

European biodiversity research for a sustainable Europe:

sustainable Europe:

Research contributing to the implementation of the
EU Biodiversity Strategy



Short report of an electronic conference, March 2007



E-Conference organisation:

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The publication should be cited as follows:

Young, J., Neßhöver, C., Henle, K., Jax, K., Lawson, G., Weber, J. and Watt, A.D. (Editors). 2007. European research for a sustainable Europe: Research contributing to the implementation of the EU Biodiversity Strategy. Report of an e-conference.

Front cover: "Scottish landscape" by Lady Catherine Young.



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Preface

Research on biodiversity is essential to help the European Union and EU Member States to implement the Convention on Biological Diversity as well as reach the target of halting the loss of biodiversity in Europe by 2010.

The need for co-ordination between researchers, the policy-makers that need research results and the organisations that fund research is reflected in the aims of the “European Platform for Biodiversity Research Strategy” (EPBRS), a forum of scientists and policy makers representing the EU countries, whose aims are to promote discussion of EU biodiversity research strategies and priorities, exchange of information on national biodiversity activities and the dissemination of current best practices and information regarding the scientific understanding of biodiversity conservation.

This is a report of the E-Conference entitled “European research for a sustainable Europe: Research contributing to the implementation of the EU Biodiversity Strategy” preceding the EPBRS meeting to be held under the German EU presidency in Leipzig, Germany from the 5th to the 7th May 2007.



Introduction

Carsten Neßhöver

Having “the sustainable use of biodiversity” as the overarching topic of an e-conference and a forthcoming EPBRS-meeting appears, at first sight, to be too broad. However, combining the conservation of biodiversity with its sustainable use is the only way forward to a sustainable future:

- The new IPCC reports outlines the danger of accelerated climate change for human well being and ecosystems,
- The Millennium Ecosystem Assessment has shown that most ecosystem services are already heavily under pressure by human use,
- The FAO has just released a report stating that continued increase in cattle production in the next decades would strongly influence the very basics of the world’s food supply and the health of its ecosystems.

Thus, dealing with the sustainable use of biodiversity in the context of different systems is essential for safeguarding human well being in the future. Furthermore, by dealing with sustainable use, the basis of the work of EPBRS comes to the fore of discussions: linking biodiversity research with the main problems and questions that arise in policy and society on biodiversity. The main document in this context for Europe is the EC’s communication on “Halting the biodiversity loss until 2010 and beyond”, published in May 2006 (COM (2006) 216).

The e-conference and EPBRS meeting focus on three main objectives within this communication:

- Session I: Research contributing to reaching the 2010 target in the wider countryside (objectives 2 and 4 of COM).

It is well known and accepted that the loss of biodiversity can only be halted if the strong pressure on it resulting from intensive land use and management practises are designed in a more sustainable way. A multitude of measures have been developed and implemented in order to approach this goal. But successes still appear to be small, due to diverse constraints. On the other hand, new pressures are emerging: e.g., increased biofuel production and climate change may strongly alter land use management within the next years and decades and, currently, integrated management strategies dealing with such dynamics and uncertainties are rarely in place. Session I will deal with such diverse issues, trying to identify the most pressing questions to be tackled by research. The session was chaired by Klaus Henle (UFZ).

- Session II: European biodiversity research and the global perspective (objectives 6, 7 and 8 of COM).

The EC's communication also strongly emphasizes the role of the EC in the conservation and use of global biodiversity. European funded biodiversity research across the globe has a long tradition but, nevertheless, has to ask itself under increasing pressures if it is still asking the right questions and how its work can be linked more properly with research and policy in the host countries of their work. Session II will deal with this question, based on a former E-conference by the ERA-NET Biodiversa (www.eurobiodiversa.org). The Session was chaired by Jacques Weber (IFB) and Gerry Lawson (RCUK).

- Session III: Biodiversity and ecosystem services: the Millennium Ecosystem Assessment concept from a European perspective.

The concept of ecosystem services and human well being, as developed by the Millennium Ecosystem Assessment framework, is having a strong impact on environmental policy formulation and reasoning for safeguarding biodiversity. Nevertheless, in a European context, the concept needs to consider the long history of environmental policy and landscape management in Europe. Thus, determining those aspects of the concept that are useful in the European context is crucial. Session III, chaired by Kurt Jax and Carsten Neßhöver (UFZ) addressed this aspect.

We hope that these topics will cover important aspects of the sustainable use debate and will lead to fruitful debates during the forthcoming EPBRS meeting.



Summary of contributions

Juliette Young and Allan Watt

Session I: Research contributing to reaching the 2010 target in the wider countryside

The topics explored in this first session can broadly be summarised under three main headings:

1. Status and trends of biodiversity in the wider countryside;
2. Drivers of change in the wider countryside; and,
3. The management of biodiversity in the wider countryside.

In terms of assessing status, changes and trends in model components of biological diversity in the wider countryside, Jan Plesnik, like many participants in session II, emphasised the need for a reasonable monitoring scheme based on the agreed baselines and standards at the European level as well as an accessible Europe-wide geo-referenced inventory of species, ecological/functional groups and habitats to better understand and assess their distribution status, changes and trends. Building on his experiences with the “Countryside Quality Counts” project, Roy Haines-Young emphasised the need for monitoring of changes in the wider countryside to take account of stakeholder values and visions. The classification of habitats was addressed specifically by Mauro Agnoletti who expressed concerns over the FAO classification of EU forest origins and possible repercussions of this classification for the selection of Natura 2000 sites. Still on the topic of forest biodiversity, Petr Petøík emphasised the need to compile a comprehensive methodology for monitoring changes in forest species diversity in order to integrate various systems of monitoring schemes for the evaluation of forest ecosystem conditions and to integrate new methods of evaluation of the carrying capacity and vulnerability of forest ecosystems in land-use planning and to develop further studies on the evaluation of mechanisms and sources of biodiversity changes on genetic, species, population, ecosystem, and landscape levels. Related to this last issue, Teja Tscharnke discussed the importance of the landscape perspective in understanding patterns in functional biodiversity and the relation of biodiversity to ecosystem services and called for more research on the relative importance of local and landscape management for biodiversity and its relation to ecosystem services such as pollination. Ernst-August Nuppenau also stressed the need to better understand the value of a diverse environment, as well as

the contribution of biodiversity to production and income in order to find answers to how farmers can be integrated into biodiversity conservation. The need to better understand the interactions of human behaviour and ecosystems was also highlighted in Silvia Wissel and Florian Hartig's contribution. In a similar vein, Klaus Henle stressed the need for more research on biodiversity conservation in the wider (European) countryside by natural resource management complemented by research that develops strategies on how the conservation of biodiversity can contribute to the cultural, social, and general well being of the people living in and of the wider countryside.

A number of contribution addressed particular threats to biodiversity in the wider countryside and possible research needs to counter these. A threat mentioned by many participants was that of land abandonment. Herbert Prins focussed in his contribution on the effects on biodiversity of shrinking human populations in the wider countryside and suggested a number of areas of research including mapping new wilderness and better understanding the demographic patterns concerning human population decline and land abandonment. In terms of the growth of wild large animal populations in new wilderness areas resulting from abandonment, he suggested research on the ecological requirements, population dynamics and possible economic and financial possibilities of sustainably harvesting rebounding wildlife, as well as the effects of such harvesting. Jan Jansen described the history of heathland-based farming systems in Western Europe and illustrated their potential role in providing local food, maintaining an attractive open landscape, contributing to the Natura 2000 network and halting the loss of biodiversity both in nature areas and the adjacent wider countryside. In order to develop heathland-based farming systems, however, he emphasised the need for economic possibilities of farming to be re-examined, particularly in remote areas where traditional farming is still being practiced, but also the economic possibilities of reintroducing heathland-based farming close to densely populated areas. Following a contribution from Richard Hardwick, Jan Jansen expanded on his earlier contribution by specifying that research on the economic possibilities of heathland-based systems should include additional functions of farming including contributions to nature conservation, water management etc. Closely related to this topic, Yvonne Cerqueira wrote about the impacts of land abandonment on biodiversity and the loss of Traditional Ecological Knowledge (TEK). She called for more documentation of such knowledge, as well as research incorporating TEK into adaptive co-management practices. Related to the shift in population from rural to urban areas, Jukka Jokimäki called for more research on the likely areas affected by urban sprawl (including tourist destinations), and the effects of urbanisation on biodiversity.

In addition to land abandonment, other threats including climate change, biofuel production, the implementation of new policies in the New Member States and illegal poisoning. Angheluta Vadineanu stressed the need for research on describing the complex links between biodiversity, climate change and socio-economics across spatial and temporal scales. In relation to biofuel production, Giselher Kaule suggested research on the impact of the new forest matrix on biodiversity and the "design" of the habitat network, which could mitigate this development. He also emphasised the need for monitoring programmes and a renaissance of field studies. Jan Jansen endorsed this need for more field studies in Session III. In view of sudden changes in the New Member States, Tiiu Kull suggested research on the impact of different spatial schemes and management techniques of different energy crops on biodiversity, research on the possibilities of

regulating the spatial planning principles and research to help formulate the necessary conditions for an agricultural management of landscape that would increase biodiversity without introducing alien species (e.g. organic farming). Another threat, highlighted by Sergio Couto and his colleagues was that of illegal poisoning of raptors and carnivores in the wider countryside. Despite local efforts and successes to coordinate and promote actions against these practices, the authors call for more research on the impacts of such practices on wildlife, research on measures to counteract this practice and the social perceptions of illegal poisoning. They also called for EU-wide coordination and dissemination of research results, as well as best practice guidelines.

A number of other contributions focussed on particular species and habitats. Discussing the issue of forest biodiversity, Tor-Björn Larsson highlighted the fact that although progress was being made to halt biodiversity loss in European forests, many types of forests were still under threat and this required additional research on identifying cost-effective and realistic ways to stop biodiversity loss in these types of forests. The loss of genetic diversity of crop varieties, livestock breeds and races was highlighted in Allan Watt's contribution, in which he identified a major research priority as being the quantification of trends in the genetic diversity of harvested and domesticated species and the identification of policies and practices that ensure long-term sustainable use. On the same topic, Brian Ford-Lloyd suggested research testing whether the numbers of distinct land races could be a good proxy indicator of genetic diversity of crops. Addressing the issue of the sustainable use of fish, Dave Carss presented some of the results of the INTERCAFE project and suggested research on how "conservation success" species needs to be best managed at the continental scale where their impacts on other species of conservation concern are apparent; research on what affects the distribution and community structure of fish; and research to help identify policies and practices that ensure the conservation of fish species, the restoration of more natural fish community structures, and their long-term sustainable use. Finally, Allan Watt called for more research on soil diversity, specifically developing standardised approaches to monitoring soil biodiversity, quantifying the impacts of the major pressures on soil biodiversity and establishing ways of alleviating these pressures. This view was shared by Carlo Jacomini, who highlighted that a wider approach to the issue might be sought through the EU Directive on soil protection.

A number of authors focussed their contribution on the management of biodiversity in the wider countryside. David Pimentel for example commented on possible ways forward in conserving the wider countryside and advocated the encouragement and implementation of ecologically sound and sustainable management practices for agriculture and forestry. Contributors addressed both existing policies and possible new measures to conserve biodiversity in the wider countryside.

On the topic of agri-environment schemes (AES), David Kleijn highlighted the need for ecological information on the impacts of schemes on land abandonment and the associated biodiversity implications. Although he acknowledged that there was sufficient ecological insight and geographical information to identify the objectives, outcomes and targeting for potential AES prescriptions, ecological insights were often lacking for spatial scale effects and for temporal and ecosystem service effects. Building on his suggestion of linking wide-scale ecological evaluations to specific case studies on the causes of effectiveness of lack thereof, Jan Jansen suggested these could, in some cases, reveal specific situations that deserved

subsidies. Still on the topic of agri-environment schemes, Frank Wätzold highlighted three main areas where research was needed to improve the cost-effectiveness of such schemes, namely the development of decision support tools for designing cost-effective agri-environmental schemes, comparative research identifying best practice, and research to investigate how institutions and governance structures have to be designed to ensure that the available money is spent in the interest of conservation.

Cross sectoral integration of biodiversity was the topic of Rainer Müssner's contribution, which stressed the need to enhance scientific methods to evaluate the relative success of integration of biodiversity concerns in sectoral strategies and implementation plans and measures; to develop feasible indicators to measure and evaluate the level of integration of biodiversity concerns in sectoral policies, strategies and operational plans; and finally to carry out research on how to enhance the effectiveness and efficiency of SEAs and EIAs.

Silvia Wissel and Florian Hartig stressed the need for integrated research between social and natural sciences to better understand the impacts of different policies, a point also made by Angheluta Vadineanu who stressed the need for research of this type to be carried out at regional, national and European scales

Discussing the design of sustainable landscapes, Dirk Wascher highlighted three main areas of research, namely research on the development of indicators of sustainable development that can be made operational in a context of trans-disciplinary research and bottom-up dynamics, research on the application of landscape planning tools that build on the concepts of dynamic sustainable development, introducing the concept of resilience to both environmental and social systems and finally research to incorporate these concepts in visions of 'ontogenetic integrity' of landscapes to be understandable for all stakeholders (from local to national level). Focussing his contribution on differences between the resilience of cultural and natural landscapes, Jan Jansen queried Dirk Wascher's claim of reaching sustainable landscapes, particularly in light of present global changes. Although Dirk Wascher believed this was indeed possible, he did however highlight that the challenge would lie in establishing decentralized dynamic market systems where economic profit is re-invested into regional sustainable goals, monitored and if necessary co-subsidized on the basis of European indicators and priorities. Still on the same topic, Alessandro Gimona came up with a number of research needs, including the need to identify landscape areas that can deliver multiple benefits (including biodiversity) from various stakeholder points of view and ways to find sound ways to incorporate stakeholder's views in the planning process. Another related research need highlighted in this contribution was the design of economic tools and incentives for farmers and land owners that take account of the relevant social factors. Finally he also called for the effect of scale on the planning process to be considered.

Possible new measures to reach the 2010 target in the wider countryside were suggested by participants, including Tradable Permits, described in Silvia Wissel and Florian Hartig's contribution. They called for more research on the Tradable Permits market to determine their potential in providing an effective policy tool for the sustainable use of landscapes. Markus Groth presented results of two plant auctions in Lower Saxony and called for more research on plant biodiversity auctions as a possible new tool in the EU's agri-environment policy.

Speaking from a policy-maker's point of view, Andrew Stott highlighted research focussing on baseline information on status and trends in biodiversity in the wider countryside, the development of methods and tools for formulating biodiversity policy and targets, recognising the dynamic global economic and environmental

situation; improving decision methods including cost/benefit analysis, risk assessment and participatory processes, monitoring and evaluating the outcomes and impacts of policies at national, regional and global levels to assess progress towards 2010 targets.

Session II: European biodiversity research and the global perspective

The introduction to session II sparked off a lively debate among participants, including a contribution by Wouter Los in which he suggested categorizing the different suggested topics in a few research domains which are relevant to be addressed at global scale, and which can be used to structure this summary section:

1. Knowledge about the relevant components of biodiversity (taxa, distributions, trends)
2. Biodiversity functions, changes and adaptive capacity
3. (Technological, societal and political) management of biodiversity (EU and CBD programmes)
4. Interactions with other policy domains (trade, food, health, combating poverty, biotechnology)

The first issue dominated the second and third weeks of this session. Norbert Jurgens, Christoph Knogge and Karl Wantzen all highlighted the need for the development and availability of inventories and assessments of present diversity. Julia Jones focussed exclusively on the topic of monitoring in her contribution, warning about the potential dangers of monitoring and indicators and advocated the use of targeted monitoring in conservation monitoring. In response to her contribution, Allan Watt called for intensive research on selected species and ecosystems to provide the basis for more informative monitoring and more effective interventions. Reflecting on his experiences of monitoring in Russia, Vladimir Vershinin acknowledged the impossibility of an “absolute” method to monitoring and suggested instead an approach combining complexity and long-term observation in ecological monitoring. In reply to Jan Jansen’s call for a common agreement on the monitoring of biodiversity, Allan Watt mentioned the efforts already in place to come to such an agreement, and suggested that researchers could help by agreeing protocols for the monitoring of biodiversity. In terms of specific methods for monitoring that could be used for such a standardised approach, Alan Feest highlighted two validated biodiversity measurement methodologies (butterfly walk method and common bird census) and suggested one area of research could be to test these methods for high biodiversity habitats. In response to this contribution, Jorge Soberon expressed doubts on the application of such methods in high-diversity areas such as Brazil or Peru and suggested high-tech methods, like sound recognition, for birds, certain bats, certain frogs and certain insects or developing monitoring schemes for lay people and developing statistical methods capable of dealing with such non-standard sampling. Jan Jansen and Frédéric Archaux et al. addressed the potential application of the walk method (and other approaches) for monitoring vegetation. The latter argued for optimisation, standardisation and calibration to successfully monitor temporal changes in plant richness as well as “averaged” indices over the community to reduce biases and help reveal mechanisms. Acknowledging the huge amounts of monitoring taking place already, Klaus Henle suggested that the EU should develop a system on how the information and the databases generated through research projects could be maintained and updated in the longer run. This approach was seconded by Vladimir Vershinin’s contribution on this topic. Taxonomy was also widely discussed in this

session. Wolfgang Wägele started the discussion with a call for technologies and databases that speed up (a) access to taxonomic and biogeographic data; (b) re-identification of already known species; (c) description of new species; (d) re-identification of yet unnamed species; (e) quantitative assessment of species diversity. Agreeing on many of the points made by Wolfgang Wägele regarding the taxonomic impediment to activities in biodiversity research, Chris Lyal suggested a number of measures to address this impediment, including increased funding, clarity regarding the needs of the users of taxonomy, digitised access to data and effective project design.

Regarding the second point, i.e. research on biodiversity functions, changes and adaptive capacity, Norbert Jürgens highlighted a number of gaps in knowledge, including monitoring and assessment of the change of biodiversity in different biomes, integrating analyses of the potential drivers of change, and understanding of the processes and mechanisms which govern change of biodiversity. He also stressed the need for analysis of the consequences of changing biodiversity for ecosystem functions and for services to local, national and continental economies and society, integrating the economic equivalent of these changes. Christoph Knogge and Karl Wantzen suggested developing tools for modelling future scenarios for management and preventive land use planning, management of biodiversity on the regional scale, management and development of techniques of land use systems and use of natural resources. In terms of biodiversity functions, Felix Rauschmayer added a number of questions to consider in this session, including the question of how to account for ecosystem services in other parts of the world when doing sub-global Millennium Ecosystem Assessment (MEA)-like assessments.

In terms of the management of biodiversity, Norbert Jürgens specifically emphasized the need to develop science-based strategies and tools for sustainable management and conservation of genes, species and ecosystems, as well as socio-economic and policy concepts for a realistic and feasible transformation from present exploitation practices to sustainable land and resource use regimes and governance patterns. Susanne Stoll-Kleemann described her work carried out in the GoBi (Governance and Biodiversity) project and stressed the need to gather more (meta) data on the level of protected areas and biosphere reserves which is open to all researchers who want to work with it in order to be able to measure the success of conservation measures. In addition she emphasised the requirement for more research conducted by interdisciplinary teams and on the basis of the ongoing participation of all relevant stakeholders. This was also a point made by Norbert Jürgens, who stressed the need for communication and learning partnerships with resource users and other stakeholders at the levels of households, farms, villages, nations and regions.

A recurrent theme throughout the session was the need for building of national capacities (see contributions from Jorge Soberon's, Christoph Knogge and Karl Wantzen). Jurgen Tack addressed this theme in more detail in his contribution, in which he suggested a number of ways to promote better capacity building in biodiversity research. These included the need to specify capacity building as a target, define capacity building and what can be expected from it, describe the process towards capacity building and specified outcomes. Finally, he emphasised the need to ensure that projects initially funded with a target of capacity building were not subsequently treated as pilot projects and refunded on a recurrent basis.

On the last point, Ashish Kothari wrote a particularly interesting contribution addressing the issue from a different perspective and suggested research on the

impacts of Europe on the biodiversity of southern countries, namely the consumption of goods and services from the south (including primary products, services such as tourism), and the impacts of development assistance.

Session III: Biodiversity and ecosystem services: the Millennium Ecosystem Approach concept from a European perspective

Martin Sharman stimulated a number of responses with his contribution, in which he foresaw a number of issues that might be recommended by SBSTTA and possible questions arising from these.

In reference to Martin Sharman's first question on MEA-like assessments, Felix Rauschmayer responded by calling for more cooperation between natural and social scientists in the design and coordination of MEA-like assessment and the integration of policy-makers in the design and implementation of the research. This was reinforced by Mirilia Bonnes' contribution. Ferdinando Boero also approved of the idea of carrying out MEA-like assessments but called for more discussion on the meaning attributed to "ecosystem". This point was explored in Marion Potschin and Roy Haines-Young's contribution where the authors considered different spatial frameworks and suggested that a landscape focus might be more appropriate.

In terms of the global standards in data collection and integration, Felix Rauschmayer argued that establishing global standards might threaten the strengths of the MEA assessments by losing policy-relevance as well as interdisciplinary integration between natural and social scientists. Regional standards may be a better option in homogenous regions. Ferdinando Boero called for standards on what data need to be collected and how this data should be stored. In addition, Petr Petøík added the need for standards to determine how to analyse data.

In terms of access to public-good research results on biodiversity, all contributors approved of the public use of such results.

Finally, regarding the communication of results, Felix Rauschmayer suggested that communication be made integral to research and suggested the integration of policy-makers in the design phase of research. In addition he suggested employing communication professionals to improve communication efforts. Finally he called for more meta-research on science/policy interfaces. Still on the issue of communication, Ferdinando Boero presented an example in Italy, where the ministry of the environment is using funds to support TV programmes in which aspects of biodiversity research are presented to the wider public.

Andrew Stott added to Martin Sharman's list by asking how far proposals for MEA-like assessments meet the needs identified by the IMoSEB consultation process. Carsten Neßhöver responded in the context of possible sub-global assessments for Europe. Still in relation to this topic, Thomas Koetz stressed "the importance of being more critical in the way needs were defined and to keep the overall objective of such mechanisms/processes/assessments in mind, before assessing whether such exercise would fill the needs raised by the IMoSEB consultative process".

Looking in more detail at the ecosystem services approach as a tool, Martin Sykes highlighted the difficulties inherent in quantifying ecosystem services and the lack of knowledge on the real effects of loss of some of these services for ecosystems and humanity. He concluded that addressing the challenge of quantifying ecosystems services involved "carefully selected cases at the right scale, combining experiments, data and models, within an integrated approach around the relevant science and socio-

economics at scales that are determined by policy requirements, rather than by the scientists”. On the topic of scale, Christoph Görg emphasised the need for multi-scale assessments including both horizontal and vertical scale interactions. Gary Luck and Richard Harrington focussed on the quantitative links between biodiversity and ecosystem services and described the approach of using “Service Providing Units” (SPUs) in the Rubicode project. Elena Bukvareva backed the SPU approach in biodiversity research (for example the valuation of boreal ecosystems), as well as more practical aspects of biodiversity conservation.

In terms of the valuation of ecosystem services, Clive Spash called for research into methods of expressing and articulating plural and multiple values and designing institutions that are able to protect and nurture them. Ferdinando Boero endorsed this view. In relation to this, Paula Harrison, Pam Berry, Gary Luck and Richard Harrington all mentioned the need to develop appropriate valuation techniques enabling costs of changes in ecosystem services to be calculated. Building on his experience of valuation of ecosystem services in the Baltic Sea, Jan Marcin Weslawski emphasised the need for valuation exercises to include more research on the view and opinions of local people. Still on the topic of valuation, Elena Bukvareva suggested a damage-based approach to valuation, i.e. the calculation of real and potential damage as a result of biodiversity degradation or loss.

Alison Holt suggested a number of other research needs, including the need to better understand the relationship between biodiversity and ecosystem services, and to collate suitable data across the natural and social sciences to assess the sustainability of ecosystem service provision and consumption. In relation to the first point, Nicola Beaumont and Melanie Austen recognised the need to better understanding the contribution of biodiversity to services such as resilience and resistance and nutrient cycling. On this point, Richard Harrington mentioned the development, within the Rubicode project, of ‘a service-led approach to understanding the link between services, functions and different components of biodiversity (e.g. functional groups...)’.

Another challenge in using ecosystem services as a tool was highlighted by Marion Potschin and Roy Haines-Young, who stressed the difficulty in determining what an ecosystem is. Moving away from the ‘habitat’ unit, they presented a more explicit ‘service’ approach and called for more research on defining the ‘relevant ecosystem service unit’ from both the ‘supply’ and ‘demand’ side. In order to achieve the above research, most participants to the e-conference stressed the need for interdisciplinarity between natural and social scientists, as well as the involvement of other stakeholders. Paul Armsworth focussed specifically on this aspect in his contribution, in which he discussed the individual and institutional changes required for such an approach. This was also the topic of Josef Settele’s contribution, which concentrated on the potential of large-scale integrative projects (such as Networks of Excellence) to meet many of the challenges of MEA-like approaches.



Research priorities

*Juliette Young, Allan Watt, Carsten Neßhöver, Klaus Henle,
Kurt Jax, Gerry Lawson and Jacques Weber*

Session I: Research contributing to reaching the 2010 target in the wider countryside

1. Status and trends of biodiversity in the wider countryside:

- Developing a monitoring schemes for biodiversity (including soil biodiversity) based on agreed baselines and standards at the European level;
- Developing an accessible Europe-wide geo-referenced inventory of species, ecological/functional groups and habitats;
- Developing a better understanding of the relationship between biological diversity and ecosystem functioning;
- Determining the relative importance of local and landscape management for biodiversity and its relation to ecosystem services such as pollination;
- Understanding the value of a diverse environment and its contribution to production and income in order to find answers to how farmers can be integrated into biodiversity conservation;
- Identifying carrying capacity thresholds and patterns in main ecosystem types;
- Understanding biological/ecological integrity concepts;
- Developing widely acceptable classifications for habitat/ecosystem/land-use/landscape types;
- Monitoring changes in the wider countryside to take account of stakeholder values and visions;
- Mapping new wilderness areas resulting from land abandonment;
- Developing indicators of sustainable development that can be made operational in a context of trans-disciplinary research and bottom-up dynamics.

2. Drivers of change in the wider countryside:

- Analysing biodiversity changes, drivers and pressures taking into account the synergistic effect of various anthropogenic and natural drivers of biodiversity change;

- Understanding the interactions between human behaviour and ecosystems in the wider countryside;
- Understanding the demographic patterns concerning human population decline and land abandonment;
- Determining the ecological dynamics, impact and economic and financial potential of sustainably harvesting rebounding wildlife;
- -Re-examining the economic possibilities of farming, particularly in remote areas where traditional farming is still being practiced, but also the economic potential of reintroducing farming close to densely populated areas;
- Identifying the opportunities and costs of biofuel production on biodiversity;
- Research into traditional ecological knowledge (TEK) and how to integrate it into research and conservation initiatives;
- Determining the likely areas affected by urban sprawl (including tourist destinations) and the effects of urbanisation on biodiversity;
- Determining the impacts and social perceptions of illegal poisoning on wildlife;
- Determining the impacts affecting the distribution and community structure of fish;
- Quantifying the impacts of the major pressures on soil biodiversity;
- Describing the complex links between biodiversity, climate change and socio-economics across spatial and temporal scales;
- Determining the impacts of agri-environment schemes on land abandonment and the associated biodiversity implications.

3. *The management of biodiversity in the wider countryside:*

- Evaluate the relative success of integration of biodiversity concerns in sectoral strategies / implementation plans and measures;
- Develop feasible indicators to measure and evaluate the level of integration of biodiversity concerns in sectoral policies, strategies and operational plans;
- Conduct research on how to enhance the effectiveness and efficiency of SEA and EIAs;
- Assess the impacts of current forestry policy and management on biodiversity;
- Understanding the Tradable Permits market to determine whether it can provide an effective policy tool for the sustainable use of landscapes;
- Understanding the impacts of different policies on biodiversity;
- Developing decision support tools for designing cost-effective agri-environmental schemes;
- Investigating how institutions and governance structures have to be designed to ensure that the available money is spent in the interest of conservation;
- Developing landscape planning tools that build on the concepts of dynamic sustainable development, introducing the concept of resilience to both environmental and social systems;
- Identifying landscape areas that can deliver multiple benefits (including biodiversity) from various stakeholder points of view and ways to find sound ways to incorporate stakeholders' views in the planning process;
- Designing economic tools and incentives for farmers land owners that take account of the relevant social factors;
- Quantifying trends in the genetic diversity of harvested and domesticated species and identify policies and practices that ensure their long-term sustainable use;

- Developing research to help identify policies and practices that ensure the conservation of fish species, the restoration of more natural fish community structures, and their long-term sustainable use.

Session II: European biodiversity research and the global perspective

1. Knowledge about the relevant components of biodiversity (taxa, distributions, trends):

- Developing and disseminating inventories and assessments of present diversity – taking into account the possibility that insufficiently intensive monitoring will not detect key changes;
- Intensive research on selected species and ecosystems to provide the basis for more informative monitoring and more effective interventions;
- Research approaches combining sampling of key taxa and with long-term ecological observation;
- Agreeing international and multi-scale protocols for the monitoring of biodiversity in different habitat types, perhaps based on techniques used in the Pan European Common Bird Monitoring Scheme;
- Developing monitoring methodologies for complex high-biodiversity groups or habitats;
- High-tech methods, like sound recognition, for birds, certain bats, certain frogs and certain insects or developing monitoring schemes for lay people and developing statistical methods capable of dealing with such non-standard sampling;
- Optimising, standardising and calibrating monitoring of temporal changes in plant richness as well as “averaged” indices over the community to reduce biases and help reveal mechanisms;
- Developing technologies and databases that speed up (a) access to taxonomic and biogeographic data; (b) re-identification of already known species; (c) description of new species; (d) re-identification of yet unnamed species; (e) quantitative assessment of species diversity;
- Measures to prioritise taxonomy effort, including clarity regarding the needs of the users, digitised access to data and wider appreciation by development projects that taxonomy information comes at a cost;
- Studies should not neglect marine biodiversity, seamounts and effects of gas hydrate emissions.

2. Biodiversity functions, changes and adaptive capacity:

- Developing science-based strategies and tools for sustainable management and conservation of genes, species and ecosystems;
- Analysing of the consequences of biodiversity change on ecosystem function, and services to local, national and continental economies and society, integrating the economic equivalent of these changes;
- Assessing change in biodiversity in different biomes, integrating analyses of the drivers of change, and understanding of the underlying processes and mechanisms which govern change;
- Exploring interrelations between genetic, species (population) and ecosystem biodiversity, as well as scale (temporal and spatial) problems;

- Research on climate change, flood, drought and fire impacts in developing countries and how this influences biodiversity conservation and sustainable use;
- Science-based strategies and tools for sustainable management and conservation of genes species and ecosystems;
- Understanding the dynamics of interactions between organisms in changing habitats, and the impact of economic and social change through modelling.

3. *Technological, societal and political aspects of managing biodiversity (e.g. EU, GEF and CBD programmes):*

- Developing tools for modelling future scenarios for management and preventive land use planning, management of biodiversity on the regional scale, management and development of techniques of land use systems and use of natural resources;
- Accounting for ecosystem services in other parts of the world when doing sub-global MEA-like assessments;
- Gathering (meta) data on protected areas and biosphere reserves which are open to all researchers who want to work with them in order to be able to measure the success of conservation measures, including societal consequences;
- Research on the impacts of Europe on the biodiversity of southern countries, including the consumption of goods and services from the south (e.g. primary products, services such as tourism), and the impacts of development assistance;
- The development of a system on how the information and the databases generated through research projects could be maintained and updated in the longer run (role for GBIF, ENBI etc);
- Building of national capacities, including stable north-south partnerships and emphasis on developing local field skills as well as institutional expansion. This will include target-setting for biodiversity identification and sustainable exploitation skills in development and research projects;
- Research on biodiversity modelling combined with modelling of societal and environmental pressures to predict ecosystem function and services and effects of policy changes;
- Development of an African biodiversity observation network, which integrates research for innovative approaches to sustainable resource use and is linked to the EU GEOSS system;
- Evaluate the effects of EU and national land use policies (e.g. CAP reform, water directive, soils directive, bio-energy) on biodiversity;
- Research on the maintenance cost of ecosystem services in decision-making;
- Quantifying the impact on biodiversity of policy decisions in producer countries on other parts of the world (e.g. imports or tourism).

4. *Interactions with other policy domains (trade, food, health, combating poverty, biotechnology):*

- Developing socio-economic and policy concepts for a realistic and feasible transformation from present exploitation practices to sustainable land and resource use regimes and governance patterns;
- Interdisciplinary applied research involving long-term participation of local stakeholders (national government, local government, extension officers, local researchers, community groups) and international stakeholders (national institutes, universities, CGIAR institutes);
- Communication and learning partnerships with resource users and other stakeholders at the levels of households, farms, villages, nations and regions;

- Development of new types of regulation, based on natural capital, as recommended by the Millennium Ecosystem Assessment.

Session III: Biodiversity and ecosystem services: the Millennium Ecosystem Approach concept from a European perspective

1. The theoretical and methodological basis:

- Testing the applicability of main MA-framework aspects in a European context in a multiscale approach;
- Develop appropriate valuation techniques enabling costs of changes in ecosystem services to be calculated and improve methods to quantify ecosystem services;
- Increase the knowledge on the real effects of loss of some services for ecosystems and humanity;
- Evaluation of existing policy measures for their applicability within the ecosystem services concept (link to Session I topics);
- Research into methods of expressing and articulating plural and multiple values and designing institutions which are able to protect and nurture them;
- Data and indicators for ecosystem services: Evaluation of the situation in Europe to ensure quantitative outcomes to enable a better assessment of the sustainability of ecosystem service provision and consumption.

2. Biodiversity explicit links to ecosystem services:

- Analysis of the shortcomings of the ecosystem services concept in the context of biodiversity conservation and the intrinsic values of biodiversity;
- Development of concepts like Service Providing Units to link ecosystem services;
- Understanding the contribution of biodiversity to services such as resilience and resistance and nutrient cycling;
- Improve knowledge on the links between ecosystem functioning and ecosystem services.

3. Assessments on different scales:

- Development of a framework for a multi-scale assessment across Europe - from the local level to a pan-European scale;
- Development participative methods for selecting the most relevant ecosystem services and decide about priorities;
- Defining the 'relevant ecosystem service unit' from both the 'supply' and 'demand' side, identifying proper scales for assessments;
- Effects of European consumption of ecosystem services in other parts of the world (link to Session II);
- Addressing uncertainty of the provision of ecosystem services under changing land use and climate change.



Annex - List of contributions

Session I: Research contributing to reaching the 2010 target in the wider countryside

Title of contribution	Author(s)
Session I Introduction	Klaus Henle
Economic viability of regional farming systems	Jan Jansen
RE: Economic viability of regional farming systems	Richard Hardwick
RE: Economic viability of regional farming systems	Jan Jansen
Sustainable agriculture and forestry systems	David Pimentel
Re: Sustainable agriculture and forestry systems	Tor-Björn Larsson
Re: Sustainable agriculture and forestry systems	Mauro Agnoletti
Re: Sustainable agriculture and forestry systems	Petr Petrøik
Pollination in a landscape context	Teja Tcharntke
Research needs in relation to habitat fragmentation and biofuels	Giselher Kaule
Recognition of ecosystem services, biodiversity evaluation and feedback mechanisms	Ernst-August Nuppenau
Agricultural development in the new member states	Tiiu Kull
Comments and suggestions from national perspective – Romania	Angheluta Vadineanu
A Biodiversity ‘Stern’ report: beneficial or counterproductive for biodiversity conservation in the wider countryside	Klaus Henle
Human Induced Climate Change vs. Biodiversity Loss: Comment on Klaus Henle	Clive Spash
Cost-effective conservation in rural areas	Frank Wätzold
Wildlife conservation through sustainable use: research needs	Herbert Prins
Tourist destinations increase urban sprawl, but do we know their impacts on nature?	Jukka Jokimäki
Re: Tourist destinations increase urban sprawl	Morad Awad
Needs of the national policy maker	Andrew Stott
Intensive husbandry, extensive farming and new wilderness	Jan Jansen
Tradable Permits for Biodiversity: Alternatives for existing	Sylvia Wissel and

Title of contribution	Author(s)
conservation policies?	Florian Hartig
Re: Tradable Permits for Biodiversity	Sergio Peña-Neira
Re: Tradable Permits for Biodiversity	Clive Spash
How can agri-environment schemes contribute to reaching the 2010 target in the wider countryside?	David Kleijn
Re: How can agri-environment schemes contribute to reaching the 2010 target in the wider countryside?	Jan Jansen
Research contributions to reaching the 2010 target in the wider countryside: Memories of the Future?	Jan Plesnik
Achieving the objective of halting biodiversity loss in the wider countryside – how to measure effective cross-sectoral integration?	Rainer Müssner
Landscape Planning Tools: Designing Socially and Environmentally Resilient Systems	Dirk Wascher
Re: Landscape Planning Tools	Jan Jansen
Planning sustainable landscapes	Dirk Wascher
Re: Planning sustainable landscapes	Jan Jansen
Re: Planning sustainable landscapes	Mauro Agnoletti
Re: Planning sustainable landscapes	Alessandro Gimona
Countryside Quality Counts: Going Beyond the Data	Roy Haines-Young
The abandonment of agricultural practices and Traditional Ecological Knowledge	Yvonne Cerqueira
Fighting illegal poisoning in the countryside	Sergio Couto et al.
Genetic diversity of crop varieties, livestock breeds and races	Allan Watt
Genetic diversity of crops and crop wild relatives	Brian Ford-Lloyd
Fishing trip	David Carss
Re: Fishing trip	Morad Awad
Soil biodiversity	Allan Watt
Re: Soil biodiversity	Carlo Jacomini

Session II: European biodiversity research and the global perspective

Title of contribution	Author(s)
Session II Introduction	Gerry Lawson and Jacques Weber
Re: Session II Introduction	Jorge Soberon
Re: Session II Introduction	Felix Rauschmayer
Re: Session II Introduction	Wouter Los
The role of capacity building in research cooperation	Jurgen Tack
Research priorities for coastal and marine areas	Magdalena Muir
Sea bottom scanning for hydrated gas with relation to benthos	Morad Awad
Monitoring of biotic resources	Julia Jones
Re: Monitoring of biotic resources	Allan Watt
Re: Monitoring of biotic resources	Vladimir Vershinin
Re: Monitoring of biotic resources	Klaus Henle
The unification problem again regarding monitoring	Vladimir Vershinin
Re: Monitoring of biotic resources	Jan Jansen
Re: Monitoring of biotic resources	Allan Watt
Re: Monitoring of biotic resources	Klaus Henle
Monitoring, citizen science and biodiversity in Europe and beyond	Ian Burfield
Baselines	Alan Feest
Re: Baselines	Jan Jansen
Re: Baselines	Alan Feest
Re: Baselines in tropical regions	Jorge Soberon
Reply to Jorge Soberon	Alan Feest
Reply to Jorge Soberon and Alan Feest	Paulo Borges
Sampling in highly diverse habitats	Jorge Soberon
Vegetation monitoring: methodological issues	Frédéric Archaux et al.
Re: Vegetation monitoring: methodological issues	Jan Jansen
European biodiversity research and the global perspective: Some thoughts	Ashish Kothari
Needs for future cooperative taxonomic research	Wolfgang Wägele
Re: Needs for future cooperative taxonomic research	Ferdinando Boero
Re: Needs for future cooperative taxonomic research	Chris Lyal
Interdisciplinary socio-economic biodiversity research in Biosphere reserves	Susanne Stoll-Kleemann
Integrated research in Africa: further research needs	Norbert Jurgens
Megadiversity vs. keydiversity	Elena Bukvareva
Experiences from German-Brazilian cooperation	Christoph Knogge and Karl Wantzen
Life-long biodiversity education	Mauri Ahlberg

Session III: Biodiversity and ecosystem services: the Millennium Ecosystem Assessment concept from a European perspective

Title of contribution	Author(s)
Session III Introduction	Carsten Neßhöver and Kurt Jax
MEA and SBSTTA: 4 questions for you	Martin Sharman
Re: MEA and SBSTTA: 4 questions for you	Felix Rauschmayer
Re: MEA and SBSTTA: 4 questions for you	Mirilia Bonnes
Re: MEA and SBSTTA: 4 questions for you	Ferdinando Boero
Re: MEA and SBSTTA: 4 questions for you	Petr Petrøik
4 questions and other opportunities	Robert Kenward
MEA and SBSTTA: Another question	Andrew Stott
Re: MEA and SBSTTA: Another question	Thomas Koetz
Linking MA, IMoSEB, and policy	Carsten Neßhöver
Challenges in quantifying ecosystem services	Martin Sykes
Ecosystem services as a tool to conserve biodiversity	Alison Holt
Re: Ecosystem services as a tool to conserve biodiversity	Richard Harrington
Auctioning plant biodiversity as a promising new instrument in the EU's agri-environmental policy: Evidence from a case study	Markus Gröth
Assessing Ecosystem Services: Spatial Frameworks	Marion Potschin and Roy Haines-Young
Goods and services provided by marine biodiversity: Implications for the ecosystem approach	Nicola Beaumont and Melanie Austen
Quantifying ecosystem services: research needs	Paula Harrison and Pam Berry
Research on ecosystem services valuation	Clive Spash
Re: Research on ecosystem services valuation	Ferdinando Boero
Obsession with quantity	Martin Sharman
Re: Obsession with quantity	Frank Wätzold
Perfect Match: Right Economist and Right Ecologist	Clive Spash
Quantifying ecosystem services: the SPU concept	Gary Luck and Richard Harrington
Re: Quantifying ecosystem services: the SPU concept	Elena Bukvareva
The necessary kind of knowledge	Ute Zander
Re: The necessary kind of knowledge	Allan Watt
Comment on Ute Zander's contribution	Clive Spash
Re: The necessary kind of knowledge	Renat Perelet
Comment on Renat Perelet's contribution	Clive Spash
Re: Comment on Renat Perelet's contribution	Renat Perelet
Research needs for practical implementation of RUBICODE concepts	Rob Tinch and Sybille van den Hove
Coming back to research questions	Carsten Neßhöver
Re: Coming back to research questions	Clive Spash
Re: Coming back to research questions	Renat Perelet
Biodiversity mapping	Ferdinando Boero
Re: Biodiversity mapping	Jan Jansen
Interdisciplinarity and the Millennium Ecosystem	Paul Armsworth

Title of contribution	Author(s)
Assessment: research challenges in Europe	
Value transfer problems	Clive Spash
Large Scale Projects and the MA	Josef Settele
Ecologists and Economists	Mac Callaway
Ecologists and Economists need to be interdisciplinary	Clive Spash
Valuation of ecosystem services in the Baltic Sea: a case study	Jan Marcin Weslawski
The damage-based approach to economic valuation of biodiversity	Elena Bukvareva
The need for multi-scale assessments in Europe – addressing horizontal and vertical scale interactions	Christoph Görg
In defence of pluralism	Rob Tinch