Project no: ERAC-NET 2005-517836

Project acronym: BIODIVERSA

Project title: An ERA-NET in Biodiversity Research

Instrument: Coordination Action

Thematic Priority ERA-Net

Scoping workshop – summary report
D2.2

Report of analyses of survey responses
D2.3

Workshop report on methods to overcome the barriers identified in partner institutions
D2.9

Report with recommendations for more effective collaboration
D2.11

Due date of deliverable: February 2006, April 2006, October 2006 and January 2006
Actual submission date: October 2006

Start date of project: May 1st, 2005
Duration: 4 years

Organisation name of lead contractor for this deliverable: DEFRA and ESF
An Assessment of Best Practice in Commissioning and Managing Biodiversity Research in Europe, and Approaches to Overcoming Barriers to Cooperation

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July 2006
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Executive Summary

In common with many ERA-Nets, BiodivERsA has a work package concerned with identification of best practices and barriers to implementation. This report focuses on two of the tasks comprising this work package, namely:

1. comparison of methods used to prioritise, manage and fund national and European trans-national biodiversity research; and
2. identify all the barriers facing the closer integration of biodiversity research in Europe, and produce recommendations for overcoming barriers to collaboration.

BiodivERsA has addressed these tasks through a survey questionnaire, issued to all partners in the consortium (plus a number of additional funding organisations in the various countries); a workshop dedicated to looking at the main issues; and a series of face-to-face discussions (case studies) with selected partners.

The main findings from this work are summarised below:

- BiodivERsA must recognise success in achieving integration in any or all of the following different areas: **science** (identifying overlap and selecting topics for joint working), **management** (assessment, monitoring and evaluation), and **finance** (testing of various mechanisms).
- Active engagement of all partners in programme development is critical, in order to identify partners’ roles and responsibilities and to build trust.
- There is a consensus on a common call, with a preference for national funding. Therefore partners must agree how to share the associated programme costs. There is still potential for a common pot: among selected partners who wish to join their funding, and/or to deal with common costs.
- Maintaining national funding would avoid legal problems associated with transferring funds to foreign researchers. However, many of these traditional barriers seem to be being broken down as more ERA-NETs are developed. Although barriers do exist, the main issues seem to be based around:
  - identifying research questions to satisfy the range of BiodivERsA partners and maximise the benefits of BiodivERsA
  - building trust in the processes and in partners to deliver them
  - demonstrating added value e.g. avoiding overlap with other ERA-NETs

Many examples of good practice in programme management already exist, within the different partner organisations and other ERA-NETs. This report discusses in more depth those most relevant to BiodivERsA. We suggest that as this work is developed under Workpackage 3, particular attention is paid to:

- assessment criteria for project selection: a reliable suite of measures to ensure not just scientific quality but other needs such as communication and knowledge transfer.
- monitoring and evaluation: including criteria, procedures and timing, which reflect the aims of both projects and the overall programme and allow sufficient time for results and impacts to develop. These costs will need to be built into programme planning.
• maximising added value e.g. training of researchers and administrators, setting aside funds for activities to develop collaboration e.g. workshops or summer schools.
• transparency of all processes including appeals.
• demand management, including the use of a two-stage procedure to reduce the numbers of full proposals.
• minimising bureaucracy wherever possible.
## Glossary

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AGRIPOCES</td>
<td>AGRicultural POlicy-Induced LandscaPe Changes: effects on biodiversity and Ecosystem Services</td>
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<td>ALTER-Net</td>
<td>A Long-Term Biodiversity, Ecosystem and Awareness Research Network</td>
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<tr>
<td>AKA</td>
<td>Finnish Academy of Sciences</td>
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<td>BELSPO</td>
<td>The Belgian Science Policy Office</td>
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<td>BiodivERsA</td>
<td>ERA-Net for Biodiversity Research and Coordination</td>
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<tr>
<td>Blue skies</td>
<td>Responsive mode research schemes</td>
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<td>BONUS</td>
<td>The Joint Baltic Sea Research Programme</td>
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<tr>
<td>CIRCLE</td>
<td>Climate Impact Research Coordination for a Larger Europe</td>
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<tr>
<td>Common call</td>
<td>A joint call by partners, each funding own national researchers</td>
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<td>Common pot</td>
<td>A joint call by partners, with shared funding of successful applications</td>
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<tr>
<td>Defra</td>
<td>Department for Environment, Food and Rural Affairs</td>
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<td>EPBRS</td>
<td>European Platform for Biodiversity Research Strategy</td>
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<tr>
<td>ERA-BUILD</td>
<td>ERA-Net on sustainable construction and operation of buildings</td>
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<tr>
<td>ERA-Chemistry</td>
<td>ERA-Net in science-oriented chemical research</td>
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<tr>
<td>ERA-Net</td>
<td>European Research Area Network scheme of the European Commission</td>
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<tr>
<td>ERA-Net Plus</td>
<td>A new element of the ERA-Net scheme, proposed under FP7, whereby the EC provides a top-up contribution to trans-national calls</td>
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<tr>
<td>ERA-PG</td>
<td>ERA-Net Plant Genomics</td>
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<tr>
<td>ESF</td>
<td>European Science Foundation</td>
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<tr>
<td>EUROCORES</td>
<td>Programme coordinated by ESF, in which funding is provided by participating national organisations</td>
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<tr>
<td>EuroDEEP</td>
<td>A EUROCORES programme concerned with ecosystem functioning and biodiversity in the deep sea</td>
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<tr>
<td>EuroDIVERSITY</td>
<td>A EUROCORES programme concerned with the challenges of biodiversity science</td>
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<tr>
<td>EUROHORCS</td>
<td>An association of European Heads of Research Councils</td>
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<tr>
<td>EURYI</td>
<td>ESF European Young Investigator Awards</td>
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<td>FCT</td>
<td>Fundação para a Ciência e a Tecnologia, Portugal</td>
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<td>FEC</td>
<td>Full Economic Costing</td>
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<td>Formas</td>
<td>The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning</td>
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<tr>
<td>Framework Programme 7</td>
<td>The European Union’s main instrument for funding research and development, 2007-2013</td>
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<td>FWF</td>
<td>Austrian Science Fund</td>
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<td>FWO</td>
<td>The Research Foundation – Flanders</td>
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<td>GBIF</td>
<td>Global Biodiversity Information Facility</td>
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<tr>
<td>Horizon Scanning</td>
<td>Systematic examination of potential threats, opportunities and likely future developments, including those at the margins of current thinking and planning</td>
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<tr>
<td>IPR</td>
<td>Intellectual Property Rights</td>
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<tr>
<td>IRCSET</td>
<td>The Irish Research Council for Science, Engineering and Technology</td>
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<tr>
<td>IWWM-Net</td>
<td>ERA-Net Integrated Water Resources Management</td>
</tr>
<tr>
<td>Lisbon Agenda</td>
<td>EU agreement, signed in March 2000, aimed at the EU becoming the most dynamic and competitive knowledge-based economy in the world</td>
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<tr>
<td>MARIFISH</td>
<td>ERA-Net on strengthening the links between European marine fisheries science and fisheries management</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<td>MarinERA</td>
<td>ERA-Net marine sciences</td>
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<td>NERC</td>
<td>Natural Environment Research Council</td>
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<tr>
<td>NORFACE</td>
<td>ERA-Net New Opportunities for Research Funding Cooperation in Europe</td>
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<tr>
<td>NWO</td>
<td>Nederlandse Organisatie voor Wetenschappelijk Onderzoek</td>
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<tr>
<td>OST</td>
<td>Office of Science and Technology, U.K.</td>
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<tr>
<td>OTKA</td>
<td>Hungarian Scientific Research Fund</td>
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<tr>
<td>PEER</td>
<td>Partnership for European Environmental Research</td>
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<tr>
<td>RAPID</td>
<td>NERC (UK) programme on Rapid Climate Change</td>
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<tr>
<td>SDS</td>
<td>Sustainable Development Strategy of the European Commission</td>
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<tr>
<td>SEPA</td>
<td>Swedish Environmental Protection Agency</td>
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<tr>
<td>SKEP</td>
<td>ERA-Net Scientific Knowledge for Environmental Protection</td>
</tr>
<tr>
<td>SMART MIX</td>
<td>NWO (NL) programme to promote economic, social and cultural innovation</td>
</tr>
<tr>
<td>SNOWMAN</td>
<td>ERA-Net Sustainable maNagement of sOil and groundWater under the pressure of soil pollution and soil contaMinAtioN</td>
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<tr>
<td>Thematic programmes</td>
<td>Directed programmes of research</td>
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<tr>
<td>VR</td>
<td>Vetenskaprådet (Swedish Research Council)</td>
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<tr>
<td>WOODWISDOM</td>
<td>ERA-Net networking and integration of national programmes in the area of wood material science and engineering</td>
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Acknowledgements

The authors wish to thank the following for their practical help and contributions to this Report:

Agnès Marhadour (FCT, Portugal)
Jan Dijkstra, Coenraad Krijger, Frans Martens, Berry Bonenkamp, Mirjam Groot, Frank Zuijdam, Marije Verschuur, Ruud Strijp (NWO, The Netherlands)
Margareta Bergman, Hans Örjan Nohrstedt (Formas, Sweden)
Lars Nilsson, Margareta Eliasson, Magnus Friborg (VR, Sweden)
Janne Bengtsson (on behalf of VR, Sweden)
Thomas Nilsson, Marie Emanuelsson (SEPA, Sweden)
Pamela Kempton (NERC, United Kingdom)
Deborah Boobyer (Defra, United Kingdom)
1. Introduction

1.1 Aims and Objectives

The BiodivERsA “description of work” states that the project will design, agree and disseminate best practices in relation to scientific evaluation of projects and funding procedures. In order to achieve this, it is necessary to:

- Compare the methods used to manage biodiversity research in each country, including foresight, programme structures, project selection, monitoring, evaluation and benchmarking;
- Identify the technical, legal, administrative and other barriers to the closer integration of biodiversity research in Europe, and place this in the context of other relevant areas of academic and applied research and other ERA-Nets;
- Make recommendations for overcoming these barriers to cooperation, both between BiodivERsA partners and other potential partners.

1.2 Approach

A survey questionnaire was issued to all BiodivERsA partners (see Appendix 1), addressing questions concerned with both best practices and barriers to trans-national cooperation. These data were collected in a single exercise in order to reduce the amount of paperwork required of partners, but are identified as distinct Tasks within Work Package 2. Due to the complementary nature of these tasks, the results have been combined into a single report.

In addition, a workshop was held in Peterborough, U.K., 22-23 February 2006, to provide partners with an opportunity to reflect on the survey responses and look in more detail at issues surrounding best practice and barriers to trans-national cooperation. This demonstrated that the survey responses allowed a general view to be formulated but in many cases, the information supplied did not provide the detail required for best practices to be appraised critically.

It was considered essential that the exercise be extended, in order to “drill down” into the practices adopted by the various partners. With 19 partner organisations forming the BiodivERsA consortium, it was decided that detailed case studies should only be undertaken for selected members. These were selected on the basis of:

- The range of experiences at a European and international level (including membership of ERA-Net Projects);
- The level of research funding available;
- A selection of Ministries, Research Councils, and agencies.

The remaining partner profiles were built up from the survey responses plus a few supplementary questions dealt with by electronic mail.

Generic issues have been identified from these case studies, and form the basis of the discussions that follow. Information specific to each partner organisation is provided in Appendix 2.
2. Background

2.1 The value of ERA-Nets

The European Commission has recognised that

“A major factor in achieving the goal of a European Research Area (ERA) will be the increased coordination and coherence of national and regional research programmes.”

If this is to be achieved, collaborating partners need to understand each other’s working practices, and converge upon a common approach to the management of research. The perception that a “best practice” exists may be unrealistic, but the range of funding bodies in existence suggests that many different approaches will have been adopted, necessitating an evaluation of these various practices. The aim should be to arrive at a set of principles to which all partners in an ERA-Net consortium can sign up, in order to move forward in developing and managing common calls for research.

The growing number of ERA-Nets currently being supported means that there is a risk of duplication of effort. Many ERA-NETs have work packages that aim to identify best practice among partner organisations and, although these may differ from the partners in the BiodivERsA consortium, there are likely to be many generic practices, applicable across research sectors. Furthermore, many of the BiodivERsA partners are members of multiple ERA-Nets.

Consequently, it is important that ERA-Net partners with responsibility for working on identifying best practice share information between projects.

2.2 Why is international cooperation in biodiversity research important?

Biodiversity loss is an issue with complex social, economic, cultural, and ecological dimensions. Dealing with it requires complex solutions. Although this is a global crisis:

“The growing human population of 6.5 billion is undermining the environment for animals and plants via pollution, expanding cities, deforestation, introduction of “alien species, and global warming…Overall, unsustainable consumption continues, as indicated by the human species’ growing global ecological footprint. The global demand for resources now exceeds the biological capacity of the Earth to renew these resources by some 20 percent.”

Global Biodiversity Outlook 2
Secretariat of the Convention on Biological Diversity (2006)

Many pressures and drivers have local elements, and solutions often require detailed local or regional knowledge. Developing policy options to manage the crisis will require a proper understanding of why and how biodiversity is changing, and the
integration of knowledge from many different disciplines. This is a difficult task, and for the moment, successful examples of fully integrated research are rare.

The EU has made significant commitments to biodiversity conservation. In 2001, EU Governments agreed “to halt the decline of biodiversity (in the EU) by 2010” and to “restore habitats and natural systems”. At Community level, a policy framework to halt biodiversity loss in the EU exists, with biodiversity objectives now integrated in the Sustainable Development Strategy (SDS) (European Commission 2005a) and implicit in the Lisbon Agenda (European Commission, 2000a and b, 2005b) for growth and jobs (to achieve the Lisbon goals requires every Member State to perform to its full economic potential; but this must also go hand in hand with improvements in our environment and quality of life (European Commission, 2003), as well as a wide range of environmental and sector policies.

An EC Biodiversity Strategy was adopted in 1998, and related Action Plans in 2001. Most Member States have also developed, or are developing, national strategies and/or Action Plans. There is concern that both the pace and extent of implementation have been insufficient, and the European Platform for Biodiversity Research Strategy (EPBRS) has highlighted the large number of gaps that still exist in our knowledge and have identified the research required to address these and inform the debate. BiodivERsA presents an opportunity to inform the debate, in a manner maximised by the participation of not just Research Councils, but agencies such as Defra (UK) and SEPA (Sweden). Obviously, coming from such diverse backgrounds, this also creates further challenges in agreeing research priorities and focus.

2.3 Current examples of trans-national cooperation: an introduction to different funding models

The funding models that exist can be summarised into three main types, as follows:

- national call, evaluation and funding
- joint call and evaluation, national funding
- joint call, evaluation and funding

National call, evaluation and funding
In this model:
- organisations agree the overall theme
- each partner launches a national call in their agreed field
- national organisations are responsible for evaluation and funding decisions
Joint call and evaluation, national funding

In this model:

- partners agree the overall research theme and launch a joint call for a common research programme
- an international panel evaluates proposals
- funding organisations make final decisions, each partner funds national researchers

Case study: ESF EUROCORES

The EUROpean Science Foundation COllaborative RESearch Scheme (EUROCORES) is one of the newer funding instruments of the ESF and the only one to provide full support for research projects. EUROCORES programmes aim to create the critical mass necessary for scientific excellence, by enabling researchers in different European countries to develop collaboration and scientific synergy in areas where European scale and scope are required for cutting edge science in a global context. Each project must have partners from a minimum of 3 different participating countries. In some cases, funding agencies outside of Europe may also join the programme, adding a further international dimension.

Whilst research funding is provided by national Funding Agencies, the ESF carries out coordination, networking and dissemination activities for each programme. Funding for these activities is currently supported by a European Commission Contract under the Sixth Framework Programme (EC contract no. ERAS-CT-2003-980409). Should this support be discontinued under the Seventh Framework Programme, the ESF will request support for the management and networking costs from the participating Funding Agencies.

Case study: The European Platform for Biodiversity Research Strategy (EPBRs)

EPBRs is a forum for scientists and policy-makers to ensure that research contributes to halting the loss of biodiversity by 2010. Its participants meet twice yearly in order to identify and promote strategically important biodiversity research that will contribute to policies and management. The main tangible deliverable of each EPBRs meeting is a short written agreement of the group on issues that are of high scientific and policy importance.

EPBRs does not act as a funding organisation, and so delegates are responsible for promoting the recommendations at their own national level, i.e. through national platforms. The forms and functions of these platforms depend on the needs and administrative landscape of each country, but they can be useful in influencing the research community and the allocation of resources by funding bodies.

As such, the direct influence of EPBRs on national programmes is difficult to demonstrate. However, the critical mass achieved by the sharing of expertise across Europe, ensures that EPBRs agreements carry some weight among the academic and research funding communities. For example, in the UK, EPBRs agreements are used to reinforce the thinking of the Biodiversity Research Advisory Group (BRAG), forming a constituent part of research strategies for specific research themes. In this way, some EPBRs recommendations can become part of research programmes funded by Defra or NERC, among others.
A summary of the scheme may be found at www.esf.org/medias/EUROCORES80x120juin2006final.pdf.

Programme topics may be suggested by researchers or funding organisations, in response to an annual call. The EUROCORES committee selects 5 themes to be developed into EUROCORES programmes, which are then subject to a strategic consultation amongst ESF Member Organisations. When the scientific scope is defined, Member Organisations are formally invited to participate; subject to sufficient commitment, a call for proposals is launched.

Proposals are sent to the ESF office where they are sifted by an international review panel. Invited full proposals are subject to international peer review, before being ranked by the review panel. Finally, the national Funding Agencies make their final funding decisions in accordance with this ranked list. Some consortia may no longer be viable at this stage if a key partner is lost because a Funding Agency does not have sufficient budget to fund all of the highly ranked proposals.

To date 21 EUROCORES programmes have been launched in a variety of subjects. Those most relevant to BiodivERsA are EuroDIVERSITY (Challenges of Biodiversity Science), which launched a call for proposals in 2004 and EuroDEEP (Ecosystem Functioning and Biodiversity in the Deep Sea), which launched a call for proposals in 2006.

**Joint call, evaluation and funding**

In this model:
- partners agree the overall research theme
- partners launch a common call and evaluate applications jointly
- research funding comes from a common pot, with highest-ranked proposals funded

**Case study: NORFACE**

Within social science, the ERA-NET NORFACE (*New Opportunities for Research Funding Co-operation in Europe*) is one of the first ERA-NETs to launch a pilot call for proposals with a true common pot mechanism. Percentage share of the common pot was calculated taking into account GDP and the population number of each country. One of the reasons for rapid progress towards a common pot is that several partners have already worked together; NORFACE is built on a history of less formal co-operation and joint activities between the Nordic and UK research councils and this ERA-Net provides a partnership between twelve research councils.

NORFACE was launched in January 2004 and opened its first call for a seminar series, to be funded from a common pot, in February 2005. This has been followed with the call for a pilot research programme, which was launched on 31 January 2006.
3. Partner Responses

3.1 Existing National Programmes and Experiences

BiodivERsA Work Package 1 collated information from the 19 partner organisations about the resources available (both their own and that of other relevant agencies in each country) for biodiversity research: national, regional, European and international programmes.

The information is available on the BiodivERsA website (www.eurobiodiversa.org).

Unsurprisingly, given the range of different organisations represented, there is wide variability in the types of programmes supported (directed versus “blue skies”, levels of available funding, etc.). This is important to bear in mind when considering the outcomes from the work to establish best practices, since partners have a wide range of experience, particularly at the European and international levels.

3.2 Decision Making and Stakeholder Engagement

**How are decisions taken?**

There are four distinct stages to the decision making process:

1. identification of research needs
2. establishment of programme structures
3. agreement of priorities
4. selection of projects

The way in which these are addressed can vary greatly between funding agencies, although the majority undertake some form of consultation with stakeholders, particularly in decisions concerning project selection. Often this takes the form of a panel of national and/or international experts. In some cases, e.g. the Austrian Science Fund (FWF), all referees are selected from outside of the country.

**Research Needs**

Within the majority of funding agencies, research priorities are set by policymakers, researchers and practitioners, although the structures used to make decisions are varied (Figure 1). While some partner countries operate “National Platforms” for biodiversity research, and these can play a role in advising on research needs; others have no such body and rely on a variety of sources. For example, within the Fundação para a Ciência e a Tecnologia (FCT) there is no single, agreed mechanism for undertaking this task. Sometimes, ideas are contributed in an informal way, through open invitation; on other occasions, a more formalised approach is taken. Advisory Councils are consulted in order to identify research needs and agree priorities and select projects. The level at which decisions are taken is dependent upon the nature of the question: i.e. political questions necessitate a decision at the ministry level; whereas for thematic questions decisions are taken in consultation with external bodies.
**Figure 1:** The range of consultative structures for decision making in BiodivERsA partner countries.

**Figure 2:** Approaches towards the identification of research needs among BiodivERsA partners.

**Programme Structures**

Decisions about programme structures are, unsurprisingly, taken by internal staff of the funding agency, e.g. as in the Swedish Environmental Protection Agency (SEPA), where a consensus view is sought from appropriate staff. However, in a few instances, funding agencies simply respond to “bottom up” applications, i.e. via a “blue skies” programme. This is the approach taken by FWF and The Research Foundation – Flanders (FWO), for example.

**Figure 3:** Methods for setting research programme structures among BiodivERsA partners.
Agreement of Priorities & Funding of Research
The different mechanisms for funding research reflect the range of funding agencies within the BiodivERsA project. Generally, the research councils focus their support on directed programmes and “blue skies” research; while the ministries support research focused on policy support. There is no consistent pattern to the funding agencies supporting Knowledge Transfer activities (e.g. the Natural Environment Research Council (NERC) http://www.nerc.ac.uk/using/kt_def.shtml) and horizon scanning work (e.g. the Department for Environment, Food and Rural Affairs (Defra) http://horizonscanning.defra.gov.uk/).

The different partners in the BiodivERsA consortium take decisions concerning research priorities in a variety of ways (Figure 4, below), but largely through an internal consensus.

Figure 4: Approaches to the agreement of research priorities among BiodivERsA partners.

Selection of Projects
The primary assessment criterion is science quality, with additional factors such as achievements against stated aims and objectives, financial management and adherence to budget, impact, knowledge transfer and exploitation, communication with stakeholders, scientific output, capacity building, policy uptake, being addressed by some funders. Clearly, many of these criteria can be interpreted differently between funding agencies, and a single, coherent measure will need to be established in each case, if these are to be used by BiodivERsA.

The workshop discussions confirmed clear differences between BiodivERsA partners. On the one hand, Research Councils, in which academics play an important role, tend to fund “blue skies” research for which scientific excellence is the main selection criterion. On the other hand, the ministries fund strategic and applied science programmes and require that scientific results be relevant for policy support and management of natural resources. When drafting the common call, these two requirements will have to be balanced.
In the majority of cases, standard setting or “Assessment” is undertaken by internal bodies, normally made up of administrative staff and in accordance with some form of nationally-recognised system (Figure 5, above), e.g. SEPA requires that research should contribute to achievement of national Environmental Quality Objectives. Many funders assess proposals in a two-step evaluation procedure, involving a written evaluation and a panel discussion. In this case, external referees are used in addition to internal staff.

The use of external referees for written review, with or without subsequent review panel meetings, requires that these standards are explained fully and well understood. In some cases, the number of reports required is determined by the level of funding requested (within FWF, at least two referee reports are required; one for each €150,000 requested; and more for projects costing over €600,000). The amount of administrative effort invested needs to be proportionate to the level of funding requested, e.g. within blue skies schemes, NERC requires fewer reviews for small grants (3 College reviews and perhaps 1 external review for applications of c. £40k) than for its consortium grants (8 external reviews for applications up to a maximum value of £3.5M full economic costs).

Project Assessment Panels are comprised of national and international scientists or acknowledged merit and competence. Panel members are elected for each specific scientific area. The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas) establishes Expert Panels in this way, with an additional one or two members from an applied research background, informed by their experience in public bodies (in contrast to VR, which has only academic scientists on its panels). The involvement of a large proportion of international scientists helps to stress the international perspective of the funding body, as well as minimising potential conflicts of interest.

While all partners consider that they undertake wide consultation when setting research priorities, the nature of this varies between countries and funders. We need to be clear in defining wide consultation, whether we mean within or beyond the individual funding bodies. It was felt that the key to success is for consultation to take place throughout the process, i.e. before and during programme development.
Decisions are generally taken within the funding body, often using an independent panel to decide on the priorities. In the case of Research Councils, these panels are usually structured around a core of internal members, plus external academics and policymakers. With regard to best practice, this very much depends on the precise nature of the programme, e.g. whether applied or fundamental research.

**What is the role of external stakeholders?**

In most cases, the funding bodies themselves decide which stakeholders they wish to consult, and this can be via written contributions, meetings and conferences. The precise composition of stakeholders involved depends on the nature of the consultation, and the methods used are also likely to differ accordingly. Although there is seldom any formal weighting, those contributing joint funding inevitably have greater influence. However, there is a perception that large research institutions and ministries normally have a stronger voice than the NGO community or individuals.

For most funding partners, consultation with stakeholders when developing biodiversity research priorities is a standard procedure. In the U.K., the Office of Science and Technology (OST) has issued guidelines on best practice, requiring departments such as Defra to “…get a wide range of advice from the best sources, particularly when there is uncertainty” (OST, 2005). The composition of these stakeholders is dependent on the aim of the consultation, and the methods used also differ in relation to the type of stakeholder, i.e. whether from the scientific research community, a Research Council body, or other.

**Figure 6:** The range of stakeholders engaged in setting research priorities.

**Figure 7:** the level at which external stakeholders become involved in research commissioning and management.
3.4 Managing Research Programmes

Monitoring and evaluation

Monitoring

Monitoring of both research programmes and individual projects is carried out at varying frequency between funders, the protocol followed differing according to the nature of the programme. There is no common approach, with formal systems reported by funding agencies involving infrequent monitoring, sometime between 1-3 years (12), while monitoring on a six-monthly or annual cycle is undertaken by a smaller number of funders (8). Three funding agencies undertake a continuous monitoring programme, but the precise details are unknown.

Figure 8: the range of monitoring structures in use among the BiodivERsA partners.

Figure 9: the frequency of monitoring undertaken by BiodivERsA partners.

Monitoring varies according to organisations and their focus; BiodivERsA encompasses organisations with a range of interests, from blue skies to policy-focussed. Correspondingly, what is monitored and why depends very much on the type of research. For example, blue skies schemes generally have less of a monitoring overhead than more applied or policy-driven research, which is seeking more specific outputs. The workshop recognised that there needs to be a careful balance between bureaucracy and the need to maintain quality; and critical elements were identified, namely: scientific quality, financial and programme management and
dissemination. It was suggested that monitoring should include the flow of information from basic research through to underpinning policy decisions.

**Evaluation**

Similarly, evaluation of completed programmes and projects tends to focus mainly on the science, i.e. science impact (normally assessed in terms of the number and quality of peer-reviewed papers). In addition to this, many funders (although primarily ministries) assess the use of science in policy decision-making, i.e. “policy impact”. This is more difficult to assess in a consistent manner, and is likely to require a longer timeframe following programme or project completion. In addition to these criteria, some funders evaluate capacity building (e.g. Formas).

In assessing success, careful thought needs to be given to a variety of questions. These might include: (1) how the results contribute to programme objectives; (2) training and capacity building (e.g. graduate students, or developing lasting networks of researchers); (3) science outputs (including publications) and their impacts e.g. to inform policy or public debate or use through the spectrum (from basic to applied research); (4) synthesis and dissemination of results to different audiences including the general public, practitioners and policymakers; (5) the added value of European collaboration.

The workshop recognised the importance of measuring the role of the agencies involved in a joint call, in terms of (1) providing new opportunities for researchers to work together; (2) providing efficient processes; and (3) producing a programme of research with demonstrable added value from collaboration.

Financial and programme or project management are also important criteria in the evaluation process. The majority of funders acknowledge the importance of sound financial management (adherence to budget) and delivery of outputs according to agreed targets and milestones.

Rather few funding agencies appear concerned with either the degree of engagement with conservation practitioners and/or the extent of trans-disciplinary cooperation. This is surprising, given the subject of the research, and is one area in which BiodivERsA might make a difference (see later section, 5 – Best Practice).

![Figure 10: the range of criteria used when monitoring progress of research projects funded by BiodivERsA partners.](image-url)
Figure 11: the range of criteria used for evaluation of outcomes of research projects funded by BiodivERsA partners.

The submission of a final report on completion of either a programme or the projects within it can address some of these criteria (e.g. the Hungarian Scientific Research Fund (OTKA) requires a final report for each funded project, where scientific impact is assessed in terms of international peer-reviewed papers, citation index, and impact; as well as financial and project management questions being addressed). Evaluation might also be undertaken using a staged procedure, as employed by BELSPO, in which stage 1 involves a written, scientific evaluation, and stage 2 involves a strategic, panel evaluation. Furthermore, evaluation can be spread out over a longer time period, post-completion of a project. This allows for a fuller, potentially more accurate evaluation of impact and application of research.

The traditional approach to the delivery of outputs is to produce a report. Partners discussed Intellectual Property Rights (IPR) – for commissioned research, the commissioning body generally holds the data, whereas for open calls, IPR remain with the researchers. However, it is important to recognise that data can be different to IPR, which could cover patents etc.

A four-part reporting approach is used in France, comprising (1) a financial report; (2) a summary or executive report (for the general public); (3) a general, scientific report (for the science community); and (4) a full report. With a reduced emphasis on the full report, e.g. by publishing in a series of peer-reviewed journal papers; this was considered to be a possible model for BiodivERsA. All partners at the workshop felt that it was necessary to provide a summary in English (i.e. in addition to the language of the country concerned).

In order to complete the evaluation of a programme from concept to outputs, it may be useful to consult at least one of the referees of the initial proposal for written comment, using a standard form (an approach used by FWF).

It was noted that outputs should be delivered through a variety of approaches with a knowledge transfer-focus e.g. workshops, public-oriented events, translation into policy. Clearly, this has implications for the overall budget of individual projects, and should be accounted for.
**Funding mechanisms**
The funding mechanisms employed by the various partners in the BiodivERsA consortium were explored in the questionnaire, and fall into the broad categories shown in Figure 12, below:

The spread of these among the questionnaire respondents reflects the range of funders involved with BiodivERsA, with most research councils operating both thematic, directed programmes and bottom-up, “blue skies” programmes. In contrast, ministries fund research in support of policy, and tend to be the primary drivers for horizon scanning activities.

![Funding mechanisms](image)

*Figure 12: Funding mechanisms used by BiodivERsA partners in the support of national biodiversity research.*

The question of research funding was considered in greater detail in the workshop, in two breakout groups:

- maintaining the funding base for research; and
- exploring the options for sourcing new money.

The funding available for biodiversity research needs to be considered from a number of perspectives: national funding, EU funding, other European and global funds, and cross-sectoral funds. The need to emphasise the value of biodiversity research was identified as a priority, including its connections to sustainable development (e.g. through the provision of ecosystem goods and services).

It was recognised that the biodiversity research community needs to “move with the times,” giving priority to hypothesis-driven research, e.g. relating to sustainable development. Some partners considered it essential that policymakers are “told what they want to hear.” However, this was also considered to be a dangerous approach, and the need for further discussion was recognised.

Sourcing new money requires consideration of new national initiatives, as well as recognising the changing emphasis of EU funding, with an increased focus on the Lisbon Agenda in Framework Programme 7 (FP7). This requires an imaginative
approach, recognising the important link between biodiversity to the provision of goods and services), and links to poverty alleviation and sustainable development. Of critical importance in all of this is the need to build partnerships and make a strong case.

The provision of new funding needs to be a collective responsibility, and should involve the private sector and foundations, in addition to the traditional funders in government and research councils. In order to engage the private sector and industry, it is essential that they are offered a suitable incentive, e.g. image improvement.

There is an important lobbying task to be undertaken here, in order to convince policymakers through improved communication. This might be a role for the European Platform for Biodiversity Research Strategy (EPBRS), through a specific mechanism or sub-group concerned with research funding. ERA-Net Plus represents a potential channel for securing new funding.
4. The opportunities and challenges of trans-national cooperation

4.1 What can BiodivERsA achieve?

Partners joining the BiodivERsA consortium did so for many reasons and, no doubt, with widely differing expectations. Unlike ERA-NETs such as ERA-Chemistry, where some partners have been working together since 1999, collaboration between BiodivERsA partners has previously been in an ad hoc way or via a joint scheme such as EuroDIVERSITY. The range of different funding bodies and their experiences of collaborative working, coupled with the fact that the biodiversity research community is particularly wide (in contrast to the plant genomics community, for example); means that an ERA-Net for biodiversity research is, by definition, ambitious.

The workplan for BiodivERsA addresses a challenging range of objectives, including the establishment of a searchable database, the identification of priority themes for research, the development of a strategy for a common call, and creating improved links with developing countries. Each of these constitutes a considerable achievement in itself and, in addition, the value of the improved networking opportunities provided through BiodivERsA should not be overlooked.

Although the workplan includes the preparation of a common call, this does not demand the participation of all partners, nor does it insist upon a common pot approach. Therefore, considerable flexibility still exists, permitting the adoption of multiple approaches, to which varying numbers (and combinations) of partners may sign up. This has been the case with other ERA-NETs e.g. ERA-Chemistry has launched a joint call in which most but not all partners are participating http://www.erachemistry.net/index/pages.view/22/.

Many bilateral agreements exist between BiodivERsA partners and different organisations although these are not always directly related to biodiversity e.g. FWF has general bilateral agreements with a number of countries, most extensively with Germany and Switzerland. Other examples include cross-border studies of the Danube-Drava National Park (Hungary) and the Kopacki Rit Nature Park (Croatia); and WOODWISDOM, which formed the basis of bilateral cooperation between Sweden and Finland. Applications were made to Finland, but Sweden carried out the evaluation. Experience within this and ERA-BUILD has demonstrated success in studying trans-national problems and showed that increased competition improved the quality and variety of ideas. Several respondents also mentioned initiatives such as the Global Biodiversity Information Facility (GBIF), although these do not fund significant research activity.

From discussions at the Peterborough workshop and off-line, it is apparent that a diversity of ambition still exists amongst BiodivERsA partners. In Peterborough, workshop participants were asked to vote for the funding model (see Section 2.3) they felt BiodivERsA should adopt; support was predominantly for model 2: joint call with national funding. It was agreed that there should be flexibility within the funding model and a hybrid between models 2 and 3 i.e. a joint call allowing those who wish to join their funding in a common pot, whilst others keep their funding national.
Whilst this flexibility is to be admired, it will add an additional layer of complication to the process, and must be planned thoroughly before implementation.

BONUS presented a comprehensive analysis of the administrative and legal barriers to each funding model (Table 1, below). From the evidence collected during this study, there is no reason to believe that any significant new barriers will arise during the development of the BiodivERsA programme (for an assessment by partners, see Appendix 3).

<table>
<thead>
<tr>
<th>Administrative Barriers</th>
<th>National Legal Barriers</th>
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<tbody>
<tr>
<td><strong>Model 1</strong></td>
<td></td>
</tr>
<tr>
<td>• Theme initiation</td>
<td>• Earmarking of funds</td>
</tr>
<tr>
<td>• Length of programme</td>
<td></td>
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<tr>
<td><strong>Model 2</strong></td>
<td></td>
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<tr>
<td>• Harmonisation of call</td>
<td>• Lack of control of</td>
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<tr>
<td>• Organisation and funding of common steering</td>
<td>evaluation procedure</td>
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<tr>
<td>• Application requirements</td>
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<td>• Evaluation guidelines and criteria</td>
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<td>• Compositions of panels</td>
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<tr>
<td><strong>Model 3</strong></td>
<td></td>
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<tr>
<td>• Agreement on common steering</td>
<td>• Lack of control of funds</td>
</tr>
<tr>
<td></td>
<td>• Lack of control of funding decision</td>
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<td></td>
<td>• Funding of foreign scientists</td>
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<td></td>
<td>• Lack of national budget control</td>
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<td></td>
<td>• Financing of common steering</td>
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</table>

*Table 1: A summary of the legal and administrative barriers (taken from BONUS Publication 2, Holm et al., 2005)*

### 4.2 Benefits of trans-national cooperation

#### 4.2.1 Background

Reaching the goal of a European Research Area (ERA) will require understanding between countries. However it will also require partners to demonstrate the benefits of such collaborations, not least to win the arguments necessary to divert funding away from national activity.

There are many reasons why coordination and the launching of joint calls can be beneficial, and in many cases several of these apply:

- Achieving critical mass, to ensure better use of scarce resources
- Joining of forces to provide common answers to common problems
- Addressing global issues
- Developing common approaches (e.g. ethics, standards)
- Addressing specific geographical issues
• Speaking with “one voice” to non-EU countries

Additional benefits or problems in transnational cooperation may be true for individual cases.

4.2.2 BiodivERsA survey results and synthesis of workshop outputs

Figure 13 demonstrates the consensus on several key benefits of transnational cooperation for biodiversity research, the clearest of which are:

• developing sufficient critical mass to make progress in large and diverse research areas
• improved scientific efficiency (sharing of expertise, equipment and infrastructure)
• opportunities for learning and development, including staff exchange

However, opinion was divided as to whether administrative efficiency (reducing funding overlaps, targeting of efforts in priority areas) is improved, or whether cooperation improves scientific quality through increased competition. It was recognised that researchers receiving no national funding could collaborate with very strong international consortia in order to obtain funds, and the point made that this needs to be prevented (i.e. in a common call and, particularly, a common pot).

![Figure 13: summary of questionnaire responses regarding the benefits of transnational cooperation.](image)

4.2.3 Discussion

Developing sufficient critical mass to address large scale research

A survey of national programmes carried out by Optimat Ltd. and VDI/VDE Innovation + Technik GmbH (Anon. 2005) found the main benefit of transnational cooperation is access to a wider pool of intellectual assets than are available in individual countries. Collaboration may bring fresh perspectives or methods to
address a problem, and cross-fertilisation of ideas from different groups is expected to lead to higher quality results.

**Improving efficiency and avoiding duplication**

*Within organisations*

Exciting developments e.g. new monitoring techniques or theoretical development increase the number of opportunities in research, but in turn increase pressure on budgets. It is critical to avoid duplication of effort at all levels: internationally, nationally and amongst individuals. Joint working can facilitate sharing of existing resources e.g. expertise, infrastructure and equipment, research sites. Pooling funding (virtually or via a common pot) will develop critical mass, effectively increasing individual countries’ research budgets in a particular area. A joint call run by a secretariat acting on behalf of all the partners can improve efficiency, by preventing duplication of administrative activity. Good planning is crucial, to develop the required high level of trust in the process and administering partner, which will be facilitated by good planning.

It is worth noting that despite identifying these benefits, opinion was divided on whether cooperation actually does improve administrative efficiency. Many partners felt that joint programmes have a much higher administrative burden, and are less efficient than national programmes. BiodivERsA must clearly demonstrate the added values of this programme and how these outweigh any additional costs.

*For researchers*

The concept of the ERA is very appealing, not least as strategic planning could be enhanced via international collaboration, e.g. in identifying different areas within a scientific field for each country to take responsibility for. However there is still a need to demonstrate the added benefits of European working, not least in demonstrating why funds should be diverted from national research. More work is required to develop criteria and methods for demonstrating and monitoring this added value.

Joint research programmes improve efficiency from the customer perspective, by providing synchronised research funding for researchers in several different countries. The EUROCORES programme *EuroDIVERSITY* succeeded in bringing together 25 funding agencies from 20 countries under a joint call. One of the largest projects, AGRIPOLES, includes partners from 10 countries. This project, examining the impacts of agricultural intensification on biodiversity, is a great example of the ability to use joint working to address issues of scale and scope. Instead of trying to extrapolate from single isolated field studies, the team can work together to study a range of sites and compare methods. Minimising the risk that results will be site-specific increases both their robustness and the likelihood that they will be used more widely e.g. by other researchers, policymakers and practitioners, as appropriate.

**Making collaboration work – learning from each other**

Trust and communication amongst partners are key issues in any collaboration. Although networking can increase costs e.g. staff time and travel expenses, good interactions amongst and between both researchers and administrators is critical to maximise the added value of the original investment.
Researchers
There are many opportunities for researchers to network, both informal e.g. at conferences and via various schemes e.g. ESF Research Networking Programmes (www.esf.org/programmes), Networks of Excellence e.g. ALTER-Net (A Long-Term Biodiversity, Ecosystem and Awareness Research Network www.alter-net.info) or initiatives such as PEER (Partnership for European Environmental Research: http://peer-initiative.org/html/). Networking amongst researchers within a research programme is increasingly recognised as an essential part of its added value and organisations may actively encourage this e.g. NERC programmes hold annual science meetings to bring together researchers (from lead investigators to PhD students) to discuss their progress. Relevant stakeholders are often invited, to set the research in context. Such events can have added benefits e.g. early dissemination of results amongst the user community and providing training opportunities for PhD students. The Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) has also initiated a SMART MIX Programme, providing €100M to fund 5-6 consortia, bringing together NGOs, government departments, companies, public and agencies. These aim to bridge the innovation gap, in order to demonstrate the benefits of science to society and, in the delivery of the Programme, improve networking (for details, see http://www.nwo.nl/subsidiewijzer.nsf/pages/NWOA_6QY9BM_Eng?Opendocument).

Administrators
EUROCORES programmes already bring together funding from organisations across Europe. As a result ESF, in particular its programme managers, holds a huge amount of corporate knowledge about how different organisations across Europe operate. Administrators from different organisations meet at Management Committee meetings. However they interact via a scheme administered by a third party, ESF, rather than working directly together. Furthermore, high staff turnover in different organisations can set back opportunities for collective learning.

The benefits of administrators learning from other people and their experiences were specifically highlighted by several organisations during our consultation. Until the ERA-NET scheme was launched, there were no large-scale opportunities for staff within funding organisations to work directly together rather than via a third party. Examples are restricted to specific schemes such as the NERC programme Rapid Climate Change (RAPID) http://ukshark.co.uk/rapid/rapid.php, which issued a joint call with 3 partners (UK, Norway and the Netherlands). To broaden partners’ understanding of administrative processes in the different organisations, BiodivERsA has begun to prepare for a staff exchange programme similar to the very successful scheme operated by BONUS.

Fostering flexibility
A bonus of developing experience and trust can lead to an increase in flexibility of approach to collaboration. The EuroDIVERSITY programme demonstrated several examples of this. Within Belgium, The Belgian Science Policy Office (BELSPO) and The Research Foundation – Flanders (FWO) worked together to share funding and ensure as many Belgian participants as possible were funded amongst the highly-ranked projects. This meant that BELSPO funded a project of interest to their policy work, even though the applicants had initially requested funding from FWO.
The Irish Research Council for Science, Engineering and Technology (IRCSET) offered to help overcome problems within the multi-logue funding process and keep various project consortia together, by invoking bilateral funding arrangements they had in place. IRCSET were prepared to fund PhD students registered at an Irish HEI, but which could spend a substantial period of time working within the laboratory of another partner country.

4.3 Barriers to trans-national cooperation

4.3.1 Background
There are many barriers to overcome before trans-national cooperation can take place. These have been recognised to occur at three main levels: policy, programme, and project (Anon., 2005). At the policy level, barriers may include a legal constitution that forbids transfer of funds, a non-EU focus for international collaboration, and a lack of policy encouragement to increase trans-nationality.

In the survey by Optimat Ltd. and VDI/VDE Innovation + Technik GmbH (Anon., 2005), it was noted that the prevalence of barriers varied according to the type of country and programme. Self-sufficiency barriers are highest in large countries (e.g. a sufficient volume of high-quality applications from internal capacity), with legal barriers highest in southern Europe (e.g. a legal constitution that forbids payment to non-residents). Consultation within BiodivERsA has demonstrated a willingness to try and overcome these barriers. However, this does vary with experience of previous international collaboration and organisational culture.

4.3.2 BiodivERsA survey results and synthesis of workshop outputs
The questionnaire revealed a much greater diversity of opinion about barriers to trans-national collaboration than the benefits (see Figure 14). Further consultation demonstrated that within these individual issues a range of potential problems may exist. The main issues were:

- funding (e.g. difficulties in synchronising national funding);
- common priorities (e.g. developing international themes that can also address specific national policy needs);
- legal issues (e.g. ability to transfer money to foreign researchers);
- overcoming perceptions (e.g. increased costs compared with national research); and
- communication (e.g. linguistic problems).
4.3.3 Discussion

**Funding issues**

Approximately two-thirds of respondents agreed that difficulties in synchronising national funding were a potential barrier. Problems may arise in several areas connected with funding:

a. Loss of control of funding.

b. Availability of funding for research starting in 2008. The necessary planning and dialogue has not yet started in all BiodivERsA organisations.

c. Flexibility in budgets in case of timetable slippage. Some organisations allocate budgets on an annual basis and experience real problems if there are delays in the process.

d. Variation in levels of financial commitment to a programme. Problems may occur if financial commitments do not reflect the size of the national capacity and expected demand in that area.

e. Differing rules on eligible costs. Different organisations across Europe have different rules: some accept requested costs, so long as they are justified in the workplan, whilst others make changes to awards in line with review panel advice.

f. Bringing together different currencies.

Given pressures on budgets, it is important that all partners feel they are getting a good return on their investment. This may be in terms of controlling the direction of research and/or the volume of relevant research funded (where relevance could be either towards a particular priority, or to support researchers from a particular country). It was suggested that more engagement with the principle of European integration was needed. Since organisations are ultimately responsible, not just internally, but to their own national research communities, no-one can afford to be altruistic with their funding. Communication will be the key to persuading
organisations that the risk of not recouping their investment is outweighed by participation in the programme in its totality, with its associated added value. However it is also important to promote the opportunities offered by this ERA-NET to the research community.

**Eligible costs**
Various discussions during this study have suggested that visibility of the levels of financial commitment and the rules covering eligible costs would help to manage expectations amongst the research community and assist them in selecting their European partners. It is also critical that the rules on eligible costs are clear. Eligibility is a prime example, since not all organisations permit applications from researchers based in institutes as opposed to universities. Variation in payment of overheads is also significant: some organisations do not pay them, whereas in the UK, Full Economic Costing (FEC) means that Research Councils pay 80% overheads and, for some items, 100%. When national funding rules apply, this can be handled within each separate organisation, which will best understand its own rules. If BiodivERsA operates a common pot, eligible costs will need to be addressed in depth.

BiodivERsA review panel members will need clear guidance on how to assess value for money. Within EUROCORES, panel members are asked to comment at a broad scale, e.g. whether the number of positions is justified, a piece of work is better suited to a postdoctoral researcher, PhD student or technician, or fieldwork plans appropriate.

**Funding commitments**
EUROCORES programmes have suffered problems when there has been a mismatch in approaches to funding: some Funding Agencies agree to fund all the highly ranked proposals, whilst others give a minimum financial commitment; occasionally, a maximum figure is given. It is also apparent that not all Funding Agencies have the same approach to dividing their available budgets amongst highly ranked projects. Most fully support each project in turn and continue down the ranked list until their funding runs out. However others try to keep as many of their researchers as possible involved in a programme by splitting the budget between all of the highly ranked proposals. Therefore a researcher from country X may have a lower budget if 5 instead of 3 projects from that country are highly ranked. This raises concerns over whether the project is adequately supported to carry out the work properly.

Currency issues may not be a problem if funding remains national. However, for any common pot, or if researchers themselves are sharing costs for common facilities; fluctuations in currency markets could, in a worst case scenario, have a large impact on the amount of funding available e.g. if Sterling or the Euro suddenly devalued. Any funding agreements need to address such issues.

**Scientific priorities**
Although most organisations indicated that biodiversity research was a priority area for them, this is not true for everyone. Discussions have suggested that in some cases, biodiversity is slipping as a priority as other priorities overtake it. It has also
been suggested that explicit links to current overarching high priorities such as climate change could help to secure funding for biodiversity research.

A recurring theme has been the balance between basic and applied research and the need to establish joint priorities. Generally, Research Councils fund research at the basic end of the spectrum. Some, e.g. FWF, do not have research priorities within their own organisation, as they fund only via blue skies or responsive mode mechanisms. However, FWF has previously joined several EUROCORES programmes, including EuroDIVERSITY, where there is an opportunity for Austrian researchers. Other Research Councils also fund more strategic, or in some cases applied research, via different mechanisms, but often within a research programme. It was widely recognised that Ministries and other organisations that need to deliver against specific policy objectives, may find it difficult to join a joint programme, where they would lose control of how funding is allocated or projects prioritised.

Ensuring a unique role for BiodivERsA will be important in securing funding. Several BiodivERsA partners are involved in one or both of the EUROCORES programmes EuroDIVERSITY and EuroDEEP. The BiodivERsA consortium as a whole should note that several Funding Agencies were sceptical of the justification for a separate marine biodiversity programme, when EuroDIVERSITY has already been launched. BiodivERsA could run into similar questions regarding the potential overlap between itself and MarinERA (see Section 6.1).

**Quality**

There is still a perception that compromise is required to achieve collaborative research between different nations and that this may result in work of lower scientific quality than that which is funded nationally. This generally appears to be a concern about losing control over funding, but there is little evidence to say whether these fears have any foundation. Some organisations commented that national researchers who are successful in international competitions are not always the same as those who are successful nationally. This may be because researchers work in different ways e.g. some prefer to collaborate more with European colleagues or it may be that those successful at a national level have no need to enter further competition for funding.

This raises questions as to why organisations are participating in a trans-national programme and what defines scientific quality. For Research Councils, scientific quality is often regarded as cutting edge science. Whilst an expanded intellectual pool may assist with development of new ideas, collaboration to address issues of scale and scope may also require the use of established techniques to ask questions in a new way. BiodivERsA will need to agree how to define and measure scientific quality. The partners must have trust in the review process, so that they agree to abide by the final ranking and that proposals are not subject to double jeopardy, i.e. that they are not re-reviewed internally. Specific proposals on quality assurance for the programme and projects may be found in section 5.2.

**Legal issues**

The application guidelines of many BiodivERsA partners indicate that they only fund researchers based at an institution in their own country. Some have no barriers to funding researchers based in any country, but few of these have experience of
 awarding funding outside their own national research community. For some partners, legal issues are still a major concern. From our discussions, it seems there are few, if any, legal barriers to developing a common call, if funding remains national. Therefore legal issues should only be a significant problem if BiodivERsA decides to develop a programme that operates via a common pot. Several partners have no legal restriction on transferring research funds outside of their country, but have never tested this system. Equally, those who identify this as a barrier may do so on the basis of a lack of precedent rather than reality (Anon., 2005).

The lack of examples of common pot programmes helps to maintain the perception that legal barriers are a major issue. Some organisations may be able to join a common pot if they so wish, by seeking special dispensation e.g. from the ministry providing funding, to change their rules for a specific case. Eventually this may lead to a political decision to change or clarify the legal situation. Others take a pragmatic approach to interpretation of the rules, e.g. when considering whether to join NORFACE and the common pot, NWO used the general objective of promoting "the best science"; as justification for trans-national collaboration.

One further area that needs to be addressed is the issue of whose rules apply for a joint call. This can be important e.g. when selecting proposals to go from an outline to full application. The ESF does not have the legal power to prevent an applicant who is not selected to submit a full proposal from doing so if they wish, but can only strongly discourage them. In contrast NORFACE, which is administered by the Academy of Finland (AKA), operates under Finnish rules and is able to restrict those who submit a full proposal. This also means that there is no right to reply to referees' comments, which would be usual practice for some other partners. During planning of the programme, it will be crucially important to address such issues.

**Communication is crucial**

From our discussions, it appears that many of the barriers relate to trust and overcoming them requires clear communication. Communication is a key issue for any collaborative activity and BiodivERsA must ensure that all partners (1) agree with the programme proposal and (2) understand and are prepared to deliver what is being asked of them individually.

With researchers scattered across Europe, once a programme is finally established, it will be essential to foster good, regular, two-way communication. There are many examples of how this can be addressed e.g. e-mail communication, web pages, networking researchers and administrators, formal monitoring and evaluation.

Benefits from such a programme should be evident beyond researchers and their funding organisations. To fully realise the added value of collaboration between basic and applied research, the benefits of biodiversity e.g. its impacts on ecosystem goods and services, must be addressed. The benefits of such research are potentially far-reaching, and the programme must develop a good dissemination strategy to ensure maximum return from the investment and lay the foundation for future collaboration.
Other issues
The questionnaire revealed that IPR and data access issues were not as significant as had been expected. These issues have been addressed by other ERA-NETs e.g. ERA-PG, who have indicated a willingness to share their experience. Other groups such as EUROHORCs are also examining these issues. Whilst these discussions may have laid good groundwork, it should be remembered that not all ERA-Net partners are members of EUROHORCs.

Political
Given the range of partners involved in common pot mechanisms such as NORFACE, it seems that the legal issues surrounding the development of a trans-national collaborative research programme are secondary to the enthusiasm of individual organisations to participate. This raises the question of why an organisation is participating in a programme. The onus is on organisations to demonstrate the benefits of trans-national collaboration. During the Peterborough workshop it was suggested that at least amongst the Research Councils the common pot issue has already been addressed as they contribute to a common pot for the ESF EURYI scheme.

It is apparent that for some new ventures, heads of organisations may have signed up, but staff or systems further down the hierarchy are less enthusiastic. Several organisations mentioned that having a staff member as a champion for trans-national collaboration, whether in general or for a specific programme, significantly increased the chances of a proposal being accepted. High staff turnover in some organisations makes it necessary to develop corporate experience, so that instead of having one key supporter, several staff have the knowledge and enthusiasm to take such projects forward. In this way the administrative burden should be reduced, as there will not be a constant need to develop trust and understanding of partners.

Technical
The need to address technological differences between partners has been identified as an important issue, particularly in relation to submission of proposals. Several organisations e.g. VR, NERC, ESF, use an electronic system for submission of proposals. One of these could be adapted for use by BiodivERsA. However, this will require careful planning of what information applications will contain. It may be that large consortia produce files that are simply too large for the system to receive. Other issues to consider may be more mundane (e.g. can the system accommodate addresses from outside the host country; are classification categories applicable to other countries?), but will be critical if they cause the system to crash close to a deadline.

Demand Management
The ESF EUROCORES programme EuroDIVERSITY (www.esf.org/eurodiversity) has already demonstrated huge interest amongst the European biodiversity research community in trans-national cooperation. The call was very broad with some similar topics to those being discussed in BiodivERsA. There were no restrictions on the range of ecosystems to be studied or geographical location. Over 300 outline proposals were received, from which 53 were invited to submit full proposals. Finally 10 proposals were funded. Some BiodivERsA partners have highlighted their
disappointment at funding so few proposals and concern at the burden that was placed upon the community involved in preparing and reviewing so many proposals.

BiodivERsA partners should consider whether to manage researchers’ expectations by publicising the amount of funding available from each country, or the total amount of funding for a common pot as appropriate. Limits could be placed on the number of applications from any one individual e.g. in the UK, the NERC limits the number of applications from any single researcher in a particular funding round to one as a lead applicant and one as a co-applicant.

Whilst BiodivERsA must address areas of overlap between funding agencies in different countries, it must also ensure there is not a new form of duplication: amongst ERA-NETs. BiodivERsA already has good links with MarinERA, CIRCLE and SKEP in particular and dialogue should be maintained to ensure that as we all develop our own calls, we are aware of what might be funded elsewhere. Many are at a rather preliminary stage and it is currently difficult to see who might fund what, e.g. MarinERA may or may not address marine biodiversity issues. With the need to make progress with the BiodivERsA call, the most pragmatic approach might be to ensure that this is widely publicised to the most relevant ERA-Nets and to ensure a joined up approach in discouraging submission of similar projects to more than one ERA-NET. Comparison of submitted projects and lists of applicants, and the use of one or two common review panel members between ERA-Nets could all help to provide the required overview and weed out any multiple submissions. However, this will require synchronisation of dates for calls and evaluation procedures between different ERA-Nets, and is likely to be very difficult to achieve.

4.3.4 Summary
Biodiversity is one of several key priorities e.g. climate change, sustainable development, pollution control, whose causes and impacts do not respect geographical borders, and where research is urgently needed to underpin decisions and action. With these competing demands, it is incumbent upon the biodiversity research community to demonstrate the key role and links that biodiversity has across sectors. This responsibility extends to supporting and delivering high quality, focused research that meets the needs of policymakers, and offers value for money. There is strong agreement on several key benefits of trans-national cooperation, including increasing subject coverage, efficiency of resource use and opportunities for staff training. Flexibility will be a key factor in the success of any programme, and planning should include risk assessment and contingency. This is needed in order to consider how to deal with unforeseen problems, as well as building flexibility into the system.
5. Best practice and the way ahead for BiodivERsA

Within BiodivERsA there is consensus on a common call, although a preference for national funding. There is potential for a common pot: amongst partners who wish to join their funding, and/or to deal with common costs from the programme. It is critical that all partners engage actively in programme development, building trust, identifying clear roles and responsibilities, and ensuring that they are happy to sign up to the end result. Formal agreements should take into account the work of other ERA-NETs e.g. ERA-PG.

To facilitate the necessary debate, issues raised during the consultation are picked out below, although it is recognised that this list is not exhaustive.

What constitutes success?
Some partners see a joint pot as the ultimate aim of BiodivERsA; this is reinforced by signals from the EC regarding ERA-Net Plus. However, integration can be achieved in different ways and it is important that BiodivERsA recognises the success in each:

1. **Scientific**: identifying overlap and selecting topics for joint working
2. **Management**: assessment, monitoring and evaluation
3. **Financial**: testing of various mechanisms

Key players in the process
The **Secretariat** will comprise a single, central body to manage the process on behalf of all partners and deal with all routine matters. The secretariat should be supported by call coordinators acting as a contact point in each country or organisation. The organisation hosting the secretariat will need robust systems to manage many, large, trans-national applications at once.

A **Management Committee (MC)** could be composed of the call secretariat and coordinators, and should oversee the process. It should be decided whether membership is limited to those contributing funding to the call.

A **Scientific Committee (SC)** should include a range of impartial scientific experts, policymakers and end-users of biodiversity research; at least two members should be from outside Europe. This body will advise the MC, define the call(s) and provide quality assurance; ensuring projects recommended for funding comply with call criteria. This committee may be supplemented if necessary to form a Review Panel.

The **Review Panel (RP)** should select applications to be recommended for funding, following consideration of: the application, referees’ comments, the reply from applicants and panel discussions.

How will costs be shared?
The consortium must agree how to share all of the associated programme costs, including any post-programme monitoring. Given the time-frame, this money needs to be set aside so that it is available when needed.

Focus of the call
The Porto workshop began to address this issue, but further work is needed to address questions such as:
- What areas would maximise the benefits of this ERA-Net?
• Can basic and applied research be accommodated within a single call?
• How can overlap with other ERA-Nets, such as SKEP, CIRCLE, IWRM-Net, MARIFISH and, in particular, MarinERA, be avoided? Is there potential or a need for joint calls?

Risk and quality assurance

**How will issues of risk and quality be dealt with at both programme and project level?** Risk analysis should be an integral part of programme planning, so that contingency measures can be developed e.g. if a partner has to withdraw from the programme. Regarding the research to be funded, BiodivERsA should consider the need for a transparent and effective quality assurance system, such as that developed by Defra (see Appendix 5).

Call procedures

**Should there be a pre-announcement of opportunity?** Pre-announcements may be useful when the overall timeframe is short, allowing applicants to identify potential collaborators, exchange ideas and consider the scope of any future proposal. This approach has been used by several ERA-NETs e.g. SNOWMAN [http://www.snowman-era.net/downloads/SNOWMAN_pre_announcement.pdf](http://www.snowman-era.net/downloads/SNOWMAN_pre_announcement.pdf)

**What information is needed in an outline proposal?** There seems to be consensus on a two-stage procedure to reduce the numbers of full proposals. A concept note (one page of science, one page of organisational structure and partners) should be screened for any particular requirements e.g. minimum number of partners; gender equality; interdisciplinarity. Given the limited information, at this stage assessment should be of the concept, rather than the science. Pre-proposal screening by the Review Panel should aim to reduce by c. two-thirds the total number of full proposals.

**What are the evaluation criteria?** A manageable and reliable suite of measures are needed to ensure scientific quality and address other needs. A fundamental consideration concerns the overall aim of BiodivERsA: is it to seek new international collaboration or develop existing ones? The following criteria are proposed for further consideration and, depending on the focus of the final call(s), they may not all be applicable:

- Scientific excellence
- Coverage of programme topics
- Knowledge Transfer / science to policy
- Stakeholder engagement
- Collaboration/international added value
- Gender equality
- Innovation
- Relevance
- Interdisciplinarity
- Risk-reward / feasibility
- Cost-effectiveness
- Opportunities for younger researchers
Some additional assessment criteria may also be considered e.g. societal benefits, industry/business relevance, training (Furman et al., 2006).

**How will external reviewers be selected?** The Review Panel and BiodivERsA partners should suggest names, but it is likely that the secretariat will have to identify more. Issues to be addressed in advance include:

- What proportion of referees reviewing an individual application should be from outside of Europe?
- What level or career-stage of reviewer is acceptable? Some organisations will not approach reviewers below associate professor level, even though many of those approached actually hand on the work to postdoctoral researchers in their lab.

Whatever is decided, pragmatism may be necessary if it is difficult to review an individual application.

**Will there be a right of reply?** We recommend that anonymous comments from referees are made available to applicants, who should then have a chance to respond, before the Review Panel meets. BiodivERsA should decide whether there will be an appeals system for unsuccessful applicants.

**How will transparency be maintained?** It is imperative that all processes are transparent to BiodivERsA partners and the research community.

- all documents and full details of procedures should be published at the beginning of the process;
- clear guidance should be provided for applicants and referees on areas including programme scope, evaluation criteria, vested interests and eligibility e.g. of individual researchers or organisations, or eligible costs;
- guidelines and deadlines should be enforced strictly;
- BiodivERsA should decide whether, like ESF, it wishes to publish the membership of review panels and a non-attributed list of referees; and
- any conditions e.g. reporting requirements, making resulting data freely available, must be spelt out explicitly.

**How will vested interests be dealt with?** Clarity is needed on organisational and collaborative/personal vested interests. Given the international nature, national vested interests may potentially be an issue. It should be borne in mind that bias may not always be positive.

**Is there a need for demand management?** It should be decided whether or not to specify a limit on the size of the grant that can be awarded. In order to manage expectations, it may be useful to include a list of all funders, and an indication of the sums they are contributing, within the call document.

**Maximising added value**

**How can BiodivERsA maximise training opportunities?** Specific opportunities for training, mobility and career development can increase the motivation of both researchers and administrators.

- BiodivERsA partners should encourage their staff to participate in the staff exchange scheme as a development opportunity.
• The call should explicitly promote training at all levels within projects, including staff exchange.
• Programme meetings should encourage presentations by junior members of project teams.
• Training in broader skills should be considered e.g. secondments of researchers into policy or practitioner organisations, workshops on media training or data management.

**How can BiodivERsA provide opportunities to develop collaboration?** Many organisations hold scientific meetings to bring researchers together. EUROCORES programmes specifically encourage (and fund) programme members to develop new ideas to bring the different projects together. As a minimum there should be an annual meeting of all projects. Furthermore, thematic seminars, joint publications and electronic networking via the website (e.g. SKEP, Furman et al., 2006) may all be useful tools. Funds should be set aside at a programme level to facilitate such activities.

**Monitoring and evaluation**

**How will monitoring be carried out?** Each project could be assigned an observer, e.g. an individual from the Management Committee, to attend project meetings and be personally responsible for monitoring progress. Annual reporting requirements seem to be primarily financial. It seems likely that there will be a mid-term evaluation of projects and the programme.

**How will the success of the programme be judged?** Many organisations assess publications produced by the programme, e.g. number, quality, and impact (Widemo, 2006). Other criteria must fully reflect the programme’s aims e.g. was a common call successfully managed, were training opportunities provided, have results been useful to policymakers and practitioners, have new collaborations been formed? Assessing the applicability of research results should allow time for their impact to be felt. Measuring impact should recognise that results may support the maintenance of a particular policy rather than changing it. Given the time-lag inherent in publication and communication of results to a wide audience, it is likely that the full impact of any research will only be appreciated several years after the programme ends. Planning needs to address how this will be carried out and funded.
6. References


7. Annexes

Appendix 1. The survey questionnaire sent to all funding partners in the BiodivERsA consortium, for collecting information on best practices and barriers to cooperation

<table>
<thead>
<tr>
<th>Your name</th>
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<tbody>
<tr>
<td>Organisation</td>
<td></td>
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</tbody>
</table>

### Methods for making decisions

**How are decisions taken?**

<table>
<thead>
<tr>
<th>Decision Method</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive decisions taken by the Chair</td>
<td></td>
</tr>
<tr>
<td>by consensus within the body itself</td>
<td></td>
</tr>
<tr>
<td>following wider consultation, i.e. with external bodies</td>
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</tr>
<tr>
<td>passed up to higher level body/bodies or ministerial level</td>
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</tbody>
</table>

If other/none of the above, please provide details: TEXT

### Stakeholder role

**Structures for consulting with stakeholders regarding biodiversity research priorities**

<table>
<thead>
<tr>
<th>Structure</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A single national body (National Platform) for biodiversity</td>
<td></td>
</tr>
<tr>
<td>A series of government-led bodies, organised by separate ministries</td>
<td></td>
</tr>
<tr>
<td>A research council body, set up to review priorities at particular intervals</td>
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</tr>
<tr>
<td>Primarily practitioners</td>
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</tbody>
</table>

If other/none of the above, please provide details: TEXT

**Who decides which stakeholders to involve and how**

TEXT

**Stakeholders engaged to set biodiversity research priorities**

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection of individuals, representing a full range of organisations</td>
<td></td>
</tr>
<tr>
<td>Primarily policymakers</td>
<td></td>
</tr>
<tr>
<td>Primarily researchers/academics</td>
<td></td>
</tr>
<tr>
<td>Primarily practitioners</td>
<td></td>
</tr>
</tbody>
</table>
Provide details of the type of stakeholders involved, and give some indication of the extent of their engagement and influence in shaping research priorities (i.e. do stakeholders have variable weighting in terms of their influence?):

At what level are stakeholders able to engage with the process?

- Making ad hoc proposals across a wide range of research fields
- Contributing to/setting indicative broad themes
- Identifying specific research programmes/individual projects
- Agreeing workplans for delivery of research

If other/none of the above, please provide details:

Experience of funding international programmes

Does your organisation fund collaborative biodiversity research with other countries?

- YES
- NO

If YES, please indicate the proportion (%) and volume (Euros) of your funding to such schemes

<table>
<thead>
<tr>
<th>%</th>
<th>volume (Euros)</th>
</tr>
</thead>
</table>

Name of Scheme:  
Partners:

Give names of jointly-funded biodiversity schemes and indicate the partners involved

If you do not fund collaborative biodiversity research, please indicate why not

- Not a priority for the organisation
- Administrative issues (please specify) e.g. need for juste retour, inability to fund researchers from other organisations or in other countries
- Other issues (please specify)
- TEXT
Who is eligible to apply to your organisation for biodiversity research funding?

| Y/N | Only researchers based in institutions in your own country | Researchers based in institutions in countries with whom you have specific agreements (please specify below) | Researchers based in institutions in any member state | Researchers based in institutions in any country world-wide |

If other/none of the above, please provide details: TEXT

What are the main benefits of joint biodiversity research programmes?

| Indicate A or D | Grade 1 - 5 | The subject is too big to be tackled by any single country | Cooperation improves scientific efficiency e.g. by sharing of expertise, infrastructure and equipment or research sites | Cooperation improves opportunities for training by staff exchange or joint working |

Please indicate whether you agree (A) or disagree (D) and relative importance, from 1 (unimportant) to 5 (extremely important) | Cooperation improves administrative efficiency e.g. by reducing overlaps in funding, targeting of efforts in priority areas | Cooperation improves scientific quality by increased competition |

If other/none of the above, please provide details: TEXT

Barriers to international cooperation

What are the main barriers to your organisation contributing to joint biodiversity research programmes with other countries?

| Indicate A or D | Grade 1 - 5 | Biodiversity research is not a priority area within our organisation | Losing control over national funds e.g. funding foreign scientists | Difficulties in synchronising national funding |
Please indicate whether you agree (A) or disagree (D) and relative importance, from 1 (unimportant) to 5 (extremely important)

| Legal issues e.g. consortium agreements or an inability to transfer funding to researchers in other countries |
| Lack of joint priorities |
| Perceptions of decreased scientific quality compared with national research |
| Perceptions of increased costs compared with national research |
| IPR issues |
| Data access issues |
| Lack of administrative control e.g. application or eligibility criteria, different costing models |
| Others |

If other/none of the above, please provide details:

| TEXT |

Are you aware of any other collaborative biodiversity research programs funded by national funding agencies? If yes please give names and brief details.

| TEXT |

If you know of any other successful joint international research programs please give names and brief details.

| TEXT |

---

**Methods used for setting standards, monitoring and programme evaluation**

How are standards/benchmarks set for assessing biodiversity research funded by your organisation?

| using an internal system |
| using a nationally recognised system |
| using an internationally recognised system |
| other |

If other/none of the above, please provide details:

| TEXT |

Who is involved in setting standards/benchmarks?

| administrative staff within your organisation |
| scientific staff within your organisation |
| a mixture of internal staff |
| a panel involving external stakeholders |
| others |


<table>
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<th>If other/none of the above, please provide details:</th>
<th>TEXT</th>
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**What monitoring protocols are in place?**

- internal assessment panel/process
- panel/process involving project team members
- independent assessment with external stakeholders
- others

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<th>If other/none of the above, please provide details:</th>
<th>TEXT</th>
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**How often are biodiversity research programmes monitored?**

- Continuously
- Regularly, i.e. at least every 6 months
- Annually
- Infrequently, i.e. sometime between 1-3 years
- other

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<tr>
<th>If other/none of the above, please provide details:</th>
<th>TEXT</th>
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</table>

**What is monitored?**

- Quality of science
- Financial management/adherence to budget
- Programme management/adherence to targets and milestones
- other

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<th>If other/none of the above, please provide details:</th>
<th>TEXT</th>
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</thead>
</table>

**What criteria are used to evaluate biodiversity research programmes?**

- Delivery of programme outputs within timeframe and budget
- Degree of engagement with conservation practitioners
- Extent of transdisciplinary cooperation and capacity building
- Science impact (number and quality of peer-reviewed papers)
- Policy impact (use of science in policy decision-making)
**Funding mechanisms used in national and transnational research programmes**

<table>
<thead>
<tr>
<th>Which of the following funding mechanisms do you use for supporting biodiversity research?</th>
<th>Type of funding</th>
<th>Proportion of funding (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directed programmes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Blue skies&quot; – innovative, not specific</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsive mode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge transfer activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizon scanning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focused on policy support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exchange schemes</td>
<td></td>
<td></td>
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<tr>
<td>others</td>
<td></td>
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</tbody>
</table>

**Please indicate the relative proportion of overall funding (%)**

<table>
<thead>
<tr>
<th>Type of funding</th>
<th>Proportion of funding (%)</th>
</tr>
</thead>
<tbody>
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**If other/none of the above, please provide details:**

**Comment on how processes for monitoring and evaluation are designed and changed**

**Where does the funding come from: i.e. a single source or joint grants (possibly with cross-sectoral contributions)?**

**Is the funding limited or controlled in any way, i.e. are there specified ‘quotas’ for research themes?**

**What level of engagement exists with European funding, and beyond?**

Please rank these in order of relative importance to your organisation, from 1 (unimportant) to 5 (extremely important)

<table>
<thead>
<tr>
<th>Grade 1-5</th>
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</thead>
<tbody>
<tr>
<td>FP6 Integrated Projects</td>
</tr>
<tr>
<td>FP6 Networks of Excellence</td>
</tr>
<tr>
<td>FP6 Article 169</td>
</tr>
<tr>
<td>FP6 Specific Targeted Research Projects (STREPS)</td>
</tr>
<tr>
<td>FP6 Coordination Actions</td>
</tr>
<tr>
<td>FP6 Specific Support Actions</td>
</tr>
<tr>
<td>FP6 Cooperative Research Projects (CRAFT)</td>
</tr>
<tr>
<td>FP6 Collective Research Projects</td>
</tr>
<tr>
<td>FP6 Mobility &amp; Training (Marie Curie Actions)</td>
</tr>
<tr>
<td>FP6 Special instruments for research infrastructures</td>
</tr>
<tr>
<td>COST Actions</td>
</tr>
</tbody>
</table>

For a description of the range of FP6 Actions see the CORDIS website

http://www.cordis.lu/fp6/stepbystep/instruments.htm

http://www.cost.esf.org/
| If other/none of the above, please provide details: | TEXT |
Appendix 2. Detailed Partner Case Studies

Fundação para a Ciência e a Tecnologia (FCT)

Background
FCT is the Portuguese governmental agency for basic research funding, and is integrated within the Ministry of Science and Higher Education. Its mission is mainly to manage, evaluate and fund research in all fields of science. The funding of research is done mainly by:

- Funding competitive proposals presented by institutions, research groups and individuals, on the basis of independent evaluations of merit, currently funding 1,900 research projects in all fields of science, including biodiversity research.
- Funding research and managing programmes in biodiversity conservation and marine science.
- Using co-operation agreements and other forms of partnerships with universities, other public and private research institutions, to fund a total of 350 institutions; in all scientific fields, including several that are totally or partially dedicated to biodiversity research.
- Funding for research fellowships in all fields of research (there are currently more than 4,000 research fellowships for Masters, PhD and Post-doctoral studies).

FCT also provides an institutional framework for Portugal’s recently created Research Councils. The Research Council for Environment and Marine Sciences is be the main body responsible for setting up priorities and proposing specific research programs in biodiversity research. Furthermore, FCT is responsible for managing the Portuguese Platform for Biodiversity. This brings together researchers from all major institutions that deal with biodiversity, including NGOs, conservation practitioners and representatives of the Institute of Nature Conservation (Ministry of Environment). FCT also plays a role in the EPBRS secretariat.

Programmes and budgets
FCT funds R&D projects through general and thematic programmes, normally in a responsive mode, aiming at enhancing capability and research excellence. It also funds research focused on policy support, and supports Knowledge Transfer activities (through Agência de Inovação). National calls for proposals are issued, and are open to universities and both public and private not-for-profit research institutions.

In 2002 FCT had an overall budget of €194.6M, and it spends annually between €2-4M in research projects dealing directly with biodiversity. There is no specific national programme for biodiversity research. Instead, in the period between 2000-2005, FCT funded projects across a range of scientific areas, within the funding programme POCTI – Operational Programme in Science, Technology and Innovation. Within POCTI, two thematic programmes are particularly relevant:
• **PDCTM** – Programme for the Enhancement of Marine Sciences and Technology; and
• **PNAT** – Programme for Nature Conservation

**PDCTM** ran for the period 2000-2004, with a total budget of approximately €10m. Among the 29 marine research projects funded by this programme, 13 were considered relevant to biodiversity research, representing a budget of around €4m. Under **PNAT**, 18 projects from a portfolio of 24 that were funded were considered relevant to biodiversity research, totalling approximately €1m.

A new general programme, **POCI** – Operational Programme in science and Innovation, is now underway for the period 2005-2010. Research projects dealing with biodiversity issues can be proposed under this programme.

**Assessment**

Research proposals are evaluated according to the following criteria:

1. Scientific merit and originality of the proposed activity
2. Scientific merit of the investigation team and their qualifications to execute the project, and provision of research opportunities for young scientists
3. Feasibility, work programme and budget

Each proposal is classified according to these criteria, before being assessed by the Evaluation and Selection Panel, which prepares a final evaluation report. This includes a classification along a five-point scale: poor, fair, good, very good, and excellent.

**Monitoring and evaluation**

Monitoring of funded projects is undertaken infrequently, i.e. sometime between 1-3 years. Interim reporting for funded projects involves use of a standard reporting form, in two distinct parts:

- A scientific report, giving a detailed description of the work carried out during the previous 12 months, with an annex listing outputs (performance indicators) such as books, reports, scientific papers in national and international peer-reviewed journals, communications in national and international meetings, organisation of seminars and conferences, etc.;
- A financial report, with a list of all expenditure during the previous 12-month period.

Final reporting follows the same model, with two distinct components to the report. Monitoring and evaluation of funded research is carried out through a peer review system, assessing scientific progress and delivery.
Formas – The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning

Background
Formas, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning, is a governmental research-funding agency related to the Ministry of Sustainable Development and the Ministry of Agriculture.

Formas encourages and supports excellent research related to sustainable development. Especially this means support in the areas of i) Environment and Nature; ii) Agricultural Sciences, Animals and Food; and iii) Spatial Planning. The projects supported cover a wide range of approaches from basic research to more applied efforts. Within the built environment also demonstration and experimental projects are supported. Formas stimulates activities aiming at cross-sectoral and interdisciplinary approaches within its area of responsibility.

The Research Council provides mechanisms for the communication of research results and stimulates the public debate on issues of concern, emerging from or related to research for sustainable development.

Formas is partly responsible for Swedish contacts with the EU programmes under the 6th Framework Programme on Environment and Quality of Life. It also has several assignments related to the urban oriented actions within the 6th FP. Formas represents Sweden in several IEA programmes and annexes and promotes Nordic research co-operation within its areas of responsibility. Formas is the Swedish member organisation of IIASA, the International Institute for Applied System Analysis.

Programmes and budgets
In 2002, Formas issued a directed call for biodiversity research. This came about due to the influence of the Swedish Green Party in the Swedish Parliament, and the money had to be allocated in the same year.

Since then, biodiversity funding has been part of Formas large annual research calls, open for ‘blue sky’ as well as more applied projects related to sustainable development. By calling for applications for funds that are not tied to programmes, Formas satisfies the need for diversity and provides the opportunity to test new ideas in research. The funding for biodiversity comes from the Ministry of Sustainable Development.

Around 10% of the Formas budget is spent on inter-disciplinary research. To qualify for funding, applications must have a minimum of two senior scientists from different disciplines.

Assessment
The Formas Scientific Council makes decisions concerning which projects to fund and on prioritised programme structures (these being decided by the administration of Formas). The Scientific Council also determines for how long funding will be provided. However, since Swedish Government funding is decided on an annual
basis, funding for 3-year projects is always provisional. The Formas constitution requires that the Scientific Council is led by scientists.

The research community submits many double applications (i.e. the same project proposal) both to Formas and Vetenskaprådet (VR), the Swedish Research Council. However, the outcomes are very different, with Formas-funded research tending to be more applied in nature. Some basic research does receive funding from Formas, but this must have some applicability within the sectors for which it is responsible.

When shaping research priorities, a variety of stakeholders are engaged by Formas; whereas, for selection of projects to meet these, stakeholders are primarily from the research/academic community. Assessment (standard setting) is undertaken by administrative staff within Formas. Research projects are appraised and ranked by Formas Expert Panels, working in accordance with an established policy for grant evaluation. The Formas Scientific Council then decides which applications to support. When science areas are to be assessed, external evaluators (national and international researchers) are used. Assessment Panels vary in terms of the number of projects they are expected to consider. Within Formas, each Panel evaluates between 40-150 proposals. If the number of applications exceeds 100, a two-stage process for evaluations may be used where 30-40% of the best proposals are selected by 2-3 Panel members, while the remainder are read by the whole Panel. However, the most common process is that evaluation is made in a single step where all panel members evaluate all proposals.

*Monitoring and evaluation*

The directed call for biodiversity research, issued by Formas in 2002, has yet to be evaluated fully. However, the entire biodiversity research field has been the subject of an appraisal (Widemo, 2006).

Evaluations are not normally carried out at the individual project level, but rather at a higher level, by an international panel (scientists from elsewhere in Europe). These are published. Evaluation of individual scientists and projects is undertaken when an applicant seeks new research funding. If the applicant fails to report previously completed projects, new funds will not be granted.

**SEPA – The Swedish Environmental Protection Agency**

*Background*

*Programmes and budgets*

Of the biodiversity research supported by SEPA, 90% is focused on policy support, with the remaining 10% concerned with horizon scanning activities (e.g. commissioning reports, which can be used to take a “forward look”; and the development of a research strategy for future years). Researchers may also be awarded grants to conduct research-related studies and knowledge-building projects. Such studies and projects are instigated and commissioned by SEPA. All SEPA funding is received from the Swedish government (the Ministry for Sustainable Development), and is subject to conditions that it should be used for research in support of SEPA’s role in policy and enforcement. SEPA is also regulated through
the priorities identified in the Government’s budget and in the annual instructions to SEPA. This means that part of SEPA’s research funding has to be used for certain purposes.

SEPA are involved in other collaborative research e.g. in partnership with MISTRA. Although as a test case SEPA has opened its funding to researchers from other Nordic countries, the system was unfortunately not really tested since the only external application was not sufficiently highly ranked to receive funding. SEPA are currently partners in 6 or 7 ERA-Nets. Although enthusiastic about international collaboration, they recognise that participation requires a lot of staff time. An ERA-Net needs to be within one of their priority areas and participation must be recommended by an internal R&D group (in which all departments of SEPA are represented). The policy is to try and ensure that relevant staff across SEPA and not just those within the research secretariat, are involved in different ERA-Nets.

Assessment
When it comes to selecting projects, SEPA’s Director General takes executive decisions. These are informed by an Environmental Research Council, a form of advisory committee with scientific expertise. This Council is made up of scientists, all but one from the university sector. The Chair is appointed by the Swedish Government, while the appointment of members is carried out by the board of SEPA.

Although many other stakeholders are involved in SEPA’s work as an environmental agency, there is no special consultative process regarding biodiversity research priorities. The prioritisation process is carried out internally, based on SEPA’s overall priorities (and those of the Swedish Government). SEPA stakeholders are able to engage with the process at all levels, i.e. making ad hoc proposals across a wide range of fields, contributing to or setting indicative broad themes, identifying specific research programmes and individual projects, and agreeing workplans for research delivery.

For the assessment of environmental quality, a nationally recognised system is used (this is also used by other Swedish Research Councils, Formas and VR). For the assessment of environmental relevance, an internal system is used. SEPA also focuses on policy support and communication. One of the key criteria for setting benchmarks is the usefulness of the scientific results for achieving national Environmental Quality Objectives (www.miljomal.nu). Another criterion is whether the research supports national environmental legislation or international environmental agreements.

Within the last year, requested by the Swedish Government (in the annual instructions to SEPA), gender equality has also been a key criterion, of equal importance to scientific quality and excellence. It is not yet clear whether this would be a requirement of participation in BiodivERsA, but might depend on the amount of funding provided. Given these very different criteria, projects selected are not always those of the highest scientific quality, but are of high scientific quality and will help SEPA achieve its specific objectives.

Monitoring and evaluation
Monitoring activities focus on programme management, i.e. adherence to targets and milestones, but are also concerned with Knowledge Transfer actions (dissemination of results, communication with stakeholders). The quality of science and financial management (adherence to budget), are also considered.

Programmes are assessed midterm, i.e. a 5-year programme is usually assessed after 2-3 years. The assessment is undertaken by an ad hoc panel, involving external scientists and internal staff (environmental and biodiversity officers). SEPA also undertakes more regular monitoring of programme activities through participation in programme management teams. It is usual for 1-2 SEPA officers to be members of the programme management team. Officially, however, they take part in meetings only as observers; their involvement is in practical matters, rather than matters of science.

Therefore, any “steering” of research by SEPA is done during project selection, midterm assessment and subsequent evaluation.

To date, none of SEPA’s biodiversity research programmes have been evaluated at completion. SEPA is still developing a wide range of evaluation criteria for future use, since evaluations are due in the next 12 months. However, the processes in use for ongoing and mid-term assessment are under continuous review, and are changed as necessary. These require a report from project managers, including assessments of Knowledge Transfer and stakeholder engagement. The mid-term assessment is a “light touch” to help the evolution of the projects, and there is a move towards this happening after 30-36 months. The evaluation panels comprise a mixture of researchers and Environment Officers.

**Swedish Research Council (Vetenskaprådet (VR))**

*Background*
VR is the largest provider of public funds (approximately SEK 2.5 billion per year) for Swedish basic research at Swedish higher education institutions and research institutes. The projects it supports are mainly initiated by the researchers themselves, i.e. “blue skies” research. The support is distributed to research that is of the highest scientific quality and best promotes the renewal of research.

Support is provided mainly for: projects, appointments (mainly senior and junior research positions), fellowships (for postdoctoral students and for PhD students), costly scientific equipment and infrastructure, travel and conferences, publication of scientific papers, and planning.

*Programmes and budgets*
Of VR’s total budget, SEK 50 million is set aside for biodiversity research. Of this, SEK 30m is earmarked for basic research, with the remaining SEK 20m for interdisciplinary research (including social and medical sciences) of relevance to biodiversity. Therefore, funding for biodiversity research is fixed, and the definition of this is clear, having been subject to substantial discussions.
The motivation for VR to join ERA-Net projects relates primarily to its existing areas of interest; i.e. joining those on themes being addressed by VR. In terms of moving towards a common call or even a common funding pot, VR has a “wait and see” attitude. VR are participating in several ERA-NETs (in biodiversity, physics, polar and social sciences). Key criteria in deciding whether or not to participate are whether the proposed activity fits the VR profile of basic research, the stage at which VR are invited to join the venture, their level of involvement (e.g. leading workpackages or tasks, or as just a partner), and perhaps most importantly, whether a member of VR staff picks up the project to act as an internal champion.

Assessment
Grants are allocated by a process of peer review of incoming applications, a system of quality assessment and prioritisation in which some 500 prominent Swedish and non-Swedish researchers appraise the applications on behalf of the Scientific Councils.

Within biodiversity research, applicants are required to indicate that they wish to apply for specific funding. Their applications are forwarded to a special Biodiversity Committee. In theory, this Committee’s role is to determine the “biodiversity relevance”. However, in practice, it also has the best Swedish competence in evaluating biodiversity science. Consequently, both the relevance and final ranking exercises contain substantial, but undefined elements of scientific quality. A project that is scientifically poor (i.e. in terms of biodiversity science) will tend to receive a low relevance ranking and, although this is a cause of some disagreement between the Biodiversity Committee and VR (since this is not normal VR practice), in practice this works well. Relevance can be high if the project tackles important biodiversity issues in an interdisciplinary manner, the Committee making its judgements after having solicited opinions from VR’s relevant scientific drafting groups and, in special cases, outside experts.

To guide its decisions and inform the research community, the Biodiversity Committee has produced a policy document for research on biodiversity, highlighting the kinds of research that the Committee will fund. As part of the discussion that has informed this document, the Committee has been able to define criteria for funding high-quality interdisciplinary research projects (which are needed urgently in biodiversity science, but can often fall between communities in the standard VR system).

VR identifies the most appropriate stakeholders using a joint approach with Formas. The membership of VR’s Biodiversity Committee is determined by nominations submitted to the Chairman, representing different aspects of the best Swedish biodiversity research. In addition to the Committee members selected according to scientific excellence, there are additional stakeholders from the social sciences, molecular and organismic biology.

VR invites international review teams to agree and set standards/benchmarks once every 3-4 years (previously, this had taken place at 10-year intervals). Reviews are carried out at a subject levels, rather than undertaking assessments of individual researchers. All collaborative opportunities are examined individually. Unsurprisingly, a good proposal including details of finance, management and
decision-making arrangements, in addition to scientific details, is more likely to be well-received than one which contains scant details.

Science quality is the most important assessment criterion used by VR but, in the field of biodiversity research, the biodiversity relevance of applications is also evaluated. Funding from the Biodiversity Committee requires that both are fulfilled. In the final ranking of projects, the Biodiversity Committee uses both its own relevance criterion and the basic scientific quality assessment made by the other scientific committees.

In addition to these, both gender balance and involvement of young researchers are examined. While retaining high quality requirements, high priority must be given to applications which give young researchers, and those who have newly acquired their PhDs, ample scope for continuing their research careers. The requirement of even gender distribution means that the representation of each sex must fall within the range 40-60%. Hence, Committees and Evaluation Panels should have access to detailed information about the gender distribution of grants and proposals in previous rounds of applications, and also about any targets adopted. Each Evaluation Panel must summarise the gender distribution of their proposals before these are presented for a decision-making meeting.

Monitoring and evaluation
Once a grant has been awarded, VR makes very little intervention. A short financial report (one side of A4) is submitted after year 1. However, with funding normally being for 3 years, the only reporting requirement is at the end of this period, if the researcher wishes to apply for a continuation of funding.

**NWO – Netherlands Organisation for Scientific Research**

*Background*
The Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) is an independent, non-governmental, self-governing funding body, with an annual expenditure of €450M. It is funded by the Dutch Ministry of Education, Culture and Science. NWO is responsible for enhancing the quality and innovative nature of, as well as initiating and stimulating new developments in, scientific research. It mainly fulfils these tasks through the allocation of resources. Furthermore, NWO facilitates the dissemination of knowledge from this research. It concentrates mainly on research delivered through the university sector, focusing on basic research in all fields of science. Traditionally, NWO has focused exclusively on basic research but, 15 years ago, moved away from this to take a broader view.

NWO acts as an umbrella organisation, with funding branches (NWO science councils and Task Forces) and research branches (NWO institutes). There are eight science councils, working semi-independently, but with a single corporate identity. ALW – the Earth and Life Sciences Council – is the most relevant to the BiodivERsA ERA-Net, but this is also of relevance to MaGW – the Social Sciences Council, and WOTRO – the Netherlands Foundation for the Advancement of Tropical Research and the International Affairs Department.
NWO’s role has been to engage scientists to write programme plans and invite the relevant Ministries to comment. In this way, NWO and academic bodies have initiated >50% of the programmes in this field. In addition, NGOs such as the Worldwide Fund for Nature (WWF) have also been approached to contribute ideas during the development of new programmes. Although they do not contribute funding, they aid the writing of proposals, share data, provide field sites, and sit on the scientific steering committee. Furthermore, a Dutch biodiversity network exists within Government, in order to keep different Ministries informed of one another’s activities. Finally, a biodiversity platform has recently been established in 2006.

In addition to funding research, NWO has a remit that includes Knowledge Transfer, including initiatives for disseminating research results to the general public.

Programmes and budgets
There are five thematic programmes associated with biodiversity:
1. biodiversity in disturbed ecosystems (1994-2004). This programme is now being evaluated by an international review group;
2. biodiversity in relation to global change (2001-2008);
3. sustainable use and conservation of marine-living organisms;
4. system-oriented ecotoxicology;
5. describing, understanding and managing biodiversity loss and recovery, and associated ecosystem functions (to be funded from 2007 onwards).

NWO has also supported a stimulation programme on biodiversity, in collaboration with the Ministry of Agriculture and the Ministry of Housing, Spatial Organisation and Environment. This programme ran between 1998-2004, aiming to:

- integrate scientific knowledge on biodiversity and translate this into policy;
- integrate scientific disciplines (ecology, economics, behavioural & social sciences); and
- encourage the drafting of new interdisciplinary proposals, engaging with end-users, including practitioners.

This third component of the programme was guided by the outcomes from a series of workshops focusing on (1) agro-biodiversity and (2) nature conservation, which brought together researchers and practitioners to draft proposals together.

The Science Council for Earth and Life Sciences (ALW) has an annual budget of €40M, to be spent on:

- Blue skies research (an open ALW programme)
- Thematic programmes
- Person-oriented programmes

In addition to these, ALW spends its funds on investments and international projects.

The “blue skies” programme receives approximately €8M per annum, with continuous submission of proposals. The success rate is between 25-30%, with a maximum of one proposal per year from any researcher. For both “blue skies” and thematic programmes within ALW, proposals have to be submitted by a senior
scientist, who is also responsible for selecting project personnel. Grants are made to support salaries of PhDs or post-docs, bench fees, instruments, and travel costs.

A number of person-oriented programmes exist:

1. Rubicon programme - aimed at researchers within one year of obtaining their doctorate, and is to support non-permanent appointments. It is open for Dutch scientists conducting their research abroad or in the Netherlands, and extends across all disciplines (travel and subsistence only);
2. MEERVOUD programme - supporting more women researchers to become university lecturers; and therefore aims to help female postdocs by creating temporary part-time lecturer positions (or similar positions in institutes), with the added guarantee of obtaining a (different) scientific position within their research institution.
3. Vernieuwingimpuls programme - to provide an “impulse” to the careers of young researchers. It focuses on support to talented, young researchers of any nationality, working within Dutch science. It aims to improve the age distribution of scientists, stimulate new, creative lines of research, and have an impact on the university system.

Note: Both the MERVOUD and Vernieuwingimpuls programmes include salaries of the applicant as well as that of co-workers.

NWO’s attitude towards supporting international programmes is a general willingness to collaborate, and even more so if the subject fits within NWO’s priorities. Decisions regarding specific ERA-Nets are dependent on existing NWO initiatives and strategic priorities, with the final decision to take part made by the Boards of the Science Councils.

Assessment
When it comes to defining thematic priorities, the approach that has been taken has involved identifying societal and scientific issues, i.e. “connecting science and society”. This process has generated thirteen themes for further development by the major players – government departments, innovation platforms, technological institutes, universities - with NWO as an intermediary. It is necessary for NWO to work closely with government bodies, foresight committees and councils from different sectors (effectively advisory committees to government), in order to identify policy-related research. NWO works particularly well with the medical sector council, but has had rather less contact in recent years with the environmental sciences council. NWO is looking to work more closely with applied researchers, in order to bring together “blue skies” and applied research.

Programme descriptions and project proposals are sent to international researchers (i.e. outside of Europe) for comment. They are required to assess science quality, innovation, feasibility, and relevance. Their report for each proposal is sent to a single referee. External referees are selected by the Scientific Programme Committee members, in a joint exercise with NWO staff. Generally, this is done by reference to an internal database of experts, although internet searches may be used to supplement this approach.
Once the referees' reports are received, a priority list is drawn up by a Scientific Programme Committee. Depending on the funding available, the Committee may use this ranked list to focus on a selected number of proposals, i.e. those considered marginal for funding. The Scientific Programme Committee is required to explain its decisions to a Scientific Steering Committee, for approval of funding. This Steering Committee exists for moderation purposes, with members being representatives from the various funding organisations. Once decisions have been made, the Steering Committee informs the NWO Board.

Monitoring and evaluation
For every programme, a mid-term evaluation is mandatory. This is undertaken by an external review team, which advises on how the remaining funds should be spent. In addition to this, a short annual report is necessary for each project.

An evaluation report is required from the researcher(s) at the end of a project. This averages between 5-10 pages, and has to answer a set of standard questions (issued by the NWO programme manager). This report is seen by both the Scientific Programme Committee and the Steering Committee.

Once a whole programme is complete, an international evaluation is carried out. An External Evaluation Committee addresses a standard set of questions relating to the delivery of the funded research at the programme level.

5 years after the project has been completed, the researcher(s) responsible for its management is asked about the outcomes of their work, e.g. publications produced, policy advice given, etc. This is carried out using an internal, NWO-derived system.

Defra – The Department for Environment, Food and Rural Affairs

Background
Defra, the U.K. government Department for Environment, Food and Rural Affairs, brings together the interests of farmers and the countryside, the environment and the rural economy. It aims to do this by integrating environmental, social and economic objectives, putting sustainable development into practice and promoting this within government. Under the overarching aim of sustainable development, Defra has five strategic priorities: (1) climate change and energy, (2) sustainable consumption and production, (3) protecting the countryside and natural resource protection, (4) sustainable rural communities, and (5) a sustainable farming and food sector (including animal health and welfare).

Defra seeks to ensure that wildlife and countryside policies are based on the best scientific evidence available. The use of science, including social science, is essential to develop and implement effective policies to conserve and enhance wildlife and promote enjoyment of the countryside. For research which seeks to anticipate future impacts on policy, Defra operates a Horizon Scanning Programme.

Programmes and budgets
Defra is a major funder of science, spending around £320 million annually. The majority of Defra’s research funding is focused on policy support (80%), with
knowledge transfer activities (10%) and “horizon scanning” (10%) making up the remainder. The Research and Development budget is set by the Science Directorate, whereas non R&D funding comes from the Director’s budget (e.g. policy development). Defra’s Living Land and Seas Directorate General does support collaborative biodiversity research with other countries, contributing 5% of its budget to this. The two main projects supported are BiodivERsA and the Global Biodiversity Information Facility (GBIF [http://www.gbif.org/]). In both cases, eligibility for funding is not restricted, and is open for researchers from institutions in any EU member state and beyond.

In order to ensure that Defra are carrying out the right scientific activities to underpin current and future policy needs, and to anticipate emerging risks and opportunities, an Innovation and Evidence Strategy (E&IS) programme was established in 2003. The E&IS document was launched for public consultation in 2005, and built upon an earlier report, Evidence and Innovation: Defra’s needs from the sciences over the next 10 years (Defra, 2004). This report identified the scientific challenges and opportunities likely to emerge over the next ten years and to which Defra may need to respond.

A standard form, known as a ROAME Statement (SID1), is used to provide a clear and succinct statement of Defra’s rationale for funding research. It outlines the reasons for requiring research in a particular policy area, as well as the policy and scientific objectives of that research. All SID1s are published and used to inform research contractors and other funders of research of the rationale and key policy drivers underpinning Defra’s research programmes. A SID1 must be produced for each research programme, and should be approved at Director level. SID1s are to be reviewed every 3-5 years.

Apart from the design of programme structures, which are decided within Defra; research needs, prioritisation and project selection are undertaken following wider consultation. This is undertaken via the national platform, The UK Biodiversity Research Advisory Group (BRAG). The stakeholders who are involved in identifying biodiversity research priorities are primarily the devolved administrations and non-governmental organisations, rather than other Government Departments. The majority of individuals involved are policymakers, rather than researchers or practitioners. Decisions about which stakeholders to involve in such discussions are taken by the appropriate Programme Manager, within the Living Land and Seas Directorate General of Defra. There is no hierarchy involved, although bodies contributing joint funding have greater influence.

Assessment
Standards for assessing research are set using both an internal system and external peer review. These are set by scientific staff within Defra and a panel of external stakeholders. Defra is encouraged to “draw on a sufficiently wide range of the best expert sources, both within and outside government.” While recognising that there is an extensive list of external sources (academics, learned societies, advisory committees, consultants, professional bodies, public sector research establishments, consumer groups and others), consideration should also be given to inviting experts from outside the UK, where appropriate.
**Monitoring and evaluation**

Prior to the introduction of the *Joint Code of Practice for Research*, the United Kingdom Accreditation Service (UKAS) undertook a baseline assessment. This examined how a selection of Defra-funded projects were being performed. It recommended that, whilst Defra projects are normally subject to regular monitoring by Defra Project Officers, organisations should review projects at planned intervals (UKAS, 2004).

Monitoring is both an internal and external process, the latter involving assessment by peer reviewers. Defra-funded projects are monitored on a continual basis, while programmes are reviewed every five years. Monitoring addresses science quality, financial management, and programme management.

Whilst peer review is used widely in Defra as a method of assessing the quality of research proposals, its use to determine the quality of the final reports received by the Department has previously been sporadic. It is crucial Defra policy is informed by high quality science, and so a unit – The Science Quality and Priorities Team (SQP) – has been set up to assist in this. Its primary role is to coordinate review by external experts (peer reviewers) of completed science programmes.

Once completed, the peer review summary report will be sent to all research contractors involved in the review, and the more detailed reports on individual projects will be sent only to the institute that conducted the research (along with the peer reviewers’ original comments). The research contractors will then have an opportunity to respond to the reports on both the individual projects and the overall summary. These comments will be returned – via Defra – to the coordinating peer reviewer, who will liaise with the other peer reviewers and consider modifications to the reports and summary. The revised reports will be sent to Defra, and these will in turn be published.

The evaluation of biodiversity research programmes addresses the following criteria: (1) delivery of programme outputs within timeframe and budget, (2) degree of engagement with conservation practitioners, (3) science impact and, most importantly, (4) policy impact. In addition, Defra conducts independent scientific audits of its Laboratory Agencies every five years, to ensure that the science carried out is of “high and appropriate quality”, delivering to Defra’s requirements.

**The Natural Environment Research Council (NERC)**

*Background*

NERC is funded through grant-in-aid, through the Office of Science and Technology (OST; part of the Department of Trade and Industry). NERC determines how this science budget is invested, delivering independent research, survey, training and knowledge transfer in the environmental sciences; with an overall aim to advance knowledge of the Earth as a complex, interacting system. NERC’s work covers the full range of atmospheric, Earth, biological, terrestrial and aquatic sciences, from the deep oceans to the upper atmosphere, and from the poles to the equator.
Science for a sustainable future, 2002-2007 (NERC, 2002) identifies strategic and scientific priorities, which have evolved from extensive consultation with scientists, business executives, policymakers and the public. Three priority areas are identified: (1) Earth’s life-support systems (water, biogeochemical cycles and biodiversity), (2) climate change (predicting and mitigating the impacts), and (3) sustainable economies (identifying and providing sustainable solutions to the challenges associated with energy, land use and hazard mitigation).

Programmes and budgets
Approximately 16% of NERC’s total expenditure (circa €53.6m) is classified as biodiversity research. This includes expenditure in NERC’s Research and Collaborative Centres: e.g. the Centre for Ecology & Hydrology (CEH); the National Oceanographic Centre, Southampton; and the Centre for Population Biology. Relevant current Directed Programmes include Rural Economy and Land Use (RELU, jointly funded with the Economic and Social Research Council (ESRC), Defra and the Scottish Executive), Environmental Genomics, Post-Genomics & Proteomics, and Marine Productivity. The allocation of funding is made in line with NERC’s Strategy and current science priorities.

NERC is a member of the National Platform, the UK Biodiversity Research Advisory Group (UK BRAG), and so is able to engage with the wider community in this way. However, NERC also operates through a variety of Research Council-led bodies and initiatives to review priorities at particular intervals. There is a continuous process of gathering views, priorities and issues feeding into strategy and policy development. Mechanisms which are used include regional events, strategy focus groups, web-based consultations, the NERC Pinboard, Science to Policy Strategy Panels, and other forums such as the Environmental Research Funders’ Forum (ERFF).

A number of Strategy Panels are operating at present, in order to develop NERC’s strategic priorities. In the case of the biodiversity panel, members are drawn from staff of the various research councils, academia, Defra, and the nature conservation agencies. The panels operate over a two-day meeting, and are primed with briefings prepared by NERC. They are encouraged to take a very broad view.

In addition, a variety of “pump priming” activities are supported. These take place prior to programmes being started, following recommendations from NERC’s Science and Innovation Strategy Board (SISB), involving the steering committees of funded programmes, members of SISB and the NERC Council.

Views are welcomed from all stakeholders, although for specific purposes (e.g. Expert Panels) NERC may engage with appropriate representatives from Government Departments, Agencies, NGOs, industry and academia. The types of engagement and extent of influence of external stakeholders are likely to be impacted by factors such as the wider national and international strategic context, significance and potential impacts. Stakeholders are consulted to contribute to and agree indicative broad research themes, and are also able to make ad hoc proposals in this way. The identification of specific research programmes and individual projects is carried out via Science Review Panels and Programme Steering Committees. Proposals for new programmes usually come from the academic community, or from gap analysis of NERC’s 5-year Science Strategy. The
agreement of workplans for research delivery can also involve some stakeholders, through the peer review process.

**Assessment**
The setting of standards (Assessment) for assessing biodiversity research is carried out using nationally and internationally recognised systems, established by a combination of internal administrative & scientific staff and external stakeholder panels. Criteria for individual research projects are scientific excellence, fit to NERC priorities (and individual Programme priorities), risk-reward, and cost-effectiveness.

Applications for “blue skies” research are sent for initial assessment to members of the NERC Peer Review College, and this is followed by a sifting stage in which approximately the lower 40% are filtered out. The remainder are sent out for external peer review. Applications to Directed Programmes may also be sent to UK and international scientists for evaluation. The referees’ comments and responses are then discussed by a Moderating Panel, which provides final grades and makes recommendations for funding. At NERC Research and Collaborative Centres, proposals for Core Programme funding (over a 5-year period) are assessed by an external (including international) peer review process and an independent panel.

**Monitoring and evaluation**
Monitoring of research underway is via an internal process, as well as involving an independent assessment with external stakeholders. Monitoring is carried out on a continual basis, with annual programme reports being produced for each Directed Programme. Output Performance Measures data are collected each year for all live grants, using an online system. Award holders fill in an annual report, in which they provide information on publications, any awards received, influence of their research on policy, and any publicity that has been received. Science Management Audits are carried out at all Research and Collaborative Centres, and reports are submitted to SISB and the NERC Council.

Monitoring addresses many criteria, quality of science being particularly important. In addition to this, the following are monitored:

- programme achievements against aims and objectives
- impact
- knowledge transfer / exploitation
- capacity building
- policy uptake
- science communication

For Directed Programmes, post-project evaluation takes place on an ad hoc basis, usually at least 6 months after the Programme end. This allows for a better assessment of outputs and achievements, and the process includes stakeholder consultation. As with monitoring, the important criteria are (1) delivery of programme outputs within timeframe and budget, (2) science impact, (3) policy impact.
### Appendix 3. Barriers to collaboration: an assessment at various planning levels, for different enablers (Peterborough Workshop, 22-23 February 2006).

<table>
<thead>
<tr>
<th>Enablers (right) Planning level (below)</th>
<th>Ministry</th>
<th>Agency / Research Council</th>
<th>Programme administrator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrier: fair contribution, loss of control over own funds (joint pot)</td>
<td></td>
<td>Barrier: no problems?! (if Blue Skies, then only interested in good science)</td>
<td></td>
</tr>
<tr>
<td>Solution: need to engage with the principle of closer European integration</td>
<td></td>
<td>Barrier: very applied v very fundamental</td>
<td></td>
</tr>
<tr>
<td>Barrier: Very applied v very fundamental</td>
<td></td>
<td>Barrier: benchmarking, and justification / explanation for scientific design</td>
<td></td>
</tr>
<tr>
<td>Barrier: establishing joint priorities</td>
<td></td>
<td>Solution: design by consensus</td>
<td></td>
</tr>
<tr>
<td><strong>Programme</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrier: lack of policy relevance</td>
<td></td>
<td>Barrier: concerns of the national science community (justification of taking a pan-European approach)</td>
<td>Barrier: communication with disparate researchers</td>
</tr>
<tr>
<td>Solution: need to ensure relevance, by consultation during the planning and delivery phase</td>
<td></td>
<td>Solution: must promote the credibility of ERA-Net approach</td>
<td>Solution: need an effective communication network (must be two-way). Need to build trust and confidence.</td>
</tr>
<tr>
<td>Barrier: perception of increased costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Project</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrier: need to understand the relevance and benefits of biodiversity (economic AND social)</td>
<td></td>
<td>Barrier: need transparency in the review process.</td>
<td>Barrier: (1) annual financial reports (using standard forms?) (2) science report at the end of the project (i.e. 3 years)</td>
</tr>
<tr>
<td>Solution: research community must show links to goods and services</td>
<td></td>
<td>Solution: is there a solution that satisfies all?</td>
<td>Solution: (1) depends on funding model used, (2) standard report? However, this must include a specific section on each partner’s role, in order to satisfy national funding bodies</td>
</tr>
</tbody>
</table>

The partners at the workshop considered the way ahead, attempting to identify mechanisms of cooperation within European funding agencies. They identified 4 major areas to be addressed:

1. Commitment to collaboration
   • high level: is participation a political move or a real interest in getting involved?
   • operational: programme managers in home organisations might fear extra work or lack confidence in new and unfamiliar programmes.
   **Solution** - communication with colleagues throughout the process should help to secure buy in.

2. Financial issues:
   • planning, to secure adequate funding made available from all partners at the same time. Some organisations may be less ready or able than others to commit quickly.
   • need to secure a sense of a good return on investments made
   • a common pot will be needed to share central administration costs, but agreement on equity in their division will be critical.
   • differences in research costs between countries
   • clear agreements on funding options e.g. national funding or joint pot, or a mixture of the two. ERA-Chemistry was identified as having experience in this area.
   **Solution** – good planning to identify what is needed from partners and when it is needed. This requires firm commitments from partners.

3. Managing and monitoring the common call:
   • the group agreed a lead organisation will be needed to manage the call and administration, but who should this be?
   • ESF identified as an independent body that could be approached to manage a call or to offer advice.
   **Solution** – identify a lead organisation to manage the process, and partners need to commit to this.

4. Agreement on priorities:
   • remit of the call (broad enough to encompass BiodivERsA partners but not too broad so as to produce unmanageable demand in larger countries)
   • evaluation of proposals to be based purely on scientific excellence or other factors e.g. theme coverage, economic and social relevance?
   • how to handle applied and basic research?
   **Solution** – this topic was considered in greater depth at the Porto workshop, 4-5 May 2006, as part of Task 2.2 of Work Package 2.
Appendix 5. A quality assurance system for managing research.

BiodivERsA needs to adopt a transparent and effective quality system, based around a core best practice process. In the U.K., Defra has recognised the importance of establishing an enhanced quality management system, built around the following set of principles (Anon., 2002):

- all research grant applicants need to commit to a set of basic minimum quality requirements for all projects;
- all research proposals should be assessed in terms of risk-reward, and those perceived as being of higher-than-average risk should identify additional quality requirements, including a detailed study plan;
- BiodivERsA should devise a monitoring programme, including pre-contract award checks if necessary, to ensure accreditation to an appropriate standard;
- contract agreements must state explicitly the quality requirements, including the need for contractors to report to BiodivERsA any problems that could impact quality;
- documentation should include a procedure for problem resolution, based on discussion and agreement of actions, but retaining the option to apply sanctions, if required;
- quality monitoring of projects will be carried out in accordance with the overall monitoring programme, but will be focused on higher “risk” projects;
- at the conclusion of the research, the results are to be subject to a formal review (including peer review if appropriate, e.g. for higher “risk” projects) – the value of the research is appraised on completion and again, if appropriate, 6 months or a year later.
Appendix 6. A list of BiodivERsA partners

1. Institut National de la Recherche Agronomique – Institut Français de la Biodiversité (INRA-IFB) – FRANCE.
2. Fonds zur Forderung der Wissenschaftlichen Forschung (FWF) – AUSTRIA.
4. Estonian Science Foundation (EstSF) – ESTONIA.
5. Ministère de l’Ecologie et du Développement Durable (MEDD) – FRANCE.
6. Projektträger im Deutschen Zentrum für Luft (PT-DLR) – GERMANY.
7. Ministry of Environment and Water (MEW) – HUNGARY.
8. Environmental Protection Agency (EPA) – IRELAND.
9. Ministero della Istruzione, Università e Ricerca (MIUR) – ITALY.
10. Netherlands Organisation for Scientific Research (NWO) – NETHERLANDS.
11. The Research Council of Norway (RCN) – NORWAY.
12. European Science Foundation (ESF) – FRANCE.
13. Fundação para a Ciência e a Tecnologia (FCT) – PORTUGAL.
14. Ministerio de Educación y Ciencia (MEC) – SPAIN.
15. Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas) – SWEDEN.
16. Swedish Environmental Protection Agency (SEPA) – SWEDEN.
17. Swedish Research Council (VR) – SWEDEN.
18. The Department of Environment, Food and Rural Affairs (Defra) – UNITED KINGDOM.
19. Natural Environment Research Council (NERC) – UNITED KINGDOM.