

7 Table T7 – Biomass stock

7.1 FRA 2010 Categories and definitions

Category	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage.
Below-ground biomass	All biomass of live roots. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Growing stock	M	All	All	From table T6
Temperate and Boreal Forest Resources Assessment (TBFRA) 2000	M	All	All	Conversion factors for stem volume to above-ground and below-ground biomass.
National Inventory of Woodland and Trees : Analysis of Management and Biodiversity Data” - Gilbert (2007)	M	Deadwood	1995-99	

7.2.2 Classification and definitions

National class	Definition
Standing deadwood	>15 cm diameter – dead tree or branch/limb
Lying deadwood	>15 cm diameter and >2m long
Fallen trees	> 7cm dbh

7.2.3 Original data

From Table T6: Forest growing stock (million cubic metres over bark)

	1990	2000	2005	2010
Total growing stock	282	309	340	379
... of which coniferous	161	212	243	281
... of which broadleaved	121	97	97	98

Conversion factors from growing stock volume to biomass were taken from a Forestry Commission guidance note (1998).

- For Sitka spruce (accounting for about half of all conifers), total to merchantable ratio of 1.2, and 0.33 tonnes biomass per m³, giving a factor of 0.40. Other conifers give factors up to 0.56, giving an average around 0.45.
- For broadleaves, total to merchantable ratio of 2.0-2.5 and around 0.45-0.55 tonnes biomass per m³, giving a factor of around 1.1.

Total above ground biomass also includes shrubs and bushes in forest and OWL, explicitly identified in TBFRA 2000, and reported as 5 million oven dried tonnes (ODT) for UK. The same estimate of 5 million ODT is included here for each year, added to the estimates for tree biomass to give total above ground biomass.

Biomass of below-ground stump and roots per m³ growing stock = 0.10
(0.13 for stump + roots as in TBFRA 2000, less 0.03 for above-ground stump).

For deadwood, classification of volume per hectare is given in Gilbert (2007) for each country. This was derived from survey counts of number of pieces (by type, and fallen trees by size category), multiplied by an estimate of average size per piece for each type/category. It is summarised to show the following averages: GB 2.0, England 2.7, Scotland 1.8, Wales 0.7.

7.3 Analysis and processing of national data

7.3.1 Estimation and forecasting

Above ground:

For each year total =conifer biomass + broadleaf biomass + shrubs and bushes biomass (ODT)

1990: $(161 \times 0.45) + (121 \times 1.1) + 5 = 211$

2000: $(212 \times 0.45) + (97 \times 1.1) + 5 = 207$

2005: $(243 \times 0.45) + (97 \times 1.1) + 5 = 221$

2010: $(281 \times 0.45) + (98 \times 1.1) + 5 = 234$

Below ground i.e. biomass of stumps and roots (ODT)

All years: $0.1 \times \text{total volume}$

1990: $0.1 \times 282 = 28$

2000: $0.1 \times 309 = 31$

2005: $0.1 \times 340 = 34$

2010: $0.1 \times 379 = 38$

For deadwood, for each country multiply volume per hectare by woodland area, and add estimate for Northern Ireland, to get a total of 5.6 million m³ (3 million ODT) for UK.

All estimation copied from a spreadsheet using unrounded values.

7.3.2 Reclassification into FRA 2010 categories

No reclassification undertaken.

7.4 Data for Table T7

FRA 2010 category	Biomass (million metric tonnes oven-dry weight)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Above-ground biomass	211	207	221	234	1	1	1	1
Below-ground biomass	28	31	34	38	0	0	0	0
Dead wood	3	3	3	3	0	0	0	0
TOTAL	242	241	258	275	1	1	1	1

7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass	<p>The source for conversion factors is the same as used for TBFRA 2000, but further adjustments were applied in TBFRA 2000 to take account of the different (standardised) definition of growing stock, giving factors of 0.43 and 0.83 respectively. These factors from TBFRA 2000 were mistakenly applied to growing stock on UK definitions in FRA 2005, so biomass and carbon were underestimated in FRA 2005.</p> <p>Better factors should be available from the models being developed for the 2011 Production Forecast, but are not available in time for this report.</p>	
Below-ground biomass		
Dead wood		<p>Deadwood in UK forests is much lower than the default figures in FRA guidelines (which were based on semi-natural and near-natural forests), because most UK forest are plantations, and past silvicultural practices in UK tended not to leave much deadwood in plantations.</p>

Other general comments to the table