

UK National Ecosystem Assessment

Follow-on



Synthesis of the Key Findings

Securing Multiple Benefits and Value from Nature: Observations from the National Ecosystem Assessment Follow on Project

Alister Scott

Mainstreaming Value of Nature

- “In many cases nature is ignored or trumped by other economic or social priorities, or seen as a barrier to growth to be overcome.
- Ecosystem services and natural capital help re-frame nature as an asset to society that delivers many benefits”.

Scott 2014



The Value(s) of Values

(Sunderland 2014 adapted)

Values (1)

- Principles or standards of behaviour; one's judgement of what is important in life or society:
- e.g. 'We expect our MPs to set standards, impart values and encourage responsible behaviour.'

Values (2)

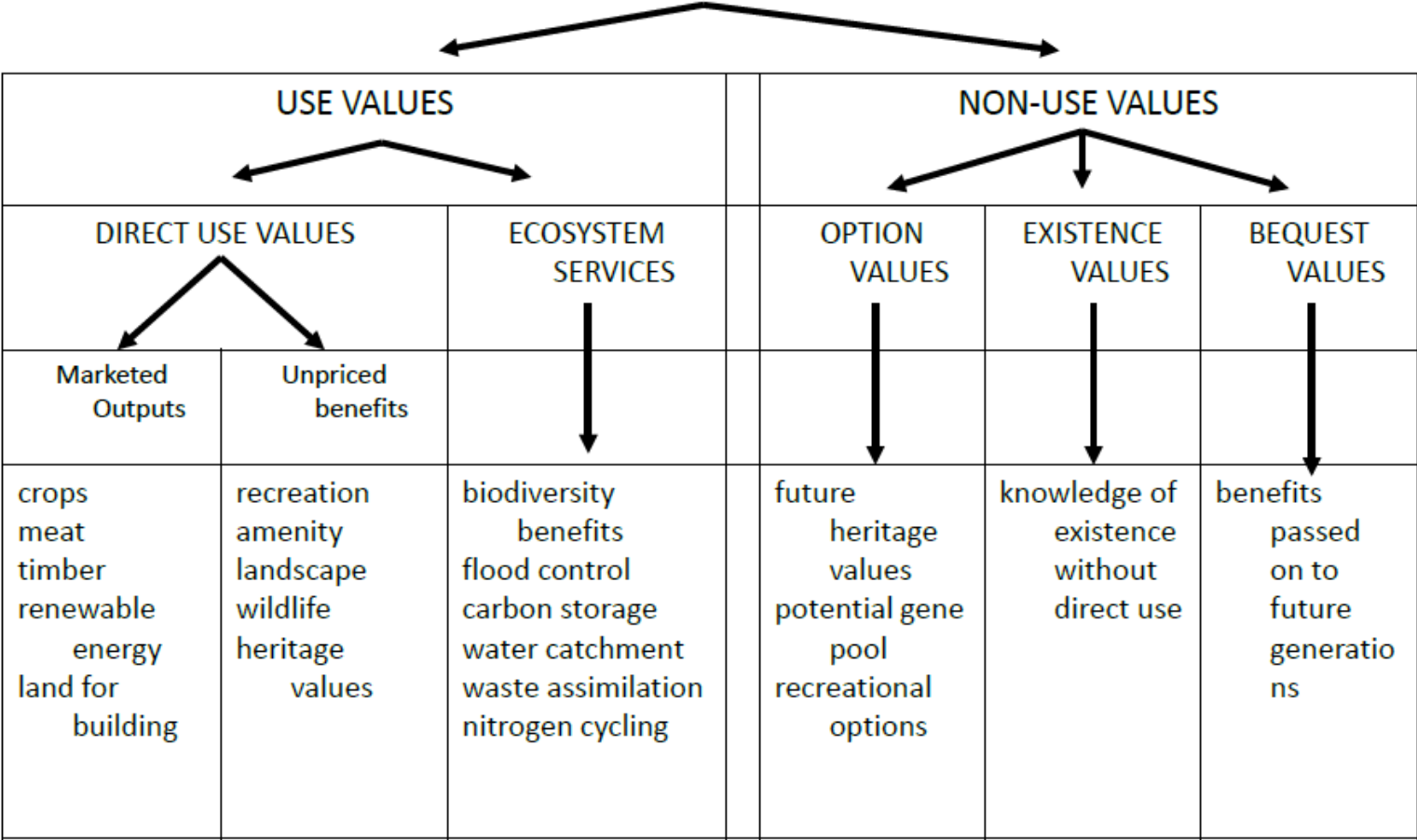
- The material or monetary worth of something:
- e.g. 'shares can rise or fall in value'

Values embedded in neo-classical economics

- Anthropocentrism
- Utilitarianism
- Individualism
- Consumer sovereignty
- Preferences revealed through markets
- Efficiency
- Perfect knowledge

Multiple Values (Hodge 2014)

TOTAL ECONOMIC VALUE of Land



Comment

- Values 1 and Values 2 are both increasingly contested
- Contestation lies at heart of many land use policies and decisions. How are they resolved.
- Easier to measure marketed outputs (GVA and GDP)
- Range of tools and methods now available to “value” non market goods
- Role of ecosystem services as a new lens within which to value.

(NEAFO 2014)

Ecosystem services, jobs and the economy (WPR 2)

To quantify the contribution of ecosystem services to local employment and economic output (£/year), ecosystem services need to be mapped to economic sectors, and an 'account' developed, for example, by using the UN System of Environmental-Ecosystem Accounting. This will generate data which can be used in econometric regional input/output modelling.

Sustaining natural capital assets (WPR 1)

Natural Capital Asset Checks can help to resolve environmental management issues that are intractable with current approaches, particularly where they cross sectors. For example:

- What are the interactions between commercial fisheries, protected areas (e.g. saltmarsh used as nursery grounds) and recreational angling?
- What role do farm woodlands play in regulating flood risk?

Spatially explicit models for land use (WPR 3)

Land use models can help consider all options for achieving the highest net benefits (both in terms of market price and value to society) from an ensemble of ecosystem services at scales down to <1 km². For instance:

- Where can new woodland be planted in order to generate the greatest benefits for the local community (such as providing amenity and recreational opportunities, contributing to flood attenuation, providing a source of wood fuel, etc.)?

Identifying cultural ecosystem services (WPR 5)

Characteristics of the local natural environment that are of cultural significance to people can be discovered through participatory methods, such as art and map-based techniques. These can elaborate on important, often unforeseen, aspects of cultural ecosystem services and provide compelling reasons for local authorities to use a wider evidence base for their planning choice.

Using shared values in decision-making (WPR 6)

Deliberation and social learning can add to our understanding of ecosystem services, as well as how shared values are formed, influenced and elicited in different groups within society. Thus, in more complex or contested situations, engagement in a participatory process can help to:

- build trust, manage conflicts, improve schemes; and
- increase acceptance of the final decision.

Figure 7. An illustration of how the work of the UK NEAFO can be used for planning at the local level.



• WP3

• WP5

• WP6



Using ecosystem knowledge in appraisal (WPR 9)

Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) are key tools for embedding ecosystem knowledge into planning processes. Using ecosystem knowledge in appraisal will:

- help to provide a more comprehensive analysis of environmental impacts and potential problems; and
- help identify critical factors which may facilitate or hinder the embedding of the ecosystem services framework.

An Ecosystem Approach to decision-making (WPR 10)

Using the Ecosystem Approach in decision-making helps local planners and elected members to think of the environment as an asset. It results in:

- better engagement with stakeholders in the early stages of planning;
- the demonstration of added value from diverse views; and
- the identification of opportunities and ecosystem service trade-offs that may not have been considered yet.

Coastal and marine ecosystem services (WPR 4)

Combining a scoping tool with conventional coastal ecosystem classifications helps to identify key ecosystem services and policy issues. Marine and coastal models and scenarios provide information on possible changes in these ecosystems over time. Estimates of monetary values exist for some ecosystem services, while others with non-monetary values may be addressed using deliberative methods.

Scenarios: exploring future worlds (WPR 7)

Scenarios can be an effective way to engage with local stakeholders because they may find it easier to relate to changes in ecosystem services which are played out in specific locations of which they have an in-depth knowledge. For example:

- How would the risk of flooding be affected under relevant contrasting scenarios?
- How do local stakeholders think these effects might be addressed in different plausible futures?

Evaluating robust response options (WPR 8)

Identifying the right mix of joined-up response options using an Ecosystem Approach can help to ensure better integration of economic, social and environmental objectives by, for example:

- combining statutory obligations (e.g. regulation) with local priorities; and
- acknowledging future change is inevitable by planning for it and learning to adapt to it.

• WP10

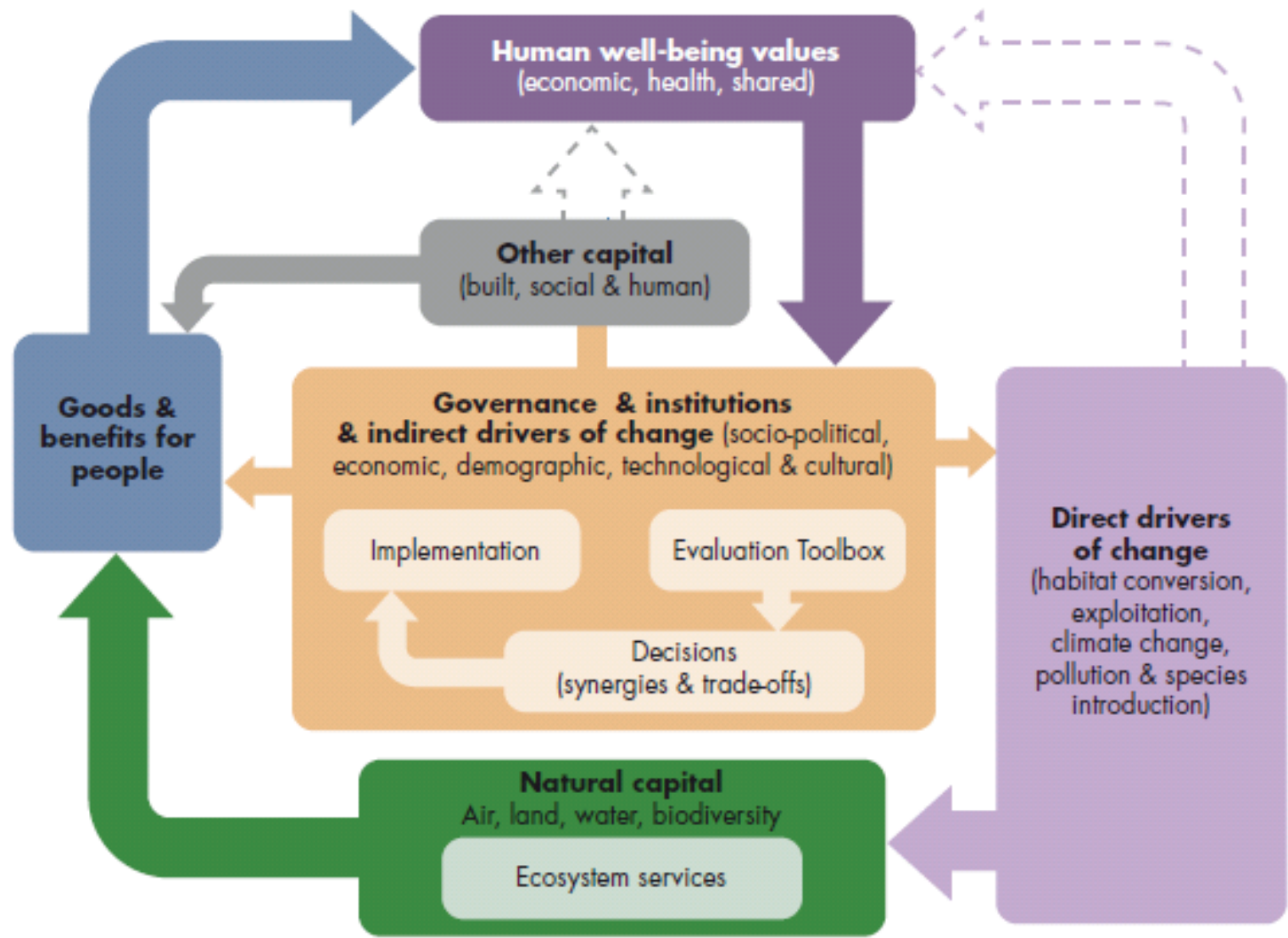


Figure 2. The UK NEAFO Ecosystem Services Conceptual Framework showing the roles of governance and institutions in the decision-making process, as well as the functions of built, human and social capital in transforming ecosystem services into goods and benefits for people.

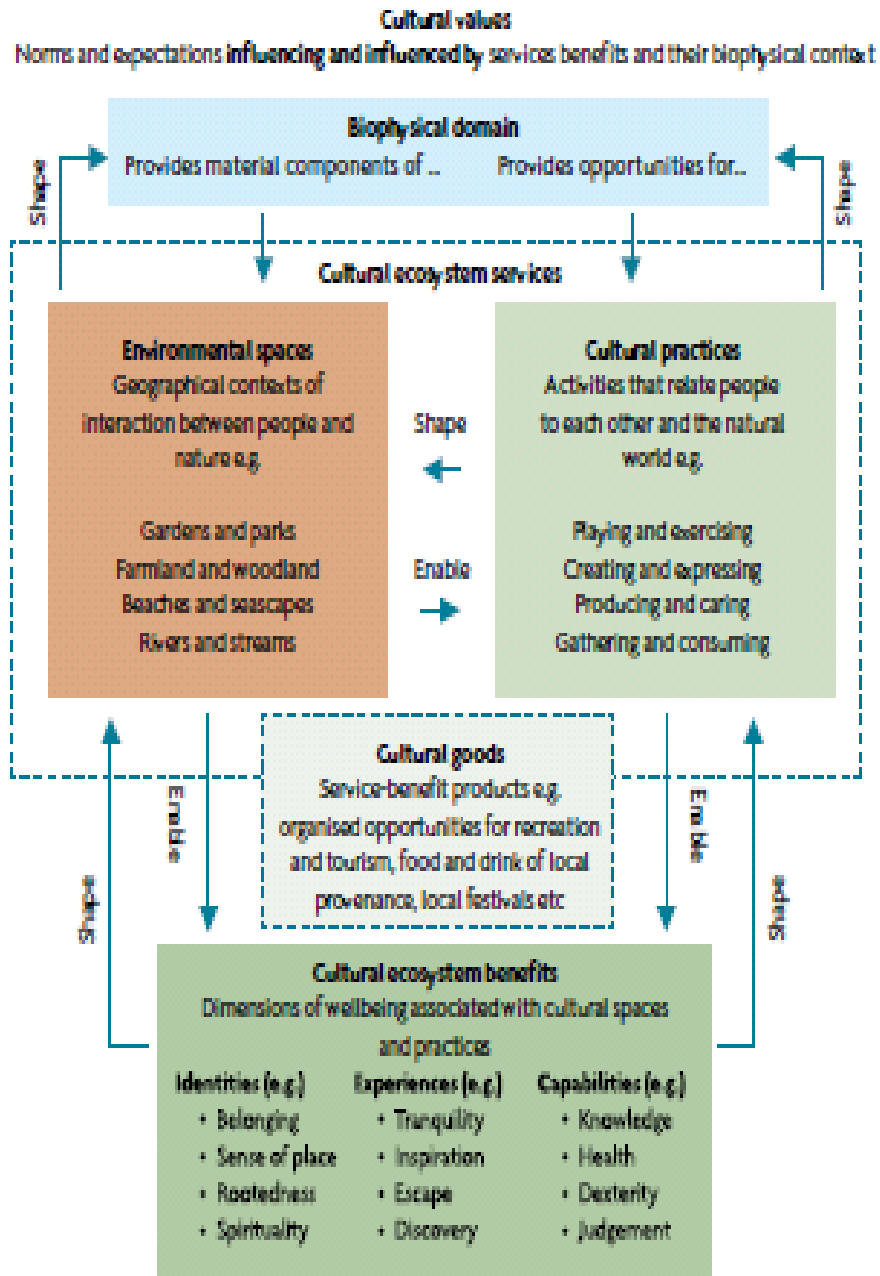


Figure 1. A conceptual framework for cultural ecosystem services.

Shared and cultural values of ecosystems



Kenter & Reed (2104)

What are cultural ecosystem services?

(Church et
al 2014)

“The individual or shared benefits to human well-being that arise from interactions between environmental spaces (e.g. gardens, parks, beaches and landscapes) and cultural practices (e.g. gardening, walking, painting and watching wildlife).”

Shared Values

(Kenter et al 2014)

Using deliberative, group-based valuation results are different from individual values. Case study evidence suggests that they are more informed, considered, confident and reflective of participants' deeper-held, transcendental values

Often the value of deliberation is not in sharing values and reaching consensus, but in understanding the diversity of values, appreciating the reasons behind other people's values, helping people to "live with" decisions that emerge from the process



Natural Guidance and Values for policy and decision making.

Box 2. The 12 principles of the Convention on Biological Diversity Ecosystem Approach³ and how they relate to the four overarching themes of the Approach: People; Management; Scale and Dynamics; and Function, Goods and Services.

PEOPLE

Objectives are a societal choice (#1)
Use all relevant available knowledge (#11)
Emphasise inclusion (#12)

SCALE AND DYNAMICS

Identify space and time scales (#7)
Recognise that ecosystems are dynamic (#8)
Accept that change will happen (#9)

MANAGEMENT

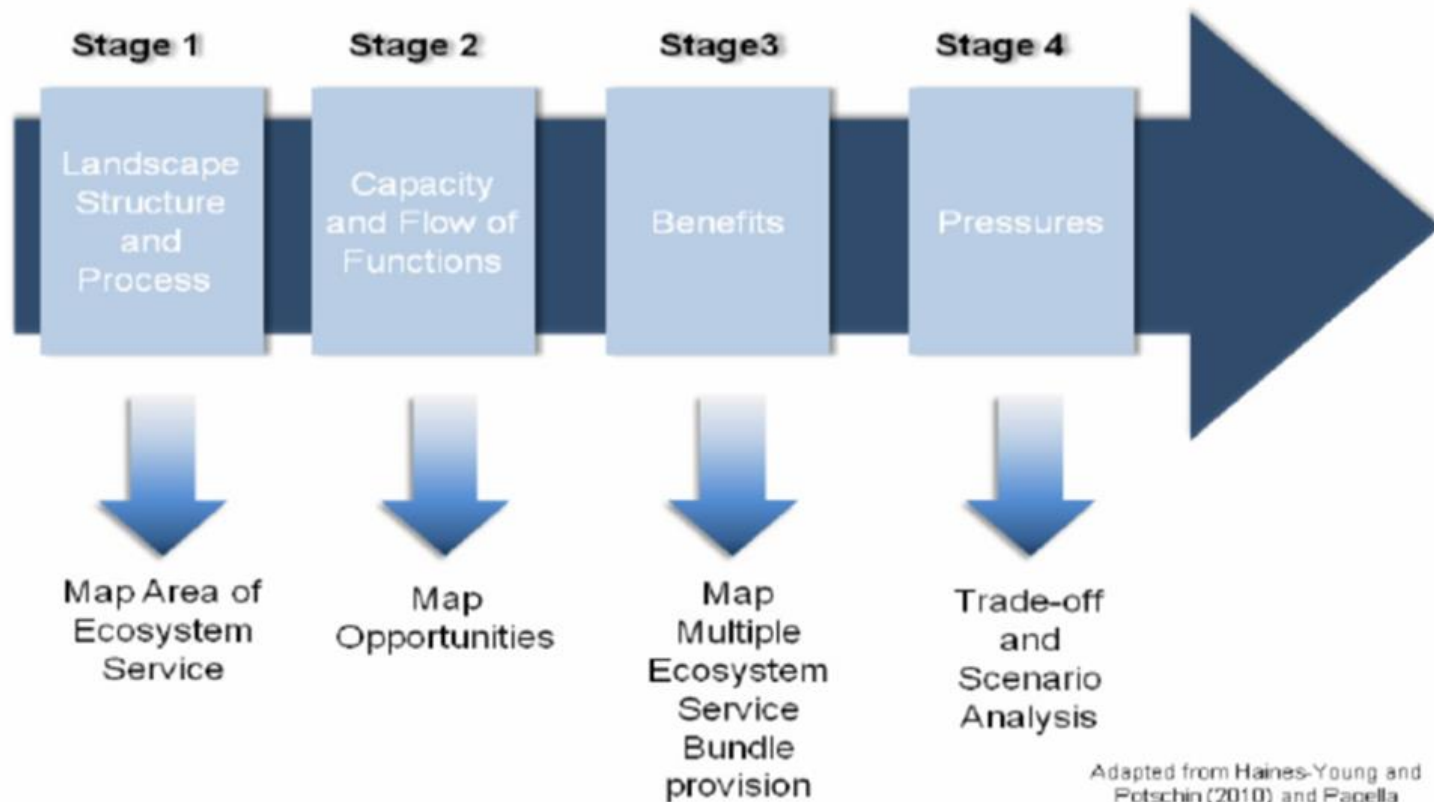
Decentralise to lowest appropriate level (#2)
Consider "downstream" effects (#3)
Understand economic context (#4)

FUNCTION, GOODS AND SERVICES

Maintain ecosystem services (#5)
Recognise functional limits (#6)
Balance demands for use and conservation (#10)

NPPF par 109 Tools for Valuation

Modelling Ecosystem Services Spatial Framework



Adapted from Haines-Young and Potschin (2010) and Pagella (2011)

Case Studies : Values in Recreation

CASE STUDY



▲ Figure 1. Red Tarn in the Lake District, England. The uplands are important for many crucial, but often overlooked, supporting and regulating ecosystem services which must be incorporated into economic valuations of ecosystems used by policy-makers. (© Zbyněk Jiroušek)

- Health Goods
- Birmingham Biophilic City
- Maximising value from new Forestry
- Visitor Payback and ecosystem services
- Shared values of Divers and Anglers.

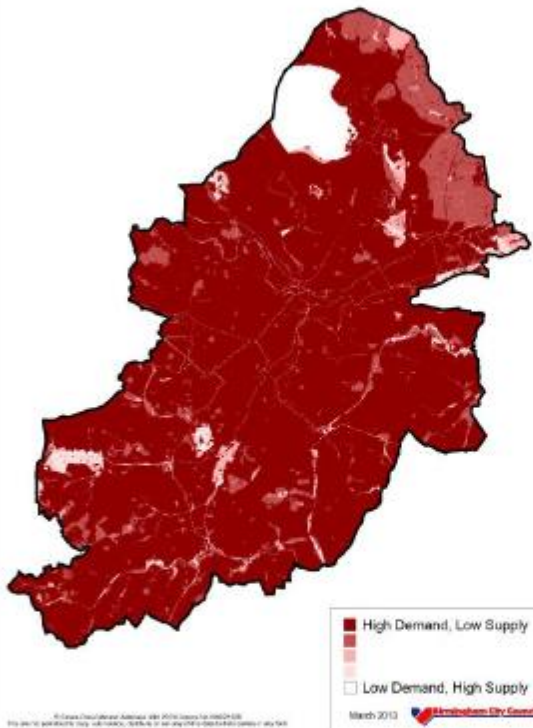
NEA Valuing health goods linked to recreation in greenspace

Mourato *et al.* 2011 – **New primary data**

- Questionnaire survey on interactions between environmental settings and health.
- A geographically referenced quota survey of 1,851 respondents
- **Statistically significant relations** between health measures of physical functioning/emotional well being and the use of the environmental settings of **domestic gardens and local green spaces**.
- Respondents who at least once a month visit non-countryside green spaces, such as urban parks, report significantly better health on both measures compared to those who do not.
- As do respondents who at least once a week spend time in their garden

Birmingham: The UK's First Biophilic City

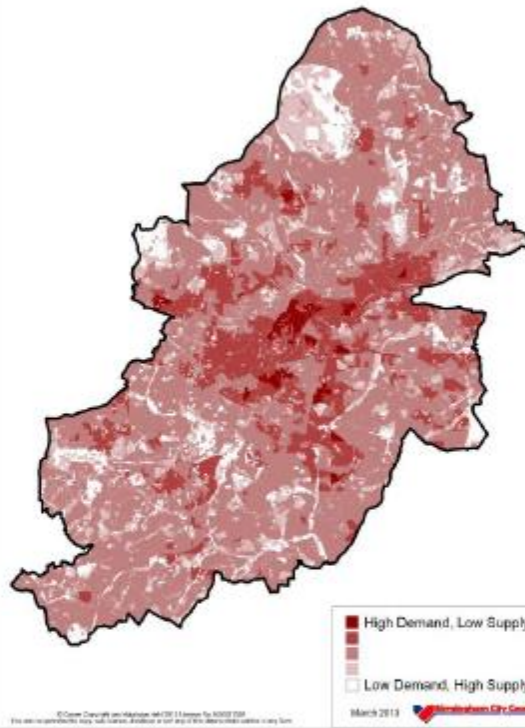
Biodiversity Services Supply and Demand map



• Biodiversity

• Education

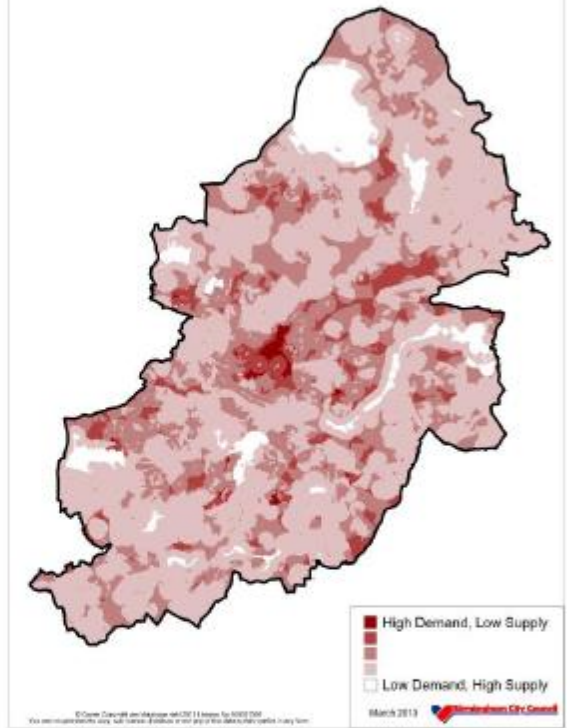
Local Climate Services Supply and Demand map



* Local Climate

* Aesthetics & mobility

Recreation Services Supply and Demand map



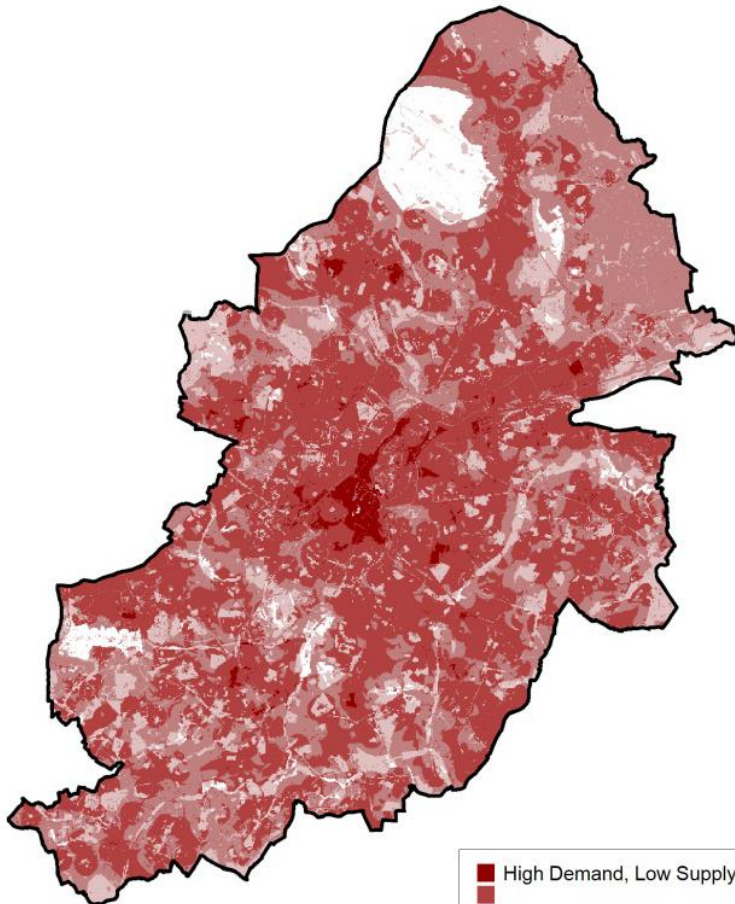
* Recreation

* Flood risk

Green Living

Spaces Plan 2014

The Multi-layered Challenge map for Birmingham



Spatial Layers

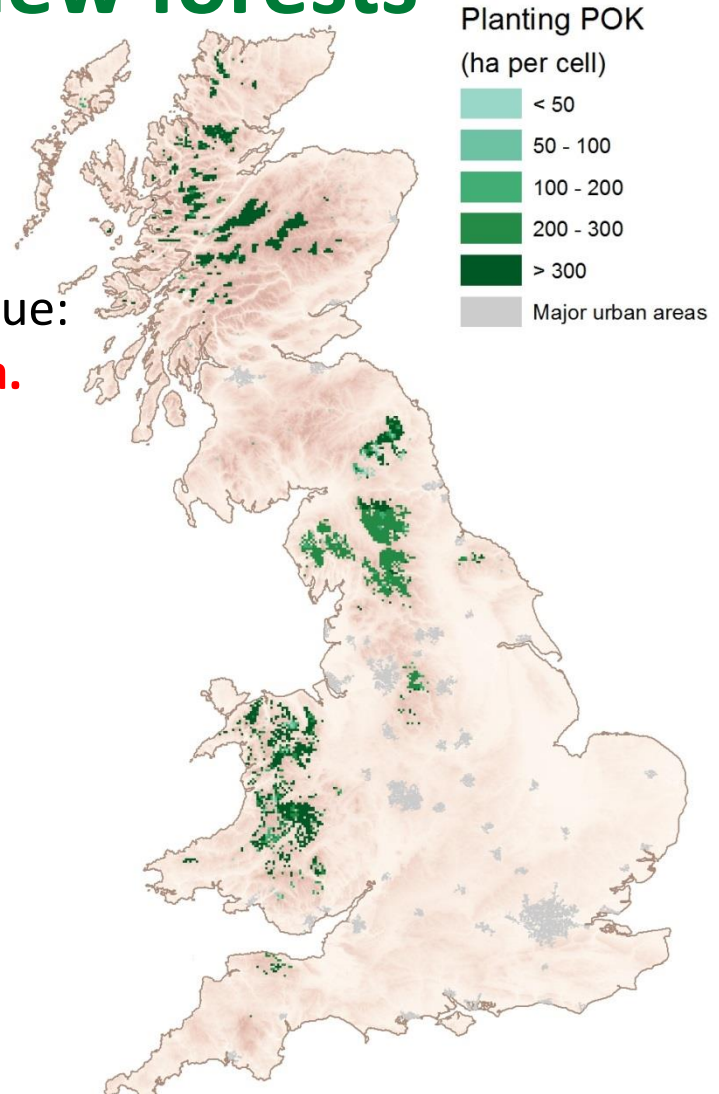
1. aesthetics and mobility
2. flood risk
3. local climate
4. education
5. recreation
6. biodiversity

Principle	Outcome
An Adapted City	Retain City's top ranking for adaptation
	<ul style="list-style-type: none"> •Ensure all future growth is adapted •Trees for cooling and thermal insulation •Green roofs, walls and street canyon research
The City's Blue Network	Adopt water sensitive urban design
	<ul style="list-style-type: none"> •Integrated SuDS, flood and water management solutions •Blueprint for enhance walking and cycling offer •Blue Corridor/ network policy with Canal Rivers Trust
A Healthy City	Adopt Natural Health Improvement Zones (NHIZ)
	<ul style="list-style-type: none"> •Integrate the delivery of health and green living spaces •Continue to extend the 'Be Active' offer •Public Health as key partners in Planning
The City's Productive Landscapes	Embrace urban forestry and urban food growing
	<ul style="list-style-type: none"> •Continue to promote allotments •Facilitate community food growing and orchards •Promote the multiple benefits of urban forestry
The City's Greenways	Change gear- to a walking and cycling City
	<ul style="list-style-type: none"> •Create walkable/ cyclable neighbourhoods •Citywide signed routes linked to public transport •Link healthcare activities and prevention programmes
The City's Ecosystem	Birmingham as a Biophilic City
	<ul style="list-style-type: none"> • City to adopt an ecosystem services approach •Partners to lead on District Nature Improvement Area plans •Birmingham to join global Biophilic Cities Network
The City's Green Living Spaces	Birmingham an international City of Green Living Spaces
	<ul style="list-style-type: none"> •Adopt the 7 principles across Planning Framework •Green Infrastructure and Adaptation Delivery Group

Optimal land use case study: Where to plant Britain's new forests

Location determined by
Market values only:
food
+ timber
(i.e. ignoring externalities)

Cost benefit value:
- £66million p.a.



Source Bateman Church
and Fish 2014

Optimal land use case study:

New forests

Location determined by
Market values only:

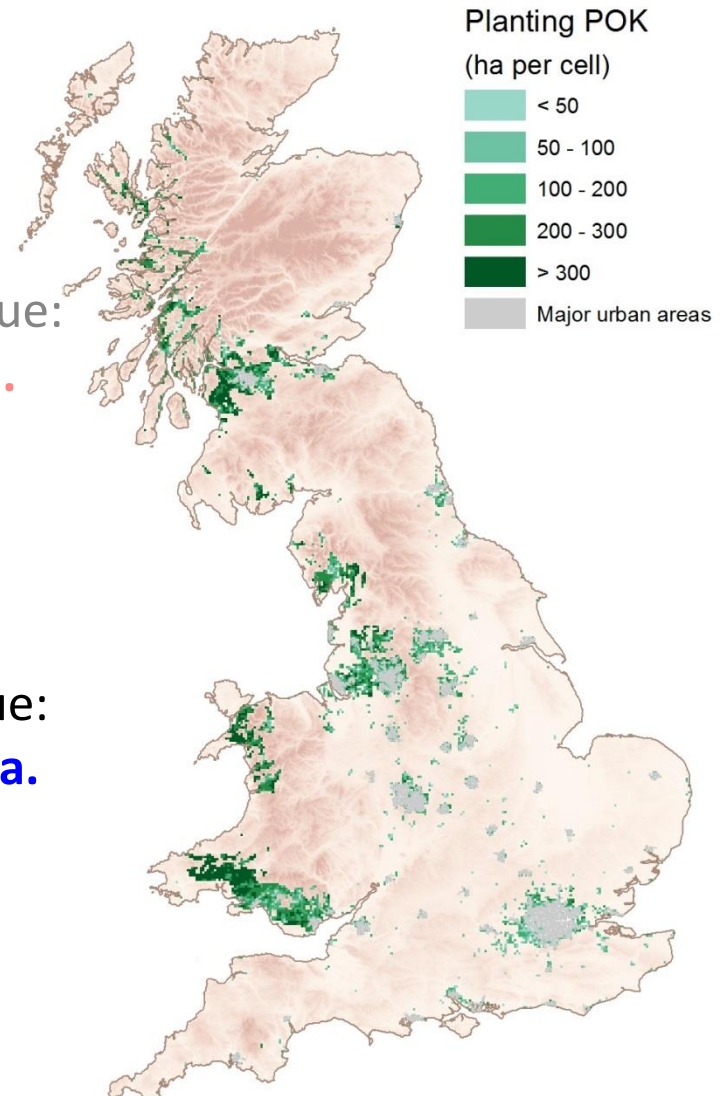
food
+ timber
(i.e. ignoring externalities)

Cost benefit value:
- £66million p.a.

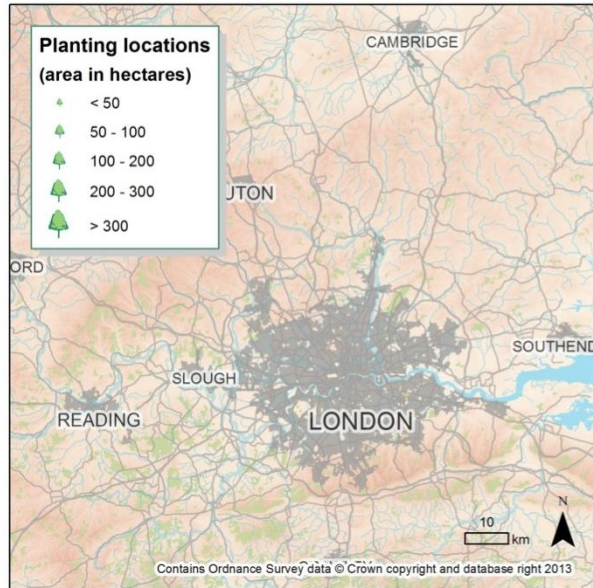
Location determined by
Market + Non-Market Values

food
+ timber
+ greenhouse gases
+ recreation
+ water quality improvement
+ biodiversity improvement

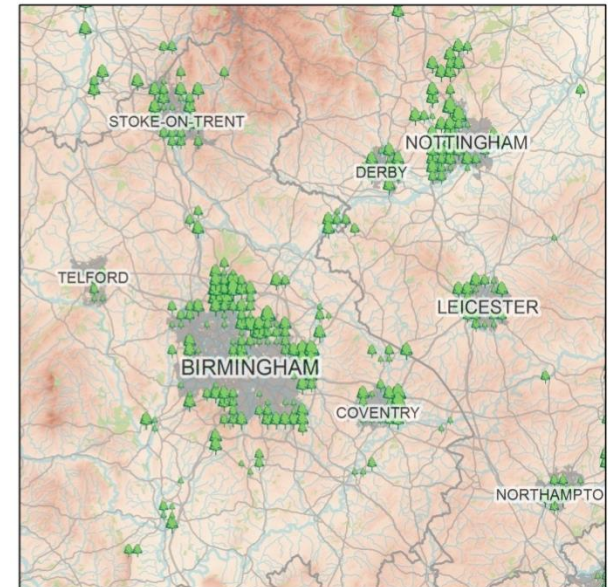
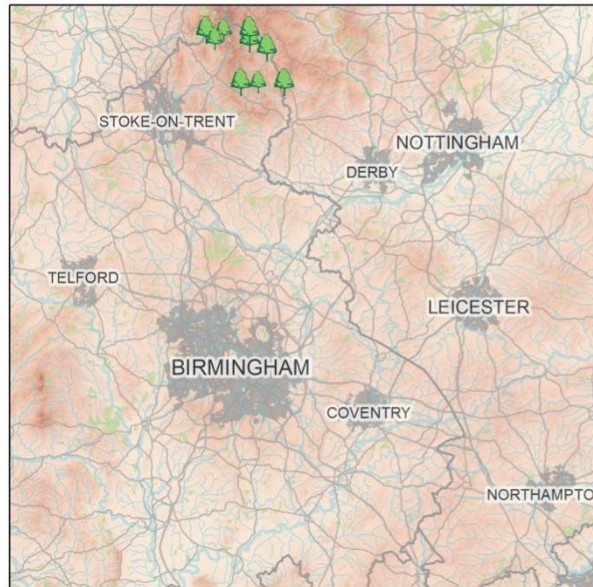
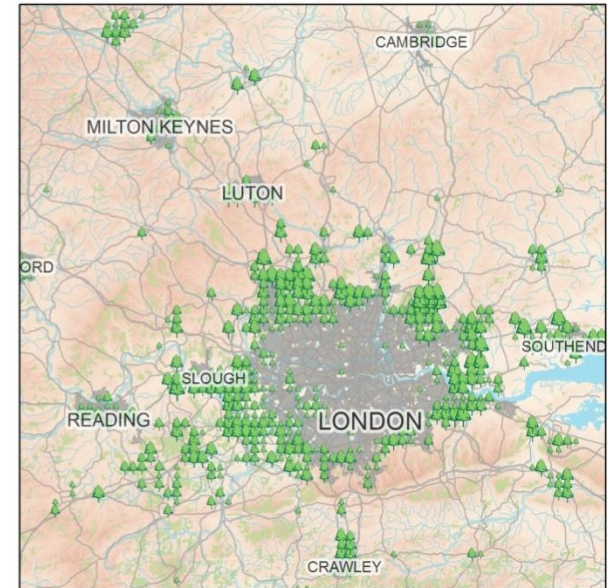
Cost benefit value:
+ £546million p.a.



Omitting non-market goods



Including non-market goods



Investing in Nature through Payments for Ecosystem Services.



BIRMINGHAM CITY
University

Visitor Giving Payment for Ecosystem Service Pilot Final Report

February 2014

Project code: NE0142

Prepared for: Defra




Department
for Environment
Food & Rural Affairs

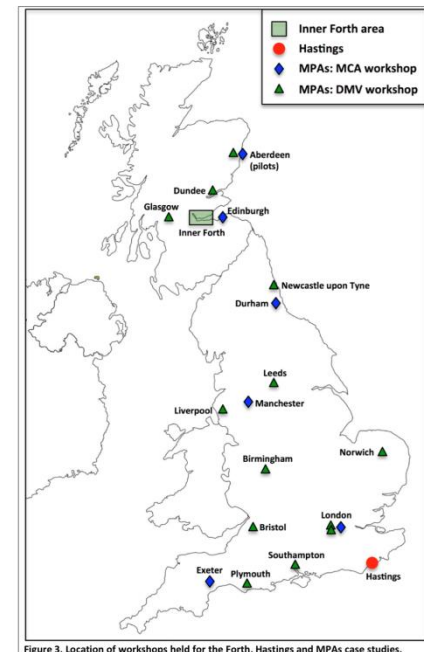
- 22 active payback schemes
- Additionality “value”.
- WTG dependent on many factors; visitor experience; clear project; feel good factor; intrinsic value
- Focus on designated landscapes and implicit cultural services.
- Range of schemes covering recreation, tourism, conservation and users
- Limited focus on ecosystem services but potential identified through survey
- App produced to support VG with [Nurture Lakeland](#).
- Admin costs limit income potential

Shared Values of Divers and Anglers

- Kenter, J.O., Bryce, R., Davies, A., Jobstvogt, N., Watson, V., Ranger, S., Solandt, J.L., Duncan, C., Christie, M., Crump, H., Irvine, K.N., Pinard, M., Reed, M.S. (2013). The value of potential marine protected areas in the UK to divers and sea anglers. UNEP-WCMC, Cambridge, UK.

Criteria/goals	Rank pre-deliberation	Rank post-deliberation	Group rank
Protecting species and habitats	1	1	1
Improve fish stocks	2	2	3
Habitat restoration*	3	5	6
Protecting non-damaging recreational opportunities	4	6	5
Reduce pollution	5	4	4
Education*	6	3	1
Ease of access*	7	7	11
Improve chance of wildlife encounters	8	9	7
Include local knowledge	9	10	10
More scientific data	10	8	7
Protect cultural heritage	11	11	9






Value of Marine Protected Areas to Divers and Anglers ranked using MCA before and after deliberation








Factor	Factor theme	Factor mean & standard deviation	Cronbach's alpha	A priori construct	Indicator (no.)	Loading	Mean divers	Mean anglers
1	Engagement and interaction with nature <i>23% variation</i>	4.04±0.6	0.87	Knowledge	Visiting these sites has made me learn more about nature (9)	0.86	4.18	4.05
				Wholeness & reflection	Visiting these sites makes me feel more connected to nature (3)	0.71	4.16	4.09
				Aesthetics	I have felt touched by the beauty of these sites (12)	0.60	4.17	3.87
				Participation	I feel like I can contribute to taking care of these sites (11)	0.49	3.82	4.03
				Inspiration	These sites inspire me (13)	0.48	3.99	4.04

“I ticked all of these [values] and more, I added religious which is strange really because I am an atheist. I was in one place and visibility opened up and it was like a cathedral, with jewel anemones lighting up everywhere. I felt like I was in the presence of God, if there is such a thing. I was crying when I came out of the water”. (Diver)

(Y)Our Challenges

- We value what is easily measured; not what society values.  Rethink how and where we intervene to optimise multiple benefits in opportunity spaces
- UK CBA models do not discount value of environment beyond 25 years  Take a long term view to our costing models to put nature on balance sheet
- Range of new tools/guidance but are preserve of expert (black box syndrome) hinders buy in  Improve understanding and application of CBA and MCDA tools (transparency)
- Failure to use ecosystem approach principles collectively.  Adapt principles of EA to your own agencies ([NRW](#))
- Cherry picking of selected ecosystem services  Look holistically at ESF. Avoid 'recreational' or cultural services silos; work in bundles.

(Y)Our Opportunities

- We value what is easily measured; not what society values.  Rethink how and where we intervene to optimise multiple benefits in opportunity spaces
- UK CBA models do not discount value of environment beyond 25 years  Take a long term view to our costing models to put nature on balance sheet
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Key Messages

Box 1. Key Messages of the UK NEA (UK NEA 2011a, b).

- The natural world, its biodiversity and its constituent ecosystems are critically important to our well-being and economic prosperity, but are consistently undervalued in conventional economic analyses and decision-making.
- Ecosystems and ecosystem services, and the ways people benefit from them, have changed markedly in the past 60 years, driven by changes in society.
- The UK's ecosystems are currently delivering some services well, but others are still in long-term decline.
- The UK population will continue to grow, and its demands and expectations continue to evolve. This is likely to increase pressures on ecosystem services in a future where climate change will have an accelerating impact both here and in the world at large.
- Actions taken and decisions made now will have consequences far into the future for ecosystems, ecosystem services and human well-being. It is important that these consequences are understood, so that we can make the best possible choices, not just for society now, but also for future generations.
- A move to sustainable development will require an appropriate mix of regulations, technology, financial investment and education, as well as changes in individual and societal behaviour and adoption of a more integrated, rather than the conventional sectoral, approach to ecosystem management.