

# National Forest Inventory statistics for Cumbria and Lancashire

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[www.forestry.gov.uk/forecast](http://www.forestry.gov.uk/forecast)

## Cumbria and Lancashire

### Map 1 Map of England and the aligned areas

The map shows shortened names for some of the aligned areas. The short names and their full equivalents are to be found in **Appendix A**.



## Key findings for Cumbria and Lancashire

Cumbria and Lancashire (CLA) has a land area of 984,400 hectares making it 7th out of the 14 aligned areas by land area. With 88,220 ha of woodland, CLA ranks 8th out of 14 in terms of woodland area (9% woodland cover). Some 24% of the woodland is under Forestry Commission ownership or management.

Sitka spruce is the most commonly occurring of the conifer species whether assessed by stocked area (58%), standing volume (56%) or number of trees (66%).

Oak is the most commonly occurring of the broadleaved species when assessed by stocked area (22%) and standing volume (34%). Birch is the most commonly occurring of the broadleaved species when assessed by number of trees (23%).

Some 24% of standing coniferous volume is beyond the age of maximum mean annual increment (or above terminal height of 25m in higher windthrow risk areas). The harvesting assumptions applied in the forecast assume that a proportion of this volume will be felled over a period of time from the start of the forecast. Some 44% of conifer and mixed broadleaf/conifer sections (PS only) show evidence of thinning.

Overall 51% of standing broadleaved volume is beyond the age of maximum mean annual increment (or above terminal height of 25m in higher windthrow risk areas). Some 21% of broadleaved sections (PS only) show evidence of thinning.

Across CLA:

- Ash is estimated as 5% of total stocked area (8% of broadleaved stocked area), 4% of standing volume (9% of broadleaved standing volume) and 4% of the number of trees (8% of the number of broadleaved trees).
- Oak is estimated as 13% of total stocked area (22% of broadleaved stocked area), 16% of standing volume (34% of broadleaved standing volume) and 7% of the number of trees (12% of the number of broadleaved trees).
- Sweet chestnut is estimated as <1% of total stocked area (<1% of broadleaved stocked area), <1% of standing volume (<1% of broadleaved standing volume) and <1% of the number of trees (<1% of the number of broadleaved trees).
- Larch is estimated as 7% of total stocked area (17% of conifer stocked area), 10% of standing volume (18% of conifer standing volume) and 5% of the number of trees (11% of the number of conifer trees).

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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 (NFI), which began in 2010, is a multipurpose operation that has involved the production of a forest and woodland map for Britain and a continuing programme of field surveys (the first cycle of field surveys completed in late 2015) of the mapped forest and woodland areas.

Information and data collected by the National Forest Inventory is being 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 stocks
- biomass

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

This report brings together key woodland information for England previously published across the range of NFI thematic reports. Within the NFI programme, results are presented by the NUTS 1 boundaries<sup>\*</sup>. This report heads a series of reports where the woodland statistics are broken down by aligned area. The data sources and methodology covering the suite of reports is to be found in the report for England and the aligned areas.

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<sup>\*</sup> See <http://ec.europa.eu/eurostat/web/nuts/overview> for a description of the Nomenclature of territorial units for statistics (NUTS) classification system.

## How the estimates are prepared

The methodology, data sources and assumptions are described in the England report. It is important that the estimates presented in this report are interpreted in the light of the information provided in the England report.

The methodology introduces the sub-compartment database and the National Forest Inventory. It describes the metrics presented in this report and how they are derived. The methodology covers how the FC and private sector (PS) forecasts are prepared and includes commentary on the assumptions made in order to calculate the forecast estimates. Finally the methodology covers the tree health metrics.

## Note on the estimates

The values in the tables have been independently rounded, so may not add to the totals shown. In some breakdowns of Private sector estimates, the estimates in the body of the table may not sum to the quoted total because each individual value, including the total, has been independently generated by the estimation procedure used for results from the NFI sample survey. Sampling standard errors attached to Private sector estimates are expressed in relative terms (%) to the right of the relevant estimate and as  $\pm$  error bars in the figures. Percentages in the pie charts may also not sum to 100 due to rounding.

Due to biological and sampling constraints, for example where there is a very small population of a species within a particular region, the estimates may have a high associated standard error. Since this indicates a high level of uncertainty around those estimates then caution should be used when drawing any conclusions from these values as the estimate may not be representative of the real population. Such estimates have been 'lowlighted' in the tables.

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Evidence of thinning .....	53
Suitability for harvesting .....	54
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# Part 2 - what our woodlands are like today

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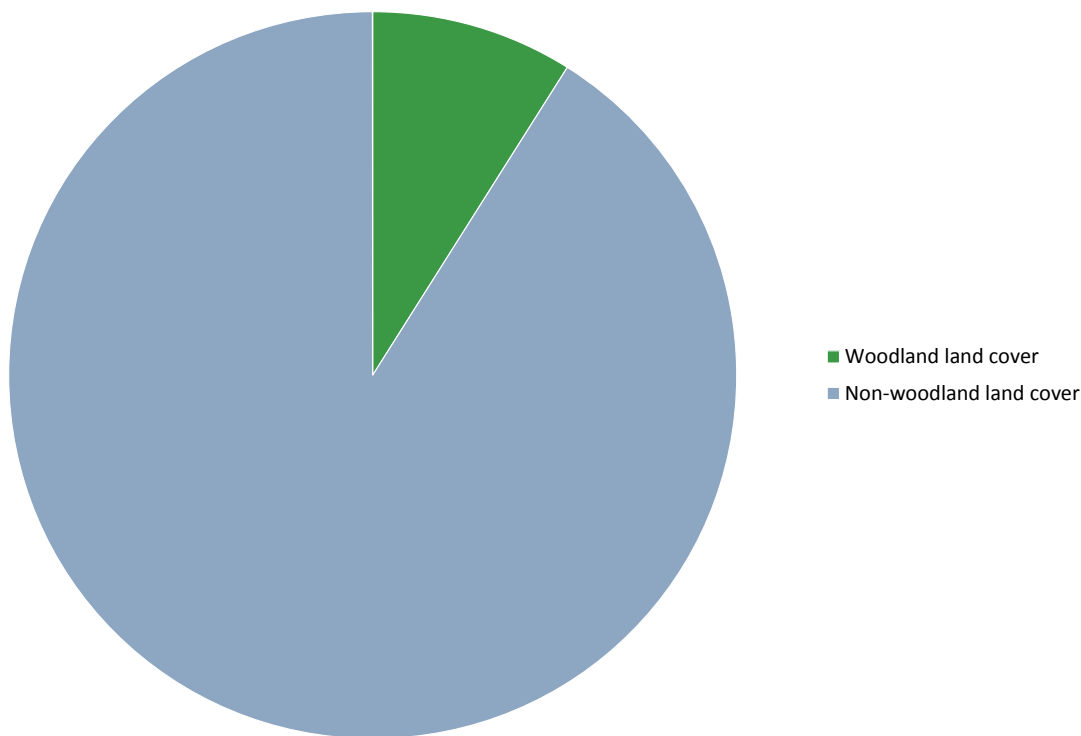
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# Woodland area statistics

## Woodland area by woodland type

**Figure 1** Woodland area by woodland type



**Table 1** Woodland area by woodland type

Woodland Type	Area (ha)	%
Cumbria and Lancashire		
Woodland	66,796	76%
Assumed woodland	2,790	3%
Low density	18,634	21%
Total mapped woodland	88,220	100%
Non-woodland area	896,180	
Land area	984,400	
Woodland land cover		9%
Non-woodland land cover		91%

# Part 2 - what our woodlands are like today

## Woodland area by ownership

Figure 2 Woodland area by ownership

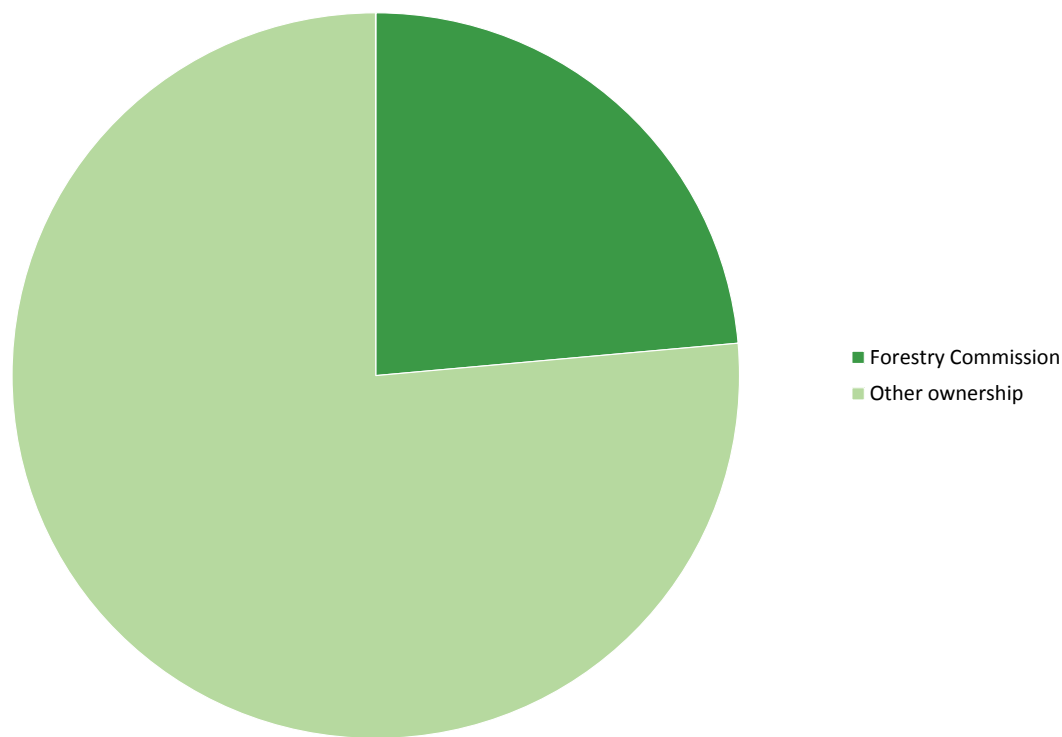


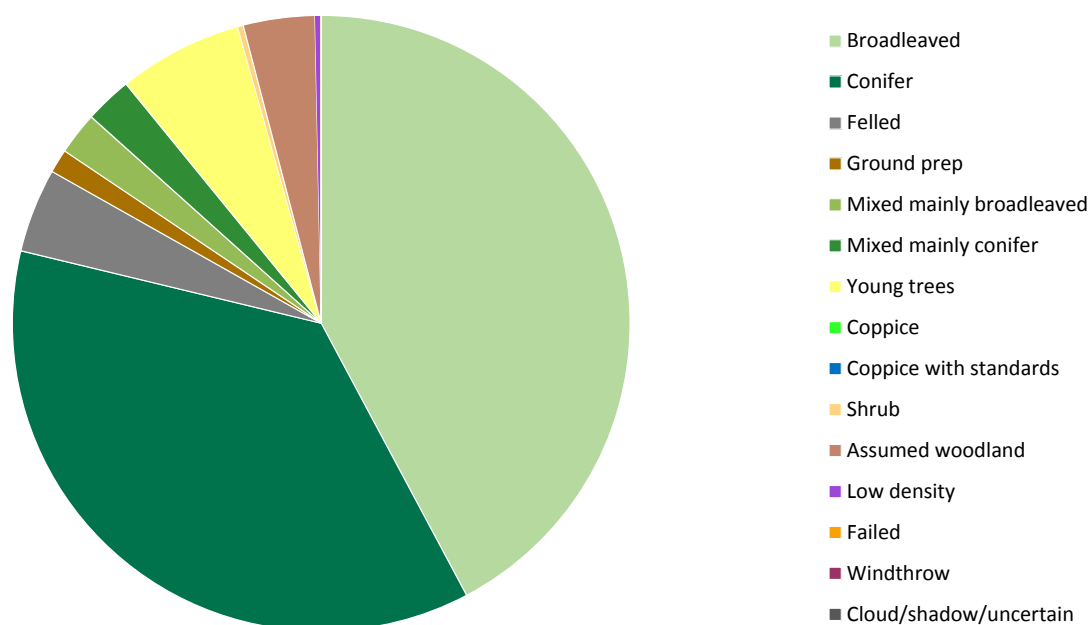
Table 2 Woodland area by ownership

Ownership	Area (ha)	% Woodland
Cumbria and Lancashire		
Forestry Commission	20,805	24%
Other ownership	67,415	76%
Total area of woodland	88,220	100%

## Part 2 - what our woodlands are like today

### Woodland area by interpreted forest type

**Figure 3** Woodland area by interpreted forest type



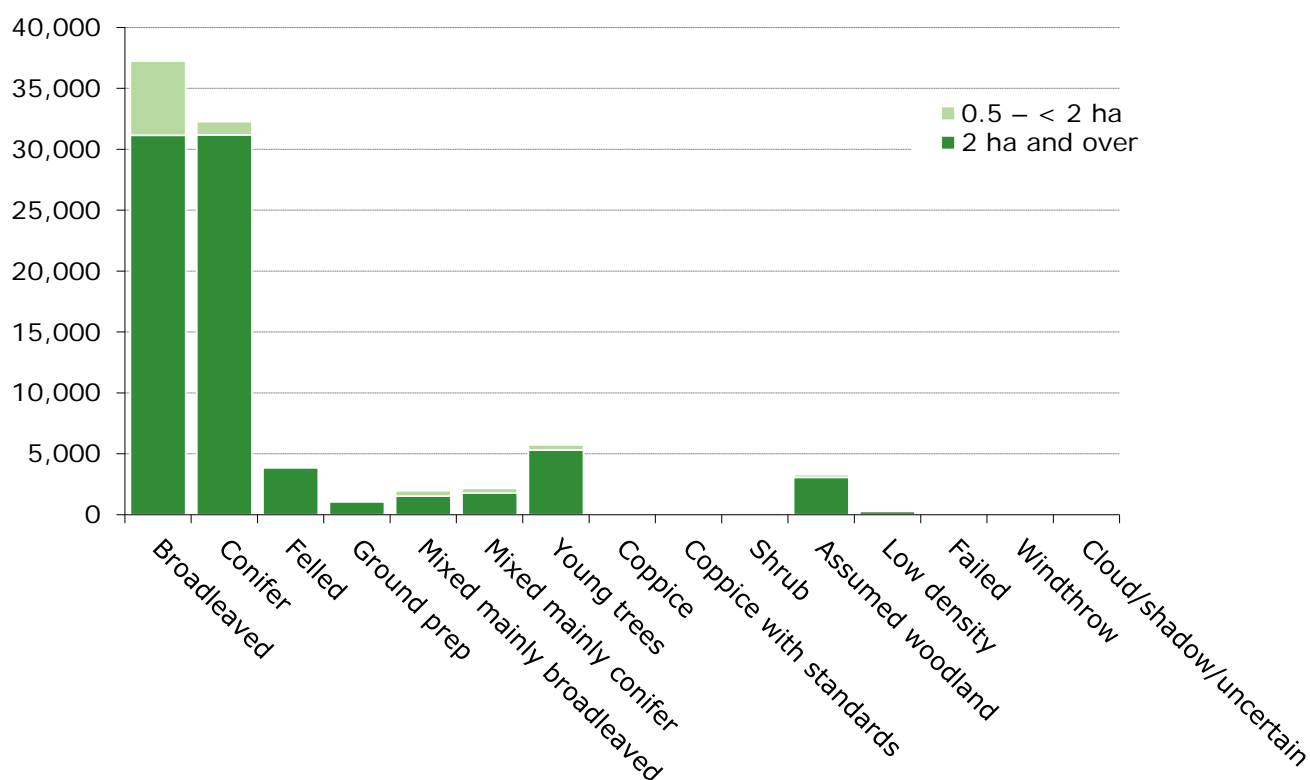
**Table 3** Woodland area by interpreted forest type

Forest type	Total area (ha)	% of total area
Cumbria and Lancashire		
Broadleaved	37,239	42%
Conifer	32,263	37%
Felled	3,888	4%
Ground prep	1,097	1%
Mixed mainly broadleaved	1,970	2%
Mixed mainly conifer	2,174	2%
Young trees	5,735	7%
Coppice	23	0%
Coppice with standards	0	0%
Shrub	250	0%
Assumed woodland	3,297	4%
Low density	284	0%
Failed	0	0%
Windthrow	0	0%
Cloud/shadow/uncertain	0	0%
TOTALS	88,220	100%

## Part 2 - what our woodlands are like today

### Woodland area by interpreted forest type and woodland size

**Figure 4** Woodland area by interpreted forest type and woodland size



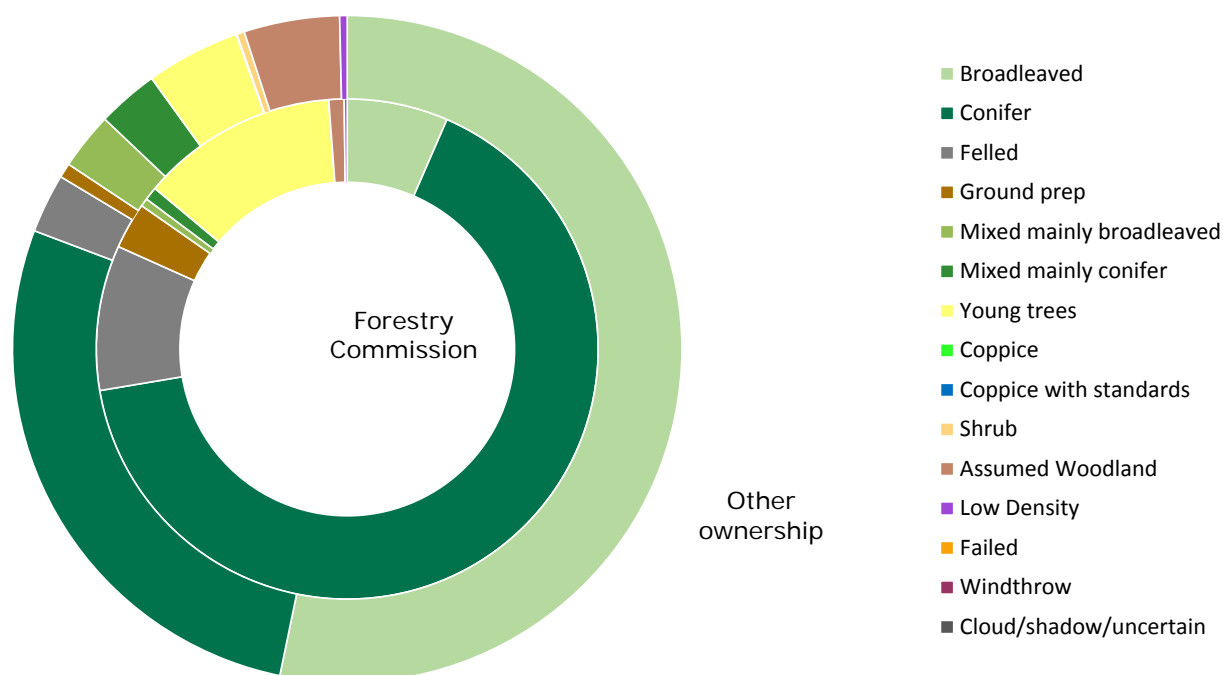
**Table 4** Woodland area by interpreted woodland type and woodland size

Forest type	Woodland size		Total area (ha)
	2 ha and over	0.5 – < 2 ha	
Cumbria and Lancashire			
Broadleaved	31,150	6,089	37,239
Conifer	31,190	1,073	32,263
Felled	3,871	32	3,903
Ground prep	1,084	17	1,101
Mixed mainly broadleaved	1,519	440	1,959
Mixed mainly conifer	1,776	394	2,170
Young trees	5,312	420	5,731
Coppice	23	0	23
Coppice with standards	0	0	0
Shrub	147	104	250
Assumed woodland	3,071	226	3,297
Low density	271	13	284
Failed	0	0	0
Windthrow	0	0	0
Cloud/shadow/uncertain	0	0	0
TOTALS	79,411	8,809	88,220

## Part 2 - what our woodlands are like today

### Woodland area by interpreted forest type and ownership

**Figure 5** Woodland area by interpreted forest type and ownership



**Table 5** Woodland area by interpreted forest type and ownership

Forest type	Forestry Commission		Other ownership	
	Area (ha)	% of total area	Area (ha)	% of total area
<b>Cumbria and Lancashire</b>				
Broadleaved	1,354	7%	35,885	53%
Conifer	13,696	66%	18,566	28%
Felled	1,951	9%	1,937	3%
Ground prep	624	3%	473	1%
Mixed mainly broadleaved	110	1%	1,861	3%
Mixed mainly conifer	178	1%	1,996	3%
Young trees	2,646	13%	3,068	5%
Coppice	0	0%	23	0%
Coppice with standards	0	0%	0	0%
Shrub	1	0%	249	0%
Assumed Woodland	204	1%	3,113	5%
Low Density	40	0%	244	0%
Failed	0	0%	0	0%
Windthrow	0	0%	0	0%
Cloud/shadow/uncertain	0	0%	0	0%
<b>TOTALS</b>	<b>20,805</b>	<b>100%</b>	<b>67,415</b>	<b>100%</b>

## Part 2 - what our woodlands are like today

### Woodland area by interpreted forest type, woodland size and ownership

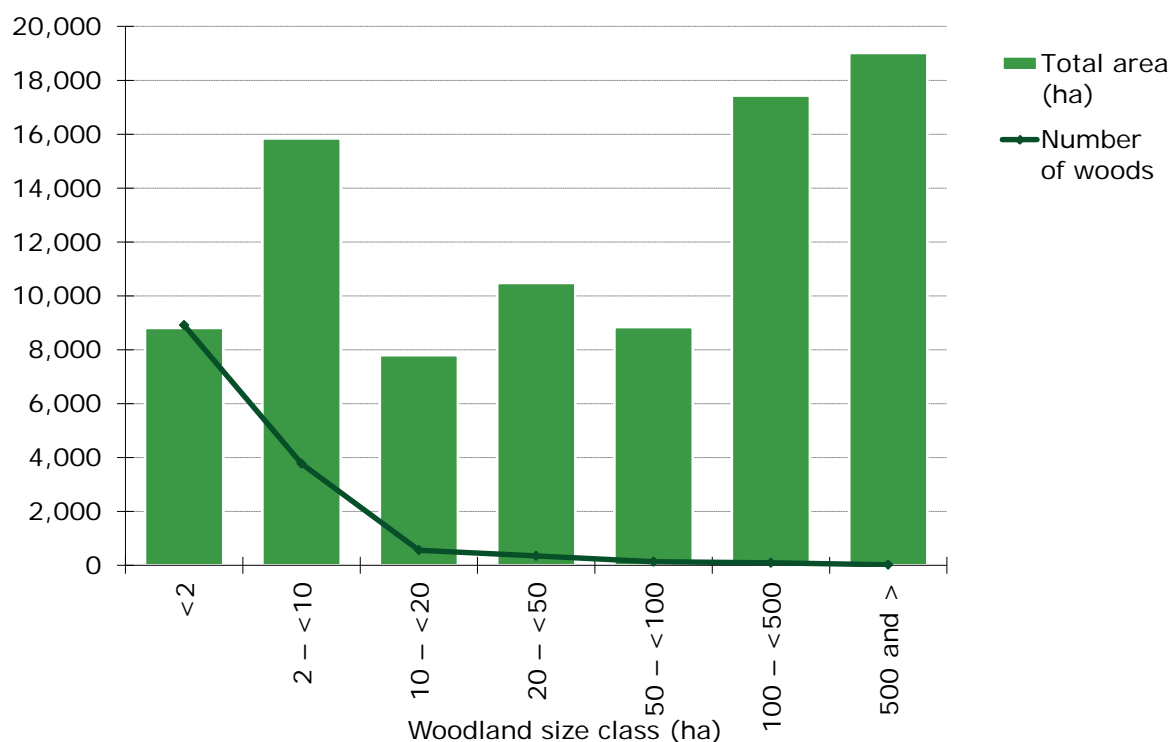
**Table 6** Woodland area by interpreted forest type, woodland size and ownership

Forest type	2 ha and over		0.5 – < 2 ha		Total area (ha)
	Forestry Commission	Other	Forestry Commission	Other	
Cumbria and Lancashire					
Broadleaved	43,570	634,558	223	108,645	786,995
Conifer	126,828	177,943	53	11,351	316,175
Felled	11,071	8,976	4	206	20,257
Ground prep	3,838	5,073	13	510	9,434
Mixed mainly broadleaved	2,177	15,277	6	4,668	22,128
Mixed mainly conifer	2,756	21,049	15	4,454	28,273
Young trees	21,858	43,896	64	9,484	75,303
Coppice	160	2,097	0	33	2,290
Coppice with standards	5	113	0	4	123
Shrub	111	3,282	8	1,382	4,783
Assumed woodland	1,043	24,034	16	2,700	27,792
Low Density	602	3,178	< 1	319	4,100
Failed	0	0	0	0	0
Windthrow	0	0	0	0	0
Cloud/shadow/uncertain	0	13	0	0	13
Totals	214,018	939,489	402	143,756	1,297,666

## Part 2 - what our woodlands are like today

### Woodland area by size class distribution

**Figure 6** Woodland area by size class distribution



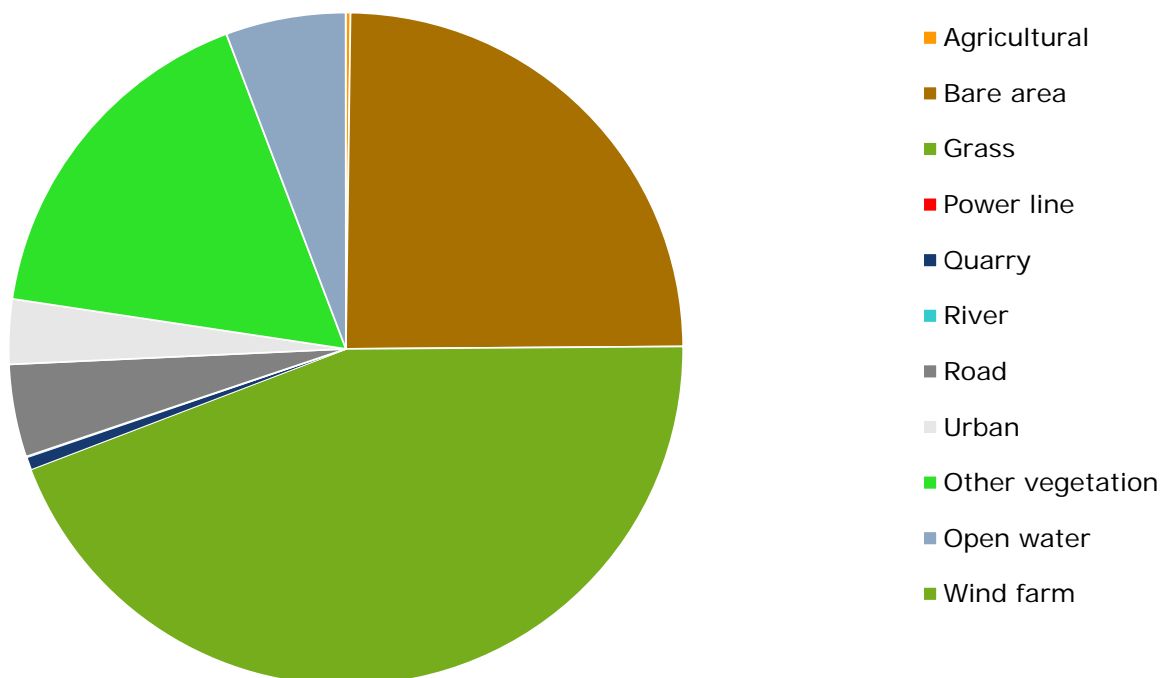
**Table 7** Woodland area by size class distribution

Size class (ha)	Total area (ha)	Number of woods	% of total area	Mean wood area (ha)
Cumbria and Lancashire				
<2	8,809	8,908	10%	< 1
2 – <10	15,842	3,767	18%	4
10 – <20	7,800	557	9%	14
20 – <50	10,479	346	12%	30
50 – <100	8,838	133	10%	66
100 – <500	17,432	92	20%	189
500 and >	19,020	15	22%	1,268
All woods	88,220	13,818	100%	6

## Part 2 - what our woodlands are like today

### Open areas in woodland by land use type

**Figure 7** Open areas in woodland by land use type



**Table 8** Open areas in woodland by land use type

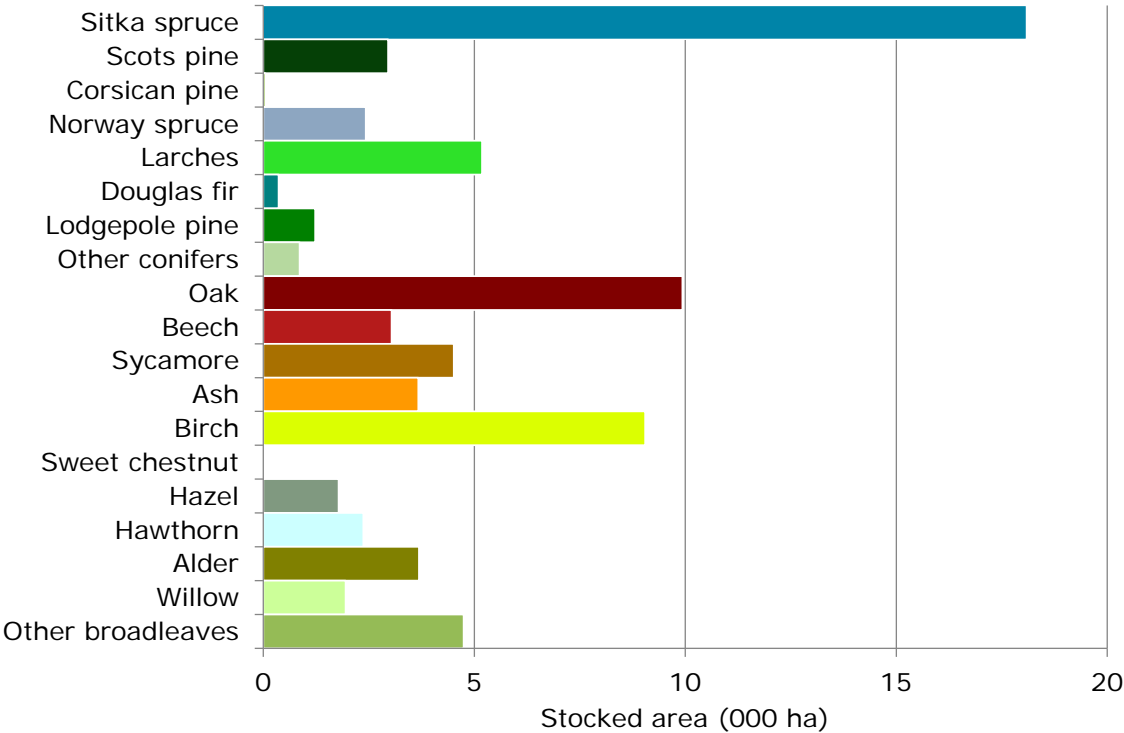
Interpreted open area	Total area (ha)	% of total area
Cumbria and Lancashire		
Agricultural	3	0%
Bare area	368	25%
Grass	661	44%
Power line	0	0%
Quarry	9	1%
River	< 1	0%
Road	66	4%
Urban	47	3%
Other vegetation	252	17%
Open water	86	6%
Wind farm	0	0%
<b>TOTALS</b>	<b>1,493</b>	<b>100%</b>



# Net area under canopy

## Stocked area by species

**Figure 8** Stocked area by principal tree species



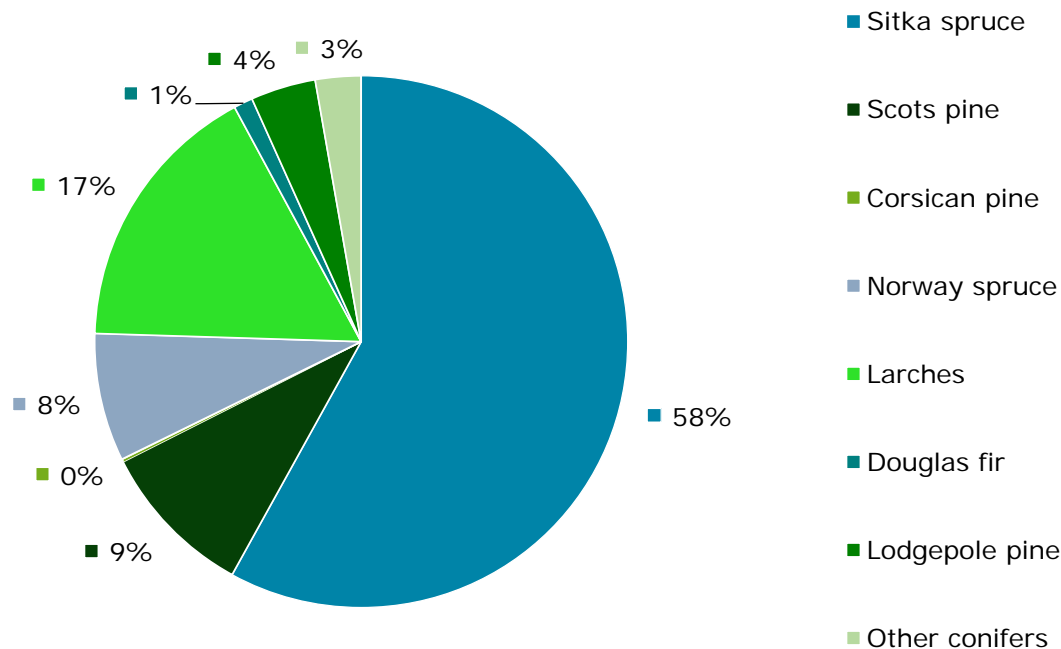
## Part 2 - what our woodlands are like today

**Table 9** Stocked area by principal tree species

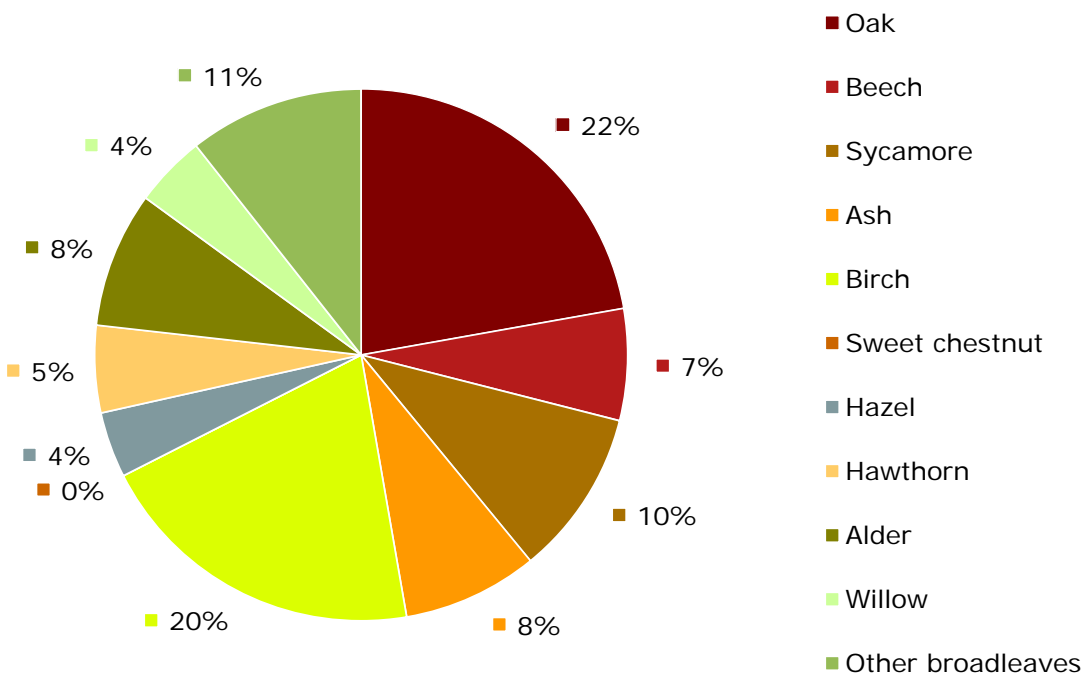
Principal species	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
<b>Conifers</b>				
Sitka spruce	9.9	8.2	12	<b>18.1</b>
Scots pine	0.6	2.4	18	<b>3.0</b>
Corsican pine	0.0	0.0	95	<b>0.1</b>
Norway spruce	0.6	1.8	23	<b>2.4</b>
Larches	1.4	3.8	15	<b>5.2</b>
Douglas fir	0.3	0.1	48	<b>0.4</b>
Lodgepole pine	0.7	0.6	40	<b>1.2</b>
Other conifers	0.2	0.6	36	<b>0.9</b>
<b>All conifers</b>	<b>13.6</b>	<b>17.6</b>	<b>6</b>	<b>31.2</b>
<b>Broadleaves</b>				
Oak	0.4	9.5	9	<b>9.9</b>
Beech	0.2	2.8	17	<b>3.0</b>
Sycamore	0.1	4.5	14	<b>4.5</b>
Ash	0.2	3.5	13	<b>3.7</b>
Birch	0.7	8.4	10	<b>9.0</b>
Sweet chestnut	0.0	0.0	89	<b>0.0</b>
Hazel	0.1	1.6	15	<b>1.8</b>
Hawthorn	0.0	2.4	18	<b>2.4</b>
Alder	0.0	3.7	16	<b>3.7</b>
Willow	0.0	1.9	20	<b>1.9</b>
Other broadleaves	1.0	3.7	12	<b>4.7</b>
<b>All broadleaves</b>	<b>2.7</b>	<b>42.1</b>	<b>3</b>	<b>44.8</b>
<b>All species</b>				
<b>All species</b>	<b>16.3</b>	<b>59.8</b>	<b>2</b>	<b>76.1</b>

# Part 2 - what our woodlands are like today

**Figure 9** Stocked area by principal conifer species



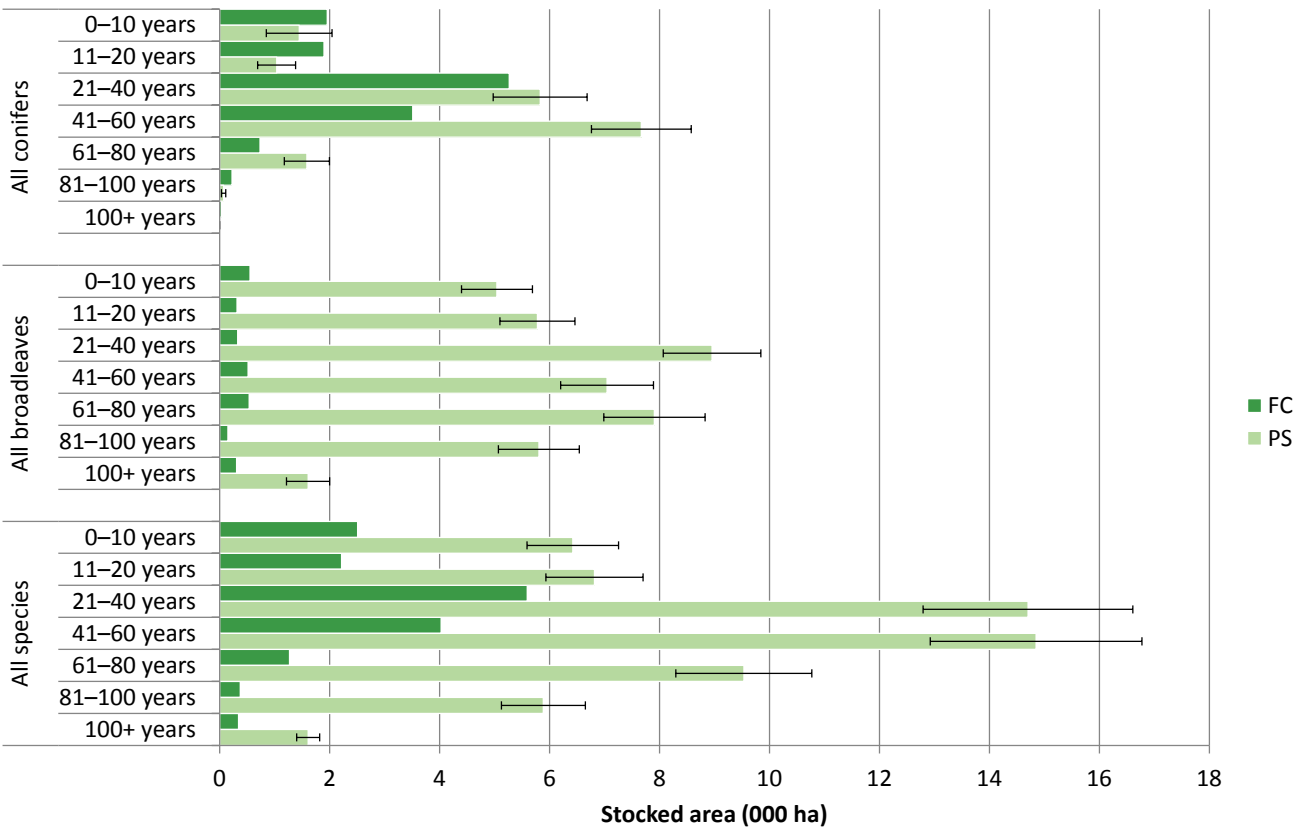
**Figure 10** Stocked area by principal broadleaved species



# Part 2 - what our woodlands are like today

## Stocked area by age class

**Figure 11** Stocked area by age class



## Part 2 - what our woodlands are like today

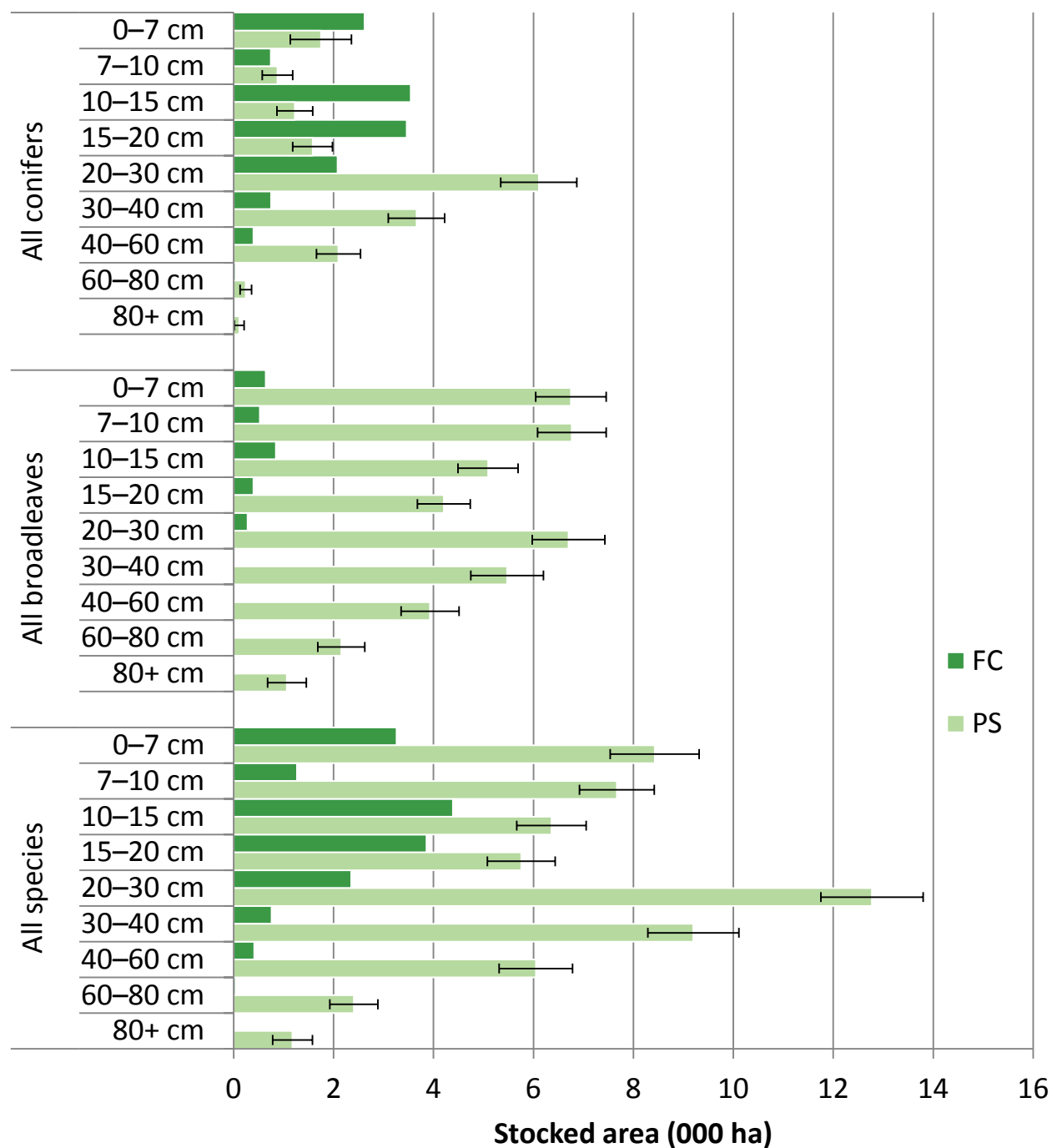
**Table 10** Stocked area by age class

Age class (years)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
<b>All conifers</b>				
0–10	2.0	1.4	41	3.4
11–20	1.9	1.0	33	2.9
21–40	5.3	5.8	15	11.1
41–60	3.5	7.7	12	11.2
61–80	0.7	1.6	26	2.3
81–100	0.2	0.1	55	0.3
100+	0.0	0.0	-	0.0
<b>Total</b>	<b>13.6</b>	<b>17.6</b>	<b>6</b>	<b>31.2</b>
<b>All broadleaves</b>				
0–10	0.6	5.0	13	5.6
11–20	0.3	5.8	12	6.1
21–40	0.3	9.0	10	9.3
41–60	0.5	7.0	12	7.6
61–80	0.5	7.9	12	8.4
81–100	0.1	5.8	13	6.0
100+	0.3	1.6	24	1.9
<b>Total</b>	<b>2.7</b>	<b>42.1</b>	<b>3</b>	<b>44.8</b>
<b>All species</b>				
0–10	2.5	6.4	13	8.9
11–20	2.2	6.8	13	9.0
21–40	5.6	14.7	13	20.3
41–60	4.0	14.8	13	18.9
61–80	1.3	9.5	13	10.8
81–100	0.4	5.9	13	6.3
100+	0.3	1.6	13	2.0
<b>Total</b>	<b>16.3</b>	<b>59.8</b>	<b>2</b>	<b>76.1</b>

## Part 2 - what our woodlands are like today

### Stocked area by mean stand dbh class

**Figure 12** Stocked area by mean stand dbh class



## Part 2 - what our woodlands are like today

**Table 11** Stocked area by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
<b>All conifers</b>				
0–7	2.6	1.7	35	4.4
7–10	0.7	0.9	35	1.6
10–15	3.5	1.2	29	4.8
15–20	3.5	1.6	25	5.0
20–30	2.1	6.1	12	8.2
30–40	0.7	3.7	15	4.4
40–60	0.4	2.1	21	2.5
60–80	0.0	0.2	47	0.3
80+	0.0	0.1	89	0.1
<b>Total</b>	<b>13.6</b>	<b>17.6</b>	<b>6</b>	<b>31.2</b>
<b>All broadleaves</b>				
0–7	0.6	6.8	10	7.4
7–10	0.5	6.8	10	7.3
10–15	0.8	5.1	12	5.9
15–20	0.4	4.2	13	4.6
20–30	0.3	6.7	11	7.0
30–40	0.0	5.5	13	5.5
40–60	0.0	3.9	15	3.9
60–80	0.0	2.2	22	2.2
80+	0.0	1.1	36	1.1
<b>Total</b>	<b>2.7</b>	<b>42.1</b>	<b>3</b>	<b>44.8</b>
<b>All species</b>				
0–7	3.3	8.4	11	11.7
7–10	1.3	7.7	10	8.9
10–15	4.4	6.4	11	10.7
15–20	3.9	5.8	12	9.6
20–30	2.4	12.8	8	15.1
30–40	0.8	9.2	10	10.0
40–60	0.4	6.0	12	6.5
60–80	0.0	2.4	20	2.4
80+	0.0	1.2	34	1.2
<b>Total</b>	<b>16.3</b>	<b>59.8</b>	<b>2</b>	<b>76.1</b>

# Part 2 - what our woodlands are like today

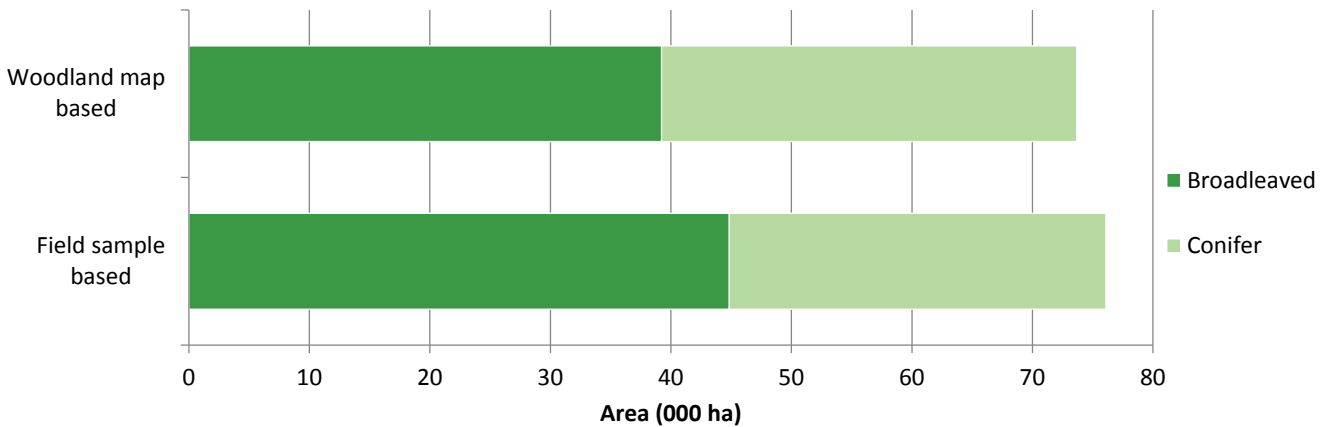
## Clearfelled area

**Table 12** Clearfelled area

Clearfelled area	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Cumbria and Lancashire	1.2	1.4	31	2.5

## Comparison of mapped area estimates and stocked area estimates

**Figure 13** Simplified comparison of mapped area and stocked area



**Table 13** Simplified comparison of mapped area and stocked area

	Woodland map based	Field sample based
	area (000 ha)	
Cumbria and Lancashire		
Broadleaved	39.2	44.8
Conifer	34.4	31.2

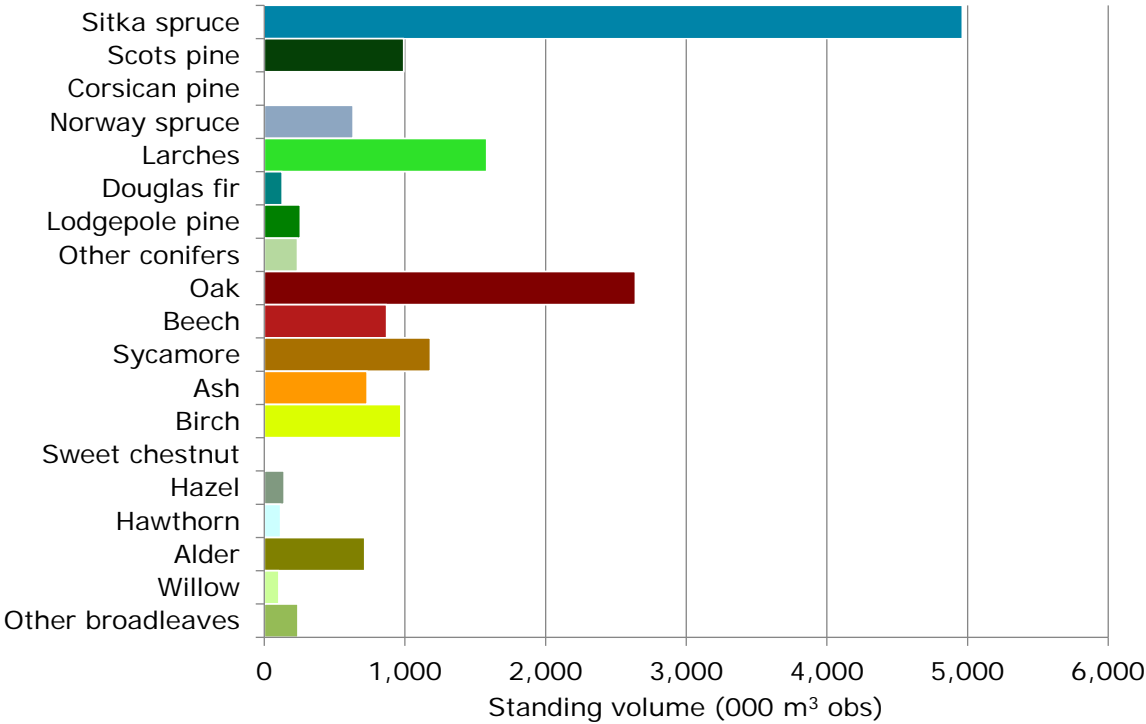
The broadleaved class includes broadleaved, mixed mainly broadleaved, coppice and coppice with standards. The conifer class includes conifer and mixed mainly conifer. The transition class is excluded from this table as it is not possible to differentiate between conifer and broadleaves with aerial photography interpretation. The area of young trees is included in the field sample based estimates.



## Standing volume

### Standing volume by species

**Figure 14** Standing volume by principal tree species



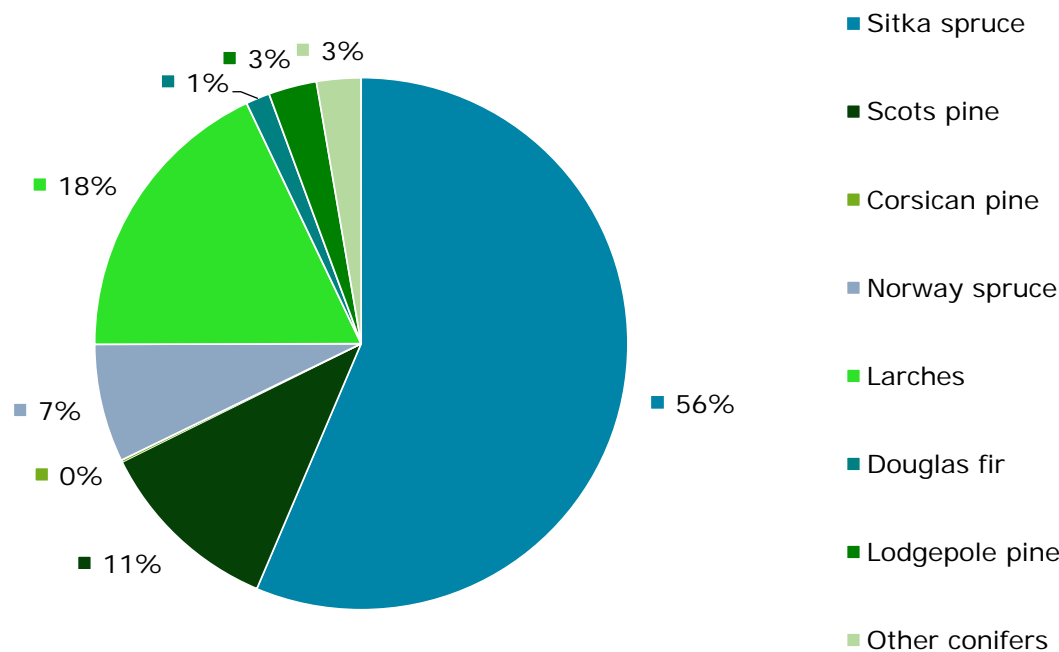
## Part 2 - what our woodlands are like today

**Table 14** Standing volume by principal tree species

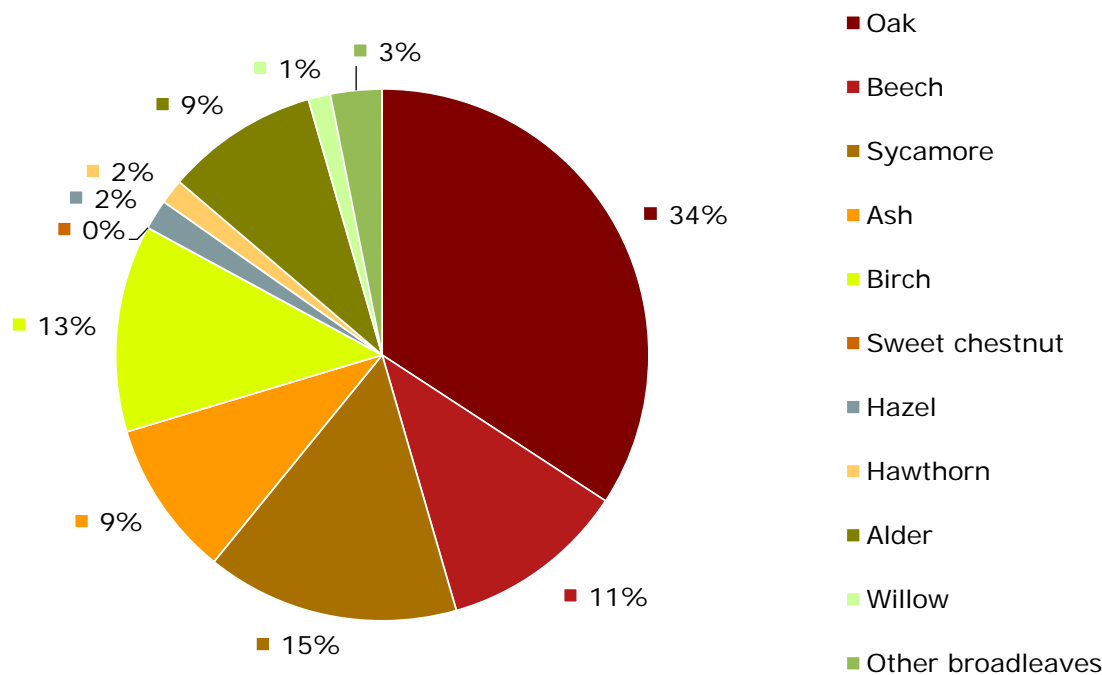
Principal species	FC	Private sector		Total
	volume (000 m <sup>3</sup> obs)	volume (000 m <sup>3</sup> obs)	SE%	volume (000 m <sup>3</sup> obs)
<b>Conifers</b>				
Sitka spruce	1,967	2,995	15	<b>4,962</b>
Scots pine	117	875	19	<b>992</b>
Corsican pine	9	2	71	<b>11</b>
Norway spruce	78	553	25	<b>632</b>
Larches	275	1,306	16	<b>1,581</b>
Douglas fir	91	36	58	<b>127</b>
Lodgepole pine	119	138	61	<b>257</b>
Other conifers	56	181	50	<b>237</b>
<b>All conifers</b>	<b>2,712</b>	<b>6,127</b>	<b>7</b>	<b>8,839</b>
<b>Broadleaves</b>				
Oak	111	2,527	13	<b>2,638</b>
Beech	35	834	33	<b>869</b>
Sycamore	12	1,169	20	<b>1,181</b>
Ash	28	704	17	<b>732</b>
Birch	54	917	11	<b>971</b>
Sweet chestnut	0	< 1	89	<b>&lt; 1</b>
Hazel	25	116	26	<b>141</b>
Hawthorn	0	116	26	<b>116</b>
Alder	6	708	17	<b>714</b>
Willow	0	104	27	<b>104</b>
Other broadleaves	77	163	16	<b>240</b>
<b>All broadleaves</b>	<b>348</b>	<b>7,378</b>	<b>6</b>	<b>7,726</b>
<b>All species</b>				
<b>All species</b>	<b>3,060</b>	<b>13,512</b>	<b>5</b>	<b>16,572</b>

# Part 2 - what our woodlands are like today

**Figure 15** Standing volume by principal conifer species



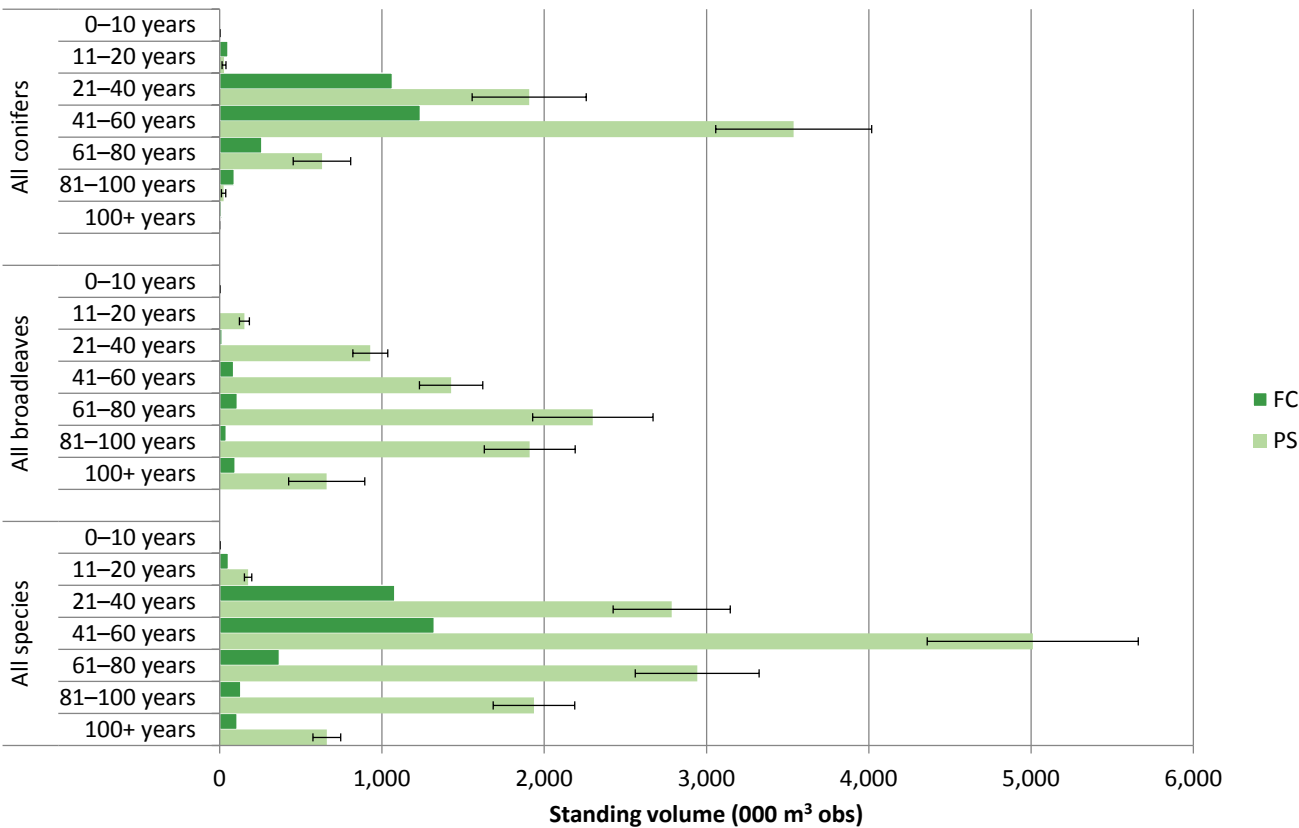
**Figure 16** Standing volume by principal broadleaved species



# Part 2 - what our woodlands are like today

## Standing volume by age class

**Figure 17** Standing volume by age class



## Part 2 - what our woodlands are like today

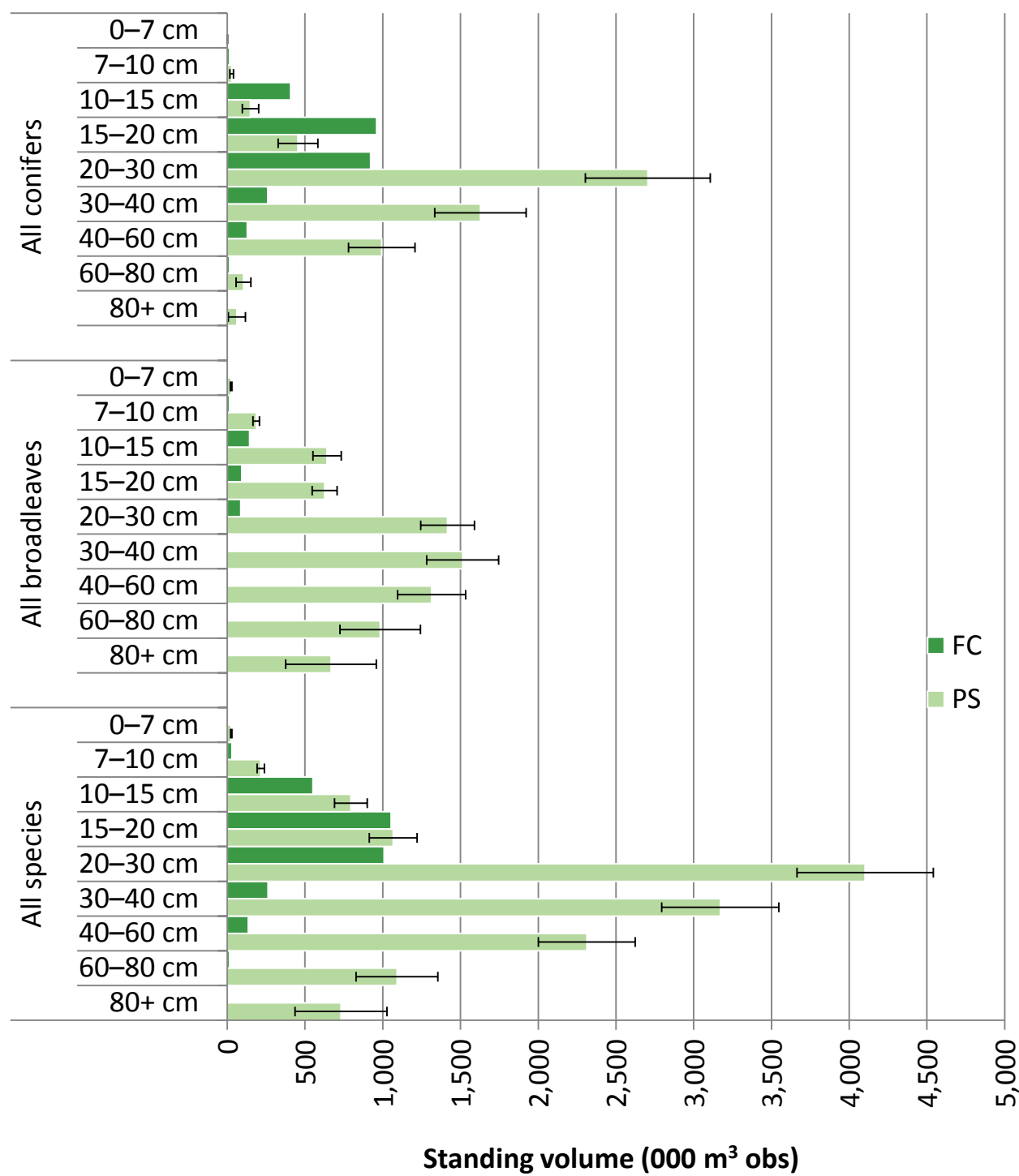
**Table 15** Standing volume by age class

Age class (years)	FC	Private sector		Total
	volume (000 m <sup>3</sup> obs)	volume (000 m <sup>3</sup> obs)	SE%	volume (000 m <sup>3</sup> obs)
All conifers				
0–10	< 1	< 1	82	1
11–20	51	27	43	79
21–40	1,063	1,908	18	2,971
41–60	1,236	3,537	14	4,773
61–80	259	630	28	890
81–100	90	24	57	114
100+	11	0	-	11
<b>Total</b>	<b>2,712</b>	<b>6,127</b>	<b>7</b>	<b>8,839</b>
All broadleaves				
0–10	< 1	1	45	1
11–20	2	153	20	155
21–40	16	928	12	944
41–60	86	1,426	14	1,512
61–80	108	2,299	16	2,408
81–100	40	1,911	15	1,951
100+	96	660	36	755
<b>Total</b>	<b>348</b>	<b>7,378</b>	<b>6</b>	<b>7,726</b>
All species				
0–10	< 1	2	41	3
11–20	54	176	13	229
21–40	1,079	2,785	13	3,864
41–60	1,322	5,010	13	6,332
61–80	368	2,942	13	3,310
81–100	130	1,937	13	2,067
100+	107	660	13	767
<b>Total</b>	<b>3,060</b>	<b>13,512</b>	<b>5</b>	<b>16,572</b>

# Part 2 - what our woodlands are like today

## Standing volume by mean stand dbh class

**Figure 18** Standing volume by stand mean dbh class



## Part 2 - what our woodlands are like today

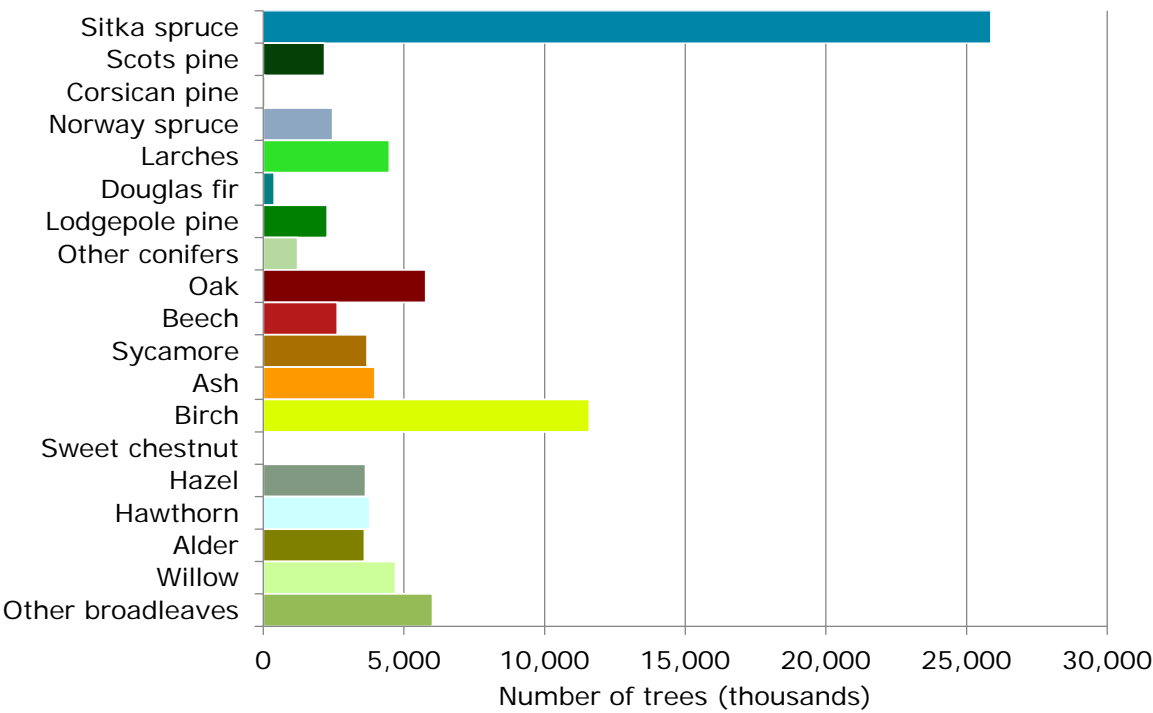
**Table 16** Standing volume by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	volume (000 m <sup>3</sup> obs)	volume (000 m <sup>3</sup> obs)	SE%	volume (000 m <sup>3</sup> obs)
<b>All conifers</b>				
0–7	< 1	< 1	54	< 1
7–10	16	28	42	44
10–15	407	149	36	557
15–20	960	455	28	1,415
20–30	922	2,705	15	3,627
30–40	261	1,629	18	1,889
40–60	129	993	22	1,122
60–80	16	105	45	120
80+	< 1	62	89	63
<b>Total</b>	<b>2,712</b>	<b>6,127</b>	<b>7</b>	<b>8,839</b>
<b>All broadleaves</b>				
0–7	< 1	25	19	25
7–10	15	187	11	201
10–15	144	642	14	786
15–20	94	627	13	720
20–30	87	1,417	12	1,504
30–40	2	1,514	15	1,516
40–60	6	1,314	17	1,321
60–80	< 1	984	26	984
80+	0	668	44	668
<b>Total</b>	<b>348</b>	<b>7,378</b>	<b>6</b>	<b>7,726</b>
<b>All species</b>				
0–7	< 1	26	19	26
7–10	30	215	11	246
10–15	551	795	13	1,346
15–20	1,054	1,067	14	2,121
20–30	1,010	4,102	11	5,112
30–40	263	3,171	12	3,434
40–60	135	2,313	13	2,448
60–80	16	1,092	24	1,107
80+	< 1	731	40	732
<b>Total</b>	<b>3,060</b>	<b>13,512</b>	<b>5</b>	<b>16,572</b>

# Number of measureable trees

## Number of measureable trees by species

**Figure 19** Number of measureable trees by principal tree species





## Part 2 - what our woodlands are like today

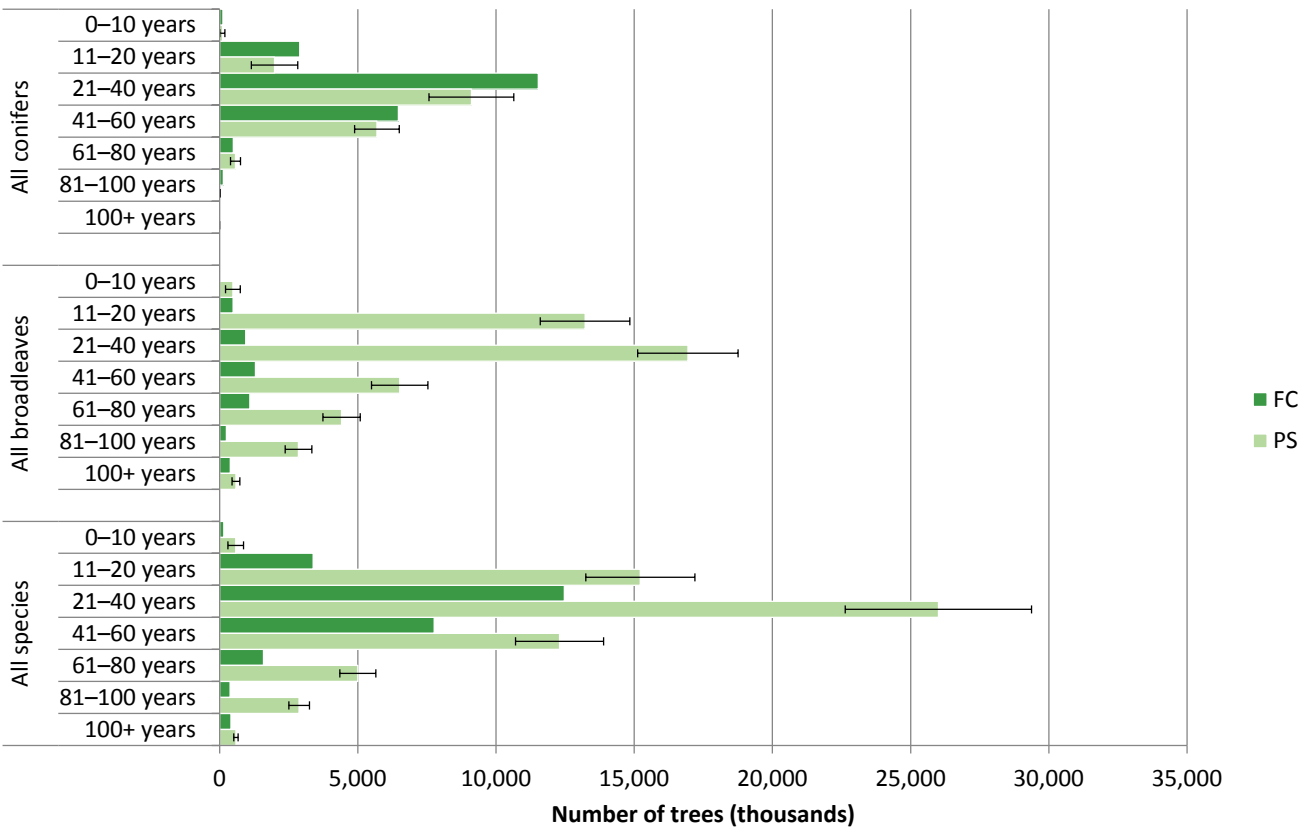
**Table 17** Number of measureable trees by principal tree species

Principal species	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
<b>Conifers</b>				
Sitka spruce	16,346	9,514	14	<b>25,860</b>
Scots pine	628	1,550	23	<b>2,178</b>
Corsican pine	25	41	97	<b>65</b>
Norway spruce	496	1,974	27	<b>2,470</b>
Larches	1,785	2,696	21	<b>4,481</b>
Douglas fir	335	49	69	<b>385</b>
Lodgepole pine	1,715	558	53	<b>2,273</b>
Other conifers	325	895	43	<b>1,219</b>
<b>All conifers</b>	<b>21,655</b>	<b>17,479</b>	<b>9</b>	<b>39,135</b>
<b>Broadleaves</b>				
Oak	690	5,088	12	<b>5,778</b>
Beech	470	2,159	20	<b>2,629</b>
Sycamore	122	3,568	15	<b>3,690</b>
Ash	331	3,637	16	<b>3,968</b>
Birch	897	10,691	13	<b>11,589</b>
Sweet chestnut	0	< 1	89	<b>&lt; 1</b>
Hazel	334	3,301	18	<b>3,634</b>
Hawthorn	0	3,780	20	<b>3,780</b>
Alder	65	3,534	18	<b>3,599</b>
Willow	1	4,701	24	<b>4,702</b>
Other broadleaves	1,569	4,449	13	<b>6,018</b>
<b>All broadleaves</b>	<b>4,479</b>	<b>45,012</b>	<b>6</b>	<b>49,491</b>
<b>All species</b>				
<b>All species</b>	<b>26,134</b>	<b>62,577</b>	<b>5</b>	<b>88,712</b>

# Part 2 - what our woodlands are like today

## Number of measureable trees by age class

**Figure 20** Number of measureable trees by age class



## Part 2 - what our woodlands are like today

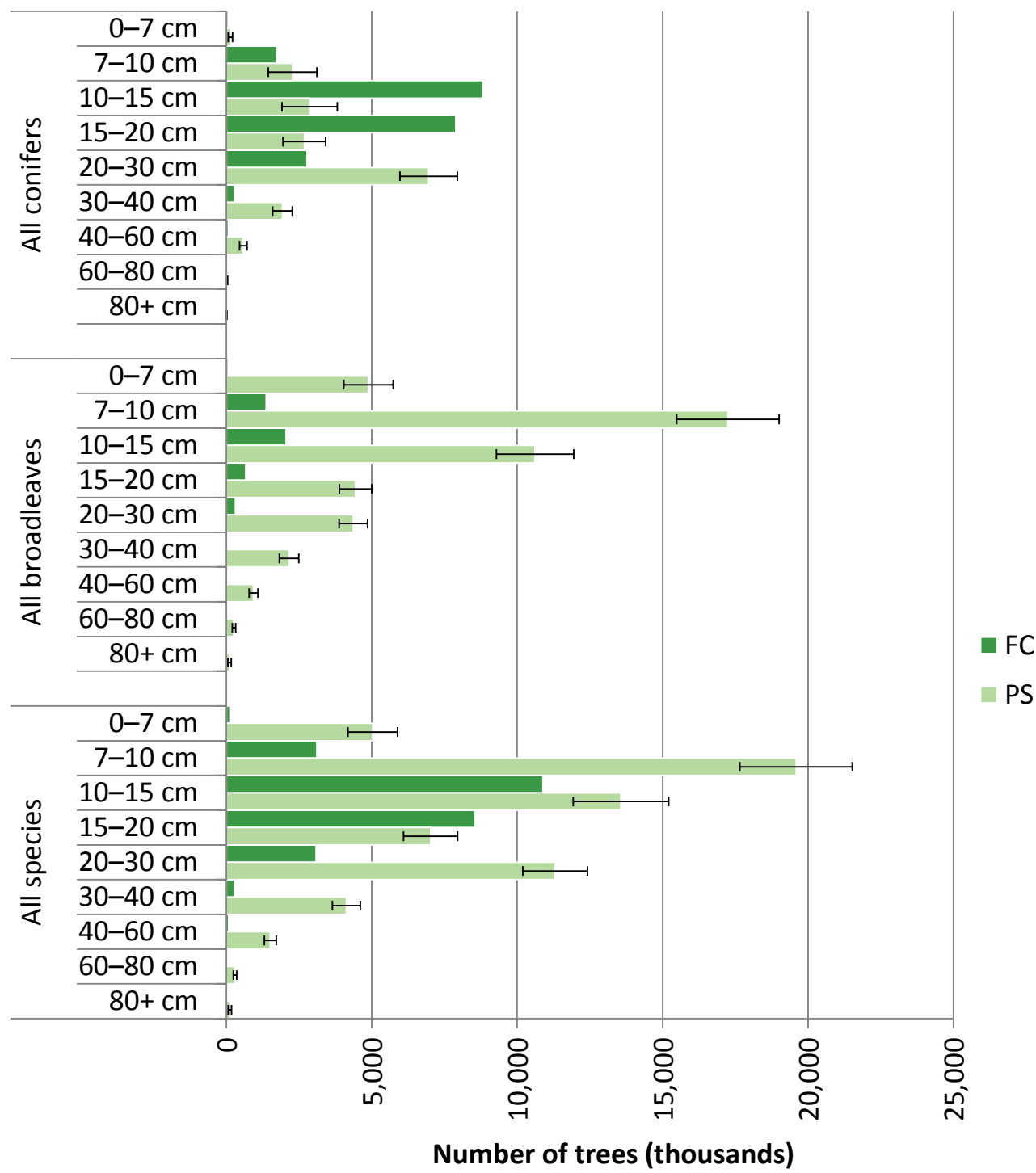
**Table 18** Number of measureable trees by age class

Age class (years)	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
<b>All conifers</b>				
0–10	121	100	90	222
11–20	2,898	1,988	42	4,885
21–40	11,527	9,109	17	20,637
41–60	6,465	5,692	14	12,157
61–80	495	573	31	1,068
81–100	132	17	49	148
100+	18	0	-	18
<b>Total</b>	<b>21,655</b>	<b>17,479</b>	<b>9</b>	<b>39,135</b>
<b>All broadleaves</b>				
0–10	27	480	56	507
11–20	485	13,223	12	13,708
21–40	946	16,942	11	17,889
41–60	1,295	6,515	16	7,811
61–80	1,091	4,410	15	5,502
81–100	244	2,852	17	3,096
100+	390	588	24	979
<b>Total</b>	<b>4,479</b>	<b>45,012</b>	<b>6</b>	<b>49,491</b>
<b>All species</b>				
0–10	149	584	48	733
11–20	3,383	15,221	13	18,604
21–40	12,474	26,004	13	38,478
41–60	7,760	12,300	13	20,060
61–80	1,586	5,001	13	6,587
81–100	375	2,877	13	3,253
100+	408	589	13	997
<b>Total</b>	<b>26,134</b>	<b>62,577</b>	<b>5</b>	<b>88,712</b>

# Part 2 - what our woodlands are like today

## Number of measureable trees by mean stand dbh class

**Figure 21** Number of measureable trees by mean stand dbh class



## Part 2 - what our woodlands are like today

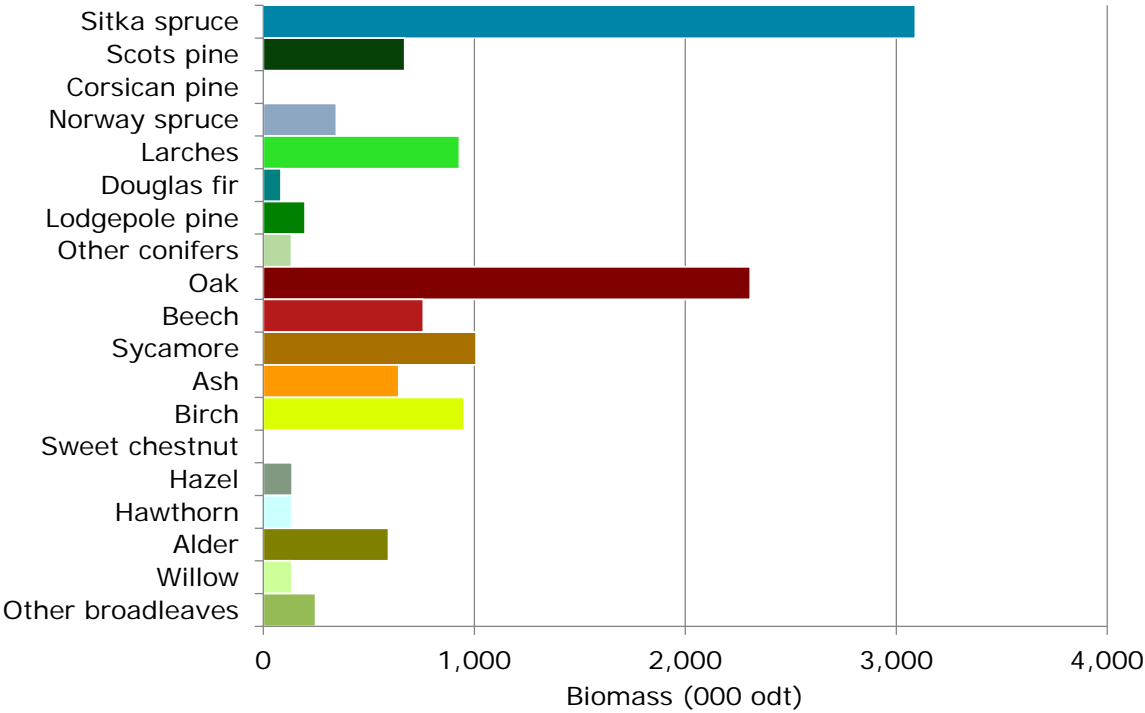
**Table 19** Number of measureable trees by mean stand dbh class

Mean stand DBH	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
<b>All conifers</b>				
0–7 cm	63	141	53	204
7–10 cm	1,737	2,276	37	4,012
10–15 cm	8,826	2,867	33	11,693
15–20 cm	7,889	2,684	27	10,573
20–30 cm	2,779	6,955	14	9,735
30–40 cm	284	1,932	18	2,216
40–60 cm	75	581	22	657
60–80 cm	4	32	39	36
80+ cm	< 1	10	89	11
<b>Total</b>	<b>21,655</b>	<b>17,479</b>	<b>9</b>	<b>39,135</b>
<b>All broadleaves</b>				
0–7 cm	65	4,887	17	4,952
7–10 cm	1,373	17,243	10	18,616
10–15 cm	2,057	10,611	13	12,668
15–20 cm	668	4,441	13	5,108
20–30 cm	308	4,366	11	4,675
30–40 cm	4	2,160	15	2,163
40–60 cm	5	932	16	937
60–80 cm	0	263	22	263
80+ cm	< 1	109	52	109
<b>Total</b>	<b>4,479</b>	<b>45,012</b>	<b>6</b>	<b>49,491</b>
<b>All species</b>				
0–7 cm	128	5,035	17	5,162
7–10 cm	3,109	19,590	10	22,699
10–15 cm	10,882	13,567	12	24,449
15–20 cm	8,557	7,024	13	15,581
20–30 cm	3,087	11,308	10	14,395
30–40 cm	287	4,124	12	4,411
40–60 cm	80	1,514	13	1,594
60–80 cm	4	296	20	299
80+ cm	< 1	120	48	120
<b>Total</b>	<b>26,134</b>	<b>62,577</b>	<b>5</b>	<b>88,712</b>

# Biomass stocks in live woodland trees

## Biomass stocks by species

**Figure 22** Biomass stocks by principal tree species



## Part 2 - what our woodlands are like today

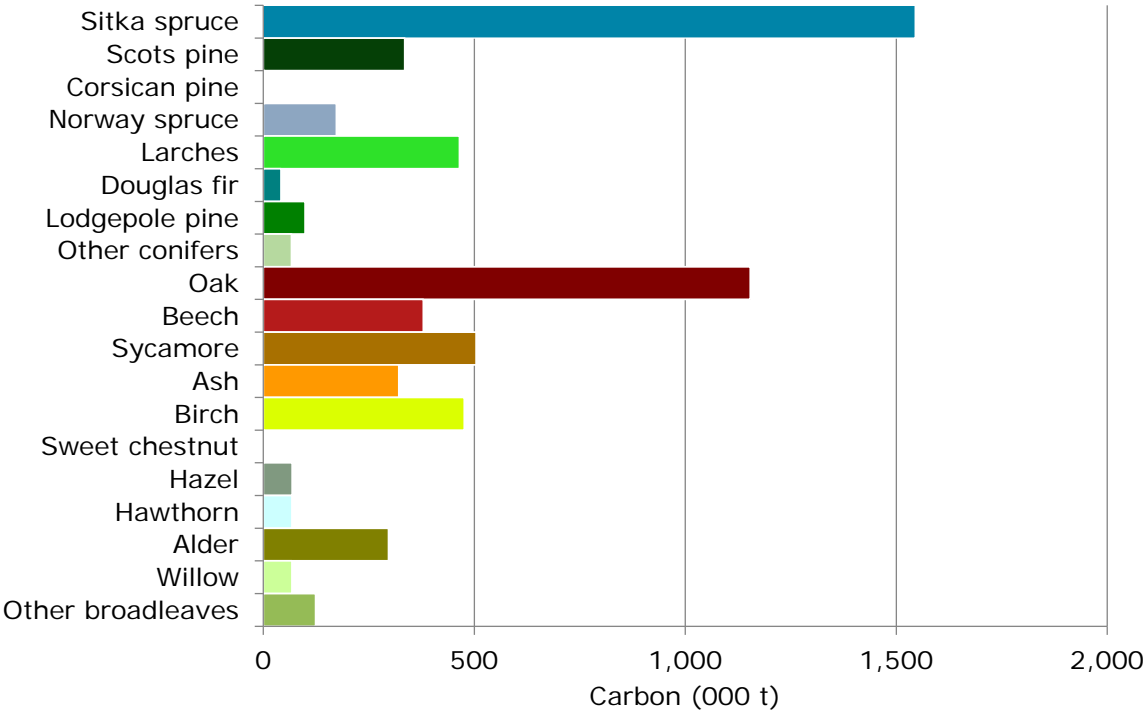
**Table 20** Biomass stocks by principal tree species

Principal species	FC	Private sector		Total
	biomass (000 odt)	biomass (000 odt)	SE%	biomass (000 odt)
<b>Conifers</b>				
Sitka spruce	1,341	1,748	14	<b>3,090</b>
Scots pine	85	586	19	<b>671</b>
Corsican pine	5	1	74	<b>7</b>
Norway spruce	45	302	25	<b>347</b>
Larches	180	750	16	<b>930</b>
Douglas fir	60	23	58	<b>83</b>
Lodgepole pine	93	105	60	<b>198</b>
Other conifers	32	101	47	<b>133</b>
<b>All conifers</b>	<b>1,842</b>	<b>3,642</b>	<b>7</b>	<b>5,484</b>
<b>Broadleaves</b>				
Oak	101	2,208	12	<b>2,309</b>
Beech	34	724	32	<b>758</b>
Sycamore	11	997	19	<b>1,008</b>
Ash	26	616	17	<b>643</b>
Birch	53	900	11	<b>953</b>
Sweet chestnut	0	< 1	89	<b>&lt; 1</b>
Hazel	23	114	23	<b>137</b>
Hawthorn	0	136	22	<b>136</b>
Alder	5	589	17	<b>593</b>
Willow	< 1	136	25	<b>136</b>
Other broadleaves	74	174	15	<b>248</b>
<b>All broadleaves</b>	<b>327</b>	<b>6,613</b>	<b>6</b>	<b>6,939</b>
<b>All species</b>				
<b>All species</b>	<b>2,168</b>	<b>10,263</b>	<b>4</b>	<b>12,431</b>

# Carbon stocks in live woodland trees

## Carbon stocks by species

**Figure 23** Carbon stocks by principal tree species





## Part 2 - what our woodlands are like today

**Table 21** Carbon stocks by principal tree species

Principal species	FC	Private sector		Total
	carbon (000 t)	carbon (000 t)	SE%	carbon (000 t)
<b>Conifers</b>				
Sitka spruce	671	874	14	<b>1,545</b>
Scots pine	42	293	19	<b>335</b>
Corsican pine	3	< 1	74	<b>3</b>
Norway spruce	22	151	25	<b>173</b>
Larches	90	375	16	<b>465</b>
Douglas fir	30	12	58	<b>42</b>
Lodgepole pine	47	53	60	<b>99</b>
Other conifers	16	51	47	<b>67</b>
<b>All conifers</b>	<b>921</b>	<b>1,821</b>	<b>7</b>	<b>2,742</b>
<b>Broadleaves</b>				
Oak	50	1,104	12	<b>1,154</b>
Beech	17	362	32	<b>379</b>
Sycamore	6	499	19	<b>504</b>
Ash	13	308	17	<b>321</b>
Birch	27	450	11	<b>476</b>
Sweet chestnut	0	< 1	89	<b>&lt; 1</b>
Hazel	11	57	23	<b>68</b>
Hawthorn	0	68	22	<b>68</b>
Alder	2	294	17	<b>297</b>
Willow	0	68	25	<b>68</b>
Other broadleaves	37	87	15	<b>124</b>
<b>All broadleaves</b>	<b>163</b>	<b>3,306</b>	<b>6</b>	<b>3,470</b>
<b>All species</b>				
<b>All species</b>	<b>1,084</b>	<b>5,131</b>	<b>4</b>	<b>6,216</b>

# Part 2 - what our woodlands are like today

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## Existing woodland management information and economic viability data (PS only)

### Sample square distribution

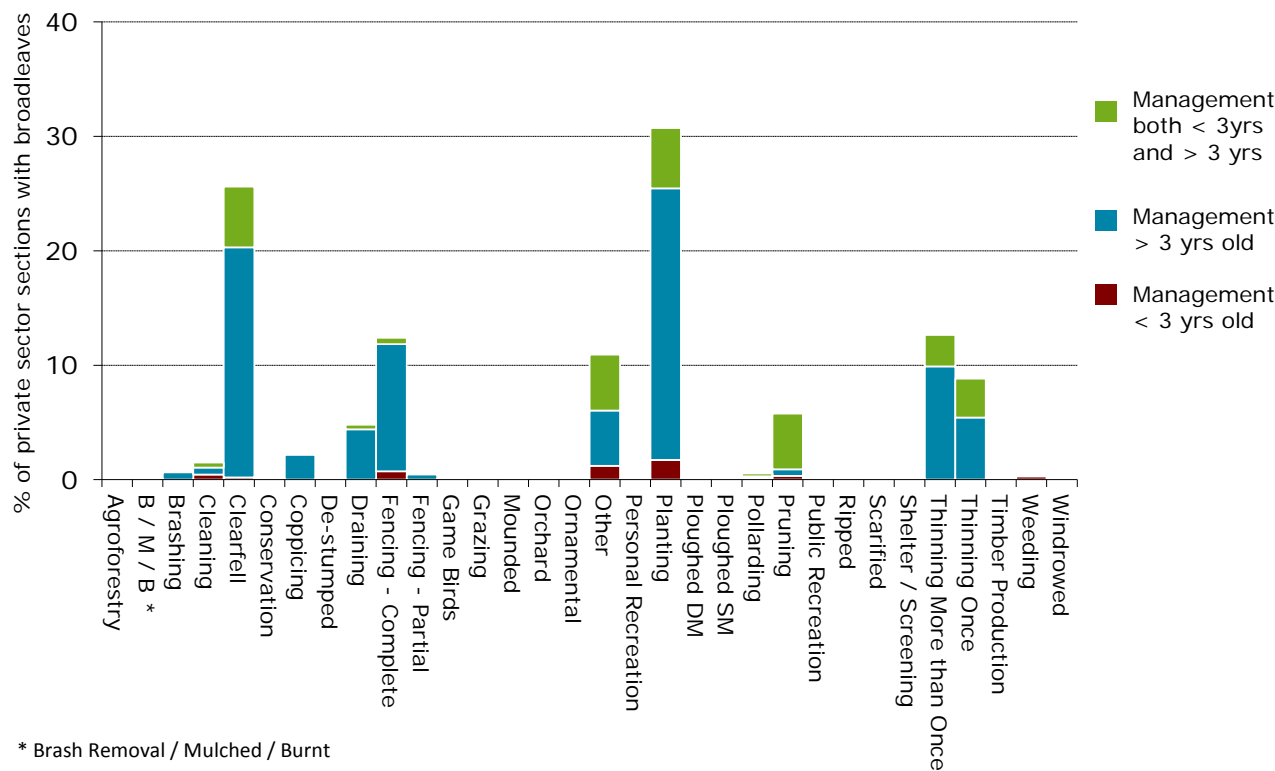
**Table 22** Sample square distribution

Number of squares surveyed	Number of squares surveyed	Number of Private sector squares surveyed	Number of Private sector squares containing coniferous species	Number of Private sector squares containing broadleaved species
Cumbria and Lancashire	284	277	191	243

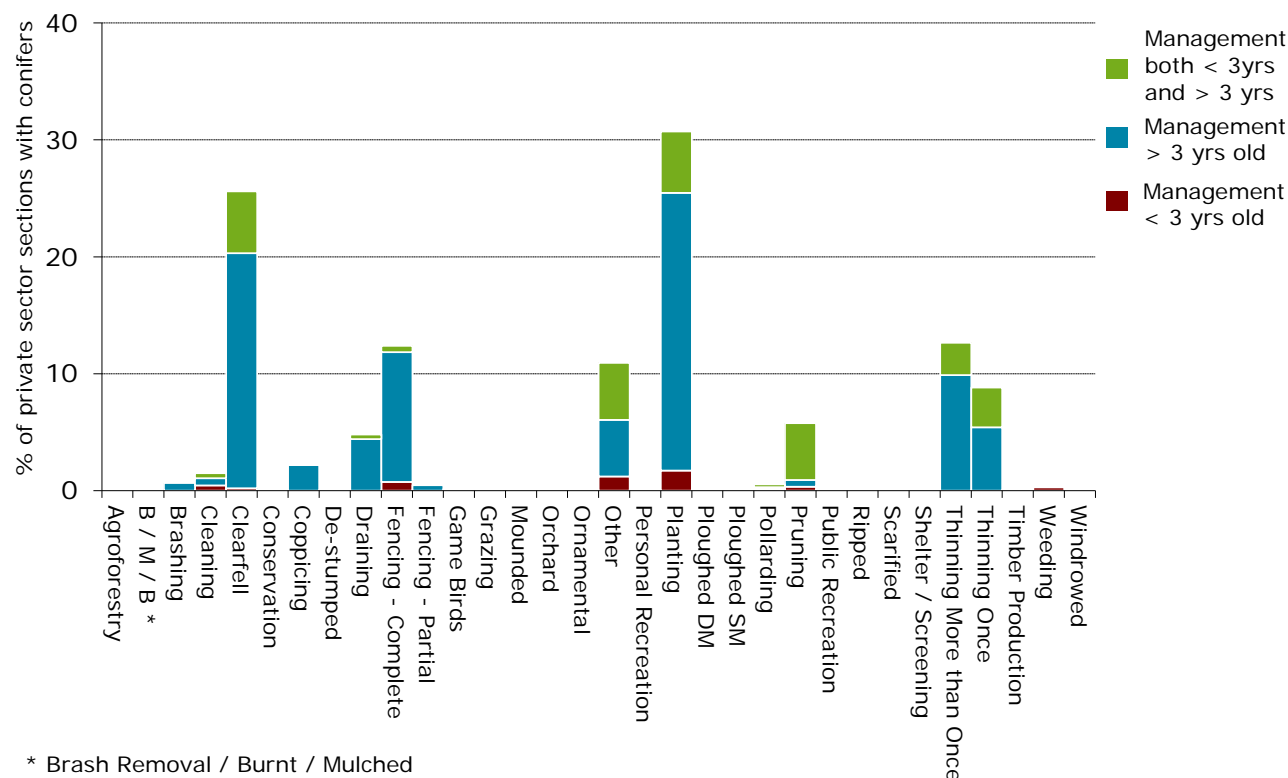
# Part 2 - what our woodlands are like today

## Evidence of management

**Figure 24** Evidence of management in PS broadleaf sections

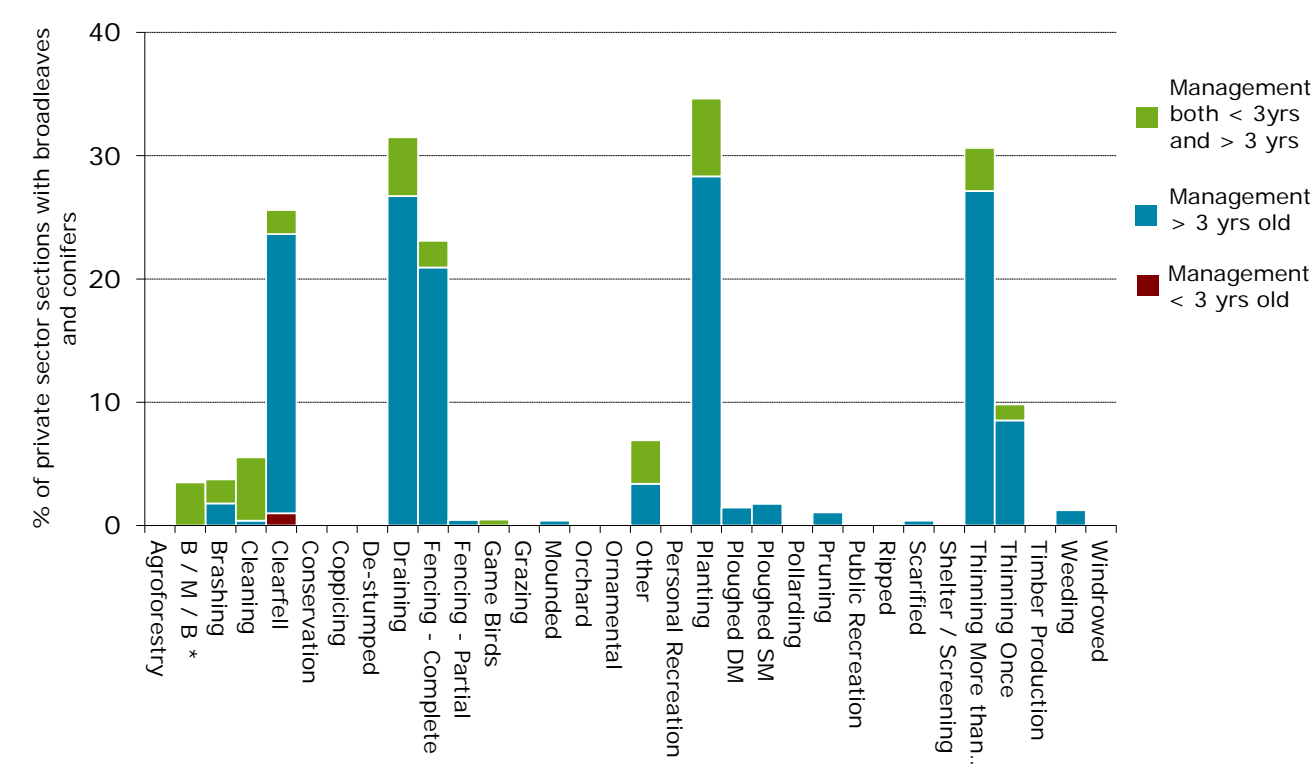


**Figure 25** Evidence of management in PS conifer sections



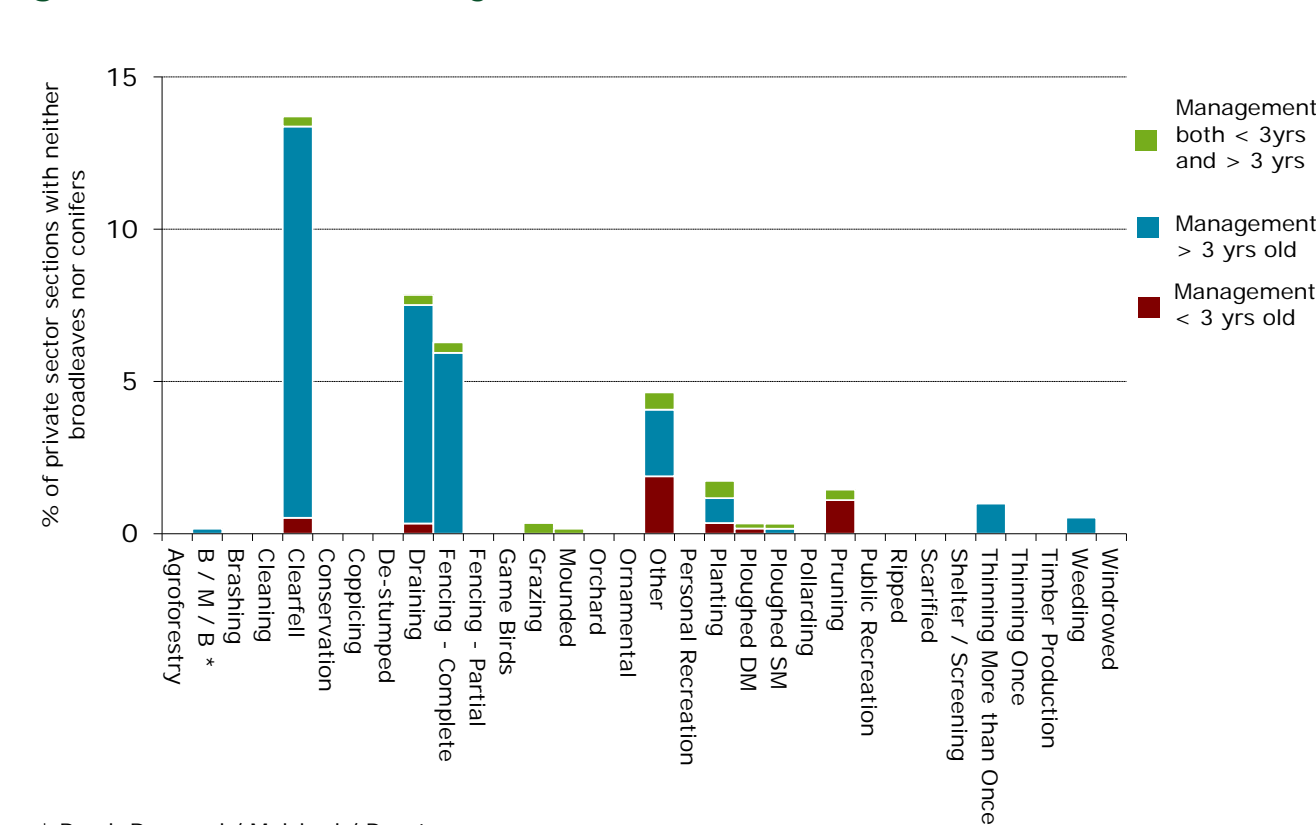
# Part 2 - what our woodlands are like today

**Figure 26** Evidence of management in PS mixed broadleaf/conifer sections



\* Brash Removal / Mulched / Burnt

**Figure 27** Evidence of management in PS sections with no broadleaf or conifer

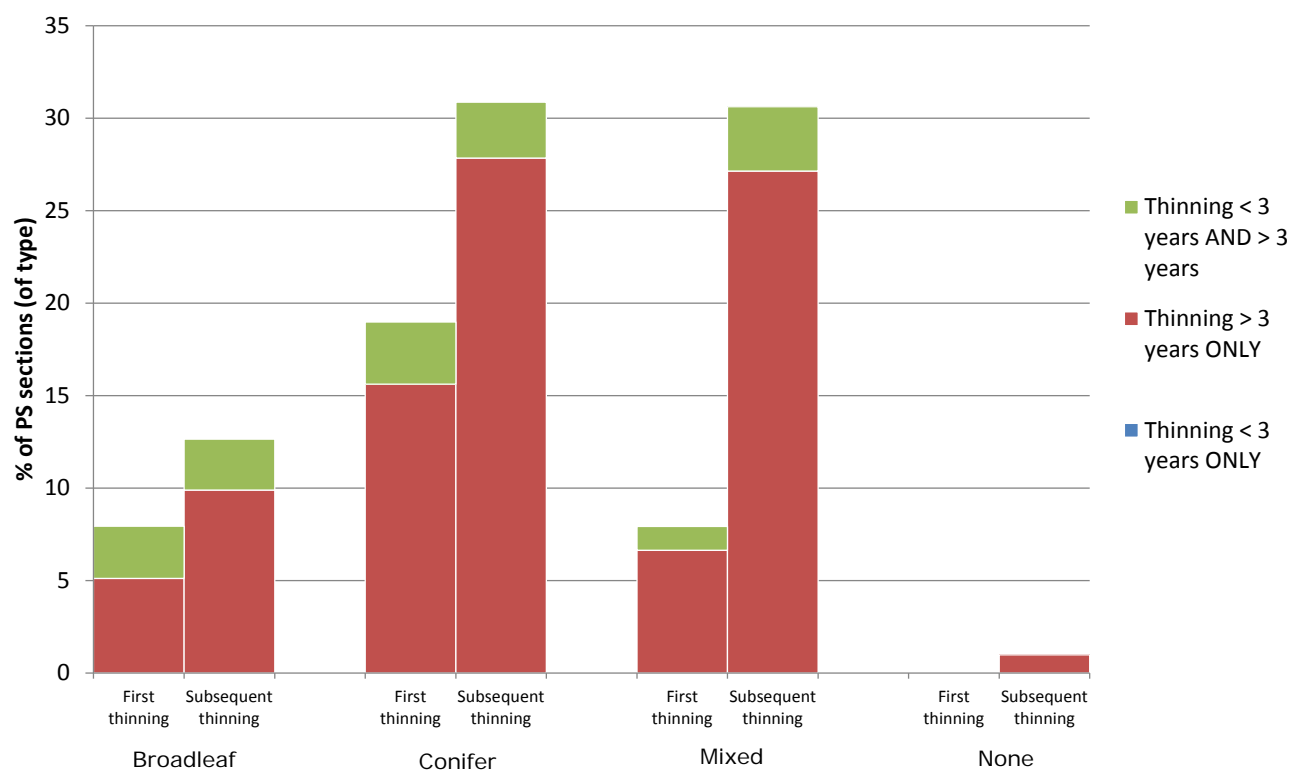


\* Brash Removal / Mulched / Burnt

# Part 2 - what our woodlands are like today

## Evidence of thinning

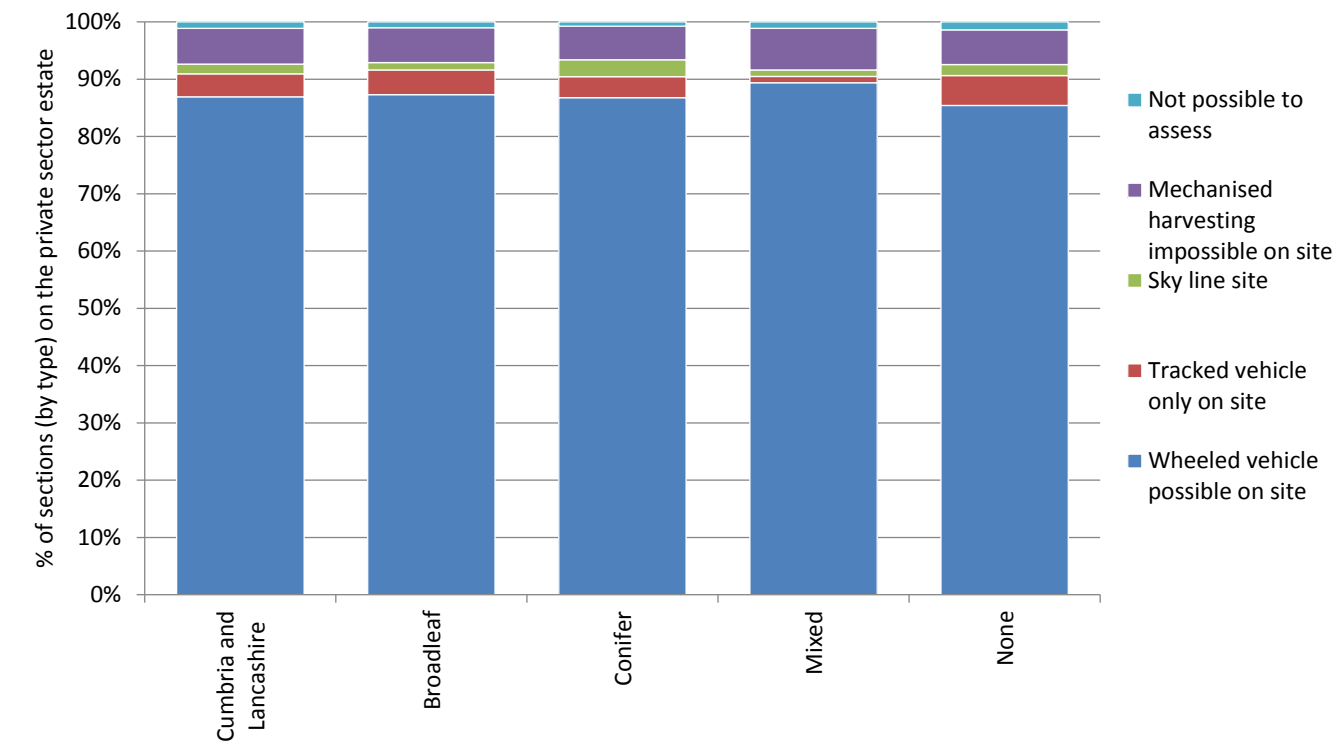
**Figure 28** Evidence of thinning



# Part 2 - what our woodlands are like today

## Suitability for harvesting

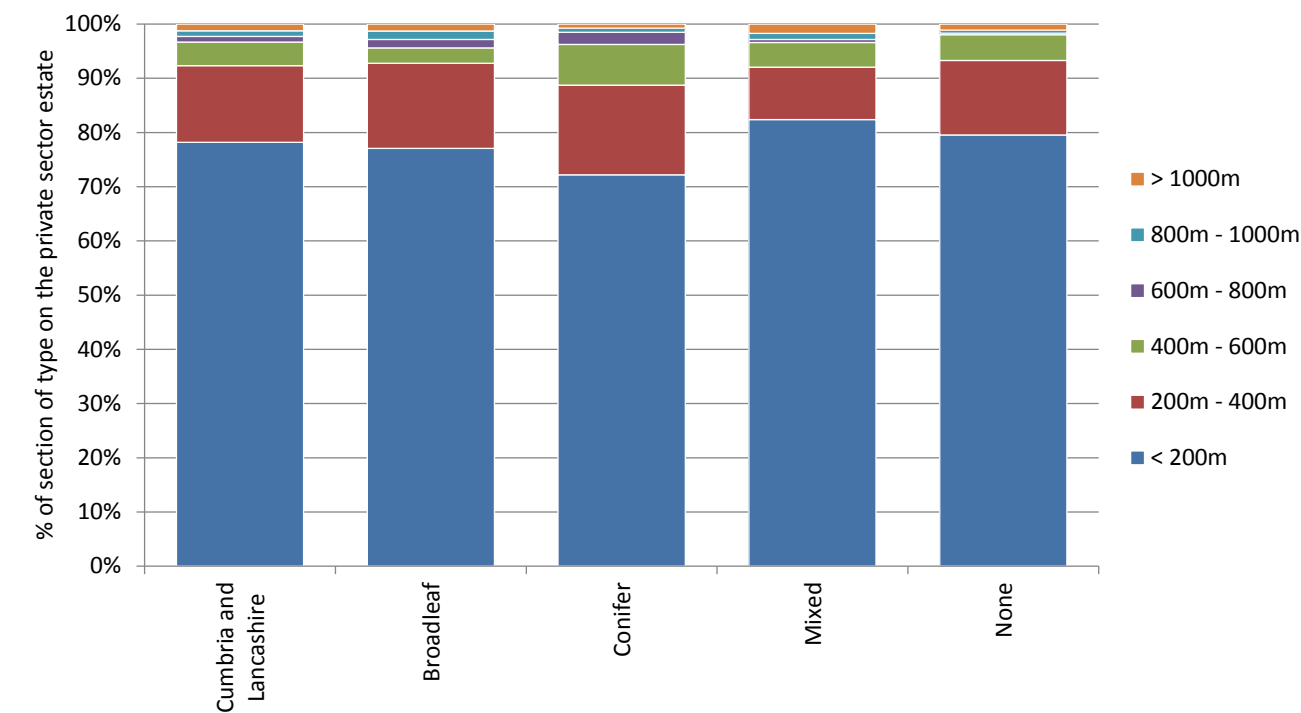
Figure 29 Suitability for harvesting



# Part 2 - what our woodlands are like today

## Distance to road

**Figure 30** Distance to road



# Part 2 - what our woodlands are like today

## Type of road or ride

Figure 31 Road or ride in survey square

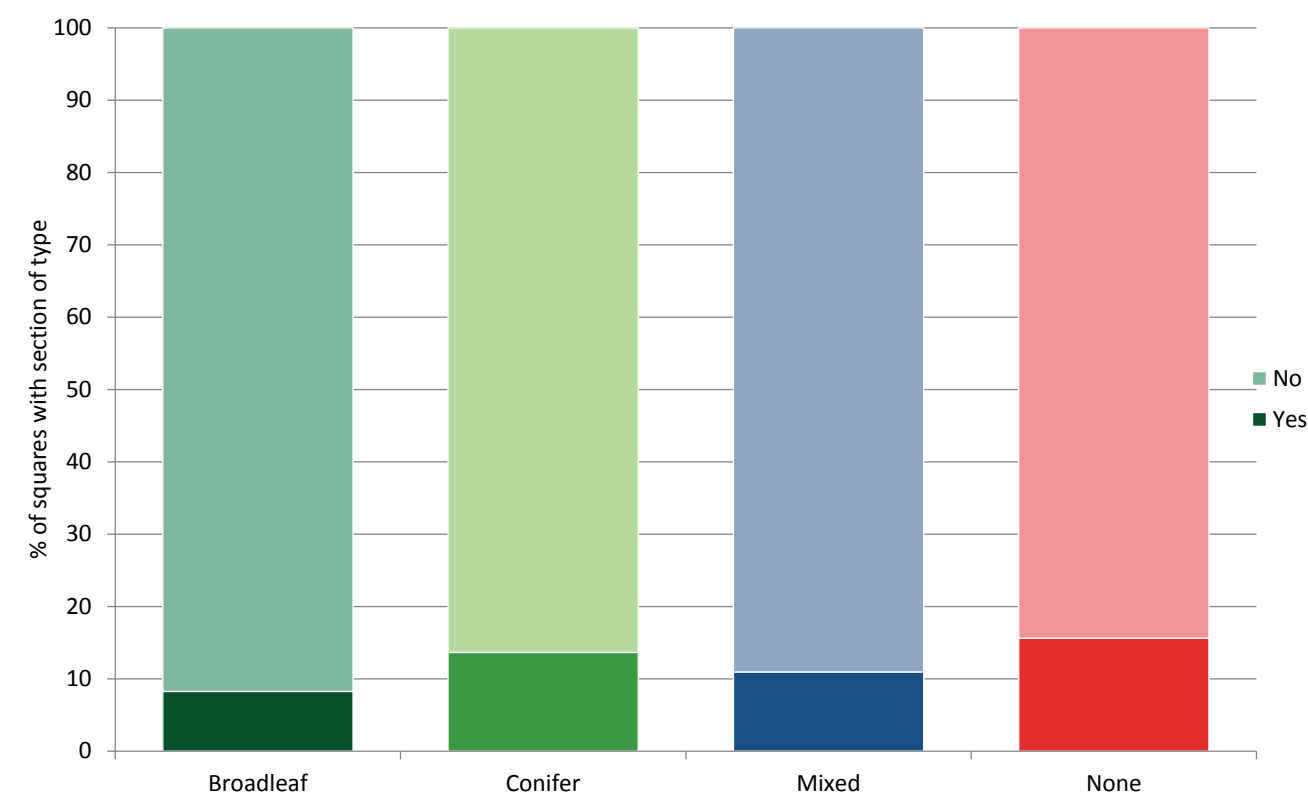
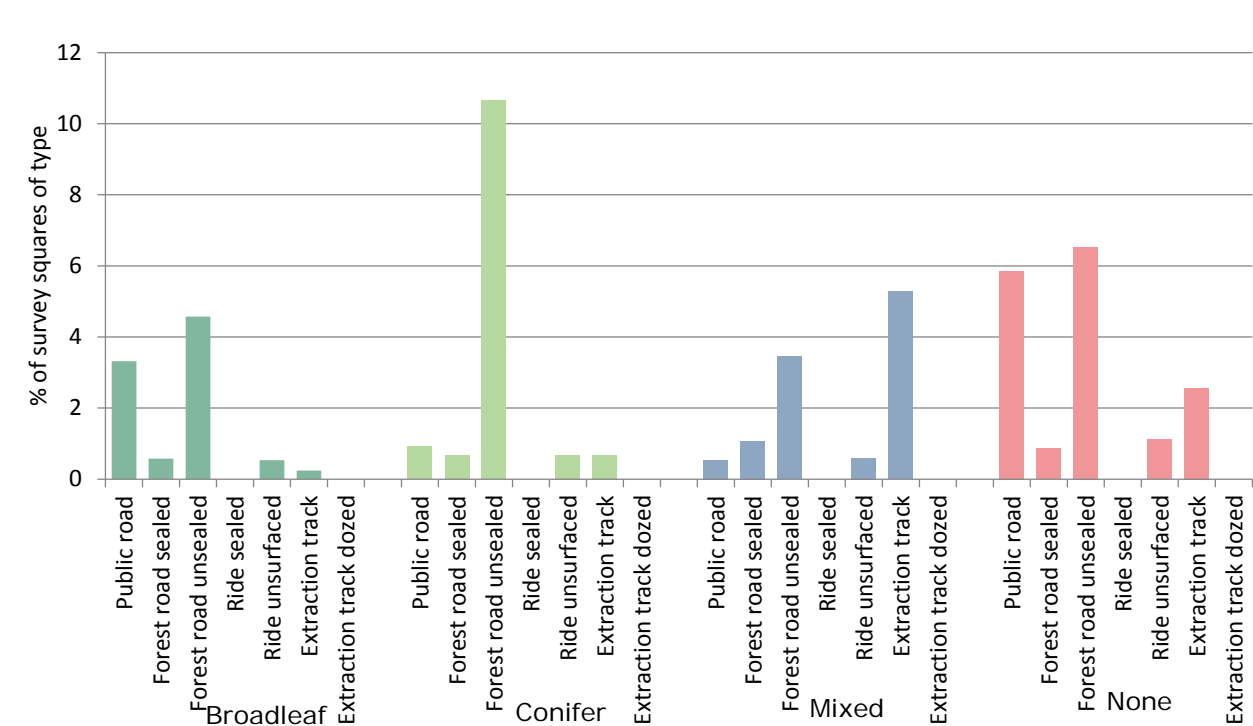


Figure 32 Type of road or ride in survey square

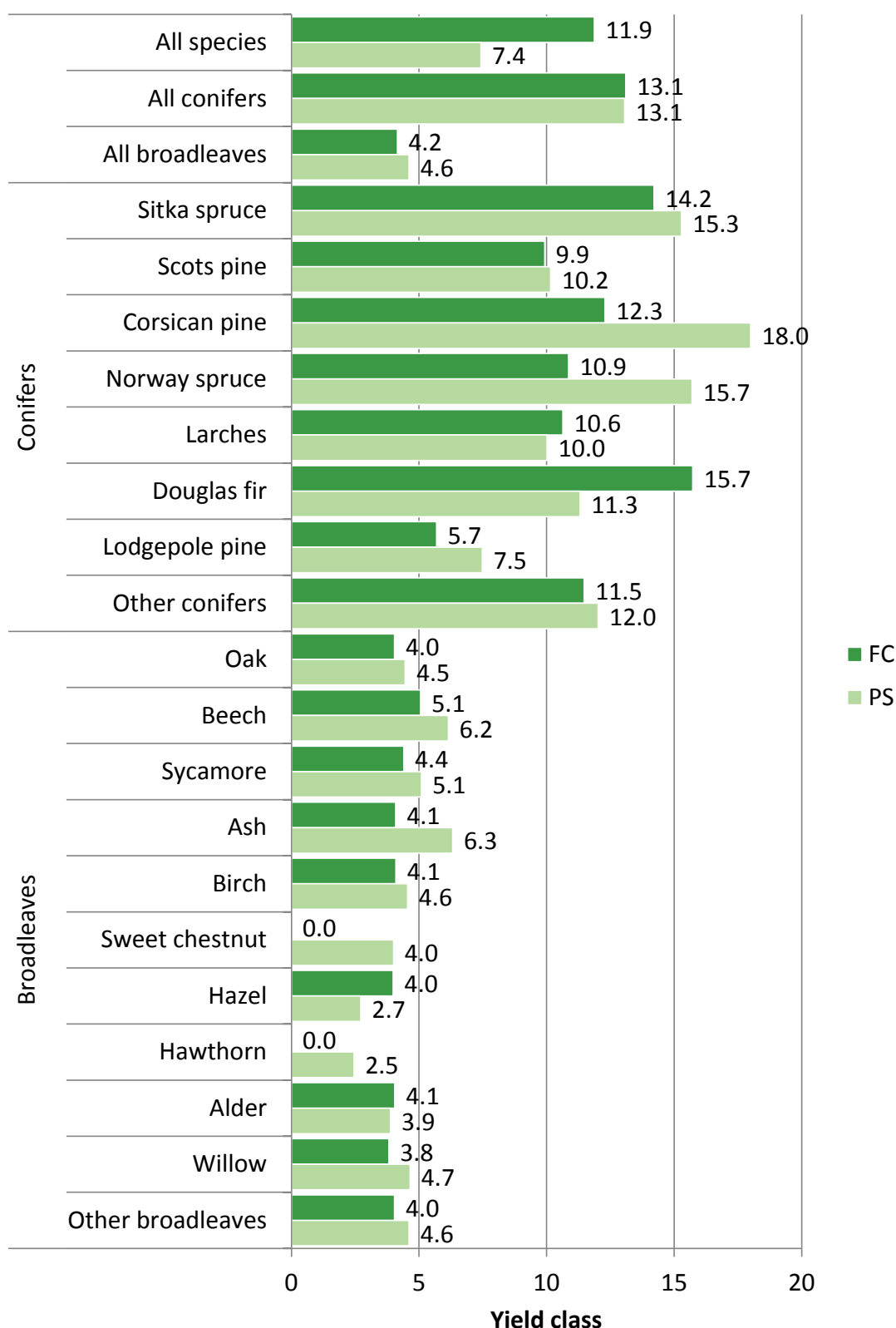




## Part 2 - what our woodlands are like today

### Mean yield class

**Figure 33** Mean yield class by principal tree species (FC and PS)



## Part 2 - what our woodlands are like today

**Table 23** Mean yield class by principal tree species (FC and PS)

Principal species	FC	Private sector
	mean yield class weighted by area	
Conifers		
Sitka spruce	14.2	15.3
Scots pine	9.9	10.2
Corsican pine	12.3	18.0
Norway spruce	10.9	15.7
Larches	10.6	10.0
Douglas fir	15.7	11.3
Lodgepole pine	5.7	7.5
Other conifers	11.5	12.0
All conifers	13.1	13.1
Broadleaves		
Oak	4.0	4.5
Beech	5.1	6.2
Sycamore	4.4	5.1
Ash	4.1	6.3
Birch	4.1	4.6
Sweet chestnut	0.0	4.0
Hazel	4.0	2.7
Hawthorn	0.0	2.5
Alder	4.1	3.9
Willow	3.8	4.7
Other broadleaves	4.0	4.6
All broadleaves	4.2	4.6
All species		
All species	11.9	7.4

### Overdue timber stocks

#### Overdue volume and area

**Table 24** Standing volume in overdue timber stocks

	FC	Private sector	
	volume (000 m <sup>3</sup> obs)	volume (000 m <sup>3</sup> obs)	SE %
Cumbria and Lancashire			
All conifers	140	1,944	17
All broadleaves	1	3,941	10
<b>All species</b>	<b>141</b>	<b>5,868</b>	<b>9</b>

**Table 25** Stocked area of overdue timber stocks

	FC	Private sector	
	area (000 ha)	area (000 ha)	SE %
Cumbria and Lancashire			
All conifers	0.4	4.0	15
All broadleaves	< 0.1	13.5	7
<b>All species</b>	<b>0.4</b>	<b>17.5</b>	<b>7</b>

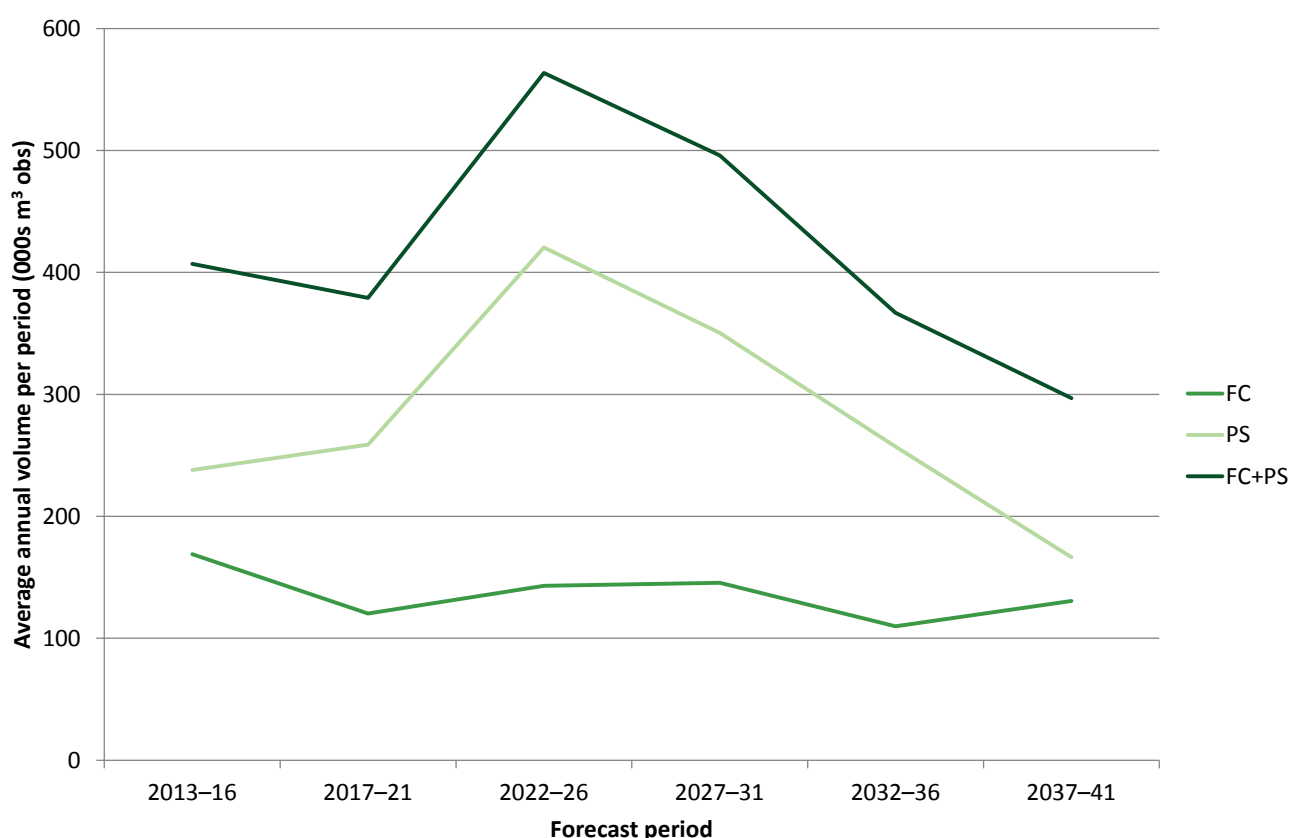
## Part 3 – How our woodlands might change over time

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Combined standing volume, net increment and availability .....	95

### 25-year softwood forecast

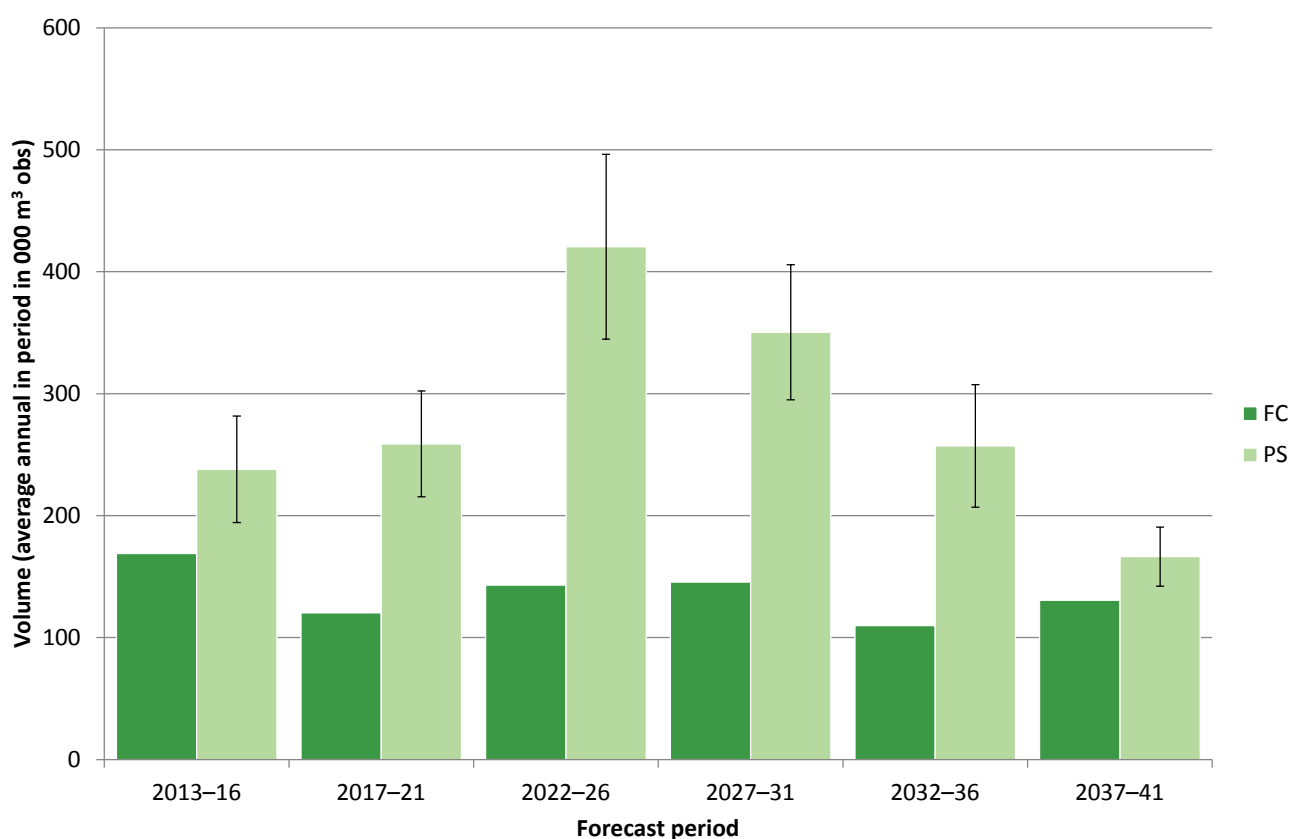
#### 25-year forecast of softwood timber availability

**Figure 34** Summary of 25-year forecast of softwood timber availability; average annual volume within period



## Part 3 - how our woodlands might change

**Figure 35** 25-year forecast of softwood timber availability; average annual volume within period



**Table 26** 25-year forecast of softwood availability; average annual volume within period

Forecast period	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
2013-16	169	238	18	407
2017-21	120	259	17	379
2022-26	143	420	18	564
2027-31	145	350	16	496
2032-36	110	257	20	367
2037-41	131	166	15	297

## Part 3 - how our woodlands might change

### 25-year forecast of softwood timber availability by principal species

**Table 27** 25-year forecast of softwood timber availability by principal species; average annual volume within period

Principal species	2013–16			2017–21		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All conifers	169	238	18	120	259	17
Sitka spruce	135	120	35	99	124	31
Scots pine	6	18	20	5	27	38
Corsican pine	0	0	89	1	0	102
Norway spruce	6	18	28	2	22	28
Larches	8	70	20	7	60	19
Douglas fir	1	1	63	1	4	71
Lodgepole pine	11	1	91	4	1	89
Other conifers	1	6	37	1	17	82

**Table 27 (cont'd)** 25-year forecast of softwood timber availability by principal species; average annual volume within period

Principal species	2022–26			2027–31		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All conifers	143	420	18	145	350	16
Sitka spruce	118	291	25	130	182	26
Scots pine	5	26	24	3	54	35
Corsican pine	0	0	102	1	0	102
Norway spruce	3	31	53	2	45	39
Larches	10	40	16	6	45	24
Douglas fir	1	1	62	1	1	52
Lodgepole pine	5	18	79	1	14	93
Other conifers	1	10	57	1	10	46

## Part 3 - how our woodlands might change

**Table 27 (cont'd)** 25-year forecast of softwood timber availability by principal species; average annual volume within period

Principal species	2032–36			2037–41		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All conifers	110	257	20	131	166	15
Sitka spruce	94	159	31	108	65	29
Scots pine	2	31	34	4	40	34
Corsican pine	0	0	102	0	0	33
Norway spruce	1	16	27	5	19	26
Larches	8	40	18	9	27	25
Douglas fir	3	3	51	3	3	23
Lodgepole pine	1	2	56	0	2	51
Other conifers	1	3	50	2	9	59

## 25-year forecast of softwood timber availability % spruce

**Table 28** 25-year forecast of softwood timber availability % spruce

Cumbria and Lancashire		Top diameter class (cm)								Total
		7–14	14–16	16–18	18–24	24–34	34–44	44–54	54+	
2013–16	FC (%)	80	85	86	87	85	77	68	50	<b>84</b>
	PS (%)	65	65	64	60	58	52	45	19	<b>58</b>
2017–21	FC (%)	83	86	87	86	82	79	77	44	<b>84</b>
	PS (%)	59	58	58	56	58	55	52	36	<b>56</b>
2022–26	FC (%)	82	86	88	89	85	72	59	44	<b>85</b>
	PS (%)	81	83	84	83	79	67	48	40	<b>77</b>
2027–31	FC (%)	91	93	93	93	91	83	68	50	<b>91</b>
	PS (%)	75	77	79	74	64	50	43	50	<b>65</b>
2032–36	FC (%)	83	90	91	91	87	78	68	40	<b>87</b>
	PS (%)	73	81	79	76	70	61	53	32	<b>68</b>
2037–41	FC (%)	82	89	90	90	87	82	75	44	<b>86</b>
	PS (%)	52	59	62	61	55	45	34	22	<b>50</b>



## Part 3 - how our woodlands might change

### 25-year forecast of softwood timber availability by top diameter class

**Table 29** 25-year forecast of softwood timber availability by top diameter class; average annual volume within period

Top diameter class (cm)	2013–16			2017–21		
	FC	Private sector		FC	Private sector	
	volume (000 m³ obs)		SE%	volume (000 m³ obs)		SE%
Cumbria and Lancashire						
7–14	48	29	13	29	25	14
14–16	19	13	12	13	12	15
16–18	19	16	15	13	15	15
18–24	48	61	19	33	62	19
24–34	28	77	27	24	89	22
34–44	6	26	26	7	34	22
44–54	2	10	34	2	13	30
54+	1	7	29	1	8	21
Total	169	238	18	120	259	17

**Table 29 (cont'd)** 25-year forecast of softwood timber availability by top diameter class; average annual volume within period

Top diameter class (cm)	2022–26			2027–31		
	FC	Private sector		FC	Private sector	
	volume (000 m³ obs)		SE%	volume (000 m³ obs)		SE%
Cumbria and Lancashire						
7–14	32	33	19	29	33	22
14–16	15	17	20	14	14	23
16–18	16	23	20	16	18	25
18–24	43	106	19	45	82	21
24–34	27	160	21	31	116	17
34–44	6	56	22	7	44	18
44–54	2	17	23	2	20	24
54+	1	10	25	1	24	32
Total	143	420	18	145	350	16

## Part 3 - how our woodlands might change

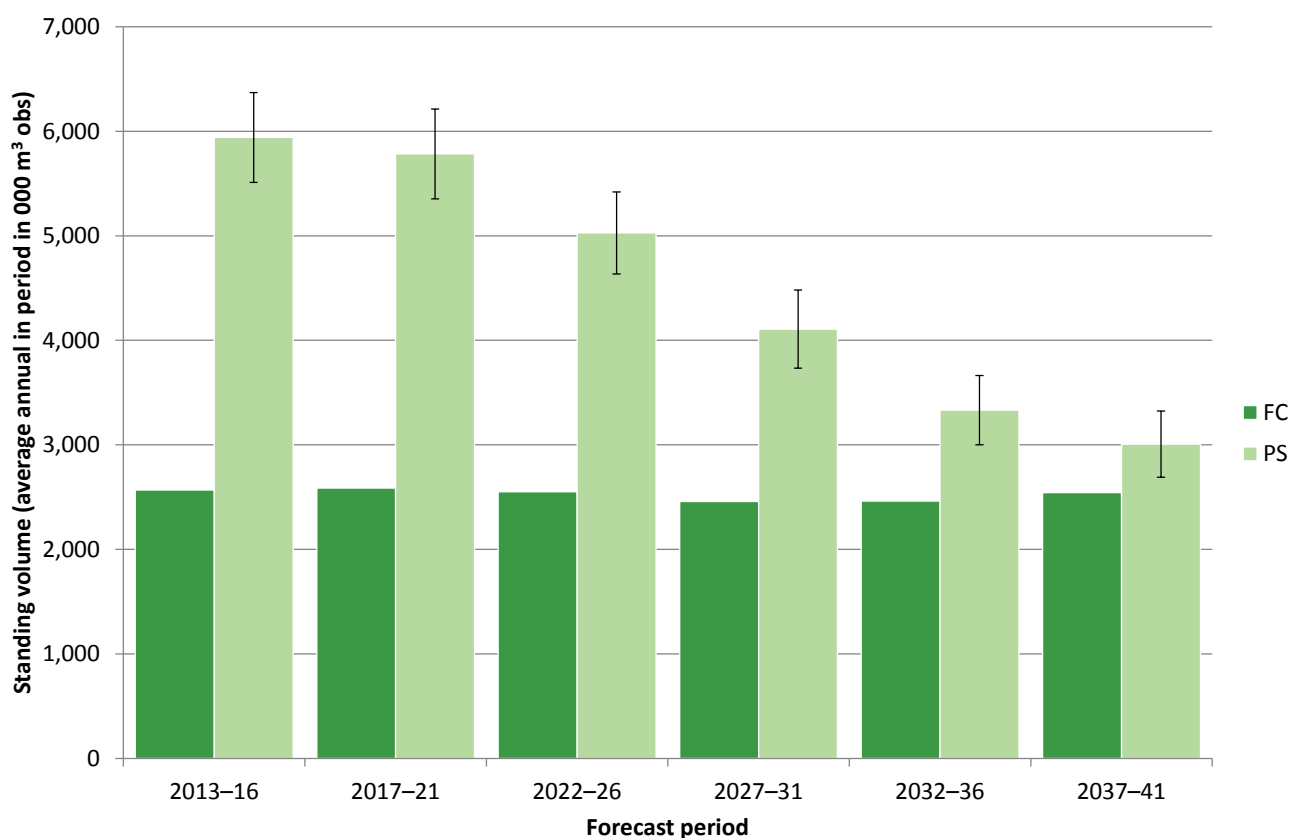
**Table 29 (cont'd)** 25-year forecast of softwood timber availability by top diameter class; average annual volume within period

Top diameter class (cm)	2032–36			2037–41		
	FC	Private sector		FC	Private sector	
	volume (000 m³ obs)		SE%	volume (000 m³ obs)		SE%
Cumbria and Lancashire						
7–14	22	26	22	33	22	14
14–16	10	12	25	13	7	14
16–18	11	13	23	14	7	16
18–24	33	53	21	38	29	18
24–34	24	87	24	25	50	20
34–44	6	38	25	5	26	20
44–54	2	15	33	1	12	21
54+	1	13	28	1	13	26
Total	110	257	20	131	166	15

## Part 3 - how our woodlands might change

### 25-year forecast of standing volume in conifers

**Figure 36** 25-year forecast of standing volume in conifers



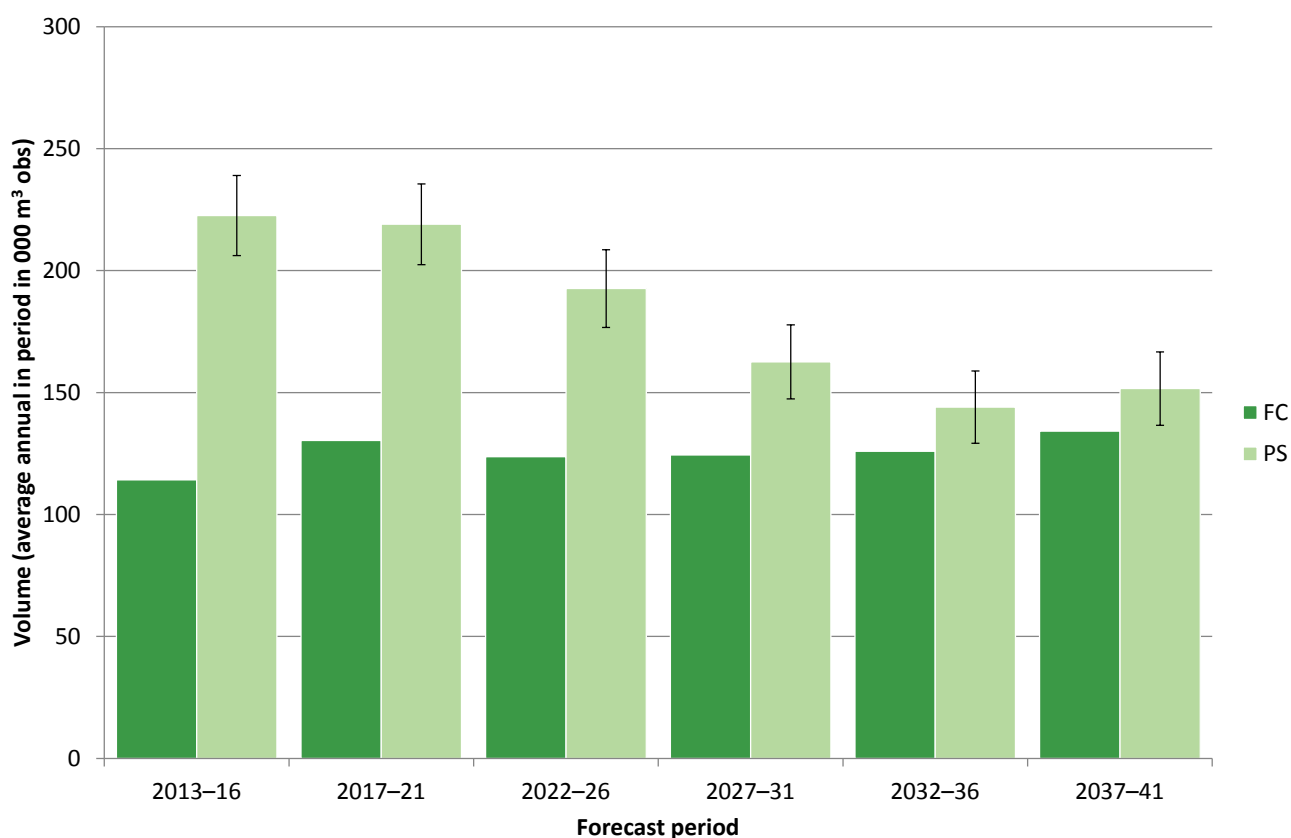
**Table 30** 25-year forecast of standing volume in conifers; average annual volume within period

Forecast period	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
2013-16	2,567	5,941	7	8,508
2017-21	2,587	5,783	7	8,370
2022-26	2,550	5,027	8	7,577
2027-31	2,458	4,107	9	6,565
2032-36	2,462	3,332	10	5,794
2037-41	2,542	3,007	11	5,549

## Part 3 - how our woodlands might change

### 25-year forecast of net increment in conifers

**Figure 37** 25-year forecast of net increment in conifers



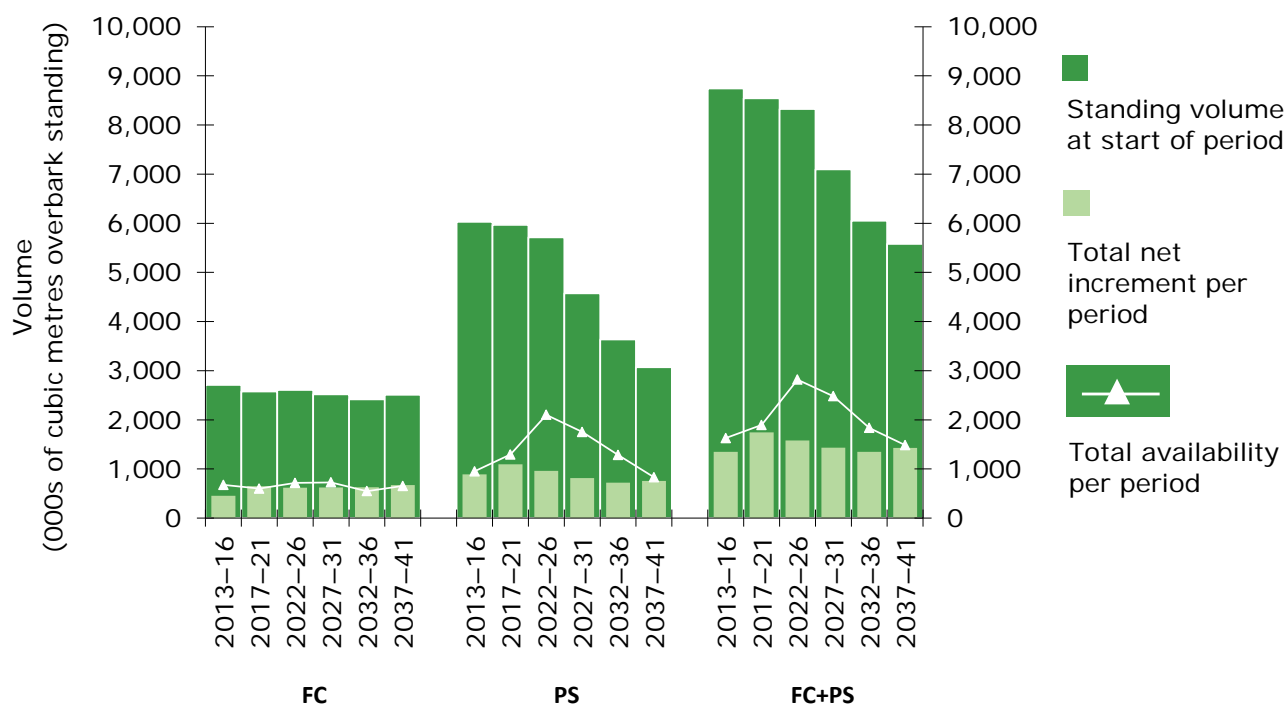
**Table 31** 25-year forecast of net increment in conifers; average annual volume within period

Forecast period	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
2013-16	114	223	7	337
2017-21	130	219	8	349
2022-26	124	193	8	316
2027-31	124	163	9	287
2032-36	126	144	10	270
2037-41	134	152	10	286

# Part 3 - how our woodlands might change

## Combined standing volume, net increment and availability

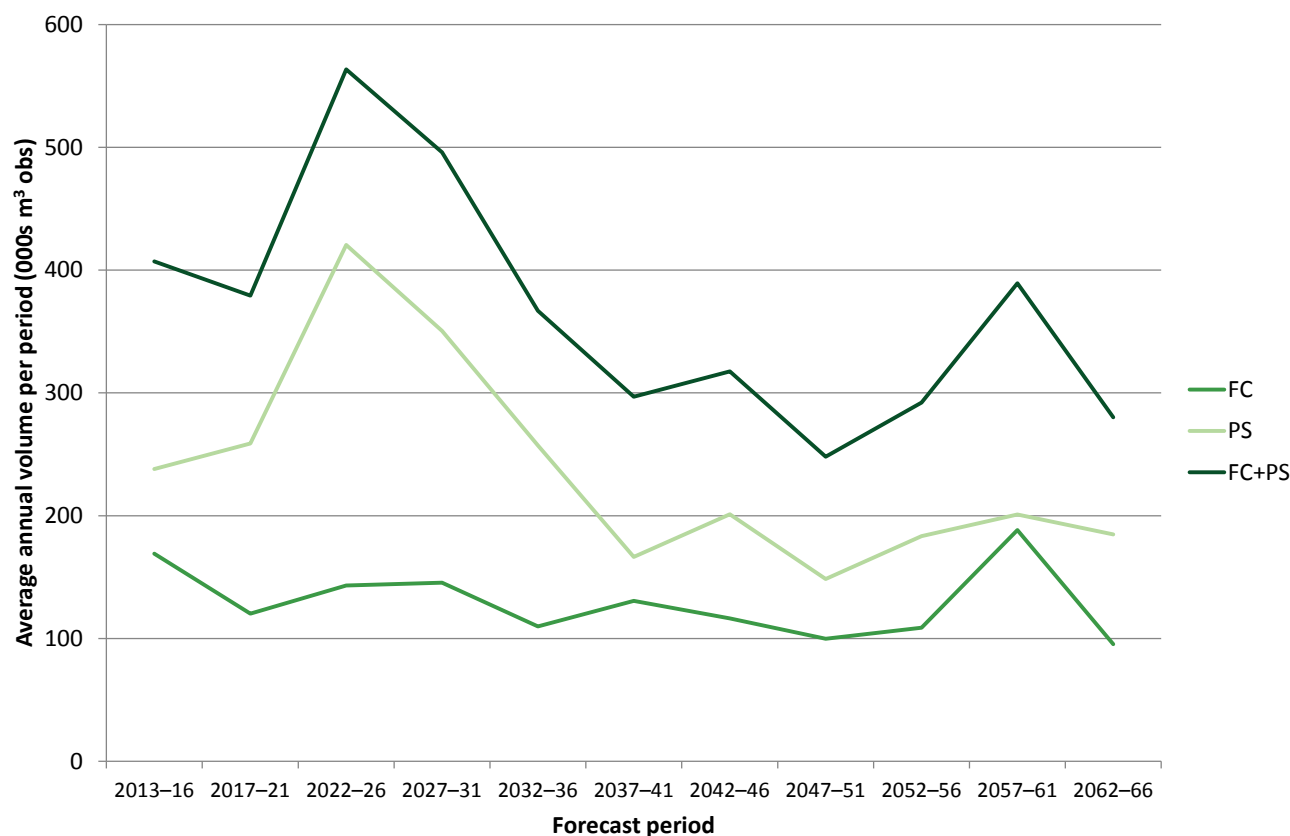
**Figure 38** 25-year forecast of standing volume, net increment and softwood availability



## 50-year softwood forecast

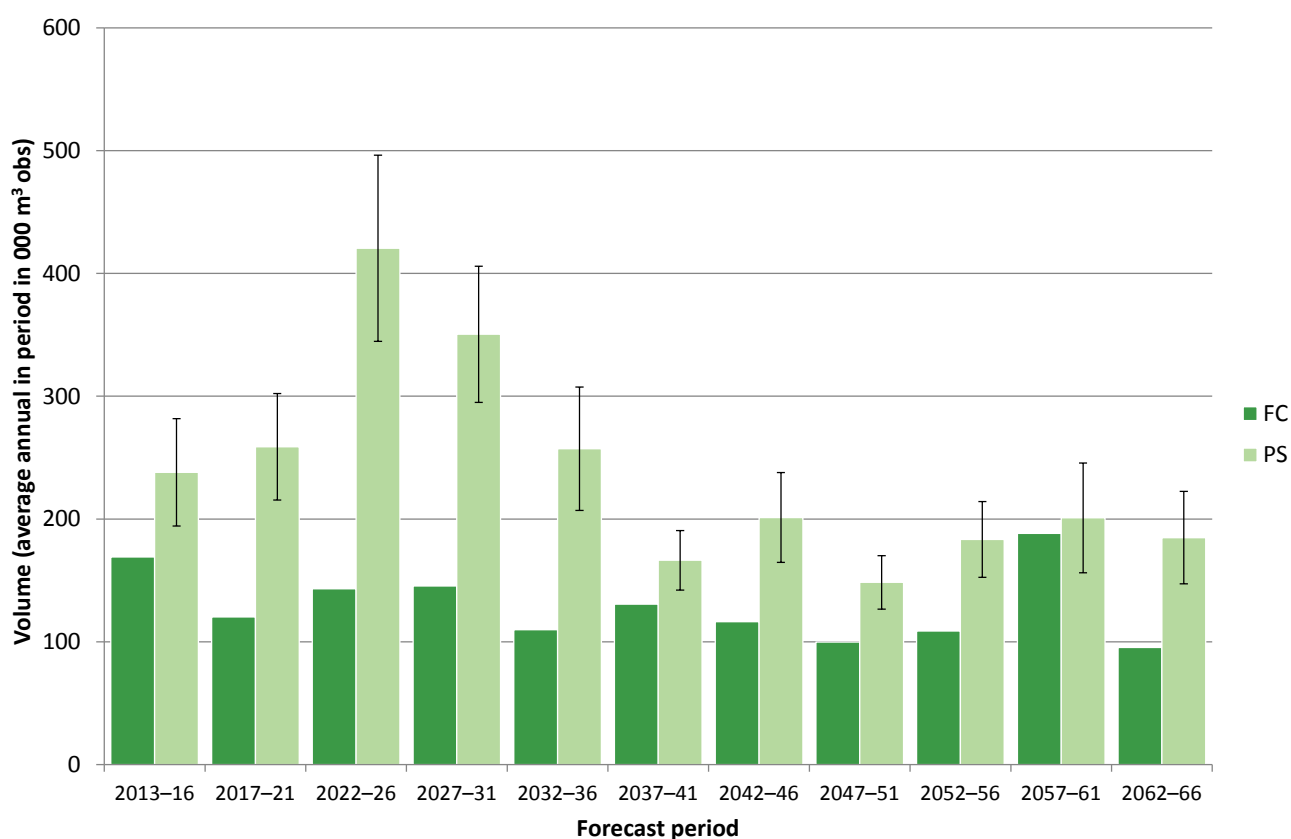
### 50-year forecast of softwood timber availability

**Figure 39** Summary of 50-year forecast of softwood timber availability; average annual volume within period



## Part 3 - how our woodlands might change

**Figure 40** 50-year forecast of softwood timber availability; average annual volume within period



**Table 32** Summary of 50-year forecast of softwood timber availability; average annual volume within period

Forecast period	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
2013-16	169	238	18	407
2017-21	120	259	17	379
2022-26	143	420	18	564
2027-31	145	350	16	496
2032-36	110	257	20	367
2037-41	131	166	15	297
2042-46	116	201	18	318
2047-51	100	148	15	248
2052-56	109	183	17	292
2057-61	188	201	22	389
2062-66	95	185	20	280

## Part 3 - how our woodlands might change

### 50-year forecast of softwood timber availability by principal species

**Table 33** 50-year forecast of softwood timber availability by principal species; average annual volume within period

Principal species	2013–16			2017–21		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All conifers	169	238	18	120	259	17
Sitka spruce	135	120	35	99	124	31
Scots pine	6	18	20	5	27	38
Corsican pine	< 1	< 1	89	1	< 1	102
Norway spruce	6	18	28	2	22	28
Larches	8	70	20	7	60	19
Douglas fir	1	1	63	1	4	71
Lodgepole pine	11	1	91	4	1	89
Other conifers	1	6	37	1	17	82

**Table 33 (cont'd)** 50-year forecast of softwood timber availability by principal species; average annual volume within period

Principal species	2022–26			2027–31		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All conifers	143	420	18	145	350	16
Sitka spruce	118	291	25	130	182	26
Scots pine	5	26	24	3	54	35
Corsican pine	< 1	< 1	102	< 1	< 1	102
Norway spruce	3	31	53	2	45	39
Larches	10	40	16	6	45	24
Douglas fir	1	< 1	62	1	1	52
Lodgepole pine	5	18	79	1	14	93
Other conifers	1	10	57	< 1	10	46



## Part 3 - how our woodlands might change

**Table 33 (cont'd)** 50-year forecast of softwood timber availability by principal species; average annual volume within period

Principal species	2032–36			2037–41		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All conifers	110	257	20	131	166	15
Sitka spruce	94	159	31	108	65	29
Scots pine	2	31	34	4	40	34
Corsican pine	< 1	< 1	102	< 1	< 1	33
Norway spruce	1	16	27	5	19	26
Larches	8	40	18	9	27	25
Douglas fir	3	3	51	3	3	23
Lodgepole pine	< 1	2	56	< 1	2	51
Other conifers	< 1	3	50	2	9	59

**Table 33 (cont'd)** 50-year forecast of softwood timber availability by principal species; average annual volume within period

Principal species	2042–46			2047–51		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All conifers	116	201	18	100	148	15
Sitka spruce	64	65	25	69	58	19
Scots pine	4	48	48	4	17	25
Corsican pine	< 1	< 1	33	< 1	< 1	33
Norway spruce	5	49	48	5	37	49
Larches	27	19	22	13	19	22
Douglas fir	13	5	16	6	6	15
Lodgepole pine	< 1	7	63	< 1	2	58
Other conifers	3	6	23	3	9	19

## Part 3 - how our woodlands might change

**Table 33 (cont'd)** 50-year forecast of softwood timber availability by principal species; average annual volume within period

Principal species	2052–56			2057–61		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All conifers	109	183	17	188	201	22
Sitka spruce	81	71	17	144	117	37
Scots pine	3	18	25	8	18	24
Corsican pine	< 1	< 1	33	< 1	< 1	33
Norway spruce	9	53	50	12	16	42
Larches	8	20	22	16	18	20
Douglas fir	4	8	14	4	9	14
Lodgepole pine	< 1	2	51	< 1	1	57
Other conifers	3	12	17	4	21	40

**Table 33 (cont'd)** 50-year forecast of softwood timber availability by principal species; average annual volume within period

Principal species	2062–66		
	FC	Private sector	
	volume (000 m3 obs)		SE%
Cumbria and Lancashire			
All conifers	95	185	20
Sitka spruce	67	104	30
Scots pine	4	14	17
Corsican pine	< 1	< 1	33
Norway spruce	4	25	75
Larches	5	8	16
Douglas fir	7	12	19
Lodgepole pine	1	6	85
Other conifers	6	15	14

## Part 3 - how our woodlands might change

### 50-year forecast of softwood timber availability % spruce

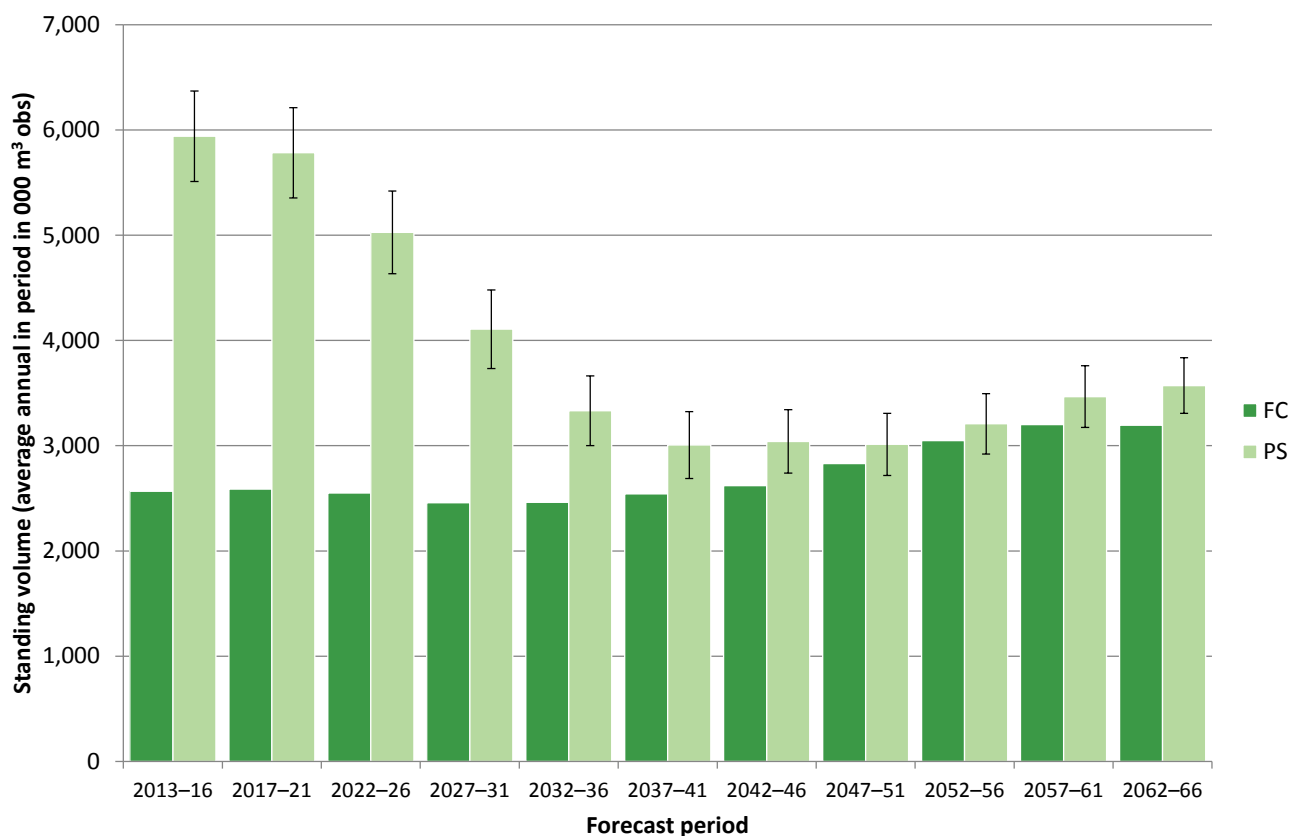
**Table 34** 50-year forecast of softwood timber availability % spruce

Cumbria and Lancashire		Top diameter class (cm)								Total
		7-14	14-16	16-18	18-24	24-34	34-44	44-54	54+	
2013-16	FC (%)	80	85	86	87	85	77	68	50	<b>84</b>
	PS (%)	65	65	64	60	58	52	45	19	<b>58</b>
2017-21	FC (%)	83	86	87	86	82	79	77	44	<b>84</b>
	PS (%)	59	58	58	56	58	55	52	36	<b>56</b>
2022-26	FC (%)	82	86	88	89	85	72	59	44	<b>85</b>
	PS (%)	81	83	84	83	79	67	48	40	<b>77</b>
2027-31	FC (%)	91	93	93	93	91	83	68	50	<b>91</b>
	PS (%)	75	77	79	74	64	50	43	50	<b>65</b>
2032-36	FC (%)	83	90	91	91	87	78	68	40	<b>87</b>
	PS (%)	73	81	79	76	70	61	53	32	<b>68</b>
2037-41	FC (%)	82	89	90	90	87	82	75	44	<b>86</b>
	PS (%)	52	59	62	61	55	45	34	22	<b>50</b>
2042-46	FC (%)	73	70	68	65	53	40	30	17	<b>60</b>
	PS (%)	52	55	56	59	54	57	64	65	<b>57</b>
2047-51	FC (%)	79	81	80	76	63	55	57	46	<b>74</b>
	PS (%)	60	55	56	63	71	70	69	51	<b>64</b>
2052-56	FC (%)	83	86	87	85	77	68	69	72	<b>83</b>
	PS (%)	64	62	58	61	72	74	73	71	<b>67</b>
2057-61	FC (%)	82	85	85	85	83	80	76	65	<b>83</b>
	PS (%)	59	67	64	64	72	73	71	48	<b>66</b>
2062-66	FC (%)	77	78	78	77	73	62	51	59	<b>75</b>
	PS (%)	51	62	60	59	78	92	94	82	<b>70</b>

## Part 3 - how our woodlands might change

### 50-year forecast of standing volume in conifers

**Figure 41** 50-year forecast of standing volume in conifers; average annual volume within period



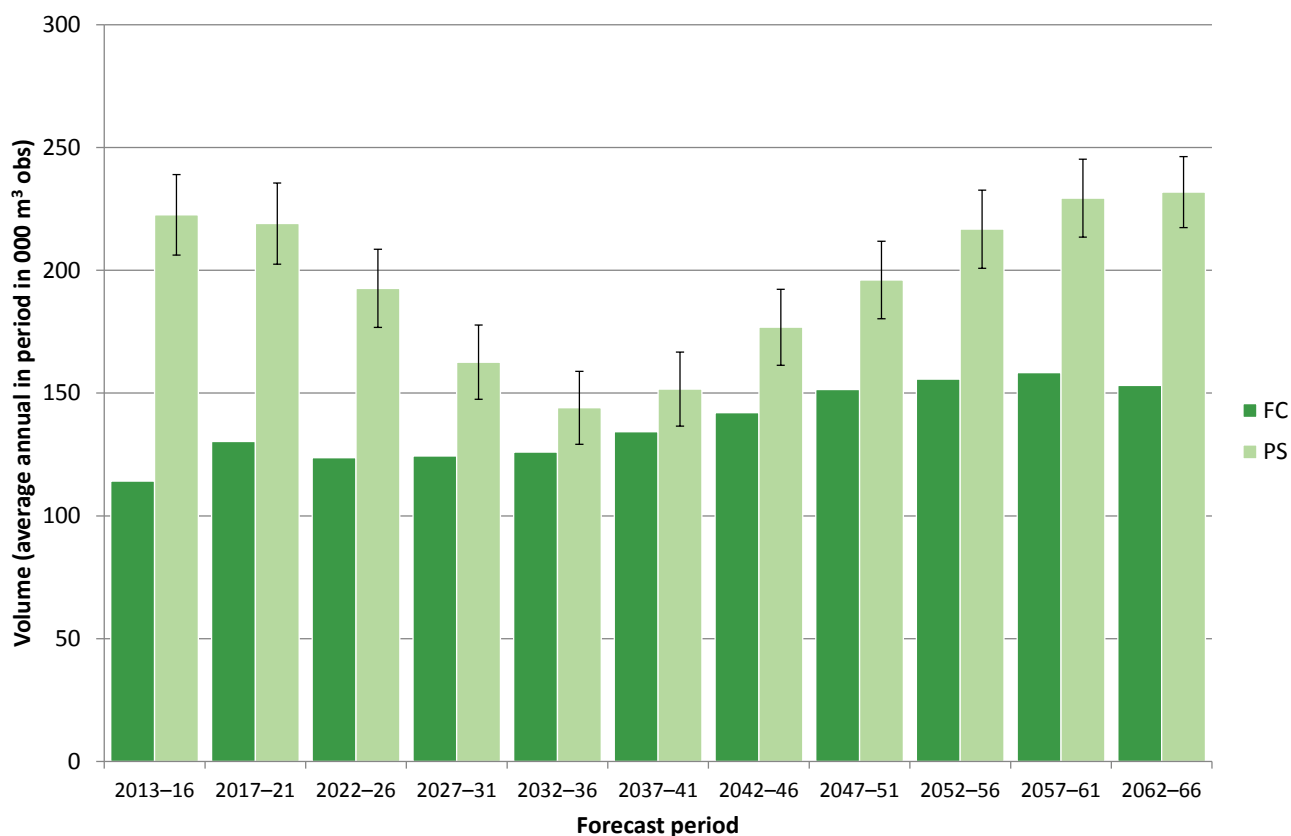
**Table 35** 50-year forecast of standing volume in conifers; average annual volume within period

Forecast period	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
2013-16	2,567	5,941	7	8,508
2017-21	2,587	5,783	7	8,370
2022-26	2,550	5,027	8	7,577
2027-31	2,458	4,107	9	6,565
2032-36	2,462	3,332	10	5,794
2037-41	2,542	3,007	11	5,549
2042-46	2,620	3,041	10	5,661
2047-51	2,829	3,013	10	5,842
2052-56	3,047	3,208	9	6,255
2057-61	3,201	3,466	8	6,668
2062-66	3,195	3,571	7	6,766

## Part 3 - how our woodlands might change

### 50-year forecast of net increment in conifers

**Figure 42** 50-year forecast of net increment in conifers; average annual volume within period



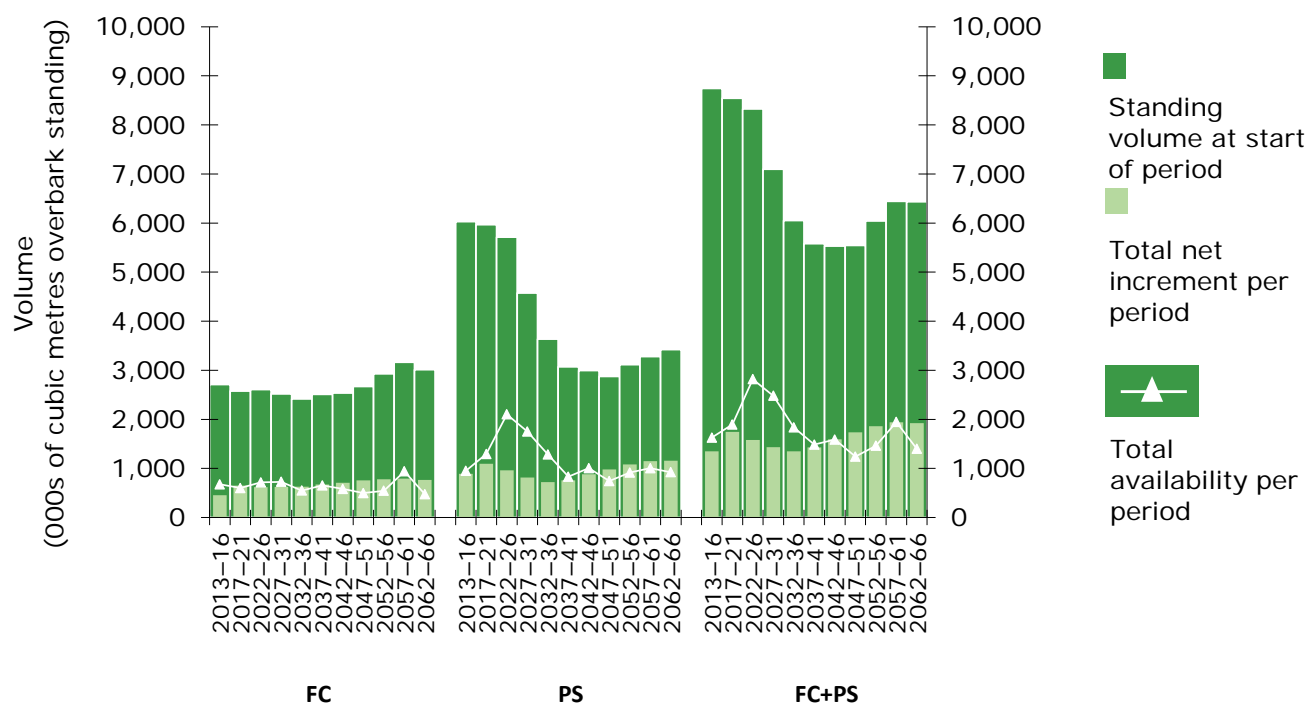
**Table 36** 50-year forecast of net increment in conifers; average annual volume within period

	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000m³ obs)
Cumbria and Lancashire				
2013-16	114	223	7	337
2017-21	130	219	8	349
2022-26	124	193	8	316
2027-31	124	163	9	287
2032-36	126	144	10	270
3037-41	134	152	10	286
2042-46	142	177	9	319
2047-51	151	196	8	348
2052-56	156	217	7	372
2057-61	158	229	7	388
2062-66	153	232	6	385

# Part 3 - how our woodlands might change

## Combined standing volume, net increment and availability

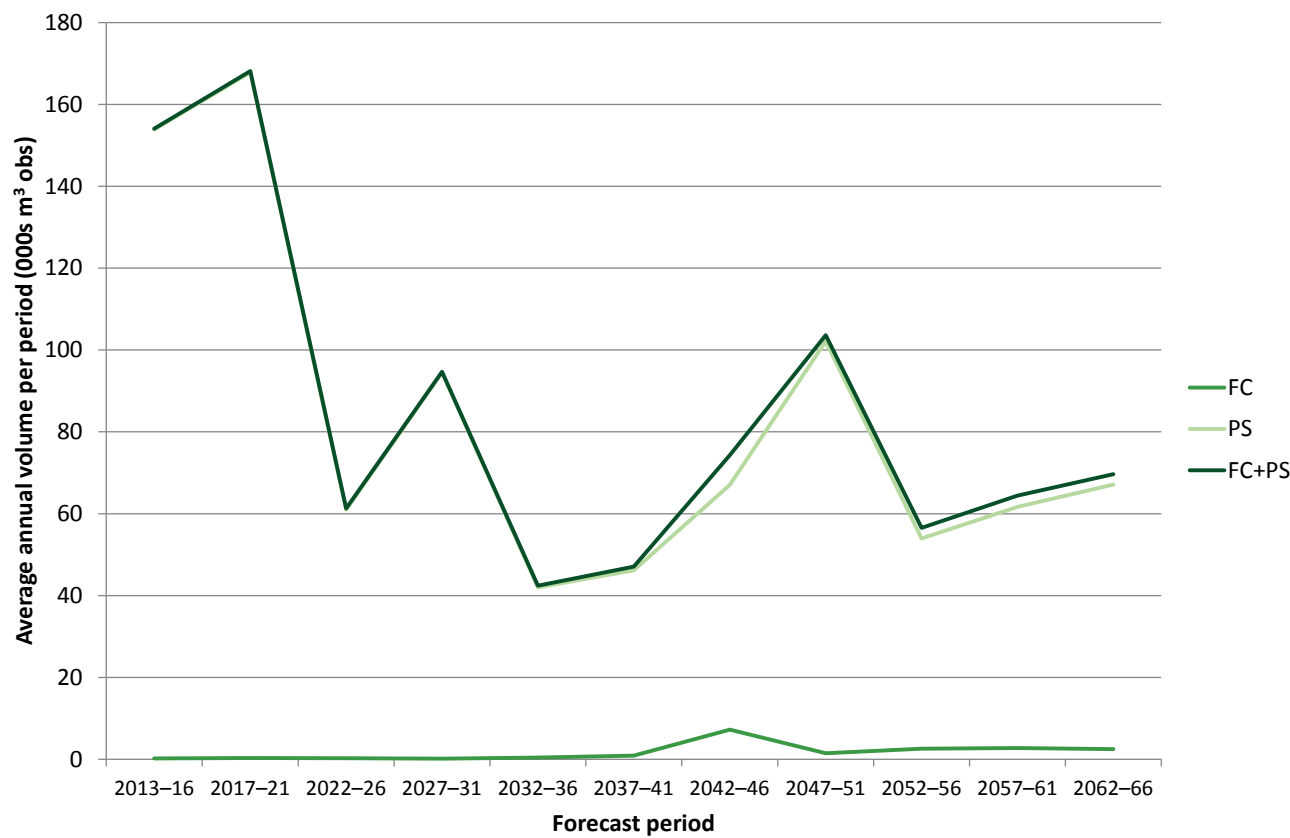
**Figure 43** 50-year forecast of standing volume, net increment and softwood availability



## 50-year hardwood forecast

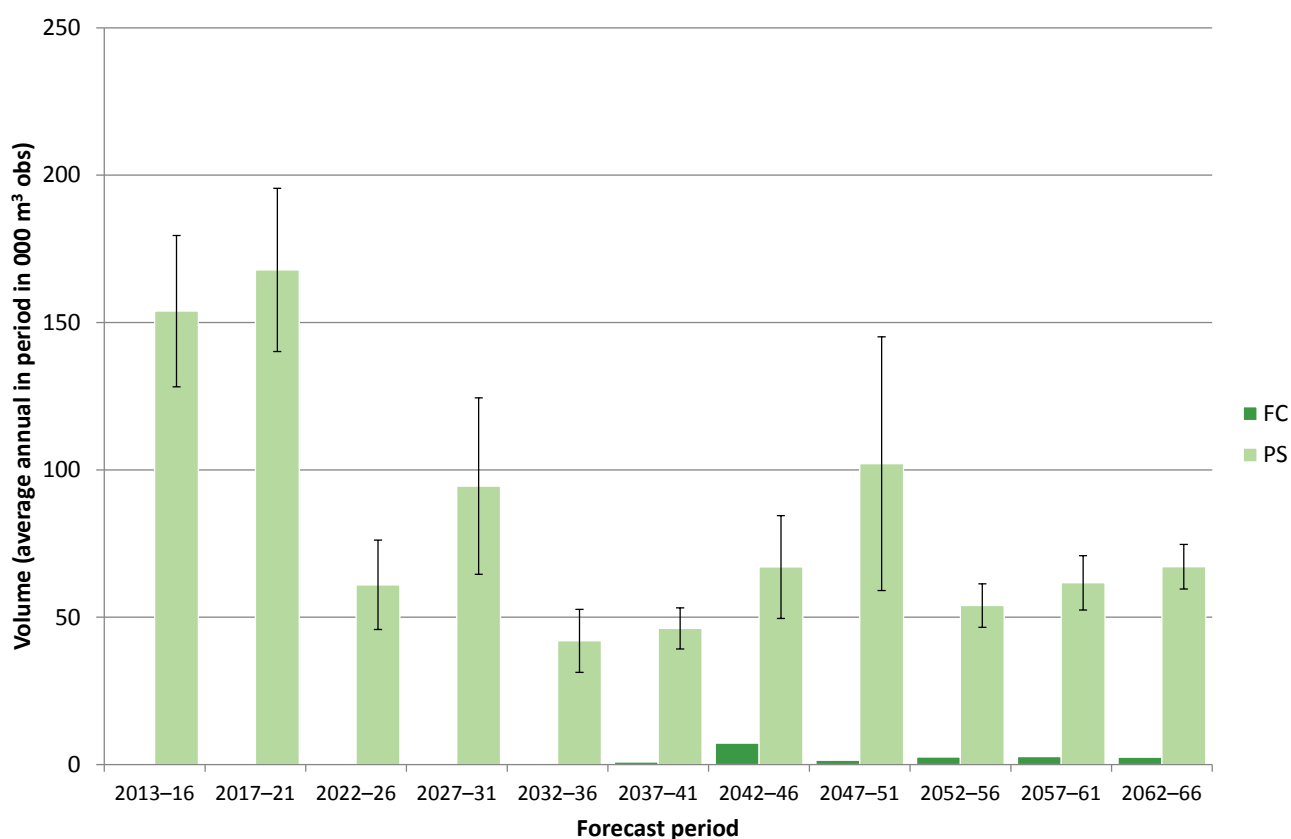
### 50-year forecast of hardwood timber availability

**Figure 44** Summary of 50-year forecast of hardwood timber availability; average annual volume within period



## Part 3 - how our woodlands might change

**Figure 45** 50-year forecast of hardwood timber availability; average annual volume within period



**Table 37** 50-year forecast of hardwood timber availability; average annual volume within period

Forecast period	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
2013-16	< 1	154	17	<b>154</b>
2017-21	< 1	168	17	<b>168</b>
2022-26	< 1	61	25	<b>61</b>
2027-31	< 1	95	32	<b>95</b>
2032-36	< 1	42	25	<b>42</b>
2037-41	< 1	46	15	<b>47</b>
2042-46	7	67	26	<b>74</b>
2047-51	1	102	42	<b>104</b>
2052-56	3	54	14	<b>57</b>
2057-61	3	62	15	<b>64</b>
2062-66	2	67	11	<b>70</b>



## Part 3 - how our woodlands might change

### 50-year forecast of hardwood timber availability by principal species

**Table 38** 50-year forecast of hardwood timber availability by principal species; average annual volume within period

Principal species	2013–16			2017–21		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	< 1	154	17	< 1	168	17
Oak	< 1	74	30	< 1	82	30
Beech	< 1	6	31	< 1	12	41
Sycamore	< 1	26	31	< 1	16	29
Ash	< 1	10	41	0	10	41
Birch	< 1	15	21	< 1	22	29
Sweet chestnut	0	0	-	0	0	-
Hazel	0	3	36	0	4	40
Hawthorn	0	< 1	54	0	< 1	34
Alder	< 1	18	41	0	19	40
Willow	0	< 1	48	0	< 1	42
Other broadleaves	< 1	2	64	< 1	2	58

**Table 38 (cont'd)** 50-year forecast of hardwood timber availability by principal species; average annual volume within period

Principal species	2022–26			2027–31		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	< 1	61	25	< 1	95	32
Oak	< 1	13	23	< 1	67	43
Beech	< 1	9	42	< 1	13	55
Sycamore	< 1	23	62	< 1	3	47
Ash	< 1	3	29	< 1	2	28
Birch	< 1	5	17	< 1	5	28
Sweet chestnut	0	0	-	0	0	-
Hazel	0	< 1	25	0	2	69
Hawthorn	0	< 1	32	0	< 1	30
Alder	< 1	4	37	0	3	88
Willow	0	< 1	28	0	< 1	26
Other broadleaves	< 1	2	29	< 1	1	16

## Part 3 - how our woodlands might change

**Table 38 (cont'd)** 50-year forecast of hardwood timber availability by principal species; average annual volume within period

Principal species	2032–36			2037–41		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	< 1	42	25	< 1	46	15
Oak	< 1	16	49	< 1	14	30
Beech	< 1	12	57	< 1	8	38
Sycamore	0	2	43	< 1	4	38
Ash	< 1	3	34	< 1	3	30
Birch	< 1	4	20	< 1	9	42
Sweet chestnut	0	0	-	0	0	-
Hazel	0	< 1	19	0	< 1	42
Hawthorn	0	< 1	28	0	< 1	27
Alder	< 1	< 1	23	< 1	2	29
Willow	0	< 1	25	< 1	< 1	25
Other broadleaves	< 1	2	18	< 1	4	27

**Table 38 (cont'd)** 50-year forecast of hardwood timber availability by principal species; average annual volume within period

Principal species	2042–46			2047–51		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	7	67	26	1	102	42
Oak	5	17	54	< 1	55	76
Beech	< 1	16	85	< 1	15	56
Sycamore	< 1	5	30	< 1	6	28
Ash	< 1	5	22	< 1	5	27
Birch	< 1	13	18	< 1	11	19
Sweet chestnut	0	0	-	0	0	-
Hazel	0	2	27	0	2	26
Hawthorn	0	< 1	27	0	< 1	27
Alder	< 1	3	25	< 1	3	30
Willow	< 1	< 1	25	< 1	< 1	25
Other broadleaves	< 1	3	22	< 1	4	22

## Part 3 - how our woodlands might change

**Table 38 (cont'd)** 50-year forecast of hardwood timber availability by principal species; average annual volume within period

Principal species	2052–56			2057–61		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	3	54	14	3	62	15
Oak	< 1	12	23	< 1	16	31
Beech	< 1	8	46	< 1	4	40
Sycamore	< 1	7	36	< 1	14	36
Ash	< 1	4	42	< 1	6	50
Birch	1	12	29	2	10	21
Sweet chestnut	0	0	-	0	0	-
Hazel	0	1	37	0	1	38
Hawthorn	0	< 1	27	0	4	68
Alder	< 1	3	31	< 1	3	33
Willow	< 1	< 1	25	< 1	< 1	25
Other broadleaves	< 1	4	32	< 1	3	27

**Table 38 (cont'd)** 50-year forecast of hardwood timber availability by principal species; average annual volume within period

Principal species	2062–66		
	FC	Private sector	
	volume (000 m3 obs)		SE%
Cumbria and Lancashire			
All broadleaves	2	67	11
Oak	< 1	13	19
Beech	< 1	4	27
Sycamore	< 1	11	28
Ash	< 1	4	38
Birch	1	18	21
Sweet chestnut	0	0	-
Hazel	0	4	63
Hawthorn	0	< 1	29
Alder	< 1	6	34
Willow	< 1	2	29
Other broadleaves	< 1	4	26

## Part 3 - how our woodlands might change

### 50-year forecast of hardwood timber availability by top diameter class

**Table 39** 50-year forecast of hardwood timber availability by top diameter class; average annual volume within period

Top diameter class (cm)	2013–16			2017–21		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
7–14	< 1	12	16	< 1	14	15
14–16	< 1	5	18	< 1	5	19
16–18	< 1	7	17	< 1	6	18
18–24	< 1	26	15	< 1	25	17
24–34	< 1	40	17	< 1	44	19
34–44	< 1	25	22	< 1	26	21
44–54	0	13	24	0	14	24
54+	0	27	38	0	33	31
Total	< 1	154	17	< 1	168	17

**Table 63 (cont'd)** 50-year forecast of hardwood timber availability by top diameter class; average annual volume within period

Top diameter class (cm)	2022–26			2027–31		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)	SE%		volume (000 m3 obs)	SE%	
Cumbria and Lancashire						
7–14	< 1	8	10	< 1	12	13
14–16	< 1	2	20	< 1	3	30
16–18	< 1	2	16	< 1	3	32
18–24	< 1	9	23	< 1	17	38
24–34	< 1	18	33	< 1	32	42
34–44	< 1	11	38	< 1	16	41
44–54	< 1	5	39	< 1	7	39
54+	0	6	40	0	5	41
Total	< 1	61	25	< 1	95	32

## Part 3 - how our woodlands might change

**Table 63 (cont'd)** 50-year forecast of hardwood timber availability by top diameter class; average annual volume within period

Top diameter class (cm)	2032–36			2037–41		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)	SE%		volume (000 m3 obs)	SE%	
Cumbria and Lancashire						
7–14	< 1	13	12	< 1	18	12
14–16	< 1	1	18	< 1	2	30
16–18	< 1	1	25	< 1	2	35
18–24	< 1	4	39	< 1	5	27
24–34	< 1	10	42	< 1	7	21
34–44	< 1	6	37	< 1	5	27
44–54	< 1	2	42	< 1	3	30
54+	0	5	57	< 1	5	33
Total	< 1	42	25	< 1	46	15

**Table 63 (cont'd)** 50-year forecast of hardwood timber availability by top diameter class; average annual volume within period

Top diameter class (cm)	2042–46			2047–51		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
7–14	2	21	11	< 1	22	12
14–16	< 1	3	11	< 1	4	15
16–18	< 1	3	12	< 1	3	12
18–24	2	10	16	< 1	9	16
24–34	1	11	43	< 1	12	46
34–44	< 1	7	58	< 1	12	62
44–54	< 1	5	62	< 1	7	65
54+	0	6	71	< 1	33	72
Total	7	67	26	1	102	42

## Part 3 - how our woodlands might change

**Table 63 (cont'd)** 50-year forecast of hardwood timber availability by top diameter class; average annual volume within period

Top diameter class (cm)	2052–56			2057–61		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
7–14	2	20	12	1	19	11
14–16	< 1	3	13	< 1	4	14
16–18	< 1	3	13	< 1	4	16
18–24	< 1	8	18	< 1	11	17
24–34	< 1	9	25	< 1	10	25
34–44	< 1	5	28	< 1	6	33
44–54	< 1	2	34	< 1	4	36
54+	< 1	3	37	< 1	4	38
Total	3	54	14	3	62	15

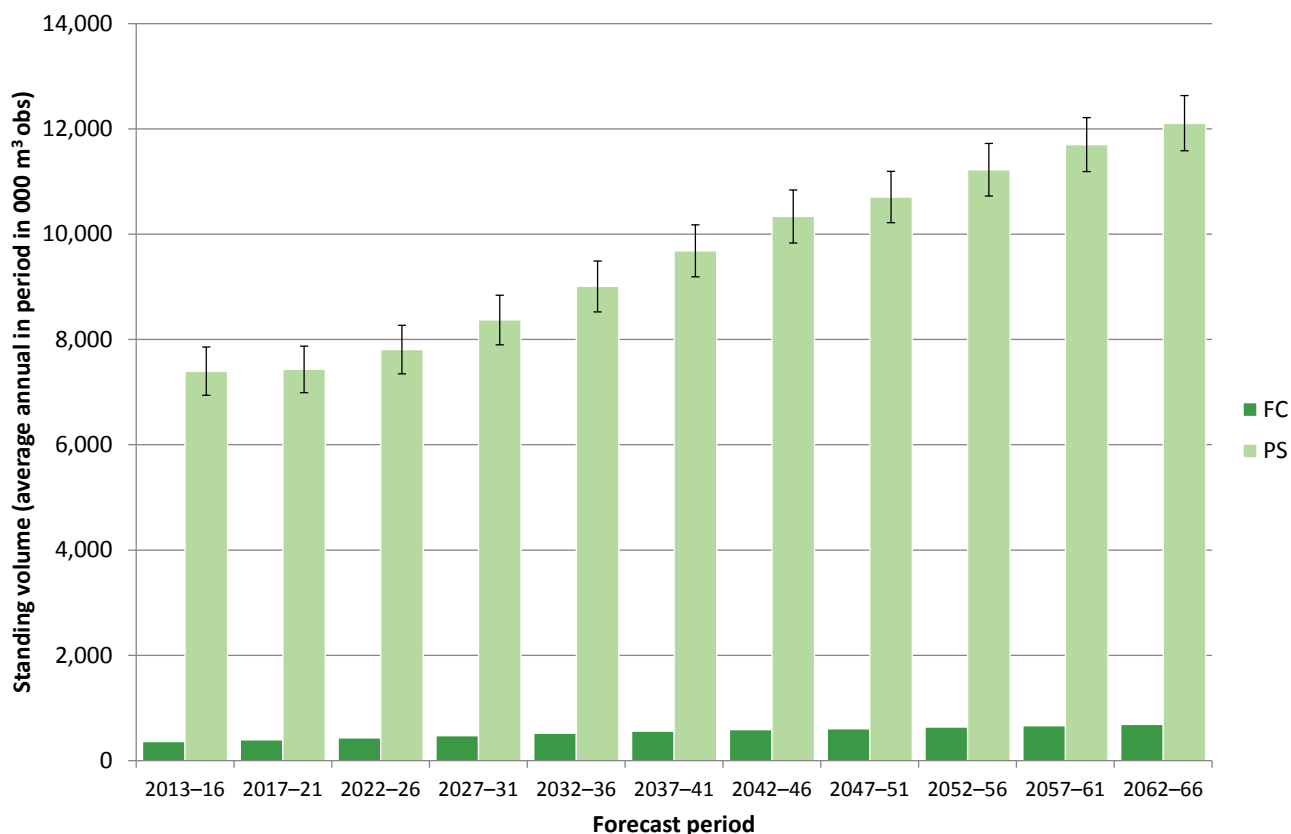
**Table 63 (cont'd)** 50-year forecast of hardwood timber availability by top diameter class; average annual volume within period

Top diameter class (cm)	2062–66		
	FC	Private sector	
	volume (000 m3 obs)		SE%
Cumbria and Lancashire			
7–14	1	23	11
14–16	< 1	5	13
16–18	< 1	6	13
18–24	< 1	16	14
24–34	< 1	10	19
34–44	< 1	4	27
44–54	< 1	2	35
54+	< 1	2	31
Total	2	67	11

## Part 3 - how our woodlands might change

### 50-year forecast of standing volume in broadleaves

**Figure 46** 50-year forecast of standing volume in broadleaves; average annual volume within period



**Table 40** 50-year forecast of standing volume in broadleaves; average annual volume within period

Forecast period	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
2013-16	363	7,397	6	7,760
2017-21	393	7,433	6	7,826
2022-26	430	7,809	6	8,239
2027-31	472	8,371	6	8,843
2032-36	518	9,007	5	9,525
2037-41	561	9,683	5	10,244
2042-46	587	10,337	5	10,924
2047-51	606	10,705	5	11,311
2052-56	637	11,224	4	11,861
2057-61	662	11,701	4	12,363
2062-66	687	12,109	4	12,795

## Part 3 - how our woodlands might change

**Table 41** 50-year forecast of standing volume in broadleaves by principal species; average annual volume within period

Principal species	2013–16			2017–21		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	363	7,397	6	393	7,433	6
Oak	114	2,470	13	118	2,258	14
Beech	37	852	32	41	885	30
Sycamore	13	1,120	20	13	1,105	20
Ash	29	712	17	30	738	17
Birch	57	965	11	64	1,053	12
Sweet Chestnut	0	< 1	89	0	< 1	89
Hazel	25	124	25	27	137	24
Hawthorn	0	126	25	0	147	24
Alder	6	700	17	6	686	17
Willow	0	126	25	0	168	23
Other broadleaves	82	183	14	94	234	12

**Table 65 (cont'd)** 50-year forecast of standing volume in broadleaves by principal species; average annual volume within period

Principal species	2022–26			2027–31		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	430	7,809	6	472	8,371	6
Oak	123	2,229	14	128	2,195	14
Beech	45	925	30	50	968	29
Sycamore	13	1,091	20	14	1,091	20
Ash	31	799	17	33	889	16
Birch	73	1,166	12	85	1,334	11
Sweet Chestnut	0	< 1	89	0	< 1	89
Hazel	28	160	22	29	190	20
Hawthorn	0	177	22	0	212	21
Alder	6	701	18	7	762	18
Willow	< 1	221	22	< 1	278	21
Other broadleaves	110	316	11	127	422	11



## Part 3 - how our woodlands might change

**Table 65 (cont'd)** 50-year forecast of standing volume in broadleaves by principal species; average annual volume within period

Principal species	2032–36			2037–41		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	518	9,007	5	561	9,683	5
Oak	134	2,199	14	139	2,287	14
Beech	54	1,000	29	60	1,030	29
Sycamore	14	1,146	20	14	1,207	19
Ash	34	974	15	35	1,048	15
Birch	98	1,500	11	111	1,635	11
Sweet Chestnut	0	< 1	89	0	< 1	89
Hazel	30	218	19	31	246	18
Hawthorn	0	248	20	0	286	19
Alder	7	817	18	7	875	18
Willow	< 1	335	20	< 1	393	20
Other broadleaves	146	530	11	163	635	11

**Table 65 (cont'd)** 50-year forecast of standing volume in broadleaves by principal species; average annual volume within period

Principal species	2042–46			2047–51		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	587	10,337	5	606	10,705	5
Oak	135	2,403	13	126	2,327	11
Beech	65	1,066	28	71	1,051	29
Sycamore	15	1,268	19	15	1,325	18
Ash	36	1,105	15	37	1,153	15
Birch	122	1,755	11	133	1,861	10
Sweet Chestnut	0	< 1	89	0	< 1	89
Hazel	32	269	18	32	285	17
Hawthorn	0	323	19	0	360	18
Alder	8	925	18	8	973	17
Willow	< 1	450	20	< 1	504	20
Other broadleaves	174	729	12	184	824	12

## Part 3 - how our woodlands might change

**Table 65 (cont'd)** 50-year forecast of standing volume in broadleaves by principal species; average annual volume within period

Principal species	2052–56			2057–61		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	637	11,224	4	662	11,701	4
Oak	133	2,418	11	140	2,539	11
Beech	76	1,076	29	81	1,125	28
Sycamore	15	1,376	18	15	1,397	18
Ash	38	1,189	15	39	1,213	15
Birch	142	1,950	10	145	2,013	10
Sweet Chestnut	0	< 1	89	0	< 1	89
Hazel	33	301	17	33	316	17
Hawthorn	0	394	18	0	412	18
Alder	8	1,012	17	8	1,048	17
Willow	< 1	554	20	< 1	601	20
Other broadleaves	192	908	12	200	993	12

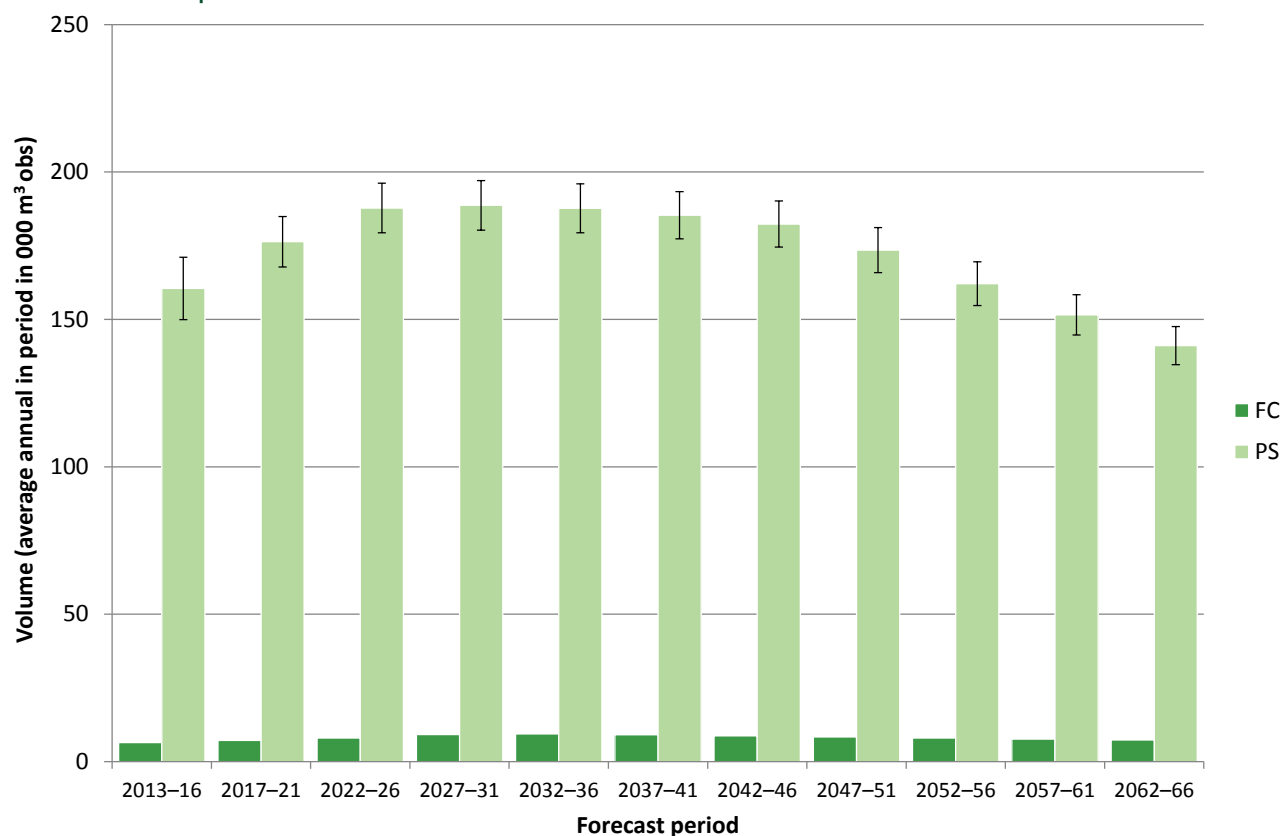
**Table 65 (cont'd)** 50-year forecast of standing volume in broadleaves by principal species; average annual volume within period

Principal species	2062–66		
	FC	Private sector	
	volume (000 m3 obs)		SE%
Cumbria and Lancashire			
All broadleaves	687	12,109	4
Oak	147	2,682	11
Beech	87	1,179	27
Sycamore	15	1,387	18
Ash	40	1,228	15
Birch	149	2,048	10
Sweet Chestnut	0	< 1	89
Hazel	34	314	17
Hawthorn	0	442	18
Alder	8	1,071	17
Willow	< 1	643	20
Other broadleaves	207	1,071	12

## Part 3 - how our woodlands might change

### 50-year forecast of net increment in broadleaves

**Figure 47** 50-year forecast of net increment in broadleaves; average annual volume within period



**Table 42** 50-year forecast of net increment in broadleaves; average annual volume within period

Forecast period	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
<b>Cumbria and Lancashire</b>				
2013-16	6	161	7	<b>167</b>
2017-21	7	176	5	<b>184</b>
2022-26	8	188	4	<b>196</b>
2027-31	9	189	4	<b>198</b>
2032-36	9	188	4	<b>197</b>
2037-41	9	185	4	<b>194</b>
2042-46	9	182	4	<b>191</b>
2047-51	8	174	4	<b>182</b>
2052-56	8	162	5	<b>170</b>
2057-61	8	152	5	<b>159</b>
2062-66	7	141	5	<b>148</b>

## Part 3 - how our woodlands might change

**Table 43** 50-year forecast of net increment in broadleaves by principal species; average annual volume within period

Principal species	2013–16			2017–21		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	6	161	7	7	176	5
Oak	1	40	11	< 1	37	10
Beech	< 1	14	33	< 1	18	20
Sycamore	< 1	11	44	< 1	14	24
Ash	< 1	14	20	< 1	17	15
Birch	1	36	12	2	38	12
Sweet Chestnut	0	0	89	0	0	89
Hazel	< 1	5	16	< 1	7	16
Hawthorn	0	4	22	0	6	19
Alder	< 1	15	23	< 1	15	22
Willow	0	9	22	0	10	21
Other broadleaves	2	11	13	3	15	12

**Table 67 (cont'd)** 50-year forecast of net increment in broadleaves by principal species; average annual volume within period

Principal species	2022–26			2027–31		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	8	188	4	9	189	4
Oak	< 1	35	10	1	36	10
Beech	< 1	19	18	< 1	19	18
Sycamore	< 1	15	18	< 1	13	16
Ash	< 1	20	14	< 1	20	14
Birch	2	38	12	3	37	12
Sweet Chestnut	0	0	89	0	0	89
Hazel	< 1	7	17	< 1	7	16
Hawthorn	0	7	17	0	8	17
Alder	< 1	14	21	< 1	13	20
Willow	< 1	12	20	< 1	12	20
Other broadleaves	3	21	12	4	23	14

## Part 3 - how our woodlands might change

**Table 67 (cont'd)** 50-year forecast of net increment in broadleaves by principal species; average annual volume within period

Principal species	2032–36			2037–41		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	9	188	4	9	185	4
Oak	1	36	10	1	35	10
Beech	1	18	18	1	17	18
Sycamore	< 1	14	18	< 1	16	18
Ash	< 1	19	15	< 1	17	16
Birch	3	36	11	3	36	11
Sweet Chestnut	0	0	89	0	0	89
Hazel	< 1	7	17	< 1	6	18
Hawthorn	0	8	17	0	8	17
Alder	< 1	13	19	< 1	13	19
Willow	< 1	12	20	< 1	12	20
Other broadleaves	4	24	14	3	24	14

**Table 67 (cont'd)** 50-year forecast of net increment in broadleaves by principal species; average annual volume within period

Principal species	2042–46			2047–51		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	9	182	4	8	174	4
Oak	1	37	11	2	39	12
Beech	1	17	17	1	15	15
Sycamore	< 1	18	20	< 1	17	21
Ash	< 1	15	16	< 1	13	17
Birch	3	34	11	3	30	11
Sweet Chestnut	0	0	89	0	0	89
Hazel	< 1	6	19	< 1	5	20
Hawthorn	0	8	17	0	8	17
Alder	< 1	13	20	< 1	12	20
Willow	< 1	12	20	< 1	11	20
Other broadleaves	3	23	14	2	22	14

## Part 3 - how our woodlands might change

**Table 67 (cont'd)** 50-year forecast of net increment in broadleaves by principal species; average annual volume within period

Principal species	2052–56			2057–61		
	FC	Private sector		FC	Private sector	
	volume (000 m3 obs)		SE%	volume (000 m3 obs)		SE%
Cumbria and Lancashire						
All broadleaves	8	162	5	8	152	5
Oak	2	39	12	2	40	12
Beech	2	15	15	2	16	14
Sycamore	< 1	16	22	< 1	14	22
Ash	< 1	11	17	< 1	9	15
Birch	2	27	11	2	23	11
Sweet Chestnut	0	0	89	0	0	89
Hazel	< 1	5	21	< 1	4	21
Hawthorn	0	8	17	0	7	17
Alder	< 1	10	20	< 1	9	20
Willow	< 1	11	20	< 1	10	20
Other broadleaves	2	20	14	2	19	14

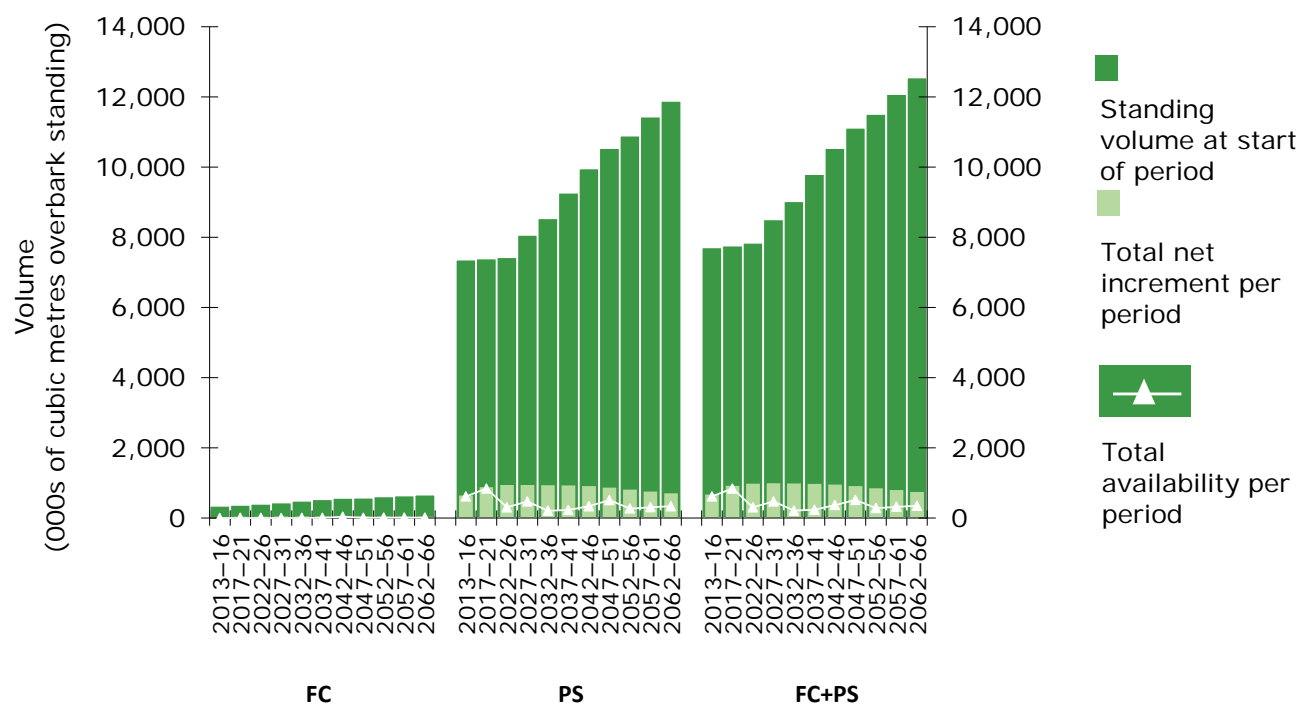
**Table 67 (cont'd)** 50-year forecast of net increment in broadleaves by principal species; average annual volume within period

Principal species	2062–66		
	FC	Private sector	
	volume (000 m3 obs)		SE%
Cumbria and Lancashire			
All broadleaves	7	141	5
Oak	2	41	12
Beech	2	16	14
Sycamore	< 1	10	23
Ash	< 1	8	14
Birch	2	21	11
Sweet Chestnut	0	0	89
Hazel	< 1	3	16
Hawthorn	0	7	17
Alder	< 1	8	19
Willow	< 1	9	20
Other broadleaves	1	18	14

# Part 3 - how our woodlands might change

## Combined standing volume, net increment and availability

**Figure 48** combined hardwood standing volume, net increment and availability



Part 4 – Tree health

Ash..... 97

Oak..... 106

Sweet chestnut ..... 115

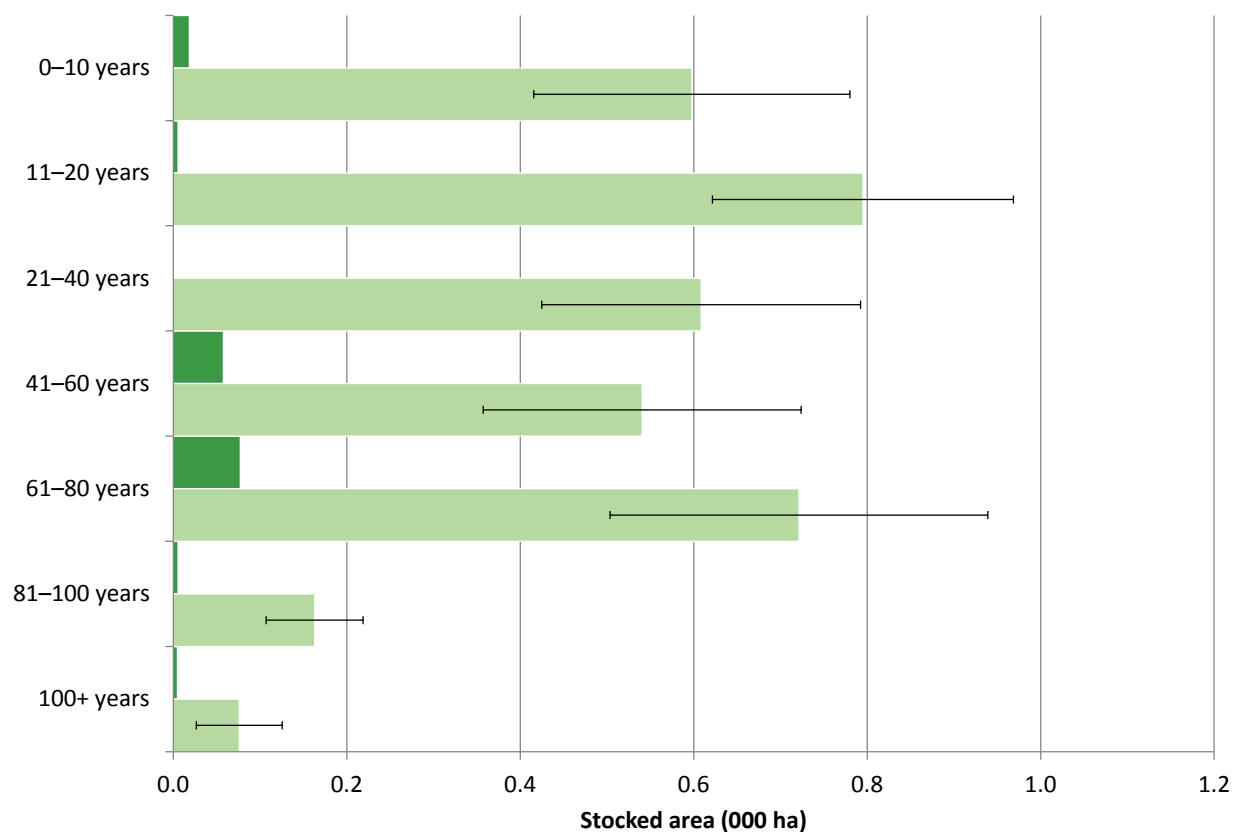
Larch ..... 124



## Part 4 – Tree health

### Ash

**Figure 49** Stocked area of ash by age class

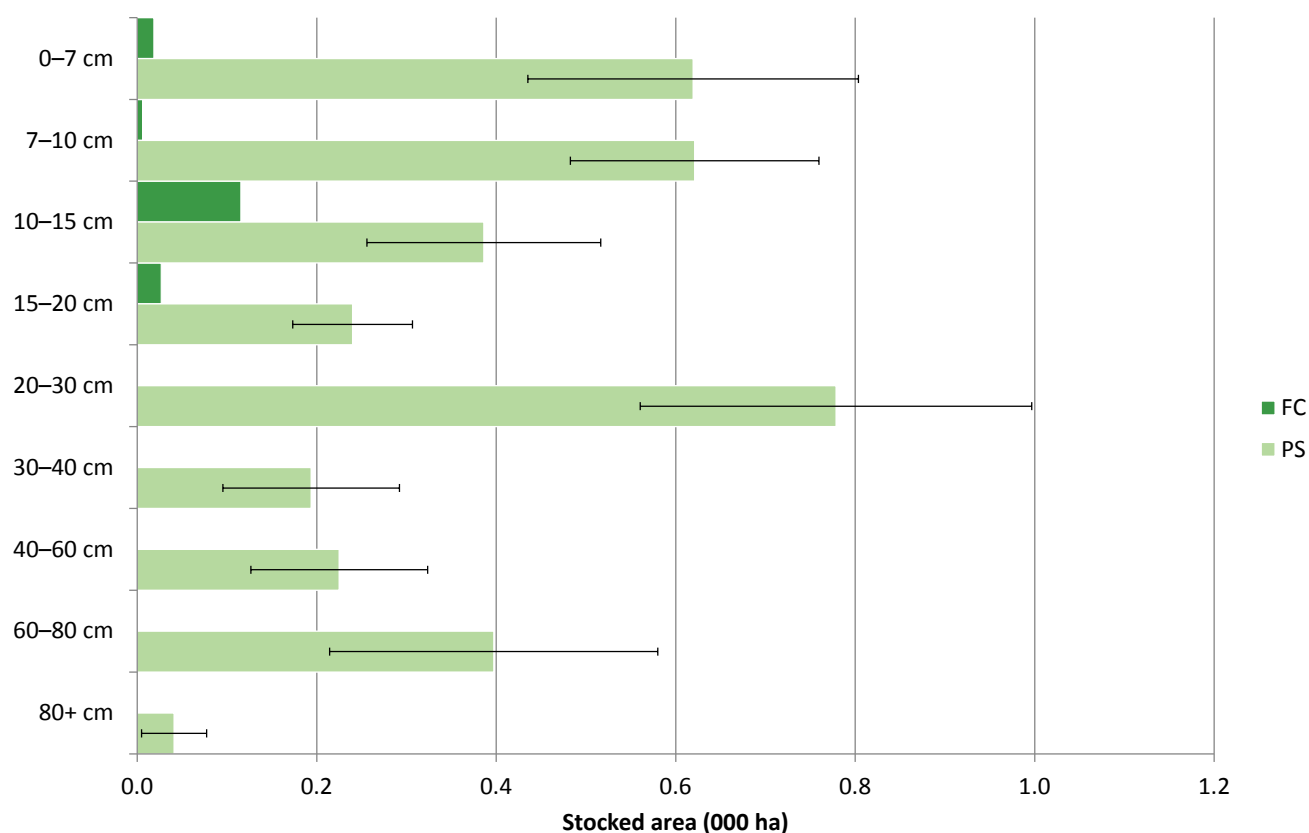


**Table 44** Stocked area of ash by age class

Age class (years)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Cumbria and Lancashire				
0-10	< 0.1	0.6	31	0.6
11-20	< 0.1	0.8	22	0.8
21-40	< 0.1	0.6	30	0.6
41-60	< 0.1	0.5	34	0.6
61-80	< 0.1	0.7	30	0.8
81-100	< 0.1	0.2	34	0.2
100+	< 0.1	< 0.1	65	< 0.1
<b>Total</b>	<b>0.2</b>	<b>3.5</b>	<b>13</b>	<b>3.7</b>

## Part 4 – Tree health

**Figure 50** Stocked area of ash by mean stand dbh class

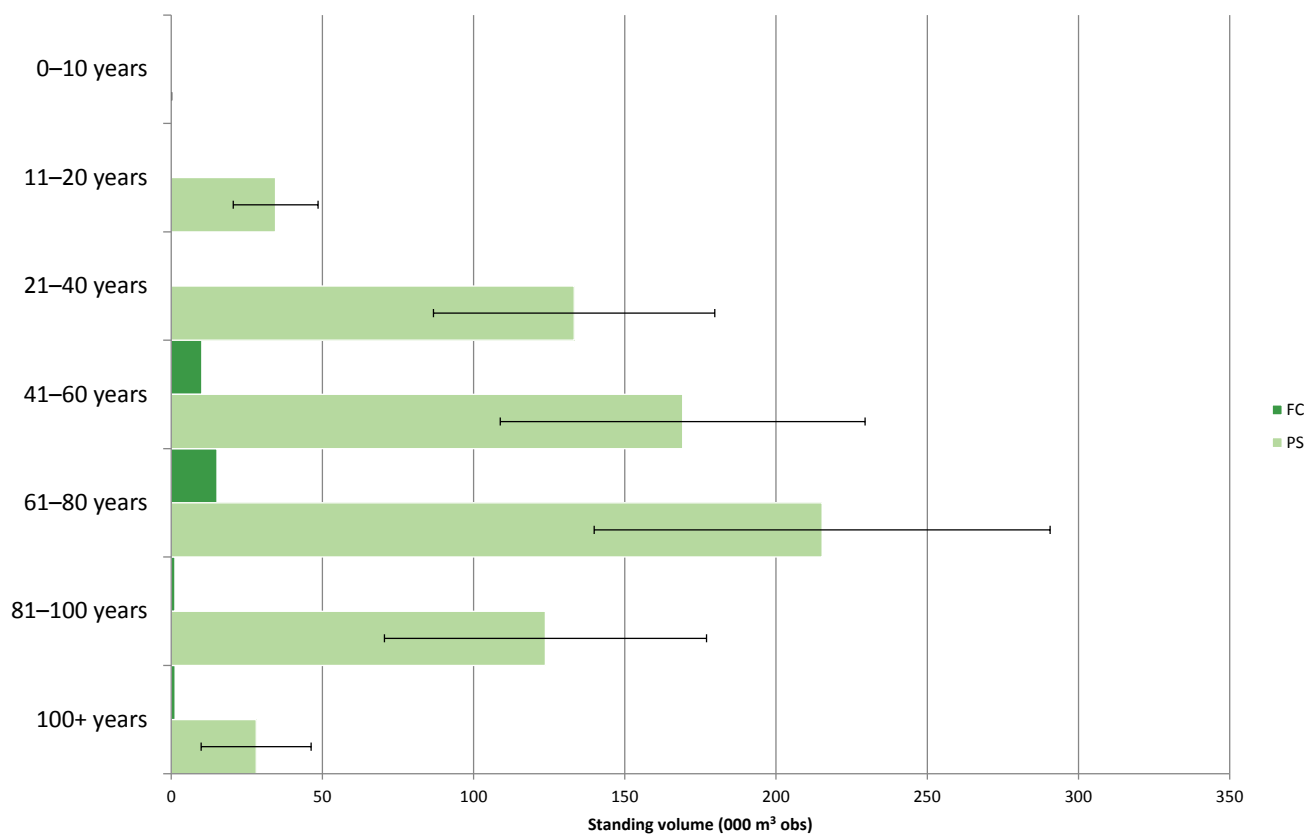


**Table 45** Stocked area of ash by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Cumbria and Lancashire				
0-7	< 0.1	0.6	30	0.6
7-10	< 0.1	0.6	22	0.6
10-15	0.1	0.4	34	0.5
15-20	< 0.1	0.2	28	0.3
20-30	< 0.1	0.8	28	0.8
30-40	< 0.1	0.2	51	0.2
40-60	0.0	0.2	44	0.2
60-80	0.0	0.4	46	0.4
80+	0.0	< 0.1	88	< 0.1
<b>Total</b>	<b>0.2</b>	<b>3.5</b>	<b>4</b>	<b>3.7</b>

## Part 4 – Tree health

**Figure 51** Standing volume of ash by age class

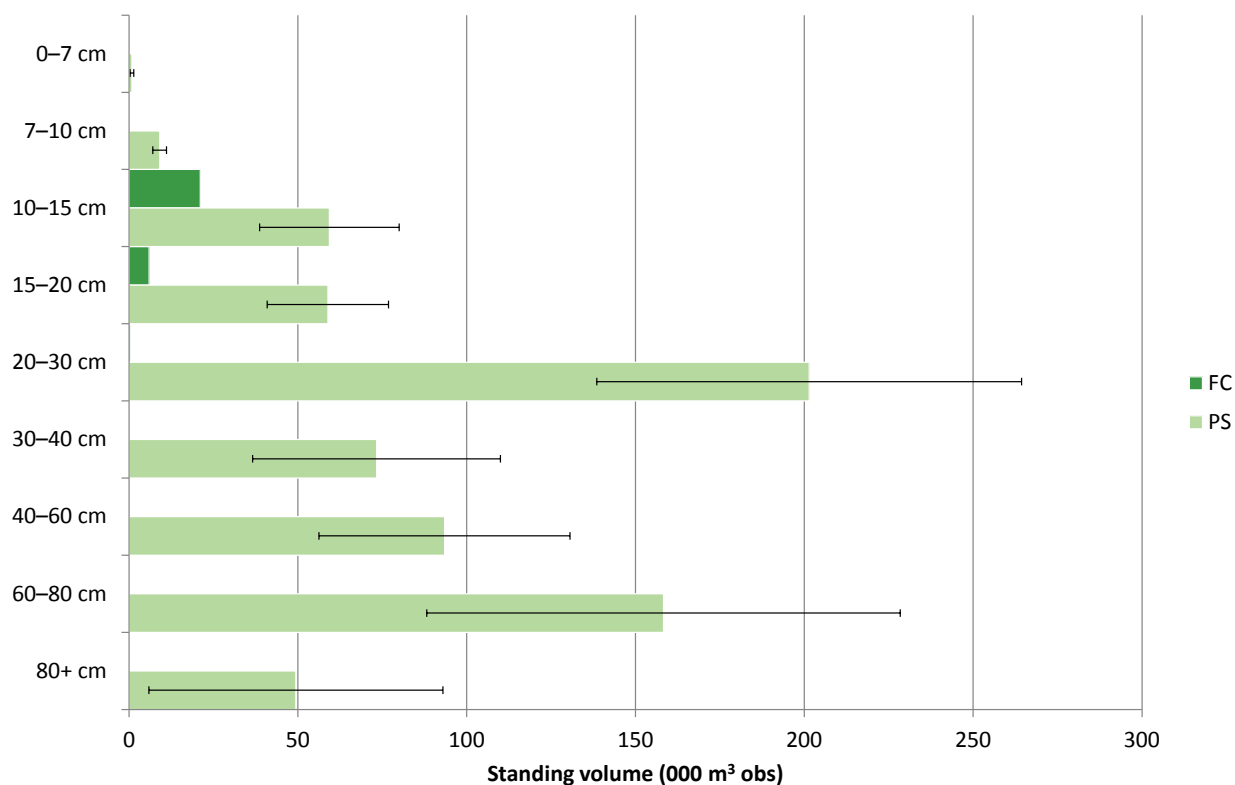


**Table 46** Standing volume of ash by age class

Age class (years)	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
0-10	0	< 1	71	< 1
11-20	< 1	35	41	35
21-40	< 1	133	35	133
41-60	10	169	36	179
61-80	15	215	35	230
81-100	1	124	43	125
100+	1	28	65	29
<b>Total</b>	<b>28</b>	<b>704</b>	<b>17</b>	<b>732</b>

## Part 4 – Tree health

**Figure 52** Standing volume of ash by mean stand dbh class

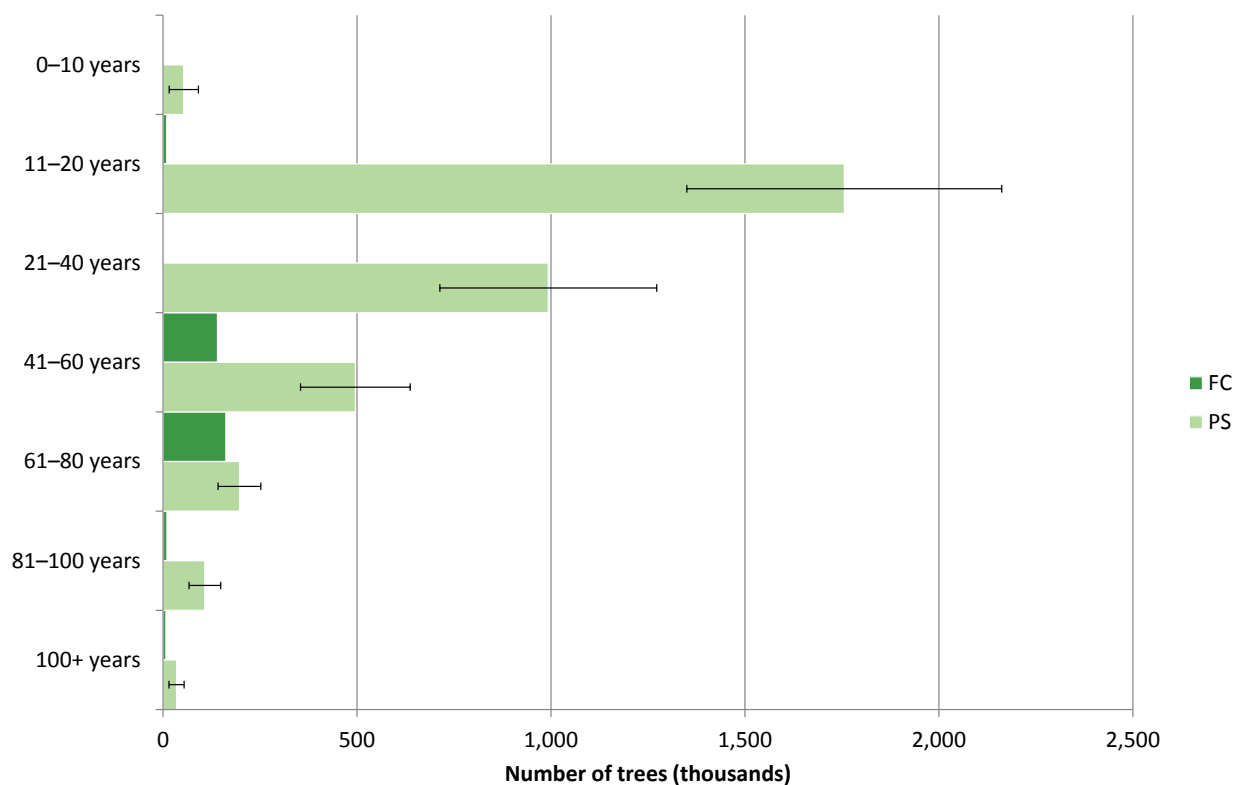


**Table 47** Standing volume of ash by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
0-7	0	< 1	66	< 1
7-10	< 1	9	22	9
10-15	21	59	35	80
15-20	6	59	31	65
20-30	< 1	201	31	202
30-40	< 1	73	50	74
40-60	0	93	40	93
60-80	0	158	44	158
80+	0	49	88	49
<b>Total</b>	<b>28</b>	<b>704</b>	<b>17</b>	<b>732</b>

## Part 4 – Tree health

**Figure 53** Number of ash trees by age class

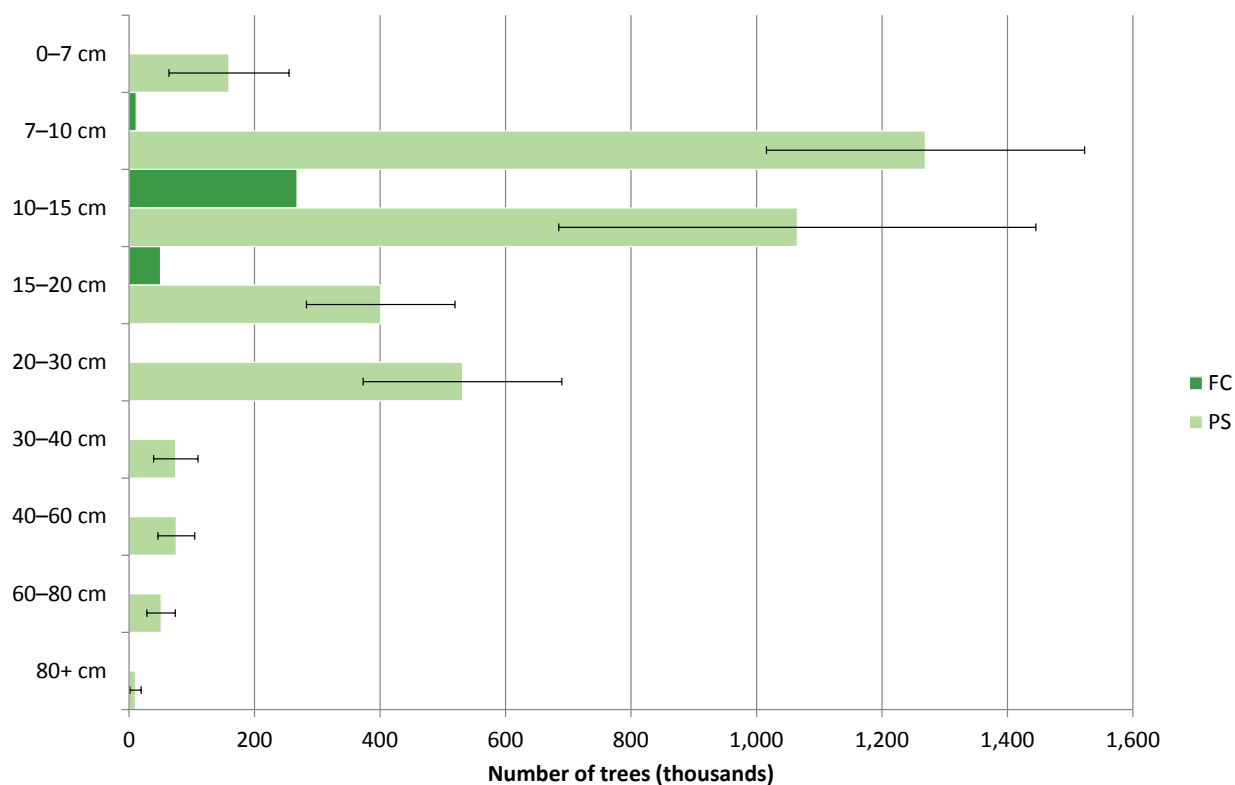


**Table 48** Number of ash trees by age class

Age class (years)	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
Cumbria and Lancashire				
0-10	0	53	71	53
11-20	10	1,756	23	1,766
21-40	2	993	28	995
41-60	140	496	29	636
61-80	162	197	28	359
81-100	10	108	38	118
100+	7	35	56	42
<b>Total</b>	<b>331</b>	<b>3,637</b>	<b>16</b>	<b>3,968</b>

## Part 4 – Tree health

**Figure 54** Number of ash trees by mean stand dbh class

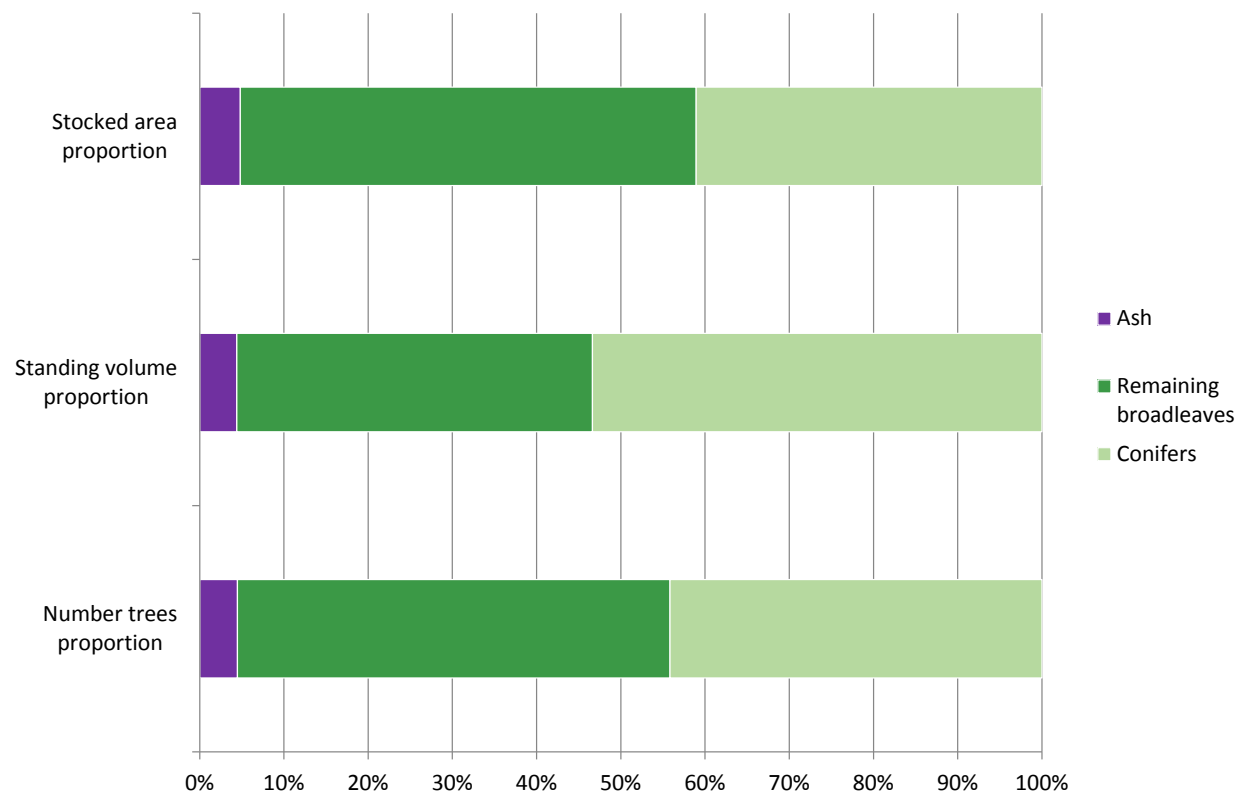


**Table 49** Number of ash trees by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
Cumbria and Lancashire				
0-7	0	159	60	159
7-10	11	1,269	20	1,281
10-15	268	1,065	36	1,333
15-20	50	401	30	451
20-30	1	532	30	533
30-40	< 1	75	48	75
40-60	0	75	39	75
60-80	0	51	44	51
80+	0	10	88	10
<b>Total</b>	<b>331</b>	<b>3,637</b>	<b>16</b>	<b>3,968</b>

# Part 4 – Tree health

**Figure 55** Ash as a proportion of woodland



## Part 4 – Tree health

**Table 50** Stocked area of ash as a proportion of woodland

Aligned area	Stocked area of ash			
	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Cumbria and Lancashire	0.2	3.5	13	<b>3.7</b>

**Table 50 (cont'd)** Stocked area of ash as a proportion of woodland

Aligned area	Stocked area of all broadleaves and all species			
	Total of all broadleaves	Total of all species	Percentage of ash in all broadleaves	Percentage of ash in all species
	area (000 ha)	area (000 ha)	(percent)	(percent)
Cumbria and Lancashire	44.8	76.2	8	5

**Table 51** Standing volume of ash as a proportion of woodland

Aligned area	Standing volume of ash			
	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire	28	704	17	<b>732</b>

**Table 51 (cont'd)** Standing volume of ash as a proportion of woodland

Aligned area	Standing volume of all broadleaves and all species			
	Total of all broadleaves	Total of all species	Percentage of ash in all broadleaves	Percentage of ash in all species
	volume (000 m³ obs)	volume (000 m³ obs)	(percent)	(percent)
Cumbria and Lancashire	7,726	16,572	9	4



## Part 4 – Tree health

**Table 52** Number of ash trees as a proportion of woodland

Aligned Area	Numbers of trees of ash			
	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
Cumbria and Lancashire	331	3,637	16	<b>3,968</b>

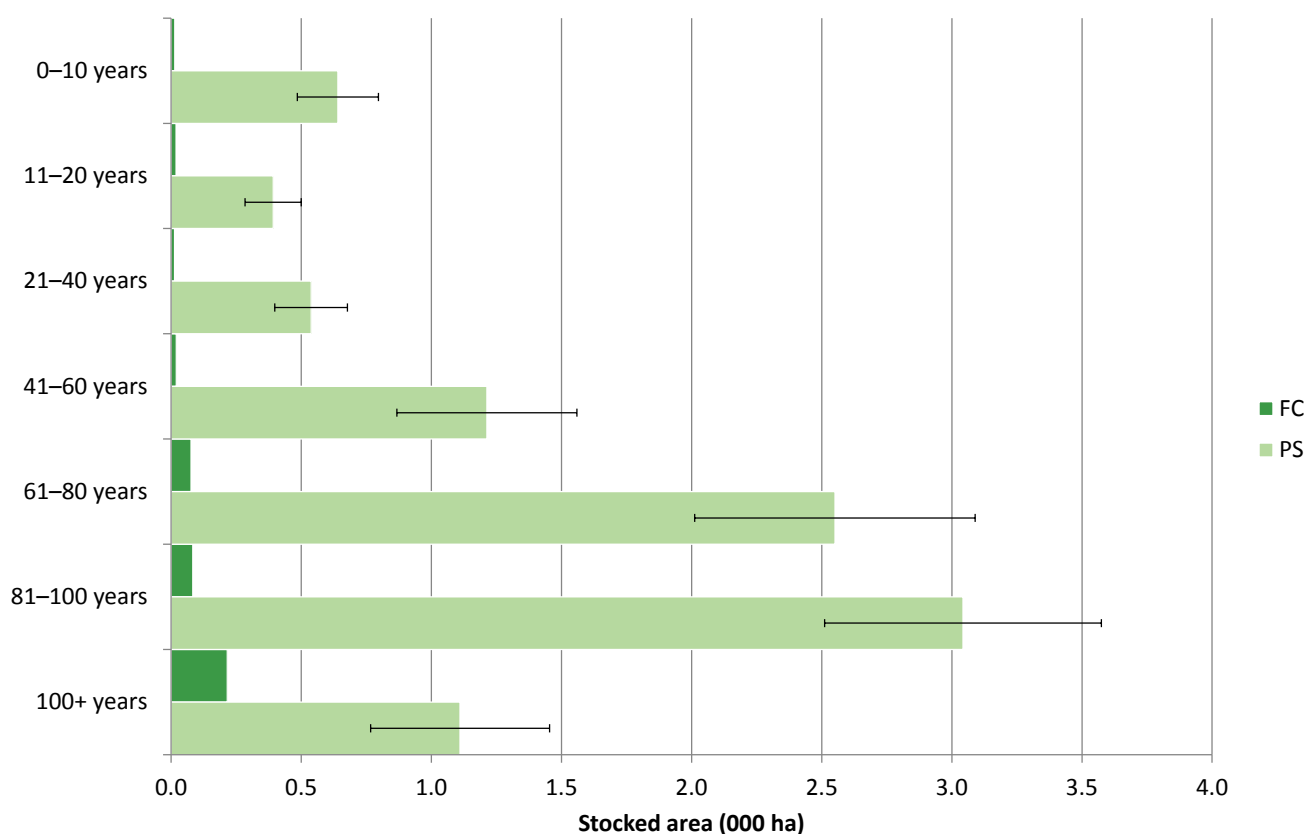
**Table 52 (cont'd)** Number of ash trees as a proportion of woodland

Aligned Area	Number of trees of all broadleaves and all species			
	Total of all broadleaves	Total of all species	Percentage of ash in all broadleaves	Percentage of ash in all species
	number of trees (thousands)	number of trees (thousands)	(percent)	(percent)
Cumbria and Lancashire	49,491	88,712	8	4

## Part 4 – Tree health

### Oak

**Figure 56** Stocked area of oak by age class

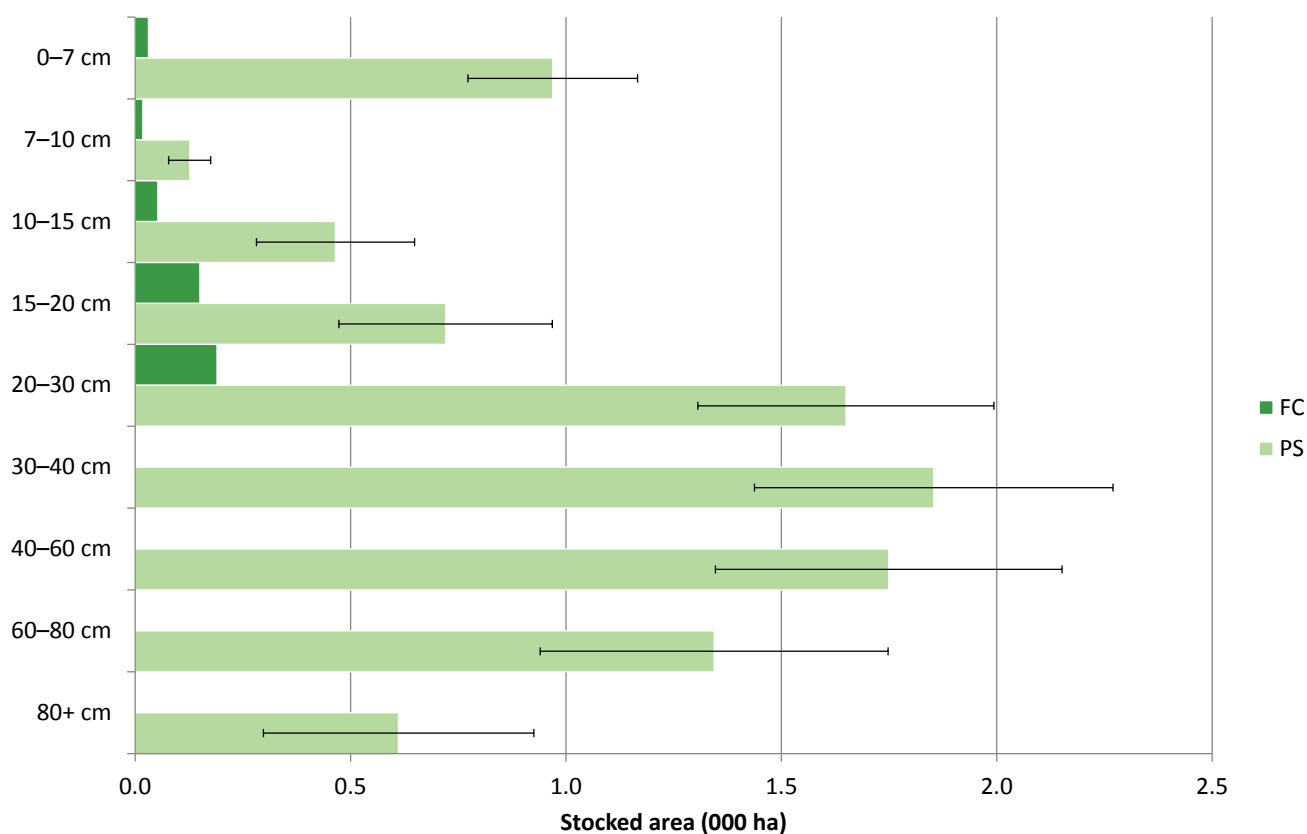


**Table 53** Stocked area of oak by age class

Age class (years)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Cumbria and Lancashire				
0-10	< 0.1	0.6	24	<b>0.7</b>
11-20	< 0.1	0.4	27	<b>0.4</b>
21-40	< 0.1	0.5	26	<b>0.6</b>
41-60	< 0.1	1.2	28	<b>1.2</b>
61-80	< 0.1	2.6	21	<b>2.6</b>
81-100	< 0.1	3.0	17	<b>3.1</b>
100+	0.2	1.1	31	<b>1.3</b>
<b>Total</b>	<b>0.4</b>	<b>9.5</b>	<b>9</b>	<b>9.9</b>

## Part 4 – Tree health

**Figure 57** Stocked area of oak by mean stand dbh class

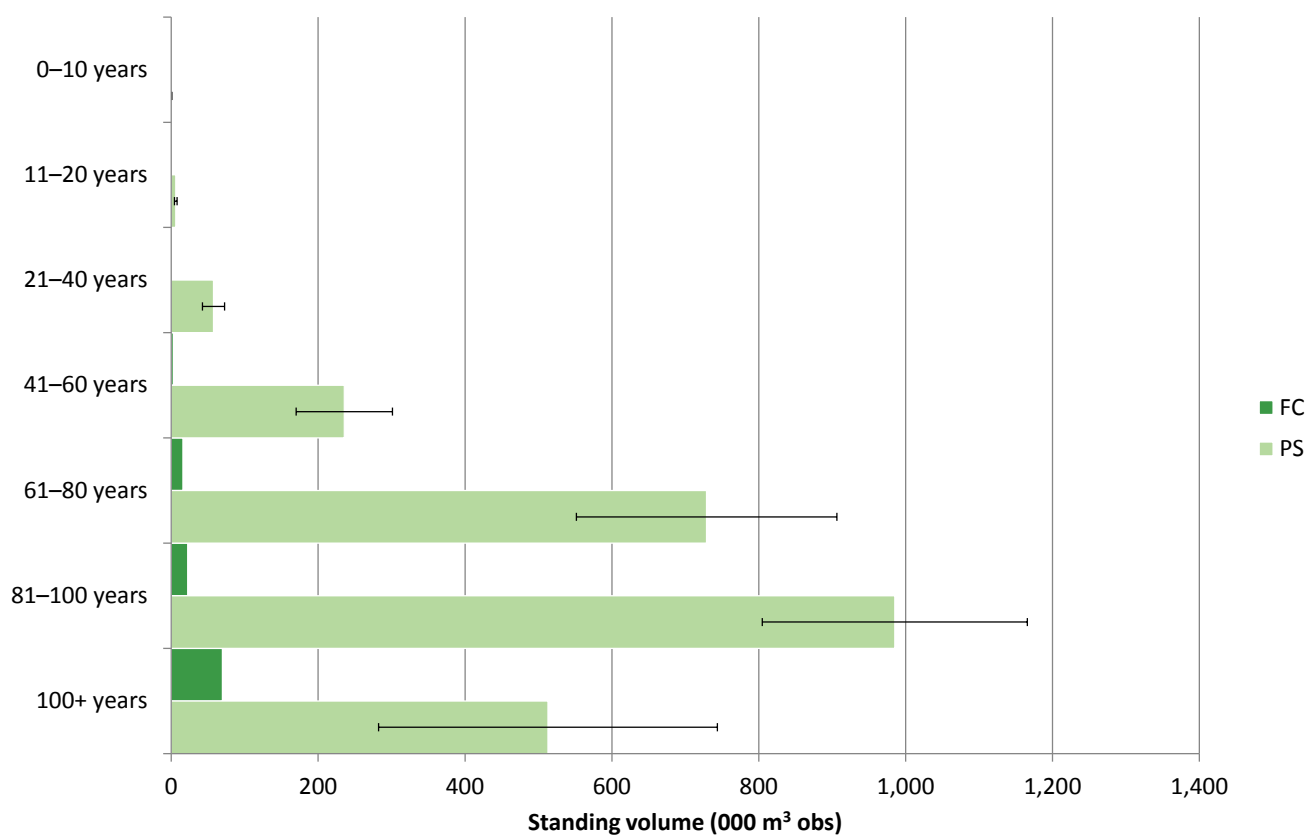


**Table 54** Stocked area of oak by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
<b>Cumbria and Lancashire</b>				
0-7	< 0.1	1.0	20	<b>1.0</b>
7-10	< 0.1	0.1	39	<b>0.1</b>
10-15	< 0.1	0.5	40	<b>0.5</b>
15-20	0.2	0.7	34	<b>0.9</b>
20-30	0.2	1.6	21	<b>1.8</b>
30-40	< 0.1	1.9	22	<b>1.9</b>
40-60	< 0.1	1.7	23	<b>1.7</b>
60-80	0.0	1.3	30	<b>1.3</b>
80+	0.0	0.6	51	<b>0.6</b>
<b>Total</b>	<b>0.4</b>	<b>9.5</b>	<b>9</b>	<b>9.9</b>

## Part 4 – Tree health

**Figure 58** Standing volume of oak by age class

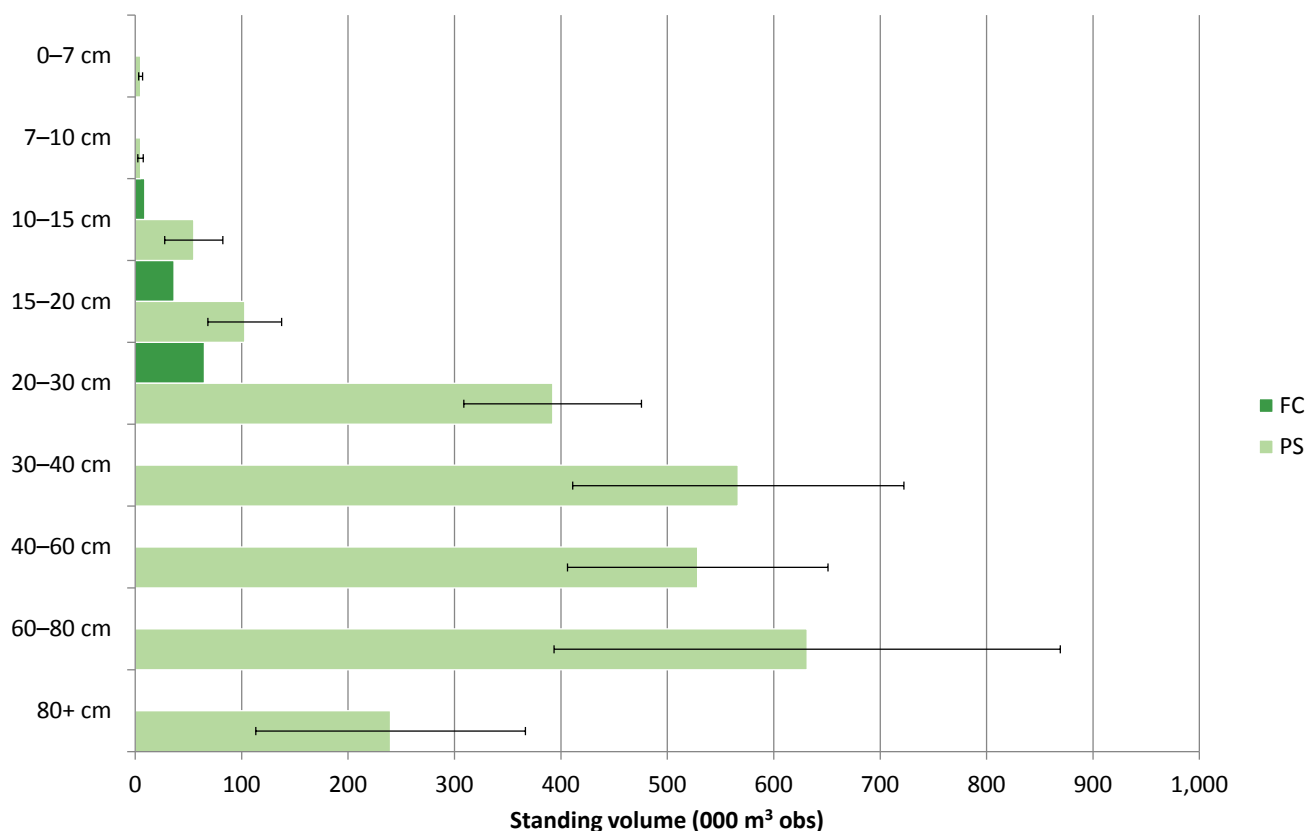


**Table 55** Standing volume of oak by age class

Age class (years)	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
0-10	0	< 1	89	< 1
11-20	< 1	6	29	6
21-40	< 1	58	26	58
41-60	3	236	28	239
61-80	16	729	24	745
81-100	22	985	18	1,007
100+	70	513	45	583
<b>Total</b>	<b>111</b>	<b>2,527</b>	<b>13</b>	<b>2,638</b>

## Part 4 – Tree health

**Figure 59** Standing volume of oak by mean stand dbh class

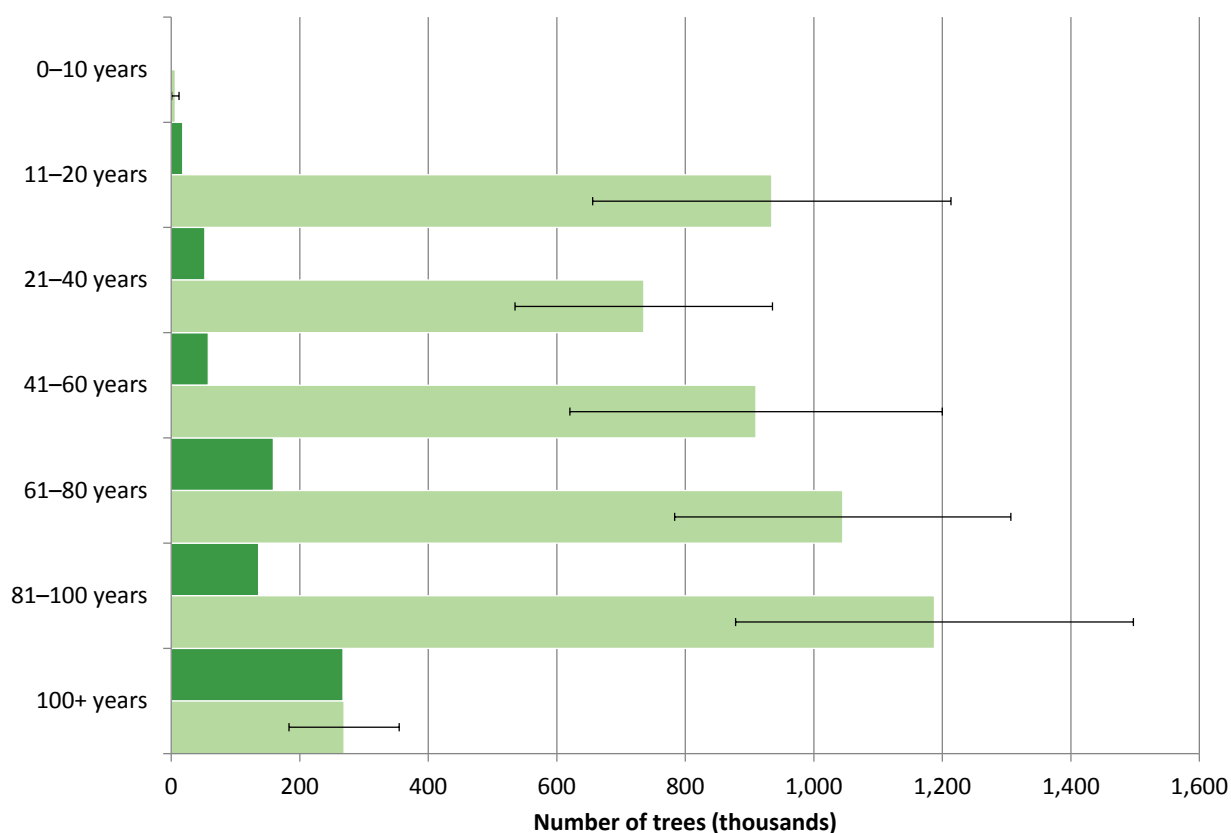


**Table 56** Standing volume of oak by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
0-7	< 1	5	35	5
7-10	< 1	5	50	6
10-15	9	55	50	64
15-20	37	103	34	139
20-30	65	392	21	457
30-40	< 1	567	27	567
40-60	< 1	529	23	529
60-80	< 1	631	38	631
80+	0	240	53	240
<b>Total</b>	<b>111</b>	<b>2,527</b>	<b>13</b>	<b>2,638</b>

## Part 4 – Tree health

**Figure 60** Number of oak trees by age class

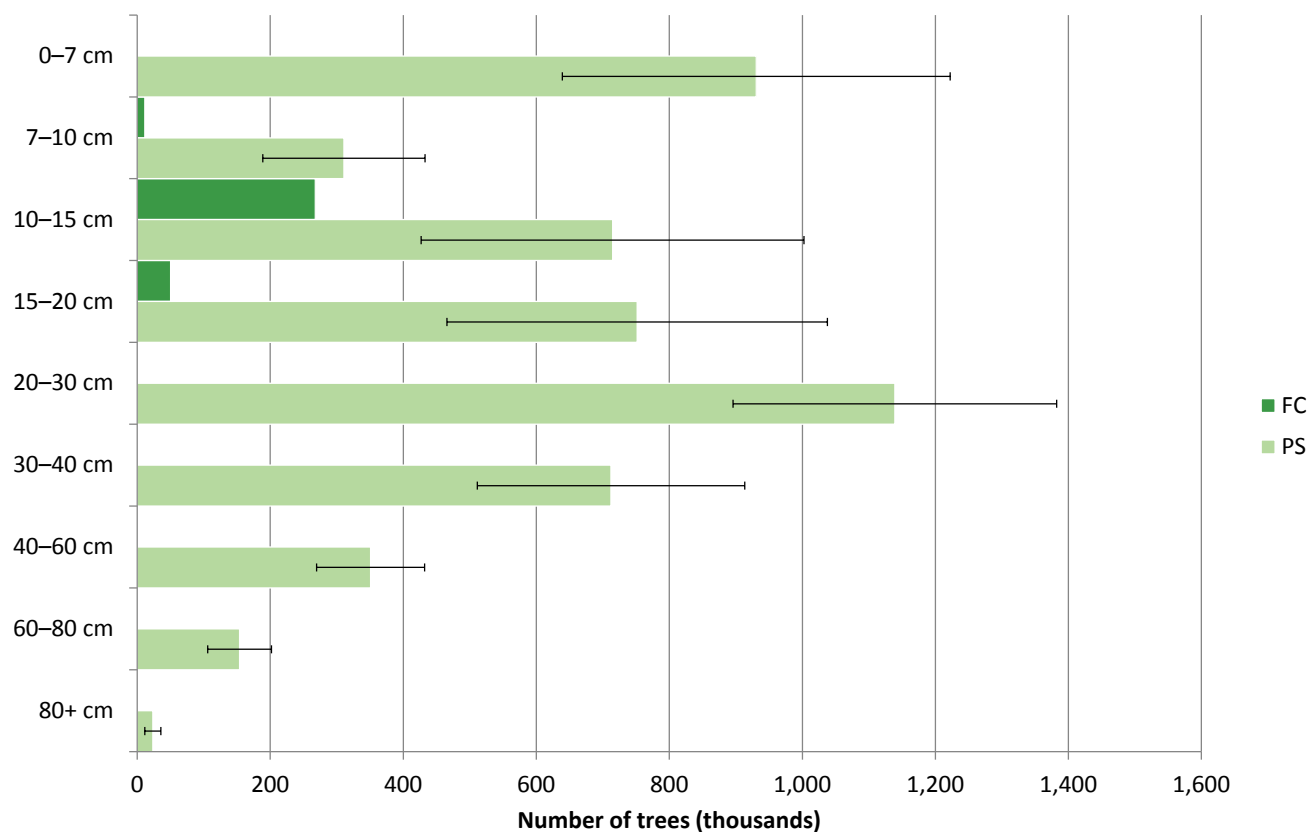


**Table 57** Number of oak trees by age class

Age class (years)	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
Cumbria and Lancashire				
0-10	0	6	89	6
11-20	18	935	30	952
21-40	52	735	27	788
41-60	58	910	32	968
61-80	159	1,045	25	1,204
81-100	136	1,188	26	1,324
100+	267	269	32	536
<b>Total</b>	<b>690</b>	<b>5,088</b>	<b>12</b>	<b>5,778</b>

## Part 4 – Tree health

**Figure 61** Number of oak trees by mean stand dbh class

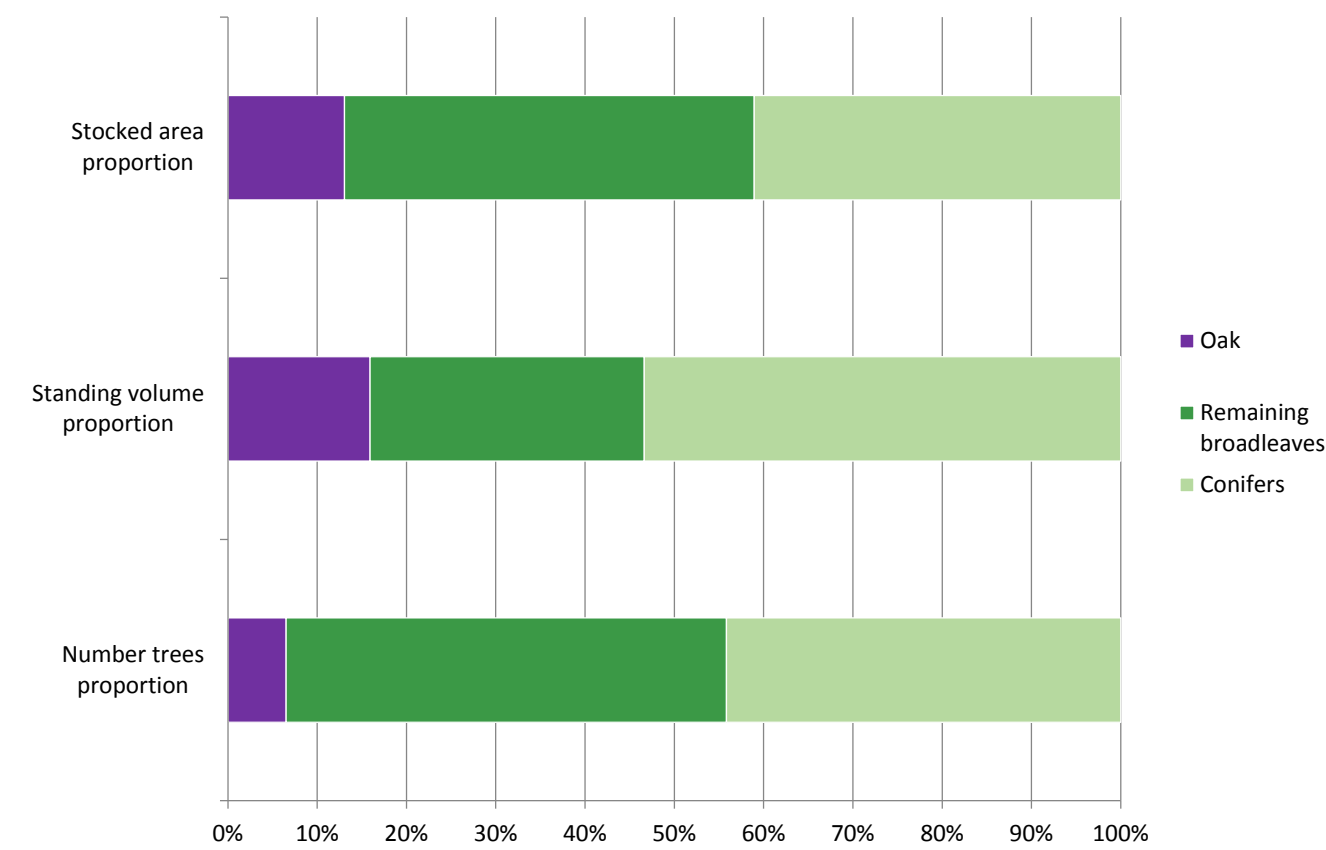


**Table 58** Number of oak trees by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
<b>Cumbria and Lancashire</b>				
0-7	0	931	31	<b>931</b>
7-10	11	311	39	<b>322</b>
10-15	268	715	40	<b>982</b>
15-20	50	752	38	<b>802</b>
20-30	1	1,139	21	<b>1,140</b>
30-40	< 1	712	28	<b>713</b>
40-60	0	351	23	<b>351</b>
60-80	0	154	31	<b>154</b>
80+	0	24	51	<b>24</b>
<b>Total</b>	<b>690</b>	<b>5,088</b>	<b>12</b>	<b>5,778</b>

# Part 4 – Tree health

**Figure 62** Oak as a proportion of woodland





## Part 4 – Tree health

**Table 59** Stocked area of oak as a proportion of woodland

Aligned area	Stocked area of oak			
	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Cumbria and Lancashire	0.4	9.5	9	<b>9.9</b>

**Table 59 (cont'd)** Stocked area of oak as a proportion of woodland

Aligned area	Stocked area of all broadleaves and all species			
	Total of all broadleaves	Total of all species	Percentage of oak in all broadleaves	Percentage of oak in all species
	area (000 ha)	area (000 ha)	(percent)	(percent)
Cumbria and Lancashire	44.8	76.2	22	13

**Table 60** Standing volume of oak as a proportion of woodland

Aligned area	Standing volume of oak			
	FC	Private sector		Total
	volume (000 m <sup>3</sup> obs)	volume (000 m <sup>3</sup> obs)	SE%	volume (000 m <sup>3</sup> obs)
Cumbria and Lancashire	111	2,527	13	<b>2,638</b>

**Table 60 (cont'd)** Standing volume of oak as a proportion of woodland

Aligned area	Standing volume of all broadleaves and all species			
	Total of all broadleaves	Total of all species	Percentage of oak in all broadleaves	Percentage of oak in all species
	volume (000 m <sup>3</sup> obs)	volume (000 m <sup>3</sup> obs)	(percent)	(percent)
Cumbria and Lancashire	7,726	16,572	34	16

## Part 4 – Tree health

**Table 61** Number of oak trees as a proportion of woodland

Aligned Area	Numbers of trees of oak			
	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
Cumbria and Lancashire	690	5,088	12	<b>5,778</b>

**Table 61 (cont'd)** Number of oak trees as a proportion of woodland

Aligned Area	Number of trees of all broadleaves and all species			
	Total of all broadleaves	Total of all species	Percentage of oak in all broadleaves	Percentage of oak in all species
	number of trees (thousands)	number of trees (thousands)	(percent)	(percent)
Cumbria and Lancashire	49,491	88,712	12	7

## Sweet chestnut

**Figure 63** Stocked area of sweet chestnut by age class

This figure has been omitted as the estimates indicate that there is a very small population, with a high standard error of sweet chestnut within Cumbria and Lancashire

**Table 62** Stocked area of sweet chestnut by age class

Age class (years)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Cumbria and Lancashire				
0–10	0.0	0.0	-	0.0
11–20	0.0	0.0	-	0.0
21–40	0.0	0.0	-	0.0
41–60	0.0	0.0	-	0.0
61–80	0.0	< 0.1	89	< 0.1
81–100	0.0	0.0	-	0.0
100+	0.0	0.0	-	0.0
<b>Total</b>	<b>0.0</b>	<b>&lt; 0.1</b>	<b>89</b>	<b>&lt; 0.1</b>

## Part 4 – Tree health

**Figure 64** Stocked area of sweet chestnut by mean stand dbh class

This figure has been omitted as the estimates indicate that there is a very small population, with a high standard error of sweet chestnut within Cumbria and Lancashire

**Table 63** Stocked area of sweet chestnut by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Cumbria and Lancashire				
0–7	0.0	0.0	-	<b>0.0</b>
7–10	0.0	< 0.1	89	< <b>0.1</b>
10–15	0.0	0.0	-	<b>0.0</b>
15–20	0.0	0.0	-	<b>0.0</b>
20–30	0.0	0.0	-	<b>0.0</b>
30–40	0.0	0.0	-	<b>0.0</b>
40–60	0.0	0.0	-	<b>0.0</b>
60–80	0.0	0.0	-	<b>0.0</b>
80+	0.0	0.0	-	<b>0.0</b>
<b>Total</b>	<b>0.0</b>	< 0.1	89	< <b>0.1</b>

# Part 4 – Tree health

**Figure 65** Standing volume of sweet chestnut by age class

This figure has been omitted as the estimates indicate that there is a very small population, with a high standard error of sweet chestnut within Cumbria and Lancashire

**Table 64** Standing volume of sweet chestnut by age class

Age class (years)	FC	Private sector		Total
	volume (000 m <sup>3</sup> obs)	volume (000 m <sup>3</sup> obs)	SE%	volume (000 m <sup>3</sup> obs)
Cumbria and Lancashire				
0–10	0	0	-	0
11–20	0	0	-	0
21–40	0	0	-	0
41–60	0	0	-	0
61–80	0	0	89	0
81–100	0	0	-	0
100+	0	0	-	0
Total	0	0	89	0

# Part 4 – Tree health

**Figure 66** Standing volume of sweet chestnut by mean stand dbh class

This figure has been omitted as the estimates indicate that there is a very small population, with a high standard error of sweet chestnut within Cumbria and Lancashire

**Table 65** Standing volume of sweet chestnut by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	volume (000 m <sup>3</sup> obs)	volume (000 m <sup>3</sup> obs)	SE%	volume (000 m <sup>3</sup> obs)
Cumbria and Lancashire				
0–7	0	0	-	0
7–10	0	0	89	0
10–15	0	0	-	0
15–20	0	0	-	0
20–30	0	0	-	0
30–40	0	0	-	0
40–60	0	0	-	0
60–80	0	0	-	0
80+	0	0	-	0
Total	0	0	89	0

# Part 4 – Tree health

**Figure 67** Number of sweet chestnut trees by age class

This figure has been omitted as the estimates indicate that there is a very small population, with a high standard error of sweet chestnut within Cumbria and Lancashire

**Table 66** Number of sweet chestnut trees by age class

Age class (years)	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
Cumbria and Lancashire				
0–10	0	0	-	0
11–20	0	0	-	0
21–40	0	0	-	0
41–60	0	0	-	0
61–80	0	< 1	89	< 1
81–100	0	0	-	0
100+	0	0	-	0
Total	0	< 1	89	< 1

# Part 4 – Tree health

**Figure 68** Number of sweet chestnut trees by mean stand dbh class

This figure has been omitted as the estimates indicate that there is a very small population, with a high standard error of sweet chestnut within Cumbria and Lancashire

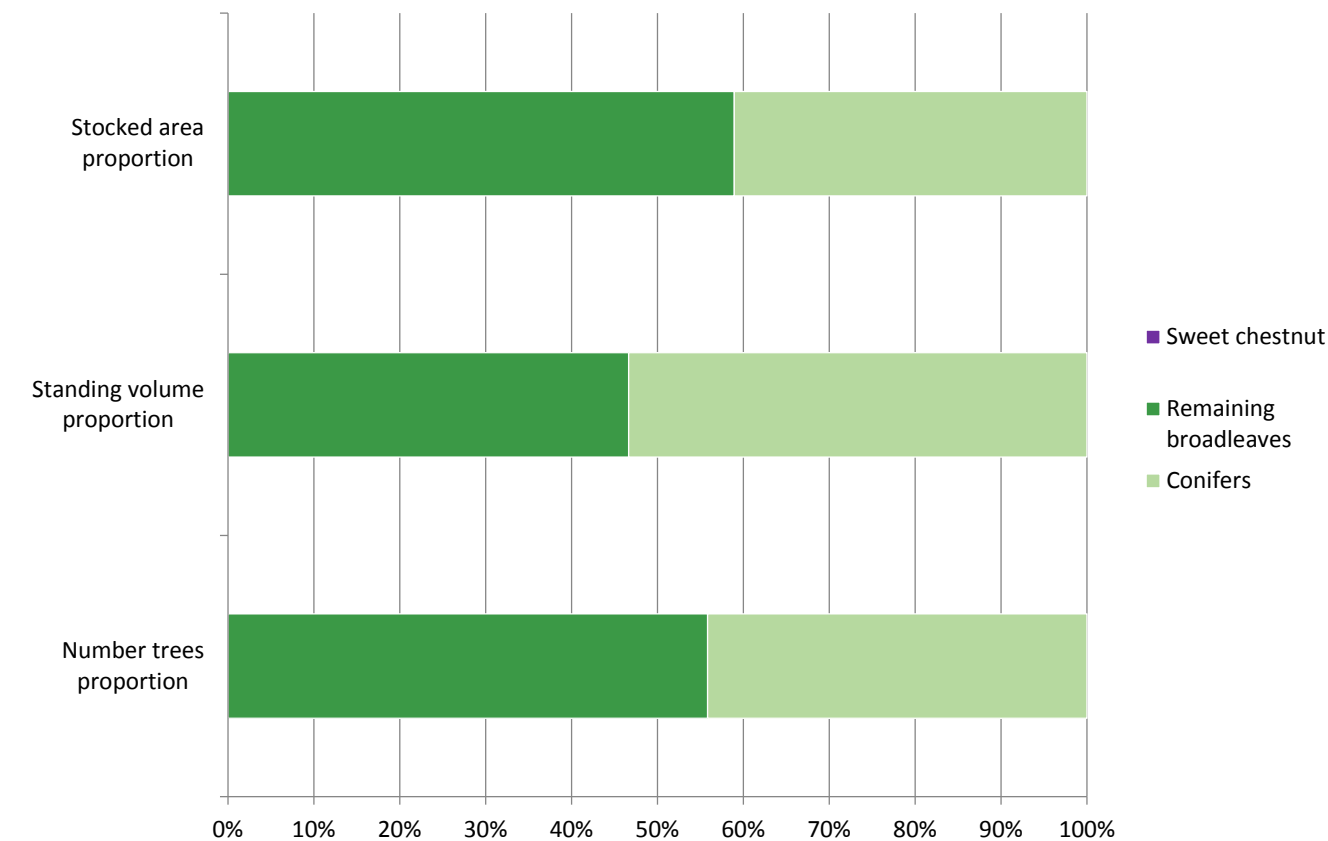
**Table 67** Number of sweet chestnut trees by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
Cumbria and Lancashire				
0–7	0	0	-	0
7–10	0	< 1	89	< 1
10–15	0	0	-	0
15–20	0	0	-	0
20–30	0	0	-	0
30–40	0	0	-	0
40–60	0	0	-	0
60–80	0	0	-	0
80+	0	0	-	0
Total	0	< 1	89	< 1



# Part 4 – Tree health

**Figure 69** Sweet chestnut as a proportion of woodland



## Part 4 – Tree health

**Table 68** Stocked area of sweet chestnut as a proportion of woodland

Aligned area	Stocked area of sweet chestnut			
	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Cumbria and Lancashire	0.0	< 0.1	89	< 0.1

**Table 68 (cont'd)** Stocked area of sweet chestnut as a proportion of woodland

Aligned area	Stocked area of all broadleaves and all species			
	Total of all broadleaves	Total of all species	Percentage of sweet chestnut in all broadleaves	Percentage of sweet chestnut in all species
	area (000 ha)	area (000 ha)	(percent)	(percent)
Cumbria and Lancashire	44.8	76.2	< 0.1	< 0.1

**Table 69** Standing volume of sweet chestnut as a proportion of woodland

Aligned area	Standing volume of sweet chestnut			
	FC	Private sector		Total
	volume (000 m <sup>3</sup> obs)	volume (000 m <sup>3</sup> obs)	SE%	volume (000 m <sup>3</sup> obs)
Cumbria and Lancashire	0	< 1	89	< 1

**Table 69 (cont'd)** Standing volume of sweet chestnut as a proportion of woodland

Aligned area	Standing volume of all broadleaves and all species			
	Total of all broadleaves	Total of all species	Percentage of sweet chestnut in all broadleaves	Percentage of sweet chestnut in all species
	volume (000 m <sup>3</sup> obs)	volume (000 m <sup>3</sup> obs)	(percent)	(percent)
Cumbria and Lancashire	7,726	16,572	0	0

## Part 4 – Tree health

**Table 70** Number of sweet chestnut trees as a proportion of woodland

Aligned Area	Numbers of trees of sweet chestnut			
	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
Cumbria and Lancashire	0	< 1	89	< 1

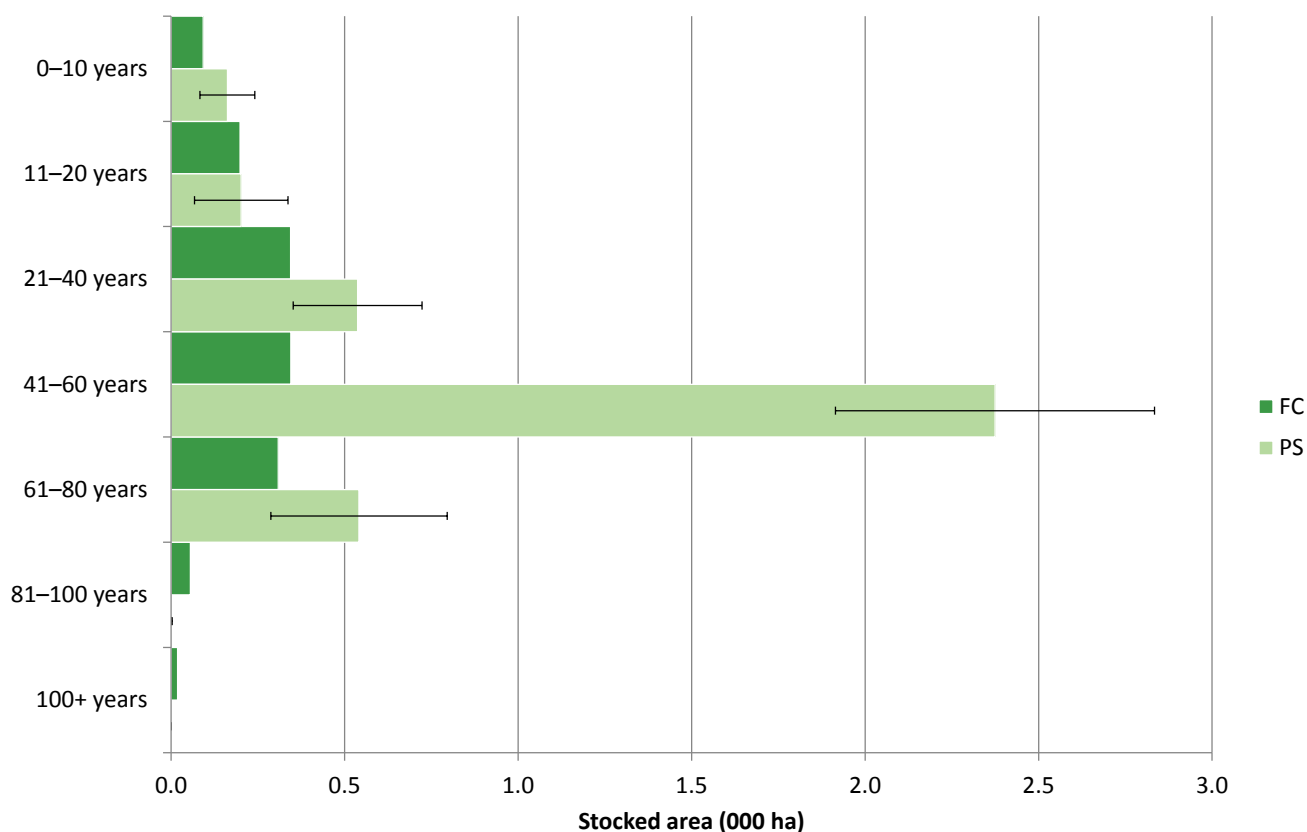
**Table 70 (cont'd)** Number of sweet chestnut trees as a proportion of woodland

Aligned Area	Number of trees of all broadleaves and all species			
	Total of all broadleaves	Total of all species	Percentage of sweet chestnut in all broadleaves	Percentage of sweet chestnut in all species
	number of trees (thousands)	number of trees (thousands)	(percent)	(percent)
Cumbria and Lancashire	49,491	88,712	< 1	< 1

## Part 4 – Tree health

### Larch

**Figure 70** Stocked area of larch by age class

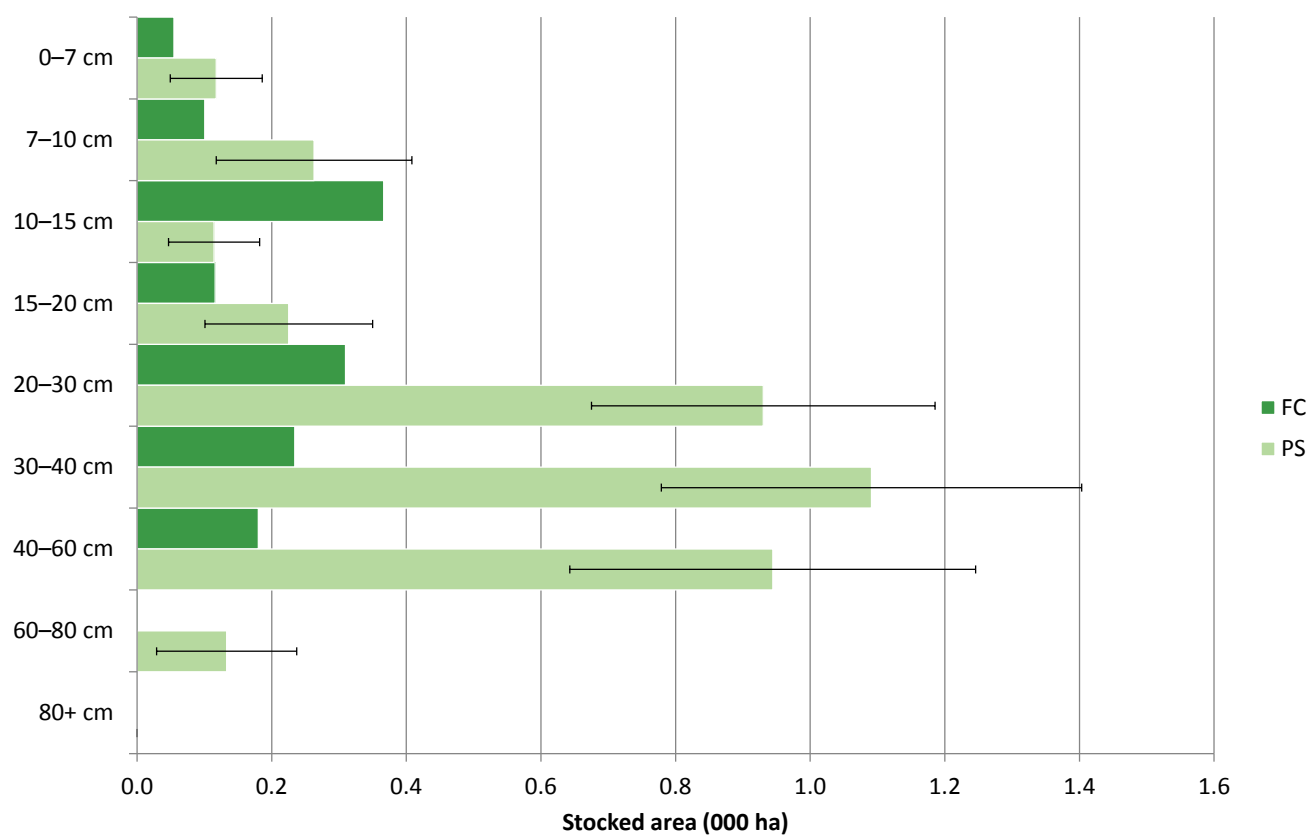


**Table 71** Stocked area of larch by age class

Age class (years)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Cumbria and Lancashire				
0-10	< 0.1	0.2	49	0.3
11-20	0.2	0.2	67	0.4
21-40	0.3	0.5	35	0.9
41-60	0.3	2.4	19	2.7
61-80	0.3	0.5	47	0.9
81-100	< 0.1	< 0.1	82	< 0.1
100+	< 0.1	0.0	-	< 0.1
<b>Total</b>	<b>1.4</b>	<b>3.8</b>	<b>15</b>	<b>5.2</b>

## Part 4 – Tree health

**Figure 71** Stocked area of larch by mean stand dbh class

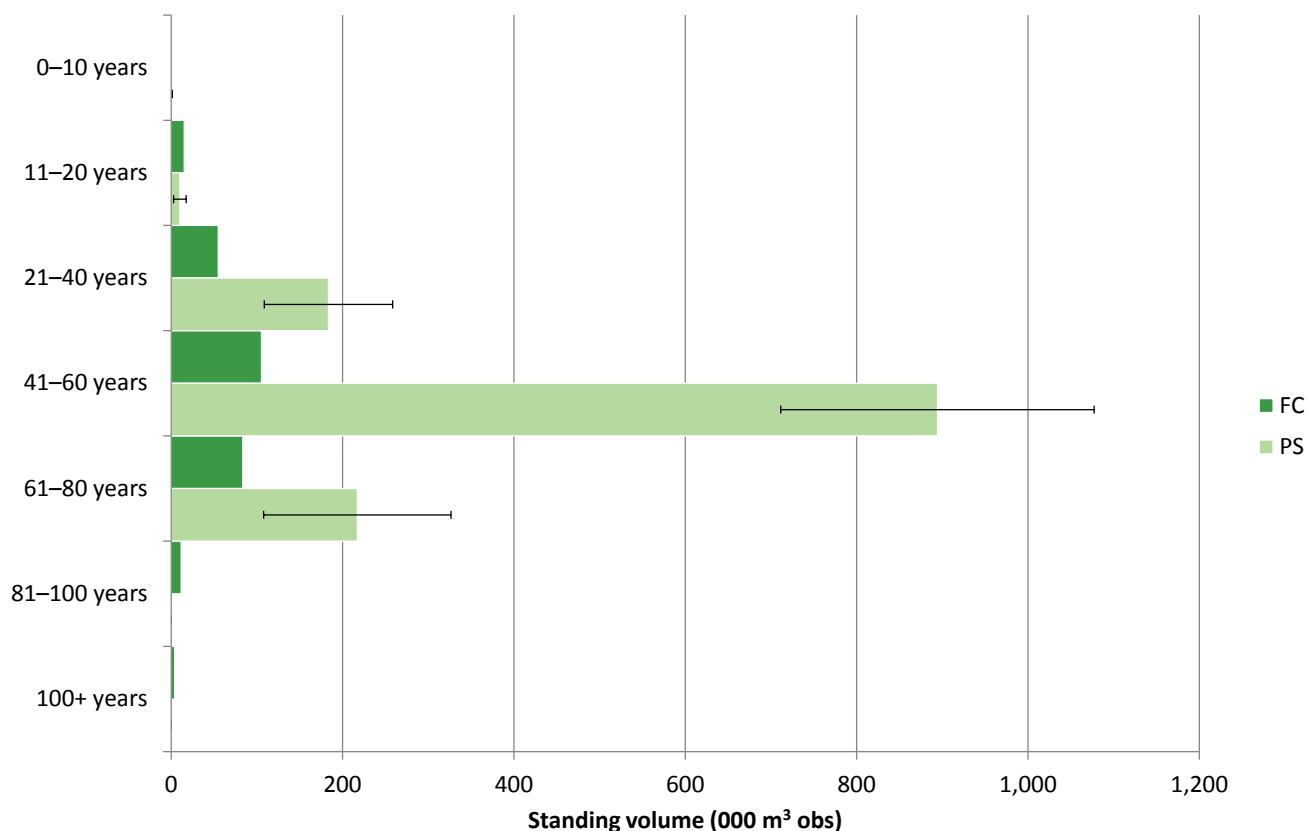


**Table 72** Stocked area of larch by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
<b>Cumbria and Lancashire</b>				
0-7	< 0.1	0.1	58	0.2
7-10	0.1	0.3	55	0.4
10-15	0.4	0.1	59	0.5
15-20	0.1	0.2	55	0.3
20-30	0.3	0.9	27	1.2
30-40	0.2	1.1	29	1.3
40-60	0.2	0.9	32	1.1
60-80	< 0.1	0.1	78	0.1
80+	0.0	0.0	-	0.0
<b>Total</b>	<b>1.4</b>	<b>3.8</b>	<b>15</b>	<b>5.2</b>

## Part 4 – Tree health

**Figure 72** Standing volume of larch by age class

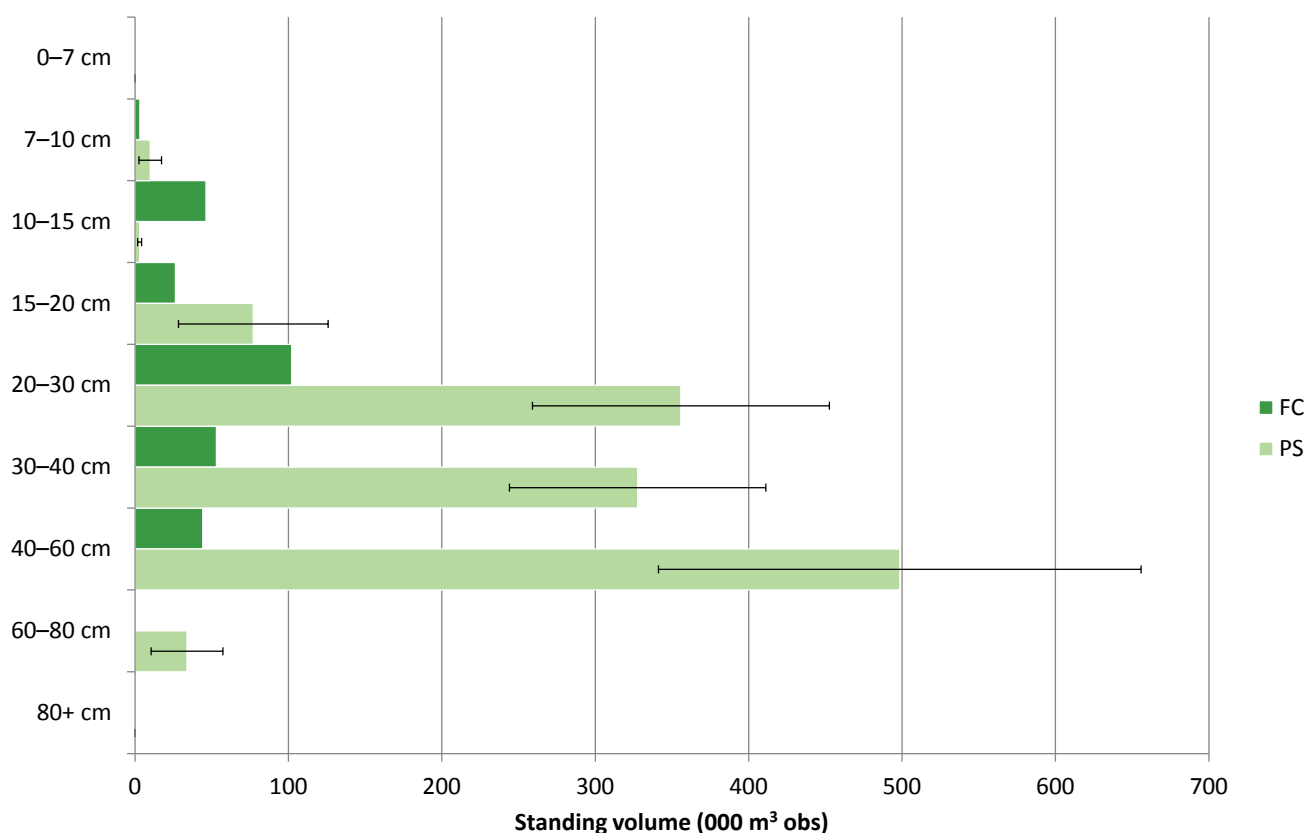


**Table 73** Standing volume of larch by age class

Age class (years)	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
0-10	< 1	< 1	82	1
11-20	15	10	73	25
21-40	55	183	41	238
41-60	105	894	20	1,000
61-80	84	217	50	301
81-100	12	< 1	82	12
100+	4	0	-	4
<b>Total</b>	<b>275</b>	<b>1,306</b>	<b>16</b>	<b>1,581</b>

## Part 4 – Tree health

**Figure 73** Standing volume of larch by mean stand dbh class

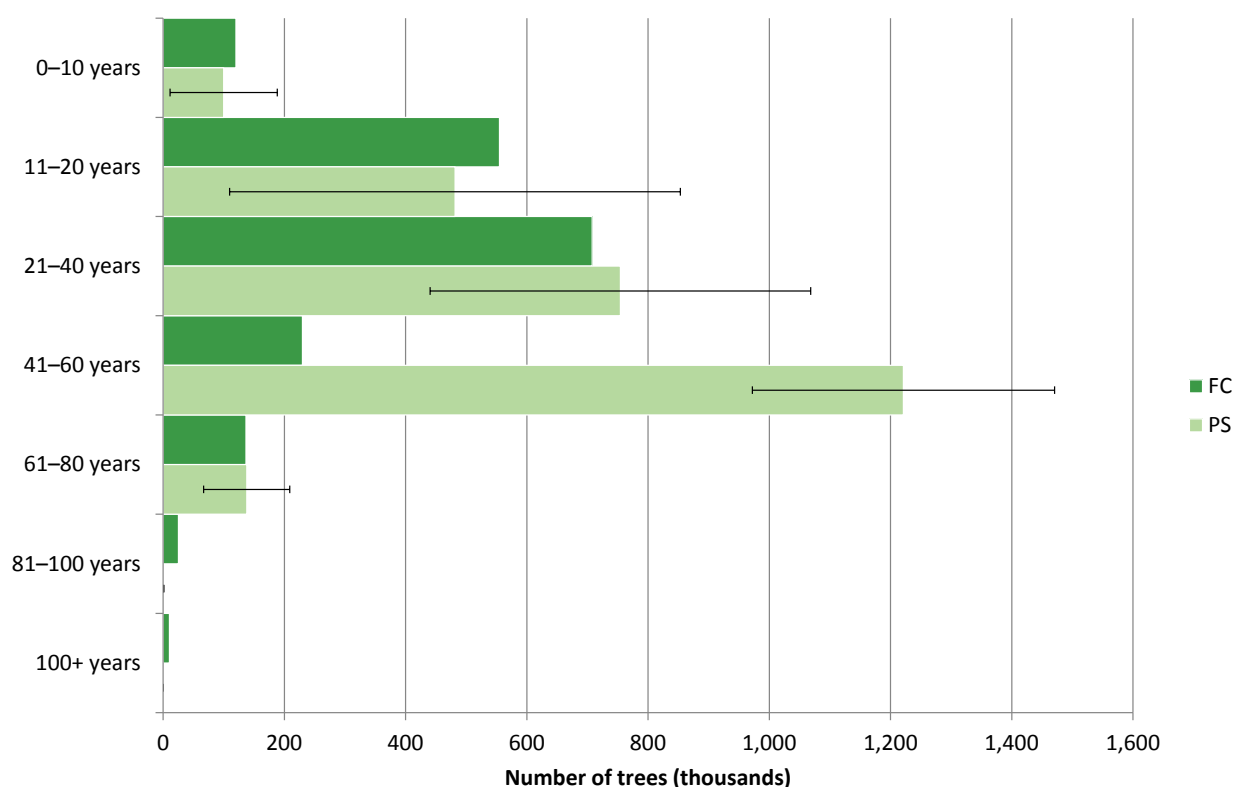


**Table 74** Standing volume of larch by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire				
0-7	< 1	0	-	< 1
7-10	3	10	74	13
10-15	46	3	44	49
15-20	26	77	63	103
20-30	102	356	27	458
30-40	53	328	26	381
40-60	44	499	32	543
60-80	< 1	34	69	34
80+	0	0	-	0
<b>Total</b>	<b>275</b>	<b>1,306</b>	<b>16</b>	<b>1,581</b>

## Part 4 – Tree health

**Figure 74** Number of larch trees by age class



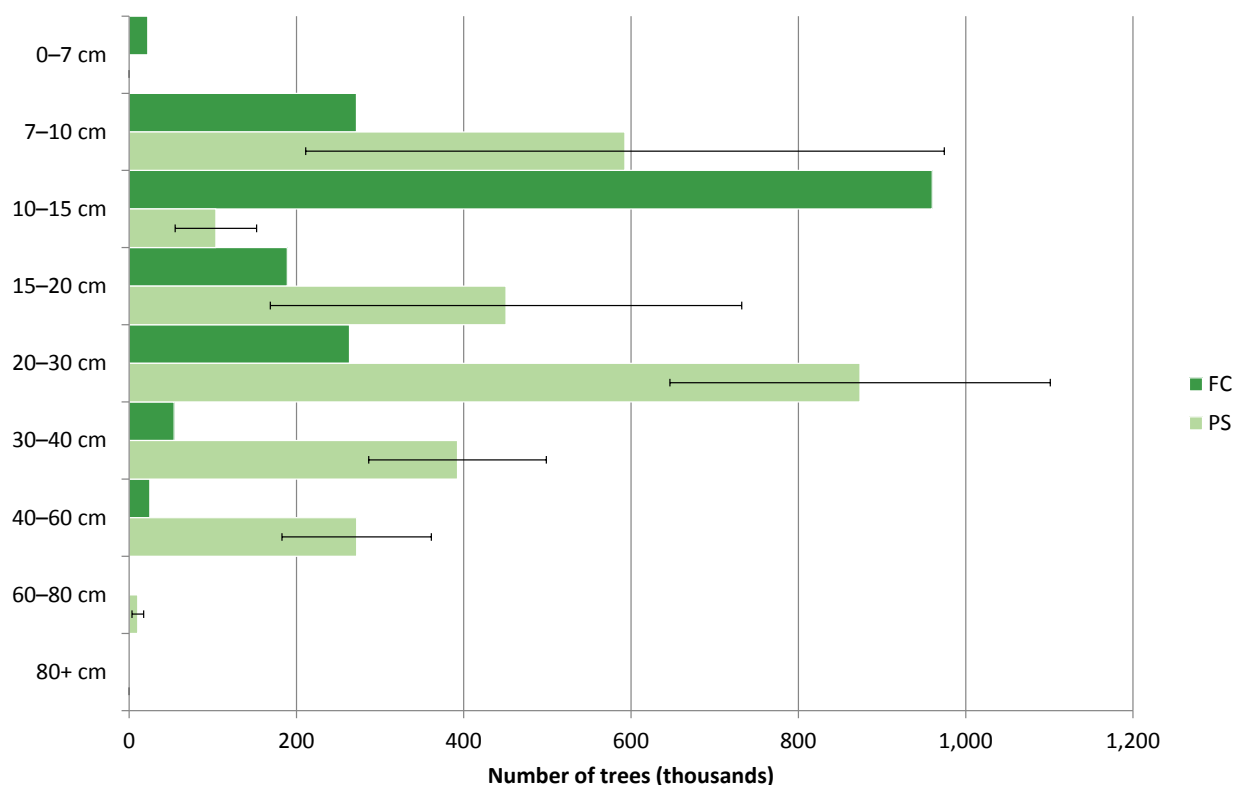
**Table 75** Number of larch trees by age class

Age class (years)	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
Cumbria and Lancashire				
0-10	120	100	89	220
11-20	555	482	77	1,036
21-40	708	754	42	1,462
41-60	230	1,221	20	1,451
61-80	137	138	52	274
81-100	25	< 1	82	26
100+	10	0	-	10
<b>Total</b>	<b>1,785</b>	<b>2,696</b>	<b>21</b>	<b>4,481</b>



## Part 4 – Tree health

**Figure 75** Number of larch trees by mean stand dbh class

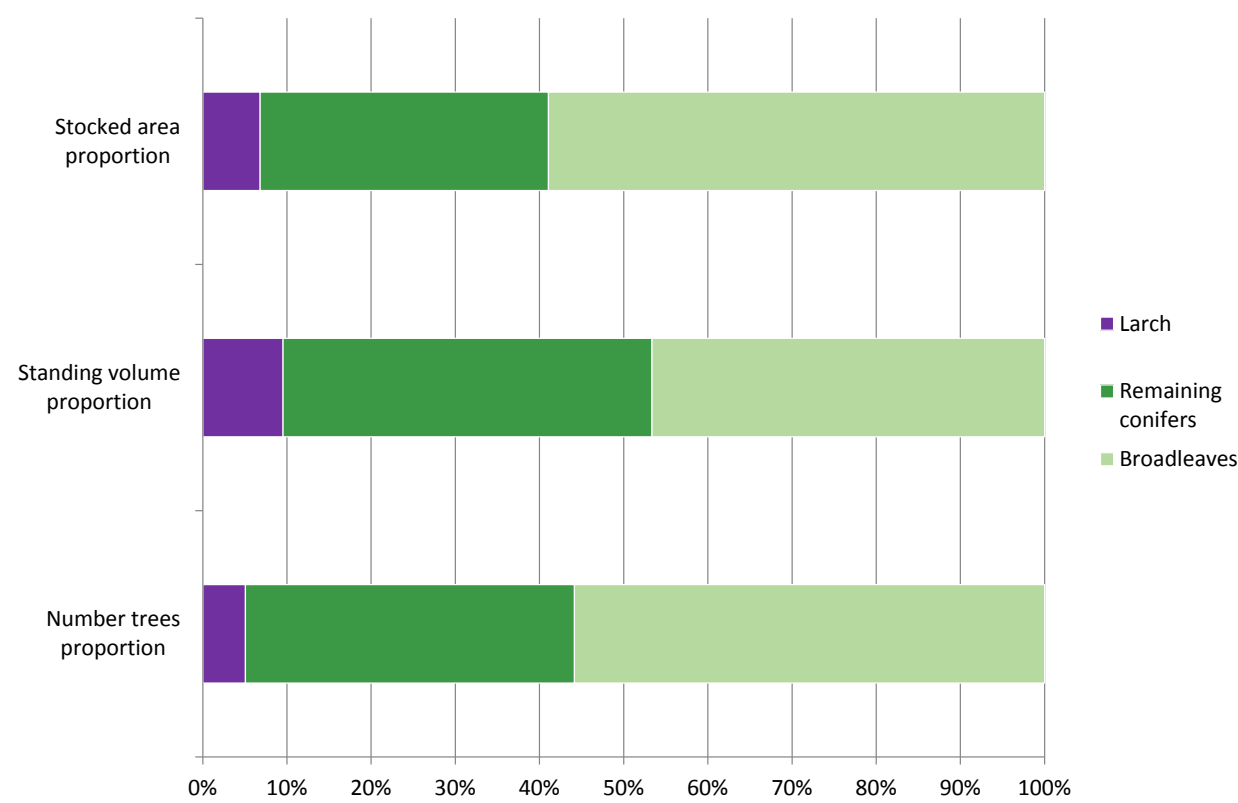


**Table 76** Number of larch trees by mean stand dbh class

Mean stand DBH (cm)	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
Cumbria and Lancashire				
0-7	22	0	-	22
7-10	272	593	64	865
10-15	960	104	47	1,064
15-20	189	451	63	640
20-30	263	874	26	1,137
30-40	54	393	27	446
40-60	25	272	33	297
60-80	< 1	10	67	10
80+	0	0	-	0
<b>Total</b>	<b>1,785</b>	<b>2,696</b>	<b>21</b>	<b>4,481</b>

# Part 4 – Tree health

**Figure 76** Larch as a proportion of woodland



## Part 4 – Tree health

**Table 77** Stocked area of larch as a proportion of woodland

Aligned area	Stocked area of larch			
	FC	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Cumbria and Lancashire	1.4	3.8	15	<b>5.2</b>

**Table 77 (cont'd)** Stocked area of larch as a proportion of woodland

Aligned area	Stocked area of all conifers and all species			
	Total of all conifers	Total of all species	Percentage of larch in all conifers	Percentage of larch in all species
	area (000 ha)	area (000 ha)	(percent)	(percent)
Cumbria and Lancashire	31.2	76.2	17	7

**Table 78** Standing volume of larch as a proportion of woodland

Aligned area	Standing volume of larch			
	FC	Private sector		Total
	volume (000 m³ obs)	volume (000 m³ obs)	SE%	volume (000 m³ obs)
Cumbria and Lancashire	275	1,306	16	<b>1,581</b>

**Table 78 (cont'd)** Standing volume of larch as a proportion of woodland

Aligned area	Standing volume of all conifers and all species			
	Total of all conifers	Total of all species	Percentage of larch in all conifers	Percentage of larch in all species
	volume (000 m³ obs)	volume (000 m³ obs)	(percent)	(percent)
Cumbria and Lancashire	8,839	16,572	18	<b>10</b>

## Part 4 – Tree health

**Table 79** Number of larch trees as a proportion of woodland

Aligned Area	Numbers of trees of larch			
	FC	Private sector		Total
	number of trees (thousands)	number of trees (thousands)	SE%	number of trees (thousands)
Cumbria and Lancashire	1,785	2,696	21	<b>4,481</b>

**Table 79 (cont'd)** Number of larch trees as a proportion of woodland

Aligned Area	Number of trees of all conifers and all species			
	Total of all conifers	Total of all species	Percentage of larch in all conifers	Percentage of larch in all species
	number of trees (thousands)	number of trees (thousands)	(percent)	(percent)
Cumbria and Lancashire	39,135	88,712	11	5

## Appendix A – Aligned area nomenclature

**Table 80** Aligned area long and short names

Long name	Short name	Abbreviation
Cumbria and Lancashire	Cumbria and Lancashire	CLA
Devon Cornwall and the Isles of Scilly	Devon and Cornwall	DCS
East Anglia	East Anglia	EAN
East Midlands	East Midlands	EMD
Greater Manchester Merseyside and Cheshire	Gtr Mancs Mersey and Ches	GMC
Hertfordshire and North London	Herts and North London	HNL
Kent South London and East Sussex	Kent S London and E Sussex	KSL
Lincolnshire and Northamptonshire	Lincs and Northants	LNA
North East	North East	NEA
Solent and South Downs	Solent and South Downs	SSD
Thames	Thames	THS
Wessex	Wessex	WSX
West Midlands	West Midlands	WMD
Yorkshire	Yorkshire	YOR

## Glossary

Actual production	Timber reported as having been felled and removed from the forest. The Forestry Commission keeps records of actual production for its estate, while estimates for the Private sector come from surveys of harvesting companies and timber processors. These figures are available from Forestry Commission Statistics.
Aerial photograph	Photograph of the ground taken from an elevated/direct-down position, with a camera that is not supported by a ground-based structure.
Age class	A grouping of trees into specific age ranges for classification purposes.
Area (forest/woodland)	Forest and woodland area can be defined in net or gross terms. Net area is the land actually covered by trees (in the National Forest Inventory that is to the drip line of the canopy). Gross area includes both the area covered by trees and the open spaces (<0.5 hectare) within (e.g. rides, glades, ponds).
Availability	A term to describe what timber could potentially be available for harvesting within a forest area.
Biological potential	A term applied to forecast scenarios with the objective of maximising timber production. It typically involves felling stands in the year of maximum MAI and management table thinning. It may not take account of factors that constrain thinning and felling (e.g. wind risk or pest attack). The forecast results set out in this report involve constraints on thinning and times of felling to take account of wind risk.
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'.
Canopy cover	Area covered by a mass of foliage and branches formed collectively by the crowns of trees.
Clearfell area	Area here all the trees have been felled at once. In non-clearfell areas, only some of the trees are felled at any one time.
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 hectare). 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 are usually evergreen. Sometimes referred to as 'softwoods'.
Cumulative volume production	The total volume of timber that is forecast to be produced over the entire forecast period, including any overdue timber.
DAMS (Detailed Aspect Methodology Score)	A measure of exposure at a particular location. Can be used as a proxy indicator of the risk of catastrophic wind damage to a stand of trees. May be used to influence decisions on thinning and timing of clearfelling where wind is a risk factor.
DBH (diameter at breast height)	The diameter on the stem of a tree at 'breast height', defined as 1.3 m from ground level.
Dothistroma needle blight	A disease of conifers (especially pine) which causes defoliation, losses in yield and, in severe cases, tree death. Also known as red band needle blight.

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Felling plan	A spatial and temporal plan of harvesting activities within a forest or woodland.
Forest (or 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 hectare 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).
Forest management plan	A holistic spatial and temporal plan stating the objectives of management together with details of forestry proposals over a period of five years and outlining intentions over a minimum total of 10 years. Such plans allow managers to communicate proposals and demonstrate sustainable forest management. They can be used to authorise thinning, felling and other management operations.
Forest Service	An agency within the Department of Agriculture and Rural Development (DARD) in Northern Ireland responsible for the regulation of forestry and the management of state forests in Northern Ireland.
Forestry Commission	The government department responsible for regulating forestry, implementing forestry policy and managing state forests in England and Scotland. 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 (FC) estate	Forests, woodlands, open land and other property managed by the Forestry Commission.
Great Britain (GB)	England, Scotland and Wales.
Hardwood	The wood of broadleaved trees or the broadleaves themselves.
High forest	Woodland which is not managed as coppice or pollards and which may or may not be managed for timber.
Increment	The increase in volume of a tree or a stand over a year or annualised over a specified period measured either in m <sup>3</sup> per year or in m <sup>3</sup> per hectare per year. See also Mean Annual Increment (MAI).
Interpreted forest type (IFT)	Interpreted forest type is a classification of woodland into woodland types as identified from aerial photography and satellite imagery.
Interpreted open area (IOA)	Interpreted open area is a classification of open spaces within woodlands as identified from aerial photography and satellite imagery.
Like-for-like (restocking)	The restocking of areas of felled trees with trees of the same species and yield class.
Maximising productivity	The management of woodland to maximise volume production by thinning at the MTI.
Mean annual increment (MAI)	The average annual rate of volume production from year of planting to a given year, expressed in m <sup>3</sup> obs per hectare per year. In even-aged stands it is calculated by dividing cumulative volume production by age.
MTT (management table thinning)	A sequence of thinnings prescribed by Forestry Commission yield tables over the life of a forest stand. Management table thinning refers to the pattern of thinning recommended in these yield tables. In standard yield tables the thinnings are set to an intensity which aims to maximise diameter increment whilst also maintaining maximum cumulative volume production
MTI (marginal thinning intensity)	The maximum sustainable intensity of thinning defined as 70% of yield class per hectare per year (m <sup>3</sup> obs/ha/year).

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Maximum MAI (maximum mean annual increment) (MMAI)	The age at which a stand reaches the maximum average rate of volume increment which it can achieve. Felling the stand at this age will ensure that the stand reaches its highest average production per annum for its lifespan, thus optimising the stand in terms of volume production over the long term.
Mean annual increment (MAI)	The average rate of volume production up to a given year, expressed in m <sup>3</sup> per hectare per year. In even-aged stands it is calculated by dividing cumulative volume production by age.
Mensuration	The study of the measurement of lengths, areas, volumes and related quantities. Forest mensuration is concerned with the measurement of trees, woodlands and forests, including standing and felled timber.
National Forest Inventory (NFI)	An inventory run by the Forestry Commission, set up in 2009, to provide a record of key information about GB forests and woodlands.
National Inventory of Woodland and Trees (NIWT)	An inventory run by the Forestry Commission, set up in 1995 and completed in 2002, to provide a record of key information about GB forests and woodlands.
Natural Resources Wales (NRW)	Natural Resources Wales is the largest Welsh Government Sponsored Body - employing 1,900 staff across Wales with a budget of £180 million. NRW was formed in April 2013, largely taking over the functions of the Countryside Council for Wales, Forestry Commission Wales and the Environment Agency in Wales, as well as certain Welsh Government functions.
Overbark	Used as a qualification when the diameter or volume of wood includes the bark.
Overbark standing (OBS)	Timber is defined in this report as the volume of stemwood to 7 cm top diameter in m <sup>3</sup> overbark standing (obs), including stump (above ground) and usable branchwood (of minimum 3 m in length and 7 cm top diameter).
Overdue	Timber contained in stands that are beyond the felling age prescribed by the harvesting scenario at the start of the forecast.
Phytophthora	Fungus-like pathogens that can cause extensive damage and mortality to trees and other plants.
Planned production	The volumes and assortments published in the removals forecast, reflecting the cumulative impact of managing the FC estate (as of 31 March 2012) in accordance with approved forest design and thinning plans.
Potential production	A forecast which will not necessarily transpire. As the private sector estate forecast makes assumptions about future levels of harvest, and the assumptions may not transpire, this forecast is one of potential production.
Private sector estate	Forests and woodlands in the UK not managed by the Forestry Commission, Natural Resources Wales or Forest Service. 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 volume production based on a firm plan of harvesting.
Restocking plan	A spatial and temporal plan describing how felled areas are to be replanted or regenerated.
Satellite imagery	Imagery of the earth taken from space from a satellite.
Softwood	The wood of coniferous trees or the conifers themselves.



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Stand	A distinct area of woodland, generally composed of a uniform group of trees in terms of species composition and spatial distribution, and age and size class distribution.
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	The live stemwood and usable branchwood of trees (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 trees in woodlands of less than 0.5 hectare. Usually expressed as m <sup>3</sup> overbark standing (m <sup>3</sup> obs).
Stemwood	The woody material forming the above ground main growing shoot(s) of a tree or stand of trees. The stem includes all woody volume above ground with a diameter greater than 7 cm overbark. Stemwood includes wood in major branches where there is at least 3 m of straight length to 7 cm top diameter.
Stocked area	The area stocked with living trees. The stocked areas in this report are quoted in gross terms for the FC/NRW estate and in net terms for the private sector estate (see the definition of area above).
Sub-compartment database (SCDB)	A database owned and maintained by the Forestry Commission that holds an inventory of all stands of trees managed by the Forestry Commission (including that formerly managed by Forestry Commission Wales which is now managed by Natural Resources Wales).
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.
Terminal height	The top height of a stand at which wind damage is expected to reach a level necessitating clearfelling.
Thinning	The periodic harvesting of trees in a woodland, involving the removal of some trees for commercial use and the retention of others for future production or long-term retention.
Thinning plan	A spatial and temporal plan of harvesting activities within a forest or woodland.
Top diameter	The diameter of the smaller (top) end of a length of stemwood, branchwood or 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.
UK (United Kingdom)	Great Britain and Northern Ireland.
Windthrow	Uprooting of trees by the wind. Windthrow can be endemic – i.e. that caused by frequently recurring peak winds – or catastrophic – an infrequent occurrence associated with exceptionally strong winds where large areas/numbers of trees are blown down.
Woodland	see Forest.
Yield class (YC)	An index used in the UK of the potential productivity of even-aged stands of trees based on maximum MAI. It reflects the potential productivity of the site for the tree species growing on it.

## Aligned area reports in this series

This report is one in a series of reports describing the current stocks in woodland, the economic viability data, timber availability forecasts and estimates of the current stocks within woodland of four species currently at risk from pests and diseases.

Reports are available for:

- England
- **Cumbria and Lancashire**
- Devon Cornwall and the Isles of Scilly
- East Anglia
- East Midlands
- Greater Manchester Merseyside and Cheshire
- Hertfordshire and North London
- Kent South London and East Sussex
- Lincolnshire and Northamptonshire
- North East
- Solent and South Downs
- Thames
- Wessex
- West Midlands
- Yorkshire

The methodology, data sources and assumptions are described in the England report. It is important that the estimates presented in this report are interpreted in the light of the information provided in the England report.

## NFI national reports and papers

This series of reports is part of the wider suite of publications from the National Forest Inventory (NFI). NFI reports that contain information relating to this series of reports are:

- NFI woodland area statistics, Great Britain, England, Scotland, Wales (2011)
- Standing timber volume for coniferous trees in Britain (2012)
- 25-year forecast of softwood availability (2012)
- 25-year forecast of standing coniferous volume and increment (2012)
- Preliminary estimates of broadleaved species in British woodlands, with special focus on ash (2012)
- Biomass in live woodland trees in Britain (2014)
- Carbon in live woodland trees in Britain (2014)
- 50-year forecast of softwood availability (2014)
- 50-year forecast of hardwood availability (2014)
- 25-year forecast of softwood availability (2016)

Each theme has a series of associated reports, papers and data, tailored for different audiences and uses.

This report is a supporting document for the Official Statistics report *National Forest Inventory statistics for England and aligned areas* (2017) and provides more detailed results for Cumbria and Lancashire.

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