

## **Valuing the ecosystem services provided by urban trees in Wrexham County Borough**

Urban forests are a valuable source of ecosystem services in towns and cities. They improve local air quality, capture carbon and reduce flooding. They also provide food and habitat for animals, such as birds and bees. Valuing these ecosystem services helps town planners, landscape architects and tree officers to plan where trees will be planted for the maximum benefit. In summer 2013 Forest Research's Land Regeneration and Urban Greenspace Research Group worked in partnership with Wrexham County Borough Council and Natural Resources Wales to complete a survey of the trees in Wrexham County Borough using i-Tree Eco, a model developed by the US Forest Service.



The ecosystem services provided by Wrexham's urban trees were valued at more than £1.44 million per year

### **Background**

Urban trees benefit people who live and work in towns and cities by providing a range of ecosystem services and these can be valued using models like i-Tree Eco.

The i-Tree Eco study in Wrexham County Borough focussed on these ecosystem services: carbon capture, rainwater interception, the removal of air pollution and habitat provision.

The threat to trees posed by pests and diseases, such as Chalara ash dieback, and the cost to replace the Borough's trees if they were lost was also calculated.

### **Objectives**

This research aimed to:

- Identify tree location, species, sizes and health
- Calculate the ecosystem services they provide
- Determine where more trees could be planted

### **Methods**

Forest Research surveyed 202 random plots in Wrexham itself and the surrounding towns.

Information on 764 trees was recorded, including species, height and canopy spread. Details about the location where the trees were growing were also recorded, including information about land uses and ground cover.

The cost of replacing trees if they were lost was calculated using tree valuation methods published by the Council of Tree and Landscape Appraisers and the London Tree Officers Association.

## Findings – Wrexham County Borough’s Trees:

- o Intercept 270,000 m<sup>3</sup> of rainfall per year, equivalent to £460,000 in sewerage charges
- o Remove 60 tonnes of air pollution each year. This is worth more than £700,000 in health damage costs
- o Store 65,773 tonnes of carbon, which is worth £14 million
- o Remove 1,329 tonnes of carbon from the atmosphere every year. This is worth £278,000 and is enough to offset the emissions of 3% of Wrexham’s annual car journeys
- o Provide canopy cover of 17%. This is average for a Welsh town, but is much lower than neighbouring Llangollen (28%) and other similar sized Welsh towns, such as Pontypool (24%) and Neath (23%)
- o Have a density of 95 trees per hectare, higher than found in an average English town
- o Have high numbers of sycamore (17%), hawthorn (13%) and silver birch (12%). 59% of the trees in the Borough are native to Wales. Willows and oaks support the most insect species
- o Has a mix of tree sizes - 47% of trees in the Borough have a girth of under 15cm, but there are a higher proportion of large trees (60 cm+) compared to that in an average English town
- o Are healthy on the whole - 80% of trees are healthy, with less than 25% of their crowns missing
- o Are mostly found in parks (61%) and residential areas (21%)

## Findings - Threats and Opportunities:

- o Acute oak decline and Chalara dieback of ash are the greatest threat to the Borough’s urban forest. Both are already present in the UK and could affect 11% of Wrexham’s tree population
- o The cost of replacing the Borough’s trees if they were lost is estimated at £900 million
- o A further 28% of urban land in the Borough could be planted with trees

## Recommendations

This study demonstrates the value that urban trees provide, for all who live in, work in and visit Wrexham County Borough. 28% of Wrexham’s urban land could be planted with trees, so to enhance this value it is recommended that more trees are planted within the Borough, bringing it into line with other Welsh towns. Trees capable of attaining large stature, such as limes, oaks and pines, provide more ecosystem services per tree and species choices should reflect this.

Three species were very common, each making up more than 10% of the population. Planting a wider variety of species would decrease the risk of the urban forest succumbing to pests and diseases. Trees on private land, representing approximately 27% of the Borough’s urban forest, are highly valuable and should be taken into account in inventories of Wrexham’s trees. A repeat i-Tree Eco survey is recommended every 5-10 years to support the management and planning of Wrexham County Borough’s urban forest.

### Partners

Natural Resources Wales, Wrexham County Borough Council, Forest Research

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