EAWG2: Discussion Paper

Prioritising Ecosystem Services and Appraising Indicators

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Introduction

The second workshop of the Ecosystem Approach Working Group (EAWG) was held at the James Hutton Institute (Invergowrie) on the 17 November 2011. The workshop was attended by representatives from a range of agencies and organisations, Scottish Government, and representatives from the main RESAS funded research themes within the Environmental Change and Land, Food and People research programmes 2011-2016 (see Appendix 1 for the list of participants).

The main objectives of the workshop were: i) to generate discussion on how we prioritise the Ecosystem Services (ESS) on which we focus our research[1]; ii) to identify and appraise indicators for these priority ESS; iii) to identify gaps in our knowledge of ESS indicators; iv) to identify and build on shared research interests and expertise in ESS and indicators.

Prior to the workshop, invited participants were sent two briefing papers by the Ecosystem Services Theme (EST) on Prioritising Ecosystem Services and Appraising Indicators for Ecosystem Services (see Appendices 2 and 3). The two papers outlined the rationale behind the objectives of the workshop, the chosen methodology for the workshop, and some background information on the two topics. The full agenda for the day can be found in Appendix 4.

This paper draws on the outputs of the workshop activities, the notes taken during breakout group and open discussions, as well as the feedback from the evaluation forms provided at the end of the meeting. It is therefore based on the expressed views of those attending the workshop and may not represent the full range of views of EAWG members. The paper is split into three parts; Prioritising Ecosystem Services, Appraising Indicators for Ecosystem Services and Next Steps.

Prioritising Ecosystem Services

The first activity of the workshop asked the participants to each choose the five most important ESS (considering both positive and negative policy implications) for delivering each of the five broad policy goals as identified from the Scottish Land Use Strategy (Scottish Government, 2011). Each participant 'voted' for what they thought were the five most important ESS by placing sticky dots against their chosen ESS for each policy goal. The five broad policy goals were low carbon economy, sustaining food production, halting biodiversity loss, sustainable water management and enhancing recreation activities. The list of ESS was taken from the UK National Ecosystem Assessment (UK, NEA, 2011). The activity was initially focussed at the national level, and then move on to focus on the

[1] As part of resubmission of the Scottish Government's tender on Ecosystem Services the EST research team were requested to carry out a prioritisation of ESS.

Scottish uplands and arable lowlands. The results of the first activity for Scotland, the uplands, and the arable lowlands are in Table 1a, 1b, and 1c respectively in Appendix 5. The totals in the last column of each table are the totals across all the five broad policy goals. Here we use the phrase "important" to indicate those ESS most highly ranked during this voting exercise.

The most notable result is that the most important ESS varied greatly between the five policy goals. For example, trees, as a provisioning service, were considered to be the most important ESS for achieving a low carbon economy in Scotland, but were not seen as important for sustaining food production. Similarly, the importance of different ESS varied across the three different systems/scales. There was debate in the groups about the categorisation of some services. For example, trees were listed as a provisioning service but clearly trees or forests provide a much wider range of ESS. Similar debate arose with peat which was also listed as a provisioning service. One conclusion is that ESS definitions should take a broader view to accommodate these issues.

Across all five policy goals (when summed) the most important ESS at both the Scotland and lowland arable scales were crops, trees, livestock and wild species diversity. For the Scottish uplands the most important ESS were trees, wild species diversity, soil formation and livestock. Across all the three tables it is apparent that, when summing across all policy goals, supporting and regulating services tended to be in the bottom half of the tables. There was discussion as to why this might have occurred. For example, it may reflect the dominance of agricultural and forestry in Scottish land uses and the obvious economic implications of changes to these service, even though there was acknowledgement that supporting services underpin all other services across all the policy goals.

The second activity tried to gauge the level of agreement on the prioritisation table across all the five policy goals for the whole of Scotland (see last column of Table 1a in Appendix 5) and facilitate discussion amongst the participants on how we (the Ecosystem Services Theme and EAWG) go about focusing our research efforts. The participants were asked the question; *to want extent do you agree with the prioritisation table for Scotland (across all the five policy goals)?*

The results of the second activity are in Table 2.

Table 2: Level of agreement table

To want extent to you agree with the ESS prioritisation table ?				
I don't agree	I agee in part but not totally	I can live with it	I can support it	I am very supportive
4	7	1	5	2

Eleven of the 19 participants that voted did not agree or only agreed in part to the prioritisation table. Eight of the participants can live with it, can support it or are very supportive of it. One of the key reasons for not agreeing or only part agreeing was that the most important ESS were very dependent on the policy goal and system. The participants felt that one couldn't just tally across to get a list for the whole of Scotland. For example, water supply, hazard regulation and water detoxification are considered to be very important for sustainable water management but are in the bottom half of the prioritisation table for all the policy groups. This highlights that the relevance of

ESS needs to be considered within the context of different policy or other goals. A participant queried why we constrained ourselves to the Land Use Strategy (LUS), because if we chose a set of different policy goals e.g. a health policy, we would get a very different prioritisation. In addition, the majority of the provisioning and cultural services - which tended to come out as most important in the prioritisation table - were closely linked to, underpinned, or dependent on the supporting and regulating services lower down the table.

A few participants felt that the cultural services presented were too narrow in scope and should be expanded to be more representative of their importance.

A number of participants commented that we should be consulting stakeholders, other than research scientists, particularly those working on the ground such as land managers, estate owners and farmers. As one participant commented, this is particularly relevant if applying the Ecosystem Approach (CBD, 2011) which is meant to take on board society's views with regards to natural resource management. This was only briefly discussed as wider involvement of stakeholders is envisaged within subsequent stages of the research programme.

Those that were supportive of the prioritisation table considered food production and security to be the biggest challenge facing us in the next 20 years.

Another approach to prioritisation was suggested by several EAWG members that were unable to come to the workshop. They suggested that prioritisation should be based on the benefits to humans of each ESS and not what we (EAWG members) think is important. The ESS ranked most highly may simply be the ones that we just know the most about, whereas maybe we should focus our attention on the things we know less about. A counterpoint is that the alternative approach might simply rank highly those services that are easy to value, and not necessarily those that are important. This needs to take into consideration that there is incomplete understanding of the links between value and 'importance'.

A number of participants asked why we were using current policies, such as those in the LUS, to help us select ESS on which to focus. They argued that it should be the other way round: research should be used to understand the importance and interactions of ESS for human wellbeing, which then informs policy. In response to this argument it was recognised that the use of research to inform policy and vice versa was an iterative process, with new policies being built upon new research findings. The success of such an iterative process is determined by the engagement and dialogue between policy makers and research scientists, which inevitably must start at some point within the cycle (in this case taking the policy rather than the science as the basis for discussion). The EAWG can provide an important forum for this dialogue to occur.

In summary; although there was some disagreement on the outputs of the activities, the activities and subsequent discussions helped to identify the relative importance of ESS, their interdependencies, and the potential for conflict/trade-offs for a range of policy goals.

Next Steps

Taking on board the feedback and comments from the participants of EAWG2, and input from other members of EAWG, the Ecosystem Services Theme will use the prioritisation to examine important ESS for individual policy goal areas, and the relative importance across policy areas. These will then be the focus of activity for elements of the Theme 1 Synthesis and Review phase. Specifically, the biodiversity and biophysical linkages element of this phase will look at the relationship between biodiversity and ecological processes in the delivery of these key services. Having undertaken this initial step it will then begin to explore and understand the first order interactions with other less tangible ESS (e.g. supporting). This will then progress to the valuation and closer examination of the benefits to humans across a number of interacting and interdependent ESS as well as the potential for conflicts and trade-offs.

With regards to working and consulting with local and community stakeholders the Ecosystem Services Theme plan to, in collaboration with EAWG members, develop a number of collaborative studies or demonstration projects where the Ecosystem Approach can be applied, and aspects of ecosystem services researched and tested. Some potential research projects with EAWG members are already beginning to emerge that can explore the application of the EA to different management systems at different scales.

Appraising Indicators for Priority Ecosystem Services

The main activity for the afternoon focused on appraising indicators for the most important ESS for each of the five broad policy goals. Having selected a preferred broad policy goal to focus on, participants were asked to write down any indicators that they were currently using (or potentially could use) to monitor the ESS for the particular policy goal in question. The participants were also asked to consider: i) What are the notable gaps in groups of indicators?, ii) What are you using the indicators for (monitoring?, valuation? or decision making?), iii) How fit for purpose are the indicators to assess the broad policy goal?, iv) Why aren't the potential indicators being used as ESS indicators?

The full list of indicators, both current and potential, can be found the Appendix 6 (EAWG2 Indicators.xlsx. Even given a relatively short amount of time the participants came up with a range of interesting and potentially useful indicators for ESS.

From the total list of indicators, about half are currently being used for monitoring ESS, and half could potentially be used. Some of the reasons cited by the participants for not currently using the indicators were a lack of resources and capacity (technical compatibility), a lack of innovative ways to utilise citizen science, lack of political imperative, and a lack of awareness and foresight to explore the potential indicators and how they could be used for a different purpose. There were many notable gaps raised by the participants; some in relation to our knowledge of ESS and their interdependences, and some in relation to our gaps in knowledge with regards to indicators. For example, a knowledge gap raised by the sub-group identifying indicators for sustainable water

management was; the lack of information between types of habitat, biodiversity and their function in relation to flood risk management.

The majority of the indicators are being used to monitor only the state or condition of a particular ESS, with few being used for the purpose of decision making. Very few of the indicators, with the notable exception of those for trees, food, and livestock are currently being used for valuation (measuring benefits to humans). The sub-group working on the broad policy of halting biodiversity loss felt that valuing the cultural service of wild species would be very difficult, although there was potential for putting value on wild species used for provisioning (wild salmon, deer, trout etc.) and the cost to recreation of non-native pest species such as Japanese Knotweed.

The open discussion following the indicator appraisal raised some interesting points and suggestions on how the ESS indicator work could be taken forward, and what research was required to address some of the knowledge gaps. Most of the participants agreed that the focus of the indicator work should be on monitoring the delivery of benefits to humans, and that there should be clarity on what the indicators will be used for and by whom (benefits approach). Although the potential list of indicators could be huge (lots of individual data-sets), the choice of what we actually monitor is critical and should be based on clear criteria. As a lot of the ESS are interlinked a number of participants felt that the way forward was to have more holistic 'bundles' or 'composite' indicators which would allow overall benefits to be measured.

It was generally accepted that we needed to better understand the inter-linkages between the environment, its benefits to humans and how to monitor these trends as well as thresholds and early warning indicators.

Next Steps

Taking on board the feedback and comments from the participants of EAWG2, the Ecosystem Services Theme will use the information generated to develop an assessment framework to collate and review current knowledge and data on indicators of provisioning, supporting, regulating and cultural services for their relevance to Scotland and for different policy goals. The EST will engage further with stakeholders to expand on what ESS indicators are currently in use or being considered for use within Scotland and place these in the context of ESS indicators considered elsewhere.

This information will be evaluated to determine the usefulness of different indicators for valuation and for monitoring delivery of benefits to humans in Scotland. Guidance will be developed on identifying ESS indicators suitable for monitoring delivery of benefits and valuation. We aim to collate information on indicators from all Themes into a pilot database on suitable indicators of ESS for Scotland at different spatial and temporal scales, ultimately searchable on-line. This will be reviewed by the EAWG with the aim of submitting this as a compatible component to the UN WRI Ecosystem Services Database. The review will also be used to identify key knowledge gaps to feed into subsequent research in EST.

References

CBD (2011). http://www.cbd.int/ecosystem/principles.shtml

Scottish Government (2011) Getting the best from our land - A land use strategy for Scotland. ISBN: 978-1-78045-104-6.

UK NEA (2011)The UK National Ecosystem Assessment: Synthesis of the KeyFindings. UNEP-WCMC, Cambridge.