

# Valuation of Welsh Forest Resources

## EXECUTIVE SUMMARY

Commissioned and funded by Welsh  
Government

Vadim Saraev  
Stuart MacCallum  
Darren Moseley  
Gregory Valatin



Llywodraeth Cymru  
Welsh Government

The Research Agency of the  
Forestry Commission

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Contract number: FRB1701

Description: Valuation of Welsh Forest Resources

Contract Manager: Richard Morgan  
Forest Resources Policy Branch  
Department for Natural Resources  
Welsh Government  
Cathays Park  
Cardiff  
CF10 3NQ

Tel: 0290 823 384

Email: [Richard.Morgan4@wales.gsi.gov.uk](mailto:Richard.Morgan4@wales.gsi.gov.uk)

Project manager: Gregory Valatin  
Forest Research  
Alice Holt Lodge  
Farnham  
Surrey  
GU10 4LH

Tel: 0300 067 5699

Fax: 01420 23653

Email: [gregory.valatin@forestry.gsi.gov.uk](mailto:gregory.valatin@forestry.gsi.gov.uk)

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## Executive Summary

This study estimated the value of woodlands in Wales in the context of five specific ecosystem goods and services: standing timber, timber extraction, carbon sequestration, recreation and air quality improvement. To help relate the estimates for Wales to those for the UK as a whole, it is useful to note that woodlands in Wales represent about 10% of the total area of UK woodlands. The full ONS UK timber asset accounts and woodland ecosystems valuations can be accessed via this [web link](#) (version dated 5 July 2016 used for this report). The headline figures for the UK are presented here for comparison. (For ease of comparison with those derived in this study, the values from ONS for the UK were reflatd from 2013 to 2015 prices):

1. In 2015, the total stock of standing timber resource in the UK was estimated at 618.1 million cubic metres overbark. The monetary value of all UK timber resources was estimated to be £8 billion in 2015 (2015 prices).
2. In 2014, the total timber removals in the UK were estimated at 12.4 million cubic metres overbark. The annual value of timber removals was £233 million in 2014 (2015 prices). The asset value for this ecosystem service was estimated at £5.3 billion in 2014 (2015 prices).
3. In 2014, the total carbon sequestration in the UK was estimated at 15.6 million tonnes CO<sub>2</sub>e. The annual value of carbon sequestration was £975 million in 2014 (2015 prices). The asset value for this ecosystem service was estimated at £39 billion in 2014 (2015 prices).
4. In 2014, the total number of visits for recreation in woodlands in the UK was estimated at 634 million. The annual value of recreation was £2.3 billion in 2014 (2015 prices). The asset value for this ecosystem service was estimated at £56.2 billion in 2014 (2015 prices).
5. In 2014, the total air filtration in the UK was estimated at 141.4 thousand tonnes of particles removed. The annual value of air filtration was £3 billion in 2014 (2015 prices). The asset value for this ecosystem service was estimated at £70.9 billion in 2014 (2015 prices).

The total annual value of four woodland ecosystem services (excluding standing timber) in 2014 for the UK was estimated at £6.5 billion (2015 prices). The corresponding asset value in 2014 was £171.4 billion (2015 prices).

We estimated the value of annual service flows provided by woodlands in Wales for four ecosystem services: timber extraction, carbon sequestration, recreation and air quality improvement. These annual values are presented in Table 1 below, together with an indicative aggregate value.

**Table 1 Annual value of service flows from forests in Wales in 2015**

| Service                       | Timber extraction | Carbon sequestration | Recreation* | Air quality | Total        |
|-------------------------------|-------------------|----------------------|-------------|-------------|--------------|
| Value, £ million, 2015 prices | 28.3              | 108                  | 85          | 385         | <b>606.3</b> |

\* Recreation value is derived from the 2014 survey. Following new recommendations from the ONS, the value is estimated from the expenditure data and is not based on mean value per visit as the figures for the UK reported above. The new approach yields lower estimates than that based on mean value per visit (see Annex in the main report).

As can be seen from the table, the indicative total annual value of the 4 woodland ecosystem services amounts to just over £600 million. Of the 4 services, air quality improvements due to pollution removal is the largest, followed by carbon sequestration, recreation and then timber production (Figure 1).

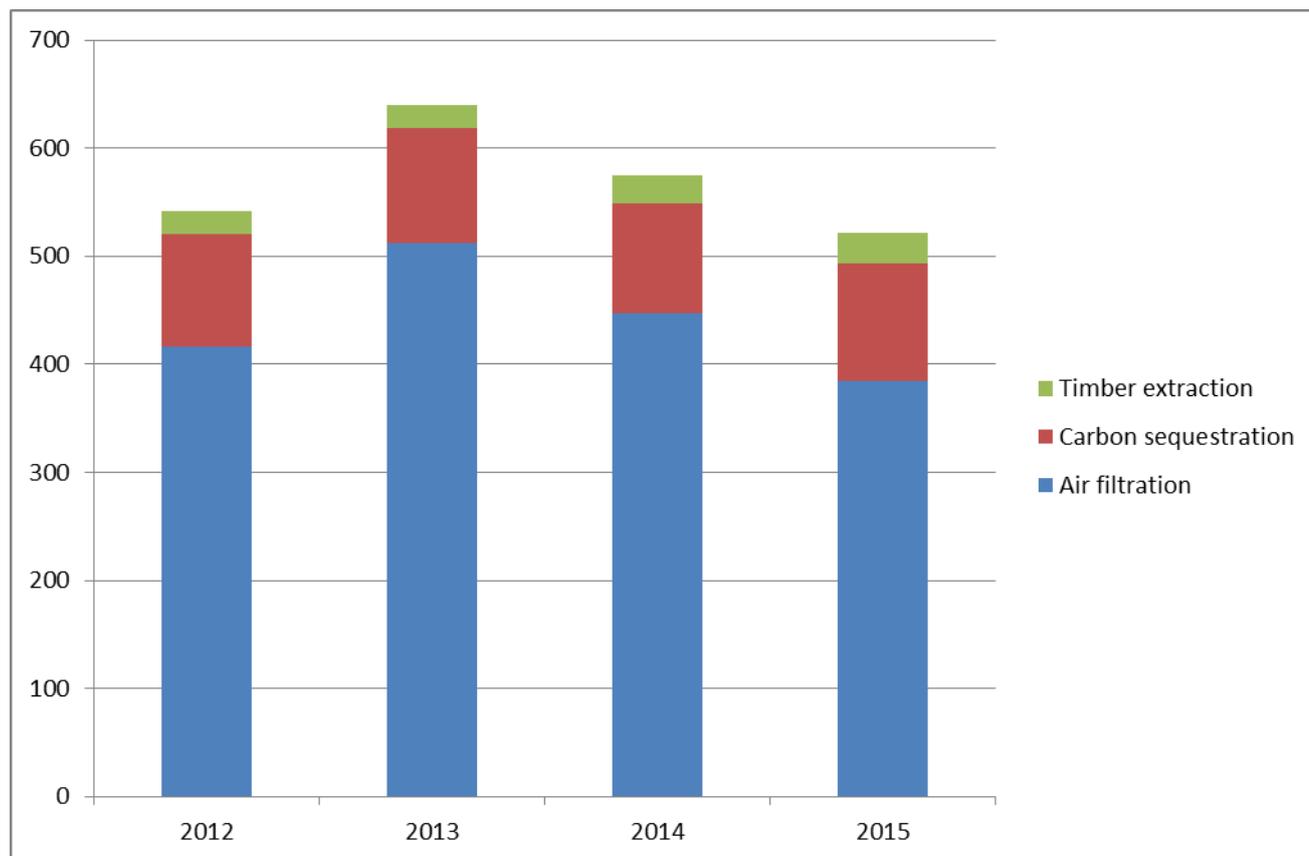
Table 1 can be expanded to cover a longer time period for the years in which data are available (Table 2).

**Table 2 Annual values of service flows from forests in Wales in 2011-2015 (£ million, 2015 prices)**

| Year | Timber extraction | Air filtration | Carbon sequestration | Recreation |
|------|-------------------|----------------|----------------------|------------|
| 2011 | n.a.              | 535            | 107                  | n.a.       |
| 2012 | 21.1              | 416            | 105                  | n.a.       |
| 2013 | 21.1              | 512            | 107                  | n.a.       |
| 2014 | 25.7              | 447            | 102                  | 85         |
| 2015 | 28.3              | 385            | 108                  | n.a.       |

n.a. means data not available

Focusing on ecosystem services for which we have full data series (2012 – 2015) enables comparison of the composite total annual values for each year (Figure 1).



**Figure 1 Composite total annual values for Timber, Carbon and Air filtration ecosystem services in the years 2012 to 2015 (£ million, 2015 prices)**

As can be seen from the Figure 1 and Table 2 air quality improvements due to pollution removal is the largest component of the total annual value, followed by carbon sequestration and timber production.

An associated asset value for each ecosystem service is estimated as a net present value over 50 years. Following the method used by the Office for National Statistics (ONS) in each case, apart from that for carbon sequestration, this asset value is based upon the assumption that the annual service flow remains the same over this period. In the case of carbon sequestration the annual service value pattern was based upon carbon sequestration projections and the schedule of carbon prices developed by the Department for Energy and Climate Change (DECC), now part of the department for Business, Energy and Industrial Strategy (BEIS).

Asset values together with a tentative total value are presented in Table 3.

**Table 3 Asset values of ecosystem services in Wales in 2015, the NPV over the next 50 years**

| Service                       | Timber extraction | Carbon sequestration | Recreation | Air quality | Total       |
|-------------------------------|-------------------|----------------------|------------|-------------|-------------|
| Value, £ billion, 2015 prices | 0.7               | 3.9                  | 2.1        | 11.2        | <b>17.9</b> |

As can be seen from the Table 3, the total asset value of the 4 woodland ecosystem services amounts to about £18 billion. As with the annual flows, that associated with air quality improvements due to pollution removals is the largest, followed by carbon sequestration, recreation and then timber production.

A value for the total standing timber is also derived. In 2015, the total stock of standing timber resource in Wales was estimated at 64.4 million cubic metres overbark. Following the approach undertaken by the ONS, the valuation is based on the assumption that all trees could potentially be sold at the current standing price and felled. In theory this could happen in a particular year, but would be a one-off activity, and would not represent a repeated annual flow. Therefore, this asset value is reported separately. It is estimated to be just under £1.2 billion (at 2015 prices).

As ONS emphasises, development of UK environmental accounts and Natural capital monetary estimates is still at a very early stage, with the methodology and datasets used still under review and subject to change. We applied the latest methodology available (as of February 2017) to derive the estimates in this report.

Given evidence gaps on ecosystem service dynamics and interactions, the estimates are subject to various degrees of uncertainty. Major sources of uncertainty in some of the estimates include: 1) incomplete scientific knowledge about the extent to which woodlands provide a service; 2) imprecise measurement and data collection; and 3) assumptions about future developments (over the next 50 years) in the provision of each ecosystem service and the associated prices to use in deriving an asset value.

Bearing different sources of uncertainty in mind, we rated the ecosystem service value estimates by level of uncertainty from 'low' (timber) to 'medium' (carbon sequestration, air quality, recreation). None are subject to 'high' uncertainty due to the selection of ecosystem services for valuation in this report having initially been based upon those for which relatively good evidence is available.