

# Global Biodiversity Sub-Committee (GBSC)

## Annual Report

**Report of the Global Biodiversity Sub-Committee (GBSC)  
to the Annual Meeting of the UK Global Environmental Change  
Committee (UK GECC)**

2006 - 2007

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to the Annual Meeting of the UK Global Environmental Change  
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**11<sup>th</sup> October 2007**

**Chairman's Report**

Prepared by the GBSC Secretariat on behalf of the GBSC members

Elizabeth Moore & Richard Ferris  
(JNCC)

## **Remit of the GBSC**

The remit of the GBSC is to inform UK science strategy relating to global biodiversity and sustainable use. The focus of the sub-committee is on the science underlying the key global issues. The focus of discussions held on agenda items are on the implications for research strategy and views of members are sought on all substantive items.

## **Meetings and attendance**

The GBSC have now met on ten occasions, with three meetings since the last report (2 November 2006, 6 February 2007, 15 May 2007). In addition, the GBSC collaborated with the Royal Society in organising a two-day workshop on 12/13 June, *Biodiversity – Climate Interactions: adaptation, mitigation and human livelihoods*. Fuller details are provided later in this report.

GBSC meetings are Chaired by Miles Parker (Defra), facilitated by the Secretariat of Elizabeth Moore and Richard Ferris (JNCC). Attendance has been variable over the past year, and some revision of or addition to the membership is under consideration (see later section on *the GBSC Review*). In addition to the standard agenda items, it is planned that future meetings will be themed, to address key issues identified as important by the members.

## **Thematic Reports**

In the past 12 months, the GBSC has addressed a number of broad topics in detail, producing thematic reports for each:

- Ocean acidification research priorities
- Invasive alien species: priorities for international research
- The Millennium Ecosystem Assessment
- Biodiversity research Priorities in the UK Overseas Territories
- Global biodiversity conventions

The report on ocean acidification provides a brief summary of the key issues, considers current predictions for pH change and their implications for marine organisms, outlines current activities and research, both internationally and at a European level, and identifies research issues and key knowledge gaps to be addressed. Crucially, the report identifies the need for a more coherent funding regime to support high quality science, and the facilitation of collaborative work between research institutes and universities.

The report on invasive alien species (IAS) proposes a small number of international IAS issues that would benefit from UK-funded research. It provides information on the international and European context, and highlights the importance of prioritising research for “at risk” ecosystems identified by the Millennium Ecosystem Assessment. The report makes the point that research funding should be focused on areas where the UK can make a significant difference to its work and obligations in this area, whilst adding significant value to what other countries are doing. The importance of considering links between the environmental, social and economic issues associated with IAS was also recognised.

Following the Millennium Ecosystem Assessment workshop, *Evaluating the Millennium Ecosystem Assessment: messages, knowledge gaps and policy implications*, organised by the GBSC in February 2006, a paper was prepared, outlining the activities GBSC members were undertaking in relation to recommendations from the workshop. This remains an active piece of work for the GBSC, updated regularly. The intention is that this paper should help to identify current levels of activity, improve coordination of existing work, and highlight areas requiring attention.

The UK Overseas Territories paper focuses on research needs and capacity issues within the territories. Identification of the research priorities came from the territories themselves, via a consultation process. Key contacts including heads of government environmental departments, heads of the main environmental NGO and known overseas territories proactive individuals were asked to identify their top 3 research priorities. The responses were analysed and given key words to summarise the contents. The research needs in priority order were baseline surveys (marine and terrestrial), invasive species (terrestrial), sustainable development (marine and terrestrial, climate change, data management and training).

The global biodiversity conventions report provides summary information on the key multilateral environmental agreements. This includes a brief overview of the objectives and commitments of each convention, the governance structure, key scientific elements, and the UK focal point. The intention is for this paper to be made available on the GECC website as an information resource on the structure and scientific components of the major multilateral environmental agreements.

The production of these reports is important, but it is recognised that for the GBSC to have added-value, there needs to be an effective knowledge transfer mechanism in place. This needs to raise the profile of the GBSC, within both the scientific and policymaking communities, and establish a number of pathways for dissemination and influencing (see later section on *working methods*).

### **Biodiversity – Climate Interactions: adaptation, mitigation and human livelihoods**

Following a presentation to the GBSC by Richard Betts (The Met Office Hadley Centre for Climate Research) on 21 February 2006, members recommended that the Royal Society be approached with a view to organising a joint workshop to consider the science gaps associated with the inter-relationships between biodiversity-climate change-human livelihoods. A steering committee was formed and funding provided by a consortium of six GBSC member organisations, plus the Met Office Hadley Centre.

This international workshop took place at the Royal Society on 12/13 June 2007, with sixteen of the world's top scientists addressing the event. Keynote speeches were provided by Barry Gardiner MP, Minister for Biodiversity, Landscape and Rural Affairs and Dr Ahmed Djoghlaif Executive Secretary, Convention on Biological Diversity. The workshop was attended by 100 delegates from twenty-six different countries, representing the science and policymaking communities; and attracted media interest from the BBC News and BBC World Service.

Feedback from the workshop has been very positive. It provided a valuable opportunity to explore the possibilities for new networks between science communities and, although judged successful in helping to bring biodiversity and climate change science closer together, it is recognised that work remains to be done to ensure that the human livelihoods / poverty alleviation agenda is addressed adequately in this context.

A summary paper from the workshop was drafted by committee, and formed the basis of a side event at the Convention on Biological Diversity Subsidiary Body on Scientific, Technical and Technological Advice (CBD SBSTTA) in Paris on 3 July 2007 (see Annex). This was attended by around 60 delegates. A similar side event is planned for the United Nations Framework Convention on Climate Change Conference of the Parties (UNFCCC CoP) in Bali, between 3-14 December 2007.

### **Networking and engaging others**

At each GBSC meeting the sub-committee considers its work programme and progress towards achieving the actions identified against the terms of reference. In relation to several proposed actions relating to European Research Area Networks (ERA-nets) the committee recognised the need to engage with others. One of the ERA nets identified as being of specific relevance to the GBSC was BiodivERsA which involves 19 European research funding agencies whose aim is to achieve efficient trans-national research cooperation in the field of biodiversity research funding.

Following an introductory presentation on the EC-funded project BiodivERsA given by two GBSC members in June 2005, the GBSC invited Coenraad Krijger (Netherlands Organisation for Scientific Research) to give a presentation in November 2006. Coenraad's paper focused on the BiodivERsA programme, providing an update on progress with developing a common call and co-operation with developing countries.

The GBSC identified a level of potential overlap with its work programme and that of the Environmental Research Funders' Forum whose remit is to bring together the UK's major public sector sponsors of environmental science, aiming to make best possible use of funding. Mary Barkham (ERFF) was invited to participate in the May GBSC meeting. Mary's presentation focused on the activities of ERFF's four working groups, planning, research co-ordination, stakeholder engagement and training. It was noted that ERFF will be looking at horizon scanning activities at their general meeting in October and this is an action identified in the GBSC work programme.

### **The review of GBSC**

Following regular discussion of the GBSC work plan the sub-committee agreed that there was a need to update the programme and re-visit the original terms of reference. It was considered that it would be opportune to undertake a review of the GBSC's activities and mode of operation, to assess whether it has met its targets and added value to strategic thinking in relation to biodiversity conservation and its sustainable use at the global level. The review was modelled along similar lines to the UK BRAG review which has a shared secretariat with the GBSC.

Members of GBSC and stakeholders with first-hand experience of the sub-committee were invited to take part in a survey questionnaire. The responses were collated and summarised in a report (see Annex) and the key issues for the GBSC to consider are grouped into the following themes.

- Terms of Reference and Work plan
- Communication
- Membership and Engaging others
- Science issues

The Sub-Committee will assess the implications of the Review at the next meeting in November and will then be in a position to decide on future science priorities. However, the review has highlighted the need for a number of generic actions and these are outlined below.

The GBSC wishes to establish closer relationships with other UK GECC sub-committees, including collaborative working on topics of shared interest. This might take the form of expert groups being set up, with members drawn from more than one sub-committee or their external networks; in order to develop a cross-cutting view of the science issues and priorities for action.

In order to facilitate this, the GBSC intends to invite the secretariat and/or Chairs of the appropriate sub-committees to its meetings, as and when items of mutual relevance are being discussed.

Furthermore, the GBSC wishes to see a strengthened relationship with the Secretariat of the main UK GECC and, in turn, with members of this Committee. Concerns over the effective dissemination of GBSC reports and the recommendations therein, requires that urgent attention is given to developing a clear knowledge transfer strategy. This needs to clarify the role of the individual sub-committee members, their Secretariats, the main UK GECC Secretariat, and the members of the main UK GECC. At present, it is unclear how sub-committee outputs are used by the main UK GECC, and whether they have any influence beyond their own user community; i.e. is our work having added value, and how does it influence research funding priorities?

The UK GECC website, hosted by ESYS, is the sole portal into the activities of the individual sub-committees. As such, it has a very important role in informing wider stakeholders. The feeling is that this is an area which would benefit from a greater investment of resources, to make the information easier to find and use.

## **ANNEX 1:**

# **Biodiversity<sup>1</sup> Climate interactions: adaptation, mitigation and human livelihoods**

## **Summary of an international meeting held at the Royal Society 12-13 June 2007**

Disclaimer: This document does not necessarily represent the views of the sponsoring organisations or those of all the meeting speakers and participants.

### **Summary of key messages**

- 1 Climate, biodiversity, and human wellbeing are inextricably linked. Significant policy objectives for each now exist in international political commitments and country actions. Although our understanding of these processes and their interrelationships is far from complete we know enough to identify some critically important components for immediate attention and priority areas for research and policy development. New mechanisms will be needed to galvanise work in this area, especially at the intergovernmental level.
- 2 Significant climate change impacts on biodiversity have already been identified with up to 50% of the species studied worldwide observed to be affected. The Intergovernmental Panel on Climate Change (IPCC) working group 2 summary report concludes that if temperature increases exceed 1.52°C, 2030% of plant and animal species assessed will be at risk of extinction.
- 3 The continuing, accelerating loss of biodiversity will compromise the longterm ability of ecosystems to regulate the climate, may accelerate or amplify climate warming and could lead to additional, unforeseen, and potentially irreversible shifts in the earth system. Urgent action now to halt further loss or degradation of biodiversity will help to maintain future options for reducing the extent of climate change and managing its impacts.
- 4 Mitigation and adaptation is urgently required if we are to reduce climate change and its impacts over coming decades. Many of the people most vulnerable to climate change and its impacts are also those that are most dependent on biodiversity. Actions to reduce climate change must maximise the opportunities for implementation of mutually supportive strategies while minimising further impact on the most vulnerable populations and ecosystems.
- 5 New policies are needed to integrate options for meeting biodiversity, climate and sustainable development objectives at the international, national, and local levels. Difficult policy choices will be required and will need to be informed by new science and socioeconomic considerations.
- 6 Significant new research effort is required in several areas to improve understanding of biodiversity in the climate system, the impacts of climate change on biodiversity and human populations, their interlinkages and crossscale effects. Whereas our understanding of the impact of climate on biodiversity is increasing, our knowledge of the impact of biodiversity on climate is limited. Mitigation and adaptation measures for both climate change and biodiversity loss must be developed with improved understanding of the drivers of each and their interactions.

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<sup>1</sup> The meeting was based on the CBD definition of biological diversity: "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

## Introduction

1 In addressing global climate change there is an opportunity to demonstrate that biodiversity can play a role in protecting and improving societal wellbeing. However, there is growing concern that efforts to address climate change may act as an additional driver of biodiversity loss, and ultimately irreversibly compromise future options for responding to climate change.

2 In June 2007 the Royal Society hosted a meeting in collaboration with Defra<sup>2</sup>, DFID<sup>3</sup>, JNCC<sup>4</sup>, Kew<sup>5</sup>, the Hadley Centre<sup>6</sup>, and NERC<sup>7</sup>, to investigate the interlinkages between biodiversity, climate change, and human livelihoods and the potential role for biodiversity management in climate change mitigation and adaptation.

3 The aim of the meeting was to bring experts from the biodiversity, climate change, and sustainable development communities together to encourage dialogue and cooperation and to identify opportunities for maximising policy and science synergies. We hope that the main messages to emerge from the meeting will be useful for informing future work and will provide new impetus for active, integrated work programmes on biodiversity, climate change mitigation and adaptation, and human livelihoods.

4 The meeting's objectives were:

- a To raise the profile of biodiversity within the climate change issue and to encourage decision makers to consider biodiversity, climate change, and human livelihoods together when developing strategies for sustainable development, protection of biodiversity, and reduction of climate change and its impacts;
- b To explore the role and function of biodiversity and ecosystems in the climate system;
- c To consider the role that biodiversity should play in climate change adaptation and mitigation strategies;
- d To identify key areas in which biodiversity, climate change, and sustainable development science and policy can be coordinated;
- e To consider the interactions between human livelihoods, the biosphere and climate in terms of functions and impacts.

## Main discussion

### Role and function of biodiversity and ecosystems in the climate system

5 Ecosystems such as tropical forests, peatlands and the oceans play a major role in climate regulation. Whilst the importance of species and genetic level biodiversity for ecosystem functioning is not fully understood, research suggests that diverse ecological systems tend to be more dynamic and resilient to change, and may play an important role in reducing the impacts of, and enabling adaptation to, climate change.

6 Biodiversity is important in the carbon cycle and other process that regulate climate. Globally, plants absorb and release water and carbon dioxide (CO<sub>2</sub>). They emit biogenic volatile organic compounds such as isoprene, which under certain conditions go on to form groundlevel ozone (an important greenhouse gas), and may also be important for cloud seeding. Marine plankton release dimethyl sulphide which influences cloud formation over the oceans. Landcover

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<sup>2</sup> UK Department for Environment, Food and Rural Affairs.

<sup>3</sup> UK Department for International Development.

<sup>4</sup> UK Joint Nature Conservation Committee.

<sup>5</sup> Royal Botanical Gardens Kew.

<sup>6</sup> Hadley Centre, UK Meteorological Office.

<sup>7</sup> UK Natural Environment Research Council.

characteristics determine albedo tropical rain forests reflect less sunlight than grasslands. All are affected by changes in ecosystems and many involve significant feedbacks in the climate system. However, improved understanding is required of the role of biodiversity in the structure and function of ecosystems, and particularly those biological processes that are important for climate regulation.

7 Ecosystems also deliver a range of other services of importance to human wellbeing. In addition to providing climate regulating services, ecosystems can deliver a range of other benefits to society such as the supply of food, fibre, and water and air purification.

## **Role of biodiversity in climate change adaptation and mitigation strategies**

8 Biodiversity loss is escalating and climate change is accelerating. Biodiversity protection may in its own right contribute to adaptation and mitigation objectives, for example land use change is a major driver of biodiversity loss and greenhouse gas emissions. Appropriate management can therefore result in mutual benefits by reducing emissions, climate change impacts and biodiversity loss, whilst also improving human livelihoods. Such winwinwin solutions should be a political and scientific priority.

9 Under future climate change a more dynamic approach to biodiversity management will be required and may include ecosystem management for enhanced resilience under climate change. A combination of approaches, such as protected areas, ecological networks, and broader landscape management will be necessary, however how these should be applied under climate change requires significant new research. Ecosystem management based on the identification, evaluation, and weighting of the relative risks posed to biodiversity in the context of risks to human wellbeing and climate will become more important.

10 While biodiversity management may potentially result in winwinwin solutions, in many cases politically difficult tradeoffs will be required. Decisionmaking frameworks must be transparent and enable activity to reduce negative impacts. Community based, decentralised, market focused adaptation and mitigation projects should be implemented to build best practice and to test whether winwinwin situations are feasible.

11 Good governance is critical for ensuring that political objectives are effectively delivered, especially where these need to be integrated across sectors. Equity, and cost and benefit sharing issues also need to be considered and resolved. International institutions have an important role to play in providing guidance for the development and implementation of climate change strategies. However national adaptation and mitigation programmes should be prepared according to national and local characteristics and address specific challenges and opportunities. Topdown approaches may be appropriate for the setting of national strategic objectives. However, bottomup approaches will be most appropriate for identifying solutions, priority setting, and programme design and implementation.

## **Opportunities for coordination of policy and science on biodiversity, climate change, and sustainable development**

12 Due to the interdependencies between biodiversity and climate it is possible to develop strategies that achieve mutually supportive outcomes. However, tools are not yet available for prioritising ecosystems for research or management under the integrated framework recommended here. One approach would be to strategically prioritise ecosystems on the basis of their importance in the climate system, biodiversity, and for human livelihoods. Their “relative climate value” could be explored in terms of the function provided by each (eg albedo, carbon cycling), and compared against their biodiversity value, human livelihoods value, adaptation potential, and intervention potential. This would provide a transparent framework for assessing where management (or research) effort should be placed as a priority and would enable the identification of where tradeoffs will be required, or alternatively, where win win win solutions may

be possible.

13 Currently, there are limited international management or governance structures in place for implementing projects at transnational levels or over the longer term. International Conventions such as the CBD<sup>8</sup>, UNFCCC<sup>9</sup>, UNCCD<sup>10</sup>, Ramsar<sup>11</sup>, CMS<sup>12</sup>, and WHC<sup>13</sup>, have taken positive steps in collaborating and taking integrated action on biodiversity and climate change. While the mandates and independence of the other international Conventions must be respected, strengthening and extending the cooperation of Convention secretariats and respective national focal points should be encouraged. Initiatives by other institutions and processes (such as the G8 and Global Environment Facility) should also be encouraged. A flagship project could include an IPCC special report on the interactions between climate change, biodiversity and ecosystem services, and human wellbeing.

14 Inadequate human and societal capacity is a major impediment to the achievement of international biodiversity, climate change, and sustainable development objectives, particularly in developing countries. Efforts to establish and increase capacity for implementation of the international environmental Conventions would provide an opportunity for developing integrated capability at both the strategic and grassroots levels. This will require the development of new mechanisms and methods for assessing progress against policy objectives, and best practice guides for policy development and implementation.

## **Interactions between human livelihoods, biodiversity, and climate in terms of functions and impacts**

15 Climate change is already disrupting species interactions and ecological relationships. Under future change ecological interactions will be disrupted and new species assemblages will be formed with unpredictable results. One of the consequences of changes in interspecies dynamics will be alteration of predator-prey and host-pathogen relationships many of which may impact on human health and productive sectors (eg agriculture, forestry and fisheries), with likely economic consequences. However, there has been very little research on the mechanisms or implications of such changes.

16 Shifts in the extremes of climatic parameters such as temperature and moisture will have an impact on biodiversity although it is difficult to predict to what extent because the ability of many species or ecosystems to respond to changes in climatic extremes is unknown. However, it is expected that many will not be able to adjust to the rate and magnitude of climate change expected over forthcoming decades. Improved understanding of how far these climatic parameters will shift, and the duration and variability of such shifts, will help to inform biodiversity impact assessments and may be useful for the development of remedial management plans. Palaeoecological studies may be useful for informing such assessments.

17 Increasing CO<sub>2</sub> emissions are also causing acidification of the world's oceans. Although all marine ecosystems may be affected by ocean acidification, coral reefs are likely to be most severely impacted with implications for biodiversity and for human livelihoods as many millions of people rely on coral reefs for subsistence, commercial and recreational fisheries.

## **Communication**

18 The interdependencies of the issues of climate change, biodiversity, and human

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<sup>8</sup> Convention on Biological Diversity.

<sup>9</sup> United Nations Framework Convention on Climate Change.

<sup>10</sup> United Nations Convention to Combat Desertification.

<sup>11</sup> The Ramsar Convention on Wetlands.

<sup>12</sup> Convention on Migratory Species.

<sup>13</sup> UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage.

livelihoods must be actively communicated to all levels and sectors of society. The messages are simple;  
climate change is unequivocal;  
adaptation is necessary to cope with inevitable changes;  
mitigation is essential to avoid most dangerous climate change;  
biodiversity is fundamental to human wellbeing and climate regulation and must be central to the development of adaptation and mitigation programmes.

19 Communicating success stories can be a powerful tool for encouraging positive action and the adoption of new practices. However, the urgency of these issues must be translated into terms that are meaningful to different groups in society. The impacts and benefits of taking action, and the costs of inaction, will have more resonance with society if these are communicated in a way that is directly relevant. This is particularly important at the grass roots level as it is here that biodiversity and ecosystems will be actively managed, and at this scale that human livelihoods will be most directly impacted by biodiversity loss and climate change.

20 The climate change community has been successful at communicating the complex science of climate change by using simple metrics to communicate the concepts. Communicating the complexity of the biodiversity issue has not had the same success. Policy makers rely on indicators representing different aspects of biodiversity and no simple tools for communicating biodiversity have yet been agreed. Top level political agreement on the CBD 2010 target and subsequent endorsement at the World Summit on Sustainable Development (WSSD) and the UN General Assembly to significantly reduce the rate of biodiversity loss is a significant step. Now incorporated as a Millennium Development Goal, effort is needed to extend the focus beyond 2010 and to measure progress using strong science and the best data.

21 The 2006 UK Government Stern Report on the economics of climate change has had a major impact on decision makers around the world. However, the report did not reflect the full costs of climate change impacts on biodiversity and ecosystems. A more balanced treatment of the issues of climate change and biodiversity depends on a comparable economic assessment of the costs associated with biodiversity loss as agreed by the G8+5 Environment Ministers in the Potsdam Initiative *Biological Diversity 2010* statement in March 2007.

## Research

22 An internationally strategic approach and wider mechanisms are required to coordinate longterm research on biodiversity, climate, and human livelihoods. These research communities must work more closely together as the exchange of data and other information will be fundamental for progressing research in these areas.

23 To improve our understanding of biodiversity in underpinning ecosystem structure and function, in climate regulation, and in human livelihoods, research into the mechanisms of biodiversity function in these contexts is essential. Biodiversity and climate change inter-relationships require further research and evaluation by the scientific community, and in particular, the hypothesis that systems with high biological diversity are more resilient to global change than less diverse systems requires testing.

24 By focusing research on ecosystems important in the climate system (eg peatlands) in areas where biodiversity is changing rapidly or at a large scale, or where there are major impacts on human livelihoods, we would increase our understanding of the mechanisms of change, feedbacks in the system, and effects of interactions of global change drivers. Palaeoecological information is not currently used to its full potential and may be helpful for improving understanding of how past climate change has affected biodiversity and for informing investigations into the importance of biodiversity for climate regulation.

25 Earth system models provide an important tool for understanding and assessing future climate change and its impacts. The accuracy of these would be improved by including key ecological and physiological processes and more sophisticated representation of the links

between biodiversity and human wellbeing. While it is unclear what level of complexity is required to improve the accuracy of these models it is possible to test model sensitivity to such information. Improved understanding of local and regional climate processes is required for informing climate change prediction and development of adaptation options. There is a similar need for biodiversity assessments. More powerful and sophisticated climate models will be required to undertake this work.

26 Development of scenarios for impacts on biodiversity and ecosystem services under different levels of climate change are necessary for informing the development of management priorities and would be helpful for identifying potentially dangerous levels of biodiversity loss.

## Next steps

27 At the meeting it was recognised that dealing with such a broad range of issues across both the scientific and policy communities is a significant challenge. Solutions will need to be innovative, socially inclusive, and immediate. An unprecedented level of cooperation will be required from all policy and scientific communities to act on the combined threats of climate change, continued biodiversity loss, and human livelihoods.

28 The outcomes from this meeting will be presented at a side event at CBD SBSTTA in July 2007 and a full meeting report will be launched in December 2007 at the UNFCCC Conference of the Parties in Bali, Indonesia.

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**Annex 2:**

**Review of the  
Global Biodiversity Sub-Committee  
of the Global Environmental Change Committee**

Edited by Elizabeth Moore and Richard Ferris  
GBSC Secretariat, JNCC

## **Executive Summary**

The Global Biodiversity Sub-Committee (GBSC) of the UK Global Environmental Change Committee (UK GECC) has been in operation since 2004, under the Chairmanship of Dr Miles Parker, Defra. The GBSC decided to undertake a review of its activities and mode of operation, in order to assess whether it has met its targets and added value to strategic thinking in relation to biodiversity conservation and its sustainable use at the global level.

A survey questionnaire was issued to all GBSC members and a number of external stakeholders with first-hand experience of the Sub-Committee. Their responses form the basis for this Report, and the issues identified for the GBSC to consider have been grouped into the following themes:

### **Terms of Reference and Work Plan**

- Review the ToR and establish a prioritised work plan
- Assess whether the amount of business being undertaken by the group justifies quarterly meetings and consider engaging members in a greater proportion of work between meetings (e.g. through electronic consultation).

### **Communication**

- Ensure good liaison with UK biodiversity initiatives in order to avoid overlaps
- Re-examine the value that the GBSC can add in the context of other initiatives to promote research co-ordination.
- Improve publicity for the GBSC, in order that it is better known and understood by the community from which it draws knowledge and expertise.
- Ensure that GBSC science syntheses are made available internationally
- Work with the main GECC Secretariat, to identify opportunities for re-designing the website, improving its accessibility and content, style and structure.

### **Membership and Engaging others**

- Build upon the strengths of the GBSC by looking beyond its members, to engage with key stakeholders from the science and policy communities, in order to provide the catalyst for future reports.
- Review the GBSC membership to make sure organisations have the most appropriate representative and number of representatives
- Identify opportunities for report back and collaboration with other GECC sub-committees, particularly the Research Sub-Committee
- Establish more regular and formal contact with the main GECC secretariat, and invite them to attend a future meeting of the GBSC

### **Science issues**

- One area the future work plan should include as a priority is to focus efforts on developing an improved understanding of the interactions between biodiversity and climate change, and their relationship with human livelihoods
- Review the scientific papers produced by the GBSC to assess whether the recommendations have been taken forward and identify if there are gaps who should address them.

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## Introduction

### What is the GECC GBSC?

The UK Global Environmental Change Committee (GECC) is an inter-agency cross-governmental committee which was established in 2000. It forms a forum for the co-ordination of the UK's involvement in climate change science and technology, nationally and internationally and reports annually to the Government's Chief Scientific Adviser. Detailed GECC work is undertaken by specialist sub-committees. The remit of the Sub-Committee on Global Biodiversity (GBSC) is to inform UK science strategy relating to biodiversity conservation and sustainable use at the global level, including the implications for human society. It provides an opportunity for members to feed their concerns on global biodiversity issues into a forum for top-level ministers via the annual report to the main GECC.

### Why is a review needed?

The GBSC was established in 2004. At the May 2007 meeting GBSC members agreed to conduct a review of the GBSC from its establishment in November 2004 to June 2007 in order to ascertain stakeholders' perceptions and to ensure the Sub-Committee is meeting its objectives. This was lead by the GBSC Secretariat and it considered the Terms of Reference, membership, successes, the mode of operation and areas for improved performance and efficiency.

### How has the review been undertaken?

Stakeholders, both those directly engaged with the GBSC and a range of other bodies with direct and indirect involvement with the sub-committee, were asked to provide their views in response to a survey questionnaire. The following individuals and organisations have responded, in full or in part:

#### GBSC members

Ian Bainbridge	Scottish Executive
Nick Dulvy	Cefas
Shaun Earl	FCO
Rachel Garthwaite	Royal Society
Pamela Kempton	NERC
Andrea Leedale	Defra
Sarah Nelson	Defra
Miles Parker	Defra
Amanda Reid	BBSRC
Diana Reynolds	Welsh Assembly Government
Andy Stott	Defra
Marcus Yeo	JNCC

#### Non-members

Richard Betts	Hadley Centre, Met Office
Sarah Cornell	QUEST, University of Bristol
Coenraad Krijger	Netherlands Organisation for Scientific Research
Georgina Mace	Imperial College London

The following text is a minimally edited account of the responses to the review survey questionnaire.

## **1. Terms of Reference**

The existing Terms of Reference for the GBSC are given in Appendix 1. Stakeholders were asked to consider:

### *Suggestions for changes to Terms of Reference*

Stakeholders were asked whether they would make changes to the Terms of Reference (ToR). The main issues identified were improvements in communicating and promoting the outcomes of the GBSC's activities to a wider field, and encouraging appropriate organisations to fund research on specific issues. It was felt that if this was not done there would be a significant risk that documents produced by the GBSC would have little influence. Furthermore, it was noted that the GBSC needs to be more proactive in terms of raising its profile, by for example meeting with other parts of Government and promoting integration of biodiversity to other activity. It was suggested that the profile of the GBSC could be raised by establishing a communications and advocacy strategy.

One response suggested that there might be merit in reducing the number of Terms of Reference, for instance removing ToR 5 ("To recommend to the GECC a lead Department/Agency in areas of science and technology where responsibility is unclear") and 6 ("To improve the evidence base and promote wider understanding across Government of science issues concerning global biodiversity") might make for a simpler overview. Furthermore, the actions associated with both of these could be seen as generic actions needed to fulfil other parts of the ToR.

#### **Issues for GBSC to consider:**

1.1 Review the ToR.

### *How activities fit with Terms of Reference*

Stakeholders considered how well the activities carried out to date by the GBSC fit with the ToR. The general feeling suggests that this is achieved well. It was noted that more prioritisation is required to ensure the GBSC undertakes the most important and effective actions. Good progress has been made in some areas, e.g. understanding the implications of new science such as the Millennium Ecosystem Assessment; whilst no progress has been made in other areas (e.g. identifying and evaluating horizon scanning activities). It was suggested that strategic priorities should be agreed by the group at the beginning of each reporting period.

#### **Issues for GBSC to consider:**

1.2 Agree a prioritised work plan at the start of the year, with clear deadlines and assignment of responsibilities. This should take account of the SBSTTA agenda

items of relevance to the GBSC's remit.

*Any conflicts or duplication with the role and remit of other bodies*

Stakeholders generally did not see any conflict or significant duplication with other groups. However, it was noted that there was some overlap with some of the issues discussed by UK BRAG. This was not considered a problem because several GBSC members sit on UK BRAG and are therefore in a position to identify issues where there may be conflict or duplication. A standing item is on the respective agendas.

**Issues for GBSC to consider:**

1.3 Ensure good liaison with UK biodiversity initiatives in order to avoid overlaps.

## 2. Key Successes

*Suggestions for past successes of the GBSC*

Stakeholders noted the Millennium Ecosystem Assessment workshop "*Evaluating the Millennium Ecosystem Assessment: messages, knowledge gaps and policy implications*" held in February 2006 and the joint Royal Society and GBSC workshop "*Biodiversity and Climate interactions: adaptation, mitigation and human livelihoods*" held in June 2007 and the communication of findings from this workshop to CBD SBSTTA as key successes. They were successful in bringing together a wide range of participants and they helped to raise the profile of the group as well as the topics they covered.

Papers on specific themes, e.g. ocean acidification, invasive alien species and capacity in the overseas territories were noted as successes; along with presentations to the GBSC from a variety of relevant bodies such as ERFF, Diversitas, CABI, UNEP-WCMC and the Hadley Centre, which provided the catalyst for the papers and workshops.

It was noted that the GBSC influenced and contributed to the creation of NERC-DfID-ESRC funding programme *Ecosystems Services for Poverty Alleviation (ESPA)*.

**Issues for GBSC to consider:**

2.1 Build upon the strengths of the GBSC by looking beyond its members, to engage with key stakeholders from the science and policy communities, in order to provide the catalyst for future reports.

*Does the GBSC provide added value*

- (i). *generally, i.e. to the coordination of research on global biodiversity issues, and*  
(ii). *to your organisation, through your membership?*

In response to the first part of this question, most stakeholders felt that there was some added value from the GBSC generally through engaging with the biodiversity community. However, it was noted that much of the value probably goes to Defra, providing input for its co-ordination of contributions to SBSTTA and other global biodiversity initiatives. Members were unconvinced that the GBSC goes beyond that to coordinating research and facilitating integration across the whole of the UK community.

It was felt that the GBSC has a valuable role to play in advising on global biodiversity research issues and is good at raising the profile of specific biodiversity issues with scientists and policy makers. Furthermore, it was acknowledged that the committee has done a good job of dealing with emerging issues and new science and facilitating a rapid and focussed response, for example to the publication of the Millennium Ecosystem Assessment through the workshop and guiding the joint DfID, NERC and ESRC Ecosystem Services for Poverty Alleviation Programme.

In response to the value the GBSC adds to members, it was generally felt that it is a useful forum for exchanging information from a range of funders, end users, policy makers and stakeholders. This opens up the opportunity for collaboration and therefore reduces the risk of duplication and effort. It provides a forum through which members can promote issues of importance to them and enhances understanding of key issues.

**Issues for GBSC to consider:**

2.2 Re-examine the value that the GBSC can add in the context of other initiatives to promote research co-ordination.

### **3. Lessons learnt, problems encountered, things the GBSC could do better**

*Details of past failures of the GBSC.*

Stakeholders identified a number of issues which could be improved. These were a relative lack of publicity for GBSC outputs, a lack of influence over research funders, at times, a somewhat un-strategic approach to identifying key issues of concern, slow progress with certain issues and a lack of perception by the biodiversity community over what the GBSC is.

**Issues for GBSC to consider:**

3.1 Improve publicity for the GBSC, in order that it is better known and understood by the community from which it draws knowledge and expertise. Raising the profile

of the GBSC by improving publicity for its outputs could help to influence research funders.

3.2 Review the scientific papers produced by the GBSC to assess whether the recommendations have been taken forward and identify if there are gaps who should address them.

## 4. Membership

Current membership of GBSC is given at Appendix 2. Stakeholders were asked to consider:

*If the group has the most appropriate membership in terms of the organisations represented?*

Stakeholders felt that, in general, the membership of the group was appropriate. However, the comment was made that a significant proportion of the members come from a single organisation (i.e. Defra), and it was noted that this might not be the most appropriate committee structure for ensuring that the interests of all the stakeholders are considered. Furthermore, the comment was made that as far as possible members need to be able to represent their organisation on a range of environmental issues.

Suggestions for additional members included: Natural England, the Met Office Hadley Centre, the MoD, the Zoological Society of London, the Office of Science and Innovation, and the Environment Agency. It was suggested that corresponding membership be extended for all the Devolved Administrations.

It was noted that the flow of information about current research in academia and research centres is probably constrained by the quality of the connections between the research councils and their research scientists. The suggestion was made for the research councils to operate as 'hubs' for information flow (given that not every scientist can talk to every policy person). This is very much an area under development given the current growing emphasis on science for policy.

### **Issues for GBSC to consider:**

4.1 Review the GBSC membership to make sure organisations have the most appropriate representative and number of representatives.

## 5. Mode of Operation

The GBSC currently operates through 4 main meetings a year (to which members are invited) and sub-groups to address specific themes. It submits an annual summary report to the main GECC for consideration at their annual meeting in October. It has also held two workshops, one on the Millennium Ecosystem

Assessment in February 2006 and one on biodiversity and climate linkages in June 2007. Stakeholders were asked to comment on:

*The current structure and how well it works*

The current *modus operandi* of the sub-committee was generally considered to work well. Some respondents felt that the existing meetings cycle was appropriate however other members questioned the amount of work the group can undertake between meetings and wondered whether there were opportunities for collaboration with other GECC sub-committees.

**Issues for GBSC to consider:**

5.1 Assess whether the amount of business being undertaken by the group justifies quarterly meetings and consider engaging members in a greater proportion of work between meetings (e.g. through electronic consultation).

5.2 Identify opportunities for report back and collaboration with other GECC sub-committees, particularly the Research Sub-Committee.

5.3 Establish more regular and formal contact with the main GECC secretariat, and invite them to attend a future meeting of the GBSC.

*Other mechanisms for achieving objectives e.g. internet etc.*

It was noted that e-conferences might provide an alternative to holding a workshop since they also provide an opportunity to summarise the current position on bigger issues. It was also noted that it is important to consider how the GBSC can disseminate information to researchers and the wider community who may have an interest in the issues.

The GBSC Secretariat (provided by Richard Ferris and Elizabeth Moore, JNCC) works with members to plan the agendas, prepare papers and circulate information. It provides minutes of the meetings and action points, and follows these up with members between meetings. Stakeholders were asked to consider:

*Whether the Secretariat has the most effective working methods?*

Stakeholders commented that the Secretariat is hardworking and efficient, and all activities have been organised smoothly in a timely fashion.

The GBSC has a web presence as part of the main UK GECC website. This provides general information about the group and other sub-committees, information about the meetings and announcements concerning relevant events and publications. Stakeholders were asked to comment on:

*The usefulness of the web site for general information and for member-specific information*

Stakeholders noted that the website is only moderately useful, as it focuses on minutes of meetings, rather than providing access to information on the bigger picture. The comment was made that it is quite hard to find and it is in need of updating.

#### *How frequently you use the web site*

None of the responses indicated a high frequency of use, and most reported that they rarely used the site. This is unfortunate, given the intention to post important documents on the GBSC page, and the need for the GBSC to engage more fully with the other sub-committees of the main GECC.

#### *Any improvements that could be made.*

Stakeholders noted that the basic listing (keyword categorisation for search engines) for the site could be improved considerably, so that it appeared when people searched for it under “GBSC”.

The site would benefit from a more attractive homepage, a latest news section highlighting recent and ongoing activities and products, a list of future meetings, a clearer section on publications and analytical papers and links to biodiversity research sites and other useful publications.

#### **Issues for GBSC to consider:**

5.4 Work with the main GECC Secretariat, hosted by ESYS, to identify opportunities for re-designing the website, improving its accessibility and content, style and structure.

## **6. Engagement with non-members**

*The GBSC opened its review to non-members with whom it had contact, in order to get an external view of its work. Non-members were asked to consider what their organisation required from the GBSC or a similar body.*

Non-members noted they were seeking insights into how best to channel science findings into the policy domain; guidance on how best to shape or communicate research activities for use in the policy domain; information about topical questions where non-members’ expertise may be of use; information about accessing syntheses of science and making the most appropriate use of information arising from them.

*Non-members were asked what scientific issues the GBSC should address as priorities in the next five years.*

Non-members suggested interactions between biodiversity and climate change, from both science and policy perspectives. The biodiversity and climate change workshop highlighted lots of potential synergies which are yet to be explored fully.

It was also noted that properly integrated knowledge seems to be a bit of a gap and that biodiversity matters most now because of human impacts, but tools to understand and manage the issues are very limited (and poorly critiqued).

**Issues for GBSC to consider:**

6.2 Ensure that GBSC science syntheses are made available internationally.

6.3 One area the future work plan should include as a priority is to focus efforts on developing an improved understanding of the interactions between biodiversity and climate change, and their relationship with human livelihoods.

## APPENDIX 1: GECC GBSC Terms of Reference & Work Programme

Terms of Reference	Proposed actions	Progress	Actions to be taken
<p>1. To ensure that Government policy on global biodiversity conservation is both sufficiently informed by, and informs the work undertaken to develop, the science base.</p>	<p><b>(1.1)</b> Complete, maintain and disseminate the paper (GBSC (05) 06) on international conventions and commitments as a reference document/database identifying the main global policy and science commitments which need to be informed by the UK science base. The document/database should be developed to include contact details for the relevant policy and science adviser leads (<b>Secretariat and GBSC members</b>)</p> <p><b>(1.2)</b> Detect and review major new, ground-breaking research of relevance to global biodiversity policy and provide critical reviews for the GBSC (<b>GBSC members and Secretariat</b>).</p>	<p>(1.1) Broadly complete</p> <p>(1.2) Links with ERA Nets including BioDivERsA, ERFF. Paper on ocean acidification research priorities, May 07, biodiversity and climate change workshop held June 07,</p>	<p>(1.1) Finish document and make sure it is up-to-date (<b>Secretariat, GBSC members</b>)</p> <p>Post onto GECC website (<b>Secretariat</b>)</p> <p>Update annually (<b>Secretariat</b>)</p> <p>(1.2) BBSRC Symposium 29 Aug 07.</p> <p>(1.2) Select small number of universities with global biodiversity research programmes. Ask universities what is happening in terms of biodiversity research. (<b>Secretariat</b>)</p>

Terms of Reference	Proposed actions	Progress	Actions to be taken
<p><b>2.</b> To identify significant gaps in scientific understanding of global biodiversity change and propose options for addressing them, including through collaborative programmes with EU and other international players.</p>	<p><b>(2.1)</b> Influence, develop and supplement existing processes for knowledge gap analysis at UK (e.g. ERFF), EU (e.g. EPBRS<sup>14</sup>) and international (e.g. SBSTTA<sup>15</sup>) scales. The Millennium Ecosystem Assessment (MA) provides a good starting point for such an analysis, building on work by UNEP-WCMC. Take forward by organising a UK workshop on MA to review findings, policy responses and gaps in scientific knowledge (<i>Defra, Secretariat</i>).</p> <p><b>(2.2)</b> Provide advice to ERFF on research needs for global biodiversity research (<i>Secretariat, GBSC members</i>).</p> <p><b>(2.3)</b> Further consider options for reviewing global biodiversity knowledge gaps through EPBRS and SBSTTA (Review of Operational Plan, Scientific Assessments) (<i>Defra</i>).</p>	<p>(2.1) MA workshop held 3 Feb 2006, report posted on GECC website. Recommendations mapped against activities in GBSC organisations.</p> <p>(2.2) Ongoing</p>	<p>(2.1) Synthesise recommendations against activity. (<i>Secretariat, Defra</i>)</p>

<sup>14</sup> The European Platform for Biodiversity Research Strategy is a forum for scientists and policymakers, to ensure that research contributes to halting the loss of biodiversity by 2010. Its participants, from across Europe, meet to identify and promote strategically important biodiversity research that will contribute to policies and management to reduce biodiversity loss.

<sup>15</sup> Convention on Biological Diversity Subsidiary Body on Science, Technical and Technological Advice

Terms of Reference	Proposed actions	Progress	Actions to be taken
<p>3. To identify and keep under review, emerging scientific questions concerning global biodiversity, evaluate their significance, and make recommendations;</p>	<p><b>(3.1)</b> Engage with existing horizon scanning (HS) initiatives by GBSC members such as Defra, OST and the research councils. Identify status of HS work amongst GBSC members, arrange for presentations of these initiatives to be made to GBSC, focusing on issues relevant to global biodiversity change, and provide feedback (<b>GBSC members</b>).</p> <p><b>(3.2)</b> Evaluate significance and report back to GECC (<b>Secretariat, GBSC members</b>).</p> <p><b>(3.3)</b> Keep under review scientific literature and bring to the attention of the Committee any major emerging issues (<b>GBSC members, Secretariat</b>).</p>	<p>(3.1) No progress made</p> <p>(3.2) see above (3.1)</p> <p>(3.3) Permanent item on GBSC agenda discussed at each meeting.</p>	<p>(3.1) Establish the extent to which members use HS as an approach, and what length of time is considered. <b>(Secretariat, GBSC members)</b></p> <p>(3.2) Arrange for presentations of global horizon scanning initiatives to be made to the GBSC e.g. OSI, Defra horizon scanning team. <b>(Secretariat, GBSC members)</b></p>
<p>4. To review the effectiveness of the national capacity, capability and performance in this area;</p>	<p><b>(4.1)</b> Identify extent of overlap of this objective with ERFF and relevant ERA-Nets, review existing initiatives and seek to ensure that global biodiversity change is identifiable within more general assessments of funding and capacity (<b>Secretariat</b>).</p>	<p>(4.1) Papers and discussion on taxonomy, mycology, capacity in the OTs and Royal Society workshop.</p>	<p>(4.1) Need to keep this issue live. Review every 6 months</p> <p>(4.1) Recommendations from RS workshop need to consider capacity issues</p>
<p>5. To recommend to the GECC a lead Department/Agency in</p>	<p><b>(5.1)</b> Identify any lack of clarity in responsibilities emerging from the</p>		

Terms of Reference	Proposed actions	Progress	Actions to be taken
<p>areas of science and technology where responsibility is unclear;</p>	<p>papers and discussions under ToR 4 and seek advice from GECC if necessary (<b>Secretariat, GBSC members</b>).</p>		
<p>6. To improve the evidence base and promote wider understanding across Government of science issues concerning global biodiversity.</p>	<p><b>(6.1)</b> Develop a website to facilitate communication between members and to ensure wide access to results of GBSC activities (<b>Secretariat</b>)</p> <p><b>(6.2)</b> Prepare annual report to GECC for their annual meeting in October.</p> <p><b>(6.3)</b> Review the approach taken in other GECC Sub-Committees</p> <p><b>(6.4)</b> Identify contacts for engaging with funding bodies and relevant committees (akin to work in UK BRAG) (<b>Secretariat, GBSC members</b>).</p>	<p>(6.1) GBSC activities posted on GECC website <a href="http://www.ukgecc.org">www.ukgecc.org</a></p> <p>(6.2) GBSC annual report to main GECC submitted September.</p>	<p>(6.2) Prepare and submit annual report by 29 September 2007 (<b>GBSC Secretariat</b>)</p>
<p>7. To recommend strategic priorities for UK and EU science relating to global biodiversity;</p>	<p><b>(7.1)</b> Identify target audience then investigate their timetables for reviews of strategic priorities for UK and EU Science and ensure that the GBSC contributes effectively to consultations directly (<b>Secretariat</b>). <i>See also Action 2.2</i></p> <p><b>(7.2)</b> Provide advice for SBSTTA</p>	<p>(7.1) One of the priorities in the NERC research strategy is biodiversity</p> <p>(7.2) Ongoing</p>	<p>(7.1) Members to inform Secretariat of any strategic reviews including a timetable of activities. (<b>GBSC members</b>)</p> <p>(7.1) Communicate with ERFF about strategic</p>

Terms of Reference	Proposed actions	Progress	Actions to be taken
	<p>agenda</p> <p><b>(7.3)</b> Provide advice to EPBRS meetings and consider recommendation statements.</p>	<p>(7.3) Ongoing</p>	<p>reviews.</p>
<p><b>8.</b> To advise on and facilitate collaborative scientific investigation of global biodiversity change;</p>	<p><b>(8.1)</b> Determine the extent to which GBSC can add value to other initiatives such as BRAG and the BiodivERsA ERA-Net (<i>Secretariat</i>).</p>	<p>(8.1) Some GBSC members also involved in BRAG and the BiodivERsA ERA-Net</p> <p>(8.1) GBSC members role in the joint Ecosystem Services and Poverty Alleviation programme (NERC, ESRC, DfID)</p> <p>(8.1) GBSC-led workshops including the MA workshop, Feb 06 and the biodiversity and cc workshop June 07.</p> <p>(8.1) Collaboration of working group on ocean acidification research priorities.</p>	

## APPENDIX 2: GECC GBSC MEMBERSHIP

Membership as of 1<sup>st</sup> August 2007

Ian Bainbridge, Scottish Executive  
Eric Blencowe, Defra<sup>16</sup>  
Nick Dulvy, CEFAS  
Shaun Earl, FCO  
Richard Ferris, JNCC (Secretariat)  
Rachel Garthwaite, Royal Society<sup>17</sup>  
Mary Gibby, Royal Botanic Garden Edinburgh  
Gary Grubb, ESRC  
Pamela Kempton, NERC  
Izabella Koziell, DfID<sup>18</sup>  
Andrea Leedale, Defra<sup>19</sup>  
Chris Lyal, Natural History Museum  
Elizabeth Moore, JNCC (Secretariat)  
Sarah Nelson, Defra<sup>20</sup>  
Eimear Nic Lughadha, Royal Botanic Garden Kew  
Miles Parker, Defra (Chair)  
Amanda Read, BBSRC<sup>21</sup>  
Andy Stott, Defra  
Vin Fleming, JNCC<sup>22</sup>

Corresponding members:

Michael Dunn, NAW<sup>23</sup>

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<sup>16</sup> Replacing Glenys Parry, who served as a member between 2004-2007

<sup>17</sup> Replacing Geoff Boxshall, who represented both the Royal Society and the Natural History Museum, 2004-2005

<sup>18</sup> Replacing Simon Anderson, who served as a member between 2004-2006

<sup>19</sup> Replacing Paul Leonard, who served as a member between 2004-2007

<sup>20</sup> Replacing Madeleine Garlick, who served as a member between 2004-2006

<sup>21</sup> Replacing Clare Rushowski, who served as a member between 2004-2005 (Vicky Jackson attended on behalf of BBSRC, 2005-2006)

<sup>22</sup> Replacing Marcus Yeo, who served as a member between 2006-2007 (Paul Rose and Wyn Jones attended on behalf of JNCC, 2004-2006)

<sup>23</sup> Replacing Gareth Jones, who served as a corresponding member between 2004-2007

Tracey Elliott, World Team, OST International  
Martin Brasher, Defra

Additional/minutes only:

Katherine Bass, Defra

Mike Meharg, DOENI

Alan Whitelaw, Esys (GECC Secretariat)

David Warrilow, Defra