

Valuing the benefits from trees in Slough

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# Thames Valley

Environmental Records Centre



*Sharing environmental information in Berkshire and Oxfordshire*

01865 815 451

[tverc@oxfordshire.gov.uk](mailto:tverc@oxfordshire.gov.uk)

[www.tverc.org](http://www.tverc.org)

# VALUING THE BENEFITS FROM TREES IN SLOUGH

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Dan Carpenter, TVERC Projects Manager  
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## VALUING THE BENEFITS FROM TREES IN SLOUGH

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### SUMMARY

Trees and woodland provide a number of benefits to society, which are termed ecosystem services. These benefits include the storage and capture of carbon, rainfall interception, shading and many others. These services are provided for free by nature to society. It is possible to value some of these services in economic terms by calculating the cost of society providing these services in another way without the benefit of nature.

TVERC used the i-Tree Canopy tool to estimate tree cover and the benefits that these trees provide. Based on this study, Slough has an estimated tree canopy cover of 16.8%. This tree cover provides annual benefits of approximately £380,000 to the residents and businesses of Slough. Tree canopy cover in Slough is below the recommended target for urban tree cover of 20%.

# Valuing the benefits from trees in Slough



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## 1. INTRODUCTION

Trees and woodland provide a number of benefits to society, which are termed ecosystem services. These benefits include the storage and capture of carbon, rainfall interception, shading and many others. These services are provided for free by nature to society. It is possible to value some of these services in economic terms by calculating the cost of society providing these services in another way without the benefit of nature.

Ecosystem service delivery is supported by a healthy and biodiverse natural environment. Habitats and ecosystems that are healthy and contain a wide range of species provide more ecosystem services than those that are degraded and species-poor. Therefore the sustainable management of the natural environment is key to maintaining or increasing the delivery of these benefits.

TVERC has used a tool called i-Tree Canopy to estimate the value of the benefits provided by trees in Slough, Berkshire. It also provides an estimate of tree canopy cover for Slough to compare to the minimum standard recommended by Forest Research.

Slough Borough Council can use this information as follows:

- To understand and communicate the value of trees to the residents and businesses of Slough
- To provide context for the management costs of trees on the public estate in light of the benefits derived from a healthy tree population
- To plan for an increase in the urban tree canopy cover to meet minimum standards

## 2. METHOD

The i-Tree Canopy<sup>1</sup> tool can be used to estimate the value of benefits provided by trees. It uses aerial photography interpretation to classify land cover types to estimate tree cover. i-Tree Canopy uses standard values for pollution and carbon removal rates to estimate the value of the benefits.

This approach uses aerial photos to estimate tree canopy cover by classifying random points within a defined area. Using standard values for ecosystem services delivered by trees, and an estimated value for tree cover for the defined area, the value of trees can be calculated.

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<sup>1</sup> <https://canopy.itreetools.org/index.php>

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This approach is relatively quick, but its precision is quite low as it is based on aerial photos and does not use any field data to verify the calculations. However, it provides approximate figures for the value of trees.

TVERC modified the standard values in the i-Tree Canopy tool for the carbon price. The i-Tree Canopy tool uses US prices for the cost of a tonne of carbon. TVERC adjusted this to the UK price of £60 per tonne of CO<sub>2</sub>, based on values from the Forestry Commission<sup>2</sup>.

TVERC classified random points as follows:

- Trees and shrubs
- All other natural surfaces (grass, arable, pitches etc.)
- Buildings and hardstanding (including roads and paths)
- Water

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<sup>2</sup> <https://www.forestresearch.gov.uk/research/review-of-approaches-to-carbon-valuation-discounting-and-risk-management/current-uk-government-guidance-for-social-value-of-carbon/>



### 3. RESULTS

TVERC classified 750 random points in Slough for this project (Figure 1).

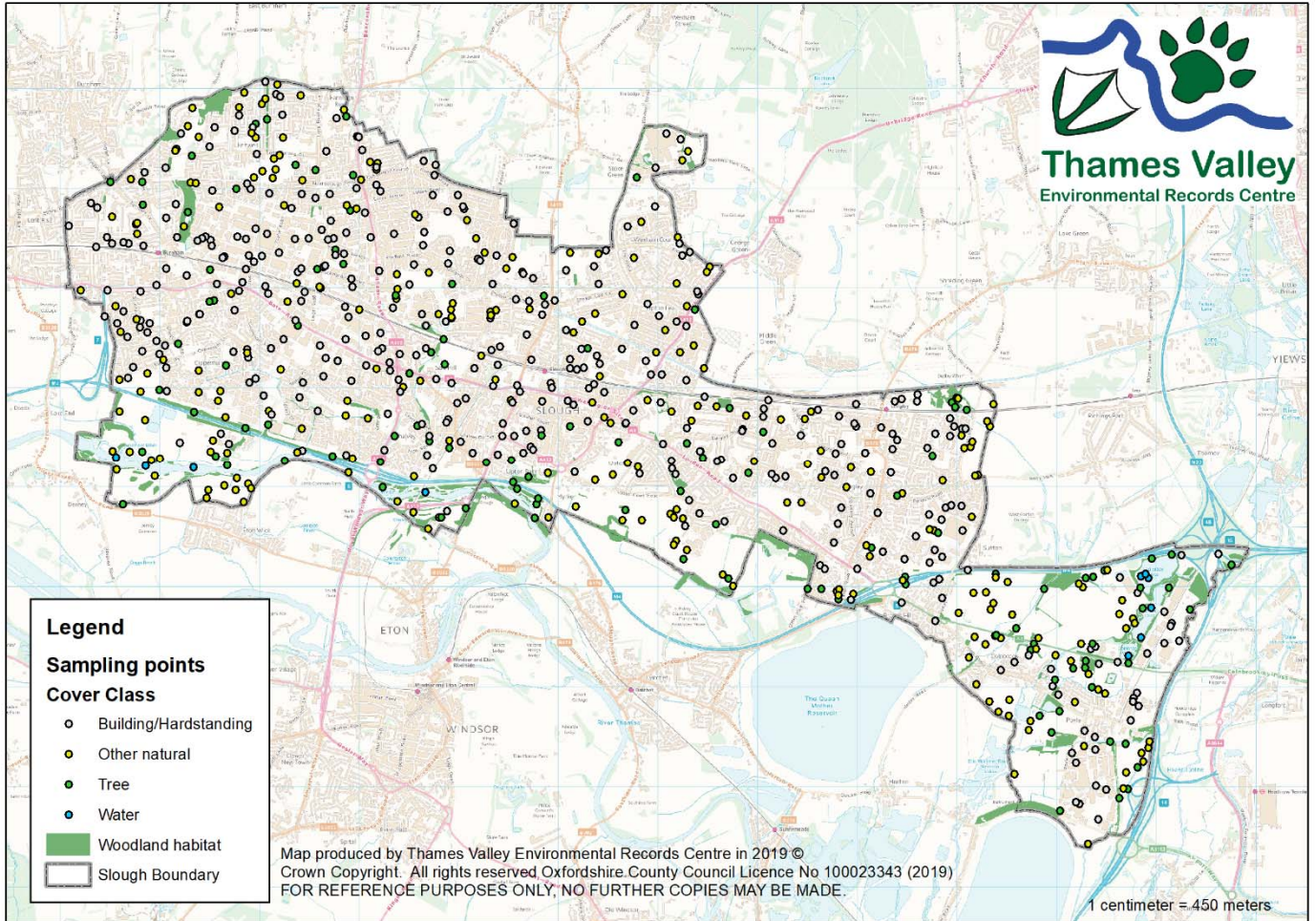


FIGURE 1: SAMPLING POINTS CLASSIFIED FOR SLOUGH. THE MAP ALSO SHOWS MAPPED WOODLAND IN SLOUGH.

Based on this classification, tree cover is estimated at 16.8% for Slough (Table 1). Buildings and hardstanding have the greatest percentage cover at 51.2%, followed by other natural surfaces at 30.6% cover. The percentage cover for water is only 1.4%.

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TABLE 1: PERCENTAGE COVER FOR EACH CLASS CLASSIFIED

Cover Class	Number of points	% cover
Trees	84	16.8
All other natural surfaces	153	30.6
Buildings and hardstanding	256	51.2
Water	7	1.40

Based on the tree cover estimate of 16.8%, the i-Tree Canopy tool estimates the benefits derived from trees in Slough (Table 2). The estimated annual value of the benefits from trees is £381,267.18. In addition, the value of stored carbon in trees in Slough is estimated at over £9 million. It should be noted that the value of stored carbon is a total value and not an annual benefit.

TABLE 2: ESTIMATES OF THE BENEFITS DERIVED FROM TREES IN SLOUGH AND THEIR VALUE

Benefit	Estimated Value	Estimated amount removed
Carbon Monoxide removed annually	£39.61	551.99 kg
Nitrogen Dioxide removed annually	£68.20	3.01 t
Ozone removed annually	£3,551.69	29.98 t
Particulate Matter less than 2.5 microns removed annually	£7,341.99	1.46 t
Sulphur Dioxide removed annually	£11.92	1.90 t
Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	£2,578.43	10.04 t
Carbon Dioxide sequestered annually in trees	£367,675.34	6.13 kt
Carbon Dioxide stored in trees (not an annual rate)	£9,233,707.32	153.90 kt

## 4. DISCUSSION

This study has shown that residents and businesses in Slough benefit from the removal of air pollutants and carbon dioxide by trees, the value of which is estimated at £381,267.18 each year. Managing trees does have a cost, but it is likely that the benefits provided by trees in terms of clean air, climate cooling, flood amelioration and more offset this management cost. It should be noted that not all benefits provided by trees have been estimated in this study; the study focusses on carbon sequestration and air pollution removal, but a number of other benefits are provided by trees.

Tree canopy cover in Slough is estimated at 16.8% by this study. Forest Research estimated mean canopy cover for England's towns and cities to be 15.8%<sup>3</sup>, meaning Slough has about average canopy cover for England. Forest Research have set a minimum target of 20% for urban tree canopy cover<sup>4</sup>. Therefore, based on this study, Slough needs to increase its canopy cover by about 3% to achieve this minimum target.

## 5. SUMMARY AND RECOMMENDATIONS

Slough has an estimated tree canopy cover of 16.8%. This tree cover provides annual benefits of approximately £380,000 to the residents and businesses of Slough. Tree canopy cover in Slough is below the recommended target for urban tree cover of 20%.

### RECOMMENDATIONS FOR FURTHER WORK

- The i-Tree Canopy tool provides only an estimate of tree cover. To provide a more accurate assessment of urban tree cover in Slough and more detailed information on the benefits of trees, TVERC recommends that a full tree survey is carried out. This approach uses the i-Tree Eco tool and uses a stratified survey of trees to identify tree cover and species composition. With more detailed data, more accurate estimates of the benefits from trees can be made. If this assessment is of interest to Slough Borough Council, TVERC are able to provide a quote for carrying out this work.

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<sup>3</sup> <https://www.forestresearch.gov.uk/research/i-tree-eco/urbancover/>

<sup>4</sup>

<https://www.researchgate.net/publication/322337570> The Canopy Cover of England's Towns and Cities baselining and setting targets to improve human health and well-being



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- Slough Borough Council should set a policy in its Local Plan for increasing tree cover to meet the minimum target of 20%. This tree planting policy should include guidance on the species that are most appropriate to plant, based on the current species distribution in Slough.
- An assessment of Slough's urban tree cover should be carried out every 5 years to assess changes in urban tree cover and to report on progress to achieving the minimum standard of urban tree cover. The i-Tree Canopy tool provides facilities to carry out change assessments and TVERC would be pleased to provide a quote for carrying out these updated assessments on behalf of Slough Borough Council.



## 6. ABOUT TVERC

Thames Valley Environmental Records Centre (TVERC) is a 'not for profit' organisation covering Berkshire and Oxfordshire. We are run by a partnership and are one of a national network of local records centres. We are a member of the Association of Local Records Centres (ALERC) and the National Biodiversity Network (NBN). Our funding partners include all the local authorities in Oxfordshire & Berkshire plus the Environment Agency. We also work closely with the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust.

### WHAT WE DO

We provide our funding partners with annually updated species and sites information as GIS tables, and undertake surveys of local wildlife sites. We also carry out data analysis for the monitoring of local authority Local Plans. We provide information to parish councils, local people, conservation bodies, land-owners, students and commercial organisations such as ecological consultants and utilities companies via data searches, data licensing and data exchanges. We provide other services such as ecological surveys, data analysis & presentation and training.

### OUR RECORDS

We hold over 2.5 million records of flora and fauna in Berkshire and Oxfordshire plus information about Local Wildlife and Geological Sites, NERC Act S41 Habitats of Principal Importance (previously called UK Biodiversity Action Plan (BAP) habitats) and Ecological Networks (Conservation Target Areas and Biodiversity Opportunity Areas). We collect this data from the general public, skilled volunteer /amateur recorders, professionals working for wildlife charities (BBOWT and RSPB), professionals working for government agencies (the Environment Agency & local authorities) and ecological consultants. This information is used:

- by planning authorities and developers to make informed decisions on the design and location of sustainable development
- to help farmers, land-owners and conservation organisations manage land in the best way to enhance biodiversity
- by nature partnerships to direct wildlife conservation work
- by teachers, students and scientists for education and scientific research.

For more information please visit our website: [www.tverc.org](http://www.tverc.org)