

# Marches Ecosystem Assessment

An Assessment of the Natural Capital and Ecosystem Services Value  
in Herefordshire, Shropshire & Telford and Wrekin

## Evidence Summary for Businesses

2016

by

Oliver Hölzinger

Consultancy for Environmental Economics & Policy (CEEP)

© Crown Copyright. All Rights Reserved. Herefordshire Council 2016. Ordnance Survey © Crown copyright 2016 OS 100049049

You are not permitted to copy, sub-license, distribute or sell any form of this data to third parties in any form.

This report has been part funded through the European Regional Development Fund



## Summary

Ecosystems and Natural Capital are of crucial importance to our wellbeing as well as the economy. Virtually all businesses depend on natural goods and services such as timber or flood regulation in one way or another. However, many of these 'ecosystem services' in the UK are already degraded and/or in decline (see Figure 2).

To get a better understanding of the benefits of nature to people and the economy in The Marches an Ecosystem Assessment has been undertaken revealing the value especially for those ecosystem services that don't have a market price and are therefore often undervalued or taken for granted. The research revealed that Natural Capital in The Marches provides services worth £14.8 billion, stating the central estimate. This figure is based on the carbon stock value (£7.2b) and the capitalised ecosystem service flow value (£7.5b). It is very important to acknowledge that this is a baseline value and only covers some elements of the total value of Natural Capital (see Figure 3).

This summary also introduces some tools that can be applied by businesses to better assess, account for, and manage corporate Natural Capital dependencies, impacts and opportunities such as Corporate Ecosystem Valuation (CEV), Payments for Ecosystem Services (PES) and the Natural Capital Planning Tool (NCPT). Links to further guidance and other relevant tools are also provided.



Herefordshire  
Local Nature  
Partnership

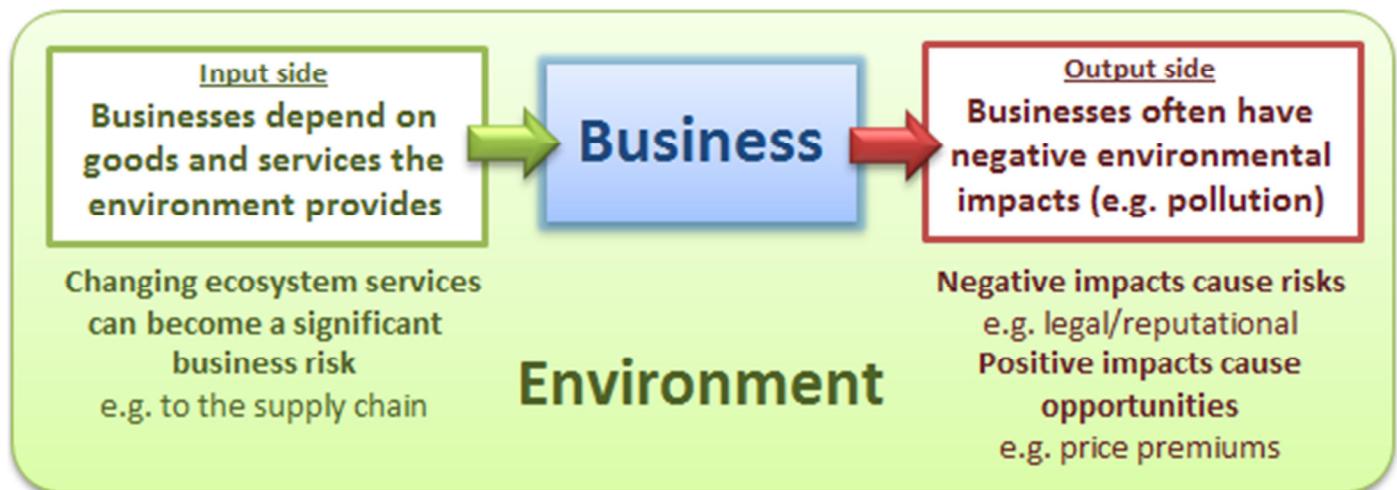
Shropshire,  
Telford & Wrekin  
Local Nature  
Partnership

## Introduction & Business Case for Natural Capital Management

Everyone, including businesses and the economy as a whole, depends on the goods and services nature provides in one or another way. Many businesses depend directly on natural resources as part of their supply chain such as water and healthy soils to produce food or timber for furniture. But even businesses that don't directly depend on environmental goods for production still benefit indirectly from the flood risk regulation services of wetlands, from trees and soils capturing and storing carbon helping to mitigate climate change, or from green amenity spaces improving physical and mental health of the workforce, to name just a few examples. These goods and services nature provides are called ecosystem services which are commonly defined as "*the benefits people obtain from ecosystems*"<sup>1</sup>. Businesses do not just depend on but also impact on such services, for example through land-use changes, pollution or environmental incidents. Negative impacts on ecosystems can for example have reputational and legal risks.

Some ecosystem services such as food and timber have a market price. But many valuable services such as green recreational opportunities or air quality and climate regulation are not commonly traded on markets – we all benefit from them as 'free-riders' without paying e.g. someone who planted the trees cleaning the air we breathe. Because of this market failure Natural Capital, which is "*the stock of natural ecosystems that yields a flow of valuable ecosystem goods or services into the future*"<sup>2</sup>, often does not have a market price and is therefore frequently undervalued or neglected. Many ecosystem services occur as positive external effect.

Figure 1: Interactions & Interdependencies Between Businesses and the Environment



*Source: Adopted from Hölzinger (2014)*

Unfortunately, Natural Capital and many ecosystem services in the UK are in declining and/or degrading status.<sup>3</sup> This means we cannot take Natural Capital and a sustainable flow of ecosystem services from them for granted anymore. Active management may be required to secure sustainable business success; even more so if natural assets and ecosystem services are an important input to the supply chain. But changing ecosystems also provide business opportunities. Businesses can for example tap into new green markets which can attract new customer segments or allow price premiums.

<sup>1</sup> Millennium Ecosystem Assessment 2005, 40.

<sup>2</sup> Costanza 2008.

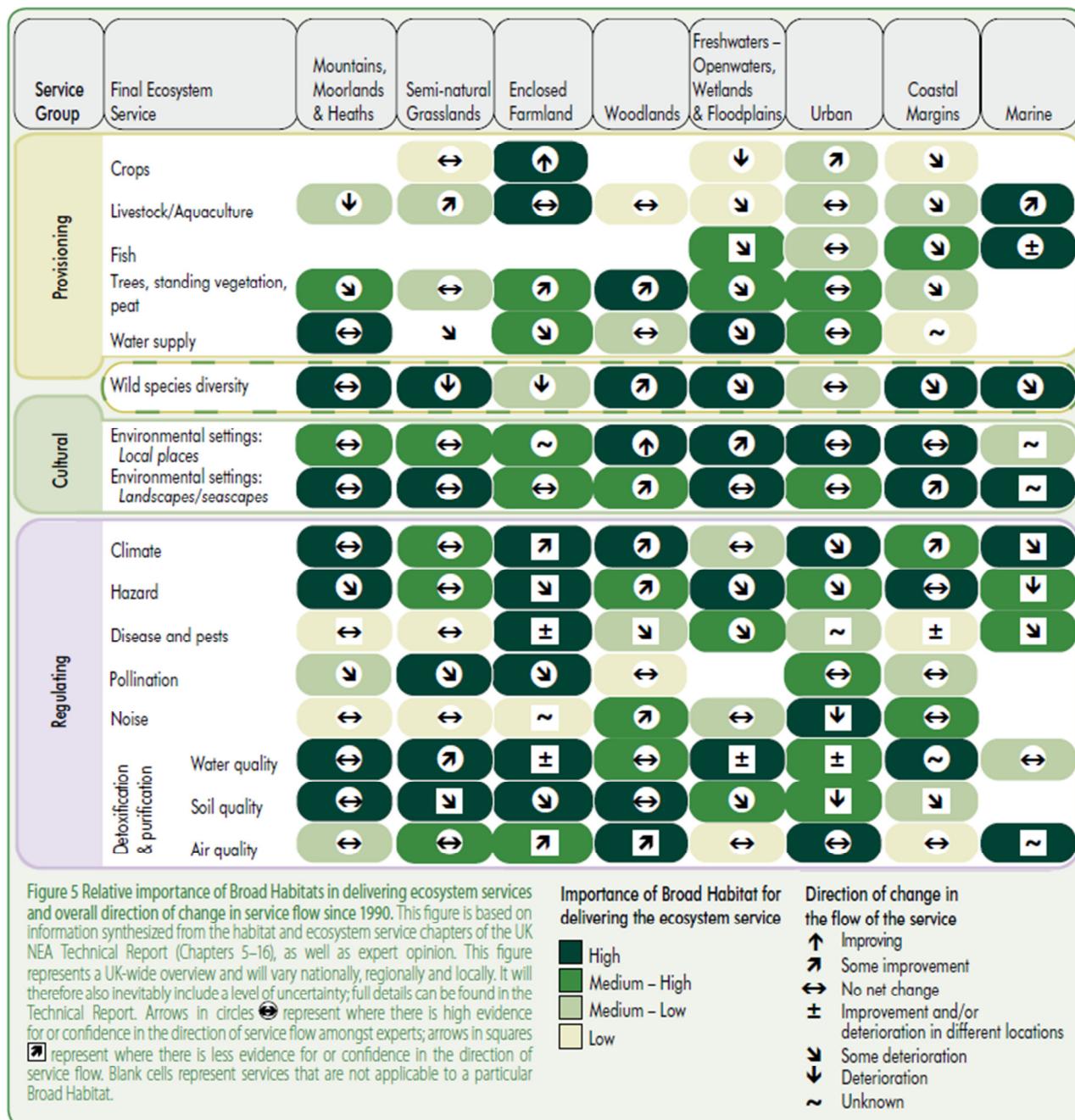
<sup>3</sup> UK NEA 2011.

In its [3<sup>rd</sup> State of Natural Capital Report](#) the Natural Capital Committee (NCC), which has been established as an independent advisory body to the Government following the publication of the [Natural Environment White Paper](#) in 2011, states that:

**"Successive 'natural capital deficits' have built up a large natural capital debt and this is proving costly to our wellbeing and the economy. If economic growth is to be sustained, natural capital has to be safeguarded."<sup>4</sup>**

The first step is to assess the value of especially those ecosystem services that don't have a market price and are therefore under threat as well as the risks and opportunities that arise from changing ecosystems.

**Figure 2: Relative Importance of Broad Habitats in Delivering Ecosystem Services and Overall Direction of Change in Service Flow Since 1990 in the UK**



Source: Adopted from UK NER (2011)

<sup>4</sup> Natural Capital Committee 2015.

## Key Findings of the Marches Ecosystem Assessment

Aim of the Marches Ecosystem Assessment was to reveal the value of especially those ecosystem services in Herefordshire, Shropshire and Telford and Wrekin that do not have a market price because these are the values that are still commonly ignored, undervalued and taken for granted.

The calculations resulted in a total ‘external’ Natural Capital value of £14.8 billion, stating the central estimate. This value is made up of the estimated stock value of carbon stored in ecosystems and corresponding soils (£7.2b) and the capitalised value of ecosystem services flows over 25 years (£7.5b). The annual flow of ‘external’ ecosystem services was valued at £358.1 million. The findings (also for each assessed geography) are summarised in Table 1 and Table 2 below. For methods, calculations and more detailed findings see the main report published alongside this summary.

**Table 1: Capitalised Baseline Value of Assessed Ecosystem Services in The Marches**

Assessment Area Assessed Habitat Area		Herefordshire 110,192 ha			Shropshire 171,878 ha			Telford and Wrekin 8,423 ha			TOTAL 290,494 ha		
		High	Central	Low	High	Central	Low	High	Central	Low	High	Central	Low
<b>Provisioning Services</b>	Wild Food	£106	<b>£31</b>	£8	£117	<b>£34</b>	£10	£12	<b>£3</b>	£1	£234	<b>£69</b>	£19
	Ornamental Resources & Non-food Products	£190	<b>£39</b>	£11	£208	<b>£42</b>	£12	£20	<b>£4</b>	£1	£419	<b>£85</b>	£24
	Water Supply	£0	<b>£0</b>	£0	£1	<b>£0</b>	£0	£0	<b>£0</b>	£0	£1	<b>£0</b>	£0
<b>Cultural Services</b>	Wild Species Diversity	£1,851	<b>£404</b>	£164	£3,241	<b>£647</b>	£262	£299	<b>£34</b>	£14	£5,391	<b>£1,085</b>	£440
	Recreation & Aesthetic Values	£464	<b>£259</b>	£111	£1,050	<b>£544</b>	£240	£495	<b>£282</b>	£129	£2,010	<b>£1,086</b>	£479
	Health	£1,364	<b>£852</b>	£451	£2,329	<b>£1,536</b>	£903	£1,074	<b>£700</b>	£403	£4,767	<b>£3,088</b>	£1,757
	Productivity	£182	<b>£118</b>	£67	£366	<b>£237</b>	£134	£156	<b>£101</b>	£57	£704	<b>£456</b>	£259
<b>Regulating Services</b>	Flood Regulation	£1,326	<b>£656</b>	£160	£1,849	<b>£915</b>	£223	£121	<b>£60</b>	£15	£3,296	<b>£1,631</b>	£397
	Water Quality Regulation	£4	<b>£2</b>	£1	£45	<b>£25</b>	£10	£5	<b>£3</b>	£1	£54	<b>£30</b>	£12
<b>TOTAL</b>		£5,488	<b>£2,362</b>	£972	£9,206	<b>£3,981</b>	£1,794	£2,182	<b>£1,188</b>	£620	£16,876	<b>£7,531</b>	£3,387

Notes:

All values are stated in million pounds (£m); 2015 prices.

The capitalised value represents the present value of ecosystem services provided over a time period of 25 years.

Where monetary values have been calculated this may only cover a proportion of the full value of the ecosystem service.

Legend:

Central Central estimate

High Higher threshold of the sensitivity analysis (even if the real value could still exceed this threshold)

Low Lower threshold of the sensitivity analysis

*For valuation methods, underlying assumptions and limitations see the relevant sections of the report.*

*Source: Author calculations*

**Table 2: Carbon Stock Value in The Marches**

		Assessed Area	Carbon Stock	Stock Value
Carbon	Herefordshire	110,192 ha	12,010,117 t	<b>£2,749m</b>
	Shropshire	171,815 ha	18,389,081 t	<b>£4,209m</b>
	Telford and Wrekin	8,423 ha	1,217,359 t	<b>£279m</b>
	<b>Total Marches</b>	<b>290,431 ha</b>	<b>31,616,557 t</b>	<b>£7,236m</b>

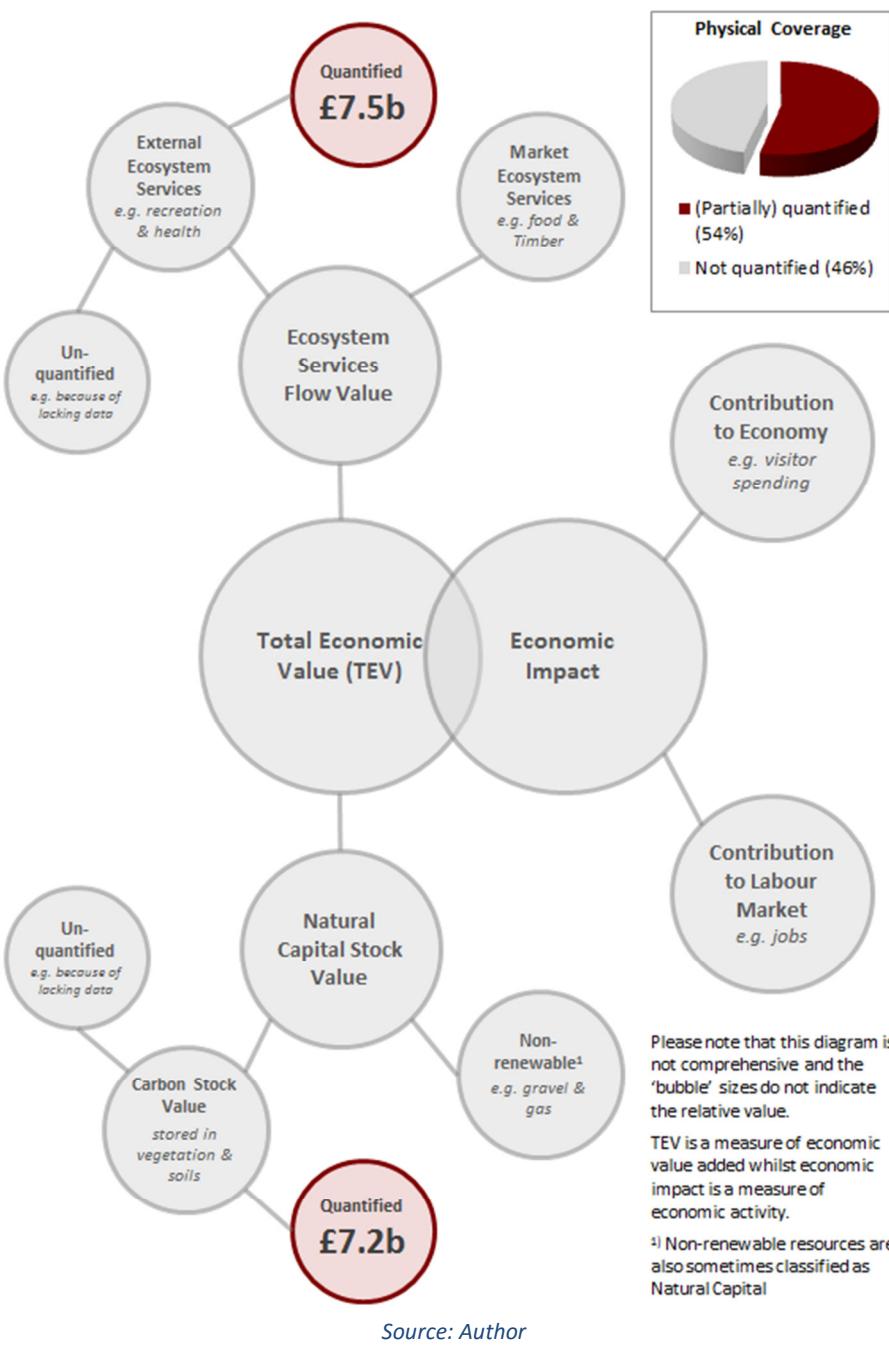
*Source: Author calculations*

The figures should be interpreted as baseline value of Natural Capital in The Marches. Figure 3 shows what is (and more importantly what isn't) included in the Marches Ecosystem Assessment. Many ecosystem services could not be valued for example because of lacking or missing valuation evidence. It should also be acknowledged that often only an element of an ecosystem service could be valued which means that stated values often still underestimate the total value. It is important that these values are not ignored which is why many unquantified ecosystem service benefits have been assessed qualitatively in the corresponding sections of the main report.

The probably most immediate benefit to the economy that has been valued was productivity gains. The annual benefit of productivity gains due to 'green' informal exercise (walking and cycling) has been valued at £21.7 million and is based on avoided absence days due to improved physical health. Again, this is a baseline value as other activities such as running or more formal activities such as football are likely to add significantly to this figure but were not assessed because of lacking valuation evidence.

There are also many other direct benefits of high quality Natural Capital that could not be quantified. A large body of evidence demonstrates that people prefer to live in areas with high quality environmental landscapes and many studies suggest that such green landscapes increase for example property prices and land values.<sup>5</sup> One UK study suggests that in environmental landscapes with trees, property values can increase by an average of 7%. This could also lead to an increase in council taxes and therefore support of public services.<sup>6</sup> A study in Berlin, Germany, found that street trees can increase land values by up to 17%.<sup>7</sup>

Figure 3: Marches Ecosystem Assessment Scope



<sup>5</sup> See e.g. Saraf 2012 for an overview.

<sup>6</sup> Forest Research 2010.

<sup>7</sup> Luther and Gruehn 2001.

The [Marches LEP Strategic Economic Plan](#) highlights for example that The Marches represents an attractive investment area because of its high quality, attractive environment.<sup>8</sup> There is increasing evidence suggesting that a good quality natural environment is an important factor for attracting inward investment and also a highly skilled workforce.<sup>9</sup> The attraction of high-skilled workers by improving green infrastructure can be seen as an opportunity to adjust the socio-economic structure of regions like The Marches.<sup>10</sup>

Green infrastructure can also influence shopping behaviour. In a study in Northumberland respondents reported that they shop about one hour longer in retail areas landscaped with greenery and trees than in areas without such amenities. About three out of four customers reported that they prefer such settings.<sup>11</sup> As part of the sustainability initiative 'Plan A' a green wall was created in the Simply Food store in Oswestry, Shropshire.<sup>12</sup> The main motivation was energy reduction but besides positive effects on air quality, biodiversity and noise regulation this feature may also well have positive effects on consumption behaviour.

These are just some examples of a vast and increasing body of evidence showing the positive effects of Natural Capital on businesses and the economy as a whole. For more evidence see for example the [UK National Ecosystem Assessment \(NEA\)](#).<sup>13</sup> For a more international perspective see also [The Economics of Ecosystems and Biodiversity \(TEEB\) Report for Business](#).<sup>14</sup>

## Natural Capital Management Tools

A good first step towards integrated corporate Natural Capital management is an assessment of the business interdependencies with nature. In 2011 the World Business Council for Sustainable Development (WBCSD) has introduced Corporate Ecosystem Valuation (CEV) which serves corporate decision-making by identifying and valuing ecosystem impacts by businesses together with the risks and opportunities businesses face from changing ecosystem services. In a CEV, the value of ecosystem services a company depends on, and those affected by its actions, is assessed to guide the company's decision-making.

In general, CEV can be applied to a business as a whole, but also products, services, projects, assets, or an incident. As the name suggests CEV includes the (monetary and/or non-monetary) valuation of ecosystem services relevant to the business. Usually CEV has two main elements. On the one hand CEV shall provide corporate decision-makers with better information about the risks and opportunities arising from changing ecosystem services. It basically evaluates which ecosystem services are most important for the business performance and how such ecosystem services are projected to change in the future. The main question is how changes in ecosystem services provision will or could affect business success and how to react. On the other hand CEV evaluates how business activities affect ecosystems and ecosystem services. Such an assessment reveals which ecosystem services are affected most (positively or negatively). This can for example help to target actions to mitigate negative impacts, to compensate for them, and/or to implement

<sup>8</sup> The Marches LEP 2014.

<sup>9</sup> Allin and Henneberry 2010; Mell et al. 2011; Keeley et al. 2013.

<sup>10</sup> Regeneris 2009.

<sup>11</sup> Rskensr 2003.

<sup>12</sup> The Marches LEP 2015.

<sup>13</sup> UK NEA 2011.

<sup>14</sup> TEEB 2010.

the value of affected ecosystem services into business accounting and reporting. For more information about CEV see the [WBCSD CEV Guidance](#) as well as the [CEV guidance](#) that has been produced for the UK context as part of the National Ecosystem Assessment Follow-On.<sup>15</sup>

However, there's no 'one size fits all' tool and the tool of choice depends for example on the decision-making context as well as the ecosystem services that shall be assessed. Other relevant tools include for example Payments for Ecosystem Services (PES) and the Natural Capital Planning Tool (NCPT). PES is a voluntary financing mechanism to incentivise improved management practices of assets important to (but not owned by) a business. A good example is New York City. Instead of building a new water filtration plant land owners in the water catchment were paid to improve farming practiced in order to prevent run-off of wastewater and nutrients. A PES scheme saved the water consumers in the city between US\$ 4.5 billion and US\$ 7 billion in capital costs for the plant plus additional annual treatment costs of between US\$ 300 million and US\$ 500 million.<sup>16</sup> For more information about PES see for example [Defra's best practice guidance](#).<sup>17</sup> The NCPT is being designed to assess the impact of the inherent land-use changes of planning and development on ecosystem services so that effects can be better monitored and managed. For further information see the [NCPT project report](#).<sup>18</sup> For an overview of ecosystem services management tools see including short reviews and guidance see also the [National Ecosystem Approach Toolkit \(NEAT\) website](#). Further questions can be directed to the author of this report, [Oliver Hölzinger](#).

## References:

- Allin, Simone, and John Henneberry. 2010. Valuing Attractive Landscapes in the Urban Economy - Baseline Analysis of Existing Economic Valuation Tools for Application to Green Infrastructure Investments. Sheffield: Department of Town and Regional Planning, University of Sheffield.
- Costanza, Robert. 2008. Natural Capital. The Encyclopedia of Earth. Available from <<http://www.eoearth.org/view/article/154791/>>.
- Elliman, Christopher, and Nathan Berry. 2007. Protecting and restoring natural capital in New York City's Watersheds to safeguard water. In J. Aronson, S. Milton and J. Blignaut 'Restoring Natural Capital: Science, Business and Practice', 208–215. Washington DC: Island Press.
- Forest Research. 2010. Benefits of green infrastructure. Report to Defra and Communities and Local Government. Farnham: Forest Research. Available from <[http://www.forestryresearch.gov.uk/pdf/urgp\\_benefits\\_of\\_green\\_infrastructure\\_main\\_report.pdf/\\$FILE/urgp\\_benefits\\_of\\_green\\_infrastructure\\_main\\_report.pdf](http://www.forestryresearch.gov.uk/pdf/urgp_benefits_of_green_infrastructure_main_report.pdf/$FILE/urgp_benefits_of_green_infrastructure_main_report.pdf)>.
- Hölzinger, Oliver. 2014. Corporate Ecosystem Valuation (CEV) Guidance. Guidance document produced as part of the UK National Ecosystem Assessment Follow On (NEAFO). Birmingham. Available from <[http://neat.ecosystemsknowledge.net/pdfs/corporate\\_ecosystem\\_valuation\\_ecosystem\\_proofed\\_tool.pdf](http://neat.ecosystemsknowledge.net/pdfs/corporate_ecosystem_valuation_ecosystem_proofed_tool.pdf)>.
- Hölzinger, Oliver, Pat Laughlin, and Nick Grayson. 2015. Planning for Sustainable Land-Use: The Natural Capital Planning Tool (NCPT) Project. London: RICS. Available from <<http://www.rics.org/uk/knowledge/research/research-reports/natural-capital-tool-planning-/>>.

<sup>15</sup> WBCSD 2011; Hölzinger 2014.

<sup>16</sup> Perrot-Maître and Patsy 2001; Elliman and Berry 2007.

<sup>17</sup> Smith et al. 2013.

<sup>18</sup> Hölzinger, Laughlin, and Grayson 2015.

- Keeley, Melissa, Althea Koburger, David P. Dolowitz, Dale Medearis, Darla Nickel, and William Shuster. 2013. Perspectives on the Use of Green Infrastructure for Stormwater Management in Cleveland and Milwaukee. *Environmental Management* 51 (6): 1093–1108.
- Luther, M., and D. Gruehn. 2001. Putting a price on urban green spaces. *Landscape Design*.
- Mell, Ian, John Henneberry, Berna Keskin, and Simone Allin. 2011. Valuing Attractive Landscapes in the Urban Economy - Exploring the value of green investments in North-West Europe: an overview of residents' and business focus groups' opinions in six cities. Sheffield: Department of Town and Regional Planning, University of Sheffield.
- Millennium Ecosystem Assessment. 2005. Ecosystems and human well-being. Synthesis Report. Available from <<http://www.maweb.org/documents/document.356.aspx.pdf>>.
- Natural Capital Committee. 2015. The State of Natural Capital: Protecting and Improving Natural Capital for Prosperity and Wellbeing. Third report to the Economic Affairs Committee. London.
- Perrot-Maître, Danièle, and Davis Patsy. 2001. Case Studies of Markets and Innovative Financial Mechanisms for Water Services from Forests. Washington DC: Forest Trends. Available from <[http://www.forest-trends.org/publication\\_details.php?publicationID=134](http://www.forest-trends.org/publication_details.php?publicationID=134)>.
- Regeneris. 2009. The Economic Contribution of the Mersey Forest's Objective One-Funded Investments. Final Report. Available from <<http://www.merseyforest.org.uk/files/Economic%20Contribution%20of%20The%20Mersey%20Forest%27s%20Objective%20One-Funded%20Investments.pdf>>.
- Rskensr. 2003. Business Case for the Environment Research Study: Summary of Principle Findings.
- Saraev, Vadim. 2012. Economic benefits of greenspace: A critical assessment of evidence of net economic benefits. Research Report. Edinburgh: Forestry Commission.
- Smith, S., P. Rowcroft, M. Everard, L. Couldrick, M. Reed, H. Rogers, T. Quick, C. Eves, and C. White. 2013. Payments for Ecosystem Services: A Best Practice Guide. London: Department for Environment, Food and Rural Affairs.
- TEEB. 2010. The Economics of Ecosystems and Biodiversity Report for Business - Executive Summary. Malta.
- The Marches LEP. 2015. A natural prospectus for the Marches Local Enterprise Partnership. Shrewsbury: The Marches Local Enterprise Partnership.
- The Marches LEP. 2014. The Marches Local Enterprise Partnership Strategic Economic Plan. Shrewsbury.
- UK NEA. 2011. UK National Ecosystem Assessment: Synthesis of the Key Findings. Cambridge: UNEP-WCMC. Available from <[http://archive.defra.gov.uk/environment/natural/documents/UKNEA\\_SynthesisReport.pdf](http://archive.defra.gov.uk/environment/natural/documents/UKNEA_SynthesisReport.pdf)>.
- WBCSD. 2011. Guide to Corporate Ecosystem Valuation: A framework for improving corporate decision-making. World Business Council for Sustainable Development.