



'Valuing Nature Network (VNN): project update and discussion'

Announcement of *'Special session on VNN'*

at the

EnvEcon 2012: Applied Environmental Economics Conference

Friday 9th March 2012,

The Royal Society in London.

The Valuing Nature Network (VNN) is a NERC Interdisciplinary Network for Valuing Biodiversity, Ecosystem Services and Natural Resource Use. It's mission is to support interdisciplinary partnerships to scope, develop and promote research capacity in the valuation of biodiversity, ecosystem services and natural resources and facilitate the integration of such approaches in policy and practice in the public and private sectors. Specific aims include:

- Articulating the challenge of valuing the contribution that the stock of natural capital and the flow of ecosystem services makes to human well-being, and developing meaningful methods of valuation.
- Identifying and developing the underpinning socio-ecological system knowledge that will enable robust monetary and non-monetary valuation to be achieved.

The VNN is supporting eight projects (see below). The aim of the VNN session at EnvEcon 2012 will be to provide an update on and discussion of these eight VNN projects. The session will comprise the following:

- Introduction to VNN (Ian Bateman)
- Overview and update on the eight VNN projects by (*Mike Christie, Susana Mourato, Sue Chilton, Alistair McVittie, Ron Smith, Mark Reed, Laurence Jones and Kerry Turner*).
- Discussion on the linkages / synergies between the VNN projects and future direction of VNN research efforts.

A summary of the VNN projects that would be discussed in the special session are provided below.

Details of how to register for EnvEcon 2012 can be found at: (<http://www.eftec.co.uk/envecon-current/envecon-2012>)

BRIDGE: Bridging the gap between supply and demand for valuation evidence (Dr Mike Christie, Aberystwyth University)

Summary: The capacity of UK natural resources to deliver ecosystem services has declined dramatically over the last 60 years. This decline is, in part, because nature is not fully accounted for in decision-making. Specifically, there is a mismatch between the supply of valuation evidence by researchers and the demand for this evidence by decision-makers.

BRIDGE aims to directly address VNN challenge 4 by developing a transdisciplinary VNN hub of researchers and decision-makers to investigate how values obtained from natural, social and economic sciences can best be integrated into governance to improve decision-making and implementation.

BRIDGE will address these aims through an iterative series of workshops. Key questions are:

- How should valuation be improved if valuation evidence is to be more effectively integrated into decision-making? Central topics include: shared social values and deliberative, social learning and non-monetary approaches to valuation.
- What are the obstacles that limit uptake of valuation evidence by decision-makers and what research is needed to address these? Key topics include: what factors affect the uptake of scientific knowledge in decision-making and to what degree has valuation research led to evidence-based decisions.

Outputs include 3 papers on the issues raised above and an agenda for future research.

Assessing and valuing peatland ecosystem services for sustainable management (Dr Mark Reed, University of Aberdeen)

Summary: This transdisciplinary network will explore how different groups of beneficiaries value stocks and flows of multiple (but sometimes mutually exclusive) ecosystem services in complex socio-ecological systems, and how this information might affect the design of financial mechanisms to lever investment in the provision of climate mitigation and adaptation. We will use UK peatlands as a case study to assess the stocks, flows, sustainability and uncertainty of different ecosystem services at multiple scales. Ecosystem services provided by peatlands are vital to UK society but under threat from various forms of degradation. Peatlands are an ideal case study in which to ask questions about links between science, values and decision-making, given growing evidence linking ecosystem functions, services and markets in peatlands, and their potential for Payments for Ecosystem Services schemes. The proposed network will use expert workshops and literature review to derive new theoretical and methodological insights, and will work actively with the policy and business community to identify and develop the regulatory mechanisms necessary to develop new markets for the sustainable management, restoration and conservation of peatlands.

Interdisciplinary methods to build a socio-ecological decision-making tool to inform marine governance and policy. (Sue Chilton, Newcastle University)

Marine policies worldwide are failing to achieve sustainability goals because there are few mechanisms to enable policy-makers, scientists and stakeholders to coherently assess policy outcomes. No tools exist to visualise the effect of management measures such as Marine Protected Areas on coastal livelihoods. This is a barrier to valuing marine ecosystems and measuring policy impact on human communities which are socially and economically dependent on vulnerable resources.

We use existing data from two marine areas (UK and West Indian Ocean) to test the hypothesis that integrated modelling, of individual-based economic values, shared social values, socioeconomic factors and marine governance processes with ecosystem characteristics can identify the optimal policy mix to achieve marine health and sustainability. The model will be based on powerful Bayesian Belief Networks (BBN) and will allow us to incorporate qualitative data into the modelling, allowing for inherent uncertainty in human response and potential interdependence of network factors

The interdisciplinary team will develop methods to translate the conceptualised marine resource management into a computer-based tool model demonstrating the welfare implications to the relevant community of different marine management options, to offer policy makers better scientific support. The resulting tool will be piloted with key marine actors and will help us to highlight gaps in existing valuation methods and key data requirements needed to further improve the reliability, robustness and generalizability of the proposed management tool.

Capturing differentiated experience of change to ensure pro-poor ecosystem service interventions are fit for purpose (Prof E.J. Milner-Gulland, Imperial College)

Summary: External and policy-driven change in social-ecological systems affects individual wellbeing (IWB), determining the impact of policy interventions. If interveners are to implement robust policies driving sustainable pro-poor change, they need to understand the consequences and heterogeneities of IWB. This requires a more differentiated approach to societal wellbeing that better reflects the position of the poorest - those most at risk from the consequences of mis-measurement and loss of ecosystem services (ES).

We aim to move the research agenda forward through: (i) engaging local people in defining, monitoring and measuring changes in wellbeing and the interactions between ES and IWB, using locally meaningful metrics and citizen science monitoring; (ii) planning a research programme of empirical exploration of differentiated experiences of environmental, socio-economic and intervention-led change; (iii) ensuring that differentiated experience of change is integrated into the wider research agenda, leading to more sustainable pro-poor interventions.

Our strong, integrated team is ideally placed to do this, comprising economists, anthropologists and life scientists, with substantial complementary academic, policy development and project implementation experience. Our work plan includes targeted reviews, intensive workshops to produce concrete research plans and deepen understanding, and a broad dissemination stream to engage researchers, policy-makers and implementers

Interdisciplinary quantitative ecosystem services team (INQUEST) (Mr Ron Smith, CEH Edinburgh)

Summary: INQUEST will focus on the scale and uncertainty challenges of ecosystem service and natural capital evaluation. Building from

the National Ecosystem Assessment (NEA), the team will review a selection of ecosystem services in order to identify common themes related to scale and uncertainty and their relevance for sustainable valuation of ecosystem services and natural capital.

Using expert panels, a framework will be developed to incorporate scale changes, uncertainty management and response function asymmetry in a coherent manner. In order to explore the approach, pilot areas which are data rich and contrasting in ecosystem services and habitat (and associated biodiversity) will be identified and analysed. The parameterization of the framework will ensure its practical relevance.

The team is fully interdisciplinary with a range of academics and researchers as well as policy champions and business representatives, thus ensuring delivery of a fully encompassing project

Scale dependence of stocks and flows in the valuation of ecosystem services (Dr Laurence Jones, CEH Bangor)

Summary: This project aims to improve our understanding of how the concepts of stocks and flows can best be applied to the valuation of the natural capital that delivers ecosystem services, in the context of long-term sustainability.

It recognises that variation with scale, both spatial and temporal, and from social and natural perspectives, is critical to this understanding. The project uses agricultural landscapes as a model system to address the following objectives:

1. To explore how flows of supporting, intermediate and final ecosystem services are dependent on stocks of natural and other forms of capital; identifying possible metrics by which they can be measured.
2. To identify the importance of scale and scale transitions for quantification, valuation and management of stocks and flows.
3. To develop an encompassing conceptual framework for quantifying and valuing stocks with regard to flows.
4. To identify knowledge gaps and set priorities for a follow-on research agenda.

Outputs will include: an interdisciplinary network with the capacity and identified approaches (a specified research agenda) to take on the valuation of biodiversity, ecosystems services and natural resource use; a report to the VNN network; and a paper submitted to a peer-reviewed journal describing the conceptual framework.

Valuing the impacts of ecosystem service interactions for policy effectiveness (Mr Alistair McVittie, Scottish Agricultural College)

Summary: Environmental policy is often concerned with the delivery and management of a single ecosystem service, e.g., food or water quality or carbon management. However, the underlying ecosystem processes are key to delivery of multiple services. For example, soil structural stability impacts on food production and water quality and carbon management.

Economic valuation of ecosystem services frequently fails to consider the underlying processes. Consequently, crucial processes may be unvalued and inadequately managed. Improved understanding is needed regarding (1) how ecosystem services arise from multiple and interacting underlying ecosystem properties and processes and (2) how processes and services are linked within and across ecosystems.

Using two linked ecosystems, this project will map out the underlying ecosystem properties and integrating functions, and characterise the processes and linkages between ecosystems. Using this information we will explore the potential to model ecosystems in a way that allows values for services to be apportioned across each ecosystem based on the relative interactions of the underlying processes.

By examining and valuing ecosystem processes and services jointly we will illustrate the relative importance of each different processes, indicating where trade-offs and synergies can take place. Crucially, this will highlight where policy and management intervention might best be concentrated.

Environmental and ecological economics and management (Prof Kerry Turner CBE, University of East Anglia)

Summary: In line with IGBP LOICZ we define the coastal zone as including river basins and catchments, estuaries and coastal seas and extending out to the continental shelf. In practical terms, the definitions of the coastal zone need to vary according to the type of problem or set of issues being addressed and the objectives of the management regime. We will focus primarily on coastal systems but with due note given to the interrelationships with terrestrial and deep ocean systems.

The coastal zone provides the dynamic transition (across time and space) between terrestrial and marine domains, while containing highly diverse natural systems. Coastal process and ecosystem changes range over a variety of spatial and temporal scales and can only be better understood and managed on the basis of an interdisciplinary 'knowledge' and 'know how'.

The aim of this network (organized through structured meetings and a Dahlem workshop process) will be to foster such interdisciplinary research to contribute to a more sustainable management of our coastal zones, while inter alia maximizing the provision of a set of ecosystem services. It will also contribute to the UK adoption of the EU Marine Strategy Directive and will draw lessons from the implementation of the EU Water Framework Directive. In addition to NEA/VNN, this action can contribute and link to NERC programmes such as Macronutrients, Ocean Acidification etc and BESS as well as build on EU and other international research projects.