

# Methodology Review of Softwood Removals from Non-FC/ FS Woodland

## Introduction

This paper describes the review that took place from August 2011 to February 2012 of the methodology used to estimate UK softwood removals from non-FC/ FS woodland. The review was undertaken by the Forestry Commission's Statistics team, in association with the Expert Group on Timber and Trade Statistics.

Softwood removals refers to the harvesting of roundwood (logs and small branches) from coniferous trees. Non-FC/ FS woodland relates to woodland that is not owned or managed by the Forestry Commission (in Great Britain) or the Forest Service (in Northern Ireland); this is sometimes also referred to as private sector woodland, although it also includes some woodland owned by other public sector organisations (e.g. local authorities or the Ministry of Defence).

## Background

### Data sources

Data on annual softwood removals are obtained from two sources. For softwood removals from FC/ FS woodland, figures are obtained from Forestry Commission/ Forest Service administrative records. For softwood removals from non-FC/ FS woodland, the figures are obtained from an annual survey of timber harvesting companies in the UK; this is known as the Private Sector Softwood Removals Survey (often simply referred to as the removals survey).

### History of the removals survey

The removals survey has been running for many years and was initially conducted by the Timber Grower's Association. From 1994, the survey has been conducted by the Forestry Commission. The survey originally covered softwood removals from non-FC woodlands in Great Britain only, but was extended from 2004 to include Northern Ireland.

### Survey coverage

The distribution list for the survey covers the largest timber harvesting companies in the UK. This list is not complete, as there are believed to be a large number of businesses that harvest very small amounts of softwood. The distribution list is reviewed annually by the Expert Group on Timber and Trade Statistics to ensure that it is up-to-date. There are currently 37 harvesting companies on the distribution list.

# Current methodology for the Private Sector Softwood Removals Survey

## Data collected

The removals survey questionnaire has remained largely unchanged for several years. A copy of the questionnaire used for the 2010 removals survey is provided in Annex A. The questionnaire asks for data covering both the latest year (in this case 2010) and the previous year (2009). The data requested relates to the quantity of softwood removals from non-FC/ FS woodlands in England, Scotland, Wales, Northern Ireland and the UK, as well as information on woodfuel and on certification.

## Calculation of totals

To estimate the total UK softwood removals from non-FC/FS woodland, the percentage change in the quantity of removals from the previous year to the latest year is calculated for all survey respondents. This percentage change is then applied to the estimated total UK softwood removals from non-FC/FS woodland for the previous year to produce an estimate for the current year. So, for example, the companies that responded to the 2010 removals survey reported a total of around 2.7 million green tonnes of softwood removals from non-FC/ FS woodlands in 2009 and around 3.9 million green tonnes in 2010, giving an increase of 44%. This 44% increase was then applied to the estimated total of all UK softwood removals from non-FC/ FS woodland in 2009 (around 3.4 million green tonnes) to give an estimated total for 2010 of 4.9 million green tonnes. These results are illustrated in table 1, below.

**Table 1: Calculation of UK non-FC/ FS softwood removals, 2006-2010**

Year	Survey results		% change	Estimated UK total
	Previous year	Latest year		
2006	3,081	3,099	1%	3,917
2007	3,105	3,463	12%	4,369
2008	3,527	3,243	-8%	4,016
2009	3,146	2,690	-14%	3,434
2010	2,696	3,879	44%	4,941

Source: Private Sector Softwood Removals Survey (Forestry Statistics 2011, table 2.2)

Note:

1. Methodology uses percentage change reported by respondents to roll forward estimated UK total.

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## Assumptions

The methodology described above therefore assumes that the trends reported by respondents are representative of the industry as a whole. Table 2 gives a breakdown of the estimated total UK softwood removals from non-FC/ FS woodland, showing the removals reported by respondents, an estimate of the removals by non-respondents and the quantity of softwood removals that has been imputed for businesses not covered by the survey.

**Table 2: UK non-FC/ FS softwood removals by data source, 2006-2010**

Thousand green tonnes

Year	Reported by survey respondents	Estimate for non-respondents	Imputed	Estimated UK total	% imputed
2006	3,099	13	805	3,917	21%
2007	3,463	7	898	4,369	21%
2008	3,243	7	767	4,016	19%
2009	2,690	86	658	3,434	19%
2010	3,879	80	982	4,941	20%

Source: Private Sector Softwood Removals Survey

Note:

1. Estimates for non-respondents based on responses in previous years.

## Drivers for change

### Comparison with other data sources

The quantity of softwood roundwood that is delivered to (or consumed by) wood processors and others is estimated from a range of data sources:

- The Sawmill Survey;
- The Survey of Round Fencing Manufacturers;
- The UK Forest Products Association (integrated pulp and paper mills);
- The Wood Panel Industries Federation (woodbased panel mills);
- Direct enquiries to others that consume or export roundwood;
- The Private Sector Softwood Removals Survey (for estimates of roundwood used for woodfuel) and
- Estimates by the Expert Group on Timber and Trade Statistics.

The estimates obtained from each of these sources are combined to produce annual totals for softwood deliveries. In theory, the total softwood removals (calculated from

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the removals survey + softwood removals from FC/ FS woodland) should be consistent with the total softwood deliveries, with any discrepancies relating to variations in the level of stocks between harvesting and delivery to (or consumption by) the processor. Table 3 shows the discrepancies between UK softwood removals and deliveries for recent years.

**Table 3: Comparison of removals and deliveries of UK softwood roundwood, 2006-2010**

Year	Thousand green tonnes				
	FC/FS removals	Non-FC/FS removals	Total removals	Deliveries	Balance
2006	4,582	3,917	8,499	8,187	312
2007	4,653	4,369	9,022	8,790	232
2008	4,415	4,016	8,432	8,187	245
2009	5,126	3,434	8,560	8,304	256
2010	4,625	4,941	9,567	9,419	147

Sources:

FC/ FS removals: Forestry Commission, Forest Service,

Non-FC/ FS removals: Private Sector Softwood Removals Survey

Deliveries: industry surveys, industry associations.

### Concerns about current methodology

The Expert Group on Timber and Trade Statistics has been concerned about the level of discrepancy between softwood removals and softwood deliveries for some time. Of the two measures, their view is that deliveries are likely to be a more accurate measure of the level of softwood roundwood that is produced in the UK each year. Further, given that the figures for removals from FC/ FS woodland are obtained from audited administrative systems, these figures should be reasonably robust.

The complexity of the current methodology makes it difficult for users to understand how figures on softwood removals from non-FC/ FS woodland have been derived. In addition, the roll-forward methodology (described above) relies on annual percentage changes being applied to an original estimate that was not well documented and is believed to have been produced over 20 years ago; given the time that has elapsed, it would now be extremely difficult to check on the validity of that original estimate.

The assumptions that are implicit in the current methodology take no account of changes that have occurred within the harvesting sector over time, either through increased mechanisation of the harvesting process or through business mergers (that are believed to have resulted in the largest harvesting companies accounting for an increasing market share). The amendments made to the distribution list over time may reflect some of these changes. For example, there were 42 businesses on the distribution list for the 2001 survey. By 2010, 26 of these businesses remained on the list and 16 had been

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removed; a further 11 businesses (including those in Northern Ireland) had been added since 2001, giving a total of 37 on the list for the 2010 survey.

Given these concerns, the Expert Group on Timber and Trade Statistics concluded that options for re-basing the estimates from the Private Sector Softwood Removals Survey should be considered.

### Options for the future

Three basic options were considered for the future methodology to estimate softwood removals from non-FC/ FS woodland. These are:

- Option 1: To assume that the businesses not covered by the removals survey account for a fixed quantity of softwood removals from non-FC/ FS woodlands;
- Option 2: To assume that the businesses not covered by the removals survey account for a fixed percentage of all softwood removals from non-FC/ FS woodlands;
- Option 3: To continue with the current methodology for the removals survey, with a revised estimated UK total.

#### Option 1: Assume a fixed quantity not covered by the survey

One possibility would be to adjust the methodology so that explicit estimates are made for non-respondents to the removals survey (based on responses in previous years) and for businesses not covered by the survey. Under this option, softwood removals from non-FC/ FS woodlands by businesses not covered by the survey are estimated as a fixed quantity.

The underlying assumption in this option is that the harvesting activity not covered by the removals survey is reasonably constant over time and not affected by changes reported through the survey. Importantly, there is also scope to adjust the fixed quantity periodically, if required, to reflect perceived changes in the harvesting activity of businesses not covered by the survey.

Under this option, there would be no requirement to roll forward overall estimates (as is currently done), and there would be less need for the removals survey questionnaire to collect data covering 2 years.

Table 4 illustrates the results that would be achieved if a fixed quantity of softwood removals from non-FC/ FS woodland were assumed for businesses not covered by the removals survey. In this case, the fixed quantity is assumed to be 600 thousand green tonnes, reflecting the average annual discrepancy between the survey results (including estimates for non-respondents) and softwood deliveries less removals from FC/ FS woodland in the most recent 5 year period (2006 - 2010).

**Table 4: Estimated UK non-FC/ FS softwood removals under option 1 – fixed quantity assumption, 2006-2010**

Year	Survey results			Non-survey (imputed)	Estimated UK total	Balance (removals less deliveries)
	Respondents	Non-respondents	Total			
2006	3,099	13	3,112	600	3,712	107
2007	3,463	7	3,470	600	4,070	-67
2008	3,243	7	3,249	600	3,849	78
2009	2,690	86	2,776	600	3,376	198
2010	3,879	80	3,959	600	4,559	-235

Source: Private Sector Softwood Removals Survey

Note:

1. Assumes a fixed quantity of 600 thousand green tonnes for businesses not covered by the survey. This is based on the average annual discrepancy between the survey results (including estimates for non-respondents) and softwood deliveries less removals from FC/ FS woodland in the most recent 5 year period (2006 - 2010).

### Option 2: Assume a fixed percentage not covered by the survey

Similar to option 1, above, the methodology could be adjusted so that explicit estimates are made for non-respondents to the removals survey (based on responses in previous years) and for businesses not covered by the survey. In this case, however, softwood removals from non-FC/ FS woodlands by businesses not covered by the survey would be estimated as a fixed percentage of the total estimated softwood removals from non-FC/ FS woodland.

The underlying assumption in this option is that trends in harvesting activity not covered by the removals survey are similar to the trends reported through the survey. Again, there is scope to adjust the fixed percentage periodically, if required, to reflect perceived changes in the balance of harvesting activity between businesses covered by the survey and those that are not.

As for option 1, there would be no requirement to roll forward overall estimates (as is currently done), and there would be less need for the removals survey questionnaire to collect data covering 2 years.

Table 5 illustrates the results that would be achieved if a fixed percentage of softwood removals from non-FC/ FS woodland were assumed for businesses not covered by the removals survey. In this case, the fixed quantity is assumed to be 15% of the total estimated softwood removals from non-FC/ FS woodland, reflecting the annual average discrepancy between the survey results (including estimates for non-respondents) and

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softwood deliveries less removals from FC/ FS woodland in the most recent 5 year period (2006 - 2010).

**Table 5: Estimated UK non-FC/ FS softwood removals under option 2 – fixed percentage assumption, 2006-2010**

Year	Survey results			Non-survey (imputed)	Estimated UK total	Balance (removals less deliveries)
	Respondents	Non- respondents	Total			
	2006	3,099	13			
2007	3,463	7	3,470	612	4,083	-54
2008	3,243	7	3,249	573	3,823	51
2009	2,690	86	2,776	490	3,266	88
2010	3,879	80	3,959	699	4,658	-136

Source: Private Sector Softwood Removals Survey

Note:

1. Assumes a fixed percentage of 15% of the estimated UK total non-FC/ FS softwood removals for businesses not covered by the survey. This is based on the average annual discrepancy between the survey results (including estimates for non-respondents) and softwood deliveries less removals from FC/ FS woodland in the most recent 5 year period (2006 - 2010).

### Option 3: Continue the current methodology with revised total

An alternative to options 1 and 2, above, is to continue with the current methodology but to produce a new estimate of total UK softwood removals from non-FC/ FS woodlands that is then rolled forward (or back) for subsequent (or previous) years.

Under this option, the requirement to request data for 2 years would continue, to enable percentage changes to be calculated and applied to the previous year's total.

Table 6 illustrates the results that would be achieved if the estimate for total UK softwood removals from non-FC/ FS woodland were adjusted (in this case to assume that removals = deliveries in 2006).

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**Table 6: Estimated UK non-FC/ FS softwood removals under option 3 – current methodology with revised total, 2006-2010**

Thousand green tonnes

Year	Survey results		% change	Estimated UK total	Balance (removals less deliveries)
	Previous year	Latest year			
2006	3,081	3,099	1%	3,605	0
2007	3,105	3,463	12%	4,021	-116
2008	3,527	3,243	-8%	3,696	-75
2009	3,146	2,690	-14%	3,161	-18
2010	2,696	3,879	44%	4,548	-246

Source: Private Sector Softwood Removals Survey

Note:

1. Resets estimated UK total non-FC/ FS softwood removals for 2006 to equal deliveries less FC/ FS removals, then uses current methodology to roll forward (or back) estimates for other years.

## New methodology

The Expert Group on Timber and Trade Statistics concluded that option 2 represented the best methodology for estimating softwood removals from non-FC/ FS woodland.

This provided a simpler methodology that would be easier for users to understand and the use of a fixed percentage to impute for businesses not covered by the survey was considered to more closely reflect trends in harvesting by those businesses.

It was agreed that a fixed percentage of 15% of the total softwood removals from non-FC/ FS woodland be used as a starting point to impute for businesses not covered by the survey, and would be applied for the years 2006 to 2010. To create a consistent time series, some earlier years would also use a fixed percentage, but this percentage would need to be adjusted to smooth the transition between the current and new methodologies.

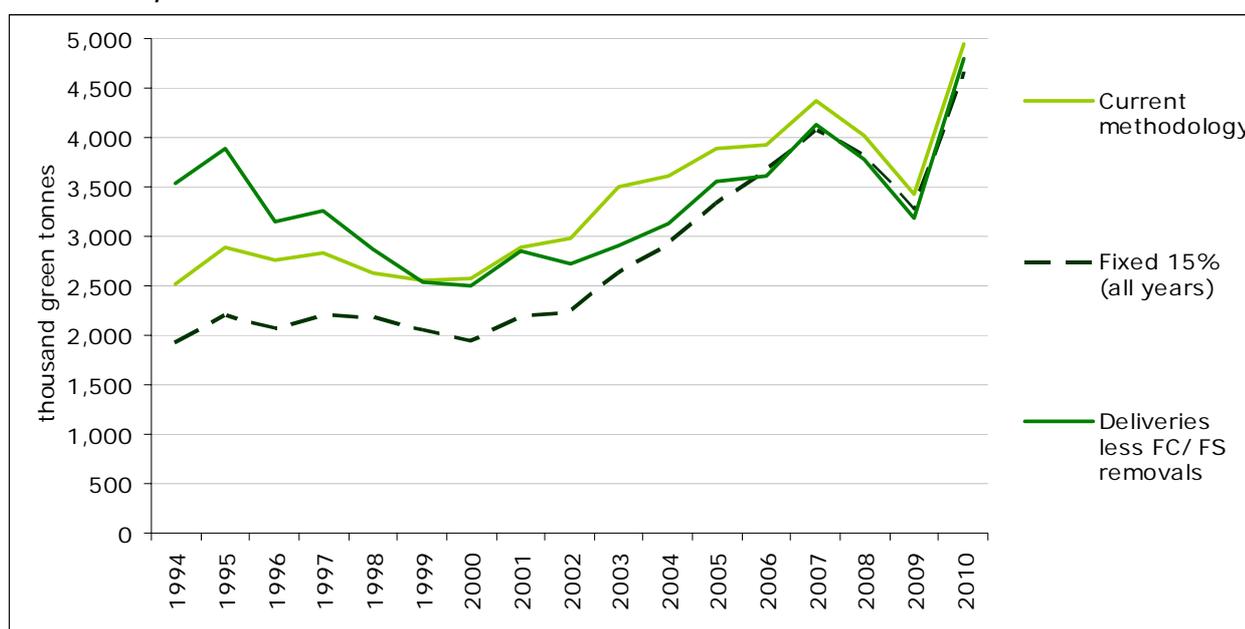
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Chart 1 compares the estimates of total UK softwood removals from non-FC/ FS woodland for 1994 to 2010, obtained from:

- the current methodology, and
- the new fixed percentage methodology (with 15% assumed for all years)

with the figures obtained from taking total softwood deliveries less FC/ FS softwood removals.

**Chart 1: Comparison of methodologies for estimating UK non-FC/ FS softwood removals, 1994-2010**



Source: Private Sector Softwood Removals Survey

The chart above indicates that a constant fixed assumption applied (in this case 15%) across the entire time period would produce estimates that diverge both from the figures for deliveries less FC/ FS softwood removals and from the results produced by the current methodology. As the discrepancy between the current methodology and deliveries less FC/ FS removals is lowest in the period 1999 to 2001, it is concluded that these estimates (and the figures for earlier years) should remain unchanged. The transition from the current methodology to the new methodology should therefore only be applied to the years 2002 to 2005 inclusive.

Under the current methodology, the percentage of UK softwood removals from non-FC/ FS woodland that has been imputed for businesses not covered by the survey in 2001 was 36%. In order to provide a smooth transition between the estimates for 2001 (based on the current methodology) and 2006 (based on the new methodology, with an assumption of 15% imputed), it is proposed that the new fixed percentage methodology

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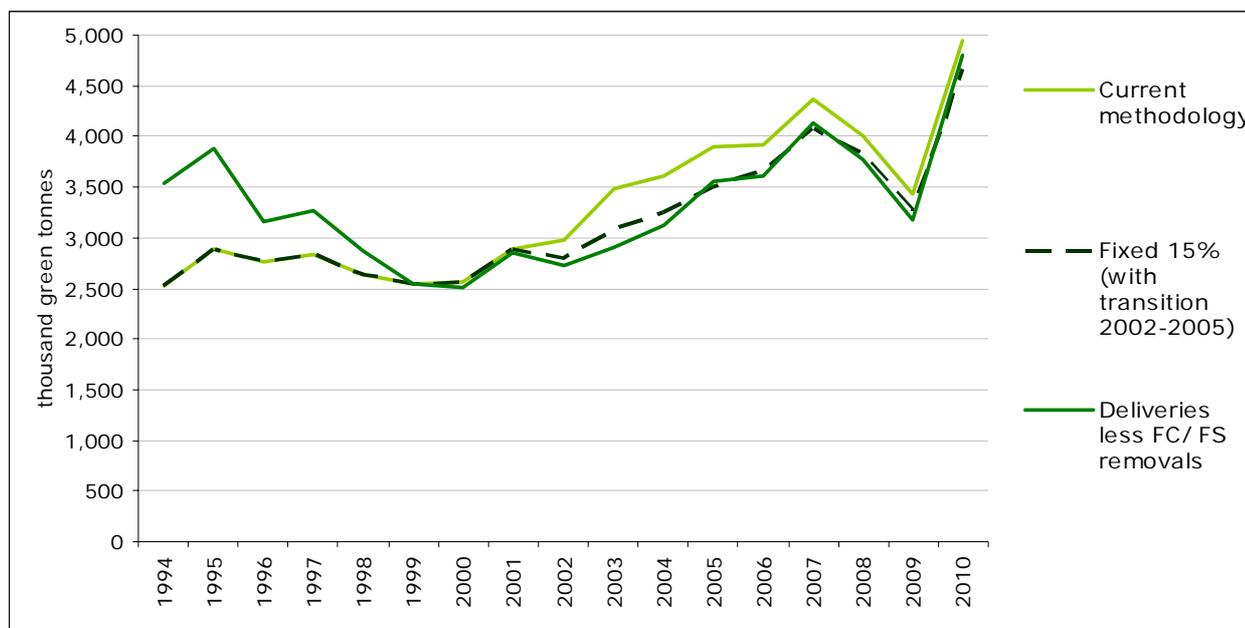
be applied to the figures for 2002 to 2005, with a decrease of around 4 percentage points per year in the percentage assumed for businesses not covered by the removals survey.

Chart 2 compares the estimates of total UK softwood removals from non-FC/ FS woodland for 1994 to 2010, obtained from:

- the current methodology, and
- the new fixed percentage methodology (with transition period in 2002-2005).

These are displayed alongside the figures obtained from taking total softwood deliveries less FC/ FS softwood removals.

**Chart 2: Comparison of methodologies for estimating UK non-FC/ FS softwood removals, 1994-2010**



Source: Private Sector Softwood Removals Survey

## Effect of changing methodology

Table 7 compares the results under the current methodology with those from applying the new methodology, including the transitional period from 2002 to 2005. The table shows that adoption of the new methodology (including transition from 2002-2005) will result in a downward revision of up to 400 thousand green tonnes (11%) to the annual figures for UK softwood removals from non-FC/ FS woodland between 2002 and 2010.

**Table 7: Comparison of estimated UK non-FC/ FS softwood removals under current methodology and new methodology, 2001-2010**

Thousand green tonnes

Year	Survey results (incl. non-respondents)	Current methodology		New methodology (with 2002-2005 transition)	
		(imputed)	Estimated UK total	(imputed)	Estimated UK total
2001	1,850	1,041	2,891	1,041	2,891
2002	1,905	1,068	2,972	888	2,793
2003	2,238	1,253	3,491	853	3,091
2004	2,487	1,131	3,618	760	3,246
2005	2,827	1,067	3,894	672	3,499
2006	3,112	805	3,917	549	3,661
2007	3,470	898	4,369	612	4,083
2008	3,249	767	4,016	573	3,823
2009	2,776	658	3,434	490	3,266
2010	3,959	982	4,941	699	4,658

Source: Private Sector Softwood Removals Survey

Note:

1. The figures for the years 2002 to 2005 under the new methodology are calculated using percentages assumed for businesses not covered by the survey that range from 32% in 2002 to 19% in 2005. Figures prior to 2002 are unchanged from the current methodology.

Under the current methodology, a country breakdown of softwood removals from non-FC/ FS woodland is calculated as follows:

- As the removals survey is believed to cover all harvesting activity in Northern Ireland, softwood removals from non-FS woodland in Northern Ireland are provided directly from the survey;
- For England, Wales and Scotland, the figures from the survey (covering data reported by respondents together with estimates for non-respondents) are updated to ensure that the total for these countries equals the UK total softwood removals from non-FC/ FS woodland less the figure for Northern Ireland.

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It is proposed that this method for estimating the country breakdown remains unchanged. However, as the change in methodology will result in downward revisions to the UK totals for 2002 to 2010, the estimates for England, Wales and Scotland will also be reduced. As the methodology used to estimate country breakdowns assumes that all softwood removals from non-FS woodland in Northern Ireland are covered by the survey, the estimates for Northern Ireland will remain unchanged.

Table 8 compares the country breakdown under the current methodology with that from applying the new methodology, including the transitional period from 2002 to 2005. The table shows that adoption of the new methodology (including transition from 2002-2005) will result in downward revisions to the annual figures for softwood removals from non-FC/ FS woodland between 2002 and 2010 of up to:

- 65 thousand green tonnes in England,
- 40 thousand green tonnes in Wales and
- 305 thousand green tonnes in Scotland.

**Table 8: Comparison of estimated non-FC/ FS softwood removals by country under current methodology and new methodology, 2001-2010**

	Thousand green tonnes						
	England		Wales		Scotland		Northern Ireland
	Current <sup>1</sup>	New <sup>2</sup>	Current <sup>1</sup>	New <sup>2</sup>	Current <sup>1</sup>	New <sup>2</sup>	
2001	544	544	375	375	1,942	1,942	29
2002	383	360	346	325	2,213	2,078	29
2003	522	461	320	283	2,620	2,317	29
2004	498	446	323	289	2,767	2,481	30
2005	595	534	296	266	2,963	2,659	40
2006	627	586	348	326	2,920	2,729	21
2007	656	612	409	382	3,275	3,059	29
2008	671	638	350	333	2,971	2,827	25
2009	561	533	337	321	2,512	2,388	24
2010	710	669	456	430	3,718	3,502	57

Source: Private Sector Softwood Removals Survey

Note:

1. Figures shown under the current methodology are as published in Forestry Statistics 2011 (table 2.3)
2. The figures for the years 2002 to 2005 under the new methodology are calculated using percentages assumed for businesses not covered by the survey that range from 32% in 2002 to 19% in 2005. Figures prior to 2002 are unchanged from the current methodology.
3. Figures for England, Wales & Scotland (all years) are updated from survey results using UK totals.
4. Northern Ireland figures from 2003 are as reported in the Private Sector Softwood Removals Survey; figures for earlier years are set at 2003 level.

## Conclusions and next steps

The review has concluded that:

- The methodology for estimating UK softwood removals from non-FC/ FS woodland should change to a fixed percentage methodology, where estimated removals for businesses not covered by the survey are imputed using a fixed percentage of the total estimated UK softwood removals from non-FC/ FS woodland.
- The starting assumption for the fixed percentage methodology, to be applied to the years 2006 to 2010 inclusive, is that businesses not covered by the removals survey account for 15% of UK softwood removals from non-FC/ FS woodland. This starting assumption is based on a comparison of removals survey results (including estimates for non-respondents) with softwood deliveries less removals from FC/ FS woodland over the 5 year period.
- The current methodology should be retained for 2001 (when the current estimate of softwood removals is close to the figure for softwood deliveries) and earlier years.
- A period of transition is required from 2002 to 2005 inclusive to move smoothly from the current methodology to the new methodology. This should be achieved by adopting the new methodology, with variable percentages for businesses not covered by the survey, during this period. The percentage of UK softwood removals from non-FC/ FS woodland that is imputed for businesses not covered by the removals survey during this transition period should vary, to provide a gradual change from the 36% that has been assumed in 2001 under the current methodology to the 15% assumed in 2006 (and subsequent years) under the new methodology.
- Application of the new methodology (including transition) will result in a downward revision to the estimates of softwood removals from non-FC/ FS woodland for the UK and for England, Wales and Scotland; estimates for Northern Ireland will remain unchanged.

It is proposed that the new methodology, with transition from 2002 to 2005, be introduced when provisional 2011 figures are released in UK Wood Production and Trade (provisional figures), on 17 May 2012. The percentage used to impute the quantity of softwood harvested by businesses not covered by the survey will be reviewed annually by the Expert Group on Timber and Trade Statistics.

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February 2012

# Methodology review

## Annex A: Questionnaire for 2010 Survey

### PRIVATE SECTOR SOFTWOOD REMOVALS SURVEY

**1. Please provide the quantity of softwood timber your company harvested from Private Sector estates during 2009 and 2010.**

These figures should include only timber harvested from the **private sector** – i.e. estates other than the Forestry Commission or (in Northern Ireland) the Forest Service. Include only timber felled by your own company and sub-contractors. Do not include timber you have sold standing to another party.

Harvested from:	2009 Quantities	2010 Quantities	
England	<input type="text"/>	<input type="text"/>	green tonnes
Scotland	<input type="text"/>	<input type="text"/>	green tonnes
Wales	<input type="text"/>	<input type="text"/>	green tonnes
Northern Ireland	<input type="text"/>	<input type="text"/>	green tonnes
United Kingdom	<input type="text"/>	<input type="text"/>	green tonnes

### WOODFUEL

**2. Please provide your best estimate of the UK volume (from Q1) sold for bioenergy (incl pellet manufacture)?**

<input type="text"/>	<input type="text"/>	green tonnes
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### CERTIFICATION

**3. How much of the UK volume (from Q1) was from certified woodlands?**

<input type="text"/>	<input type="text"/>	green tonnes
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**4. Does your company have a Chain of Custody Certificate?**  
(tick one)

YES  NO

If possible, please complete this questionnaire online at [www.forestry.gov.uk/timbersurveys](http://www.forestry.gov.uk/timbersurveys).

If you are submitting a paper return, please send it to us at the following address (no stamp required):

Statistics Branch, Forestry Commission, FREEPOST, Edinburgh, EH12 0PD