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15th November 2012. Thank you!

Principal Investigator

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Discipline	<input type="text" value="Ecologist"/>		
Role in team	<input type="text" value="Project co-leader"/>		

Project team

Total number of people involved	Academics	<input type="text" value="18"/>
	Non-academics	<input type="text" value="6"/>
Of these, how many are	Natural scientists	<input type="text" value="9"/>
	Social scientists	<input type="text" value="7"/>
	Economists	<input type="text" value="7"/>

Project title (<120 Characters)

Project objectives

1. To identify and define the stocks and flows of ecosystem services from farmed land; the relationships between those stocks and flows and, where possible, define appropriate metrics for them.
2. To define, for all stocks and flows identified under objective 1, the temporal and spatial scales at which they operate and their interdependencies.
3. Following on from objectives 1 and 2, outline a generic (semi-) quantitative framework which incorporates spatial and temporal scale, interdependencies and quality, and highlights potential uncertainties, building on previous frameworks as appropriate.
4. Identify knowledge gaps and define future research agenda in relation to the objectives above.

Nature is essential in making human life possible and (for many) pleasurable, and it is important to understand the aspects of nature and its processes (sometimes called Natural Capital) which support this benefit. Humans play a dual role, as consumers of the goods that nature provides and as managers of ecosystems that provide those goods. Farmed land is a key part of the UK landscape which provides a range of goods and services beyond just food production. This project focused primarily on creating a conceptual framework to describe how human interactions with stocks and flows of natural capital underpin the provision of ecosystem goods and services from farmland.

Project scientists worked with farmers and policy makers (hereafter referred to as stakeholders) to explore the range of goods and services provided by farmland, the role of humans in their provision and consumption and to consider whether different services operate at different scales, and whether it is possible to compare services across scales. Development of the conceptual framework relied on this initial groundwork, which allowed us to build a shared understanding among stakeholders and natural, social and economic scientists of the concepts of ecosystem services (ES) and natural capital.

A key project finding was that whilst the ES concept was widely acknowledged and understood among natural scientists, it was not always either familiar or intuitive to scientists from other backgrounds or to stakeholders. As a result, the natural scientists led the way in outlining the conceptual framework. Although sometimes sceptical, social and economic scientists were willing to buy-in to this framework and engaged in the process of identifying the key natural and human components which underlie provisioning, regulating and cultural services. The social scientists provided greater clarity on the role that humans play in co-production and use of ecosystem services, while the economists provided grounding as to what is required from a valuation perspective.

The project created a generic framework which recognises;

1. The environment is a social-ecological system and the supply of ecosystem services involves co-production by both humans and natural processes.
2. This co-production is dependent on stocks of natural capital – the ‘stock’ of natural components and the complex interactions (including flows) supporting natural processes, but also on stocks (and flows) of human capital in a variety of forms.
3. Not all processes within the environment can be described as stocks or flows; the quality, condition or attributes of stocks also determine their ability to provide services, and there are (non-depleting) conditional relationships which also govern service provision.
4. The values of ES whilst ultimately dependent on the sustainable use of natural capital are currently set by human interactions with ecosystems, within a context of property rights and ownership, regulation and policy.

The framework consists of a set of basic building blocks which can be combined to represent any type of ES as a simple model. A library of common building blocks (which can be added to) accompanies the framework. With a suite of linked ES models, changes in one natural capital stock can be traced through to impacts on multiple services.

This framework is important because it allows quantification of the links between ecosystem processes and ecosystem service delivery for a range of services, and identification of the key stocks or flows on which each service depends. These are essential to understand and therefore to manage the system for sustainable ecosystem service production into the future. It helps resolve the lack of a common understanding of ES concepts among stakeholders and scientists, as identified early on in this project.

The framework will be particularly useful to policy makers and land managers because it allows them to frame ideas in a way which provides clarity to systems which are highly complex, and to understand how and where interventions may impact on different components of socio-ecosystems, and the goods and services they produce. For farmland in particular, it is extremely important to ensure that the values which humans currently place on ecosystem services reflect the full suite of both services and dis-services in addition to food or fibre production.

