Recommendations to improve the communication between scientists and policy-makers on biodiversity

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Recommendations to improve the communication between scientists and policy-makers on biodiversity

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SPIRAL Deliverable 2.1

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Juliette Young and Kerry Waylen
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1. Executive summary

The focus of WP2 is to improve understanding of the science-policy dialogue with regards to the role of biodiversity in underpinning livelihoods and ecosystem services. This was achieved by (i) identifying the factors that constrain or facilitate communication on this issue between scientists and policy-makers, and (ii) recommending steps to improve this exchange in Europe and elsewhere.

WP2 focused data collection around three different case studies relevant to i) local-scale decision-making – deer management in Scotland, ii) biodiversity-related policy – the recent process of publishing the UK National Ecosystem Assessment, and iii) non-biodiversity focused policy – planning for the implementation of the Water Framework Directive within a state (Scotland). Our data were primarily collected via semi-structured interviews with a range of individuals with knowledge of one or more of these case studies. We used Nvivo 10 to assist with grounded analysis of verbatim transcripts from these interviews. Our data collection also included a workshop with key actors working in the science-policy interface to test some of our preliminary results and gain additional insights on improving communication between science and policy.

Our main results were that:

• Communication is most usefully understood as a network activity. It would be helpful to have wider recognition of this, to help efforts to improve communication.

• There are many actors involved, at different levels. These actors cannot be easily or usefully compartmentalised into ‘policy’ and ‘science’: i) many individuals have backgrounds spanning both policy and science; ii) within any department individuals will vary in backgrounds; iii) many actors (e.g. media) not formally based in research or policy departments are still important to flow of knowledge, formulation and implementation of policy.

• Personal relationships matter. Training ‘broker’ or ‘intermediary’ individuals (in policy making, implementation and research organisations) can help to improve SPIs.

• Improving “packaging” of information is often a focus of recommendations for improving SP connections, but this is not sufficient on its own. Organisation and sectorial changes must be made so both policy and research have the motivation and opportunity to build better long-term relationships.

• As knowledge flow happens across networks of multiple actors, and often aided by personal relationships, formal processes to aid communication must be understood to be only part of biodiversity SPIs.
2. Introduction

The aim of this discussion document is to explore factors constraining and facilitating communication between science and policy. The topic was explored by using over 20 semi-structured interviews, with a range of stakeholders linked with science, policy making and policy implementation. All interviews were carried out in the latter part of 2011. In choosing interviewees and interview topics, we focused on three case studies: the UK National Ecosystem Assessment (NEA), the implementation of the Water Framework Directive (WFD) in Scotland, and a local-level example of decision-making for deer management in Scotland. We also used existing data of decision making processes in our analysis of the WFD case study. Our data collection also included a workshop with key actors working in the science-policy interface to test some of our preliminary results and gain additional insights on improving communication between science and policy (Annex A).

In the course of our research, we noted many reflections relevant to direct and indirect science-policy communication and science-science communication. The interaction between science and policy-making is not restricted to a direct, two-way communication flow between scientists and policy-makers, but rather encompasses a range of processes. Indeed, environmental policies are embedded within a societal context where environmental benefits need to be balanced against societal welfare and economic growth and where other actors, including the wider public, the media, NGOs and business, can also influence the policy-making process. All these actors produce and process scientific information, which in turn can be taken up by policy-making processes. There was clear evidence from our interviews that such ‘indirect’ flows and connections were important. For example, there was no new research, consideration of scientific evidence or direct input of research scientists in the 5 years of planning for implementation of the WFD in Scotland (although science had already been used to set some standards and was indirectly presented). It is more helpful to picture a network of many actors to understand how knowledge is constructed and used, rather than considering a linear process of evidence requests for science and use by policy. Considering such processes also calls into question the idea of what counts as “science” (methods, data or general insights) and if and how should scientific knowledge should be used versus other forms of evidence.

Academic perspectives on science-policy interfaces also suggest that there are no easy categories of “science” and “policy”. Many actors, interests and issues are potentially relevant to the science-policy interface, and it would be hard to draw boundaries between the two worlds. Therefore we do not attempt to do so: rather, we tend to favour an inclusive approach, and we suggest the recommendations should be considered by everyone connected with or interested in science-policy interfaces. We intend for the recommendations to be relevant to individuals, projects, and organisations.

We begin by highlighting the need to carefully understand context when planning communication, and highlight some issues to consider when doing this (section 2), then move to summarise some key ideas useful for any individual or organisation seeking to improve science-policy communication (section 3). After this, we provide some detail behind these points (section 4) and finally a table of key recommendations (section 5) which we have attempted to categorise by scale (individual through to sectorial). We finish with a very brief conclusion (section 6).

This document is focused on recommendations based on the data collected for SPIRAL. For this reason, in this report we do not dwell on insights from other relevant bodies of theory and experience, and we deliberately do not reference other authors (although they underlie and inform our work and conclusions) nor make comparisons with other work.
3. **Understanding before acting**

Before considering intervention to improve communication in any situation, some reflection is needed on current given situations. By scoping key constraints, incentives and existing knowledge and knowledge flow, it may be easier to identify productive ways to improve and support communication. We identify three main aspects to consider prior to communication. These are based on the interviews and developed below:

- **Understand that communication is a network activity**
  - Look for different routes by which information may flow
    - Multiple routes
    - Informal as well as formal or official
  - Communication happens between actors at different levels
    - Individuals
    - Organisations
    - Projects and initiatives

- **Consider the personal & professional background of different actors**
  - There are often no easy dichotomies between categories (e.g. scientists versus policy-makers).
  - Nor are these categories homogenous - backgrounds and roles can vary greatly.
  - Factors at each level can constrain and facilitate and influence communication
    - Resources (time, money)
    - Timescales and flexibility
    - Expectations of role

- **There are many forms of knowledge**
  - Many different forms of information may be shared and linked to create knowledge.
  - Data, ideas, opinions all influence knowledge and ways of understanding.
  - Messages are more salient when they fit with existing ideas or mindsets.
  - Salience, credibility and legitimacy all affect how any specific message or effort is perceived.

- **Consider the purpose and means of communication**
  - Identify the purpose of communication
  - Scientists and policymakers should consider what a reasonable expectation of research impact is (one study is unlikely to cause radical policy change, whilst policy-makers may be unlikely to get exact ‘facts’ they might like..)
  - Understand universal principles of good communication
  - Choose your audience(s)
  - To introduce a concept or idea, accessible messages are those that are simple and clear.
4. Cross-cutting ideas to help improve communication

The diagram below identifies factors identified in interviews and common to all types of communication discussed in this document: direct and indirect science-policy communication, and science-science communication. Of course, different communication strategies are required according to both the purpose of outreach and actors needed to be linked, but some general principles may help to identify appropriate strategies.

**Knowledge is messy**

- Recognise that knowledge is something constructed from various pieces and sources of information and values, opinion. Interpretation and reaction to any new ‘fact’ is influenced by all these influences and our preexisting understandings. There are few (any?) objective indisputable truths.
- Uncertainty and ignorance should be expected and communicated appropriately.
- Communicators should make efforts to ‘get inside the mindsets’ of others.
- Consider multiple routes for communicating and learning.
- Repeat efforts over time to help build shared understandings.

**Tools, training and resources**

- Visual material (maps, GIS) promotes accessibility.
- Scenario planning process helps with uncertainty.
- General communication skills training for all scientists can be helpful.
- Create and promote accessibility of topic contacts (e.g. directories of research experts, and of policy contacts).
- Make time: easier said than done, but time is often the crucial limiting factor.
- Resource “linker” individuals in different institutions.
- Create career incentives for engaging in cross-sectorial communication.
- Financial resources (i.e. new project funding) can incentivise new links between different sectors or disciplines.
- Reviews, summaries and links to detail help prove credibility.

**Personal contacts**

- Personal contact provides an opportunity to build trust and understand other points of view or mindsets.
- Workshops, meetings and field visits are valuable opportunities to develop personal relationships and discuss ideas informally.
- Work-shadowing across sectors is often valuable, both to meet individuals and to learn about other sectors.

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The diagram above highlights the importance of various factors in improving communication. It emphasizes the need for effective tools, training, and resources, as well as personal connections, to bridge the gap between different sectors and enhance understanding.
5. **Detail behind these ideas**

Here we provide some detail on the recommendations made in the previous suggestions. They are mainly a synthesis of the suggestions made by interviewees, but also reflect our analysis of the views held by different interviewees.

This section is divided into three parts. We focus on recommendations for better direct science-policy communication (to be read by both science and policy). However, many of the recommendations covered indirect science-policy links, and science-science links, and many ideas were perceived as generally relevant across these areas. Therefore, the second and third parts discuss improving communication in these two areas.

**Improving direct science-policy communication**

Here we discuss both specific tangible tools and processes which may assist in improving science-policy communication.

The suggestions and our recommendations cover a range of purposes for communication, from communicating about a specific new technique or best practice (particularly relevant in the deer case study) through to new ways of approaching issues (particularly relevant in the NEA case study). Interviewees and readers will naturally focus on particular tools or needs according to their own situation.

However, it is important that all individuals realise that communication can take many forms, not just because audience interests vary, but because of cultural values, and qualitative differences in what is to be communicated: a general discussion on a topic or new idea calls for different approaches to communicating a specific piece of data or fact to address a well-defined agreed data gap. The communication of knowledge encompasses a wide range of approaches as well as tools and there is no ‘one size fits all’ solution.

### 1.1.1 Tangible tools for enabling communication

**Simple visual tools.** Simple visual materials can include paper maps, presentations, photographs and diagrams. The main point of a message should be carefully considered and used to design these visuals. Many respondents emphasised the need to transmit messages in a visual way, specifying that “we’re visual animals”. The emphasis however was very much on simplicity—avoiding “tortured diagrams”. One suggestion was to employ artists to “demystify” complex concepts for broader publics. Potential concerns associated with this approach were that individuals have different learning styles and not everyone responds well to visual tools. Furthermore, face- to-face interactions may mean that visual materials are not to hand. However, new and interactive technologies may allay some of these problems.

**Interactive visual tools and maps.** Simple, relevant maps that contain some type of information, and/or trends were often valued. Whilst maps may not provide any “new” information, they were often seen as a good starting point for discussions: “if you then have that map, supported by some words for each of the estates and their policies, then it’s so much more powerful than a big multipage tabular thing”.

In recent years, new technology has created the possibility of new ways of presenting and interacting with information. In particular Geographic Information Systems (GIS) tools (and participator GIS) are popular for allowing individuals to explore and interrogate certain forms of information. It was a popular tool in both the WFD and the Deer management...
case study. For example, for (particularly young) gamekeepers, the use of digital tools was considered attractive, particularly in terms of developing “mapping software which you can have layers”.

Constraints included the labour-intensive nature of developing and updating such tools; the expense of good quality mapping software; and lack of buy-in by older people or those less familiar and comfortable with technology. There can be concerns over accuracy of such tools (particularly at the finer scale), and that these tools could be considered more useful to national level decision-makers rather than decision-makers or stakeholders at other scales: “I could see that being used by government. But an estate owner’s going to know their land, well their stalker is anyway, if he’s a full time guy he’s on it all day, every day, and generally been there for 5 years”. But the salience of these tools probably depends more on the relevance of information presented and the aptitudes of individuals. No tool can satisfy all communication needs, especially when communicating about complex systems and issues, which is often the case with biodiversity and ecosystem services. Therefore, ideally, graphics should contain links to and/or be accompanied by more information, often in a textual form.

**Written reports.** The limitations of written reports are well known: they are often deemed inaccessible and indeed many emails go unread, let alone long reports. Therefore, to communicate new ideas and concepts, text reports should not be the ‘front line’ of communication. However, for decision-makers to be influenced by an idea or information, they may need to be convinced of the quantity and quality of evidence (“weight of evidence”), and detailed written reports can help with this. In these reports, it is helpful to clearly acknowledge and communicate the extent of any uncertainty and gaps in knowledge.

Although large reports may be valued for their detail rather than for their accessibility, this does not mean that reports should be written without attention to universal principles of clear writing. All libraries stock style guides which can assist with this. For example, wherever possible terminology should be familiar to the audience, and if not, then clearly explained. Unnecessary verbosity and jargon should be discouraged: it may be useful to ask the question “Could an intelligent 18-year old understand what I am writing?”

**Short text and video guides.** Specific user guides can help act as gateways to these larger reports (as was sometimes suggested for WFD case study and for the large NEA report). Similarly, policy briefs can be helpful, but this depends on them being carefully written, very short (no more than 2 pages), and promoted widely. Similarly, DVDs or online video messages can also be helpful for introducing topics, particularly where the message to be communicated lends itself to certain contexts, or is intended to communicate certain practices.

**The internet.** Whether or not the information is textual or visual, making it available online can help widespread dissemination of messages, and enable easy cross-linking.

**Scenarios.** These were considered a useful tool for presenting different options and trade-offs to policy-makers. The distinction was made between scenarios as a process and as outputs - as a process, scenarios were seen as potentially helpful (e.g. planning processes) to ensure possible futures were captured, but as an output they were not always seen as very credible. Scenarios therefore have the potential to be powerful tools, but care needs to be taken to manage expectations, and not to play down uncertainties.
Creating reviews. Both systematic reviews\(^1\) and traditional academic reviews were seen as having the potential to be helpful to decision-makers whilst being a powerful output for scientists. A concern for systematic reviews was finding suitable topics where comparability of studies was achievable.

1.1.2 Processes and approaches to encourage communication

In this section we discuss activities and approaches which perhaps require a longer term perspective, but also have the potential to improve science-policy interfaces widely and profoundly.

Training and capacity-building

Linker individuals, bridging individuals, brokers. The main role of these individuals was seen as condensing scientific information to deliver accessible, clear and robust information to decision-makers: “a channel through to the policy makers”. Other words to describe these individuals are ‘brokers’ or ‘intermediaries’. Within research organisations these may be knowledge exchange specialists, or within policy departments these may be specialist scientific advisors. However, these roles, at present, may not always be formally recognised or rewarded. One such individual described their role as “actually understanding what the question is and what the person wants to try to…the point the person is trying to make, you need to be able to hear that and translate that, and then to be able to read the facts and translate those and try and marry the two together.” The latter comment also relates to our point for the need to engage and understand the mindsets and questions held by others.

Such individuals should be fostered and supported to fulfil linking roles. This includes giving them opportunities to meet other linkers or brokers in other organisations and other sectors. Attending events and meetings is useful for this, to help build understandings and relationships. It could also be helpful to arrange visits where linkers can meet, ask and answer questions from people in other organisations.

However, linker individuals should not and cannot absolve all individuals from having some role to play in seeking out communication, learning and sharing opportunities. Otherwise, a risk is that communication can become overly vulnerable to the continuity of key personnel, and those personnel struggle to learn and share what is needed.

Training courses on communicating to wider audiences, including policy-making actors. The emphasis from interviewees was the need to learn how to communicate the broader impacts of the research – not only the facts. Suggestions on how to achieve this included training course on communication, for example as part of PhD training.

Transparency in terms of how policy gets information and “routes in”. Interviewees from the science community often admitted not knowing how policy-making acquired information, and how to feed their research into the policy-making process. Increased

\(^{1}\) Definition by the Cochrane Collaboration: “A systematic review attempts to identify, appraise and synthesize all the empirical evidence that meets pre-specified eligibility criteria to answer a given research question. Researchers conducting systematic reviews use explicit methods aimed at minimizing bias, in order to produce more reliable findings that can be used to inform decision making.”
transparency with regards to routes into policy-making was seen as potentially beneficial. Equally, there needs to be transparency on routes from policy to research.

**Increasing the number of scientists who feel comfortable in their understanding of policy processes**, and vice versa, increasing the number of policy actors who feel comfortable in their understanding on scientific processes, and so more confidence in contributing to the science-policy interface. This involves using the knowledge acquired by those scientists and decision-makers who understand the science-policy interface and are active within this interface to develop more effective approaches.

**Better incentives for scientists** to get involved in policy work. Incentives for scientists to engage with the policy-making process were perceived as insufficient. This would require support from institutions, funders and journals. Examples of possible incentives included H-indexes that incorporated grey literature, and high impact journals aimed at policy-makers.

**Expert directories**. Directories would consist of groups of experts in specific fields, which could be compiled and supported by research institutes and accessed by policy-making actors. Experts could be called upon to provide information in particular policy areas, identify potential new research avenues, or suggest other experts. Risks associated with such an approach include an over-reliance on certain individuals, limited incentives for such experts to be involved and maintaining these directories active and up-to-date. Another issue based on one interviewee’s experience was the difficulty in getting certain groups of scientists (e.g. social scientists) involved in such directories.

**Promoting face-to-face contact**

**Workshops or meetings**. Such meetings need to have clear and joined-up agendas, aims and outcomes. Concerns include incentives for scientists and decision-makers to attend regularly (people need to get something out of these meetings), getting the right people to attend and contribute. However, getting people to turn up is a challenge, although ‘piggy-backing’ on existing events can help with that.

**Regular themed workshops** where scientists and decision-makers could “focus, share information on the latest developments around”. One example was “transient think tanks”, where a small group of experts and policy-makers in a particular field could meet up to discuss a specific policy issue.

**Field trips and practical demonstrations**. They can be more popular than meetings held in conference rooms, and can provide an enjoyable way to combine formal and informal learning. However, concerns raised were the difficulties in getting some decision-makers to attend events. For example: “getting the Scottish Government out to wellie boot stuff is difficult”.

**Work-shadowing**. It is helpful for scientists to shadow decision-makers, and many suggested that the opposite would also prove true, though less often attempted. These initiatives were seen as beneficial in terms of understand the culture, constraints and day-to-day activities of science and policy. Support for such initiatives is essential.

**Adapting research and policy processes**

**Reviewing and cross-reviewing of outputs**. Within academia, the reviewing process (for quality assurance of science) is done by an author’s peers in the scientific community. Whilst this should not be ignored, there may be some benefits of having scientific work reviewed by peers within other communities (e.g. policy, NGOs, etc). These actors could
evaluate critically the scientific outputs to make these more policy relevant. This sort of reviewing would also address some of the interviewees' comments on the potential lack of feedback from funders on contracted research reports at the end of projects.

**Adapting the design of research projects.** It can be useful to ‘take a step back’ in the early stages of research planning, so that overall research designs consider adapting to or engaging with relevant policy-making. Similarly, if policy-makers could share their views and concerns with scientists, this could help making research plans that were mutually engaging and relevant. Trying to plan ahead at the start is helpful as our interviewees suggested that it was very hard to make research “policy-relevant” in retrospect. Another concern was that whilst research may start as a direct response to a policy need, research process could stray off the policy need as it progressed. Similarly, policy needs and views will change over time. Whilst it will not always be possible or appropriate for evolving research plans and outputs to neatly ‘fit’ with evolving policy needs and thinking, keeping in close contact throughout the course of a project can help to identify where engagement can be made.

A number of suggestions were proposed to adapt issue-oriented research designs to policy needs:

- **Common shared problem.** There needs to be a shared problem, in other words, a policy “problem” identified at the start, and requiring a new approach.
- **Developing the research plan jointly:** “it’s resource well spent to spend the time with the scientists’ agreeing the method and helping steer the work”
- **Regular feedback from policy:** frontloading, regular meeting to check that research is still aligned to policy “problem”.
- **Research should not only plug particular research gaps but should include a (funded) synthesis of the evidence**
- **Evaluation of communication should be incorporated into the research design:**
  - Feedback from decision-makers on the research and the way in which results were communicated. This was perceived to have the potential to provide lessons for the future.
  - Lessons to be taken from the experiences and practices elsewhere in the world.

**Improving indirect science-policy communication**

Our data suggest some specific mechanisms through which indirect science-policy communication might be improved.

**Media training.** Interactions with the media are still perceived by actors in science and policy-making as risky. Better understanding how the media works, training and involving journalists, and understanding how best to work with the media may promote indirect communication into policy.

**Holding meetings with diverse stakeholder groups.** This was considered particularly useful in the case of contentious issues where different stakeholders may have very different views on the same topic.

**Promote broad societal understanding of science.** There is little doubt that science needs to be more visible, not just to the policy communities in terms of developing effective policies, but to society as a whole in order to justify and encourage continued funding towards scientific research and produce research which benefits society. Scientists, as key knowledge-holders, are best-placed to make science more visible and the scientific
process and its potential benefits to society better understood. All fora need to be exploited to make this science more accessible, including conferences, articles in different media, and activities with interested communities. Personal meetings and talks with interested communities and groups can be helpful in promoting links and understanding in any group from business partners through to NGOs and civil society groups.

**Improving science-science communication**

As a first step to improved knowledge transfer, knowledge needs to be better integrated. This involves gaining the most comprehensive knowledge on particular issues, which means integrating different knowledges to gain the best possible input to policy action. This means more collaboration within and amongst disciplines, through interdisciplinary projects, meetings with scientists from different disciplines and other knowledge-holders and other fora capable of bringing different groups together. Although funding of research projects is increasingly putting the emphasis on interdisciplinarity, all too often, different disciplines work on the same project but on their own sub-projects with very little interaction between groups of different disciplines. There needs to be more fundamental integration by building up relationships across disciplines and understanding of the methods and approaches used in each scientific discipline.

**Training.** This could include university courses designed to include basics in social or natural sciences or short training courses on the fundamentals of different disciplines.

**Funding focused on cross-cutting issues.** This could be fostered through mechanisms such as ERA-Nets, EU research programmes, or potentially the IPBES that require groups that would not normally come together to do so.

**More contact between disciplines.** This could be achieved, for example, through interdisciplinary conferences. Another option suggested by one interviewee was meetings that promote the interaction between junior and senior scientists to share experiences and discuss novel ideas.
6. **Specific recommendations by sector and scale**

Here we present recommendations for improving communication. Of course, all recommendations are relevant across scales (for example, individuals are constrained and dependent on their parent organisations and sectors, and vice versa) but we have separated these by scale to highlight different options for different audiences. The following table, based on results from interviews, describes the overall rationale for these in more detail.
<table>
<thead>
<tr>
<th><strong>Individual</strong></th>
<th><strong>Teams</strong></th>
<th><strong>Organisation and sector</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Look for training courses or opportunities to learn about policy processes.</td>
<td>- Policy briefs can be useful but must be disseminated and linked to other communication outputs.</td>
<td>- Research and fund training for effective communication skills, and understanding of policy processes for scientists.</td>
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<tr>
<td>- Recognise that ‘policymakers’ are diverse and have diverse views. Some have science backgrounds.</td>
<td>- Organise field trips and practical demonstrations.</td>
<td>- Explore potential for broader assessment of impact (H indexes?), and high impact journals aimed at policy.</td>
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<tr>
<td>- Use different communication tools, e.g. scenarios, user guides, DVD or online best practice guides, maps, social media (twitter, blogs)</td>
<td>- Discuss plans and outputs throughout projects, and from the start, not just at the end.</td>
<td>- Support scientists to understand policy processes and those who wish to focus on the science-policy interface.</td>
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<td>- Be prepared to adapt approaches according to your audience.</td>
<td>- Allow communication strategies to evolve and be flexible.</td>
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<tr>
<td>- Plan to publish reviews. These are helpful to non-researchers, and can fit with academic motivations</td>
<td>- Learn from experience in interdisciplinary research</td>
<td>-</td>
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<tr>
<td>- Contextualise the presentation of research or specific findings.</td>
<td>- Proactively seek out ways to present research and its implications to different audiences.</td>
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<tr>
<td>- Provide directories of experts /subject-contacts.</td>
<td>- Preface all reports with accessibly-written summaries.</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Both science and policy</strong></th>
<th><strong>Policy &amp; decision-makers</strong></th>
<th><strong>Science research</strong></th>
</tr>
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<tbody>
<tr>
<td>- Seek out events where other disciplines and sectors will attend.</td>
<td>- Subscribe to email feeds about relevant news and policy brief sites.</td>
<td>- Science research</td>
</tr>
<tr>
<td>- Explore work-shadowing.</td>
<td>- Recognise that many researchers are personally motivated to see their research used and valued.</td>
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<tr>
<td>- Cultivate personal contacts though recognise that everyone is under time pressures.</td>
<td>- Recognise that ‘scientists’ are diverse and do not have knowledge on all biodiversity and ESS issues.</td>
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<td>- Look for training courses and opportunities to improve communication and networking skills.</td>
<td>- Seek out opportunities to learn how science works in general, as well as to learn about specific job-related topics.</td>
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<td>- Plan projects and budgets to spend time and resources on science-policy interfaces and communication.</td>
<td>- Be transparent about questions, uncertainties and expected needs for current and/or future knowledge. Putting this into a briefing note for researchers can be a helpful starting point for discussion.</td>
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<td>- Explore the use of scenario-building and other tools as a process for building shared understanding.</td>
<td>- Welcome conversations about defining questions or problems.</td>
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<tr>
<td>- Provide directories of experts /subject-specific contacts.</td>
<td>- Consider developing a list or network of scientific experts and researchers to help you.</td>
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<td>- Consider the merits of cross-/beyond peer review (e.g. academics reviewing policy, policy reviewing academic outputs)</td>
<td>- Provide space and resources to allow teams and individuals to learn and to build contacts beyond the policy sphere.</td>
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<tr>
<td>- Plan topic-focused events that allow mingling from those with different backgrounds.</td>
<td>- Be transparent about questions, uncertainties and expected needs for current and/or future knowledge. Putting this into a briefing note for researchers can be a helpful starting point for discussion.</td>
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<td>- Organise field trips to bring together researchers at stakeholders across levels (e.g. from policy to land-manager).</td>
<td>- Explore if and why science is valued versus other forms of evidence.</td>
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<td>- Support scientists to understand policy and decision-making and implementation processes.</td>
<td>- Provide training courses to improve policy understanding of science and scientists.</td>
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<td>- Liaise with funders to ensure funded projects 1) clearly reflect policy priorities  ii) encourage communication e.g. enforce clearly written summaries from tender stage.</td>
<td>- Liaise with funders to strike a balance between efficiency and communication: very tightly research projects can leave no space for interaction or flexibility by the researchers.</td>
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<td>- Fund training or resourcing for “linker/broker/facilitator” individuals and “linker” events to build cross-sector relationships (do not just focus on tangible “KE outputs”).</td>
<td>- Promote transparency and wider knowledge of policy and decision-making and implementation processes.</td>
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<td>- Develop a communication strategy to help identify and prioritise audiences and partners.</td>
<td>- Promote conversations about career structures and motivations.</td>
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<td>- Provide funding for networking events even where these</td>
<td>- Fund and support interdisciplinary research.</td>
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<td>- Fund training or resourcing for “linker/broker/facilitator” individuals and “linker” events to build cross-sector relationships (do not just focus on tangible “KE outputs”).</td>
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<td>- Promote general understanding about science and discussion about its role in society.</td>
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<td>- Develop a communication strategy to help identify and prioritise audiences and partners.</td>
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<td>- Provide funding for networking events even where these</td>
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</table>
7. Conclusion

Data gained through interviews and the workshop outlined five main issues relating to communication between science and policy on the importance of biodiversity in underpinning ecosystem services and livelihoods:

- Communication is most usefully understood as a network activity. It would be helpful to have wider recognition of this, to help efforts to improve communication.

- There are many actors involved, at different levels. These actors cannot be easily or usefully compartmentalised into ‘policy’ and ‘science’: i) many individuals have backgrounds spanning both policy and science; ii) within any department individuals will vary in backgrounds; iii) many actors (e.g. media) not formally based in research or policy departments are still important to flow of knowledge, formulation and implementation of policy.

- Personal relationships matter. Training ‘broker’ or ‘intermediary’ individuals (in policy making, implementation and research organisations) can help to improve SPIs.

- Improving “packaging” of information is often a focus of recommendations for improving SP connections, but this is not sufficient on its own. Organisation and sectorial changes must be made so both policy and research have the motivation and opportunity to build better long-term relationships.

- As knowledge flow happens across networks of multiple actors, and often aided by personal relationships, formal processes to aid communication must be understood to be only part of biodiversity SPIs.
SPIRAL workshop on science-policy communication for biodiversity and ecosystem services

Centre for Ecology and Hydrology Edinburgh

8th June 2012

Workshop report

Juliette Young (CEH) and Kerry Waylen (JHI)
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1. Executive summary

The workshop explored issues relating to science-policy communication on biodiversity and ecosystem services.

The main issues highlighted by participants were that:

- Science and policy are “messy” and complex. While some rhetoric may have moved on from the linear model of scientific truth to policy, expectations often have not yet moved on.
- Science can be seen to influence policy more directly when the issue being tackled is “narrow” and well defined, so requiring specific facts to help solve problems.
- Science-policy communication on biodiversity and ecosystem services is inherently difficult due to the nature of the problem: messy and complicated, takes time to research and there is no clear end point.
- Science-policy communication is also made difficult by institutional barriers, conflicting policies, disagreements about the problem and solution – in short, many environmental problems are ‘wicked problems’.
- Wicked problems do not have perfect single solutions, and hence there is no single tool or solution for promoting communication. There is therefore a need for flexible and adaptive approaches.
- Communication involves a broad range of stakeholders (i.e. ‘indirect’ science-policy communication)
- Simple tools can help but there is a need for a change in mindsets and behaviours in both science and policy, and this change will require institutional and funding support.

Based on these broad ideas, our recommendations on science-policy communication will:

- Follow a ‘menu’ approach, where 2-page briefs will allow different audiences to better understand the policy and science cycles, and have a better understanding of the changes required and tools at their disposal to facilitate communication.
- Focus on possible shifts at the macro-scale that could impact on the interaction between science and policy at all levels, i.e. cultural changes in science and policy emanating from macro-scale changes.
- Include consideration of how the recommendations relate to the current literature
- Include consideration of ‘indirect’ science-policy links (i.e. the role of actors other than scientists and policy-makers).

2. Introduction

A workshop on science-policy communication for biodiversity and ecosystem services took place on the 8th June 2012 as part of the SPIRAL project.

SPIRAL (Science-Policy Interfaces for Biodiversity: Research, Action and Learning) is an interdisciplinary project funded under the European Union’s 7th Framework Programme (www.spiral-project.eu). The SPIRAL project aims to enhance the connectivity between biodiversity research and policy-making to improve the conservation and sustainable use of biodiversity.

One of the project’s objectives is to identify factors constraining or facilitating the communication on the role of biodiversity in underpinning livelihoods and ecosystem services. The topic was explored by using over 20 semi-structured interviews, with a range of stakeholders linked with science, policy making and policy implementation. All interviews were carried out in the latter part of 2011. In choosing interviewees and interview topics, we focused on three case studies: the UK National Ecosystem Assessment (NEA), the implementation of the Water Framework Directive (WFD) in Scotland, and a local-level example of decision-making for deer management in Scotland. We also used existing data of decision making processes in our analysis of the WFD case study.

Initial analysis resulted in a draft set of recommendations to improve communication between science and policy. This set of recommendations was discussed in a workshop with over 20 participants from a wide variety of perspectives (for a list of workshop participants, see Annex A). For a programme of the workshop, please refer to Annex B. The workshop took place at the Centre for Ecology and Hydrology in Edinburgh and was organised by Juliette Young (CEH Edinburgh) and Kerry Waylen (JHI). Allan Watt (CEH Edinburgh) helped them to facilitate the smaller working groups. We also received some comments via email and feedback forms - these are summarised in Annex D.
The workshop used a mix of approaches to elicit discussions, including plenary sessions and carousels where specific issues relating to the draft recommendation were approached by smaller working groups. The first carousel entailed a focused discussion considering different scales at which recommendations can apply (‘micro’, ‘meso’ and ‘macro’), while the second carousel focussed on three major issues to emerge from our analysis of science-policy communication: the potential disconnect between science and policy due to timescales, the potential onus on science in communication, and lessons learned from other sectors (e.g. climate change).

This report starts by setting out some of the main issues discussed in the workshop, before outlining ways in which the recommendations could go forward.

3. Main findings

3.1. Focused discussion considering different scales at which recommendations can apply

The draft report on recommendations to improve science-policy communication divided recommendations up according to the scale at which they could be applied (see Annex C, Table 1). Plenary and small group discussions elaborated on whether this was a useful format, and how such an approach could be improved.

A working group discussing the recommendations

3.1.1. Specific suggestions for changing Table 1 (or other specific aspects of report)

- Pg 9 – ‘Adapting design of research projects’ is very important. E.g. simply doing a project to provide a decision support tool is inadequate for improving the decision, it would need to involve end-users right from the start, and throughout, for such tools to be useful.
- Funding– need to emphasise that it’s for all career stages and move it to the ‘both sectors’ box.
- Need to clarify what we mean by the meso-scale? Project: Does this relate more to science, does the policy side have “projects”? Department? This might be more linked to the macro-scale. Depends on how we interpret ”department” – might be different in different science/policy institutions; Are we thinking of time-bound projects or programmes (i.e. boundaries in time)? Individual initiatives? Projects and teams?
- Break the column down to reflect different types of research, e.g. studentships (PhDs, multi-agent/multi-stakeholder projects, smaller research projects or programmes. Policy “objectives” could be another layer.
- Divide column into two: how to run projects (usually cross-institutional) and how to run teams (usually inter-institutional).
- Need to be consistent in terms of the recommendations (for the moment there is a tendency to have very general and very specific recommendations – need to be consistent throughout e.g. instead of “field trips”, say “create relationships, for example through the use of field trips, meals etc”
Scenarios may be useful in some cases: From a policy perspective there is a need from science to meet demand. The key from policy is to visualise what will be different if different courses of action are adopted – this is not necessarily through the use of scenarios.

Need to shift from policy-makers to decision-makers (more multi-scale).

Policy briefs can be really useful, especially for putting science into context – could also add executive summaries if not specifically for policy. Could add: post-notes (SPICE). Plain English translations of science (can be done by individual scientists or translators).

Add a 4th cog: policy is messy (messier than science). Science is just one form of evidence/knowledge that goes into decision-making. Sometimes decisions may go against what science recommends.

In the 1st column, 2 of the “don’t” could be turned into “do’s” and could go up the table (more positive and more prominent). Could add “don’t do token consultation”.

3.1.2. General comments on recommendations

**Additional recommendations for the policy side:**
- Know your limitations (some may feel like they know everything)
- Make time (but how?): think about institutional and personal rewards for policy-makers and their aides involved in the SP
- Need a change of culture from policy to a place where dynamics of uncertainty are better understood by all.
- Change of policy mindset: need to stop expecting that there will always be a certain answer.
- Get to know each other (across the environmental policy sphere, but also out of the environment sector, e.g. health)
- Understand where scientists are coming from through e.g.
  - Conferences
  - In-house seminars
  - Mindset changing days

**Additional recommendations for the science side:**
- Know your limitations too
- Be more honest about their role(s): are scientists engaging with policy-makers to make a difference or to tick the box?
- Encourage policy to devise questions with science – need for discourse. What do they need to know, why, and how can policy questions be reformulated into useful scientific questions?
- Transfer enthusiasm to decision-makers (easier in person!), but beware of not introducing bias
- Understand the influences on policy other than scientific information (commercial etc), also need to understand policy-makers’ backgrounds
- Change of scientific culture: Need to embed our research in the broader context.
- Know opportunities (e.g. small government)
- Recognise when you’re lobbying
- Ask how the science will be used at the outset
- Scientists have a social responsibility to explain their work, and can achieve this via societal engagement efforts and with the media (takes time and needs trust). Public understanding can be ‘woefully low’ e.g. hedgehogs [eradication from islands]
- Scientists should also be honest about their personal views on an issue— transparency actually makes it is easier for them and also helps to build trust with audiences.
- Think about how acceptable the change you’re proposing will be (must be acceptable for PMs as well as society as a whole)
- Create opportunity for conversations between scientists and policy-makers. These conversations can change individuals’ way of seeing issues, can create a direct questions and answers which is easier to manage – Trust and honesty are essential here
- Scientists should communicate different stakes associated with different options, not just different options (and even that we do poorly!).
- Remember it is rare to influence ministers directly – usually you will need to influence minders, policy advisers, the policy process
- Beware of being doomsayers! Don’t be overly negative about what isn’t known and what will happen since this is probably not very constructive and quite off-putting!
- Contextualisation of research
  - Co-supervision of students
Separate evaluation of projects
- Reviews can be helpful and also fit with science careers. Systematic reviews are helpful for motivating synthesis of science that is useful for policy BUT these needs dissemination.
- Researchers should be clear about what could and should achieve within a permitted timescale.

Recommendations applicable to both science and policy:
- Note translator limitations
- Build curiosity / vision (well-being links understood)
- Every stage of policy needs to be co-evolved to check that ideas and needs are clear enough
- Policy makers need to be more explicit about the answer they want and what timescale is needed.
- Know each other across science and policy:
  - Personal (building trust)
  - Summer schools (young people meeting Scientists and policy-makers)
  - Specialist translators (knowing what is going on and who might be interested in science and policy and linking them)
  - Meetings (like this!)
  - Learn from business
  - Learn from interdisciplinary successes
  - Courses + practice (keep skills)
  - Work shadowing (mixed successes, e.g. bias with more scientists shadowing than policy makers) or secondments (some come back, some don’t!)
  - “lonely hearts” columns or “speed dating” to link scientists and policy-makers so they can meet and develop ideas together

3.1.3. On the issue of ‘translators’ (or ‘facilitators’)

Translators can be individuals or departments, although we most often referred to them as the former. The example of SEPA was highlighted, where one department commissions research and translates it back to staff – it acts as a 2-way translator. Translators have the challenge of being open to new ideas as well as communicating existing ideas/knowledge/data. They are needed on both the policy and science sides. Ideally, they should actually be facilitators, and ideally help to identify new issues. For a graphical representation on the role of facilitators in science-policy communication see Figure 1.

**Figure 1.** Possible roles of science-policy ‘facilitators’

There are, however, a few aspects to consider regarding translators and/or facilitators:
- We should not expect everyone to be a translator. Everyone has different strengths. We should make teams of ‘backroom’ scientists and more public-facing scientists. Some people are better at it than others. We also need to allow people to move between roles over time – particularly retirees may be good at moving into communication roles.
• However, there is a danger in relying too much on communication specialists – need an organisational culture which recognises the need for communication. Backroom scientists must know how their work is generally relevant, and be prepared to work with translators.
• Scientists should all have some awareness and responsiveness to policy processes (in addition to dedicated translators). E.g. so they can see the relevance of their research for policy and vice versa. Not everyone needs to know every detail of a policy document - translators should – but all researchers should be vaguely aware of the relevant ones.
• Beware that describing the relevance of research is harder when the policy/funder’s priorities are not clear. For example, in the Scottish Government there used to be a ‘gold book’ which was helpful for scientists.
• Need trusting ‘mature’ relationships for there to be reliance on particular translators or departments from other organisations.
• Non-translator researchers also need to trust translators. Translators cannot be too separate as they would then lose authenticity (credibility).

3.1.4. What funders/organisations/research councils can/should do to help communication
• Funders should (en)force readable syntheses and/or summaries of the work that they fund.
• Aim to increase trust between science and policy through a) frequency of contact and b) distance/proximity
• Science organisations should support and train ‘science translators’ – and value this as a different skill. Translators are needed on the policy side too.
• Research Councils should force scientists to be relevant (to what policy bodies?) but ensuring that commitments to ‘impact’ are not just considered and delivered in a ‘tick box’ perfunctory fashion.
• There needs to be capacity-building for policy people to understand science processes. However, there are some intractable demands e.g. become an expert bat rabies expert by lunchtime in order to advise a minister – these will never go away.
• A communication strategy is needed by any organisation but it will vary according to its output-types and strengths/topics.
• Research commissioners should be key in promoting closer SP links and better communication.
• The EU’s Desk officers in different DGs should be better in tune with what societal/public needs are.
• It is important for policy-makers and organisations to ask themselves what their objectives and their timescales will be, for various information needs.
• Encourage open access data

All the above need:
• Institutional support
• Should be part of education (life-long)
• Continuing dissemination to avoid repetition and reinvention
• Need to differentiate and curate different systems for ‘knowledge maintenance’ versus for new knowledge (learning and training teams can deal with the former but scientists and translators should deal with the latter)
• Trust and credibility (credibility may come with exposure, trust with experience)
• To distinguish between short-term and long-term policy processes

1 E.g. the WFD forces a long-term perspective and increased ‘rationality’ good for forcing us to look at scientific needs; the issue of Beaver management in Scotland – in the short-term attention is demanded on this issue because of particular incidents/public interest; Fisheries is a case where scientific data is ignored and this is bad for society and for nature, but it is overridden by short-termist arguments.
3.2. Group discussion on intractable timescales between science and policy

Issues linked with intractable timescales:
- If policy makers ask “what will happen if we do X?” only 2 years before the opportunity to input, that may not leave enough time for science to come up with useful insights – 5 years is more reasonable in the 7 year cycle of CAP for example.
- The time it takes for a concept to enter policy from science can cause problems
- Policy-makers can have short-term horizons: too short, leads to no strategic overview.
- Intractability can be overemphasised by scientists
- Science may have moved since concept or idea emerged, so researching it is no longer cutting edge.
- Capacity to do this science may have been lost e.g. soil science was good in the UK 20 years ago, then it was dropped, now it is in demand again but people and institutional memory of previous work has been lost – new capacity must be trained. Overall this is inefficient.
- It also risks duplication of previous work commissioned/carried out, certainly for small or applied projects (work which makes contribution to theory will not be forgotten but relevant research does not always do this).
- There is an obvious issue of ‘supply’ and ‘demand’ here (see Figure 2 for a suggested graph of the mismatch between supply and demand): high demand/low supply tends to be valued more than low demand/high supply.
- Early warning rarely heard: Who accepts the need to change? Issues of power and legitimacy (strong lobbies often discredit early warnings)

Figure 2. A suggested graph of the mismatch between supply and demand

What can work well:
- WFD is an example where it can be easier to align science with policy needs because of the longer timescales allowed for planning.
- Rapid reviews
- Scottish Government Centres of Expertise – they help ensure questions are asked of relevant people with capacity to help.

How do we manage timescales (and uncertainties) better?
- We need to accept a trade off in how fast research moves forward versus communication of research findings and demonstration of relevance.
- Research institutes could do strategic planning to keep research areas even when they are not immediate demand
- Funders would need to support this maintenance of capacity (sometimes this already happens e.g. with the Scottish government funds underpinning capacity e.g. soils database) BUT we need to be careful because researchers have a tendency to claim everything needs protecting and overbid funders.
- Scientists need to better understand/ take into account policy needs with respect to uncertainty, in order to identify ‘good enough’ levels of certainty for a particular question/issue.
• Policy-makers can help to reduce the problem of intractability by a) understanding what science might reasonably be able to offer, and that there is never absolute certainty and b) being willing to engage in dialogue
• Scientists need to better understand policy processes and timescales
• Need to balance new knowledge, existing knowledge, and turning data into knowledge
• Scientists need to link and/or do horizon-scanning processes at the organisational level
• Coping and priority-setting of research should be carried out - who should do this? Not necessarily PMs for ‘blue-skies’ but their input will be relevance for more applied research.
• Resources for maintaining capacity are needed. e.g. soils database, e.g. taxonomic skills
• It is worthwhile to consider a Centre of Expertise on Biodiversity?

3.3. Group discussion on the possible imbalance in communication efforts

Many initiatives to improve communication and connections seem to place more emphasis on what scientists can do, versus other actors. Discussion in the group focussed on whether that imbalance indeed exists, whether it is justified and whether there are options in terms of rebalancing needs and roles of different actors.

What are the challenges?
• Two barriers between science and policy – while scientists can help remove one, opening the policy “box” is difficult.
• Frustration from science that onus is always on them, while there should also be onus on policy-makers to better engage with science. BUT scientists often take it for granted that not all have been trained in scientific thinking.
• Policy-makers maybe don’t recognise that science is not being taken into account enough. Policy-makers can face a situation in which there is too much knowledge, and yet not enough of the sort that is relevant or easily understood (highlighted in KNEU project).
• Policy-makers may be frightened of what may come out of scientific process. They may also be unclear about the questions they want answering, and how to deal with results (e.g. complexity etc).

How can we tackle these challenges?
• Accept that responsibility for communicating role of biodiversity will naturally be more on science.
• Promote more iterative processes (e.g. project officers following the scientific team throughout a project rather than a quick evaluation at the end of a project)
• Allow more time for iteration
• Build trust to allow for iteration

3.4. Group discussion on learning lessons from other sectors or activities

Many interviewees referred to examples from other sectors. Discussions on this topic focussed on whether the biodiversity and ecosystem services communication could benefit from lessons learned in other sectors, topics or activities.
Lessons learned:
- Evidence-based approach (pros and cons – enough data available for review? Good in principle) - HEALTH
- Measurability (and speed of?) - HEALTH
- Holistic (in part)? - HEALTH
- Pushed too far (focus on negatives) – CLIMATE CHANGE
- Long-term guidance / support to policy – CLIMATE CHANGE
- Consensual – CLIMATE CHANGE
- Global – CLIMATE CHANGE
- IPCC is prepared to speak to climate issue – CLIMATE CHANGE
- Communicating uncertainty – WFD/CLIMATE CHANGE
- Policy interference/ engagement (WFD) - WFD / Clean Air Act
- Made differences (why?) - WFD / Clean Air Act
- Expert opinion can be rigorous - WFD / Clean Air Act
- Common understanding / definition of problems - WFD / Clean Air Act
- Wait until things get really bad? - WFD / Clean Air Act
- Capture problem better or more clearly - WFD / Clean Air Act
- Clearly addressable by science – TREE HEALTH/ AGRICULTURE
- Clear end point - AGRICULTURE
- Don’t keep tinkering with same policy - AGRICULTURE
- Argues internally but comes out as one voice - MARINE
- Look widely for better ways of working – INNOVATIVE BUSINESS
- Team working and team building – INNOVATIVE BUSINESS

Conversations across sectors:
- Is there literature on this?
- Possible lessons from small governments (e.g. Wales)?
- Build consensual politics

Problems with biodiversity and ecosystem services:
- Messy and complicated – wicked problems.
- It takes time
- No clear end point

Possible solutions for BD and ESs based on lessons learned:
- Address specific aspects?
- Make science more influential – use carrots as well as sticks (WFD e.g. only works so far…)
- Ecosystem approach is working
- Have we got the correct message?
- Are we using the wrong way to communicate?
- Need to create shared goals (project scale)

4. Ways forward

4.1 Finalising the report containing recommendations
- Develop a menu type approach: who and what they need to do – could work for both policy and science worlds.
- Focus much more on the macro-scale (i.e. looking at possible shifts at the macro-scale that could impact on the interaction between science and policy at all levels) – cultural changes from macro-scale changes.
- Tease out what a better (even ideal) science-policy communication situation could look like. Once that is established we can tease out the more pragmatic approaches on how to get to that ideal situation.
- Acknowledge the role of institutional structures (these are mentioned don’t receive much space/emphasis). These can act as barriers and communication (sometimes) mainly only occurs by informal means.
- Separately consider “demand/supply” – communication may be very different depending on whether the science is demand-driven (applied science usually from specific scientific institutions) or supply-led (blue-skies, provided by other institutions, universities etc). Could be interesting to see how
demand and supply interact. The challenge for scientists working on the demand side is to supply knowledge before the demand is gone. Ideally there might be a balance between supply and demand.

- Focus on commonalities between science and policy in order to help build links.
- Add literature to make the context and contribution of these recommendations more clear – it is not clear what is new about these.
- Focus on project design and/or processes: i.e. focus much more on the change of culture (scientists need to move away from the “we need more research” to providing relevant information; policy needs to focus more on creating adaptability in the policy implementation process to enable quicker changes when information comes in).
- Need our recommendations to focus much more on policy implementation, rather than just policy-making or legislation.
- Focus more on the indirect science-policy links:
  - Consider research more holistically:
    - What do stakeholders want in terms of environmental policy?
    - What are the impacts of environmental policy on stakeholders’ activities?
    - What societal changes are impacting on policy?
    - Better understanding of wider world will enable better framing of the crucial science-policy questions we need to address and answer and will lead to science that people need.
  - This will require:
    - Working jointly with a broader range of stakeholders
    - Managing duplication/requests
    - Use of twitter etc
    - Raising issues in order to engage with the broader public

4.2. Possible ‘briefs’ that could make up the report following the ‘menu’ suggestion

- We can use ‘SPIRAL briefs’ to help target our messages to different audiences
- Brief on understanding the policy cycle, and different entry points of information into policy (e.g. difference between SPICE and parliament etc) – different sectors will have different entry points, and different actors.
- Brief on setting out the problem: decisions require scientific knowledge and there are lots of demands for help. However, SPIRAL does not assume a ‘linear rational’ model of communication, therefore it is not just about getting facts across so there are clear answers for decision-makers. Being more explicit about the problem will help the recommendations. Well-being needs more emphasis/needs to be more clearly linked to help emphasise why the topic is important.
- Brief on the different models of knowledge flow: it helps to lay out what the problem is.
- Briefs on each of the individual case studies (look at peculiarities) – the main report would then look at the commonalities.

4.3. Possible audience(s) for sections of the report/ its constituent briefs

- Wider policy audience:
  - Policy advisers
  - Translators
  - Politicians
  - Senior civil servants (e.g. heads of profession, HR etc)
  - Chief scientific advisers
  - Local government (local government advisers, politicians, advisers)

- Broader “stakeholder” audience, e.g.:
  - NGOs (e.g. National trust and civil society groups (community groups))
  - Broader public
  - Business (Agriculture, Forestry, land managers)
  - Education

5. Conclusion
The workshop provided lively discussions on the broader issue of communication between science and policy on the issue of biodiversity and ecosystem services, as well as specific suggestions on how to improve our recommendations and their dissemination.

The next step will be to redesign the recommendations following suggestions in the workshop (see Section 4). Revised reports will be sent out to workshop participants, SPIRAL participants and the SPIRAL Dynamic Network of Advisers for further comments.
Annex A. Workshop participants

Steve Albon, James Hutton Institute
Ian Bainbridge, Scottish Natural Heritage
Estelle Balian, MEDIAN
David Edwards, Forest Research
James Davidson, SEPA
Roddy Fairley, Scottish Natural Heritage
Ceri Margerison, British Ecological Society
Davy McCracken, SAC
Roger Owens, SEPA
Chris Quine, Forest Research
Simo Sarrki, Oulu University
Charles Stewart-Roper, Scottish Government
Des Thompson, Scottish Natural Heritage
Rob Tinch, MEDIAN
Sybille van den Hove, MEDIAN
Allan Watt, Centre for Ecology and Hydrology
Kerry Waylen, James Hutton Institute
Juliette Young, Centre for Ecology and Hydrology
## Annex B. Workshop programme

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tr>
<td>9.00-9.10</td>
<td>Registration</td>
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<tr>
<td>9.10-9.20</td>
<td>Welcome and introduction to SPIRAL (Allan Watt &amp; Sybille van den Hove)</td>
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<td>9.20-9.30</td>
<td>Round table introductions</td>
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<td>9.30-10.15</td>
<td>Presentations on WP2 work on communication, including recommendations</td>
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<td></td>
<td>(Juliette Young &amp; Kerry Waylen) – followed by plenary Q&amp;A and discussion.</td>
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<tr>
<td>10.15-10.30</td>
<td>Coffee</td>
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<tr>
<td>10.30-11.30</td>
<td>Break-out sessions to discuss and work on recommendations:</td>
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<tr>
<td>11.30-12.30</td>
<td>Potential subgroups could work in carousel fashion to focus on different areas.</td>
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<td>Plenary: Rapporteurs report of recommendations</td>
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<td>Discussion and comparison of points made by each group.</td>
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<td>12.30-13.10</td>
<td>Lunch</td>
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<tr>
<td>13.10-15:00</td>
<td>Considering broad challenges for science-policy communication</td>
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<tr>
<td>15.00-15.15</td>
<td>Next steps and wrap-up, coffee, close of meeting.</td>
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<tr>
<td>15.15-15.30</td>
<td>Coffee, close of meeting</td>
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## Annex C. Draft recommendations

### Table 1. Recommendations for improved communication between science and policy on biodiversity and ecosystem services at the micro, meso and macro scales

<table>
<thead>
<tr>
<th>Micro (Individual)</th>
<th>Meso (Project, department)</th>
<th>Macro (Funder, Sector, Large organisation)</th>
</tr>
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<tbody>
<tr>
<td><strong>Science research</strong></td>
<td><img src="image" alt="Checkmark" /> Attend training course on communication (media training, communicating to policy etc)</td>
<td><img src="image" alt="Checkmark" /> Explore the use of scenario-building and other tools as a process for building shared understanding.</td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Recognise that ‘policymakers’ are diverse. Some have science backgrounds.</td>
<td><img src="image" alt="Checkmark" /> Policy briefs on their own may not be read – plan for other communication outputs</td>
<td><img src="image" alt="Checkmark" /> Research and fund training for effective communication skills in scientists.</td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Use visual materials</td>
<td><img src="image" alt="Checkmark" /> Organise field trips and practical demonstrations.</td>
<td><img src="image" alt="Checkmark" /> Explore potential for broader assessment of impact (H indexes?), and high impact journals aimed at policy.</td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Use different communication tools, e.g. scenarios, User guides, DVD or online best practice guide, Online best practice methodologies, maps</td>
<td><img src="image" alt="Checkmark" /> Discuss plans and outputs throughout projects, not just at the end.</td>
<td><img src="image" alt="Checkmark" /> Support scientists to understand policy processes and those who wish to focus on the science-policy interface.</td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Be prepared to adapt approaches according to your audience.</td>
<td><img src="image" alt="Checkmark" /> Learn from experience in interdisciplinary research</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Plan to publish reviews. These are helpful to non-researchers, and can fit with academic motivations</td>
<td><img src="image" alt="Checkmark" /> Proactively seek out ways to present research and its implications to different audiences.</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Always contextualise research or specific findings, when presenting it.</td>
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<td></td>
</tr>
<tr>
<td><strong>Policy &amp; decision-makers</strong></td>
<td><img src="image" alt="Checkmark" /> Plan projects and budgets to spend time and resources on science-policy interfaces and communication.</td>
<td><img src="image" alt="Checkmark" /> Provide incentives (monetary and career) for interaction.</td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Subscribe to email feeds about relevant news and policy brief sites.</td>
<td><img src="image" alt="Checkmark" /> Provide directories of experts/subject-specific contacts.</td>
<td><img src="image" alt="Checkmark" /> Promote conversations about career structures and motivations.</td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Recognise that many researchers are personally motivated to see their research used and valued</td>
<td><img src="image" alt="Checkmark" /> Consider the merits of cross-/beyond peer review. E.g. academics reviewing policy, policy reviewing academic outputs</td>
<td><img src="image" alt="Checkmark" /> Fund and support interdisciplinary research.</td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Plan topic-focused events that allow mingling from those with different backgrounds.</td>
<td><img src="image" alt="Checkmark" /> Plan budget and resources on science-policy interfaces and communication.</td>
<td><img src="image" alt="Checkmark" /> Fund training or resourcing for “linker/broker” individuals and “linker” events to build cross-sector relationships.</td>
</tr>
<tr>
<td><strong>Both</strong></td>
<td><img src="image" alt="Checkmark" /> Transparently communicate (and discuss) questions, uncertainties and needs for current or future knowledge.</td>
<td><img src="image" alt="Checkmark" /> Promote general understanding about science process and discussion about its role in society.</td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Seek out events where other disciplines and sectors will attend.</td>
<td><img src="image" alt="Checkmark" /> Welcome conversations about defining questions or problems.</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Explore work-shadowing.</td>
<td><img src="image" alt="Checkmark" /> Provide transparency and wider knowledge of policy and decision-making and implementation processes.</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Checkmark" /> Recognise that everyone is under time pressures but cultivate personal contacts.</td>
<td><img src="image" alt="Checkmark" /> Explore if and why science is valued versus other forms of evidence.</td>
<td></td>
</tr>
<tr>
<td><strong>Don’ts!</strong></td>
<td><img src="image" alt="Cross" /> Don’t rely on any one method to get your view across. For example, don’t rely only on powerpoint. Written reports can be bad for new messages but useful to back up and add detail.</td>
<td><img src="image" alt="Cross" /> Don’t specify and fund only tangible ‘KE outputs’.</td>
</tr>
<tr>
<td><img src="image" alt="Cross" /> Don’t rely on someone else to communicate for you – it ultimately relies on everyone being mindful</td>
<td><img src="image" alt="Cross" /> Don’t leave any time for communication</td>
<td>Don’t sacrifice communication opportunities in the desire for efficiency (e.g. very tightly funded research projects leave no space for interaction or flexibility by the researchers.)</td>
</tr>
<tr>
<td><img src="image" alt="Cross" /> Don’t ignore existing views</td>
<td><img src="image" alt="Cross" /> Don’t delay communication to the end of a project or process, or only when there are specific needs</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Cross" /> Don’t set communication and SPI strategies without allowing space to understand and adapt according to audiences’ existing views &amp; interests</td>
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</tbody>
</table>

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15
Annex D. Comments received by email and through feedback forms

General comments
- Expand on the nature of policy, science and knowledge
- Expand from policy-making to decision-making
- Ensure that policy makers are seen as having responsibility and ability to influence communication (e.g. by tailoring research questions), to avoid appearing to conform with the linear model of science-policy communication.
- Ensure that need for resourcing comes through strongly.
- Learn from or link to the Knowledge Exchange guidelines that LWEC has recently developed: [http://www.lwec.org.uk/ke-guidelines](http://www.lwec.org.uk/ke-guidelines)
- Recommendations need to be disseminated widely in order to be useful (use different media including websites, downloadable PDFs, 2-sided summary sheet for snail mail, seminars in research institutes, meetings, using existing networks for dissemination etc)

Suggestions for specific changes to the recommendations
- Check text and diagram match in section 2
- Consider including in section 2 something about the need to understand what forms of communication is wanted by different sectors/organisations so they can be more effectively targeted
- In section 3 note that champions/enthusiasts have a vital role to play in communicating outwardly but also embedding into their own organisations.
- Check phrasing is similar across consistent units of diagrams (e.g. cogs in section 3)
- Provide information about how to deal with uncertainty
- In section 4.1 Organisational/sector culture is important as an organisational view of whether or not it is productive for staff to attend meetings and network affects what happens. Its often the intangible benefits of meeting/networking that may only months/years later lead to something more tangible.
- Section 4.1.1. Note that beautiful but meaningless diagrams also need to be avoided.
- Section 4.1.1 Separate (interactive) maps from interactive visual tools.
- Section 4.1.1. Separate short text from video guides.
- Section 4.1.1. Add consideration of “Web 2.0” – more interactive internet experiences.
- Section 4.1.1. Another tool is the use of video clips to get across research messages.
- With respect to section 4.1.2.1, an example is Forest Research’s “research liaison officer” posts created in the past few years to go out to the Forestry Commission to communicate what FR and what it does and how it might assist them. A number of roadshows have been organised by these officers not only with FC but other bodies - local authorities/third sector.
- Redistribute bullets in Section 5.
- Better balance across rows in the recommendations table (science, both, policy)
- Don’t dismiss policy-briefs. Also promote the usefulness of executive summaries.
- Emphasise the importance of clear executive summaries for reports.
- For truly policy relevant research specs should be developed in consultation with policy makers and in general deliverables, how they will be used, by whom and when should be identified up front.
- A communication strategy could be important to create and have for an organisation/sector - helps to start identifying and prioritising audiences.
- Social media could be mentioned as a new tool for engaging wider audiences - whether this is apps, twitter, blogs, websites etc.
- Experience from RELU projects suggested that field trips that involve researchers, land managers, and representatives from organisations interested in the research area are very useful ways to talk about the practicalities of the research and the needs of managers on the ground and where the research might assist them in their decision-making.
- As a career incentive for communication with end-users such as policymakers, penalise grant applications that have not got an easy to understand summary at the start, as requested.
- Section 4.2 – discuss the role of scientific communicators and journalists: scientific researchers may sometimes be excellent communicators but often do not have the skills needed, can even be counterproductive. In this situation science communicators are the best intermediaries (though scarce). Researchers should at least be able to review the writing of the science communicators, to check whether the ideas have been captured correctly.
- Training offered should be broader than simply communications training but focus too on the science-policy interface. This should explain what policy actually is, how it is made and why it’s important for
scientists to engage with the development of policy. Complementary capacity building is needed for policy-makers.

- Use the term translator rather than linker.
- Note potential role of learned societies.
- Recommendations box: First recommendation should be moved to ‘both’ box - both researchers and policy-makers need to attend training courses
- Policy-makers need to recognize that scientists are diverse, and that all of them do not necessarily have knowledge on all biodiversity issues.
- Policy-makers can develop a network of scientific experts and researchers that can help you on a wide range of issues.
- Usability needs to be a greater concern throughout research
- Policy-makers should take time to be explicit in their ideas. It may be useful to put these in writing, e.g. by providing the scientific researchers with a briefing note that details your needs.
- Policy-makers should recognize that scientists are diverse, and that all of them do not necessarily have knowledge on all biodiversity issues.
- We need to focus on where there are clear issues – know the problem and address it. Have a vision of what success will be and what it will bring
- Is there more that can be said about Western scientific culture and how it functions and is resourced? To interact with policy, scientists need to make better with, and communicate better, uncertainty and risk.
- The report needs to differentiate between repeated messages and novel messages
- The report would need an executive summary
- There should be more emphasis on “indirect” science-policy communication