Valuing Surrey

This study produces an illustrative natural capital analysis for Surrey with the intention of highlighting how the principles, concepts and frameworks of natural capital analysis can be applied. The work was carried out on behalf of a partnership including Surrey Nature Partnership, Surrey Connects @ Surrey County Council, Surrey Wildlife Trust, Bioregional, The Aldersgate Group and Natural England.

The study focussed on two main aspects; developing a set of natural capital accounts for Surrey's woodland and two detailed 'asset check' case studies of key natural capital issues (flooding / catchment management and greenspace).

The scope of the study and its objective is ambitious. It represents the first attempt to apply natural capital concepts within a Local Nature Partnership. This requires addressing both conceptual and practical challenges in the process of mapping and reporting the extent, condition and distribution of natural capital assets, trends in these, and the associated goods and services they provide. This study provides the first opportunity to understand the natural capital infrastructure of Surrey as part of bringing natural capital considerations into decision making.

Since carrying out this work Defra have commissioned the development of a framework for Natural Capital Investment Plans to assist LNPs and the Surrey example was utilised in this framework. Surrey is one of the leading LNPs in developing the ability to understand a county's natural capital asset and the need to invest in it as part of more local infrastructure development, in particular understanding the link this has with local economic development.

This work is one of a number of projects which will be used to inform the Natural Capital Investment Strategy for Surrey being developed by SyNP.

Next steps:

- Refine the current woodland accounts for Surrey by improving the data sets used; developing it for a specific baseline year (e.g. 2006); covering a greater range of woodlands characteristics and environmental goods/services; exploring the potential to report in a subsequent reporting year (e.g. 2006 and 2011) and the use of Geographical Information Systems;
- Developing natural capital accounts across other (all) natural capital assets in Surrey (not just woodland) in order that a more comprehensive account of the contribution of natural capital to the county is available;
- Explore the potential to expand the existing asset check on flooding to county wide level, considering:
    - The role of natural capital in regulating water flows, by examining rainfall levels on different land cover types;
    - Built assets directly at risk (e.g. property and strategic assets like rail and power infrastructure) and built assets indirectly at risk (e.g. transport network connectivity);
    - Risks to different socio-economic groups, and Incorporating predicted risk as a result of climate change;
- Explore the potential to expand the existing asset check on green space to establish the potential economic value of reducing healthcare costs and improving economic performance in Surrey by expanding green space in specific locations;

- Assess how evenly distributed accessible green space is to people within Surrey according to 'deprivation' as measured through the Index of Multiple Deprivation (IMD) and to establish whether social (health) and economic (productivity) outcomes might be improved by making space more accessible to more deprived areas.
- Produce a natural capital asset check(s) for other specific environmental management issues and/or natural capital assets that are of particular importance to the economic performance of Surrey, and
- Develop a natural capital asset check for Surrey as a county within the context of a green infrastructure plan and/or other strategies/plans, this would require the use of Geographical Information Systems to map the location of natural capital, built capital and population and changes in this over time.

If you would like to see the full Valuing Surrey report or to discuss the report in more detail then please contact Sarah Jane Chimbwandira (sarahjane@surreywt.org.uk or 01483 795484).

A summary of the main information from the report is provided below.

Key findings from the natural capital account analysis for Surrey's woodland.

Surrey's 41,225 ha of woodland produces an estimated £90million of value every year for the subset of environmental goods and benefits assessed which include:

- Approximately 800 tonnes of air pollutants are removed from the county's air by Surrey's woodland worth £13 million through the avoided healthcare cost;
- Carbon removed from the atmosphere by woodland within Surrey is estimated to be over 350,000 tonnes a year valued at £12 million;
- Each year around 18 million visits are made to Surrey's woodland valued at £63 million;
- The main market benefit of woodland is timber production in Surrey which is estimated to be in excess of 150,000m3 of timber worth £2.5 million a year, the fourth largest monetary value provided by the county's woodland;
- The three largest sources of value from Surrey's woodland are not reflected in market prices. Non-market benefits of carbon and air quality regulation (£24m) are both estimated to be worth several times the market benefits of timber (£2.5m), and in turn are much smaller than recreational values (£63m) of the county's woodland;
- The existence (non-use) value of wildlife in Surrey's woodland to the local population is estimated to be around £2 million a year.

Other environmental goods and services that are of value have not been quantified or monetised in this work, including woodfuel and water regulating services (quantity of water/flooding and quality of water) of woodland.

These multiple benefits from woodlands can be secured in the future through effective and efficient management of this natural capital asset.

Natural Capital Asset Check Case Study; flooding/catchment management

The first asset check considers the economic cost of flooding in the Wey catchment, which is predominately within Surrey. The Wey catchment is susceptible to flooding, with just under 10% of the catchment being under flood zone risk 2. About 1,050 commercial and residential properties in the urban centres of the Wey catchment are vulnerable to this (EA, 2013). In December 2013, the River Wey flooded as a result of an exceptional flooding event in the south of England. In Guildford,

the typical river level range for this location is between 1.10 metres and 2.45 metres, on 25th December 2013 this level reached 3.72 metres on 25/12/2013 (EA, 2014) and several days of flooding resulted. The total cost in Guildford alone was estimated to be £434,000, with disruption to businesses and homeowners made worse by a loss of power (Guildford Borough Council, 2014).
The analysis shows that the total urban area within flood risk zone 2 in the catchment had increased by 15% (216 ha) over a 20 year period. The analysis estimates that if the urban floodplain extent had not increased between 1991 and 2011, then the costs of the 2011 event would have been approximately £74,000 lower (in present value terms).
An assessment of the main land cover types within the catchment was carried out and key observations from this data include:

- The total area of woodland is the largest single land cover type, and accounts for approximately 24% of the land cover in the Wey catchment (broadleaved and coniferous). The high proportion of woodland is generally a good thing for intercepting rainfall (eftec, 2015);
- The total area of grassland in the Wey catchment is high, accounting for around 23% of the total land cover in the catchment. This can be a good thing for catchment management, but depends on its type/condition (e.g. how intensively farmed, whether compacted by machinery, location, the existence of anything between the grassland and water course like a wood, hedge or pond that can intercept flow, and topography (slopes)) (eftec, 2015);

Spatial analysis of the Wey catchment over a 20 year period from 1991 was carried out and the data allowed the following observations:

- 6,715 hectares (9%) of the catchment is under flood risk zone 2;
- There was a 12% (1,450 ha) increase in the urban area over the 20 years to 2010. It is not known what this replaced, whether woodland or arable land, which will have very different implications for flooding;
- Of the increase in urban area over the 20year period, 15% (216 ha) of this development was on flood zone 2.

Urban development in Surrey since 1991 has potentially increased flood risk in three ways. Firstly, the increase in the developed area of the catchment has likely reduced the capacity of natural capital assets to absorb and slow runoff during rainfall. Secondly, the proportion of development on the floodplain has reduced the capacity of the floodplain to safely store water during flood events. Thirdly, this floodplain development has increased the built assets at risk of flooding.
It is challenging to link this increase in urban development on the floodplain area to an increased risk and/or cost of flooding because of the many interrelated factors that affect these outcomes. However, an approximation of the economic implications for Guildford alone can be made based on the following data and assumptions:

- total cost of flooding in 2014 was £434,000 (Guildford Borough Council, 2014);
- the proportion of urban development on the floodplain area in the Wey catchment between 1991 and 2010 is 15%;
- this 15% of urban development across the Wey is assumed to be applicable to Guildford. This is deemed to be an appropriate assumption based on expert judgement, and because the population in Guildford increased from 122,300 people to 137,183 people between 1991 and 2011, suggesting that a proportion of the housing development in Surrey during that time was likely to have been on floodplain around Guildford (Surrey-i, 2014; Surrey CC, 2014) the cost of flooding is attributable only to the urban area within flood risk zone 2 within Guildford, and that this cost is evenly distributed;
- the costs would be avoided if the urban area on the floodplain did not exist as there would be no built capital assets on the floodplain for the floodwater to damage. Furthermore, this would be expected to reduce the costs of flooding downstream are as the natural floodplain function would store water

Natural Capital Asset Check Case Study; greenspace

The second asset check relates to labour market productivity and the economic cost of healthcare related to accessibility of green space in Surrey. A basic check on location of woodland relative to areas of deprivation shows that areas with a shortage of accessible woodland in the North and East of the county overlap with locations where social deprivation is relatively high.
There is also a link between the accessibility of green space and physical and mental health which was explored in more detail. For example, structured moderate outdoor physical exercise such as walking offers the opportunity for social interaction, helps reduce isolation, improves mental health, and provides encouragement to stay active (Chief Medical Officer, 2014). As a result it can:

- Reduce healthcare costs; *and*
- Boost economic output through improving worker health and productivity.

The overall incidence of mental health conditions across Surrey is below the national average. However, there are areas where it is above the national average, and these areas correlate with the areas of greatest deprivation in Surrey. Poor mental health is the major factor in people in Surrey claiming incapacity benefits / employment support allowances with 46.1% of people in Surrey who claim these benefits also have a mental health problem (JSNA, 2014).
There is extensive protection of green space within Surrey with the majority of the county (74% or 155,025ha) designated as green belt (JSNA, 2014). The county is also the most wooded county in the country, with between 15% – 25% of land area being woodland (McKernan and Grose, 2007; IHS, 2006) compared to an average within England of 12%.
However, it is the location and accessibility of this green space relative to beneficiary populations that is of interest in this asset check. The following evidence provides an indication of whether green space is well located for people's use.
The ANGSt (Accessible Natural Green Space Standard – Natural England, 20105) is a measure of accessible natural green space. Having accessible green space close to home can play a substantial role in good levels of physical and mental health. In Surrey, 23% of households have accessible green space of 2hecatres in size within 300m (2minutes walk) of their home. The county therefore compares favourably with the England average of 15% of households having accessible green space of 2hecatres in size within 300m.
The 23% of the population in Surrey that have access to green space within 300m is higher than the national average. However, this still leaves 77% of the county's population that does not have this access to green space within 300m, despite the 74% of protected green belt within the county. Therefore, consideration should be given to the location of areas within Surrey where access can be improved for the remaining 77% of the population.