The **RUBICODE** Project

Rationalising Biodiversity Conservation in Dynamic Ecosystems

Workshop on Habitat Management and Conservation Policy - Strategies for a new dynamic approach focused on ecosystem service provision

With official endorsement by the Slovenian Presidency of the European Union

Kranjska Gora, Slovenia, 29/30 April 2008

WORKSHOP REPORT

July 2008

Key Messages from the Workshop

The Problem

There is a fundamental tension between human use of the natural world and its conservation. Traditional conservation policy aims primarily at protecting biodiversity through networks of protected sites. This leads to two problems: firstly, this largely ignores the huge day-to-day contributions to human welfare and economic activity from biodiversity outside the protected areas; and secondly, the conservation networks are mostly static and ill-fitted to meeting their objectives in the face of climate change.

This situation is worsened by a lack of scientific and general understanding of the systems involved and of the ways in which their ecosystem services are produced and used. Furthermore, there are divergent views on the proper ways for human societies to interact with, and represent, nature. Fundamentally we are dealing with striking a balance between conservation and exploitation, between forms of the question "what does society want from nature?" - for example:

1. What is a high quality landscape?

2. What ecosystem services do we want?

3. How do we trade-off between different types of ecosystem services, or between conserving wilderness and using natural resources?

The Ecosystem Services Approach

The ecosystem services approach is a communication tool and framework for structuring thinking about the relationships of humans with natural systems. It helps to demonstrate and explain how humans benefit from, and depend upon, natural systems, via the "services" these systems provide. And although the ecosystem services approach should be seen as complementing and not replacing conservation, it can be used as the basis of arguments in support of conservation.

The services approach is often extended into a market framework, through monetary valuation (assessment) and/or payment for environmental services (policy). Some argue that the market/monetary framework helps to shift context from "nature free" to "nature valuable", and can enhance the efficiency of policy. Others feel that it is inappropriate, unethical or dangerous, shifting focus from real changes to monetary changes, and from sustainability constraints to trade-offs. It is important to bear in mind that these methods are merely tools for aiding thinking and decision-making, and that the ecosystem services approach does not necessarily or logically entail the market/monetary approach.

The ways we identify and categorise ecosystem services are not value free, nor are they independent of the social and economic organisation of societies. There are some important issues for applied research and wide debate here.

Key Challenges

Better communication and education is a priority. We need research to improve basic scientific understanding of ecosystems, their dynamics, and the ways we depend on their services. We also need education so that general knowledge and acceptance of the key importance of natural systems are improved. But at the same time plural views must be recognised, confronted, and taken into account. Debates exclusively involving experts and convinced conservationists will not lead to successful policy in practice.

Integration of the ecosystem services approach into other policy sectors is needed to develop a more holistic approach to policy-making and delivery. An adaptive approach is also required which re-evaluates objectives and targets over time, takes a long-term perspective and includes flexible interpretation.

Key challenges arise regarding the governance of the relationships of human societies with ecosystems:

- mismatch of governance scales with landscape and other ecosystem service boundaries;

- time scales mismatch – short-termism versus sustainability;

- improving transboundary, transdisciplinary and cross-governance level cooperation;

- pervasive problem of uncertainty, including variability in ecosystem services;

- integrating nature conservation and climate change - conservation networks will need to have flexible and negotiable borders, management strategies, objectives and indicators;

- but there is also an opportunity to integrate ecosystem services into the design of adaptation and mitigation policy – for example natural systems for flood protection;

There are important applied research needs in designing better strategies and institutions for coping with these challenges.

Research needs

Addressing these issues calls for both fundamental and applied research.

Basic information on the current state of ecosystem services and how they are provided is missing. Ecological research is needed to understand the interactions between biodiversity, ecosystem functioning and ecosystem services. The contribution of different ecosystem service providers to service provision needs to be quantified. Trade-offs between different services should be examined to determine how bundles of ecosystem services are generated by complex ecosystem processes. We need improved knowledge on environmental limits of ecosystems and the impacts of drivers and pressures on their capacity to deliver services. At the same time, we need a shift of attention to less visible and charismatic aspects of ecology, such as below-ground diversity, which are nevertheless of primary importance in ecosystem function and service.

We need socio-economic research, and research on the ways in which human societies, enterprises and well-being depend upon, or can be enhanced by, ecosystem services and nature.

For maximum benefit, research should involve a wide range of disciplines, and stakeholders, including business and civil society. It is important to improve the interface between science and policy to ensure that research is focused on filling those gaps in knowledge needed to develop and implement policy.

Contents

1.   Introduction

The second RUBICODE stakeholder workshop took place in Kranjska Gora, Slovenia on 29-30 April 2008, bringing together a selected group of 17 stakeholders from policy-making institutions, civil society and business from across Europe, and 20 RUBICODE researchers (see Annexes).

The aim of the workshop was to explore how existing habitat management and conservation strategies may be supported and complemented by taking better account of the dynamic nature of ecosystems and by considering the provision of ecosystem services. Specifically, the workshop objectives were:

- To compare existing approaches to the conservation management of habitats and related policies;

- To evaluate the effectiveness and appropriateness of existing pan-European conservation approaches;

- To explore innovative approaches (including the dynamic nature and service-provision of ecosystems) to meet major threats and impediments to biodiversity conservation;

- To identify next steps and priorities.

From the project perspective, additional objectives were to obtain detailed feedback on the RUBICODE concepts and cases as they have been further developed since the initial stakeholder workshop of May 2007, and to gather relevant input for the preparation of the final RUBICODE workshop that will focus on dissemination of results and a roadmap for future research required to develop innovative pan-European conservation strategies for terrestrial and freshwater ecosystems.

The first afternoon included an opening speech by Dr. Gordana Beltram, Undersecretary, Ministry of the Environment and Spatial Planning of the Republic of Slovenia, and a series of presentations on RUBICODE and some of its key concepts, all followed by open discussions. The next day was dedicated to work in break-out groups around a selection of case studies and to a plenary discussion to discuss next steps and conclusions.

This report gives an account of the workshop, including presentations and discussions. The key messages emerging from the workshop have been summarised in the previous section. It will be distributed to stakeholders and internally to all RUBICODE partners, and posted on the website. The intention is to stimulate further thinking and debate amongst the project partners, and with stakeholders. The results of the workshop will be used by RUBICODE in its future work, in particular in the design of the roadmap for future research and in the production of recommendations on habitat management and conservation policies.

2.   Challenges and needs for conservation and sustainable use, and the potential of an approach in terms of ecosystem services

2.1   Opening and introductions to the workshop

In her opening, Dr. Gordana Beltram from the Slovenian Ministry of the Environment and Spatial Planning recalled that there is still a lot of confusion about what ecosystem services are, as illustrated for instance in the preparatory debate to the ninth Conference of the Parties to the Convention on Biological Diversity. There is even a problem of translation of the concept from one language to another. For this, the terms and concepts used in RUBICODE are relevant. It is particularly important to look at where concepts come together

or apart and to use language that actors and stakeholders from different disciplines and backgrounds can understand.

After an introduction by the facilitators on the process of the workshop, several participants stressed some of their needs regarding management and conservation practices and strategies. These included: knowing more about what works or not, and why; practical, realistic and sustainable solutions; answers to their scientific and technical questions; and policy-relevant advice.

2.2   Ecosystem services, habitat management and conservation policies

Dr. Paula Harrison, Coordinator of RUBICODE gave an overview presentation of the project.

RUBICODE is an EC Coordination Action project involving 22 partners which commenced in September 2006 and has a 2½ year duration. A central aim of the project is to extend general awareness of the importance of conserving biodiversity to maintaining our own quality of life. The project should deliver a "road-map" to the EC to permit future development of efficient policies for biodiversity conservation in Europe that take account of environmental and socio-economic drivers of biodiversity change. To do this, RUBICODE focuses on assessing the ecological resilience of those components of biological diversity essential for maintaining ecosystem services.

Methods for relating biodiversity in terrestrial and freshwater ecosystems to the provision of services are being compared and tested. Frameworks for linking biodiversity traits to service provision and for improving and testing indicators are also being developed and used to explore management strategies and inform priorities for biodiversity conservation policy. RUBICODE will also identify current gaps in knowledge, to contribute to the development of research strategies.

The project consists of 3 main activities: (i) to review relevant concepts and methods from a wide variety of sources – 6 review papers are available from the project website (www.rubicode.net); (ii) to organise workshops to evaluate the concepts and methods, raise awareness and identify gaps in knowledge; and (iii) to synthesise knowledge from the reviews and workshops, and further develop various concepts, frameworks or strategies to address gaps in knowledge and inform future research needs.

BOX: THE MILLENNIUM ECOSYSTEM ASSESSMENT (MA)

The Millennium Ecosystem Assessment (www.millenniumassessment.org) undertook an extensive review on ecosystem services between 2001 and 2005 involving 1300 researchers from 95 countries. They found that 60% of the ecosystem services they evaluated are being degraded or used unsustainably, often resulting in significant harm to human well-being. The MA also concluded that the degradation of ecosystem services could grow significantly worse during the first half of this century due to the growing intensity of many direct drivers of biodiversity change, and the challenge of reversing the degradation of ecosystems while meeting increasing demands for their services will require significant changes in policies, institutions and practices.

The MA categorised ecosystem services into four classes:

- Provisioning services which are the products obtained from ecosystems, such as food, water, fuel and materials for building.
- Regulatory services which are the benefits obtained from the regulation of ecosystem processes, such as climate, flood or disease regulation and water purification.
- Cultural services which are the non-material benefits people obtain from ecosystems and landscape through spiritual enrichment, reflection, recreation, and aesthetic experiences.
- Supporting services which are necessary for the production of all other ecosystem services, such as soil formation, nutrient cycling and primary production.

Two presentations focusing on state-of-the-art on approaches to biodiversity conservation then followed.

Dr. John Haslett discussed current approaches to habitat management for biodiversity conservation in Europe.

He recalled that nature conservation began with our concerns about the disappearance of particular, usually charismatic species of animals and plants and the destruction of beautiful scenery. Even now, whether to protect species or the habitats in which they live is still a dilemma in the use of limited financial and human resources. Present European legislation recognises that habitat protection is prerequisite for species survival and covers a continuous, overlapping spectrum of valid species/habitat conservation strategies. However, in addition to our moral, ethical and aesthetic concerns about species and habitats, socio-economic values have become a new and major driving force in how we make decisions about managing and protecting biodiversity. We need to acknowledge and protect all that biodiversity does for human well-being – so-called ecosystem services. This may include placing economic values on different aspects of nature, and the different grounds for being able to do so. We may thus promote the sustainable use of nature and at the same time offer a value-added strategy to supplement (not replace) presently established biodiversity conservation efforts. These ideas are presently not explicitly included in European biodiversity conservation strategy and policy.

Establishing and managing Protected Areas (PAs) is central to modern European strategies for biodiversity conservation. However, we are failing to protect biological and landscape diversity in Europe. A major cause appears to be that management has been, and still is, extremely inefficient (often due to poor political will), and it is not easy to close the gaps. This became obvious under the recent shift of conservation emphasis worldwide, from designing Protected Areas and cataloguing the species within them, to effective management of Protected Areas for sustainable development. Also, despite heavy human influences, much of Europe´s biodiversity is to be found outside the borders of designated PAs. Thus we need ecological corridors and other linkages between PAs to form a coherent network across Europe and biodiversity conservation must be integrated with sectoral policies, such as transport, tourism, agriculture, forestry, water resources and others. All these issues are being addressed through present instruments such as the European Landscape Convention, the Pan-European Biodiversity and Landscape Diversity Strategy (PEBLDS), the Pan-European Ecological Network (PEEN) within PEBLDS, and the Water Framework Directive (WFD) of the EU.

Even so, present European conservation strategies remain rather limited in the effectiveness of their implementation. The nature we wish to protect is inherently dynamic – it is constantly changing over space and time and this dictates ecosystem functioning, resilience and "health". Anthropogenic influences are of overriding concern, e.g. through changes in land use, climate change, invasive alien species and more. Unfortunately, most present conservation instruments assume a rather unchanging, static situation. Thus a new flexibility is required to allow organisms to adapt to change or to move. This means that we will need to acquire new abilities, for example to enable redefinition of Protected Area boundaries, or to forecast efficient placement of future PAs and networking links relevant to future landscapes or to re-designate the status of existing Protected Areas.

A further limitation is our failure to view landscapes over the relevant spectrum of many spatial scales. Heterogeneous habitat mosaics must be understood from the organism point of view, not just from the human perspective, and managed accordingly (e.g. an eagle´s eye view of a woodland, a meadow, a lake is very different to the habitat mosaic relevant to a beetle that spends its life within a few square metres, but which experiences equally heterogeneous patches of terrain at that scale). There is indeed currently a major deficit in the extent to which small invertebrate animals and their associated functions are included in

habitat management decisions, even though these organisms make up the major part of biodiversity.

In short, future successful habitat management for nature conservation in Europe requires some major changes in emphasis to take account of our own needs and the changing needs of the biodiversity that provides the services upon which we so heavily depend.

Dr. Rob Jongman then addressed the effectiveness and appropriateness of existing conservation policies and their integration into other policy sectors. He discussed the problems and opportunities related to institutional structures in the member states, the responsibilities in the field of biodiversity conservation policy and the possibilities to include ecosystem services.

Current EU and national policies have a common basis in the Birds Directive and the Habitats and Species Directive. These two Directives are the focus of site and species protection in the European Union. Their objectives and messages have to be translated into national legislation and actions and carried out within national institutional structures. All EU-member states have their own structure for the organisation of biodiversity policy. Every member state interprets the European Directives within its own political setting and structure. However, it is not only the 27 member states that interpret European policies, but many regions with executive power do this as well. In some member states, NGOs also play an important role as initiators of policies and land managers. In other member states, it is more difficult for NGOs to become recognised as partners with government.

The significance of agriculture for European biodiversity is evident from the fact that roughly 40% of the land cover is in agricultural use. Therefore, farmers are the most important land managers. Depending on their farming practices, they can significantly impact all levels of biodiversity, i.e. landscape, species and genetic material. Farmland that provides habitat for a diverse range of flora and fauna is categorised as High Nature Value (HNV) farmland. Approximately 15 - 25% of the European countryside can be considered HNV farmland. The CAP strongly influences agricultural measures and funding in the EU member states. All EU member states are obliged to present the subsidy schemes of the second pillar for their country in a Rural Development Programme (RDP). This provides opportunities to identify (in part) ecosystem services, and their costs and benefits for society.

The presentation elaborated on the situation in a number of countries such as Hungary, Ireland, Veneto (Italy), Lithuania, Netherlands, Sweden and England (UK) where Rural Development Plans (RDP) were available. They provide information on CAP application. In many regions extensive farming practices are important to prevent land receding into the succession process towards abandonment and to keep agricultural biodiversity. Intensification is a problem in the Netherlands, Veneto and England. Often marginal lands with low market value are threatened by afforestation.

Payments for natural handicaps[1], Natura 2000 and agri-environment measures can protect farmland biodiversity. Implementation of these measures is very diverse throughout the EU. Pillar 1, the Single Farm payments, continues to receive the lion's share of the CAP budget in most countries, except countries that joined the EU after 2004.

A very important challenge in the near future in all the analysed countries is establishing connectivity between protected and designated areas as well as effective management of the Natura 2000 system. The message from various countries was that there is a need to adapt the traditional concept of area protection to ecosystem dynamics and other innovative

---

[1] Areas with handicaps, other than mountain areas, are often divided into various area categories with specific handicaps, such as remoteness, or significant natural handicaps, such as poor productivity and lower than average production levels due to natural features.

approaches with measurable and quantifiable objectives. The SPU concept could help in setting more quantitative targets and define systems based on their service-providing 'value'.

It seems hard to make "ecosystem service" ideas come to the fore because of difficulties in conceptualising complex relationship between biodiversity, ecosystem functions, and ecosystem services. When comparing effectiveness to the threats, in several counties there was concern about inactivity, invasive species and the decline of marine systems. Political problems were mentioned that hamper the effectiveness of decision making and land use planning, and federalism was considered a problem in Germany. The lack of political will is evident in the limited availability of financial resources.

<div align="center">*</div>

The following points were raised by participants during the discussion.

On the concept of ecosystem services:

- The question was asked whether protecting –and paying for– ecosystem services is equivalent to conserving biodiversity. The link between ecosystems services and biodiversity is still unclear and it is not guaranteed that if ecosystem services are protected, biodiversity will necessarily be conserved. It might be anticipated that most ecosystem services are provided by common, rather than rare, species. Hence it is important to stress that the ecosystem services approach is additional to the conservation approach, it does not replace it.

- The ecosystem service approach helps to underpin the need to spend public money on policies.

- It is important to clarify the difference between 'efficiency' of protection and 'effectiveness' of protection.

- The concept of ecosystem services moves us away from taking nature, biodiversity and their services as free goods.

- It was asked whether the ecosystem service concept has similarities with the concept of multifunctionality in agriculture that stresses the public good character of agriculture.

On values of ecosystem services:

- A problem is that all services interrelate and that it is very hard to put a value on biodiversity in general or on individual services.

- A point to stress is that it is not merely that an ecosystem service has an economic value, but also that if one uses the natural service, then one does not need the chemical or technical alternative.

On knowledge needs and learning:

- Conservation policies are often not successful even though a lot of effort is put into developing them. Hence we need to investigate the reasons for failures.

- It is not only because there is not enough public support that politicians do not spend funds on biodiversity, in other policy domains such as education, there can be a lot of public support yet the politicians prefer to spend the money on other issues. When money is spent, it is important to assess how it was spent and who is really benefiting; hence policy assessments are crucially needed.

On communication:

- Sometimes the discourse in terms of ecosystem services is seen as a separate and maybe contradicting development to the more traditional conservation approach. There is a need to clarify this, to stress the complementarity and to communicate in an integrated way.

- The ecosystem services approach can provide evidence to convince politicians of the importance of biodiversity. Efforts to mainstream the approach across policy sectors are needed.

- A key issue is that there remains an opposition between 'nature' and 'development' which makes it difficult to get funding for conservation or compensation. Hence, we need more arguments for why nature and biodiversity are important.

- The argument that both protected areas and non-protected areas are needed for conservation and sustainable use of biodiversity is not sufficiently used and developed. One of the key problems is that nature conservation departments do not sufficiently communicate, in particular with their counterparts (e.g. with transport departments).

- It is important to find the right metaphors to communicate and to be wary of how metaphors may become frozen in policies. For instance, the concept of 'ecological networks' is somewhat frozen because if corridors are rigidly defined, then they become de facto part of the protected area.

- It is of paramount importance to stress new opportunities stemming from biodiversity conservation and not just constraints.

- Public and professional awareness can be raised through the ecosystem service approach.

On policy design:

- A major issue is to find ways to develop and implement policies with long-term visions.

- Moving away from bureaucratic, top-down and multiple regulations is important. The example of grassland management in Sweden was given, where very bureaucratic and multiple rules still exist so that one farmer can find himself with more than 20 pieces of regulation on his land, which can be perceived as suffocating. This led to dead-end situations where land-owners blamed scientists and authorities. With a series of workshops, a new dynamic could be found where actors looked for common solutions and whereby the land-owners recognised that the local government was not working against them but with, and for, them.

On policy tools:

- It was asked why payment for ecosystem services schemes are not more widely used and more systematically assessed? There may be in particular problems of acceptance, and monitoring, of such schemes.

- Managing the landscape outside of protected areas and corridors remains a policy challenge, particularly in relation to implementation and limited resources.

On collaboration and integration across sectors:

- The example of ecological networks was discussed. It was stressed that they have not yet been very successfully implemented. The easy part is to establish the protected areas. The requirements for networks then need to be ascertained and problems can arise when trying to develop connectivity because then one has to deal with the productive sector. The way forward is to engage more with these sectors.

- There can be problems of collaboration within the conservation sector itself as well as with other sectors. It is important for the different sectors to work together rather than independently.

- Recreation is a rising driver of land-use change, hence it is important to involve the recreation sector in policy design and implementation to ensure that things are done the 'right' way.

- Integrated approaches may contribute to biodiversity conservation, as illustrated by the examples of the Nature Framework, the Urban Framework and the Cultural Heritage Framework in Lithuania.

2.3 Challenges to biodiversity conservation in Europe

In break-out groups, stakeholders selected what they regarded as the main challenges for biodiversity conservation in Europe.

The following challenges were identified which can be grouped into three main categories: conceptual, policy and pragmatic.

Conceptual challenges:

- To reduce the degree of confusion amongst policy makers, stakeholders and people in general, there is a need to clarify some key concepts and approaches, and the differences and relations between them:

  - Nature conservation

  - Biodiversity conservation

  - Ecological networks

  - Landscape management, etc

  This could be done through integrated (landscape) management which may serve as a unifying framework.

- To identify functional traits that can be linked with ecosystem services.

- To propose perspectives that will allow politicians and the public to be aware, understand and handle the issue of biodiversity loss.

Policy challenges:

- The competition for land-use and resources, and the competition between biodiversity conservation and economic development, and the challenge of how to reconcile them.

- Tackling the key actual or potential drivers of biodiversity loss:

  - land-use change (including abandonment)

  - land rights (production)

  - climate change

  - demographic factors (growth, age, greed, migration)

  - biofuels and renewable energies

  - GMO

  - invasive species

  - consumerism

  - unsustainable development

- Tackling the key risks of biodiversity loss, in particular:

  - food insecurity

  - water issues (quality-volume)

  - disease risks

- Developing and implementing appropriate regulation, supported by appropriate budgets.

- Conserving and restoring biodiversity outside of protected areas and the necessity to communicate more with the public about it.

- Involving the whole chain of actors and stakeholders (consumers, farmers, wholesales, WTO, etc.).

Pragmatic challenges:

- A series of practices and threats pose practical challenges: agricultural production, GMO proliferation, traditional farming, competition between food and energy, climate change…

- Developing new information systems that are more directly useful to actors.

The conceptual and policy challenges listed by the participants are in line with those that are being addressed in RUBICODE. A driver that is missing in the list above is institutional fragmentation.

*

Dr. Michael Samways then gave a presentation on *"Challenges to biodiversity conservation"*, putting the ecosystem service approach in a broader perspective.

He stressed that current biodiversity in any particular area has an historic precedent. This means that both natural changes and human cultural changes to the landscape must be taken into consideration when making conservation decisions at the present time. The various factors which constitute these changes interact with each other. An example is when megaherbivores modify the landscape, changing conditions for other organisms. Such interactions are also influenced by such features as topography. Other factors, such as water table levels, in turn, change with varying weather and climatic conditions. This emphasises that conservation is as much about dynamics, as it is about entities, such as species which supply a service. This is a challenge for conservation of ecosystem services as the services will vary in extent and magnitude, hence value, over time.

Threats too, will vary over time. In particular, they will vary in magnitude and consequence when the various threats are synergistic. An example of this is when anthropogenic climate change is synergistic with, among other things, landscape fragmentation. Such synergisms will have a differential effect upon the various species and their interactions. This again emphasises that service provision will vary according to varying and interacting external forces.

Bearing in mind the above, ecological service provision must therefore build in contingency plans to cater for the various changing scenarios. It must also consider the future and longer term genetic changes over evolutionary time as well as over current ecological time.

These points illustrate that in addition to identifying the more obvious ecological services that there must also be a precautionary approach, where ecosystems are maintained intact as far as possible to ensure continued provisioning to embrace changing environmental conditions and biotic interactions. The precautionary approach also caters for many possible services that have not yet been identified, including a supporting role for the identified main players in an already recognised provision of service. The upshot of this is that conservation cannot simply be focused on ecosystem function alone. There must also be due consideration to all the biotic elements. This means maintaining ecological integrity as well as ecosystem function.

In summary, we must be careful to ensure that extensive landscapes are conserved which encompass natural areas, a quality heterogeneous matrix, and soft ecotones[2]. Through this precautionary approach, the ecotissue[3] is maintained as a functioning whole, where a

---

[2] An ecotone is a transition area between two adjacent ecological communities (ecosystems).
[3] Ecotissue is a term used by landscape ecologists to refer to the fact that the landscape is variegated. It reflects the selective movement and flux across boundaries at various spatial scales from biotope to landscape.

multitude of services are provided, even though we may not have yet identified all these services. This conservation of the landscape must also be managed to simulate natural conditions. It must also have sufficient linkages to ensure ecological continuity and to enhance propagule[4] dispersal over both ecological and evolutionary time scales. This means always maintaining intact metapopulation dynamics through encouragement of large patch size, good patch quality and reduced patch isolation. Use of bioindicators and surrogates is essential for assessment of sites in the first place, for maintaining good ecosystem health in the long term, as well as for validation where management interventions are practiced.

*

A debate ensued, in which the following points were made:

- Insects and below ground diversity, in particular microbes, are too often forgotten in management procedures.

- In Europe, we tend to classify habitats but forget to think about interactions between them, a change of mind and practices is needed here.

- Invasive aliens are a major threat in South Africa, they take large amounts of the available water, which results in damages to other species.

- Defining a 'quality' landscape can be problematic as the concept is unclear. This relates to the discussions about indicators and traits and it is where the concept of ecological integrity can meet the ecosystem services approach. But still, in defining quality there will be trade-offs between different types of ecosystem services (e.g. provisioning vs. supporting vs. cultural services).

2.4   Needs for future conservation approaches

Dr. Pam Berry made a presentation on "Needs for future conservation approaches". It was suggested that ecosystem services need to be seen as a value-added and complementary strategy for current conservation measures. This view stemmed from consideration of various factors including:

- How to value species with little or no apparent ecosystem service contribution, such as many rare species of high conservation importance?

- Many current conservation practices implicitly contribute to the maintenance of ecosystem services.

- The value of the ecosystem services approach in strengthening conservation arguments when competition with alternative land-use options is taking place.

She then raised a number of questions about how ecosystem services and conservation could be integrated, as current conservation policy is largely framed in terms of species and habitats, but ecosystem services do not often relate to a single species or habitat. The question of how, and by whom, such an integrated approach would be implemented was also raised, in particular, as the needs for, and provision of, a service may change through time. The necessity of a dynamic perspective was also identified, as well as the importance of identifying limits, dangers and difficulties of the ecosystem service approach. The question of how to monitor the environmental and institutional effectiveness of policies was raised and requirements for indicators for such measurements were identified. And finally the need for basic information on the current state of, and trends in, services was mentioned.

*

---

[4] A propagule refers to the offspring from a resident population.

A debate ensued, in which the following points were made:

On the development of the ecosystem service approach:

- Among the effects of the debate around the ecosystem services approach are the important philosophical discussions it triggers, which raise many deep issues. In most policy areas, such as education, there are tensions between usefulness (e.g. to the economy), citizen's rights and ethics. The case of biodiversity is no different, where those tensions between utilitarian, deontological[5] or other ethical approaches such as a virtue-based approach exist. The plurality of thoughts around the issue is here to stay and should be regarded as something to cherish in a democratic society.

- It was remarked that it may be the case that the people currently involved in the debate about conservation and ecosystem services might not be very aware of what different components of society want. Hence, it is important to understand the various views and go beyond debates that merely involve experts and convinced conservationists.

- Societal choices depend on how much society is informed. The question is then how do we communicate that biodiversity has value? Giving it a monetary value is but one way to do it. Stressing the public good aspects is important too, as well as clarifying the impacts resulting from different individual or societal choices. We also need to communicate what happens if a service is lost.

- Environmental education is of strategic importance to ensure that the public has the means to grasp the complex aspects of biodiversity, its loss and the services ecosystems provide, and to tune in to the issue.

- Society may only recognise the value of some ecosystem services once they are lost.

- The ecosystem services approach is relevant not just to conservation objectives but also to many other policy objectives (e.g. more sustainable land uses). There is a need to identify links between ecosystem services and various desirable policy results.

- It is also important to select win-win approaches which are good from both the provision of services and the conservation point of view.

- The question of multiple services of very different types is crucial. These 'bundles of services' need to be integrated in the approach.

On the dangers of the ecosystem services approach:

- Three points were raised which can lead to potential problems with the service approach and need further research:

  - The identification of services is not neutral. We may overlook some services simply because we do not know them, we may also prioritise some services over others without being explicit about the underlying choices.

  - When valuation of services is made, it might be used for prioritising land-use decisions, this implies that the valuation process needs to be very carefully done.

  - Including the dynamic aspects is no easy task and needs careful reflection.

  - The degree to which conserving ecosystem services will conserve biodiversity is unknown.

- There is a danger of pursuing a one-size-fits-all approach in Europe. Because of the diversity of social and ecological systems and because of the many ecological uncertainties, a diversity of approaches needs to be encouraged so that experimentation

---

[5] Sometimes described as "duty" or "obligation" based ethics. Deontology is an approach to ethics that focuses on the rightness or wrongness of actions themselves, as opposed to the rightness or wrongness of the consequences of those actions.

and learning can take place. Nevertheless, coordination and sharing of best practice also needs to be pursued.

- Because of language short cuts, people sometimes confuse approaches based on ecosystem services with the ecosystem approach[6].

On practical issues:

- There seems to be a rising recognition in policy circles that biodiversity is important and that we are facing a severe problem. But there is a lack of practical ideas of what to do about it.

- Finding the appropriate level of governance to implement biodiversity-related policies remains a challenge. In particular, there exists no landscape-level governance structure. For instance, how can the ecosystem services approach be integrated into rural development?

- There needs to be flexible guidance on principles at higher levels, then flexible implementation of these at different levels.

- Enforcement remains an issue and monitoring is needed to assess compliance.

- Building networks of actors is a good way to increase communication.

3. Case studies: exploring the ecosystem services approach

The morning of the second day was spent working in break-out groups on a series of four case studies exploring the potential of an approach in terms of ecosystem services. The cases were:

A. Riparian buffers in the context of the Water Framework Directive

B. Natura 2000: Protected areas and climate change

C. Agri-environment schemes: Pest control and agricultural biodiversity

D. New policy for ecosystem services?

The cases were briefly presented to the groups which were then asked to answer the following questions:

1. How far is the existing policy in this area up to the challenges/needs identified?

2. What has to be done and who does it?

3. What are the consequences for overall policies?

Each participant attended two case study sessions. In the second round of break-out groups, the new group was introduced not only to the case study but also to the conclusions of the former group, and was asked to address another set of questions:

4. What do you see as the main obstacles for the identified actions?

5. How can we effectively remove or deal with these obstacles?

6. Add further actions if necessary.

---

[6] The CBD defines the 'ecosystem approach' as "a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. (...) It is based on the application of appropriate scientific methodologies focused on levels of biological organisation which encompass the essential processes, functions and interactions among organisms and their environment. It recognises that humans, with their cultural diversity, are an integral component of ecosystems. (Source: CBD website).

For each of the case studies we hereafter give a short summary of the presentation, followed by the results of the group discussions as presented in plenary.

3.1 Riperian buffers in the context of the Water Framework Directive

Case study

Dr. Christian Feld presented the case study "Conservation of riverine and riparian biodiversity to sustain river ecosystem services"

<u>Background</u>

The riparian area is a substantial part of stream and river ecosystems. It is located at the transition between the river and its floodplain and is linked to many river ecosystem functions and services. As part of this area, the riparian vegetation plays an important role as it acts as a buffer zone. Only diverse riparian vegetation is capable of retaining nutrients, fine sediments and toxic substances, which is necessary to provide the full buffer function against the harmful effects of those substances on the riverine flora and fauna. An intact riparian buffer is, therefore, crucial for the integrity of river ecosystems and for the maintenance of both the riverine and riparian biodiversity.

<u>The role of policies</u>

Riparian buffers are included in several European and global policies. As part of freshwater ecosystems, they belong to the focal areas considered by the Convention on Biological Diversity. European legislation related to the Natura 2000 network refers to the corridor function of riparian areas. The Water Framework Directive indirectly refers to riparian areas, as the Directive generally raised a demand for a "good ecological quality" of river ecosystems. Embedded in this policy context, the role and function of riparian buffers seems to be well-acknowledged at an international scale.

However, these policies do not provide a suitable instrument for biodiversity conservation. The biodiversity of riparian buffers is neither specifically addressed by the Convention on Biological Diversity nor by the Water Framework Directive and the Natura 2000 network. In particular, there is a substantial lack of acknowledgement of functions and processes that provide the regulatory services of riparian buffers.

Drivers such as climate change and a globally increasing demand for energy will likely pose additional stress on river ecosystems through intensified land use and, thus, will likely threaten the diversity and function of riparian areas. The future challenge will be to modify existing policies and make them ready for future challenges, i.e. the maintenance of biodiversity of riparian buffers and related river ecosystem functions.

Report from groups

<u>*How far is the existing policy in this area up to the challenges/needs identified?*</u>

The first group stressed that other directives, conventions and regulations besides the Water Framework Directive (WFD) are relevant to this case. Hence, it is important to ensure that existing policies are implemented before focusing on new ones. Moreover, existing policies, and in particular the WFD, are open to interpretation, for instance such terms as 'River Basin Management' or 'Good Ecological Status' may have different interpretations. It is not stronger regulations that are needed but better guidance on how to effectively implement existing ones and to combine/integrate across policies. In particular, Natura 2000 provides an opportunity to create coherent ecological networks but not everything has to be designated. Climate change policies also need to be taken into account and integrated.

What has to be done and who does it?

The groups identified the following actions:

- Conflicting policies need to be identified and there should be an effort to resolve them by finding ways to create synergies.

- Guidance for integrated (transboundary) spatial planning to address multiple land use issues should be provided.

- Assessments are needed to understand why some ecosystem services are/are not conserved under existing policies.

- Future research is needed on valuation, the development of frameworks for service identification (including multiple services), and risk analysis, so that information on costs and benefits can be used as a "selling" argument and to encourage participation by stressing that there are benefits for all. However, cost-benefit arguments should only be used within a clearly defined, explicit and transparent framework when used to evaluate trade-offs.

- The services should be "made real" for land-owners and farmers, hence direct benefits to them should be highlighted (e.g. pollination, pest control).

- Exploring more effective ways to "force" actors to conserve biodiversity, with incentives and long-term subsidies. Altruism is not sufficient.

- Communication strategies must be developed to raise awareness and trigger action. More case studies should be developed and used in communication strategies.

As far as who does it, the groups stressed that participation of stakeholders and the general public must be encouraged. They should be involved from the beginning. Collaborations between the political, technical and financial sides are also needed. Scientists for their part should provide clearer messages on impacts of practices.

What are the consequences for overall policies?

Two main consequences were stressed:

- the need for integration across policy sectors (forest management, agricultural development, ecology, flood protection, water supply…) and

- the need for transboundary cooperation inside and outside the European Union on water and biodiversity policies.

Again case studies would be useful here as a way to raise public awareness.

What do you see as the main obstacles for the identified actions?

The following obstacles were identified by the group:

- The time-intensiveness of stakeholder engagement, in particular given the time schedules of the WFD.

- The competition between different regulatory departments, the silo mentality of many departments, the lack of staff, and the institutional resistance to change and integration.

- The difficulty of organising cooperation between the EU and non-EU neighbours.

- The lack of transdisciplinary research.

- The methodological confusions around valuation and the difficulty of comparing costs of action with costs of inaction.

- The intrinsic limitation of the valuation approach which can potentially be used to value (some) specific ecosystem services but not to value the whole ecosystem. An approach

in terms of costs and benefits requires that the ecosystem services are very well known and understood.

How can we effectively remove or deal with these obstacles?

- Participatory approaches are provided for in the WFD but they need to be made a reality and to be implemented at all scales building on the participatory methods that exist. Awareness needs to be raised about these methods, new participatory institutions must be developed, and guidance to implement participatory approaches must be provided.
- Better interfaces need to be implemented between research, policy and practice.
- Positive growth as the only indicator of development should be abandoned.

*

During the discussions that ensued in plenary, participants stressed that protected sites on their own are not sufficient, there is a need for a coherent ecological network and integrated management. Some also mentioned that it is not always necessary to have closed sites, traditional land-uses can be reinstated. There is always the danger of thinking that we are "recreating" wilderness, which in Europe makes very little sense given the history of the landscape. However, wilderness areas are important in the context of climate change because these areas enable climate change impacts to be disentangled from management and other socio-economic effects.

3.2 Natura 2000: Protected areas and climate change

Case study

Dr. John Haslett and Dr. Pam Berry presented the case study on protected areas and climate change.

We know that global climate change is happening. We also know that biodiversity needs to be conserved and that Protected Areas (PAs) are important for this. There are many legal instruments that address each of these issues at all levels, from global to pan-European to national or local. However, although climate change policy is widespread, it does not specifically consider Protected Areas, while conversely, conservation policy and strategies aimed at species, habitats, or overall biodiversity do not explicitly consider climate or other drivers of change. There is increasing consolidation of aims and effort in both directions, but there are still many major gaps.

A further, rather recent consideration is the sustainable provision of ecosystem services, which involves the protection of everything nature does for humankind. Protected areas are extremely important sources of these services in all of the categories defined in the Millennium Ecosystem Assessment, but their protection is still largely passive and not explicitly addressed in current protected areas policy and management. Also, service provision, and indeed biodiversity, normally extend beyond fixed protected areas boundaries, so that even with the current emphasis on more protected areas, managed buffer zones, networking to maximise connectivity for animals and plants to be able to move (e.g. Natura 2000, PEEN - the Pan-European Ecological Network) and general policies to cover non-protected areas are also required. Policy articles covering non-protected areas also require effective implementation.

Ultimately, protected area networks and management need to take account of the dynamic influences of a changing climate. For example, climate change is already causing species to move locally upwards, so that particularly on mountains, but also generally, species are squeezed into smaller areas at higher altitudes, eventually disappearing off the top when ´climate space` runs out. At the same time, new species may come in and change ecological communities lower down. There is clear evidence of such mountain top movements of plant species in the Alps. Equally, species may move regionally northwards in response to climate

change. This is exemplified by northward extensions of the distributions of some butterflies in the UK, such as the comma, *Polygonia c-album*. This species has extended its range from central and southern England north towards the Scottish border in the last 35 years in response to climate change.

Thus there are considerable challenges for European protected areas management in the future. Particularly, they will need to: (i) have flexible and negotiable borders, (ii) have management strategies that are flexible enough to encompass protection of new or changed communities and ecosystems, and (iii) have management strategies that will actively protect sustainable ecosystem service provision.

Report from groups

How far is the existing policy in this area up to the challenges/needs identified?

The first group stressed that there is a need for a more flexible interpretation of existing legislation and instruments, as well as some specific additions to fill gaps, including buffer zones. (i) and (ii) above could be considered to be contained within the Birds and Habitats Directives within the six-yearly reviews and requirements for compensation. There was a suggestion that Natura 2000 is more flexible than it is often portrayed, the difficulty is in the way it is implemented. Also there is a need to differentiate between management and protection. Under management policies, the risk of losing habitats and species can remain.

What has to be done and who does it?

The first thing to do is to ensure that the various actions provided for in existing policies are fully implemented by all concerned actors, e.g. DG Environment, Member States, statutory agencies, spatial planners, area managers, etc. Climate change should also be incorporated into existing policies, such as Natura 2000.

The group also identified a series of specific actions, such as:

- Revising and completing IUCN protected areas categories;
- Ensuring that protected areas also include landscape protection;
- Changing management schemes to allow in situ adaptation;
- Swapping ownership between private landowners and state;
- Leaving room for natural processes (non-intervention practices);
- Strengthening Article 10 of the Habitats Directive (ecological coherence);
- Carrying out long-term research and monitoring;
- Evaluating the effectiveness of management;
- Using adaptive management;
- Developing additional protected areas aimed at ensuring continuity of ecosystem services;
- Developing trans-national review mechanisms for policies.

What are the consequences for overall policies?

There is a need to ensure existing instruments fully incorporate ecosystem services and climate change, and for better communication.

The group also identified a series of specific points:

- Strategic environmental assessment and environmental impact assessment should be applied taking climate change into account.
- The production of an adaptation guide for Natura 2000 is to be welcomed.

What do you see as the main obstacles for the identified actions?

One of the key obstacles is that costs will increase when trying to adapt protected areas to climate change. There is a need to explain the costs and benefits and in particular to look at the benefits. The ecosystem service approach provides an opportunity to show some added value and strengthen the argument. There is, however, a lack of valuation methods to do so and sometimes the immediate benefits do not outweigh the costs.

A second obstacle is the conflicts that arise from increasing demands for land use, e.g. for food production and biofuels.

The lack of political will and parliamentary time also constitute obstacles. There exists no model legislation for the flexible, adaptive and cross-sectoral approaches that are required. Hence, there is a need to be more vocal about what protected areas provide to societies.

The group also stressed that climate change is not the only driver of biodiversity loss and that by separating the effects of climate change from all other drivers of change, there is a danger of writing everything off to climate change which is difficult to deal with, when there may be other more tractable causes. There is a need for a holistic approach and a reflection in terms of global change.

How can we effectively remove or deal with these obstacles?

- By strengthening technical abilities in:
    - Economic tools, in particular valuation;
    - Information and public awareness;
    - Identification of critical areas of actions and possible responses.
- By adjusting policies and allowing intersectoral and institutional change to increase coherence. This requires more effective cooperation between policy makers (e.g. between different DGs) as well as transboundary and cross-level cooperations.
- By advocating the benefits of protected areas, including the role they play in climate change adaptation and mitigation.
- By developing a holistic approach, where climate change aspects are integrated into management and decision-making tools rather than taken as separate guidance.

3.3   Agri-environment schemes: Pest control and agricultural biodiversity

Case study

Dr. Rob Butger presented the case study "Hoeksche Waard".

Background

About 5 years ago, the Dutch Ministry of the Environment and the Province of Zuid-Holland were looking for pilot projects for the policy tracks "operationalising biodiversity protection" and "functional agro-biodiversity (FAB)". In the Hoeksche Waard, technically an island just south of the agglomeration of Rotterdam with agriculture as the predominant land use, the local community was beginning to feel threatened by big city interests. Rotterdam basically saw an 'empty sugar beet area', ideally suited for recreation facilities and industrial estates. They realised that a protected landscape status could help them to resist these interests. The result was the "Biodiversity in the Hoekse Waard by and for civilians" project that started in 2004, with national, provincial and local authorities together with the civilian 'Hoeksche Waard Landscape' organisation as project partners. Since then, the Hoeksche Waard has acquired national landscape status, a biodiversity action plan has been developed and permission for a large industrial estate has been refused by the government.

One of the outcomes of the biodiversity pilot was that the Hoeksche Waard should aim to be a 'sustainable blue-green veined landscape', in terms of economic as well as environmental sustainability. To achieve sustainability a move of the whole area towards natural pest control was seen as necessary. Studies investigating if the blue-green veining in the area could potentially support sufficient levels of pest control everywhere and investigating the cost-benefit of several blue-green veining development scenarios were initiated from the FAB track. Results show that a change to natural pest control is not only feasible, but also profitable. The challenge is now to implement it.

The role of policies

General biodiversity and sustainable use policies (basically inspired by the CBD) were instrumental in initiating the project and financing the start-up project. National spatial planning policy, introducing national landscape status for landscapes of high natural and/or cultural historic value, provided the possibility to give the area a protected status. General biodiversity policies, as well as agri-environment schemes, offered the necessary finances for the biodiversity measures and management of the blue-green veining. Finally, general biodiversity policies facilitated the necessary research through the FAB track.

Report from groups

Participants noted that this case study shows the importance of ecological networks, and in particular their spatial influence. Blue-green veining has more meaning than merely pest control. However, it is not obvious whether the veining approach would be transferable to countries which have more structure and endemism and less human population than the Netherlands, such as Greece for example.

Agri-environment schemes are in principle a good instrument and should be extended to ecosystem services.

How far is the existing policy in this area up to the challenges/needs identified?

The answer to this question, according to the first group, was clearly no. There is competition between the agricultural and other sectors (e.g. tourism, recreation, industry, housing) and the question remains whether it is better for a farmer to sell the land or to plough it. This may also hinder the transition towards sustainable agriculture.

What has to be done and who does it?

The groups identified the following actions:

- The long-term environmental targets of the CAP need to be clearly stated and farmers need a stable regulatory environment (persistency and consistency).

- The budget needs to be restructured, with increased funds available for agri-environment schemes. This can be achieved via a restructuring of the CAP budget.

- The schemes need to be better adapted and take account of local environmental conditions and local social background. Local initiatives need to be encouraged. Policy-makers have to provide the framework, regulations and instruments, but choices should be made at the local level.

- Monitoring of the schemes must be improved and made more flexible.

- More communication and cooperation between farmers, scientists and policy-makers is needed. Farmers need to be convinced of the values of the direct and indirect services they receive from nature. Training of farmers and capacity-building are also needed.

- Long-term effects of the schemes on ecosystem services should be considered in spatial planning.

What do you see as the main obstacles for the identified actions?

The following obstacles were identified:

- The lack of trust in nature, feeling that human technology is more trustworthy than what nature can do;
- The variability associated with ecosystem service provision and the human intolerance to natural variations in production yields (risk aversion);
- The lack of awareness of what ecosystems do for us;
- When some services such as biocontrol are well provided by the ecosystem, they disappear from our mental horizon and it is then difficult to cost their benefits;
- No proper facilitation and insufficient investment in human capital;
- A bad political context (food prices, biofuels, focus on short term economic interest);
- A lack of technical and legal background.

How can we effectively remove or deal with these obstacles?

The following actions can contribute to address the obstacles:

- Communication and education;
- Argumentation;
- Development of technical and legal background;
- Enhancing facilitation at low levels;
- Capacity building;
- Improving risk management;
- Establishing pan-European action group on ecosystem services.

3.4 New policy for ecosystem services?

Case study

Dr. Rob Jongman presented the case study on "new policy for ecosystem services?"

A policy on ecosystem services would need to have a different focus to present policies on biodiversity as traditional policies include a strong sectoral approach. Coordination with societal issues is rather difficult, partly due to the attitude of conservationists, partly due to the structure of governance. Therefore, a new policy should include:

- Attitude change among citizens and policy makers;
- Influencing consumption and production;
- Supporting and awarding biodiversity behaviour;
- Making production chains sustainable;
- Including costs of biodiversity loss in prices of products and services.

Societal interest in ecosystem services should be promoted to highlight the value of biodiversity for society. The Millennium Ecosystem Assessment, as well as several national documents (UK, Netherlands), show that there is a need for closer links between research, policy and business. We need to have proper definitions of research needs on ecosystem services, for example:

- Pollination: who needs it and where?, what organisms provide the service?, and what are the costs?

- Agro-biodiversity and mountain grazing for tourism and avalanche management: who is doing it for what costs?, what is the role of transhumance not only for meat production, but also for keeping up the landscape and preventing avalanches?

- Coastal wetlands and marine reserves as cradles for sea fish and fisheries: what are the costs and benefits?, and how, and who, organises this?

A systematic approach is the challenge for the near future. For example, for mountain grazing this would mean an analysis and recognition of its public services, but also raising awareness and providing for its continuation. Among others, its added value as a High Nature Value farming system must be explored and research proposed on techniques available from transhumance for modern farming. Finally, improved use of Pillar 2, Axis 2 of the CAP would be needed.

Report from groups

How far is the existing policy in this area up to the challenges/needs identified?

Participants stressed that in many areas it is not so much new policies that are needed but rather adapting existing ones. For some areas however, new policies are needed. These areas can be identified based on a regular revision and assessment of objectives.

If conservation policies were delivering sufficiently, there would not be a need to develop policies based on ecosystem services. However, outside protected areas, the need is clear. An approach based on ecosystem services outside conservation areas may increase support for biodiversity conservation and reduce the difference between protected and non-protected areas.

Policy development should take account of the actors who are actually managing the landscape and think in terms of what these actors have to do.

What has to be done and who does it?

The following actions were identified:

- Building strong attractive stories for communication to convince other groups (e.g. civil engineers, businesses, etc.), informing and educating the various actors;

- Using market mechanisms, taxation, access rights, stakeholder pressure, and other means to change attitudes besides regulations;

- Developing decision-support systems/end-user tools at the landscape level (containing spatial data, models and maps);

Furthermore actions have to be taken at all levels, by all concerned groups. It requires patience.

What are the consequences for overall policies?

Integration of policy fields is needed. This is complicated and requires more knowledge. To integrate conservation policies in other fields there is a need to reach out to these fields and open-up to the concerns of other areas, as for instance in the case of integration of the biodiversity issue in the soil directive. This is being attempted in the UK in the Department of the Environment, Food and Rural Affairs (Defra) action plan for embedding an ecosystems approach across government which aims to shift the focus away from separate policy 'silos' towards a more integrated approach (www.defra.gov.uk/wildlife-countryside/natres/pdf/eco_actionplan.pdf).

Adaptive approaches to policy making must be developed so that we can adapt as we learn more about ecosystem services and about the effects of our policies. Moreover what we find important is always a (temporary) societal choice, so we need to keep the potential for change and in-built flexibility.

What do you see as the main obstacles for the identified actions?

The following obstacles were identified, but opportunities were also discussed:

- Some ecosystem services are provided for in existing legislation but are not named as such, so there are opportunities for biodiversity in many existing regulations.

- It is difficult to identify all ecosystem services, and some we do not even know about.

- In some cases there may be a loss in biodiversity without a loss in services. So the focus cannot be only on services.

- There are language gaps between land managers, scientists, policy-makers, hence the need to develop appropriate languages.

- Intervention at the local level is important. It should account for interactions between species and multiple benefits of landscapes.

- Cultural traditions and traditional knowledge (e.g. healing plants, cultural heritage and connection with landscapes) are important and can be built upon.

- In Europe, we tend to teach people to consume, rather than to understand and enjoy ecosystem services and take responsibility for the land.

- There is growing homogenisation of food crops and livestock through current agricultural practices, influenced by market pressure and consumer demand. This leads to a loss of traditional, cultural and biological diversity.

- There is a need for a study looking at the various regulations at different levels and to see if, and how, biodiversity is integrated in policies.

How can we effectively remove or deal with these obstacles?

- Connections to human well-being (beyond narrow cost and benefit arguments) should be made and promoted through communication.

- More flexible and adaptive approaches need to be developed and implemented.

- Best ways to communicate and educate about ecosystem services need to be identified.

- Research needs must be assessed. For instance, applied research on ecosystem services in the countryside is missing, as well as research to identify ecosystem services on which businesses and human well-being depend.

- Research and academic institutions should reach more across disciplines, for instance they should reach out to civil engineers.

- There is a need to reach out to, and involve, business. This can be done through the use of case studies. Businesses also need to know more about the impacts they have on ecosystems and biodiversity, and about the services they get from them.

- A strategy should be developed consisting of a tiered approach from legislation to research needs to implementation. Such an approach must be supported by communication at all stages. There is a need to act now, but in the framework of a long-term vision.

- Not all species are known to be 'useful', for those species that do not seem to provide any service, an approach in terms of cultural services may help.

- Education of children, allowing children to feel the importance of nature is of paramount importance and contributes to maintaining or restoring cultural heritage.

4. Conclusions: Consequences and next steps

The last session of the workshop was dedicated to taking stock of the key input from the discussion.

Dr. Paula Harrison listed the take-away messages from the RUBICODE project point of view:

- Integration is needed at all levels. At the policy level, it is important to integrate ecosystem services into other sectors where the approach can be used as an argument to support biodiversity conservation. At the landscape level, it is important to implement integrated management which doesn't just focus on river courses or PAs in isolation, but considers coherent ecological networks and biodiversity friendly landscapes. It is also important to improve the interface between science and policy to ensure that research is focused on filling gaps in knowledge needed to develop and implement policy.

- Cooperation is needed across boundaries and governance levels as well as amongst different actors. This could be achieved through more participatory approaches.

- An adaptive approach to policy making is required which re-evaluates objectives and targets over time, takes a long-term perspective and includes flexible interpretation.

- Communication, awareness raising, education and training are needed to bring in all actors, build trust, understanding and develop PR.

- There is a message of caution about the use of the ecosystem services approach: it can not be used as a replacement, but as a complementary approach, to conservation.

*

Exchanges of views about the next steps led to the following points:

On the workshop results
- The results of this workshop will be used by the RUBICODE project in its future work, in particular in the design of the roadmap for future research and in the production of recommendations on habitat management and conservation policies.

- Key messages from the workshop should be summarised and disseminated broadly.

On RUBICODE's communication strategy
- Communication of results from RUBICODE should not wait for the end of the project and it should use existing fora.

- Information should be focused into a limited number of short readable messages, adapted to different audiences.

- It is important to disseminate the workshop and project results towards Southern European stakeholders who were not well represented at the workshop.

On the need for examples and case studies
- Several participants stressed a need for examples, stories or case studies that they can use to convince others of the interest of an approach in terms of ecosystem services. This is beyond the scope of RUBICODE but there is already the website of the "Nature Valuation and Financing" Network that includes a database of case studies: www.naturevaluation.org. Moreover, as the approach in terms of ecosystem services is a component of the ecosystem approach, some interesting cases can be found in the CBD case studies at http://www.cbd.int/ecosystem/cs.shtml.

- The need for more case studies can be stressed in the research roadmap.

Acknowledgements

The RUBICODE consortium is grateful to all stakeholders who participated in the workshop and kindly offered their valuable input.

Annex I: Stakeholders participating in the workshop

SURNAME	FIRST NAME	ORGANISATION
Böttcher	Marita	Federal Agency for Nature Conservation (BfN), Germany
Catchpole	Roger	Natural England, UK
Gulbinas	Zenonas	Public Agency Nature Heritage Fund, Lithuania
Higuero	Ivonne	United Nations Environment Programme – Regional Office for Europe, Switzerland
Hopkins	John	Natural England, UK
Levrel	Harold	Marine Economics Department, IFREMER Centre de Brest, France
Ligetvári	Ferenc	Szent István University, Hungary
Mardiste	Peep	Environmental Advisor to Estonian MEP, European Parliament, Belgium
Márkus	Ferenc	WWF Hungary
Miklós	László	National Council of the Slovak Republic, Member of Parliment, Vice-chair Committee for Agriculture and Environment, Slovak Republic
Mortimer	Diana	Joint Nature Conservation Committee (JNCC), UK
Pontier	Helen	Department of Environment, Food and Rural Affairs (Defra), UK
Robinet	Karin	Federal Agency for Nature Conservation (BfN), Germany
Rosén	Ejvind (Eje)	Department of Plant Ecology, Uppsala University, Sweden
Špinerová	Anna	UNESCO Chair for Sustainable Development, Technical University Zvolen, Slovak Republic
Tsotos	Spiros	CEJA- GESASE Young Farmers, Greece
Van Wensem	Johanna (Joke)	Soil Protection Technical Committee, The Netherlands

Annex II: Project partners participating in the workshop

SURNAME	FIRST NAME	ORGANISATION
Anton	Christian	UFZ Centre for Environmental Research, Germany
Bela	Györgyi	Szent István University, Hungary
Berry	Pam	Environmental Change Institute, University of Oxford, UK
Bugter	Rob	Alterra, The Netherlands
Chobotova	Veronika	Slovak Academy of Sciences, Institute for Forecasting, Slovakia
Feld	Christian	University of Duisburg-Essen, Germany
Gramberger	Marc	Prospex bvba, Belguim
Harrington	Richard	Rothamsted Research, UK
Harrison	Paula	RUBICODE Coordinator, Environmental Change Institute, University of Oxford, UK
Haslett	John	University of Salzburg, Austria
Jongman	Rob	Alterra, The Netherlands
Moora	Mari	University of Tartu, Estonia
Pataki	György	Szent István University, Hungary
Samways	Michael	University of Stellenbosch, South Africa
Scholten	Linda	Alterra, The Netherlands
Tieleman	Katia	Prospex bvba, Belgium
van den Hove	Sybille	Median SCP, Spain
Vandewalle	Marie	Lund University, Sweden
Watt	Allan	NERC Centre for Ecology & Hydrology Edinburgh, UK
Zobel	Martin	University of Tartu, Estonia

Annex III: Workshop agenda

Tuesday, 29 April 2008

14:00	Opening	Gordana Beltram, Ministry of the Environment and Spatial Planning, Republic of Slovenia
14:15	Introduction to the workshop	Marc Gramberger Katia Tieleman
14.25	Introduction to RUBICODE	Paula Harrison
14.40	Introduction of participants	Facilitators
15.00	State-of-the-art on approaches to biodiversity conservation	Facilitated interaction with presentations by: John Haslett Rob Jongman
16.00	Break	
16.15	Challenges to biodiversity conservation	Facilitated interaction with presentation by: Michael Samways
17.30	Needs for future conservation approaches	Facilitated interaction with presentation by: Pam Berry
18.00	Break	
18.15	Continued: Needs for future conservation approaches	
19:00	End of day's work	

Wednesday, 30 April 2008

09:00	Overview of the day	Marc Gramberger Katia Tieleman
09.15	First round of case study breakout groups: 1. Water Framework Directive: Riparian buffers 2. Protected areas and climate change 3. Agri-environment schemes and sustainable agriculture 4. New policies for dynamic ecosystem services?	Facilitated interaction with presentations by: 1. Christian Feld 2. John Haslett and Pam Berry 3. Rob Bugter 4. Rob Jongman
11:00	Break	
11:15	Second round of case study breakout groups	
12.30	Lunch	
13.30	Reporting back from case study groups	Facilitated interaction
14.30	Consequences and next steps	Facilitated interaction
15.30	Wrap-up and closure	
16:00	End of workshop	