Where next for the UK National Ecosystem Assessment and IPBES?

Report of a joint session between the British Ecological Society (BES) and the UK Biodiversity Research Advisory Group (UK BRAG):

Tuesday 13th September 2011: Council Chamber, Octagon Centre, University of Sheffield

Chair: Professor Ken Norris, University of Reading

Introduction

The first few months of 2011, and the end of 2010, saw significant developments likely to inform the development of environmental policy for a long time to come. These have included the publication of the Lawton Review, assessing the ecological coherence of England's protected area network, and the Natural Environment White Paper ('The Natural Choice'). Perhaps no development has been as significant however as the publication, in June 2011, of the report giving the findings of the **National Ecosystem Assessment** (NEA). This report, which analyses the value of the UK's natural environment by taking account of the economic, health and social benefits we get from nature, is the first of its kind at a fully national scale. At the launch of the NEA, Professor Robert Watson, Chief Scientific Advisor at DEFRA, commented that he had never before seen a publication inform the development of policy so rapidly, feeding in as it did to the White Paper published the following week.

At an international level, 2011 has seen significant developments in the formation of the **Intergovernmental Platform on Biodiversity and Ecosystem Services** (IPBES). This body is being established by the United Nations as a mechanism to address the gaps in the science policy interface on biodiversity and ecosystem services.

This special session at the British Ecological Society's (BES) Annual Meeting was organised by the BES and UK Biodiversity Research Advisory Group (UK BRAG) to examine how the NEA is already having an effect on policy and how the results of the NEA will feed into, and inform, IPBES.

Over 80 delegates were present to hear a range of invited and submitted presentations and to contribute to discussion on 'Where next for the UK National Ecosystem Assessment and IPBES?'

Presentations

Two plenary speakers delivered 30 – minute presentations: **Professor Steve Albon**, from the James Hutton Institute, jointly chaired the NEA with Professor Robert Watson of DEFRA, and **Dr. Andrew Stott,** the UK representative for DEFRA on the IPBES. Four 15-minute presentations then

examined the practical aspects and experiences of incorporating ecosystem services into policy: these were delivered by **Professor Jim Harris** (Cranfield University), **Dr Laurence Couldrick** (Westcountry Rivers Trust), **Steve Evison** (Resources for Change) and **Dr Stewart Clarke** (Natural England).

1. The UK National Ecosystem Assessment[1]: Key Findings and future research directions

Professor Steve Albon (James Hutton Institute and Co-Chair, National Ecosystem Assessment)

Professor Albon had last spoken at a session organised by the BES and UK BRAG in 2009, providing an introduction to the NEA, then in its very early stages. Since then substantial progress had been made, with some 500 scientists contributing to the NEA report, launched on 2nd June 2011. Those who had worked on the NEA had been very pleased with the press interest it attracted, with coverage by the BBC and the journal Nature amongst others. Press coverage had largely focused on the economic value of nature but there had been some attention given to the conceptual, intrinsic value of biodiversity and the delivery of health benefits by ecosystems.

The NEA examined fundamental 'supporting' ecosystem services; from provisioning, regulating and cultural services to goods and human wellbeing. For the purpose of the NEA the environment in the UK had been classified into eight 'broad habitats', including urban; here the focus had mainly been on the provision of green space. There were major geographical differences in the distribution of habitats across the four nations of the UK, with Scotland possessing a disproportionately large area of the UK's seas for example.

The NEA looked at changes in the status and trends of species and ecosystems since 1945, and proposes different potential scenarios for the future. Results of the analyses show that agricultural yields have increased since 1945 but at a cost to biodiversity. Whilst cereal production has increased, the numbers of farmland birds have declined. Likewise, overexploitation in the seas has seen declining fish stocks – indicated by decreased fish landings. In the last 20 years however some fish stocks have returned to sustainable levels. Overall the direction of change for the delivery of ecosystem services by broad habitats is mixes, with some services in some habitats declining and others increasing or remaining stable.

The NEA has analyzed the drivers for the changes observed in ecosystems in recent years. Habitat change and the degradation of habitats has been a major driver, with pollution and overexploitation as also strong drivers in some cases. Climate change has not been a major driver of change to date but is projected to become one of the most, important in the future.

The NEA has revealed knowledge gaps which the ecological research community should seek to fill. Less is known about the effects of drivers – such as land use change – on supporting,

[1] UK National Ecosystem Assessment (2011). Coordinating Lead Authors: Robert Watson and Steve Albon. The UK National Ecosystem Assessment: Synthesis of the Key Findings. UNEP-WCMC, Cambridge.
UK National Ecosystem Assessment (2011) The UK National Ecosystem Assessment Technical Report. UNEP-WCMC, Cambridge.

regulating and cultural services than on provisioning services. How different drivers interact is a significant gap, even for provisioning services. A further issue to be examined is the spatial and temporal scales over which drivers act alone and together. Better holistic models of systems are needed, at appropriate scales. The new NERC Biodiversity and Ecosystem Services for Sustainability (BESS) programme aims to address this requirement.

Further results from the NEA demonstrate the importance of higher plants in the delivery of ecosystem services. However provisioning and regulating services are highly dependent on microorganisms, fungi and lower plants but little is known about these groups. The ecological community has the greatest knowledge and understanding of mammals and birds, which are significant for the delivery of cultural and some regulating ecosystem services. This can be characterized as the 'cultural service divide'; we know a great deal about charismatic fauna but do not understand how this influences human wellbeing, whilst also understanding little about how biodiversity underpins provisioning and regulating services. There is a need to improve our understanding of how functional biodiversity groups underpin ecosystem services and to identify key indicator groups where changes will impact on ecosystem services. Again, the BESS programme may address these knowledge gaps.

The NEA generated contrasting scenarios, demonstrating how drivers of change may impinge upon the UK in the future. Taken together with high and low emissions projections from the UK Climate Impacts Programme (UKCIP, 2009), these allowed the NEA team to explore the relative, (not absolute), differences between the impacts of the different scenarios on biodiversity and ecosystem services into the future. The UKCIP scenarios demonstrate that climate change is likely to become a more significant driver of change in biodiversity and ecosystem services in the future. At least four of the NEA 'storylines' suggested that although the UK has implemented policies which are still to take effect, significant steps could still be taken to improve outcomes for biodiversity.

The NEA incorporated only a certain number of ecosystem services into its analysis of economic outcomes The 'storylines' can be ranked in terms of their implications for the delivery for biodiversity and ecosystem services. If only ecosystem services for which there are markets are considered, the rank order differs from if non-market services, to which values transfer has been applied to generate monetary figures, are also incorporated into the analysis. The scenarios each generate markedly different spatial outcomes for the delivery of ecosystem services. One important conclusion from the NEA is the need to be adaptive in the application of scenarios to managing ecosystem services in the real world; one scenario should not be wholeheartedly adopted and applied universally.

The NERC Valuing Nature Network (VNN) aims to make progress on the understanding of non-market ecosystem services and how these can be incorporated into decision-making. For example, there is evidence that physical exercise and access to green space can increase a person's sense of emotional wellbeing. Intuitively there is a connection between the two but ecologists need to join with experts in health to study this.

Ecologists must also be open to exploring the use of new technology in understanding people's connection to nature. A recently developed 'app' for the Apple i-Phone allows the public to record their subjective feeling of happiness and upload this in real time. This can then be linked to the

location of the individual at the time the recording was made and can incorporate information regarding weather conditions and time of day to create a 'happiness map' of the UK.

In promoting an ecosystem approach to policy-making ecologists need to be better at integrating across ecosystem services holistically. Ecologists must also think across both spatial and temporal scales. Collaborative partnerships between stakeholders are also vital. Finally, multiple responses to tackle ecosystem degradation are also needed: legislation and regulation have their place, but behaviour change and alteration to underpinning markets and incentives are also needed.

Society already has the information necessary to manage our ecosystems better. Ecological science must however improve our understanding of ecosystem services and ecologists must work with other professions to understand how market and non-market approaches can be adopted, for example to take health and social values into account. Halting the loss of biodiversity remains a priority!

In following up the NEA it is likely that future work will focus on better understanding stocks and flows of ecosystem services, in understanding cultural ecosystem services and on incorporating these measures into scenario projections. Both market and non market benefits from ecosystem services can influence economic prosperity, and developing tools which demonstrate this will be important.

2. **Bringing Ecosystem Services into the planning regime.**

Professor Jim Harris (Cranfield University)

Planners currently operate without access to detailed knowledge of how land use change affects ecosystems. Planners need answers to questions about where, how much and what type of ecosystem(s) will be needed to balance the impact of a development of a particular type and in a particular location. Prof Harris quoted a phrase from the EU Wadenzee judgement of 2004[2], 'A plan or project may be authorised only if a competent authority has made certain that the plan or project will not adversely affect the integrity of the site'.

Working on a Defra project, Prof. Harris and his team analysed the amount that individuals were prepared to pay for housing if this was located in close proximity to green space. The connections between the green space in the City of Cambridge were also mapped and assessed to see the effect this may have on species' dispersal. This analysis revealed the likelihood of a member of the public encountering wildlife, such as a butterfly, (which may have an implication for an individual's happiness), and that this type of mapping could be useful in planning urban and sub-urban development, along with assessments of flood risk, noise and other ecosystem service delivery.

Areas can be mapped to reveal what they could or should be like without human influence. The costs and benefits of allowing or prohibiting development in these areas can then be assessed. Models can also be linked to provide an indication of the standing stocks of natural capital present

[2] 7th September 2004, Case C-127/02.

in an area. Costanza et.al (2006)[3] mapped the ecosystem services delivered in New Jersey. If adopted similarly in the UK, this could provide the foundation for guidelines to planners regarding where development should be located.

An interactive map of ecosystem services in the UK could be developed, available to planners and local authorities, based on soil, hydrological and vegetation layers. This could allow the potential impacts of building in different locations to be assessed for their likely impacts on the delivery of ecosystem services. This tool should generated by ecologists. The planning community must use this type of tool in order to maintain the environmental gains of recent years, particularly in the context of the UK Government's draft National Planning Policy Framework, which proposes to place economic growth beyond environmental considerations. Critical, much higher resolution mapping of resources, such as soils, must be carried out to enable effective decision making at the scales at which the planning regime operate – from individual dwellings to large new communities. The data acquisition could be sponsored by developers and councils – the quality of the information gained would be dependent upon on the amount of resource spent in achieving it – a role for stakeholder engagement, as communities would decide what level of robustness they require in this respect. Prof. Harris suggested that with a modest investment, the tool could be developed rapidly, and be in routine use within four to six years' time.

3. **Delivering biodiversity as a by-product of other ecosystem services –Can it be done?**

Laurence Couldrick (Westcountry Rivers Trust)

The Westcountry Rivers Trust (WRT), a small environmental charity based in the West Country of England, works with farmers to generate 'win wins' in conservation. The WRT work on the principle that to improve water quality, management practices along the whole river catchment needs to be examined. Intensive management of farmland in the South West of the UK has led to habitat loss, whilst livestock management practices, such as high stocking rates and poor slurry storage, has led to the degradation of pathways, bank erosion and impacts on water quality. In tackling this, some organisations have advocated a 'fortress conservation' approach, commandeering land and the right to manage it for environmental objectives, either by legislative process, or by purchase – both of which are costly methods of enforcement.

The WRT, in contrast, works with farmers to ensure solutions which benefit both the farmer and conservation, for example fencing a riverbank, which prevents issues with livestock for farmers and which can also maintain riverbank integrity and structure. This voluntary approach has worked successfully for the past 15 years but increases in the price of commodities threaten to undermine the gains made; market forces can change the economic incentives behind decision-making on the part of farmers.

[3] Costanza, R., Wilson, M., Troy, A., Voinov, A., Liu, S., D'Agostino, J. (2006). *The Value of New Jersey's Ecosystem Services and Natural Capital*. Report to New Jersey Department of Environmental Protection

Payments for Ecosystem Services (PES) offer a further tool to provide incentives to farmers to incorporate conservation objectives into land management. Under PES, beneficiaries pay providers for the delivery of ecosystem services. At present there are very few legislative requirements in the UK to effectively change farming practices that currently lead to water pollution. To be successful, and to provide real incentives for farmers to amend practice, PES relies on an assessment of the ecosystem services and an understanding of the buyer, or buyers, for these services.

The WRT is currently working with the University of East Anglia to model the benefits of specific farming practices.
The WRT acts as an ethical broker between South West Water and farmers. Farmers are paid to better manage their farms in order to avoid water pollution. Customers of South West Water pay for this through their water bills, with the payment channeled to WRT and then provided to the farmers. A covenant is written into the deeds of participating farms to prohibit overstocking and other damaging practices. In addition to provisioning services (water provision), regulating services such as the regulation of drought, flooding and water purification could be incorporated into PES schemes. In addition PES could also be applied to cultural services such as recreation and tourism, and to the provision of food or habitat.

A mapping tool is needed to show clearly the ecosystem services delivered at the scale useful for PES schemes. The WRT has mapped four study catchments around rivers, examining areas where South West Water abstracts water, to assess where drinking water is provided. All maps have been produced on the basis of extant, easy to find and use data sets. Overlaid onto these maps are details of those areas that may be important for the regulation of water quality, water regulation and flood risk. Carbon sequestration can be incorporated, through data on woodland and wetland habitat, data on access areas and footpaths can reveal recreation opportunities and Biodiversity Action Plan (BAP) habitats illustrate important locations for biodiversity. Combining these metrics into one map provides a tool for discussion regarding where potential PES schemes could be established and as evidence for negotiating equitable payments that benefit both landowners and conservation.

4. **Resources for Change. Valuing Goods and services from landscapes in North Wales.**

Steve Evison (Planning for Change)

Using street stalls and three workshops for local residents, the Cambrian Mountains Project had asked members of the public for information on how they valued land and what they understood about biodiversity. Monopoly money, the 'Cambrian Pound', was used to elucidate information about how the public would spend this on conservation. Food, recreation, culture, education and wildlife all emerged as highly valued. Although the way such data can be used is limited, more important than the information to emerge from these exercises was the dialogue that was stimulated between researchers and the local community.

The GIS tool 'Polyscape', generating 'fly-throughs' and map overlays, had been used as a tool to stimulate conversations with members of the public around land-use because the visualization tools were so helpful in generating interest and in supporting complex ideas . The Welsh Assembly Government, Environment Agency and Countryside Council for Wales had been involved in these discussions, along with representatives from the local groups and feedback from the street stall

exercises. The feedback from dialogue at open public fora was that the tools used by the project had been useful, but that consultations must be seen to "go somewhere" and that dialogue needs to be maintained

When asked for their views on how members of the public can gain real influence over policy, people suggested that greater stakeholder debate was necessary. Ecologists should engage with the public regarding the tools that they are developing, informing people about how the tool will be used and how it could inform the development of policy. Farmers had suggested that they wished to discuss their land-use management with the local community and were interested in using the 'Polyscape' tool to facilitate this.

Discussions with the public could usefully start by talking about 'change'. From this a more sophisticated conversation around ecosystem services can be opened. Allowing adequate time for dialogue is very important, for drawing out assumptions and talking to local communities about the changes that they would like to see happen. The Polyscape tool is very sophisticated but simpler visual aids can be used. Aerial photographs and the use of 'Monopoly' money are both simple and powerful.

The results of the project have been used to inform meetings with policy-makers and the outcomes from these discussions will then feed back to the local participants. In developing the project, dialogue will continue, along with the generation of tools and smart phone applications, allowing people to monitor their local area, whilst 'Polyscape' will be trialed at a local farm scale.

5. **Ecosystem services in practice: experiences from three upland pilot projects.**

Stewart Clarke (Natural England)

The past year has seen the release of the Lawton report[4], the launch of the NEA[1], and the launch of the Natural Environment White Paper[5]. With these reports has come a fundamental shift in policy in the UK, which provides an opportunity to begin to think more holistically about how the natural environment is managed. The Ecosystem Approach provides a framework to allow this as it concerns engaging with communities and taking action at appropriate scales.

Natural England had run a series of pilot projects in the uplands, linking to water companies in these areas, all of which had begun to consider the importance of investing in measures to address problems with water quality at the source of the issue, rather than at the level of infrastructure. There is a significant opportunity to combine agri-environment funds (up to £400 million per annum) with funding from water companies to invest in sustainable agriculture.

One of the pilot sites for the Natural England project was Bassenthwaite, in Cumbria, a town with a long history of community engagement with respect to lake management. As part of the project,

[4] Making Space for Nature: A review of England's Wildlife Sites and Ecological Network
Chaired by Professor Sir John Lawton CBE FRS
Submitted to the Secretary of State, the Department for Environment, Food and Rural Affairs on 16 September 2010

[5] The Natural Choice: securing the value of nature. Presented to Parliament by the Secretary of State for Environment, Food and Rural Affairs. June 2011

Natural England staff had involved over 70 people from over 25 organisations in planning future land and water management; and consulting on the aspects of the environment which were important to them, engaging them in conversations about how land should be managed and how Natural England could work with land-managers and communities within catchments to deliver this. Natural England aimed to integrate the work of the pilot project with initiatives already ongoing, including work on the improvement of rights of way, the second phase of the Sustainable Catchment Management Programme (SCaMP) and activity under the Water Framework Directive.

Eight pages of maps and a table were produced as an output from the project, illustrating the aspirations of communities within the catchment. Ongoing negotiations on agri-environment payments in the Bassenthwaite catchment provide an opportunity to integrate payments for ecosystem services and the results of the pilot programme.

As part of the South Pennines pilot project, Yorkshire Water is conducting work to deal with issues of water quality. Using Yorkshire Water (and United Utilities) provided estimates of potential changes in water treatment costs stemming from possible changes in the level of dissolved organic carbon (DOC) and pesticides, Natural England is examining marginal change in the catchment over a 25 year period, examining habitat improvement and restoration. Two scenarios have been generated – an "Improvement Scenario" and a "Decline Scenario" and then both assessed against the starting baseline..

To translate from ecology into metrics that are useful and intelligible to an economist, two different "valuation" techniques are used. The first is 'value transfer', as refined by Professor Mike Christie at the University of Aberystywth in a recent study on BAP habitats[6]. The second is the UK National Ecosystem Approach[1] combined with direct 'measurement' of ecosystem service changes and using DECC carbon values[7].
The modeling exercise projects marginal changes in habitats; bog, heathland and woodland areas in the catchment emerged as those in which alteration was likely. The ecosystem services provided by these habitats were then assigned values, using first the method from the NEA[1] and then the method developed by Professor Christie[5]. The likely changes in the delivery of ecosystem services through time was then examined, and a cost/ benefit analysis developed on the basis of the values assigned.

Using the approach to valuing ecosystem services developed by the NEA, it can be estimated that an improved South Pennines catchment would be worth £9 million to society over the 25 year period. This suggests that for every pound spent in improving the catchment, society will benefit by £2.96. If the ecosystem services delivered by the catchment were to decline, if the catchment were degraded, the loss to society would be £5.20 per pound spent.

The social capital generated through the Natural England pilot projects, through workshops to develop consensus with the local communities involved, has been a very valuable outcome. The project has revealed the need for decision-support tools in assessing the value of ecosystem

[6] Christie et al., (2011) Economic Valuation of the Benefits of Ecosystem Services delivered by the UK Biodiversity Action Plan (Defra Project SFFSD 0702)
[7] DECC carbon valuation guidelines (DECC, 2009)

services, and managing land on this basis, and that the strength of the valuation methodology is dependent upon sound ecological knowledge to underpin these decisions.

6. **Creating an Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)**

Andrew Stott (Defra)

Signatories to the Convention on Biological Diversity negotiated a new agreement in October 2010, to address the loss of biodiversity and ecosystem services worldwide. The Nagoya Protocol, a new strategic plan for biodiversity which contains 20 targets and five strategic goals, was the international community's response to the failure to meet the 2010 target to reduce the rate of biodiversity loss (and in the UK and Europe, to halt this decline). The Nagoya Protocol and Aichi Targets commit international signatories to ensure the resilience of ecosystem services by 2020. Signatories must also address biodiversity loss, although this is not tied to the 2020 date; a major difference from the earlier 2010 target.

In 2005 Jacques Chirac, at the Paris meeting, Biodiversity, Science and Governance said, '…Since 1988, the IPCC has brought about a scientific consensus on the reality and significance of global warming…We need a similar type of mechanism for biodiversity. I hereby call on all scientists to join forces in order to set up a world- wide network of experts…' In 2006-7, the French Government established IMoSEB (International Mechanism of Scientific Expertise on Biodiversity), which held a number of consultative meetings and concluded that there was a need for a mechanism to improve the interface between science and policy with respect to biodiversity and ecosystem services. An evaluation of the Millennium Ecosystem Assessment (MA) concluded that, although a great achievement, this had failed to influence policy to a significant degree. The way in which the MA had been conducted was a factor in this, as it had been run by non-governmental organisations and not formally endorsed, or supported financially by, governments. Governments were therefore suspicious of the conclusions of the MA to a degree.

Following discussions, the Busan Outcome (2010) agreed that the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES) would be formed to satisfy the need for an effective science – policy mechanism and the desire to establish a panel which would have similar weight and influence to the Intergovernmental Panel on Climate Change (IPCC). The synthesis of a building weight of evidence in support of anthropogenic climate change by the IPCC has had a significant impact on international policy-making by governments.

All UN member states can join IPBES, which should respond to requests from Governments, MEAs (multi-lateral environmental agreements), IGOs (Inter-Governmental Organisations) and NGOs (Non-Government Organisations) according to priorities agreed by Plenary.

One issue to be resolved as IPBES develops is over how access to tools can be improved. One function of IPBES will be to support capacity building in developing countries, so that they have the expertise to generate knowledge themselves. One further challenge is to resolve how IPBES will relate to other bodies and agreements in its area of interest, occupying an already crowded space. Over time, streamlining may be necessary to ensure that action is coordinated and effective.

Two plenary meetings are planned to develop IPBES further; one in October 2011 in Nairobi, and the second in spring 2012. Decisions will be taken on the form and function of the initiative. The

IPBES may initiate comprehensive assessments, similar to the MA, or thematic assessments, for example on topics such as geoengineering.

A further question to consider is the incentives which may need to be in place for scientists to engage with IPBES. Consideration is needed regarding whether scientists should be remunerated for their work with IPBES, and over how their contribution may be recognised by their institutions.

Dr Stott encouraged those present to engage with IPBES as it developed, by contacting Helen Baker, JNCC, who is co-ordinating the UK's response to IPBES (email ipBes@jncc.gov.uk) and by registering their interest in finding out more through the UK Stakeholder Group. For further information see http://jncc.defra.gov.uk/default.aspx?page=5869 on the JNCC web site and http://ipbes.net/ for the IPBES web site.

Question and Answer Session

Q: (Ceri Margerison) To what extent does the UK NEA provide a model for the assessments which may be conducted by the IPBES?

A: Dr Stott suggested that the UK NEA has attracted interest from the international biodiversity and ecosystem service research and policy communities. The United Nations Environment Programme World Conservation Monitoring Centre (UNEP- WCMC) was currently developing guidance on sub-global assessments and would study the methodology used in the NEA. The NEA has developed a community of interest on which IPBES can capitalise and build.

Q: (Ken Norris) The NEA has formed a community of interest which has led to developments such as the formation of the NERC Valuing Nature Network (VNN). IPBES seems to be developing without engagement with these networks. (Steve Albon): There is a danger of arallel communities developing. The UK science community should be engaged sooner rather than later in IPBES.

A: Dr Stott suggested that discussions outside the meeting to explore this further would be useful. Engagement with the UK science community is one of the purposes of the UK Stakeholder Group for IPBES, with which Dr Stott encouraged participants in the session to engage.

Q: (Kathryn Monk) The valuation of ecosystem services is a topic which has been applied in the development field for a long time, particularly overseas, with or without evidence. The big challenge is taking stock of the number of tools available. Tools seem to be developed from first principles each time, without heed to what may already exist, because developing novel methodologies is of most interest to the scientific community.

A: Dr Stott commented that by institutionalising the tools used for assessment and valuation of ecosystem services, IPBES will coordinate this effort and so reduce the generation of new tools on a project-by-project basis.

Q: (Dr Nicholas Worsfold) How will information from IPBES flow down to the ecological science and practitioner communities and so influence the practical conservation of biodiversity in the UK?

A: The UK biodiversity and conservation sector could learn a great deal about the importance of clear-cut messages with a high political impact. Such messages, as in the case of climate change syntheses produced by the IPCC, can result in policy truly reflecting scientific evidence and delivering outcomes for biodiversity.

Q: It is difficult to see the evidence that politicians genuinely understand the importance of acting to address the loss of biodiversity and degradation of ecosystem services, and that they understand the impact of this upon the economy. Local authorities are losing trained biodiversity specialists and de-skilling is also occurring within universities.

A: (Peter Costigan) The NEA is taken seriously by politicians. Caroline Spelman MP, Secretary of State for the Environment, Food and Rural Affairs, recognised the importance of the NEA, and this piece of work has directly informed the content of the Natural Environment White Paper for England. Oliver Letwin MP, Minister of State, in the Cabinet Office, specifically requested to be present at the launch of the UK NEA and spoke of it as a paradigm shift in Government policy. Oliver Letwin recognises the importance of being able to take account of a broader spectrum of ecosystem services than appear in markets. The contents of the White Paper also commit the Government to develop better indicators of human wellbeing and to build natural capital into national accounts.

Q: Despite these commitments, the UK Government has recently released the draft National Planning Policy Framework, the contents of which undermine the positive intentions of the White Paper.

A: (Peter Costigan) With the White Paper the Government has set out a strong framework for action on the natural environment which needs to be reconciled with other Government priorities. The Natural Environment White Paper is a framework to which other parts of Government are obliged to pay heed

(Comment: Steve Evison): There is a problem with a lack of money at a local level and limited time. It is not easy to translate complex concepts around ecosystem services and biodiversity to people in the short space of time available at a workshop.

There is not enough dialogue and knowledge exchange between local level discussions and national level policy-making.

(Comment: Stewart Clarke): Valuation is a very important component of Payments for Ecosystem Services. If valuation is done well, this can feed into a robust analysis of benefits and costs. There is a high cost to conducting such analyses for individual projects but this is nonetheless important to be able to demonstrate to people the value of their local ecosystems, and therefore stimulate further action.

It is easy for people to recognise the value of clean water.

The system is regulated, allowing water companies and Offwat to broker between providers of ecosystem services and the beneficiaries. Ofwat, the regulator of these companies, has in the last two spending rounds, allowed companies to spend on restoration at the source of a problem and to recover the cost via water bills. Water companies are eager to know how much carbon storage is worth in financial terms because they want to be able to participate in Carbon offsetting.

Defra has recently published a document on barriers and opportunities to PES in the UK. It is possible to demonstrate that ecosystem services are valuable but beginning to pay for this will be complex and may require major institutional change.

Q: Is there a danger in pushing ecosystem service valuation too soon into policy? These methodologies could be very open to challenge in a public enquiry? Can we find better, more defensible ways to value non-market ecosystem services?

A: (Steve Albon) Policy-makers are taking the valuation of ecosystem services seriously and it is too late to roll back efforts in this area. Business leaders too are becoming more engaged with this area; the World Business Council for Sustainable Development is currently producing documents on ecosystem valuation for business. The Cambridge Partnership for Science Leadership is working with major food producers to examine how ecosystem services can be built into business models. The ecological community needs to make sure that in all of these and other efforts, the best science is incorporated and gaps addressed.

Q: Is there any more that the ecological and environmental science communities can do to make sure that research and valuation on biodiversity and ecosystem services is coordinated at the UK level, given efforts for greater coordination and cooperation, through IPBES, internationally?

A: (Peter Costigan) Discussions are taking place between the Research Councils, the UK governments and others regarding the further development of the UK NEA. The NEA is research, not policy however. It is up to the devolved governments to decide how to respond to the NEA. It is not always clear that a single approach to taking forward the NEA, similar across the four countries of the UK, will be most appropriate in any case.

Scientists must help to ensure that data sets are not fragmented and that there are common measures in place across the UK. Scientists have a role to play in persuading policy-makers that there is huge value in a coordinated approach. Contrasting approaches are also valuable for what they reveal about the efficacy of differing policy responses.

Q: Can the IPBES play a role in developing common indicators for ecosystem services?

A: (Andy Stott) There will be some development in this area but the pace will be slow as ecologists work towards these standards.

The UK NEA does provide a valuable evidence base for governments in the UK to use and policy-makers have already made use of this, for example in the Natural Environment White Paper.

Reform of the Common Agricultural Policy (CAP) has a common monitoring and evaluation framework across Europe. This may be useful in informing how the UK NEA is developed further. The science community should engage with negotiations with respect to reform of the CAP.

Q: (Peter Carey) Ecosystem service models seem to miss out the importance of food and fibre. A fundamental question to answer is how society can balance food production and biodiversity?

A: The drive to produce provisioning ecosystem services at the expense of all else is a major challenge.

Although there were still several people wanting to ask questions, and to carry on discussion with the panel of speakers, time called a halt. Peter Costigan and Ken Norris thanked the speakers and organizers, for a fascinating session which had seen the room at full capacity throughout.