

NFI provisional estimates for woodland in the Welsh Valleys

Issued by: National Forest Inventory, Forestry Commission,
231 Corstorphine Road, Edinburgh, EH12 7AT

Date: March 2015

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Summary

This report provides a detailed picture of the stocked area in woodland, the standing volume of timber and the associated live biomass and carbon stocks for woodland in the Welsh Valleys. These estimates are a subset of those published as part of the 2012 growing stock information presented in the National Forest Inventory (NFI) *50-year forecast of softwood timber availability* (2014) and *50-year forecast of hardwood timber availability* (2014). NFI reports are published at www.forestry.gov.uk/inventory.

In addition, the report provides forecasts of timber availability, standing volume and increment for softwoods and hardwoods arising from the stocked area and standing volume. Forecasts are based on the 'headline' harvesting scenario described in the 50-year forecasts NFI reports. An alternative forecast is provided using a harvesting scenario which brings all Private sector broadleaved woodland into production.

The estimates provided in this report are provisional in nature.



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Approach

The approach taken in the derivation of these results and to be used in their interpretation is described in the full suite of forecast reports which can be found at www.forestry.gov.uk/forecast. Refer to the *Standing timber volume for coniferous trees in Britain* (2012) and the *NFI preliminary estimates of quantities of broadleaved species in British Woodlands with special focus on ash* (2012) reports for a description of the underlying methodologies and interpretation, and also for the Wales and Great Britain (GB) context. Refer to the *NFI forecasts methodology* (2012) overview report for a detailed description and discussion of forecasting future availability of timber from NFI field survey data and from information in the Natural Resources Wales (NRW) sub-compartment database (SCDB). The wider context of forecasts of timber production from woodland in GB and its constituent countries under a range of harvesting scenarios can be found in the *50-year forecast of softwood timber availability* (2014) and the *50-year forecast of hardwood timber availability* (2014).

The estimates reported here are based upon field samples assessed between October 2009 and August 2013, the results of which have been subjected to rigorous data quality assurance procedures. These field samples constitute approximately two-thirds of the sites to be sampled within the first cycle of NFI field sampling. As a consequence, the estimates in this report are classed as provisional.

Results

The results presented in this report are estimates of standing volumes and stocked areas at 31 March 2012, and 50-year forecasts of softwood and hardwood availability under the 'headline' harvesting scenario and also under a scenario assuming all hardwoods are harvested in Private sector woodland in the Welsh Valleys. The data sources used for the compilation of these estimates are the same as described in the NFI reports *Standing timber volume for coniferous trees in Britain* (2012), the *50-year forecast of softwood availability* (2014) and the *50-year forecast of hardwood availability* (2014). Estimates for the Natural Resources Wales (NRW) estate* are derived from the NRW's SCDB, while those for the Private sector (i.e. non-NRW in Wales) estate are derived from information collected in the NFI field survey. A fuller description of these data sources and how they are used in the production of estimates, including sampling standard errors (SEs) attached to the Private sector estimates, is provided in the earlier documents.

Results are provided for stocked area at 31 March 2012 (**Figures 1–1a** and **Tables 1–3**), felled area (**Table 4**), standing volume at 31 March 2012 (**Figures 2–2a** and

* The Natural Resources Wales estate in this report refers to the estate formerly managed by Forestry Commission Wales. It does not include former holdings in Wales of the Environment Agency or Countryside Council for Wales, which are regarded as Private sector woodland in this report.

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Tables 5–7), biomass and carbon stocks at 31 March 2012 (**Tables 8–9**), evidence of thinning in Private sector stands from the NFI field survey (**Figure 3**), the ‘headline’ 50-year forecast (**Figures 4–8** and **Tables 10–12**) and the ‘unrestricted’ 50-year forecast (**Figures 9–13** and **Tables 13–15**). **Figures 14–15** and **Table 16** compare the hardwood production under the two scenarios.

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 SEs attached to Private sector estimates are expressed in relative terms (%) to the right of the relevant estimate. Percentages in the pie charts may also not sum to 100 due to rounding.

Stocked area at 31 March 2012

Figure 1 Principal tree species composition by stocked area at 31 March 2012

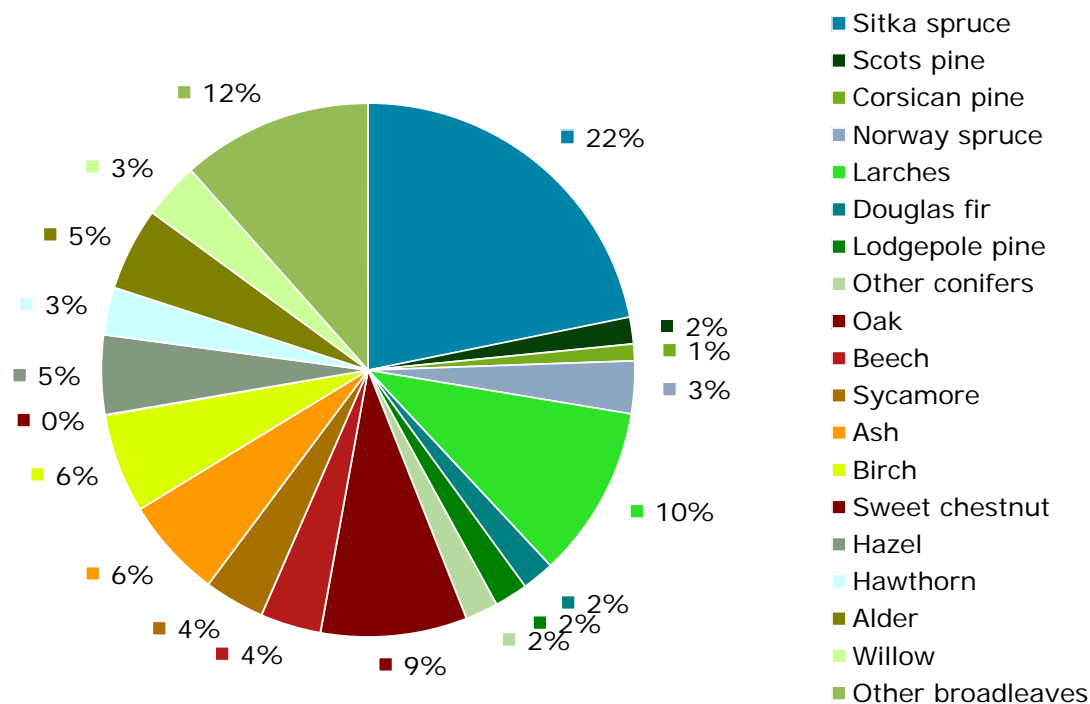
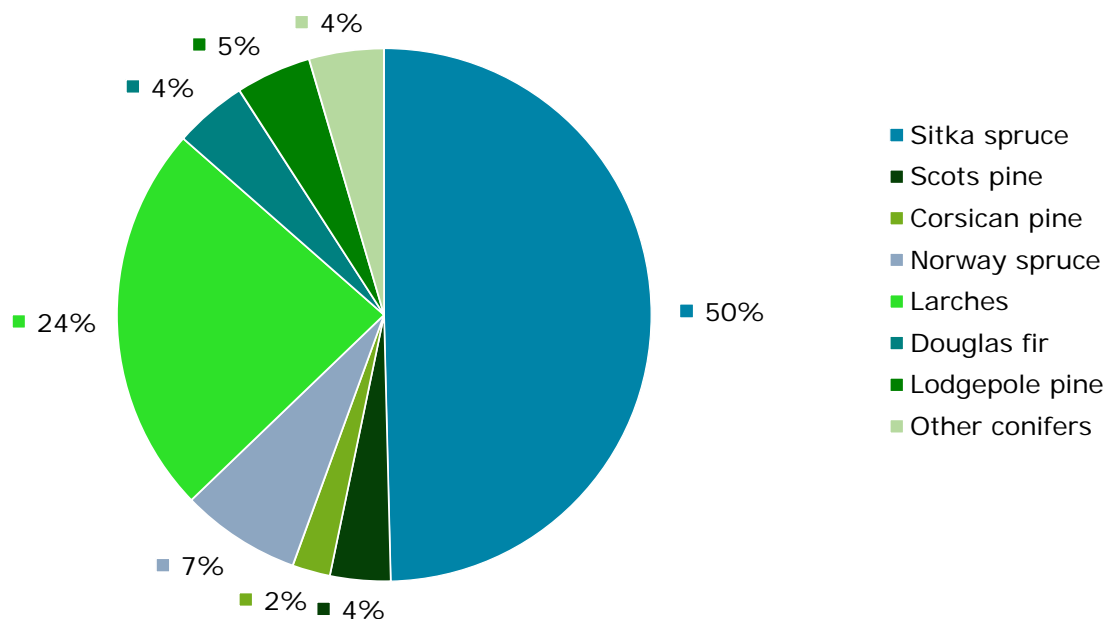


Figure 1a Principal conifer tree species composition by stocked area at 31 March 2012



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Table 1 Stocked area by principal tree species at 31 March 2012

Principal species	NRW	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
Conifers				
Sitka spruce	12.8	1.7	26	14.4
Scots pine	1.0	0.0	57	1.1
Corsican pine	0.4	0.2	43	0.7
Norway spruce	1.6	0.5	42	2.1
Larches	5.3	1.6	23	6.9
Douglas fir	1.2	0.1	70	1.3
Lodgepole pine	1.1	0.2	54	1.3
Other conifers	0.7	0.6	39	1.3
All conifers	24.2	5.0	9	29.2
Broadleaves				
Oak	1.0	4.9	14	5.9
Beech	1.0	1.4	30	2.4
Sycamore	0.0	2.4	21	2.4
Ash	0.3	3.7	15	4.0
Birch	0.6	3.4	18	4.0
Sweet chestnut	0.0	0.0	80	0.0
Hazel	0.0	3.2	14	3.2
Hawthorn	0.0	1.9	24	1.9
Alder	0.1	3.2	17	3.3
Willow	0.0	2.3	19	2.3
Other broadleaves	3.9	3.8	14	7.6
All broadleaves	6.9	30.1	3	37.0
All species				
All species	31.1	35.3	2	66.3

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Table 2 Stocked area by age class at 31 March 2012

Age class	NRW	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
All conifers				
0–10 years	2.8	0.1	49	2.9
11–20 years	3.7	0.2	52	3.9
21–40 years	7.5	3.3	16	10.8
41–60 years	8.2	1.0	29	9.2
61–80 years	1.8	0.1	63	1.9
81–100 years	0.2	0.2	102	0.4
100+ years	0.0	0.2	71	0.2
Total	24.2	5.0	9	29.2
All broadleaves				
0–10 years	1.2	4.3	15	5.5
11–20 years	0.9	4.3	14	5.2
21–40 years	0.7	9.3	9	10.0
41–60 years	1.0	4.4	17	5.5
61–80 years	1.0	3.8	21	4.8
81–100 years	0.4	2.6	21	3.0
100+ years	1.6	1.4	30	3.0
Total	6.9	30.1	3	37.0
All species				
0–10 years	4.0	4.4	14	8.4
11–20 years	4.6	4.5	14	9.1
21–40 years	8.2	12.7	8	20.9
41–60 years	9.3	5.4	15	14.7
61–80 years	2.7	3.9	21	6.7
81–100 years	0.6	2.7	21	3.3
100+ years	1.6	1.6	28	3.2
Total	31.1	35.3	2	66.3

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Table 3 Stocked area by mean stand DBH class at 31 March 2012

Mean stand DBH	NRW	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
All conifers				
0–7 cm	3.9	0.1	46	4.0
7–10 cm	1.3	0.4	36	1.7
10–15 cm	4.4	0.6	38	4.9
15–20 cm	5.3	1.3	29	6.6
20–30 cm	6.2	1.3	27	7.5
30–40 cm	1.6	1.0	28	2.5
40–60 cm	1.4	0.4	54	1.8
60–80 cm	0.1	0.0	-	0.1
80+ cm	0.0	0.0	-	0.0
Total	24.2	5.0	9	29.2
All broadleaves				
0–7 cm	1.4	4.0	13	5.4
7–10 cm	1.1	5.8	11	7.0
10–15 cm	1.1	5.1	13	6.2
15–20 cm	1.6	3.1	16	4.7
20–30 cm	0.8	4.2	15	5.0
30–40 cm	0.4	3.2	17	3.6
40–60 cm	0.4	2.9	20	3.3
60–80 cm	0.1	1.7	27	1.8
80+ cm	0.0	0.0	97	0.0
Total	6.9	30.1	3	37.0
All species				
0–7 cm	5.3	4.2	13	9.5
7–10 cm	2.5	6.2	11	8.7
10–15 cm	5.5	5.7	12	11.2
15–20 cm	6.9	4.4	14	11.3
20–30 cm	7.0	5.5	13	12.5
30–40 cm	2.0	4.2	15	6.2
40–60 cm	1.7	3.4	18	5.1
60–80 cm	0.2	1.7	28	1.9
80+ cm	0.0	0.0	98	0.0
Total	31.1	35.3	2	66.3

Table 4 Felled area at 31 March 2012

Clearfelled area	NRW	Private sector		Total
	area (000 ha)	area (000 ha)	SE%	area (000 ha)
	2.9	0.0	-	2.9

Standing volume at 31 March 2012

Figure 2 Principal tree species composition by standing volume at 31 March 2012

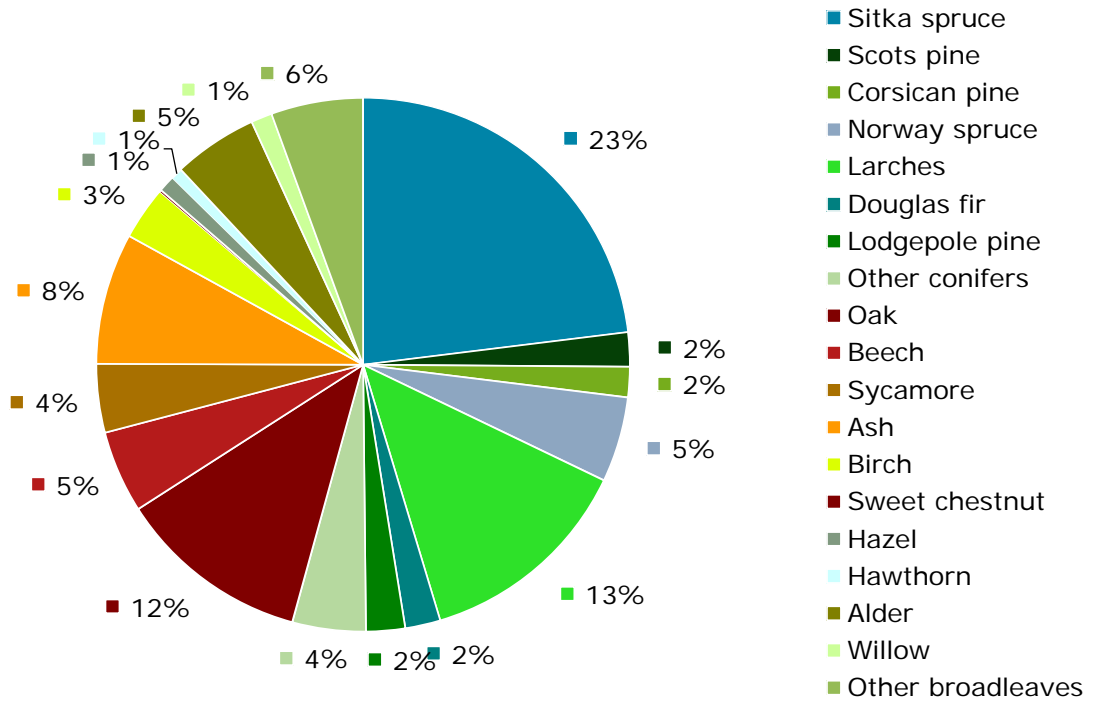
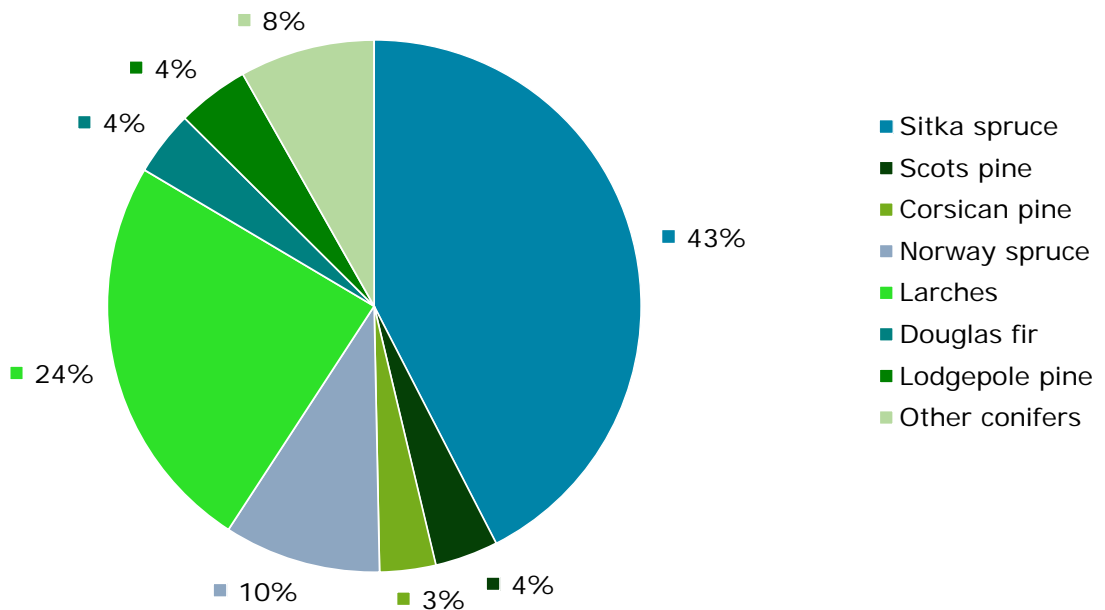


Figure 2a Principal conifer tree species composition by standing volume at 31 March 2012



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Table 5 Standing volume by principal tree species at 31 March 2012

Principal species	NRW	Private sector		Total
	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)
Conifers				
Sitka spruce	2,786	470	27	3,256
Scots pine	288	7	65	295
Corsican pine	143	117	47	260
Norway spruce	476	254	46	730
Larches	1,345	523	29	1,868
Douglas fir	280	21	97	301
Lodgepole pine	254	81	61	335
Other conifers	236	391	61	627
All conifers	5,809	1,906	14	7,715
Broadleaves				
Oak	190	1,455	18	1,645
Beech	245	459	34	704
Sycamore	7	581	30	588
Ash	61	1,063	19	1,124
Birch	54	402	20	456
Sweet chestnut	4	11	83	15
Hazel	4	137	24	141
Hawthorn	0	100	29	100
Alder	12	711	25	723
Willow	0	180	26	180
Other broadleaves	402	385	26	788
All broadleaves	979	5,484	7	6,463
All species				
All species	6,788	7,380	6	14,169

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Table 6 Standing volume by age class at 31 March 2012

Age class	NRW	Private sector		Total
	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)
All conifers				
0–10 years	2	0	76	2
11–20 years	142	7	58	150
21–40 years	1,604	1,195	23	2,799
41–60 years	3,270	544	29	3,814
61–80 years	717	61	62	778
81–100 years	68	85	102	153
100+ years	7	13	93	20
Total	5,809	1,906	14	7,715
All broadleaves				
0–10 years	0	15	43	15
11–20 years	8	252	17	260
21–40 years	50	1,227	12	1,277
41–60 years	185	1,267	21	1,452
61–80 years	206	1,194	23	1,400
81–100 years	99	1,022	25	1,121
100+ years	431	506	26	937
Total	979	5,484	7	6,463
All species				
0–10 years	2	16	43	17
11–20 years	150	262	16	412
21–40 years	1,655	2,430	13	4,085
41–60 years	3,454	1,822	17	5,276
61–80 years	923	1,260	22	2,183
81–100 years	167	1,068	25	1,235
100+ years	438	522	26	960
Total	6,788	7,380	6	14,169

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Table 7 Standing volume by mean stand DBH class at 31 March 2012

Mean stand DBH	NRW	Private sector		Total
	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)
All conifers				
0–7 cm	0	0	102	1
7–10 cm	35	12	42	47
10–15 cm	501	79	40	579
15–20 cm	1,507	340	30	1,846
20–30 cm	2,686	543	27	3,230
30–40 cm	569	760	36	1,330
40–60 cm	477	172	54	649
60–80 cm	30	0	-	30
80+ cm	4	0	-	4
Total	5,809	1,906	14	7,715
All broadleaves				
0–7 cm	1	12	24	13
7–10 cm	25	215	13	240
10–15 cm	165	540	17	704
15–20 cm	384	511	22	896
20–30 cm	202	1,054	17	1,256
30–40 cm	89	1,081	20	1,170
40–60 cm	84	1,284	22	1,368
60–80 cm	27	771	27	798
80+ cm	2	16	97	18
Total	979	5,484	7	6,463
All species				
0–7 cm	1	12	25	13
7–10 cm	60	229	12	290
10–15 cm	665	624	15	1,289
15–20 cm	1,891	854	18	2,745
20–30 cm	2,888	1,601	15	4,489
30–40 cm	659	1,835	19	2,493
40–60 cm	561	1,464	20	2,025
60–80 cm	57	746	28	803
80+ cm	6	16	98	22
Total	6,788	7,380	6	14,169

Biomass and carbon stocks at 31 March 2012

Table 8 Standing biomass by principal tree species at 31 March 2012

Principal species	NRW	Private sector		Total
	biomass (000 odt)	biomass (000 odt)	SE%	biomass (000 odt)
Conifers				
Sitka spruce	1,835	296	27	2,131
Scots pine	203	5	66	208
Corsican pine	84	65	47	150
Norway spruce	259	128	46	387
Larches	852	300	28	1,151
Douglas fir	199	14	97	213
Lodgepole pine	182	55	60	237
Other conifers	129	199	58	328
All conifers	3,743	1,086	13	4,829
Broadleaves				
Oak	172	1,267	17	1,439
Beech	231	402	33	633
Sycamore	6	507	31	513
Ash	56	878	19	934
Birch	55	397	20	452
Sweet chestnut	3	8	82	11
Hazel	3	147	22	151
Hawthorn	0	132	29	132
Alder	10	572	24	582
Willow	0	214	25	214
Other broadleaves	369	386	24	755
All broadleaves	905	4,911	6	5,816
All species				
All species	4,648	5,996	6	10,644

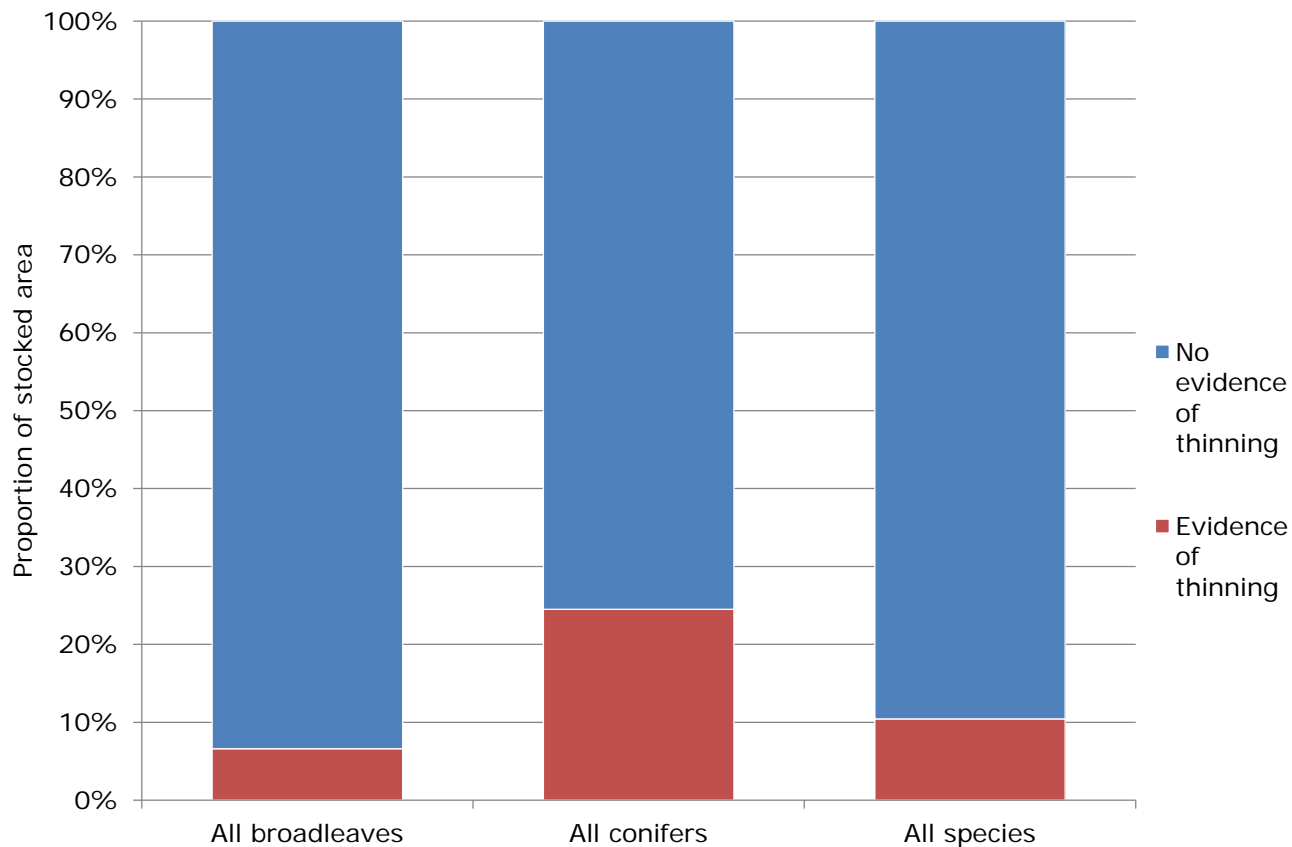
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Table 9 Total carbon stocks in principal tree species at 31 March 2012

Principal species	NRW	Private sector		Total
	carbon (000 t)	carbon (000 t)	SE%	carbon (000 t)
Conifers				
Sitka spruce	917	148	27	1,065
Scots pine	102	2	66	104
Corsican pine	42	33	47	75
Norway spruce	129	64	46	194
Larches	426	150	28	576
Douglas fir	100	7	97	107
Lodgepole pine	91	27	60	119
Other conifers	65	100	58	164
All conifers	1,872	543	13	2,415
Broadleaves				
Oak	86	634	17	720
Beech	115	201	33	316
Sycamore	3	253	31	256
Ash	28	439	19	467
Birch	27	199	20	226
Sweet chestnut	2	4	82	6
Hazel	2	74	22	75
Hawthorn	0	66	29	66
Alder	5	286	24	291
Willow	0	107	25	107
Other broadleaves	184	193	24	377
All broadleaves	452	2,456	6	2,908
All species				
All species	2,324	2,998	6	5,322

Evidence of thinning

Figure 3 Evidence of thinning in Private sector sites



50-year forecast of timber availability

Refer to the NFI report *50-year forecast of softwood timber availability (2014)* for a description of the underlying methodology and interpretation of the softwood forecast, and also for the Wales and GB context.

Refer to the NFI report *50-year forecast of hardwood timber availability (2014)* for a description of the underlying methodology and interpretation of the hardwood forecast, and also for the Wales and GB context.

In **Figures 4–8 and Tables 10–12** the estimates for the Forestry Commission are based on harvesting regimes derived from Forestry Commission felling and thinning plans as of 31 March 2012.

For the Private sector, information for **Figures 4–8 and Tables 10–12** is based on a scenario which assumes felling at age of maximum mean annual increment with moderate wind risk measures for conifers. For broadleaves, however, only those areas where there is evidence of thinning are assumed to be managed in future. This is a highly conservative assumption but better reflects current practice than assuming all stands will be managed. In turn it is assumed that these broadleaved stands are managed to felling at age of maximum mean annual increment with moderate wind risk measures.

Restocking assumptions for conifer stands clearfelled during the forecast period have been implemented that assume:

- a 10% reduction in the area of conifers on the subsequent rotation
- restocking of currently clearfelled land
- a change in the composition of conifer species on restocking

Restocking assumptions for broadleaved stands clearfelled during the forecast period have been included that assume:

- no reduction in stocked area
- like-for-like species choices are used for broadleaves
- 50% of the land associated with the reduction in conifer stocked area arising from the assumption above is stocked with broadleaves

A full description of the restocking assumptions is to be found in Table D3 of the *50-year forecast of softwood timber availability (2014)*. The same restocking assumptions have been applied to both the Forestry Commission and Private sector forecasts.

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Woodland that is classed as currently clearfelled will be restocked according to the restock prescription.

In **Figures 9–13** and **Tables 13–15** the management assumptions for the Private sector hardwoods have been changed to assume all hardwoods are thinned and felled rather than only those in areas that have evidence of thinning. In this report, the tables and figures for estimates under this management scenario will be labelled as 'unrestricted'.

Figures 14–15 and **Table 16** compare the Private sector hardwood timber availability under the two scenarios. **Figure 14** shows the Private sector hardwood availability for the two scenarios during the 50-year forecast. **Figure 15** and **Table 16** compare the hardwood availability in first 15 years of the forecast under the two scenarios.

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50-year forecast of timber availability under the 'headline' harvesting scenario

Table 10 50-year forecast of timber availability by time period and principal species

Principal species	2013–16			2017–21			2022–26			2027–31						
	NRW	Private sector	Total	NRW	Private sector	Total	NRW	Private sector	Total	NRW	Private sector	Total				
	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)				
All conifers	275	79	28	354	226	78	28	305	204	134	41	338	182	64	35	246
Sitka spruce	168	7	38	175	139	12	56	151	135	23	60	157	125	37	60	162
Scots pine	9	0	63	9	15	0	54	15	8	0	63	8	6	0	58	6
Corsican pine	7	3	50	9	5	3	44	8	7	26	49	33	2	1	93	3
Norway spruce	21	9	43	30	19	7	43	26	13	7	43	21	8	7	43	16
Larches	35	47	46	82	23	26	38	49	20	14	30	34	19	14	43	33
Douglas fir	10	1	97	11	9	0	105	9	9	5	97	14	9	0	102	10
Lodgepole pine	13	3	55	16	11	2	54	13	10	2	54	11	7	2	54	9
Other conifers	12	8	62	20	6	26	73	32	3	54	94	57	4	3	42	7
All broadleaves	11	31	37	41	0	14	33	14	9	14	27	23	1	20	51	21
Oak	3	5	63	8	0	2	51	2	2	2	48	4	0	2	48	2
Beech	5	0	69	5	0	0	59	0	4	2	90	6	0	0	34	0
Sycamore	0	6	58	6	0	5	65	5	0	1	53	2	0	1	33	1
Ash	1	11	81	11	0	1	45	1	1	0	29	1	0	1	31	1
Birch	0	7	65	7	0	2	55	2	0	3	55	3	0	12	82	12
Sweet chestnut	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0
Hazel	0	0	70	0	0	1	87	1	0	0	29	0	0	1	46	1
Hawthorn	0	0	32	0	0	0	33	0	0	1	38	1	0	1	38	1
Alder	0	1	81	1	0	1	77	1	0	3	72	3	0	1	78	1
Willow	0	0	50	0	0	0	31	0	0	1	26	1	0	1	26	1
Other broadleaves	2	1	35	2	0	1	25	1	1	1	21	2	0	1	18	2
All species	285	111	22	396	227	93	24	320	213	149	38	361	183	83	30	266

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Table 10 (cont'd) 50-year forecast of timber availability by time period and principal species

Principal species	2032-36			2037-41			2042-46			2047-51						
	NRW	Private sector	Total	NRW	Private sector	Total	NRW	Private sector	Total	NRW	Private sector	Total				
	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)				
All conifers	296	138	31	434	197	119	30	316	170	24	21	195	186	52	29	238
Sitka spruce	229	89	46	318	110	20	69	130	50	4	51	53	91	4	46	95
Scots pine	9	0	58	9	5	0	40	6	5	1	32	6	5	3	44	8
Corsican pine	3	0	54	3	3	0	105	3	5	0	-	5	4	0	-	4
Norway spruce	16	7	40	24	15	65	48	81	12	6	54	17	11	17	77	27
Larches	22	23	44	44	36	7	49	43	76	4	49	80	50	4	54	53
Douglas fir	12	1	38	13	12	4	37	16	13	6	30	19	18	7	27	25
Lodgepole pine	2	2	54	4	4	15	76	20	0	0	94	1	2	4	102	6
Other conifers	4	14	55	18	11	5	59	16	10	4	44	13	6	14	45	20
All broadleaves	9	9	15	19	6	24	56	30	38	17	16	55	5	20	19	24
Oak	2	2	48	4	1	15	91	15	13	1	27	13	1	2	53	3
Beech	4	0	30	4	1	0	28	1	10	0	28	11	1	0	28	2
Sycamore	0	1	43	1	0	1	50	1	1	3	42	3	0	2	35	2
Ash	0	2	51	2	0	2	59	2	3	2	34	5	1	3	35	3
Birch	0	1	31	1	0	2	31	2	1	3	33	4	0	6	48	6
Sweet chestnut	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0
Hazel	0	1	22	1	0	1	20	1	0	1	24	1	0	2	32	2
Hawthorn	0	1	35	1	0	1	32	1	0	1	30	1	0	1	30	1
Alder	0	0	36	0	0	1	42	1	0	1	46	1	0	1	39	1
Willow	0	1	24	1	0	1	23	1	0	1	23	1	0	1	23	1
Other broadleaves	2	2	17	3	4	2	17	5	10	4	40	14	1	3	32	4
All species	305	148	29	453	203	144	27	347	208	41	15	249	191	73	22	263

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Table 10 (cont'd) 50-year forecast of timber availability by time period and principal species

Principal species	2052-56			2057-61				
	NRW	Private sector	Total	NRW	Private sector	Total		
	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)		
All conifers	159	30	17	188	216	37	18	253
Sitka spruce	60	4	42	64	79	12	43	91
Scots pine	5	4	49	9	8	2	25	10
Corsican pine	3	0	-	3	6	0	-	6
Norway spruce	10	2	24	12	24	3	21	26
Larches	44	4	54	48	47	4	49	51
Douglas fir	20	9	23	28	25	10	21	34
Lodgepole pine	4	0	102	4	10	0	69	10
Other conifers	12	7	41	19	18	6	42	24
All broadleaves	14	17	17	31	8	16	31	24
Oak	4	1	24	5	2	1	24	3
Beech	4	0	28	4	1	0	28	1
Sycamore	0	1	47	1	0	1	71	1
Ash	0	3	35	3	0	6	77	6
Birch	1	3	42	4	2	2	55	4
Sweet chestnut	0	0	-	0	0	0	-	0
Hazel	1	2	30	3	2	2	30	4
Hawthorn	0	1	30	1	0	1	30	1
Alder	0	2	45	2	0	1	79	1
Willow	0	2	59	2	0	1	22	1
Other broadleaves	3	2	20	4	1	2	30	3
All species	173	47	13	219	224	53	15	277

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Table 11 50-year forecast of standing volume; average annual volumes within periods

Forecast period	NRW	Private sector		Total
	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)
All conifers				
2013–16	5,693	1,913	14	7,607
2017–21	5,775	1,861	15	7,636
2022–26	5,968	1,703	15	7,670
2027–31	6,332	1,425	16	7,756
2032–36	6,092	1,035	18	7,126
2037–41	6,109	642	18	6,751
2042–46	6,664	549	19	7,213
2047–51	7,177	616	16	7,792
2052–56	7,803	719	14	8,522
2057–61	8,403	940	13	9,343
All broadleaves				
2013–16	992	5,790	7	6,782
2017–21	1,068	6,421	6	7,489
2022–26	1,152	7,220	6	8,372
2027–31	1,250	8,025	5	9,275
2032–36	1,350	8,790	5	10,139
2037–41	1,431	9,502	5	10,933
2042–46	1,454	10,114	5	11,568
2047–51	1,448	10,689	5	12,138
2052–56	1,510	11,196	5	12,707
2057–61	1,562	11,663	5	13,226
All species				
2013–16	6,685	7,694	6	14,379
2017–21	6,843	8,276	6	15,119
2022–26	7,120	8,920	5	16,039
2027–31	7,582	9,452	5	17,034
2032–36	7,441	9,838	5	17,279
2037–41	7,540	10,162	5	17,702
2042–46	8,118	10,686	5	18,804
2047–51	8,625	11,332	5	19,957
2052–56	9,313	11,945	5	21,258
2057–61	9,965	12,636	4	22,601

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Table 12 50-year forecast of net increment; average annual volumes within periods

Forecast period	NRW	Private sector		Total
	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)
All conifers				
2013–16	209	76	11	285
2017–21	237	71	13	308
2022–26	236	61	14	298
2027–31	257	48	14	305
2032–36	242	41	14	284
2037–41	237	38	15	275
2042–46	258	41	16	300
2047–51	289	57	13	346
2052–56	305	69	12	374
2057–61	309	80	11	389
All broadleaves				
2013–16	18	152	7	169
2017–21	20	165	6	185
2022–26	22	178	5	200
2027–31	25	175	5	200
2032–36	25	165	5	191
2037–41	24	153	5	177
2042–46	23	139	5	162
2047–51	22	129	5	151
2052–56	22	117	5	139
2057–61	21	107	5	128
All species				
2013–16	226	228	6	455
2017–21	257	237	5	494
2022–26	258	240	5	498
2027–31	282	224	5	506
2032–36	268	208	5	476
2037–41	261	192	5	453
2042–46	281	182	5	463
2047–51	311	186	5	497
2052–56	327	187	5	514
2057–61	331	187	5	517

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Figure 4 Overview of 50-year forecast of average annual softwood availability

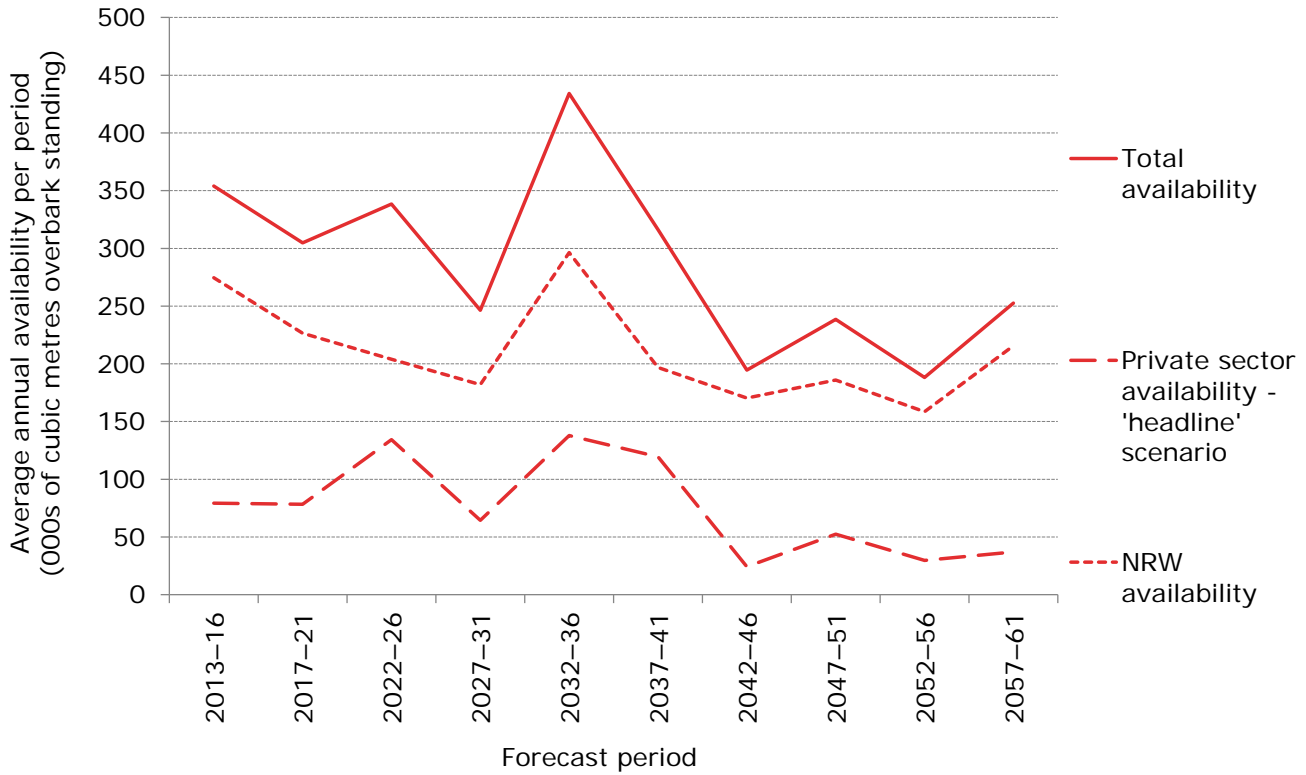
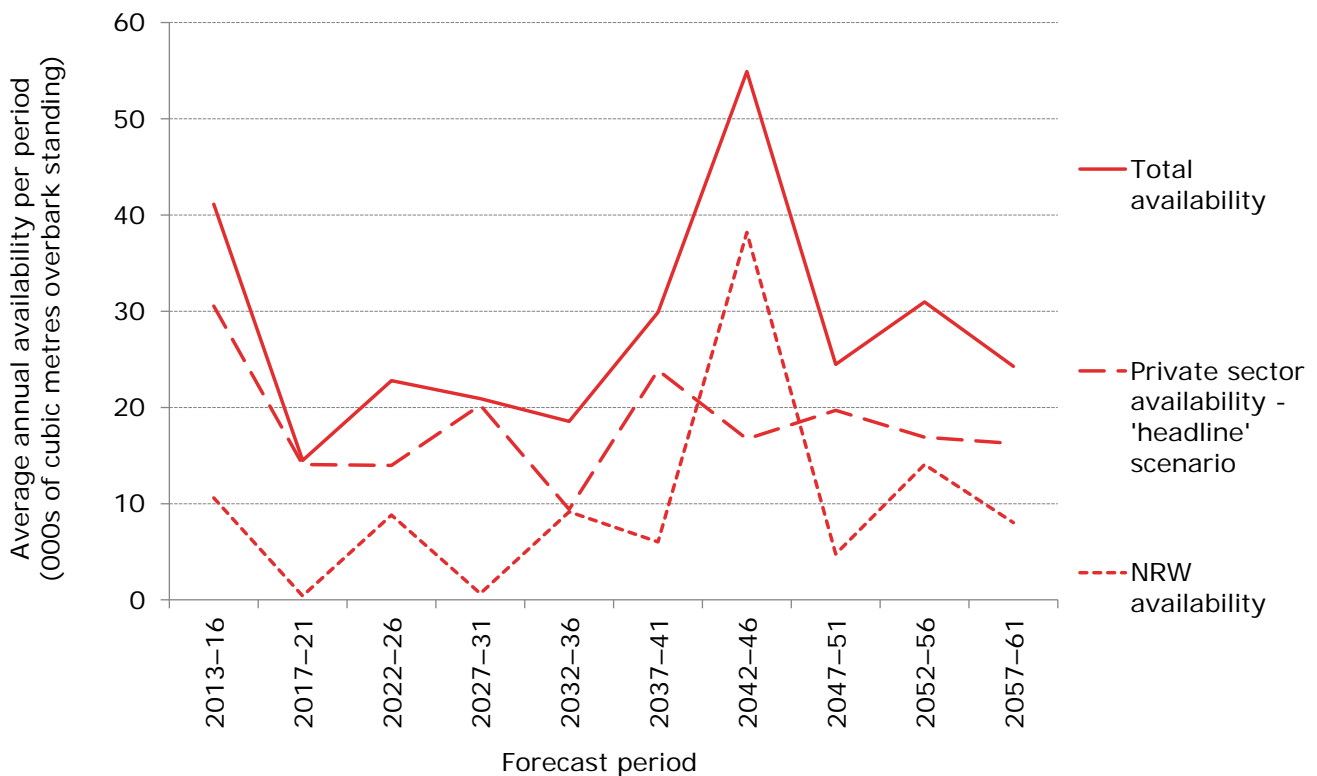


Figure 4a Overview of 50-year forecast of average annual hardwood availability



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Figure 5 50-year forecast of average annual softwood availability

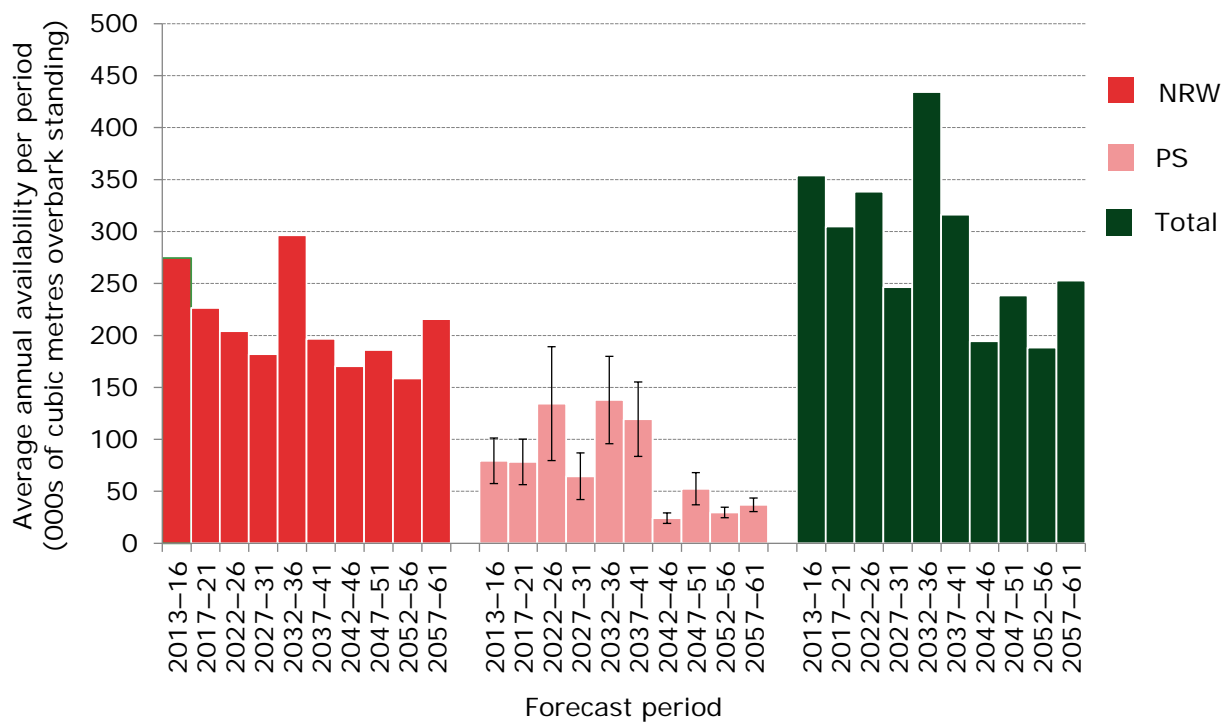
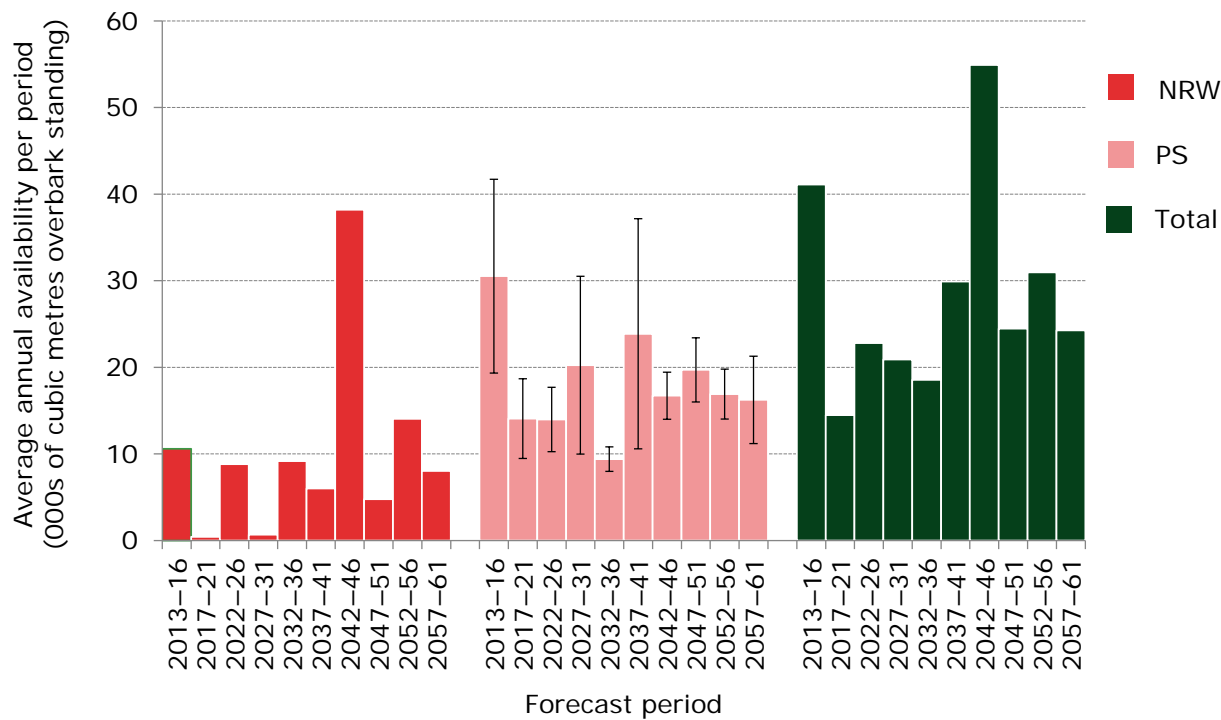


Figure 6 50-year forecast of average annual hardwood availability



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Figure 7 50-year forecast of softwood standing volume, increment and availability

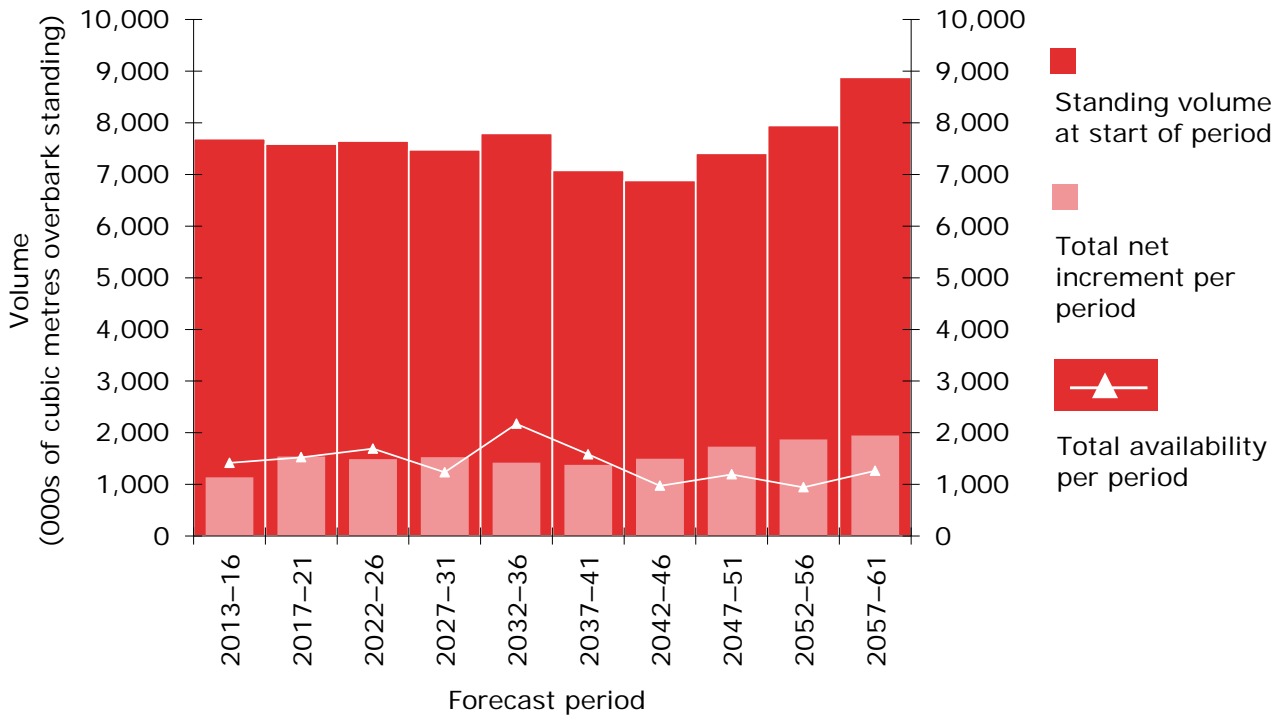
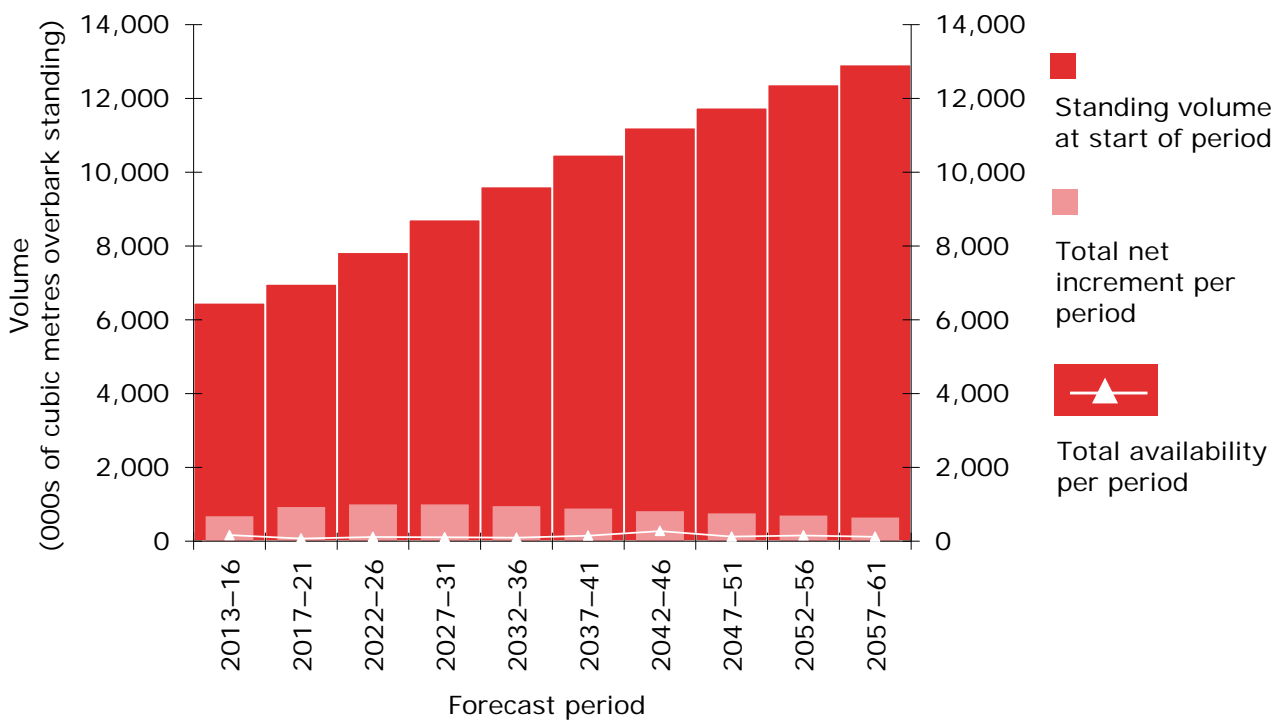


Figure 8 50-year forecast of hardwood standing volume, increment and availability



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50-year forecast of timber availability under the 'unrestricted' scenario

Table 13 50-year forecast of timber availability by time period and principal species – unrestricted biological potential for Private sector hardwoods

Principal species	2013–16			2017–21			2022–26			2027–31						
	NRW	Private sector	Total	NRW	Private sector	Total	NRW	Private sector	Total	NRW	Private sector	Total				
	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)				
All conifers	275	79	28	354	226	78	28	305	204	134	41	338	182	64	35	246
Sitka spruce	168	7	38	175	139	12	56	151	135	23	60	157	125	37	60	162
Scots pine	9	0	63	9	15	0	54	15	8	0	63	8	6	0	58	6
Corsican pine	7	3	50	9	5	3	44	8	7	26	49	33	2	1	93	3
Norway spruce	21	9	43	30	19	7	43	26	13	7	43	21	8	7	43	16
Larches	35	47	46	82	23	26	38	49	20	14	30	34	19	14	43	33
Douglas fir	10	1	97	11	9	0	105	9	9	5	97	14	9	0	102	10
Lodgepole pine	13	3	55	16	11	2	54	13	10	2	54	11	7	2	54	9
Other conifers	12	8	62	20	6	26	73	32	3	54	94	57	4	3	42	7
All broadleaves	11	392	13	403	0	316	10	316	9	190	12	199	1	157	17	157
Oak	3	26	20	30	0	21	17	21	2	47	40	50	0	49	49	49
Beech	5	8	36	13	0	7	34	7	4	10	32	14	0	7	33	7
Sycamore	0	55	32	55	0	67	35	67	0	13	27	13	0	9	24	9
Ash	1	140	23	140	0	86	22	86	1	28	20	28	0	15	28	15
Birch	0	36	24	36	0	29	24	29	0	23	35	23	0	26	42	26
Sweet chestnut	0	0	82	0	0	0	82	0	0	0	82	0	0	0	82	0
Hazel	0	9	30	9	0	17	36	17	0	6	21	6	0	6	29	6
Hawthorn	0	2	37	2	0	4	26	4	0	5	30	5	0	5	31	5
Alder	0	85	40	85	0	58	23	58	0	31	24	31	0	17	36	17
Willow	0	5	28	5	0	6	21	6	0	7	19	7	0	7	19	7
Other broadleaves	2	25	44	27	0	20	41	20	1	19	31	21	0	14	29	15
All species	285	465	12	750	227	395	10	622	213	326	18	539	183	220	16	403

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Table 13 (cont'd) 50-year forecast of timber availability by time period and principal species – unrestricted biological potential for Private sector hardwoods

Principal species	2032–36			2037–41			2042–46			2047–51						
	NRW	Private sector	Total	NRW	Private sector	Total	NRW	Private sector	Total	NRW	Private sector	Total				
	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)				
All conifers	296	138	31	434	197	119	30	316	170	24	21	195	186	52	29	238
Sitka spruce	229	89	46	318	110	20	69	130	50	4	51	53	91	4	46	95
Scots pine	9	0	58	9	5	0	40	6	5	1	32	6	5	3	44	8
Corsican pine	3	0	54	3	3	0	105	3	5	0	-	5	4	0	-	4
Norway spruce	16	7	40	24	15	65	48	81	12	6	54	17	11	17	77	27
Larches	22	23	44	44	36	7	49	43	76	4	49	80	50	4	54	53
Douglas fir	12	1	38	13	12	4	37	16	13	6	30	19	18	7	27	25
Lodgepole pine	2	2	54	4	4	15	76	20	0	0	94	1	2	4	102	6
Other conifers	4	14	55	18	11	5	59	16	10	4	44	13	6	14	45	20
All broadleaves	9	143	9	152	6	182	19	188	38	146	11	184	5	187	16	192
Oak	2	22	22	25	1	72	49	72	13	22	29	35	1	35	42	36
Beech	4	7	32	11	1	7	31	8	10	7	31	18	1	30	75	32
Sycamore	0	12	26	12	0	14	26	15	1	21	28	21	0	14	26	14
Ash	0	24	21	25	0	18	18	18	3	17	16	20	1	24	22	24
Birch	0	22	27	22	0	13	31	13	1	16	31	17	0	24	36	24
Sweet chestnut	0	0	82	0	0	0	82	0	0	0	82	0	0	3	96	3
Hazel	0	7	21	8	0	12	31	12	0	8	23	8	0	13	26	13
Hawthorn	0	5	31	5	0	5	28	5	0	5	29	5	0	5	28	5
Alder	0	20	30	20	0	20	28	20	0	13	27	13	0	12	20	12
Willow	0	7	19	7	0	8	20	8	0	8	19	8	0	8	19	8
Other broadleaves	2	15	20	16	4	13	16	17	10	28	38	38	1	19	24	20
All species	305	282	15	588	203	303	17	506	208	171	10	380	191	241	14	431

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Table 13 (cont'd) 50-year forecast of timber availability by time period and principal species – unrestricted biological potential for Private sector hardwoods

Principal species	2052–56			2057–61				
	NRW	Private sector		Total	NRW	Private sector		Total
	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)		
All conifers	159	30	17	188	216	37	18	253
Sitka spruce	60	4	42	64	79	12	43	91
Scots pine	5	4	49	9	8	2	25	10
Corsican pine	3	0	-	3	6	0	-	6
Norway spruce	10	2	24	12	24	3	21	26
Larches	44	4	54	48	47	4	49	51
Douglas fir	20	9	23	28	25	10	21	34
Lodgepole pine	4	0	102	4	10	0	69	10
Other conifers	12	7	41	19	18	6	42	24
All broadleaves	14	161	11	175	8	143	10	151
Oak	4	13	17	18	2	18	27	20
Beech	4	20	68	23	1	8	30	9
Sycamore	0	13	25	14	0	21	53	21
Ash	0	26	21	26	0	22	25	22
Birch	1	15	25	16	2	10	22	12
Sweet chestnut	0	0	102	0	0	1	102	1
Hazel	1	15	26	17	2	15	27	17
Hawthorn	0	5	28	5	0	7	30	7
Alder	0	19	24	19	0	13	20	13
Willow	0	15	32	15	0	13	30	13
Other broadleaves	3	20	26	23	1	17	25	18
All species	173	192	10	365	224	181	9	405

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Table 14 50-year forecast of standing volume; average annual volumes within periods – unrestricted biological potential for Private sector hardwoods

Forecast period	NRW	Private sector		Total
	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)
All conifers				
2013–16	5,693	1,913	14	7,607
2017–21	5,775	1,861	15	7,636
2022–26	5,968	1,703	15	7,670
2027–31	6,332	1,425	16	7,756
2032–36	6,092	1,035	18	7,126
2037–41	6,109	642	18	6,751
2042–46	6,664	549	19	7,213
2047–51	7,177	616	16	7,792
2052–56	7,803	719	14	8,522
2057–61	8,403	940	13	9,343
All broadleaves				
2013–16	992	4,782	7	5,774
2017–21	1,068	4,082	8	5,150
2022–26	1,152	3,585	9	4,737
2027–31	1,250	3,647	9	4,898
2032–36	1,350	3,727	9	5,077
2037–41	1,431	3,824	8	5,255
2042–46	1,454	3,848	8	5,302
2047–51	1,448	4,041	7	5,489
2052–56	1,510	3,980	7	5,490
2057–61	1,562	4,123	7	5,685
All species				
2013–16	6,685	6,714	7	13,399
2017–21	6,843	5,964	7	12,807
2022–26	7,120	5,309	8	12,428
2027–31	7,582	5,092	8	12,674
2032–36	7,441	4,786	8	12,228
2037–41	7,540	4,487	8	12,027
2042–46	8,118	4,415	7	12,533
2047–51	8,625	4,675	7	13,300
2052–56	9,313	4,713	6	14,027
2057–61	9,965	5,076	6	15,041

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Table 15 50-year forecast of net increment; average annual volumes within periods – unrestricted biological potential for Private sector hardwoods

Forecast period	NRW	Private sector		Total
	volume (000 m ³ obs)	volume (000 m ³ obs)	SE%	volume (000 m ³ obs)
All conifers				
2013–16	209	76	11	285
2017–21	237	71	13	308
2022–26	236	61	14	298
2027–31	257	48	14	305
2032–36	242	41	14	284
2037–41	237	38	15	275
2042–46	258	41	16	300
2047–51	289	57	13	346
2052–56	305	69	12	374
2057–61	309	80	11	389
All broadleaves				
2013–16	18	149	6	167
2017–21	20	150	6	171
2022–26	22	155	6	177
2027–31	25	164	6	189
2032–36	25	175	5	200
2037–41	24	186	5	210
2042–46	23	190	5	213
2047–51	22	189	4	211
2052–56	22	179	4	201
2057–61	21	172	4	193
All species				
2013–16	226	226	5	453
2017–21	257	222	5	479
2022–26	258	217	6	475
2027–31	282	212	5	494
2032–36	268	218	5	485
2037–41	261	225	4	486
2042–46	281	232	4	513
2047–51	311	246	4	558
2052–56	327	249	4	576
2057–61	331	252	4	582

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Figure 9 Overview of 50-year forecast of average annual softwood availability – unrestricted biological potential for Private sector hardwoods

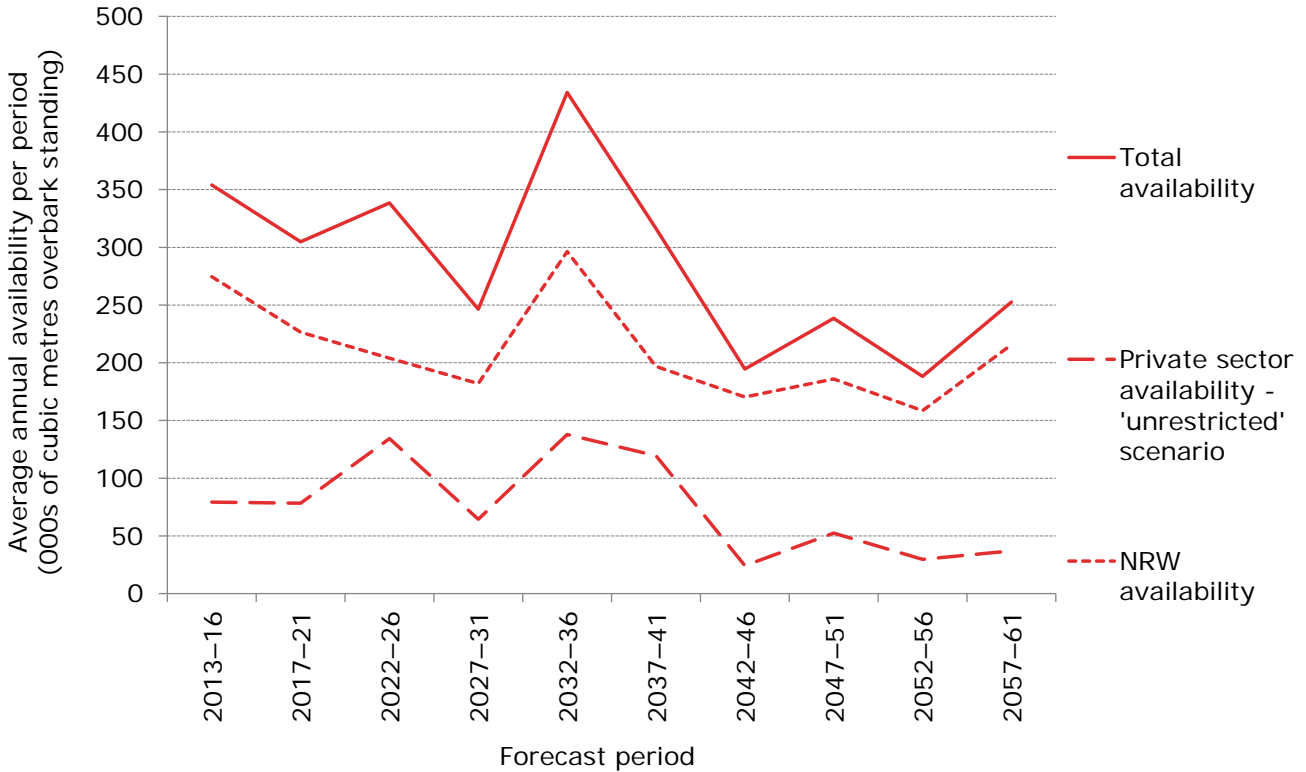
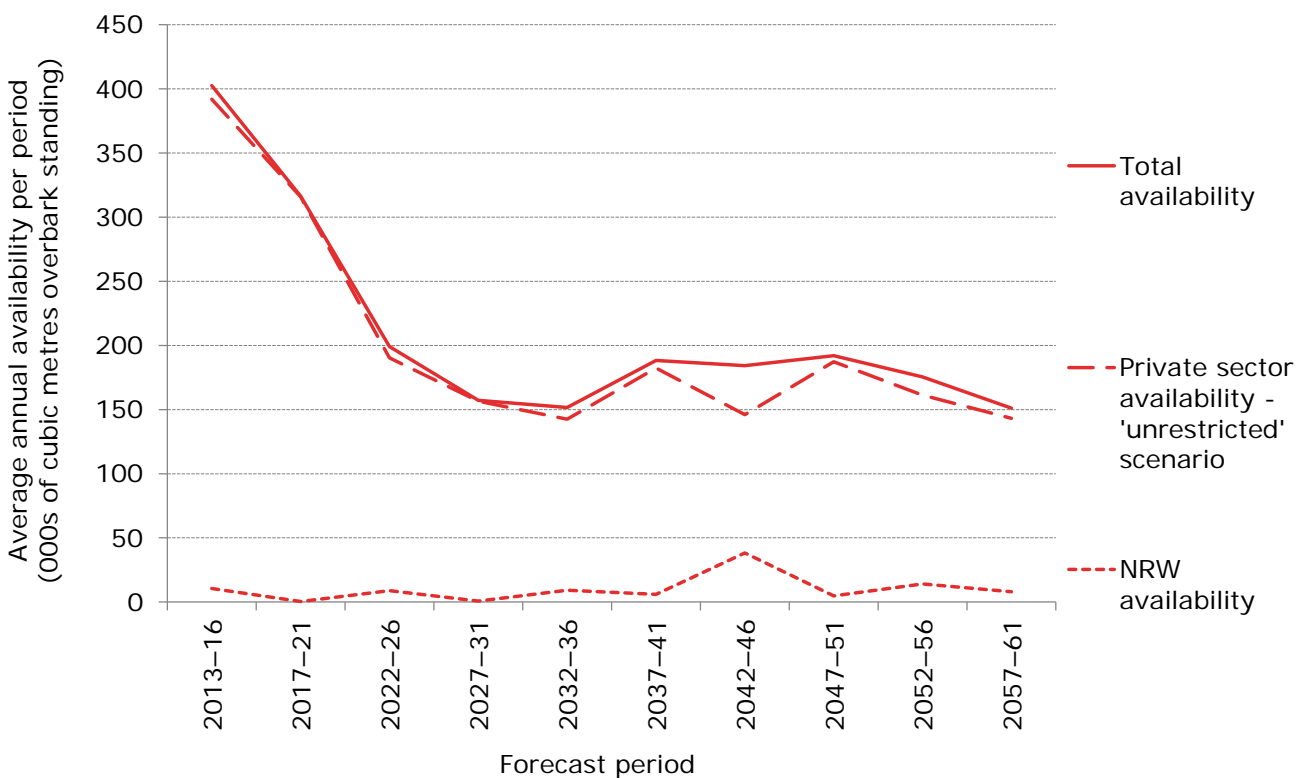


Figure 9a Overview of 50-year forecast of average annual hardwood availability – unrestricted biological potential for Private sector hardwoods



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Figure 10 50-year forecast comparison of average annual softwood availability–unrestricted biological potential for Private sector hardwoods

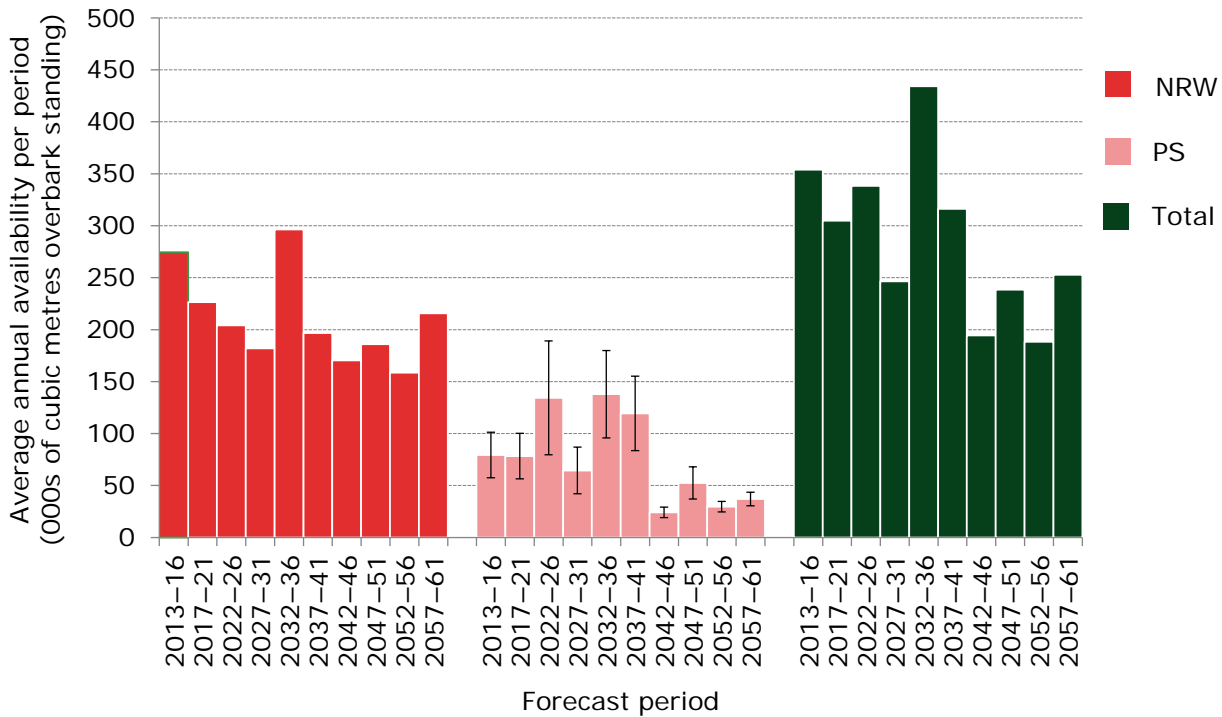
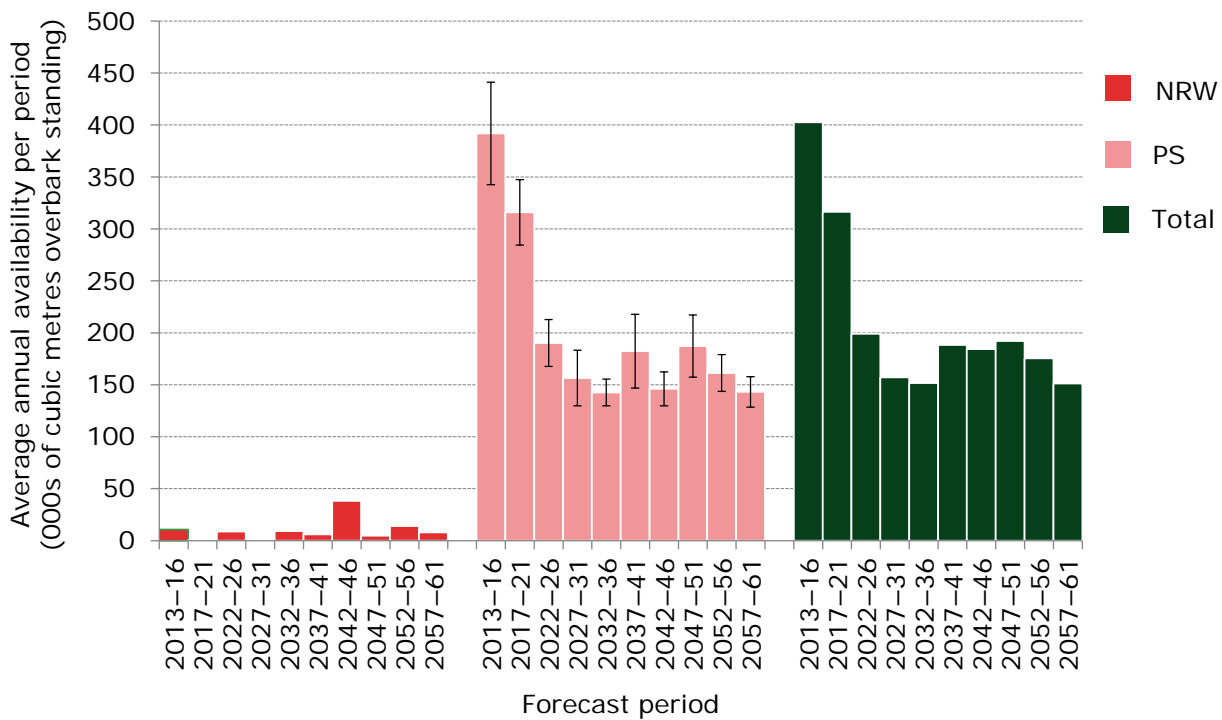


Figure 11 50-year forecast comparison of average annual hardwood availability – unrestricted biological potential for Private sector hardwoods



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Figure 12 50-year summary of softwood standing volume, increment and availability – unrestricted biological potential for Private sector hardwoods

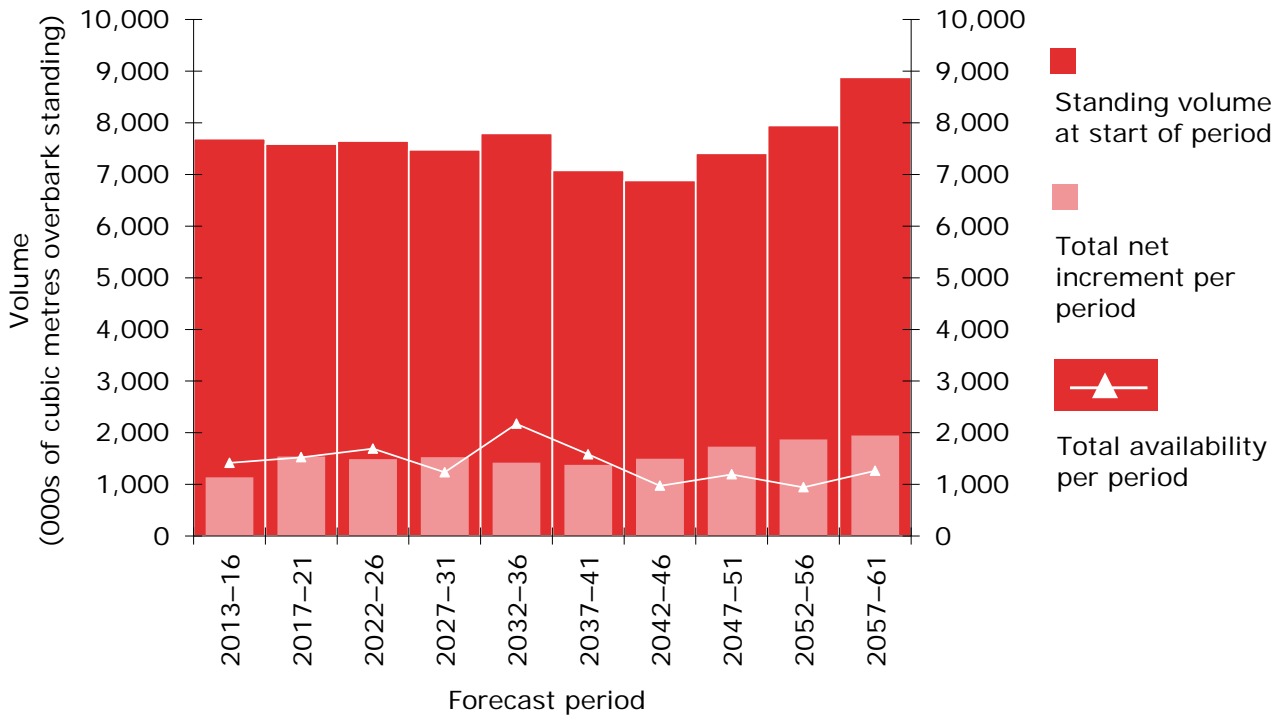
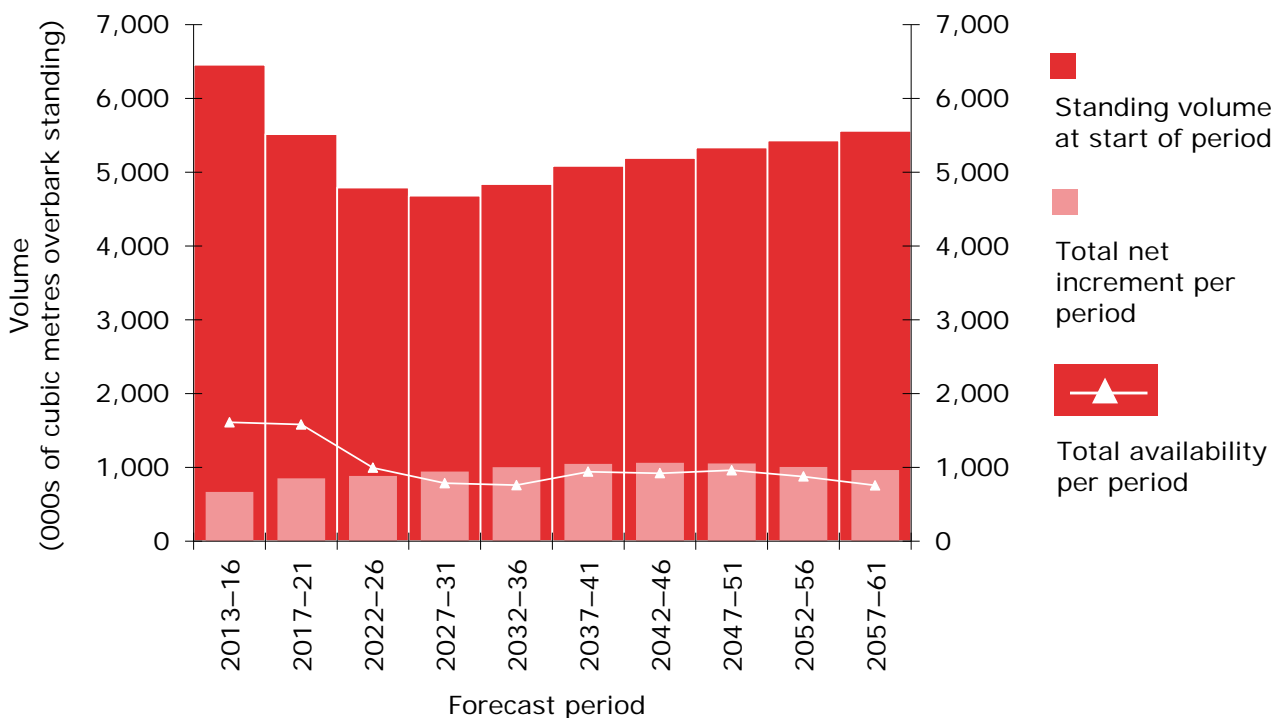


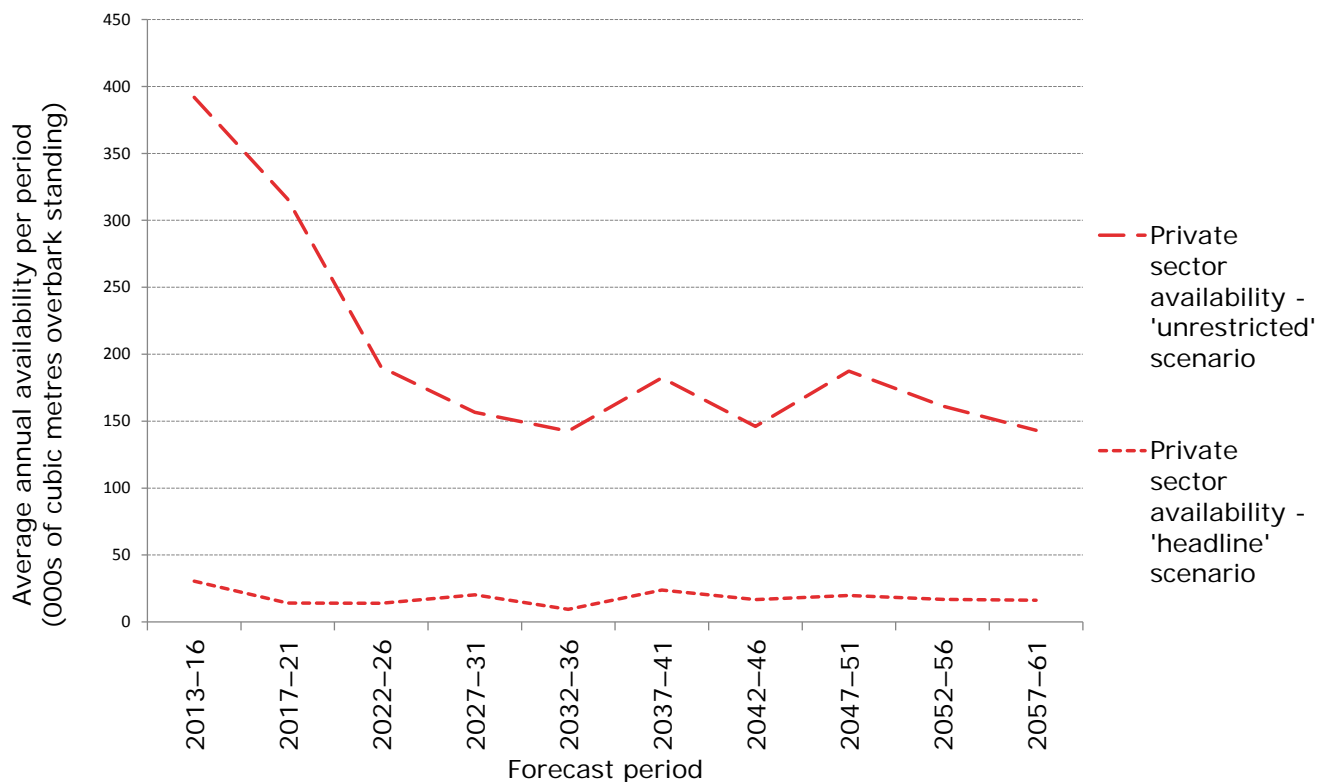
Figure 13 50-year summary of hardwood standing volume, increment and availability – unrestricted biological potential for Private sector hardwoods



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Comparison of hardwood production between harvesting scenarios

Figure 14 50-year forecast comparison of average annual hardwood timber availability



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Figure 15 15-year forecast comparison of average annual hardwood timber availability

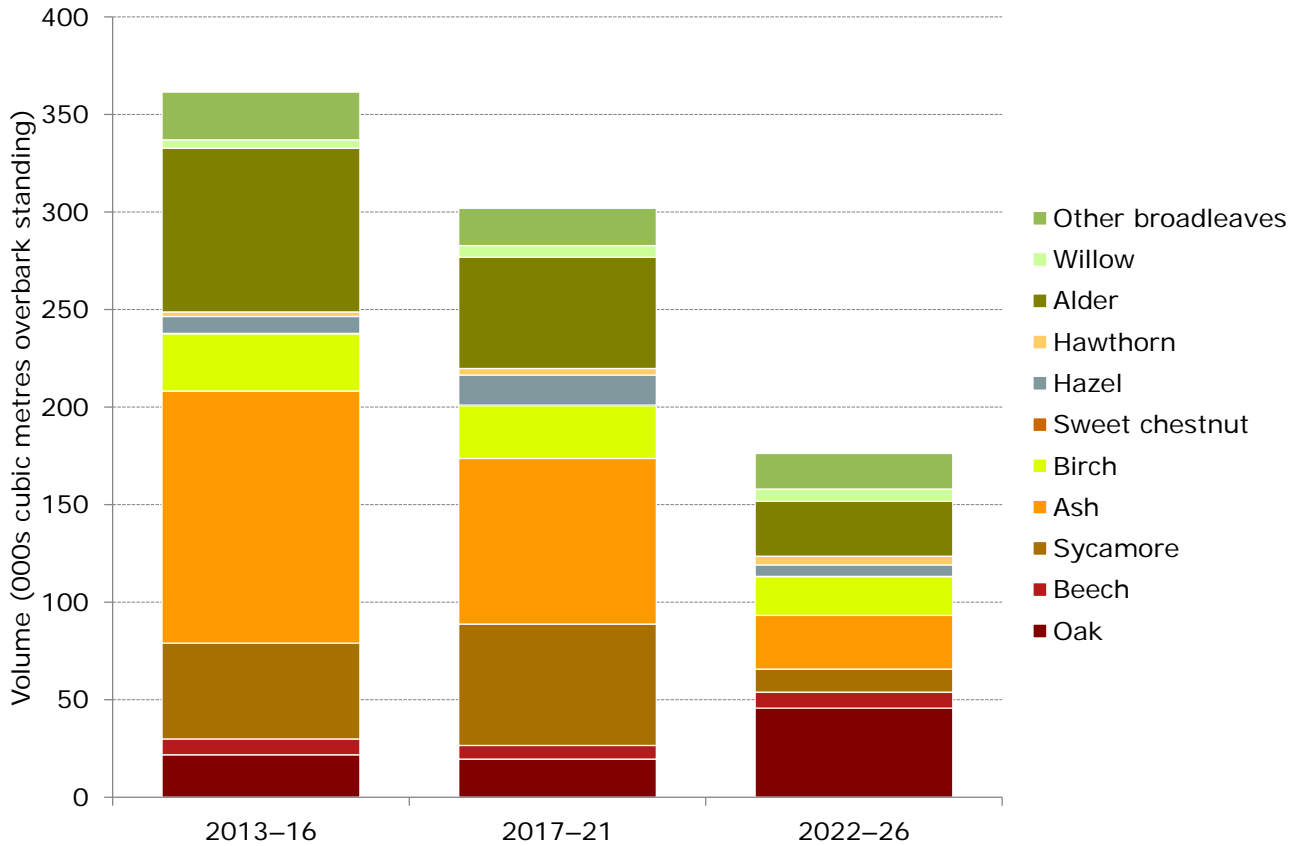


Table 16 15-year forecast comparison of average annual timber availability

Principal species	2013-16			2017-21			2022-26		
	Headline	Unrestricted volume	Difference	Headline	Unrestricted volume	Difference	Headline	Unrestricted volume	Difference
	(000 m³ obs)			(000 m³ obs)			(000 m³ obs)		
All conifers	354	354	0	305	305	0	338	338	0
Sitka spruce	175	175	0	151	151	0	157	157	0
Scots pine	9	9	0	15	15	0	8	8	0
Corsican pine	9	9	0	8	8	0	33	33	0
Norway spruce	30	30	0	26	26	0	21	21	0
Larches	82	82	0	49	49	0	34	34	0
Douglas fir	11	11	0	9	9	0	14	14	0
Lodgepole pine	16	16	0	13	13	0	11	11	0
Other conifers	20	20	0	32	32	0	57	57	0
All broadleaves	41	403	361	14	316	302	23	199	176
Oak	8	30	22	2	21	20	4	50	46
Beech	5	13	8	0	7	7	6	14	8
Sycamore	6	55	49	5	67	62	2	13	12
Ash	11	140	129	1	86	85	1	28	28
Birch	7	36	29	2	29	27	3	23	20
Sweet chestnut	0	0	0	0	0	0	0	0	0
Hazel	0	9	9	1	17	15	0	6	6
Hawthorn	0	2	2	0	4	3	1	5	4
Alder	1	85	84	1	58	57	3	31	28
Willow	0	5	4	0	6	6	1	7	6
Other broadleaves	2	27	24	1	20	19	2	21	18
All species	396	750	355	320	622	302	361	539	177

NFI national reports and papers

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

- 2011 preliminary estimates of broadleaved species in British woodlands
- 2011 standing coniferous timber volume
- 25-year forecast of softwood availability
- 25-year forecast of coniferous standing volume and increment
- 2011 biomass in live woodland trees in Britain
- 2011 carbon in live woodland trees in Britain

The principal themes reported on for the 2012 woodland profile and future forecasts are:

- 50 year forecast of softwood availability
- 50 year forecast of hardwood availability

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

www.forestry.gov.uk/inventory.

Glossary

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

Official Statistics

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

National Forest Inventory Statistician: Alan Brewer