

NFI provisional estimates for woodlands in the Central Scotland Green Network

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Summary

This report provides a more detailed picture of the estimates of stocked areas and standing volumes for the Central Scotland Green Network published as part of the 2011 National Forest Inventory (NFI) suite of reports. Reports are published at www.forestry.gov.uk/inventory. In addition the report provides forecasts of softwood availability based on the headline harvesting scenarios described in the 2011 suite of NFI reports.

The estimates provided in this report are provisional in nature. They may be subject to revision after further quality checks on the data and the processes used to generate the estimates. If these result in substantial changes to the estimates, a revised publication will be issued.



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Approach

The approach taken in the derivation of these results and to be used in their interpretation is described in the full suite of 2011 forecast reports which can be found at www.forestry.gov.uk/forecast. Refer to the *Standing timber volume in coniferous trees in Britain* and the *NFI preliminary estimates of quantities of broadleaved species in British Woodlands with special focus on ash* reports for a description of the underlying methodologies and interpretation, and also for the Scotland and GB context. Refer to the *NFI forecasts methodology overview* report for a detailed description and discussion of forecasting future availability of timber from NFI field survey data and from information in the Forestry Commission's sub-compartment database (SCDB). The wider context of forecasts of timber production from conifer trees in the United Kingdom and its constituent countries under a range of harvesting scenarios can be found in the *25 year forecast of softwood timber availability* report.

The estimates reported here are based upon field samples assessed between November 2009 and February 2012, the results of which have been subjected to rigorous data quality assurance procedures.

Results

The results presented in this report are estimates of standing volumes and stocked areas as at 31 March 2011, and a 25 year forecast of softwood availability under the "headline" harvesting scenarios for the Central Scotland Green Network. The data sources used for the compilation of these estimates are the same as described in the National Forest Inventory reports *Standing timber volume for coniferous trees in Britain* (2012) and the *25 year forecast of softwood timber availability* (2012). Estimates for the Forestry Commission (FC) estate are derived from the FC's sub-compartment database, while those for the private sector (i.e. non-FC) estate are derived from information collected in the NFI field survey. A fuller description of these data sources and how they are used in the production of estimates, including sampling standard errors attached to the private sector estimates, are provided in the earlier documents.

Results are provided for stocked area at 31 March 2011 (**Figure 1** and **Tables 1-3**), standing volume at 31 March 2011 (**Figure 2** and **Tables 4-6**) and a 25 year forecast (**Tables 7-10**).

Stocked area as at 31 March 2011

Figure 1 Principal species composition by stocked area at 31 March 2011

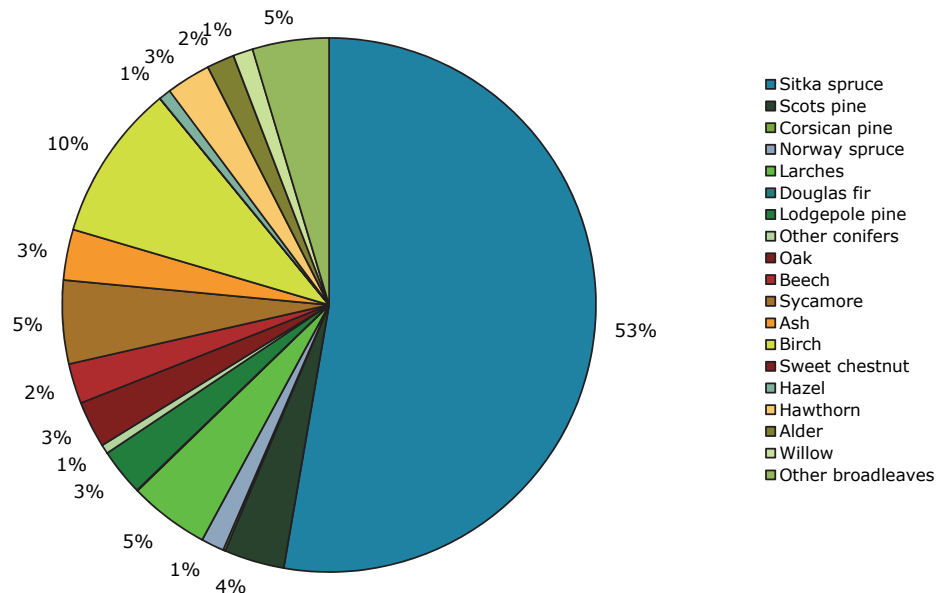


Table 1 Stocked area by principal species at 31 March 2011

Principal species	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Central Scotland Green Network				
All conifers	36.0	57.0	4	93.1
Sitka spruce	29.7	44.4	7	74.1
Scots pine	1.2	3.9	22	5.1
Corsican pine	0.0	0.2	77	0.2
Norway spruce	0.6	1.4	74	2.0
Larches	1.8	5.0	21	6.8
Douglas fir	0.1	0.0	-	0.1
Lodgepole pine	2.5	1.5	44	4.0
Other conifers	0.2	0.6	36	0.8
All broadleaves	2.2	45.3	7	47.5
Oak	0.1	3.9	25	4.0
Beech	0.0	3.4	28	3.4
Sycamore	0.0	7.0	22	7.1
Ash	0.1	4.3	26	4.3
Birch	0.3	13.1	16	13.4
Sweet chestnut	0.0	0.0	-	0.0
Hazel	0.0	1.0	48	1.0
Hawthorn	0.0	3.8	34	3.8
Alder	0.1	2.3	42	2.3
Willow	0.0	1.7	60	1.7
Other broadleaves	1.7	4.9	25	6.5
All species	38.3	102.3	4	140.6

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Table 2 Stocked area by age class at 31 March 2011

Age class (years)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Conifers				
0-10	5.0	6.8	23	11.8
11-20	4.2	13.3	15	17.5
21-40	19.9	28.7	11	48.6
41-60	6.6	5.8	25	12.4
61-80	0.3	2.0	45	2.3
81-100	0.0	0.2	106	0.3
100+	0.0	0.2	63	0.2
Total	36.0	57.0	4	93.1
Broadleaves				
0-10	0.9	6.3	40	7.2
11-20	0.5	5.5	21	6.0
21-40	0.5	17.9	14	18.4
41-60	0.1	8.9	18	9.0
61-80	0.1	3.8	39	3.9
81-100	0.0	2.1	48	2.1
100+	0.1	0.9	58	0.9
Total	2.2	45.3	7	47.5
All species				
0-10	5.9	13.1	23	19.0
11-20	18.8	18.8	13	37.7
21-40	20.4	46.5	9	66.9
41-60	6.7	14.7	15	21.4
61-80	0.4	5.8	30	6.2
81-100	0.0	2.3	45	2.3
100+	0.1	1.1	49	1.2
Total	38.3	102.3	4	140.6

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Table 3 Stocked area by mean stand dbh class at 31 March 2011

Mean stand DBH (cm)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Conifers				
0-7	6.3	8.4	20	14.8
7-10	1.8	6.5	20	8.3
10-15	8.9	9.2	19	18.1
15-20	13.5	14.5	14	28.0
20-30	4.7	13.7	16	18.4
30-40	0.6	2.9	28	3.5
40-60	0.1	1.1	44	1.2
60-80	0.0	0.5	69	0.5
80+	0.0	0.2	106	0.2
Total	36.0	57.0	4	93.1
Broadleaves				
0-7	1.0	6.0	30	7.0
7-10	0.7	12.3	17	13.1
10-15	0.4	4.5	18	4.9
15-20	0.0	2.8	37	2.9
20-30	0.0	6.8	23	6.8
30-40	0.0	4.1	31	4.1
40-60	0.0	5.0	28	5.0
60-80	0.0	3.7	35	3.7
80+	0.0	0.0	-	0.0
Total	2.2	45.3	7	47.5
All species				
0-7	7.3	14.4	17	21.8
7-10	2.6	18.8	13	21.4
10-15	9.3	13.8	14	23.0
15-20	13.6	17.3	13	30.9
20-30	4.8	20.4	13	25.2
30-40	0.6	7.0	22	7.6
40-60	0.1	6.1	24	6.3
60-80	0.0	4.3	32	4.3
80+	0.0	0.2	106	0.2
Total	38.3	102.3	4	140.6

Standing volume as at 31 March 2011

Figure 2 Principal species composition by standing volume at 31 March 2011

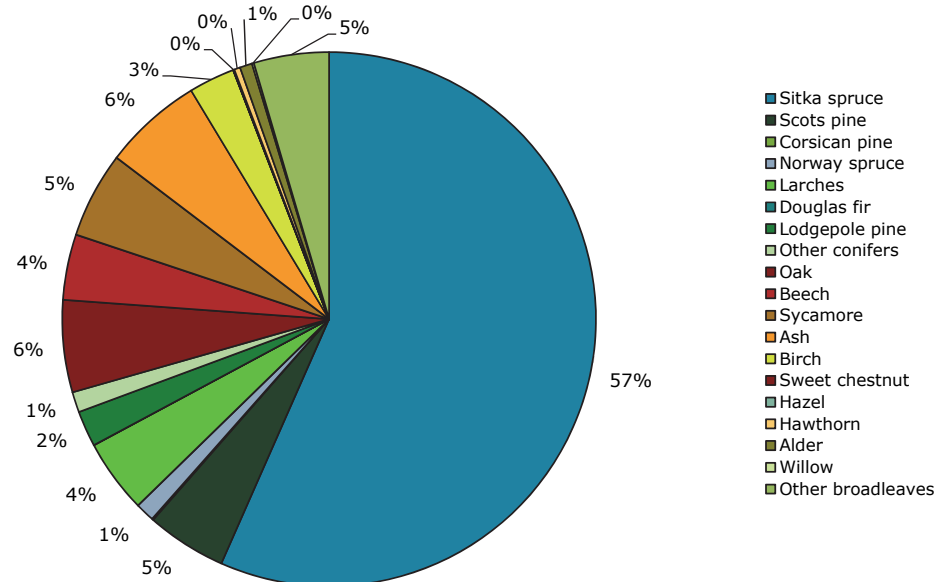


Table 4 Standing volume by principal species at 31 March 2011

Principal species	FC	Private sector		Total
	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)
Central Scotland Green Network				
All conifers	6,789	15,473	9	22,262
Sitka spruce	5,879	11,966	11	17,845
Scots pine	168	1,358	24	1,526
Corsican pine	4	22	67	26
Norway spruce	125	241	71	366
Larches	210	1,197	24	1,407
Douglas fir	4	0	-	4
Lodgepole pine	371	310	52	681
Other conifers	29	361	56	390
All broadleaves	98	9,174	14	9,272
Oak	15	1,741	38	1,757
Beech	7	1,245	36	1,252
Sycamore	5	1,638	32	1,642
Ash	1	1,895	41	1,895
Birch	15	866	18	881
Sweet chestnut	0	0	-	0
Hazel	0	24	72	24
Hawthorn	0	116	35	116
Alder	3	230	40	233
Willow	0	39	43	39
Other broadleaves	52	1,382	43	1,434
All species	6,887	24,649	8	31,537

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Table 5 Standing volume by age class at 31 March 2011

Age class (years)	FC	Private sector		Total
	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)
Conifers				
0-10	0	0	-	0
11-20	109	791	23	900
21-40	4,404	10,160	14	14,564
41-60	2,130	2,916	29	5,047
61-80	127	779	48	907
81-100	14	506	106	521
100+	3	319	63	323
Total	6,789	15,473	9	22,262
Broadleaves				
0-10	0	5	48	5
11-20	3	77	37	80
21-40	26	2,415	23	2,441
41-60	19	3,387	25	3,406
61-80	27	2,077	45	2,105
81-100	1	961	55	963
100+	21	252	51	273
Total	98	9,174	14	9,272
All species				
0-10	0	5	48	5
11-20	112	869	22	981
21-40	4,430	12,573	12	17,004
41-60	2,149	6,306	19	8,455
61-80	154	2,858	36	3,012
81-100	16	1,468	51	1,484
100+	25	571	42	596
Total	6,887	24,649	8	31,537

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Table 6 Standing volume by mean stand dbh class at 31 March 2011

Mean stand DBH (cm)	FC	Private sector		Total
	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)
Conifers				
0-7	0	7	65	7
7-10	35	194	22	229
10-15	908	941	20	1,850
15-20	3,722	4,583	17	8,305
20-30	1,914	6,543	17	8,457
30-40	165	1,670	46	1,835
40-60	44	570	50	614
60-80	0	458	54	458
80+	0	506	106	506
Total	6,789	15,473	9	22,262
Broadleaves				
0-7	0	6	49	6
7-10	13	419	22	432
10-15	52	339	17	391
15-20	11	362	33	373
20-30	11	1,243	25	1,254
30-40	9	1,412	35	1,421
40-60	0	3,078	30	3,078
60-80	1	2,316	36	2,317
80+	0	0	-	0
Total	98	9,174	14	9,272
All species				
0-7	0	13	41	13
7-10	48	614	17	662
10-15	960	1,281	15	2,241
15-20	3,733	4,945	16	8,678
20-30	1,925	7,785	15	9,710
30-40	174	3,082	30	3,257
40-60	44	3,648	27	3,693
60-80	2	2,775	32	2,776
80+	0	506	106	506
Total	6,887	24,649	8	31,537

25-year forecast of softwood timber availability

Refer to the NFI report *25 year forecast of softwood timber availability (2012)* for a description of the underlying methodology and interpretation, and also for the Scotland and GB context.

In **Tables 7-10** the figures for the Forestry Commission are based on harvesting regimes derived from Forestry Commission felling and thinning plans as of 31 March 2011. The Private sector information for these tables is based on a scenario which assumes felling at age of maximum mean annual increment with moderate wind risk measures. Like-for-like restocking assumptions have been made.

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Table 7 25-year forecast of softwood availability broken down by time period and principal species

Principal species	2012-16			2017-21			2022-26			2027-31			2032-36		
	FC	Private sector		FC	Private sector		FC	Private sector		FC	Private sector		FC	Private sector	
	volume (000m ³ obs)		SE%	volume (000m ³ obs)		SE%	volume (000m ³ obs)		SE%	volume (000m ³ obs)		SE%	volume (000m ³ obs)		SE%
Central Scotland Green Network															
All conifers	493	530	28	380	638	23	345	1,273	20	301	1,075	19	315	866	24
Sitka spruce	432	428	34	348	428	27	322	1,169	22	283	984	20	295	702	30
Scots pine	1	21	28	3	21	48	3	48	38	4	40	35	2	89	39
Corsican pine	0	2	80	0	2	80	0	2	81	0	4	70	0	0	-
Norway spruce	6	11	65	5	11	71	4	10	72	3	9	76	3	9	76
Larches	10	56	59	8	56	73	6	37	84	8	30	60	10	28	38
Douglas fir	0	0	-	0	0	-	0	0	-	0	0	-	1	0	-
Lodgepole pine	42	9	59	16	9	77	8	6	71	2	5	72	4	22	80
Other conifers	1	2	60	1	2	63	1	1	70	0	1	69	0	15	98

Table 8 25-year forecast of softwood availability broken down by time period and size class

Top diameter class (cm)	2012-16						2017-21					
	FC		Private sector				FC		Private sector			
	volume (000 m ³ obs)	% spruce	volume (000 m ³ obs)	SE%	% spruce	volume (000 m ³ obs)	% spruce	volume (000 m ³ obs)	SE%	% spruce		
Central Scotland Green Network												
Total	493	89	530	28	83	380	93	638	23	84		
7-14	142	83	95	18	85	95	88	101	15	84		
14-16	63	87	42	23	86	45	92	44	18	85		
16-18	64	89	48	27	86	47	93	52	20	85		
18-24	152	92	172	34	87	121	95	195	28	89		
24-34	66	96	137	38	82	64	96	184	30	86		
34-44	6	96	25	38	63	8	93	41	34	70		
44-54	1	96	6	50	32	1	79	16	44	55		
54+	0	91	4	61	46	0	53	4	60	64		

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Table 8 (cont'd) 25-year forecast of softwood availability broken down by time period and size class

Top diameter class (cm)	2022-26					2027-31				
	FC		Private sector			FC		Private sector		
	volume (000 m ³ obs)	% spruce	volume (000 m ³ obs)	SE%	% spruce	volume (000 m ³ obs)	% spruce	volume (000 m ³ obs)	SE%	% spruce
Central Scotland Green Network										
Total	345	95	1,273	20	93	301	95	1,075	19	92
7-14	75	90	174	18	90	54	92	134	17	86
14-16	37	93	90	20	92	37	93	74	19	92
16-18	40	94	111	21	93	29	95	92	19	93
18-24	112	96	410	21	93	32	96	377	21	95
24-34	67	97	355	24	93	99	97	310	22	94
34-44	11	97	89	47	94	70	96	46	26	86
44-54	2	93	30	76	96	14	95	10	51	71
54+	0	89	16	86	95	3	92	30	90	87

Top diameter class (cm)	2032-36				
	FC		Private sector		
	volume (000 m ³ obs)	% spruce	volume (000 m ³ obs)	SE%	% spruce
Central Scotland Green Network					
Total	315	95	866	24	82
7-14	59	90	87	28	79
14-16	31	92	43	30	83
16-18	34	93	55	28	87
18-24	101	95	229	26	88
24-34	71	98	302	29	88
34-44	15	99	96	34	75
44-54	3	98	28	53	52
54+	1	93	26	49	19

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Volumes and areas in the following categories have not been included in the main forecast results; due to their specific nature they are treated as 'special cases' and are assessed separately. Dependent on the perspective taken on their future treatment, the likelihood of these stands being harvested or not can be assessed and a view taken as to whether or not these volumes should be added to the figures quoted in the main forecasts to obtain an overall assessment of total standing volume, increment and production.

Overdue timber

Overdue volume relates to that volume which is held within trees and stands that are currently beyond the fell age set by the harvesting scenario.

Table 9 Overdue volumes and areas

Principal species	FC	Private sector		SE%	FC	Private sector		SE%
	volume (000 m ³ obs)					area (000 ha)		
Central Scotland Green Network								
All conifers	229	1,851	35	0.8	3.2	31		
Sitka spruce	157	807	70	0.5	0.8	51		
Scots pine	20	113	59	0.1	0.2	62		
Corsican pine	2	0	-	0.0	0.0	-		
Norway spruce	19	0	-	0.1	0.0	-		
Larches	16	607	36	0.1	2.0	39		
Douglas fir	0	0	-	0.0	0.0	-		
Lodgepole pine	13	0	-	0.1	0.0	-		
Other conifers	2	320	63	0.0	0.2	63		
All broadleaves	1	4,519	50	0.0	2.3	17		
Oak	0	253	51	0.0	0.9	58		
Beech	0	518	69	0.0	0.6	69		
Sycamore	0	954	38	0.0	3.1	32		
Ash	0	1,431	52	0.0	2.0	43		
Birch	0	92	62	0.0	0.7	74		
Sweet chestnut	0	0	-	0.0	0.0	-		
Hazel	0	0	-	0.0	0.0	-		
Hawthorn	0	0	-	0.0	0.0	-		
Alder	0	78	72	0.0	0.4	69		
Willow	0	0	-	0.0	0.0	-		
Other broadleaves	0	1,193	50	0.0	2.3	50		
All species	230	6,372	19	0.8	13.1	15		

Refer to the *25-year forecast of softwood timber availability* report for a description of the underlying methodology and interpretation of overdue volume and area.

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Forestry Commission sales of land

Forestry Commission flag the year of any planned disposals within the sub-compartment database and these areas continue to contribute to the Forestry Commission forecast until the date of disposal. After that point these areas and their standing volumes are removed from the FC forecast. Table 10 summarises the area and standing volume at the time of disposal as indicated within the sub-compartment database.

Table 10 Standing volume and stocked area of Forestry Commission land marked for disposal

FC	Conifers	Broadleaves	Conifers	Broadleaves
	volume (000 m ³ obs)		area (000 ha)	
Central Scotland Green Network				
Total	116	0	0.6	0.0
2012	43	0	0.1	0.0
2013	74	0	0.5	0.0
2014 - 2036	0	0	0.0	0.0

Refer to the *25-year forecast of softwood timber availability* report for a description of the underlying methodology and interpretation of standing volume and stocked area of land marked for disposal.

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Currently clearfelled area

Mapped forest areas were identified as clearfelled by aerial photography and subsequently updated by satellite imagery. Areas of clearfell that were observed in the NFI field survey (2010 to 2011) are not included in these forecasts. The assumption is made that these areas are not replanted in the future. This assumption is conservative and is used because the NFI has no information on what was planted on these sites before felling and therefore the replanted crop on the 'like-for-like' replanting assumption that is applied for the rest of the forecast period cannot be determined. It is probable that a high proportion of this area will be replanted and will contribute to future standing volume, increment, production, carbon sequestered and biomass. Assuming no replanting on these areas will create a small underestimate in most forecasts, especially in later years. There will be much less impact on the production forecast than on standing volume, biomass and carbon forecasts, as such stands, if replanted, would come to full maturity after the forecast period. Due to recent increases in harvesting without replanting, associated with wind farm development and open habitat restoration, the actual realised future scenario is likely to entail partial replanting of currently felled areas. The approach taken here is consistent with that taken by all previous forecasts. Future forecasts will provide more options on how this land may be utilised in future.

Although Forestry Commission records providing information on the stand structure from the previous rotation are available, currently clearfelled land on the Forestry Commission estate has also been excluded from the forecast of softwood availability to give a consistent approach with the Private sector methodology.

NFI national reports and papers

The principal themes reported on for the 2011 woodland profile and future forecasts are:

GB 2011 preliminary estimates of broadleaved species

GB 2011 standing coniferous timber volume

UK 25-year forecast of softwood availability

GB 25-year forecast of coniferous standing volume and increment

Each theme has a series of associated reports, papers and data, tailored for different audiences and uses. All the documents and data can be found on the NFI website

www.forestry.gov.uk/inventory.

Glossary

A glossary of terms is presented in the full suite of forecast reports which can be found at www.forestry.gov.uk/forecast.

Official Statistics

This is an Official Statistics publication. More information about Official Statistics and the UK Statistics Authority is available at www.statisticsauthority.gov.uk

National Forest Inventory Statistician: Alan Brewer