

Valuing the Windsor Estate's ecosystem services

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Our 6,300 hectare Windsor Estate attracts over 5.5 million visitors each year. It is actively managed to the highest standards by the Estate team, comprising over 150 gardeners, foresters and managers.

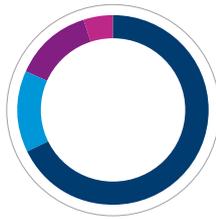
The high number of visitors reflects the benefits and value the Estate holds for them in terms of health, wellbeing and recreation. Less recognised are the fantastic ecosystems (biological communities of interacting organisms and their physical environment) which are nurtured at Windsor. They not only help to provide the unique character of the Estate enjoyed by our customers, but also provide a wide range of services to the surrounding areas.

In order to better understand the value of these ecosystem services, we recently commissioned [Route2](#) to look at the value of services derived from the Windsor Estate's ecosystems. A conservative, indicative value of £21 million per annum has been attributed, based on available data and by applying specific methodologies. The value calculated is conservative as it is not possible to fully record the numbers of species of flora and fauna found at Windsor, nor fully appreciate their roles in the ecosystem.

As part of the work, an extensive hydrological study was carried out which gave new insight on flood risk mitigation to adjacent areas and water quality.

Value of ecosystem services

The total of £21 million per annum is comprised of four main values:



■ Recreation: based on research attributing £2.55 per person per visit.	£14.1m
■ Flood risk mitigation: the Estate retains, on average, 49% more water than surrounding areas.	£2.9m
■ Net greenhouse gas (GHG) emissions: there is net sequestration amounting to 52,000 tonnes of GHGs per annum.	£2.8m
■ Water quality: the Estate retains more phosphorous (23%) and nitrogen (22%) than the surrounding areas.	£1.0m

Recreation

Based on a conservative estimate of 5.5 million annual visitors to the Windsor Estate, the visitation and welfare value of its accessible green space can be assessed as £14.1 million per annum. This recreational value is calculated using the Outdoor Recreation Value (ORVal) Tool – a web application developed by the Land, Environment, Economics and Policy (LEEP) Institute at the University of Exeter with support from DEFRA.



It can be accessed at:
leep.exeter.ac.uk/orval

Flood risk mitigation

The Estate spans 6,300 hectares in the Thames basin, and cuts into 11 Thames Valley sub-catchments. There is a risk of surface-water flooding resulting from run-off which accumulates in low-lying areas during high-intensity rainfall. Surface run-off also contributes to higher river flow and potentially exacerbates river flooding downstream (i.e. when the capacity of the river is exceeded). Flood risk exists in many Thames Valley sub-catchments (especially in Hale-Mill, Chertsey-Bourne and Thames-Egham). In the Royal Borough of Windsor and Maidenhead, run-off retention on the Windsor Estate helps to mitigate the flood risk to a value of £2.9 million per annum. Of all the different types of land cover at Windsor, forestry retains the most flood water (excluding water bodies) at 488m³ per hectare.

Water quality

Ecosystems on the Windsor Estate contribute to improved water quality by retaining pollutants, including nutrients. High nutrient loads lead to algal bloom which has recently become an issue on the Estate (e.g. for recreational fishing in lakes). On average, the Estate retains 54% of phosphorous and 52% of nitrogen, mainly due to the high retention rates of its forestry. This compares to the rest of the sub-catchments which retain an average of 31% of phosphorous and 30% of nitrogen. Windsor's contribution helps to decrease the cost of water purification by the water companies. Based on nitrogen treatment cost (£18/KG) and phosphorous treatment cost (£34/KG), the economic value of the Windsor Estate's water quality services (in terms of avoided treatment costs) is equal to £1.03 million per annum.



Net GHG emissions

While there are some carbon dioxide (CO₂) emissions associated with day-to-day business activity on the Windsor Estate, the overriding picture is one of the Estate sequestering (taking in) CO₂ rather than emitting it (-52,525 tonnes of CO₂). See the graphic below for a summary of major positive and negative CO₂ impacts. The value of the net carbon saving is calculated as £2.8 million per annum.

Conclusion

The results of this study have been very beneficial: they have prompted questions and highlighted the need for more information which will be useful for decision-making and engagement with the community and local authorities. There have been challenges with data availability. It is clear that there is more value in the ecosystem services on the Windsor Estate than has been expressed. However, it is difficult to quantify without more comprehensive data – for example on species and condition of flora and fauna.

The Windsor Estate has a wealth of natural resources which are vulnerable to human impact and at risk of irrecoverable damage if not appropriately managed.

Once damaged, it can take years to nurture them back to good condition and ecosystem losses can be permanent. The team continues to work hard to balance the needs of all the Estate's stakeholders, protecting and enhancing its natural resources while enhancing the visitor experience.

➤ For more detail, including valuation methodologies, see here: thecrownestate.co.uk/media/3182/20190621-route2-windsor-value-of-ecosystem-services.pdf

Greenhouse gases in the atmosphere on the Windsor Estate

