Estimating the value of natural capital for forests in Wales: Falling values can reflect increasing environmental quality

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Background and Context

Quantification and valuation of the benefits that forests provide 'ecosystem services' is essential to developing natural capital accounts that include forests.

Forest Research was commissioned by the Welsh Government to estimate values for woodlands in Wales.

The study[2] was commissioned in response to evidence gaps highlighted in the State of Natural Resources Report published by Natural Resources Wales (NRW) in September 2016[3].

The study will inform policy development, supporting the Sustainable Management of Natural Resources objective of the Environment (Wales) Act 2016 and delivery against the Wellbeing of Future Generations goals.

Aims

Estimate the value of five ecosystem goods and services provided by woodlands in Wales: standing timber, timber extraction, carbon sequestration, recreation and air quality improvement.

Compile experimental environmental accounts for forestry, at an all-Wales level using methodologies employed for the UK by the ONS for natural capital accounting developed in partnership with DEFRA for UK environmental accounts, utilising the best available data for the Welsh context.

Materials and Methods

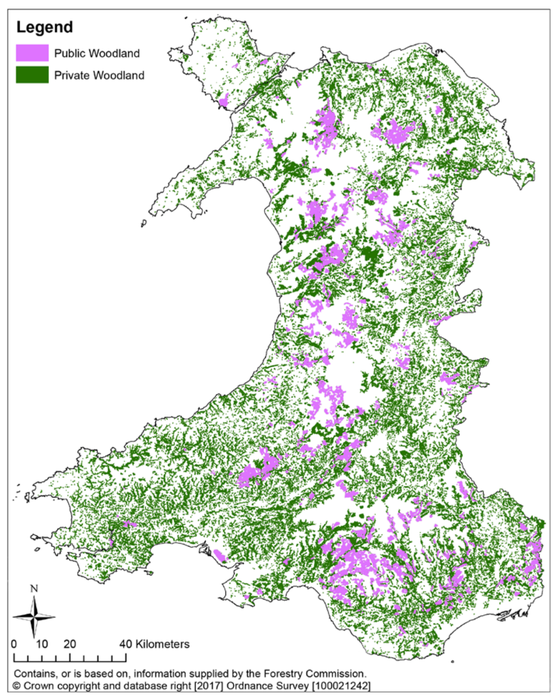
The methodology is similar to that detailed in the ONS approach for published UK accounts[4].

A net present value (NPV) approach is used within the System of Environmental-Economic Accounts (SEEA) and this is adopted to value natural capital based upon the stream of services (annual flows) expected to be generated by forests in Wales.

In line with the ONS/Defra approach, a 50-year asset life is assumed and the discount rate schedule from the HM Treasury Green Book applied.

Data on timber were from Forestry Commission, on carbon from BEIS/DECC, on recreation from the Wales Outdoor Recreation Survey and on air quality from the Corine land cover dataset (2012) and DEFRA.

> Natural capital is defined as *'the elements of nature that produce value or benefits to people (directly and indirectly), such as the stock of forests, rivers, land, minerals and oceans, as well as the natural processes and functions that underpin their operation'* [1].



Left: Geographic distribution of woodlands in Wales

Forest type and ownership	Wales	UK
Conifers FC/NRW/FS	98	743
Private sector	53	871
Total	150	1,614
Broadleaves FC/NRW/FS	19	129
Private sector	136	1,412
Total	156	1,540
All FC/NRW/FS	117	871
Private sector	189	2,283
Total	306	3,154

Woodland area by ownership and forest type at 31 March 2015 (thousand hectares)

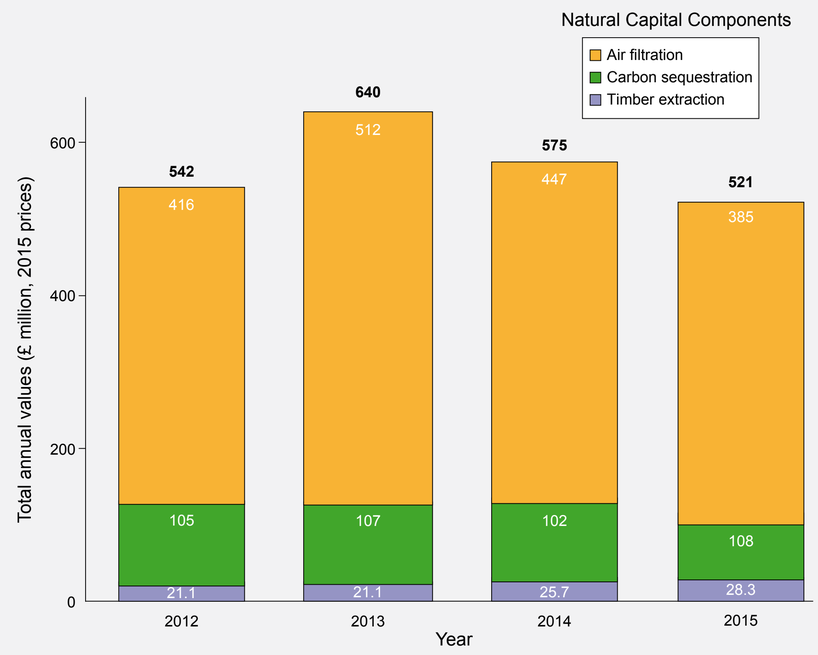


Figure 1: Composite total annual values for Timber, Carbon and Air filtration ecosystem services in the years 2012 to 2015 (£ million, 2015 prices)

Results

- The indicative annual aggregate value of the four ecosystem service flows provided by woodlands in Wales (timber extraction, carbon sequestration, recreation and air quality improvement) was estimated at just over £600 million (in 2015 prices).
- Of the 4 services, air quality improvements due to pollution removal is the largest, followed by carbon sequestration, recreation and then timber production.
- Recreation value is derived from the 2014 survey and is valued at £85 million (in 2015 prices). Following new recommendations from the ONS, the value is estimated from the expenditure data and does not use the same approach as figures published for the UK. (Adopting the new approach yields lower estimates than those using the previous ONS method based upon a mean value per visit).
- The indicative aggregate value for the three services (timber extraction, carbon sequestration, and air quality improvement) for which time series were available, suggest that the natural capital value of Welsh forests for these increased at 2015 prices from £542m in 2012 to £640m in 2013, before declining to £521m in 2015 (see Figure 1).
- The total asset value of the 4 woodland ecosystem services is estimated to amount to about £18 billion (in 2015 prices).

Discussion

- The overall decline in the value of natural capital was not due to any reduction in the extent or condition of the forests in Wales, but simply due to changes in wider environmental factors, notably a downward trend in the atmospheric concentrations of pollutants.
- The results illustrate how a more degraded environment can be associated with a higher natural capital value, while an environmental improvement can lead to a reduction in the value of natural capital.
- For those viewing valuation of natural capital as essential in overcoming environmental externalities, the finding that in practice a lower natural capital value can be associated with an improvement in the environment may be quite a surprise.
- It highlights the need for caution in interpreting changes in natural capital values: just as growth in GDP may be associated with environmental degradation, so may an increase in natural capital values.
- The results illustrate the importance of understanding the underlying environmental factors affect how natural capital values change rather than focusing purely upon changes in natural capital values in isolation.

More details at: **https://www.forestry.gov.uk/fr/BEEH-ATXLH6**

References

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