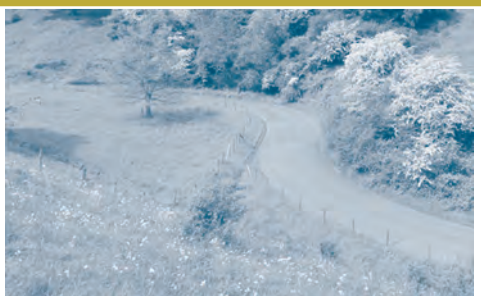
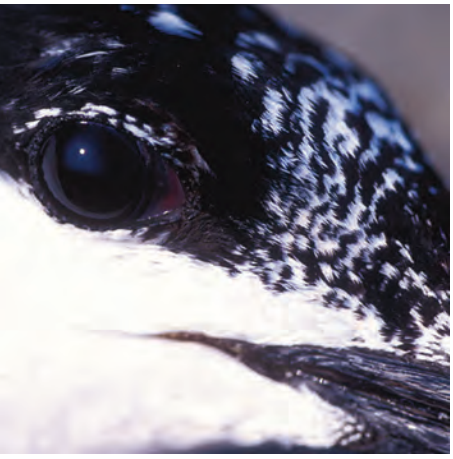
Newsletter 01



The Changing Climate for Biodiversity Research

Terry Parr, Centre for Ecology & Hydrology, CEH, UK



This is a fascinating time to be involved in European biodiversity and ecosystem research. The Habitats and Birds Directive have seen the establishment of a network of more than 10,000 protected sites across Europe and parties to the Convention on Biological Diversity are committed "to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level ...". In addition, the shift in policy emphasis towards sustainable development has given fresh impetus to the ecosystem approach and the role that biodiversity plays in the provision of ecosystem services.

It has been a significant achievement to reach this position, but we are beginning to see that the knowledge base required to implement policies in these areas is being severely stretched and leaving us with hard questions that we are no position to answer. For instance:

- >> How do we measure changes in biodiversity?
- >> What are the main drivers of biodiversity change and what are the opportunities for adaptive management?
- >> How does biodiversity loss affect ecosystem services?
- >> Who cares and what do they do about it?
- >> How do we communicate the results of scientific research in ways that best inform public and policy responses?

We can see the problems this lack of basic scientific knowledge creates when we consider recent discussions on the impacts of climate change and biodiversity.

Climate Change and Biodiversity

Climate change is happening and its going to cause problems that must be solved. In the final Communiqué of the July 2005 meeting of the G8 in Gleneagles,Scotland the signatories including George Bush and Jose Manuel Barroso [President of the EC] agree that "climate change is a serious and long-term challenge that has the potential to affect every part of the globe" and that "adaptation to climate change due to both natural and human factors is a high priority for all nations." Three months later the European Platform for Biodiversity Research Strategy [EPBRS] considered the implications of climate change for biodiversity conservation. It concluded, amongst other things, that "climate change may stop us reaching site, regional, national and international conservation objectives". The EPBRS went on to identify fundamental knowledge gaps in relation to quantifying climate change impacts on species, habitats and ecosystems; understanding socio-economic aspects of adaptation; interactions between biodiversity and sectoral adaptation; providing policy advice and knowledge transfer.

For instance, if we are to adapt to climate change we must have a clear idea of its likely impacts, but our knowledge of current trends and forecasts about the future are dogged with uncertainty. Basic questions about the relationship between species diversity, ecosystem function and ecosystem services remain unresolved. Therefore at a more practical level, we are also uncertain about how to manage the Natura 2000 network of sites. Will many of these sites simply be blown away by climate change? Perhaps. But it is more likely that these sites will continue to be important areas for wildlife – they will just be different. But how different will they become and what point do we stop managing them for what they are

Relevant policies and issues

- >> **VIth European Environment Action Plan & CBD.** Commitment to "Protect and restore habitats and natural systems and halt the loss of biodiversity by 2010"
- >> **EU Habitats Directive and Birds Directive.** Legal obligation to protect wildlife in designated sites
- >> **UN Convention on Biological Diversity.** Requires an ecosystem approach to the sustainable use of biodiversity

Why do we need effective networking of biodiversity research in Europe?

Terry Parr, ALTER-Net coord.

now and manage them for what the will become in 50 to 100 years time? Climate change will also make us face up to the importance of the thousands of protected sites, not as individual sites, but as a single inter-linked network. There are legal and policy minefields here that will be very difficult to navigate without some very incisive R&D.

It will be difficult for biodiversity to adapt to climate change unless we take a more holistic view of biodiversity protection and develop adaptation strategies that involve working closely with other sectors [agriculture, forestry, water, energy etc]. This larger-scale ecosystem approach will require complex inter-disciplinary research in which issues such as conflict resolution between multiple stakeholders, public attitudes, valuation of ecosystem services and policy science become just as important as ecological science in developing adaptation strategies.

Research by itself will change nothing unless the results can be used to inform and change the actions of the public, ecosystem managers and policy actors. However complex the research challenge, we must find ways of communicating ideas to public and policy communities that enable them to understand the costs, benefits and risks of alternative responses to climate change.

Key Research Questions in ALTER-Net

>> How do we measure changes in biodiversity?
>> What are the main drivers of biodiversity change and what are the opportunities for adaptive management?
>> How does biodiversity loss affect ecosystem services?
>> Who cares and what do they do about it?
>> How do we communicate the results of scientific research in ways that best inform public and policy responses?

Large scale long-term inter-disciplinary issues will be required to fill these knowledge gaps identified by EPBRS in relation to climate change and biodiversity. But climate change is just one of the many threats facing biodiversity. Never before has biodiversity been so threatened, particularly through pressures such as land use change, pollution, climate change and invasive species. The implementation of policy responses to these threats is, however, seriously hampered by a lack of effective science on both the assessment of biodiversity status and change and its implications for sustainable use. The current European capability in biodiversity and ecosystem research is rich and varied, but it is also dispersed and disconnected and cannot easily be marshaled to deliver the information and knowledge required to address these issues at a European scale.

*What is **ALTER-Net**?*

ALTER-Net is addressing these issues by creating a European long-term inter-disciplinary facility for research on the complex relationship between ecosystems, biodiversity and society. It will provide scientific support for policy assessment and development on the conservation and sustainable use of biodiversity in the European Union, and a facility for information retrieval and reporting on biodiversity-related issues.

ALTER-Net is a partnership of 24 organisations from 17 European countries which will develop durable integration of biodiversity research capacity at a European level. **ALTER-Net** is a 5-year programme [2004-2009] that will:

>> Create a network for European long-term terrestrial and fresh-water biodiversity and ecosystem research, based on existing facilities
>> Develop approaches to assess and forecast changes in biodiversity, structure, functions and dynamics of ecosystems and their services
>> Consider the socio-economic implications and public attitudes to biodiversity loss.

ALTER-Net is working towards the following common research and development goals:

>> Development of a pan-European framework for understanding and quantifying the main drivers and pressures for change in biodiversity inside and outside protected areas and the resultant impacts on ecosystem services.
>> Development of a pan-European research and monitoring framework for improved biodiversity indicators.
>> Methods, tools and policies and tools for improvement and cost-effective management of biodiversity.

To reach these goals, **ALTER-Net** will, in collaboration with a range of national and international organisations, develop integrated research agendas focussing on priority policy issues. This will be achieved through Work Packages leading to:

>> integration of national centres of excellence in biodiversity research and social science;
>> integration of environmental and socio-economic approaches;
>> development of a network of multi-functional long-term ecosystem research platforms [LTER];
>> development of a partnership between research scientists, science communicators and science-based visitor centres;
>> development of a science-policy link to improve information exchange related to biodiversity assessment;
>> development of a framework for a distributed data, information and knowledge management system.

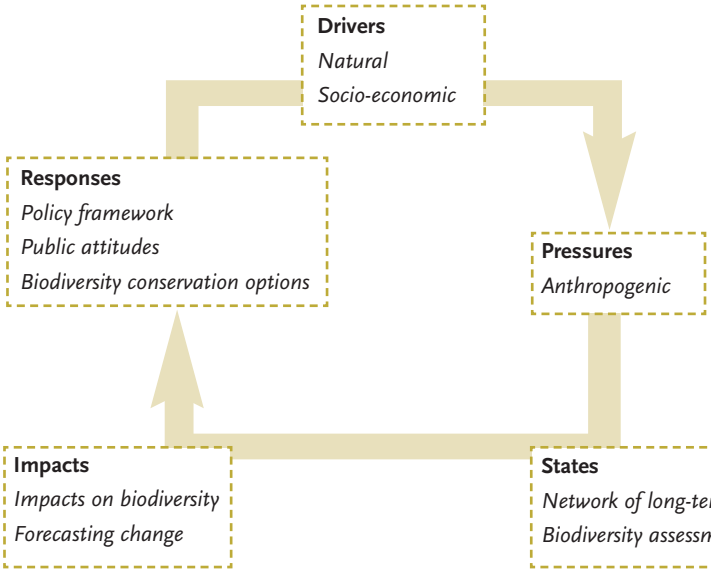
It's early days for **ALTER-Net**, but recent progress in some of these areas is reported elsewhere in this Newsletter or on our web-site **[www.alter-net.info]**.

What are Networks of Excellence?

NoEs are multipartner projects aimed at strengthening scientific and technological excellence on a particular research topic by integrating at European level the critical mass of resources and expertise needed to provide European leadership and to be a world force in a given domain. This expertise will be networked around a joint programme of activities aimed primarily at creating a progressive and durable integration of research capacities of network partners while at the same time advancing knowledge on the topic.

NoEs are more than just schemes for the co-ordination of research and information exchange; and the research itself is not their main focus either. Participating institutions have to invest seriously in **structural change** aiming at a durable integration of their research capacities. This requires the commitment of all levels of decision-making in an institution, including top management, supervising and financing bodies.

The **main result** should be a **durable restructuring and reshaping** of the way research is carried out in Europe in a given area.



ALTER-Net research activities will be structured around the DPSIR model. The specific areas being addressed by ALTER-Net are shown in italics.

BORN to provide Large Scale Ecological Observatories in Europe

Terry Parr, Centre for Ecology & Hydrology, CEH, UK

Long-term, European-scale observations, experiments, models and forecasts – these are the essential components of the knowledge base required to understand what is happening to our ecosystems and develop appropriate policy responses. It's just a shame we don't have them in a form that's of much practical use for European scale research and policy.

ALTER-Net is developing a strategic plan for a European "Biodiversity Observation and Research Network" [BORN]. The aim is to create an extensive infrastructure for the investigating and quantifying the processes affecting biodiversity loss and its consequences in relation to current and future pressures on the environment, particularly global climate change. The infrastructure will be based on a network of instrumented long-term field [LTER] sites, distributed data centres, and synthesis and interpretation centres. The design of BORN will form a unifying concept for integration activities within ALTER-Net and could form part of a major new proposal for a research infrastructure in the EC's Framework VII Programme.

ALTER-Net is also working with two other Networks of Excellence [MARBEF and EDIT] to ensure that BORN infrastructure design helps join together the data from marine, terrestrial, freshwater and taxonomic sources. By working together to provide access to data from ground and sea-based observations, the aim is to fill a significant gap in the data available from remote systems [e.g. satellites] currently provided under the EC's Global Monitoring for Environment and Security [GMES] programme and provide a key contribution to the global GEOSS programme.

European LTER Network

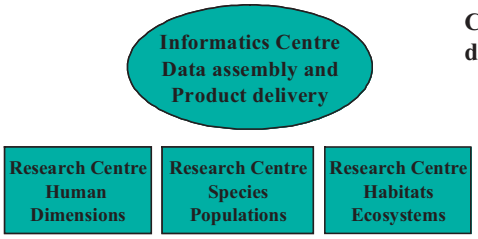
As part of this infrastructure plan, **ALTER-Net** is driving the establishment of formal national LTER Networks across Europe. Since planning started on **ALTER-Net**, four more countries have joined the International Long-term Ecological Research Network and two more are expected to apply over the next year. Three more are working actively towards the development of national networks. **ALTER-Net** has been raising the awareness of the research community of the research potential of the LTER-Networks. Future research agendas are likely to drive the design of the network [harmonisation of measurements, establishment of long-term experiments] and also benefit from the use of existing data in a number of cross-site synthesis studies [e.g. quantifying the main pressures on biodiversity].

Structure of The Network

A Network of fully instrumented sites for long-term observations and experiments. About 100 sites in at least 30 countries across Europe

Inter-operable data centres

Inter-operable data centres capable of delivering data and information to the European global research communities.



Centres for research and interpretation of data and information

- **informatics, data, modelling and knowledge management**
- **genomics**
- **species distribution and abundance**
- **communities and ecosystem functions**
- **human dimensions**

ALTER-Net has agreed to work towards the establishment of the partnerships and the overall design and specification for a European Biodiversity Observation and Research Network.

Targeted Monitoring of Atmospheric Pollution and Climate Change Impacts on Biodiversity: Network Design in the UK and Europe?

Mike Morecroft, Centre for Ecology & Hydrology, CEH, UK

As part of its international commitment to the protection of biodiversity, the UK is considering extending its network of Long-term Ecosystem Research [LTER] sites to provide more effective surveillance of the impacts of climate change and air pollution on biodiversity and ecosystems. The UK's LTER sites form part of the UK Environmental Change Network [ECN] **[www.ecn.ac.uk]**.

The power of this UK network to detect and interpret change would be substantially improved if it could be linked to similar initiatives across Europe. As part of its role to facilitate the process of developing European LTER Networks, ALTER-Net will be inviting contributions to the UK design process. This process will include discussions on site selection, measurements, sampling design and the key outputs required to support policy.

If you would like to get involved in this initiative please contact Andrew Sier **[arjs@ceh.ac.uk]**'

Targeted Monitoring of Atmospheric Pollution and Climate Change Impacts on Biodiversity: Network Design and implementation planning in the UK.

Climate change and air pollution are likely to cause substantial changes in ecosystems. It is important that these changes are monitored, so that policy and management techniques can be developed to minimise adverse impacts on biodiversity on the basis of reliable scientific evidence. Plans for a new UK research programme and network of sites to address this issue are being developed and if agreement for funding can be achieved, it is hoped that implementation will start during 2006. The proposed network will be linked to the existing Environmental Change Network, substantially increasing its spatial coverage across the UK.

Testing whether climate change, air pollution or another factor, such as changing management patterns, is the cause of an ecological change is central to the project and the design for the network will be based on the following premises:

- >> Climate and aspects of air pollution will be monitored together with aspects of biodiversity, such as vegetation composition and populations of selected animal groups
- >> The network will cover the whole of the UK with sufficient number of sites to ensure that results are representative and that similar habitats can be compared in areas with contrasting climate and pollution conditions
- >> Sites included in the network will have stable management and high conservation value. It is anticipated that National Nature Reserves will form the core of the network.
- >> Data will be stored centrally within the ECN Data Centre.
- >> The monitoring programme will be associated with a programme of data analysis and interpretation, to both identify changes and test what is causing them.
- >> Linkages will be established with experimental and modelling programmes as well as other national and international monitoring programmes.

This work will inform the UK's implementation of European legislation such as the Habitats Directive and Birds Directive, by providing information on the causes of change in protected areas. In particular, it will contribute to the knowledge base required for the development of new policy instruments aimed at enabling biodiversity conservation to adapt to climate change and minimising the impacts of air pollution.

The planning phase of this project is being led by the Centre for Ecology and Hydrology and Hydrology, with statistical input from Biomathematics and Statistics Scotland and funding from the Department of Environment, Food and Rural Affairs [Defra], English Nature and the Countryside Council for Wales. Input to the project is also being provided by staff from UK conservation agencies, universities and research organisations.

Further details may be obtained from:
Dr Mike Morecroft, NERC Centre for Ecology & Hydrology, Maclean Building, Wallingford, Oxon, OX10 8BB, UK. Email: **mdm@ceh.ac.uk**
or from ALTER-Net's Andy Sier **[arjs@ceh.ac.uk]**

Mobility and Training

Karl Baadsvik, Norwegian Institute for Nature Research, NINA, Norway

An over-arching work package

Integration can only happen when people are able to work together, which in turn can only happen effectively, when people know and understand one another. Integration also requires the right set of skills and expertise; major skills gaps will hinder the process. ALTER-Net is therefore promoting mobility and training between its partners and across the work packages into which it is organised. A specific over-arching work package [E1] is coordinating these activities. Training and mobility activities will also be opened up beyond the partnership, and during the second half of the five-year programme we expect this to become normal practice.

A Mobility Scheme is launched

Exchange of personnel is a key instrument to promote integration and cooperation. In June 2005 an ALTER-Net mobility scheme was launched, giving staff members and PhD students from partners or affiliated organisations the opportunity to apply for funding to work at other institutions. Work must be related to ongoing work packages, aimed at concrete outputs, and visitors should learn about their host institution. Application procedures are un-bureaucratic, and we now see an increasing interest for the new mobility scheme.

Summer School from 2006

An ALTER-Net Summer School of two week's duration will be arranged as a yearly event from 2006 on. The school is part of the network's joint training programme. Main target groups are young scientists and PhD students. The school will contribute to durable integration and spread of excellence in a variety of ways, for instance by promoting interdisciplinary approaches and true European perspectives in biodiversity research and by being a meeting place for students and researchers from the whole network, thus promoting exchange of ideas and future exchange and mobility. We also believe that the Summer School will become a very visible ALTER-Net "flagship".

Facilities and infrastructure

Part of the E1 work package is to provide all partners with an overview of the network's tools, platforms and facilities, including ongoing training open to participants from outside the institute. This work is well under way, and once the picture is known before the end of 2006, we believe it will stimulate exchange, cooperation as well as mutual and efficient use of the network's research infrastructure

It is likely that the first ALTER-Net Summer School will be arranged in the picturesque village of Peyresq in Alpes de haute Provence in France"

Creating a distributed, multi-disciplinary institute

Mr. Allan Watt, Centre for Ecology and Hydrology, CEH, UK

The purpose of Work Package I1 is to create a distributed, multi-disciplinary institute from the existing centres that comprise the ALTER-Net partnership. This ambitious goal is being addressed through two major activities:
top-level institutional integration amongst the ALTER-Net partners and
the development of a set of co-ordinated projects addressing European scale research questions.

Institutional integration will be achieved by supporting the Network Council, particularly through organising and running a top-level workshop to agree a common vision for organisational integration in ALTER-Net. A major input to this workshop will be a review of current approaches to research management and science priorities among the partners of ALTER-Net. The main output will be a common vision of the nature of the institutional integration we are aiming to achieve and an implementation plan for developing common research agendas.

The development of co-ordinated projects will be achieved through co-ordination of activities on four over-arching goals:

- >> Development of a pan-European framework for understanding and quantifying the main drivers and pressures for change in biodiversity inside and outside protected areas and the resultant impacts on ecosystem services.
- >> Development of a pan-European research and monitoring framework for improved biodiversity indicators.
- >> Development of a pan-European framework for the development and implementation of methods, tools and policies for effective management of biodiversity.
- >> A design for a "Biodiversity Observation and Research Network"

Work on this has already begun in the form of discussions to ensure that the future Work Programmes for the other Work packages relate clearly to the over-arching goals.

Integrating environmental and socio-economic research

Mr. Henk Siepel, Alterra, NL

A key objective of ALTER-Net is the integration of sociological and economic approaches to biodiversity valuation and management with ecological biodiversity research. The exciting challenge is to integrate the scientific knowledge from very distinct disciplines into an acceptable and, for the public, understandable approach to biodiversity conservation and management. One of our first activities has been to evaluate the DPSIR model [Drivers, Pressures, States, Impacts and Responses] that is often used in discussions on biodiversity conservation among different disciplines.

In our evaluation it has become clear that the model is primarily founded on ecological and economic ways of thinking rather than sociological approaches. We have, therefore, proposed to strengthen the DPSIR model approach by adding discourse analyses [see box 1]. We have shown that in several common discourses in the field of biodiversity conservation, the perception of reality varies greatly between different parts of the model. An important pressure in one discourse type appeared to be a non-item in another. We have proposed an improved approach in which the conventional "mono-discursive" application of the DPSIR framework is extended by the incorporation of discourse analysis. Such an approach may enhance the public trust in biodiversity research and perhaps in science in general.

ALTER-Net Council meeting, Rome 2005.

Another important development is the establishment of Long Term Socio-economic and Ecological Research [LTSER] sites. These research sites integrate the approaches mentioned above in a defined study area. A preliminary selection of LTSER-sites in Europe has been made [see box 2] and has been proposed to the Network Management Group of ALTER-Net. In these sites we will conduct research on the combined socio-economic and ecological approaches developed elsewhere in Europe. In this way we may reach a more general integration of sociological, economic and ecological research, as well as helping to enable mobility of researchers across Europe.

1 What is discourse analysis?

Discourse analysis is a number of approaches to analysing language at a higher level than that of sentences or clauses. It is a way of approaching a problem, used to help reveal the hidden issues behind a text or discussion. In our context, discourse analysis is the analysis of discussions and meetings of a group, composed of different people from different interest groups. The emphasis of these discourses is on preset principles.

Well-known discourses on biodiversity include: the win-win (in which the leading principle is that the local population as well as local biodiversity should profit from any initiatives to maintain that biodiversity); the prometheus model (in which biodiversity should be able to yield sufficient for the economic developments that take place; i.e. there isn't a real problem, because biodiversity will adapt), and the the conservationist discourse (in which biodiversity should be protected and maintained aside any human intervention).

2 Possible European LTSER sites

Aberdeenshire [Scotland, UK]
Nora [Sweden]
Veluwe [The Netherlands]
Pilica river catchment [Poland]
Pleine Fougères [France]
Eisenwurzen [Austria]
Balaton lake and catchment [Hungaria]
Braila islands [Romania]
Doñana [Spain]

Biodiversity Assessment and Change

Mr. Michael Bredemeier, FERC [UNIGOE], Germany

Understanding the im natural and anthropo pressures on biodivers

The effective assessment of biodiversity state and change is essential if we are to properly address the threats facing that biodiversity. To this end, ALTER-Net has a work package focussing on the methods and programmes that are currently employed for measuring biodiversity across the European countries and the ALTER-Net partner institutions. The mission of this work package is to develop standard methodologies to monitor, analyse and assess trends in biodiversity in terrestrial and freshwater ecosystems. These methodologies will enable us to better quantify and predict the impacts of the main man-made and natural drivers of biodiversity change, and to develop improved options for its conservation and sustainable use.

The following tasks are currently being undertaken:

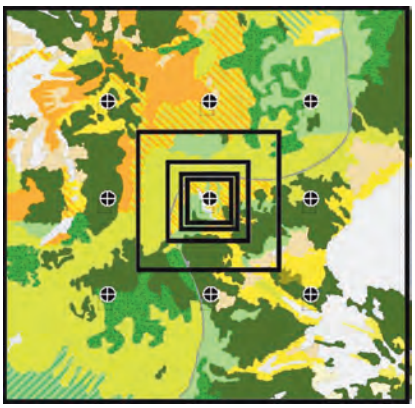
- >> To develop a framework for selecting, testing and improving biodiversity indicators;
- >> To recommend a set of standard approaches and methods for analysis of state and trends in biodiversity, focused on a network of established Long-Term Ecosystem Research sites;
- >> To recommend a similar set for sites at different scales in the wider countryside [from plot to regional scales];
- >> To develop the interface and methodology for communicating scientific information on biodiversity assessment to policy makers and other users.

Different levels of biodiversity have to be considered in this endeavour, from the genetic level over species, communities, ecosystems to entire landscapes and regions. But the sheer measurement of diversity is not enough: it is also important to know its ecological functions and the processes on which they rely. These ecological functions ultimately provide ecosystem services on which we humans heavily rely, such as the purification of water, or the protection of soils from erosion.

Land use changes like intensification of agriculture, land abandonment and urbanization lead to habitat change and habitat loss and to a fragmentation of landscapes. Climate change, biological invasions and pollution [including nitrogen and phosphorous] are also significant anthropogenic drivers and pressures on biodiversity. These anthropogenic pressures interact with natural drivers like climatic fluctuations, natural disturbance regimes and primary succession. The knowledge of the complex interaction of these factors will help to develop a better framework of nature conservation and management in Europe.

ALTER-Net is attempting to establish a scientific framework to understand and quantify the integrated impact of natural and anthropogenic drivers and pressures on biodiversity and the consequences for, and relationship to, the structure and function of ecosystems.

This work involves synthesising current knowledge and understanding of the main impacts of anthropogenic and natural drivers and pressures on biodiversity, including species and genetic diversity. This is revealing the main gaps in knowledge that hamper attempts to understand effects of drivers and pressures on biodiversity.



Nested sampling grids in an alpine landscape to determine biodiversity indices at different spatial scales [author: Stefan Dullinger]

Abandoned arable field in Central Germany. Land abandonment is one of the important changes within European cultural landscapes. Photo: S. Klotz

PACT OF THE MAIN OGENIC DRIVERS AND SITY

Mr. Stephan Klotz, UFZ, Germany

A further step is to define key research hypotheses of the role and impacts of the main drivers and pressures of biodiversity at different spatial and temporal scales. This will help in developing an appropriate analytical framework, approaches and methods. These will incorporate case studies in selected sites and comparative studies between sites along the main bio-geographic and anthropogenic gradients within Europe to address these hypotheses.

A further goal is to develop models characterising the main components and functions of the systems and the relationships between them and biodiversity, and finally to propose appropriate conservation and management methods.

ALTER-Net: Building partnerships for biodiversity communication

Mr. Andrew Sier, Centre for Ecology and Hydrology, CEH, UK

When it comes to understanding and protecting Europe's biodiversity, effective communication with the public and other audiences is essential. There is no question that human activities are impacting biodiversity in a multitude of ways. To reduce these impacts requires us to change our behaviour, which in turn requires us to better understand the issues and to place a higher value on biodiversity. Unfortunately, the communication that is required – between scientists and ordinary people - is not always particularly common, frequent or effective, and is very variable across Europe. ALTER-Net is working to develop new and better ways for scientists and the public to communicate.

The scientific community has traditionally lacked people with the right skills and experience to engage with the public. Fortunately, these skills are abundant amongst science visitor centres – museums, botanic gardens and purpose-built visitor attractions presenting fun and informative exhibitions and events to audiences across Europe. ALTER-Net is working to bring these two communities together, to find new and sustainable forms of public science communication. ECSITE is an established network of European science visitor centres, together enjoying over 30 million visitors each year. ECSITE is represented in ALTER-Net by At-Bristol, a leading UK science visitor centre.

Visitors to Wildwalk-At-Bristol engage with the natural world.

Research activity on c

looks for innovative v

versity

Eeva Furman and Mihai Adamescu, SY

Analysis has shown that very few of ALTER-Net's science research partners currently work with science centres and museums on public communication. ALTER-Net is therefore encouraging science partners to establish links with relevant ECSITE members. One of the ways this is being achieved is through the development of two new 'tools' for engaging the public in biodiversity-related issues.

The first tool takes the form of a card 'game', which can be played by up to 9 people. Development of this game will be informed by a current European Commission funded project - DeCiDe [Deliberative Citizens' Debates in Science Centres and Museums]. Through a set of issue and fact cards, and carefully chosen case studies, players build an understanding of a complex issue; the conflict between development and habitat loss, for instance. They then have to form opinions and make decisions. Such approaches can lead to a deeper understanding of an issue than might otherwise be gained. Results can be collected and assimilated centrally.

The second is a web-based tool that can also have a physical presence at a visitor attraction [in the form of a computer 'kiosk']. The tool aims to raise awareness of a set of issues and to invite users to record their views and attitudes about the issues. The aim is to capture data that can be used in a variety of ways, including in socio-environmental research, to identify gaps in communication and to feed back to the users. The longer-term vision is create a multi-lingual website – linked to exhibitions and activities in visitor centres and other venues – which both informs and captures public attitudes on a range of contemporary biodiversity issues. At-Bristol has previously collaborated with other ECSITE members to develop the BIONET website, which deals with contemporary life science issues. Through ALTER-Net we will take this concept further and address biodiversity-relevant topics.

By collaborating on projects like these, researchers and science communicators should be able to form a long-lasting relationship, equipped with a range of new - but tested - approaches for effective public engagement on biodiversity issues.

There are plenty of initiatives on biodiversity that nations agree and commit themselves to, but how do these initiatives get translated to the practical world of biodiversity and its management? We focus our research on the underlying issues of successful practical implementation of international and supranational biodiversity initiatives, such as the Convention on Biological Diversity and the European Biodiversity Strategy. To be able to give answers on successes of present conservation means and their practical application, we are directing our interests on the practical resolution of conflicts, the use of existing research and the development of future research agendas that support the formulation of future innovative conservation policies and actions. We want to know whether ways to manage are formed in a way that various parties and communities of people are prepared to follow and respect them. We are interested in finding out whether present research gives the information needed for implementing existing policies and whether the outcomes of research are taken into account when developing new, effective ways to manage biodiversity. For example, how does the latest knowledge on spatial dynamics of meta-populations get translated into the development of biodiversity management?

These questions require close collaboration with other research and integration activities ongoing in ALTER-Net. Through the participating organizations, we extend our research communication with activities beyond ALTER-Net as well. During the first year, we concentrated on analyzing the ways to measure success in the implementation of initiatives and the ways to frame constraints of implementation. We found, among other things, that indicators still concentrate on measuring the state of biodiversity rather than looking into the drivers, pressures and responses. We also supported the development of pilot LTER-sites for ALTER-Net by providing valuable information on issues that need to be taken into account from the perspective of biodiversity management. One of the key issues found is the need to build links between ecological and social research through broad research platforms. We also opened the discussion on the framework for analyzing participation,

CONSERVATION OPTIONS WAYS TO MANAGE BIODI-

KE, Finland

conflict management and social learning from the perspective of biodiversity management. These definitions are complex and need translation to reach a common understanding of various disciplines.

These discussions, reported in present and forthcoming reports, feed into the deeper analyses that will take place during the second period of ALTER-Net and in the long term. We are now moving to analyze, to what extent the present ALTER-Net has contributed to the research needs raised by the EPBRS-process, thus demonstrating the existing link between science and management. We are also looking at the practical application of the Natura 2000 network from various angles such as its cost-effectiveness and its success in participating the public. One interesting forthcoming task is to find common understanding about the capabilities for practical application of biodiversity initiatives in natural resource management, in forestry, agriculture and land use management. The development of the LTER-network is supported by research which studies the rhetorics of biodiversity in selected pilot areas of Europe. Finally, we see it as important that European biodiversity conservation scenarios are analyzed. Whether ALTER-Net will play a role in this scenario building will be decided next spring, when a workshop concentrates on a gap analysis of existing scenarios and of ongoing scenario building processes.

INTEGRATING ALTER-NET'S SCIENCE INTO EUROPEAN POLICY

Ben Delbaere, ECNC, NL

It is widely recognized that biodiversity conservation needs to be integrated into many government sectors and policies. An illustrative example of this is the incorporation of agri-environmental measures into the EU's Common Agricultural Policy: these measures are set up to support biodiversity in farmland throughout Europe.

It is not just conservation that needs to be integrated into policy. Scientific research also needs to feed more effectively into policy processes, from the development phase, through implementation to evaluation. Sound science is needed for policymakers to take balanced and objective decisions. Policy relevance has become a standard condition for most research that is funded by EU and national governments; scientific research must answer policy requirements.

Within ALTER-Net a work package is included that deals with this interaction between science and policy. Coordinated by ECNC-European Centre for Nature Conservation it aims at developing a durable mechanism for ensuring the science-policy link within and beyond ALTER-Net. This is a challenging aim that involves multiple policy levels, many stakeholders, various parallel policy cycles and timings.

A key tool in developing such a mechanism is the setting up of a Network Advisory Committee. This Committee is composed of representatives of policy, end users and other stakeholders and provides a platform for discussing the ALTER-Net research direction in the perspective of international policy. During the first year of ALTER-Net's operation, case studies and workshops have provided a basis for conceptual developments of a science-policy interface and yielded a number of lessons learned that will be useful in developing the durable mechanism.

A basis has now been created for further activities on communication, stakeholder involvement, dialogue and true embedding of biodiversity research into international policy cycles.

Further information: Ben Delbaere, ECNC, NL – **delbaere@ecnc.org**

Discussing science-policy integration with a wide perspective. Work package workshop at the Danube river, Braila, Romania (May 2005) (Photo: Odd Terje Sandlund)

Public attitudes to biodiversity and its conservation

Anke Fischer, Macaulay Land Use Research Institute, UK

Through Research Activity [RA] 5, ALTER-Net is looking at public attitudes to biodiversity and biodiversity loss. Understanding how people think and feel about biodiversity and the threats it faces is important, for example when formulating policies or management plans: what works in one country or region may not work in another, because of differing public attitudes.

This work has a number of objectives. The first is to assess public attitudes, perceptions and understanding of biodiversity across different European states. The second is to analyse how attitudes, perceptions and understanding are affected by factors such as cultural background, age and gender and by communication and information provision. Following on from this, ALTER-Net will develop more effective communication tools. It also aims to create a network involving researchers, science communicators, policy makers and other stakeholders. The figure below summarises the components of this work.

The group of people currently working on these issues includes members from research and science communication organizations in ten European countries. They come from different disciplinary backgrounds including sociology, environmental and ecological economics, ecology, environmental and social psychology and educational sciences.

Methodological approaches

Several qualitative and quantitative techniques from a variety of scientific disciplines are being adapted and further developed, tested and evaluated to assess public views on biodiversity changes and management.

These approaches include ***deliberative techniques*** such as focus-group discussions and value clarification methods which should improve our understanding of public perceptions of biodiversity and values assigned to elements such as specific species, landscapes and diversity.

Other approaches focus on more ***quantitative concepts*** of attitudes. They are being adapted to address the biodiversity concept and trial tested in several European countries. The aim is to develop a common approach which can be applied in different contexts all over Europe to inform biodiversity-relevant policies.

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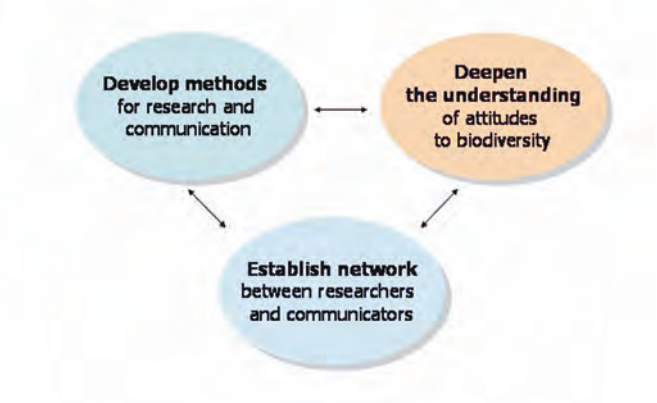
Main components of ALTER-Net RA5



Countries of currently participating organisations in ALTER-Net RA5 on public attitudes

Towards a Framework for Effective Information and Knowledge Management

Mandy Lane [CEH, UK], Herbert Schentz [UBA, Austria], Katharina Schleidt [UBA, Austria]

The analysis of environmental change and its impacts requires access to data and information from a wide range of disciplines, across different time and geographic scales. Scientists may need, for example, to access climate data and relate these to changing vegetation patterns across Europe. Or they may wish to analyse how economic and social policy and attitudes influence land use practices or affect water quality. To perform these multi-disciplinary and multi-scale analyses, considerable efforts are necessary to bring together and integrate the necessary data, which are scattered across distributed and unrelated resources. Ideally, scientists need 'seamless' access to these data so that they can analyse the whole data collection as if it were in one single database.

This work package aims to build a technological framework to link these distributed data sources automatically, using new 'data-grid' networks. However, the physical networking of these systems is not the main problem. A bigger issue is how to make data from these distributed systems comparable when they have been collected by different agencies according to different methods, based on different scales [time, space and measurement], and using different classifications and definitions.

Traditionally, researchers have had to find out from each data provider, through telephone calls and emails, how each data item is defined and the extent to which it can be compared with another similar data item collected by someone else in another country. This tedious and time-consuming effort forms a significant barrier to environmental change research, and we need to find ways of automating the process.

The WPI6 team is working with new and innovative 'informatics' approaches that describe and translate the meaning, or the 'semantics', of the data so that datasets can be shared, combined and analysed across the network. This can be done by defining a common language, or common 'ontology' describing semantic concepts and relationships, on which all partners in the network can agree. Systems that translate between the common ontology and the local structure of each data source can then be built to support the dynamic integration of data across the network, on request by a user from a single internet portal.

ALTER-Net aims to collaborate with other similar national and international initiatives in this endeavour, for example the US ' Science Environment for Ecological Knowledge' [SEEK] Programme, and the ' Global Biodiversity Information Facility ' [GBIF]. The developments described here are in their relative infancy. However, the resulting ability to link different datasets and perform integrated analyses on request will have a major effect on the efficiency of the research process in understanding environmental change.

SEEK: **http://seek.ecoinformatics.org/**
GBIF: **http://www.gbif.org/**

International Press Centre Biodiversity Research - IPCB

On 14th and 15th November 2005, during the Communicating European Research conference in Brussels, Alter-Net launched the International Press Centre Biodiversity Research [IPCB].

The main goal of the IPCB is to offer a portal on biodiversity research news to the international press community. At the same time it will become an important source of information for researchers working in the field of biodiversity related research. The site will offer the latest news related to biodiversity research, press releases on recent findings, background documents on important biodiversity research issues and links to important information sources on biodiversity.

IPCB – do you fit the user profile?

Journalists

Are you a member of the international press community and are you interested in biodiversity related research [including natural, economic and social sciences] than the IPCB website should become your most important colleague. All the latest information brought together on 1 website: your gateway to biodiversity related research.

PR-responsibles and science communicators

You want to send your message to the national and international press? IPCB can assist you. Register as information provider and post your event, news item or press release on the IPCB website and we take care that journalists all over Europe and beyond are informed on your research findings in the field of biodiversity.

Researchers

As a researcher you make research news, so you can register as information provider. But you are also interested on what is going on in the biodiversity research community? Visit the IPCB website and get the latest news on biodiversity related issues.

Webmasters

Are you responsible for a website concerning biodiversity and/or biodiversity related research and you want to offer research news? IPCB is offering research news you can use free of charge. Off course it is appreciated when IPCB is mentioned as source.

What kind of information is IPCB offering?

Biodiversity Research News

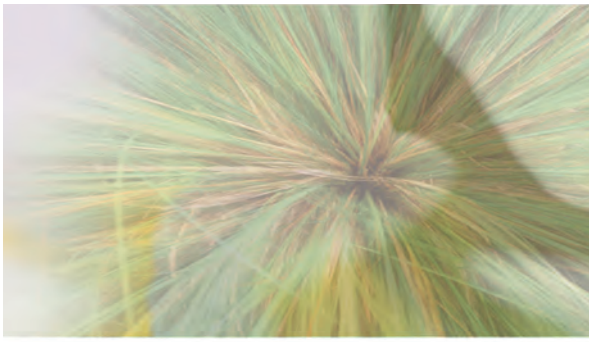
The latest information on biodiversity related news. This part of the website informs users of the latest findings in the field of biodiversity research. However research related news is also covered: use of research results in environmental policy, funding opportunities for biodiversity related research, new research views, etc. News items on the IPCB site are coming directly from research institutes, universities, individual researchers or from other news agencies.

Press releases

The latest press releases from research institutes, universities and funding agencies. All press releases are posted by the responsible organisation. For each press release you will find a summary and the full text on the website, as well as links to photographic material, audio and video, and more textual material.

Background files

Expert scientists will be asked to prepare background documents on important biodiversity related research issues. Those background documents are summarizing the existing knowledge and will become an important resource of information for journalists preparing articles on biodiversity and biodiversity related research. Also researchers searching for background information on biodiversity related research



issues will find interesting information on those pages.

More information
Newspapers, television and radio stations, and news agencies publish regularly biodiversity research related topics. This section of the IPCB website links to news and information on biodiversity related research published on other websites.

Events
An overview of events in the field of biodiversity related research: congresses, workshops, calls for proposals. The event section has to become the agenda for journalists and researchers with an interest in biodiversity related research.

How to access the IPCB website?

Access to the website is free of charge. All information is freely available. Additional registration is possible for journalists and information providers. Registered journalists can use of additional features like receiving recent news and press releases on a daily/weekly or monthly basis. Registered information providers can post news items, press releases and event on the site. Information providers.

Your gateway to biodiversity related news:
http://www.biodiversityresearch.net

IPCB, an initiative of ALTER-Net

ALTER-Net is a partnership of 24 research organisations from 17 European countries which will develop durable integration of biodiversity research capacity at a European level. Starting in April 2004, the EC [6th Framework Program] is contributing € 10 000 000,- over the next 5 years to help ALTER-Net:

>> Create a network for European long-term terrestrial and fresh-water biodiversity and ecosystem research, based on existing facilities
>> Develop approaches to assess and forecast changes in biodiversity, structure, functions and dynamics of ecosystems and their services
>> Consider the socio-economic implications and public attitudes to biodiversity loss.

IPCB

Jane vs. John Doe

In each ALTER-Net Newsletter we will ask two prominent members of the biodiversity research, the science policy and/or the environmental policy community to discuss a specific topic related to biodiversity and biodiversity related research. They do not know from each other who their opponent is. Only after the discussion we have informed them with who they were discussing the topic.

Topic under discussion in this issue is:
In the recent EU Nature Directors' Meeting (5th - 7th October, Aviemore, UK) the participants felt that biodiversity research "should stress the goods and services of ecosystems and add a financial aspect to biodiversity". To what extent do you feel that this is true?

Dear Dr. X,

I do not believe that it is legitimate to ask scientists to focus on this aspect of research into natural systems, especially if it is to the detriment of other aspects.
The present political climate in Europe, and elsewhere in the industrialised world, causes us to focus on the question "what is the use of biodiversity? What is it good for?" Underlying this attitude seems to be the unspoken belief that if you cannot find an economic argument in support of biodiversity, then that bit of biodiversity can be abandoned - it is not important. More economically viable activities may be allowed to supplant those ecosystems that have insufficient economic interest.
This approach worries me greatly. I understand the worth of pointing out what biological diversity provides as goods and as services, but I feel that if we stress this aspect too much, we run a considerable risk of allowing the battle to take place on ground not of our choosing.
The Millennium Ecosystem Assessment brought the concept of "goods and services" into much wider use than was previously the case. Certainly, the MEA has done much to bring the continuing plight of biodiversity into the forefront of many people's thinking. But the concept on which it was based suggests, perhaps subliminally, that biodiversity is just a tradable commodity, therefore subject to classical economic analysis. There are many reasons to believe that this is not the case.
Many ecological economists believe, and I agree, that the maintenance of human well-being goes beyond the need to maintain ecosystem services. I think that they would therefore agree with me that goods and services are not the only - and arguably not even the most important - reason to carry out research into biodiversity. Economists and social scientists working on biodiversity should also examine how biodiversity satisfies other human preferences, not just financial ones, and research ways to help to share the benefits and burdens more equitably.
Furthermore, much of the knowledge from the natural sciences that we need to allow our living world to survive has very little to do with goods and services, but concerns more fundamental issues such as the conservation status and trends of biodiversity and ecosystems, the drivers of biodiversity loss, and the answers to a wide range of questions about governance, policy and ways to mitigate or adapt to biodiversity loss.

Dr. Y

Dear Dr Y,

After reading your arguments, I agree that asking scientists to stress the goods and services of ecosystems and add a financial aspect to biodiversity will probably not in general contribute to the conservation and sustainable uses of biodiversity. I also agree that assessing the contribution of biodiversity to the maintenance of human well-being in financial terms only does not adequately reflect its significance.

However, we have to realize that we live in a world in which financial considerations play a principal role in management decisions at all levels. I'm therefore convinced that there is a genuine need for research on the financial aspects of biodiversity. The information this will deliver may be most useful in persuading managers and decision makers. After all, it would be naive to believe that hard economic and financial considerations will not play a major role in shaping policy. Such research should of course be done in a proficient way, hence consider more than just the obvious contributions ecosystems deliver to humanity.

My main point is that research should not preferentially focus on a specific issue. If interdisciplinary research is what we really want, and it is clear that only this approach promises to deliver answers to the wide range of questions raised in conjunction to environmental change and biodiversity loss, then all pieces of the puzzle will need to be addressed. This goes for the whole range of issues, from financial aspects of biodiversity, to biodiversity inventorying. Finding a balance in which no discipline becomes a weak link in the chain is of primordial importance. This requires responding to perceived needs by different actors, from policy people asking for more information on the financial value of goods and services of ecosystems, to scientists warning that lack of resources is jeopardizing the applicability of taxonomy as tool for applied research.

Best regards
Dr X

Dear Dr X,

Yes, money talks. And yes, we need all the arguments we can muster, which means we must understand the financial arguments in support of maintaining biodiversity, which in turn requires research. But I resist the idea that we should stress research on the provision of goods and services and developing the financial arguments.

I fear that when we talk about research into the provision of goods and services, we tend to focus on short term, immediate returns - now! or at best, this year or next year, perhaps 3 or 4 years hence. We forget, perhaps, that the main service that biodiversity provides is the very existence of life on Earth, and that a major secondary service is the quality of that life.

For the first time in the short history of our species, our actions today have begun to reduce our options for tomorrow. To meekly allow that it is legitimate for short-term financial considerations to rule in management decisions is to abdicate our responsibility towards our children and future generations. Can we continue to impoverish the only planet that we will ever have just to makes some of us rich? Can we go on eating into our capital, just because we like the high life?

Underlying your comments, it seems to me, is a belief that we do not have convincing arguments to show that our long-term well-being depends on biodiversity. If this is indeed your belief, then I must - unfortunately - agree with you. I do not think that we have any invincible argument to convince those who do not wish to be convinced that the loss of biodiversity is vitally important for us as humans and for our civilizations. At least some of our research effort should focus on seeking those arguments. And here, I completely agree, we must bring all our intellectual capacity to bear, uniting the natural and social sciences with philosophy and economics, to understand better the world on which so much - indeed everything - depends.

With best wishes,
Dr Y

Dear colleague,

It's comforting to notice that we appear to agree on the major points. For one, I concur with you that *stressing* research on the provisions of goods and services and developing the financial arguments may divert an inordinate amount of resources to one of many aspects in biodiversity research that is in need of strengthening.

On the other hand, I don't share your fear that we tend to focus on short-term perspectives. This is not by necessity the case, even if we do only consider the future. I feel it is our only scientifically correct to incorporate in our research estimations of long-term effects and costs of choices made by society, and to confront managers and decision-makers with the results of our studies.

Even if we do have arguments to show that our long-term well-being depends on biodiversity, the problem remains that these may not be sufficiently convincing to impact on decision-making. One of the reasons for this may be that scientific results always come with the *caveat* that they should be interpreted within the narrow settings of the research, and this is a sort of language that is all too easily misinterpreted by managers and policy people as downplaying their relevance. Translating scientific language to policy speech (and vice-versa) is important if we want research to contribute in a more effective way to the decision-making process, and may be more relevant than re-orienting research to stress the goods and services of ecosystems and add a financial aspect to biodiversity.

With best regards,
Dr X.

Dear Dr X,

I take your point about the scientific perspective, but perhaps only in part. When a modern ecologist looks at biodiversity and ecosystems, she sees complex structures and processes that evolve under pressures from the environment and from within the system itself. She understands that most relationships in the system are non-linear (although she may not always be able to quantify them), and that feedback operates within the system - and in its interactions with the environment. She knows that what she interprets as a dynamic ecosystem or observes as shifts in biodiversity is not the result of a deterministic process, but emergent behaviour of sub-systems, themselves complex and experiencing non-linear feedback. Given the nature of complex systems exhibiting emergence, predicting how any but the most elementary ecosystem will change in the long term will never - in my view - be much better than necromancy, no matter how good our models may become. Eco-forecasting will have the same kind of limitations as weather forecasting, and for much the same reasons. I agree very much with almost all of your last paragraph. But although I think we have essentially found common ground, that paragraph reminds me of something Lord May said recently. He confessed that - despite his extensive and profound grasp of biodiversity issues, and understanding of the implications of the loss of biodiversity - he still had not found any convincing argument to persuade cynics of the need to conserve and protect biodiversity. Medical discoveries? Soon, he said, we shall be developing medicines from the molecule up. Food? In the near future we should be able to synthesise food from sunlight, water and carbon. Spiritual refreshment? Lie down on the couch, and plug in your virtual rainforest experience. And so on and on. In short, we run the risk that an argument that depends on the provision of ecosystem goods and services and on the financial worth of biodiversity is, in the end, no more convincing than any other. Lord May admitted that this is all rather depressing.
But in the end, the most convincing reason of all to increase our knowledge of the living world is, I think, and I feel sure that you will agree, the wish to pass on to our descendants a viable and enjoyable planet. And above all, not to be the generation where everything went wrong.

Cordially,
Dr Y

Who participated?

Dr X was Dr. Hendrik Segers. He is a member of the Belgian Biodiversity Platform at the Royal Belgian Institute of Natural Sciences. His major scientific expertise: Taxonomy, biogeography and biodiversity of freshwater invertebrates (esp. Rotifera).
He published more than 100 peer-reviewed scientific contributions including books, book chapters on taxonomy, biogeography and biodiversity of rotifers, and ecology of forest spiders. He is editor of the volumes on Rotifera in the series "Guides to the Identification of the Microinvertebrates of the Continental Waters of the World". He conducted international scientific cooperation with numerous institutes and universities, including (in 2005) Jinan University, Guangzhou, PR China; Prince of Songkla University, Hat Yai, Thailand and University of Khon Kaen, Khon Kaen, Thailand.

Dr Y Was Dr. Martin Sharman. Dr. Martin Sharman is a scientific officer of the European Commission. He is working in the unit Research DG DI-4 Biodiversity and Ecosystems. He is actively involved in science policy related issues linked to biodiversity within the European context.

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