. The addition of new planting and replanting since 2005 will have had little to no effect on the evolution of standing volumes through to 2011.

The development of the planted forest resource in GB has led to an uneven planting and age profile, which is the principal determinant of standing volume and volume per hectare at any particular point in time. This is in contrast with forests of a more evenly distributed age, which result in a more stable evolution of total standing volume through time. Additionally, it should be noted that this is a snapshot of standing volume, taken in a single year, looking at a fraction of the life cycle of the forest. If a 25, 50 or 100-year window were to be used, a different perspective on standing volume would be given.

The stocked areas set out by principal species (Table 1) illustrate how relatively few species occupy most of the stocked areas at a GB level, and hence contribute most standing volume. Sitka spruce plays a significant role in the GB forest industry, accounting for around half of total standing coniferous volume (57% for the Forestry Commission estate, 47% for the Private sector estate).

The relative standing volumes of principal species (Table 3) are largely dependent on the proportion of total stocked area occupied by each species. Sitka spruce dominates the standing volume because it is also the species occupying the largest conifer-stocked area in GB. However, other factors, including age distribution, thinning history (which affects the number of live stems remaining in a stand) and growth rates (affecting average size of trees of a given age) will influence the total standing volume of a single species.

The estimates of standing volume by age class (Table 4) show that most standing volume in GB (over 83%) is contained in

trees within an age range of 21–60 years; around half of this (over 41%) is within trees aged between 21 and 40 years, reflecting a period of high planting between 1970 and the late 1980s, most particularly by the Private sector in Scotland. However, in England and Wales, the 41–60 year age class contains the higher proportion of standing volume.

Similarly (and particularly for the Private sector estate) the results of the standing volume by size class (Table 5), show that there is currently a sizeable concentration (76%) of standing coniferous volume contained within trees in the 15–40 cm DBH size class and 36% of standing volume in trees within the 20–30 cm DBH size class. This again reflects the period of intensive planting between 1970 and the late 1980s, which would tend to produce trees within these size classes.

## Future work

This report has built on the woodland area reports and maps published in 2011 with robust new estimates of standing coniferous volume. Knowing what we have on the ground now is an essential part of planning for sustainable forest management across a range of interests, including, for example, biodiversity and climate change in addition to the development of the forest products industry. Further reports (to be published during 2012) will explore the implications of the results in this report, with particular reference to potential softwood availability and carbon sequestration.

# Glossary

**Age class:** A grouping of trees into specific age ranges for classification purposes.

**Area (forest/woodland):** forest and woodland area is divided into net forest area – the land area actually covered by trees (in the National Forest Inventory defined to the drip line of the canopy); and gross forest area – which includes both the area covered by trees and the small open spaces (of less than 0.5 hectares) within the forest boundary (e.g. rides, glades, ponds).

**Broadleaves:** trees and shrubs that belong to the angiosperm division of the plant kingdom (as distinct from the gymnosperm division that includes conifers). Most in the UK have laminar leaves and are deciduous. Sometimes referred to as ‘hardwoods’ but not all produce hardwood timber.

**Canopy:** the mass of foliage and branches formed collectively by the crowns of trees.

**Clearfelling:** cutting down of an area of woodland (if it is within a larger area of woodland it is typically a felling greater than 0.25 hectares). Sometimes a scatter or small clumps of trees may be left standing within the felled area.

**Conifers:** trees and shrubs that belong to the gymnosperm division of the plant kingdom (as distinct from the angiosperm division that includes broadleaves). Conifers mostly have needles or scale-like leaves and, with the exception of larch, all are evergreen. Sometimes referred to as ‘softwoods’, they produce softwood timber.

**DBH (diameter at breast height):** the diameter of a tree (overbark) at breast height, which is usually defined as 1.3 m along the axis of the stem from the ground.

**Forest (and woodland):** land predominately covered in trees (defined as land under stands of trees with a canopy cover of at least 20%, or the ability to achieve this, and with a minimum area of 0.5 hectares and minimum width of 20 m), whether in large tracts (generally called forests) or smaller areas known by a variety of terms (including woods, copses, spinneys or shelterbelts).

**Forestry Commission:** the government department responsible for the regulation of forestry, implementing forestry policy and management of state forests in Great Britain. Forestry policy is devolved, with the exception of common issues addressed on a GB or UK basis, such as international forestry, plant health and forestry standards.

**Forestry Commission estate:** forests, woodlands, open land and other property managed by the Forestry Commission.

**Great Britain (GB):** England, Scotland and Wales.

**Overbark:** a term used in measurements of wood volume that include the bark.

**Private sector estate:** forests and woodlands in GB not managed by the Forestry Commission. In the context of the National Forest Inventory, ‘Private sector’ is used for convenience although it includes land owned or managed by bodies such as local authorities and charities.

**Production forecast:** a forecast of softwood availability from the Forestry Commission (GB), the Forest Service, an agency within the Department of Agriculture and Rural Development in Northern Ireland) and potential softwood availability from the Private sector (UK).

**Softwood:** wood of coniferous trees or the conifers themselves.

**Stand:** a relatively uniform collection of trees (from either planting or natural regeneration) composed, for example, of a single species or a single age class.

**Standard error (SE):** the measure of the margin of error associated with an estimate as a result of sampling from a population with statistical variability. Larger standard errors indicate less precision in the estimate. Standard errors in this report are quoted in relative terms (i.e. as percentages of the value of the estimate).

**Standing volume:** a measurement of timber volume within standing trees. Usually expressed as cubic metres overbark standing (m<sup>3</sup> obs). In the Production forecast, standing coniferous volume is defined as live coniferous stemwood and useable branchwood (to 7 cm top diameter and at least 3 m in length). It excludes roots, below ground stump material, small branches, foliage and deadwood. For Private sector woodland only, it also excludes standing volume in trees in woodlands less than 0.5 hectares.

**Stemwood:** the volume of wood in stems, with stems being defined internationally as the above-ground part of the main shoot (or offshoots) with apical dominance. In GB stemwood includes wood from the stump up to 7 cm top diameter of the main stem and sometimes branchwood at least 3 m in length with a minimum top diameter of 7 cm.

**Stocked area:** the area stocked with living trees. The stocked areas in this report are quoted in gross terms for the Forestry Commission estate and in net terms for the Private sector estate (see **definitions of Area above**).

**Sustainable forest management:** the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity and vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions at local, national and global levels, and that does not cause damage to other ecosystems.

**Thinning:** the removal of a proportion of trees in a forest after canopy closure, usually to promote growth and greater value in the remaining trees.

**Top diameter:** diameter of the smaller (top) end of a log, often used to define different categories of wood products (e.g. sawlogs, roundwood, pulp) and merchantable timber.

**Top height:** the mean total height of the 100 largest dbh trees per hectare.

**Yield class (YC):** a classification based on tree species, height growth (top height) and tree age, used to assess the volume production of a stand of trees. It reflects the potential productivity of the site for the tree species growing on it.



This report is one of a series of Inventory Reports that will report on the outputs from the Forestry Commission National Forest Inventory. See [www.forestry.gov.uk/inventory](http://www.forestry.gov.uk/inventory) for more information. The woodland map and areas calculated from it can be found in the 'National Forest Inventory Woodland Area Statistics' for Great Britain, England, Scotland and Wales can also be downloaded here.

The National Forest Inventory supports sustainable forest management in Great Britain. For more information see The UK Forestry Standard and its supporting Guidelines on:

- Forests and Biodiversity
- Forests and Climate Change
- Forests and Historic Environment
- Forests and Landscape
- Forests and People
- Forests and Soil
- Forests and Water

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