Targets for Biodiversity Beyond 2010 – Review and Cases in a European Context

Background report

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Content

Tables

Part I Introduction

Background

As part of the preparation for the EPBRS meeting "Targets for biodivesity beyond 2010" Mindicate and U&W[you&we] were comissioned by the Swedish Environmental Protection Agency to produce a report that could serve as input to the meeting. The report consists of two parts, the first is a literature study presenting relevant research (articles and dissertations) in the area of targets and biodiversity, the second is a case study introducing the work with biodiversity targets at national and sub-national level in four european countries. This report serves as a basis for the European Platform for Biodiversity Research Strategy meeting in Visby 2009.

The report is written by Eva Mineur, Mindicate and Katrin Dahlgren, U&W [you&we]. A reference group made up of Thomas Nilsson and Ann-Christin Weibull from the Environmental Protection Agency and Marie Emanuelsson from Formas[1] has been giving input to the work during the process.

The European biodiversity context

The European Community and its Member States are contracting parties to the UN Convention on Biological Diversity (CBD)[2], hereby commited to reach goals of conservation of biodiveristy, and sustainable use of natural resources amongst others. Further, at the European Council in Gothenburg in 2001 targets to stop the loss of biodiversity by 2010 were adopted by the EU Heads of State. In 2002 the EU also joined the 130 world leaders at the UN summit in Johannesburg who agreed to significantly reduced the rate of biodiversity loss globally by 2010. In 2006 the European Commssion adopted the communication *Halting Biodiversiy Loss by 2010 – and Beyond: Sustaining ecosystems services for human well being*.

The communcation resulted in the *EU Biodiversity Action Plan* which addresses the challenge of integrating biodiversity concerns into other policy areas. The *Biodiversity Action Plan* contains a plan of priority actions, the EU institutions' responsibilities in the work and the repsonsibilities of each member state. The *Biodiversity Action Plan* also contains indicators to monitor progress and a timetable for evaluations and mid-term assessments. Annual reporting on progress of the *Biodiversity Action Plan* is undertaken by the European Commission.

The 2010 target has mobilized action in many different areas, however the midterm assessment of the implementation of the Biodiversity Action Plan from 2008 shows that the biodiversity loss is *not* significantly reduced (EC COM (2008) 864 final).

EPBRS

European Platform for Biodiversity Research Strategy (EPBRS) is a forum for scientists, policy makers and other stakeholders to identify future research needs essential to conserve biodiversity in Europe. The overarching questions for the EPBRS are what kind of

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

2 The CBD was adopted at the 1992 world summit in Rio de Janeiro held by the UN.

biodiversity research agenda does Euorope need to help stopping biodiversity loss globally, where to set research priorities in times of scarce resources and how to make sure that biodiversity research has an impact on environmentasl policy and conservation..

Since 1999 EPBRS has met twice a year under successive EU Presidencies to discuss and give recommendations on strategic research priorities for biodiversity. The agendas of the meetings of the EPBRS strive to balance science and policy and the main tangible deliverable of each EPBRS meetings is a short written agreement on issues that are of high scientific and policy importance.

So far the group has dealt with many different topics, including health, climate change, islands and archipelagos, invasive organisms, water and forest, the ecosystem approach, indicators, sustainable use, sustainable development, and sustaining livelihoods.

Membership in the EPBRS is open to all states that participate in the 7th Framework Programme and to the EU institutions. The participating states each nominate one scientist and one policymaker to attend the meetings. When appropriate, other experts and stakeholders are invited to participate at the meetings. The meetings involve keynote speeches, presentation of European research, breakout groups to prepare agreements, and plenary meetings to discuss and adopt agreements. Each meeting is prepared by an electronic pre-conference to include as much scientific excellence and opinions as possible and to give everyone a say.

The EPBRS 2009 conference in Visby, Sweden

The 2009 meeting in Visby - Targets for biodiversity beyond 2010 - will discuss how science can support policy makers setting new targets for biodiversity beyond 2010. It will generate scientific advice on principles for new biodiversity targets and recommendations on what kind of research we should prioritise to get a better understanding of targets as part of biodiversity policy. The background of the focus on the role of targets is the fact that midterm assessment showed that the loss of biodiversity is not significantly reduced despite action in several areas. Focus for the meeting are the three dimensions; target setting, conflicts between targets and objectives and governance level and accountability. Is it the the formulation of the target which is the key issue? Or are there significant conflicts between different policy goals that hinder the achievement of the 2010 target? Or is the failure a result of governance issues?

Definitions

In order to facilitate further reading we would like to comment the relationship between the words goals/targets/objectives as well as define abbreviations frequentelly referred to in the text.

Goals/targets/objectives – on a theoretical level the three concepts goals, targets and objectives differ in meaning. Usually the goals are seen as long term aims to be achieved by the organisation; objectives are relatively short term milestones to be accomplished, while the targets generally refer to physical achievements in the organisation's business. Throughout the report we have used the terms employed by the authors, organistaions, websites etc respectively. We have not replaced any expressions even though the meaning and use of the words goals, targets and objectives differs among the sources.

CBD – The Convention on Biological Diversity was adopted at the Earth Summit in Rio de Janeiro, Brazil in June 1992. It provides a legal framework for biodiversity conservation.

Contracting Parties are required to create and enforce national strategies and action plans to conserve, protect and enhance biological diversity.

CHM – Clearing-House Mechanisms of the CBD aims to contribute significantly to the implementation of the CBD through the promotion and facilitation of thechnical and scientific cooperation among Parties, other Governments and stakeholders. In this context the term "clearing-house" means matching demand with supply.

EEA – The agreement on the European Economic Area, entered into force 1994. It provides for the inclusion of the EU legislation that covers the four freedoms (movements of goods,services, persons and capital) throughout the 30 EEA states, including the EFTA countries (Iceland, Liechtenstein and Norway). In addition, the Agreement covers co-operation in important areas such as research and development, education, social policy, the environment, consumer protection, tourism and culture.

EPI – Environmental Policy Integration is a well known concept within the academic community and among policy makers and is seen as a key element when implementing sustainable development. It entails a fundamental recognition that all sectors within society needs to take on board environmental policy objectives if these are to be achieved.

MSP – Marine Spatial Planning

NBSAP – National Biodiversity Strategies and Action Plans set out the contracting Parties' strategies to implement the CBD. Each Party develop their own plan reflecting local conditions and capabilities.

Part II – Literature study

Introduction

Potentially, an infinite number of articles and dissertations could be relevant to the theme of the conference. For practical purposes the search was delimited to the three subtopics of the conference; Target setting, Conflicts between objectives and/or targets, and Governance level and accountability; and their respective specifications according to draft concept notes. For further details on delimitations, methods and material, see the respective sections on Articles and Dissertations below.

Delimitations and method

Articles

Our main priority was articles that were relevant to Europe, in the sense that the cases were European or the author's academic affiliation was European. Articles that were directly related to biological diversity issues were also a priority, in relation to articles covering other environmental or sustainability fields.

Furthermore, for academic as well as practical purposes, we delimited our search to the Web of science, which indexes more than 9300 peer reviewed journals in natural science, social science and the humanities, and covers more than 39 million references.

Approximately 140 different search strings were used, combining keywords of the conference themes in different ways, in order to make sure we covered as many possibilities as we could. Based on title and abstract just over 100 articles were assessed to be potentially relevant, and were subsequently more carefully studied. Ultimately 41 articles were assessed to be relevant to the study.

Dissertations

Regarding the search for relevant dissertations we used the LIBRIS database search system. LIBRIS contains references to six million books and journals including dissertations held by about 170 Swedish research libraries. Virtually all Swedish titles since 1866 are included. By using a swedish database search system we delimited our selection of dissertations to those produced at Swedish universities. Since the norms of publishing and/or printing dissertaions varies to a large extent between countries there is no global database covering all internationally produced dissertations found, equivalent to the Web of science.

25 search strings were used, combining keywords of the conference themes in different ways. Based on title and abstract just over 50 dissertations were assessed. Out of those, 17 were found relevant for the study.

Results

This section presents, in an aggregated way, the main relevant results and conclusions of the 41 articles and 17 dissertations in question. It is important to keep in mind that it is difficult giving full justice to the individual studies in this format and any assessment of the overall degree of generalizability of study results is beyond the scope of this report. In appendix A you find a complete register of the articles and dissertations, with full references, giving you the opportunity to look further into the articles and dissertations of your interest. The article

and dissertation numbers, within square brackets in the text below, correspond to their numbers in the appendix.

Approximately half of the articles were directly relevant to Europe in the sense that the authors' academic affiliation or the cases were European, the rest were either global or geographically non-specific, or covered other geographic areas but were interesting enough in their results to be deemed relevant anyway. A few articles touch upon more than one theme, 18 of the 41 relate to governance and accountability as a broad category, while 14 relate to target setting and 12 to conflicts between goals.

Regarding the 17 dissertations, they are almost equally distributed in terms of numbers between the three themes (target setting, conflicts between targets and objectives and governance level and accountability). Under the respective headings below we present in more detail the thematic aspects and summarized conclusions of the articles and the dissertations.

Target setting

Articles

The articles that touch upon the issue of target setting do so in a variety of ways. Several articles prescribe characteristics of both the method by which targets are set, and the targets as such.

The latter is the most common, and four articles respectively point out that targets need to be clearly defined and relate to a desired ecological state [1, 5, 8, 9, 4, 7]. One article develops guidelines for objective setting, based on three case studies. Guidelines which state that apart from goals needing to be clear, objectives need to be measurable, science needs to be separated from feasibility in setting conservation objectives, objective setting needs to follow more closely the fundamentals of sound science, and change needs to be anticipated since scientists' ability to precisely answer the question "How much is enough?" is tenuous [4].

Generically defined objectives need to be transposed into specific operational objectives [10]. They need to be precise, evaluable, approachable, motivating and coherent [7]. According to one study objectives need to relate to sustainability and quantify the sustainability gap, even though quantified targets are not uncontested, since they tend to hide social choices and other problems by giving the appearance of scientific objectivity [7, 8]. Evaluations of the Swedish system of national environmental objectives concludes that some of the objectives are imprecise, and they therefore differ in the degree of operationalizability and are difficult to evaluate [7, 19]. A north American study states that percentage targets for conservation have become a popular tool (advocated in both the scientific literature and the conservation community) for setting minimum goals for the amount of land to be set aside as protected areas. The authors conclude that the use of percentage targets is not an appropriate conservation strategy, since while the percentage area required for representation varied, the mean number of protected areas needed to achieve representation did not differ by the minimum reserve size [6].

A study on fisheries, developing a multi-objective model of the North Sea, concludes that short-term goals led to short-term financial gains but lower long-term yields and stock sizes. According to the authors, using a model like the one used in the article provides managers with an option based on a compromise between long-term and short-term objectives [2]. Another study points to the importance of setting both short-term and long-term goals [4].

A study on river restoration in Europe concludes that planning cohesive networks is more effective than conserving species habitats, and points to several reasons for changing species oriented conservation policies into landscape oriented ones; 1. Landscapes are the arena for human activities where biodiversity is situated; 2. Many species need different habitats and contrasting spatial conditions; and 3. The conservation of single species will never be a successful instrument in biodiversity policy when their associated habitats are not considered in their context and configuration in the landscape [1].

Four methods by which targets are set are presented. A success framework developed by the Nature Conservancy (USA) includes identifying a limited number of local conservation targets [3]. Another article presents Sustainability Assessment as a strategic instrument capable of assisting policy makers in electing development priorities and helps in defining a framework of sustainability objectives [13]. The Dashboard of Sustainability is a mathematical and graphical tool that was tested in a local Italian setting where graphical and numerical results were helpful in reaching consensus on the plan for future sustainability. Aggregated indexes can, by providing a simple representation, help communities in the definition of effective improvement goals [12]. The fourth article claims that current methods for setting biodiversity targets lack crucial characteristics and often require too high a level of ecological expertise. The authors propose the following prerequisites for a goal-setting method in multi-stakeholder decision making: 1. The use of the goal-setting method should not require expertise on complex ecological processes or statistical procedures; 2. The method should allow planning with ecosystems based on species requirements; 3. The method needs to be spatially explicit, based on ecosystem type, quality, area, and spatial configuration; 4. The method should allow stakeholders to modify the goal(s) during the planning process: 5. The method should be applicable in metropolitan landscapes; 6. The approach needs to be adaptable to different spatial scales, i.e. it should allow up- and downscaling; 7.the method should also be adaptable to the regional setting and capable of being enriched with local ecological knowledge [11]

Dissertations

The dissertations we found relevant for the study's target setting dimension were produced within a wide range of academic diciplines, namely botany, landscape planning, political science, conservation biology and water resources engineering.

One of the dissertations [42] discusses the connection between policy actors' values and attitudes towards an issue and their willingness to formulate operative goals of conservation. Here, forest owners' intentions and knowledge about biodiversity is scrutinized. There seems to be a difference in attitudes towards production vs.conservation issues between industrial forest owners (occupied with land-use) and private owners (non-occupied with land use). The former group rank "Forest health" as their first priority, and only a minority of them ranked the goal "long-term species survival" as top priority. Compared to the latter group who showed that their attitudes towards conservation were positivle related to a larger knowledge of conservation. The study concludes that the policy process regarding conservation policies in the forestry areas must incorporate the different levels of knowledge of the area among the forest owners.

Two studies [43,44] focus on effects of urbanisation on biodiversity. They both conclude that the human function of urban environments should be an integrated part of urban biodiversity studies. Urban biodiversity is a complex concept in need of explanations and part of that process relates to the process of defining relevant indicators of urbanisation. The issue of scale in relation to achieving sustainable development is also linked to the impacts on biodiversity of urbanisation, infrastructure and land-use. Those impacts need to be considered

not only at local, but regional and landscape levels as well. However, yet another study [46] points to the importance of considering the local level as the appropriate scale for conservation programmes when selecting indicators, as the regional level may be too aggregated.

The process of indicator selection and design on a meta-level is analaysed in a study [45] focusing on municipalities' work with environmental issues, including biodiversity. Depending on which indicator system the politicians and policy makers choose to work with the local definition and understanding of e.g biodiversity or climate change differs largely. What is not indicated in the system is not seen as a part of the question. This implies that indicator systems used in environmental and conservation policies are bearers of values rather than facts. There is need to involve many different stakeholders in the processes of designing indicators and related targets in order to reflect different angles of the problem. For the politicians this may be necessseary in order to gain legitimacy from the public.

Conflicts

Articles

Six articles present different tools or specific methods for planning conservation initiatives, tools or methods that can assist in assessing trade-offs between multiple objectives.

One article concludes that in relation to the hotspots approach, trade-offs, given their key role within regions, may influence priorities among regions simply because we want to know where they are most urgently needed. Simply assuming all undisturbed areas within a hotspot deserve protection could imply an unduly great opportunity cost of conservation. When trade-offs are possible, there can be a large penalty to society to ignore them. Conceivably every country or region could benefit from implementing some trade-offs planning, in order to prioritize within regions and explore scenarios [15].

Landscape IMAGES is a methodology for spatially explicit explorations of options for multifunctional agriculture. It could be applied to the design of nature conservation strategies focusing on relationship between landscape structure and biodiversity, and trade-offs between multiple objectives can be explored [22].

In a paper exploring the potential occurrence of synergies within the agricultural landscape of northeast Scotland, the authors state that conservationists' efforts to influence policy making, can benefit from a tool that will help them to identify other socio-economic functions or values that coincide with good ecological conservation options. The paper evaluates an existing woodland planting policy using and combining three different policy objectives and concludes that there are indeed broad areas of the studied landscape where multiple objectives (biodiversity, visual amenity and on-site recreation potential) could be achieved simultaneously (hotspots), and that the case study could be much better spatially targeted with regards to each individual objective as well as with regards to these hotspots of multifunctionality, and the analysis of the case study demonstrates that multi-functional zonation can be a very useful tool in policy evaluation, as it can provide insights into the potential efficiency of the impacts of land use policies at the landscape level [21].

Another article, based on a case study of a river in Australia, presents a methodology applicable also to other regions requiring more efficient and integrated planning for the management of natural resources. Results suggest that the inclusion of smart spatial targeting of vegetation management and revegetation actions according to established systematic principles can result in significant natural resource management benefits at minimal extra cost. According to the authors, the use of integer programming within a multi-criteria decision

analysis framework provides a structured means of handling multiple data sets to support complex spatial decisions [23].

Yet another study conducted a systematic and trade-off analysis of different policy objectives, based on a land use optimization model (linear programming) integrating biophysical, agro-technical and socio-economic information. The results can serve two purposes, i.e., to reveal the solution space for each of the objectives and to analyze trade-off relationships between pairs of objectives. The trade-off results indicated that for a specific objective, a small deviation from its optimum value could result in a great improvement for most other objectives. These so-called nearly optimum solutions could be appealing alternatives to stakeholders [18].

Progress in implementing ecosystem approaches to conservation and restoration is slowed by legitimate concerns about the effects of such approaches on individual imperiled species. When formerly extensive ecosystems are reduced in area, fragmented, and altered in terms of natural processes and structure, the remaining area is often difficult to manage in a way that maintains the ecological integrity of the system as a whole while meeting the needs of all native species. Spatial analysis puts the perceived conflicts "on the map" and allows all parties to see where and how much imperiled species' habitat is placed at risk by planned restoration actions. This american study shows that, instead of slowing on-the-ground management actions, spatial analysis including the modeling of management actions and their likely effects on forest structure and fire behavior, can provide managers with a sharp focus on management objectives and the tools needed for better coordinated and more effective planning [24]

Other articles focus more on identifying the problematic areas, such as e.g. potential and actual conflicts between different programmes within the same sector, leading to the recommendation to first review the existing policy environment before instituting new programmes [5]. Fragmentation in the policy process, due to changing government modes and separation of functions at all governance levels, leads to difficulties for policy makers in identifying and avoiding unintended policy outcomes, including trade-offs between economic, social and environmental objectives. Environmental Policy Integration (EPI) initiatives in the European Union have not been able to resolve these issues [17]. The Swedish system of national environmental objectives had (by 2004) no rules or principles in place by which to solve goal conflicts or prioritize between different objectives [19].

One article assesses some potential conflicts using a *Calluna vulgaris*-dominated moorland invaded by bracken (*Pteridium aquilinum*) as a model system. According to the authors, conservation management in Europe is often geared towards restoring semi-natural ecosystems, where the objective is to reverse succession and re-establish early-successional communities, to comply with national and international conservation targets. At the same time, it is increasingly recognised that ecosystems provide services that contribute to other, possibly conflicting policy requirements. The article adresses the question of needing to balance conservation goals against potential damage to biogeochemical structure and function, since there is a potential dilemma between controlling a mid-successional invasive species for conservation policy objectives, especially when that species has evolved to sequester nutrients etc [20].

Another article lifts the potential for participation to contribute to the formulation as well as implementation of environmental policy and law, through managing trade-offs. The impact and effectiveness of participatory strategies is to a great extent dependent on a holistic approach, the normative structure of the current political context, the environemtal problem

being adressed, and the structure and desig of the national legal system and its institutions [14].

Finally, ten common mistakes in developing and using forest biodiversity indicators lead to inconsistent and indefensible management strategies and hidden trade-offs according to the authors. Among the ten mistakes are (1) failure to define endpoints and (2) mixing means and ends. Problem definition and definition of clear targets needs to preceed the definition of indicators [16].

Dissertations

Several of the dissertations in this category deals with the conflict between production goals and biodiversity goals in forestry. Yet, they represent different academic fields such as; ecology, conservation biology, land and water resources engineering, forest science, international environment and development studies and natural resource management.

According to one dissertation [47], the intensive forest management of a long time period has made conservation measures necessary to maintain forest biodiversity. Here, the analysis focuses on how to get conservation strategies to be cost-efficient solutions. By looking at factors determining what information should be used when selecting conservation areas and the costs for collecting information, the author shows that a conservation strategy based on many types of conservation areas is most likely efficient for long-term conservation of forest biodiversity. A focus on trade-offs between production of timber and maintainence of biodiversity in forstes is also found in yet another dissertation [50].

Another study [48] investigates ways to facilitate the process of biodiversity conservation in the context of forest policy implementation. Today, compared to yesterday, communication and co-ordination with other sectors and stakeholders outside the forest sector have become a prerequsite in Europen forest policy making. The study attempts to combine ecological and institutional aspects of biodiversity conservation in the forest policy process. The toolbox identified in the study, explicitly recognizes the connectedness, complexity, and ideological differences of ecological and social systems, and employs individual features relevant to these systems in an integrated manner to the benefit of facilitating policy implementation.

Related to the former study this dissertation [52] approaches the issue of local particiaption in policy making. Here the integration of indigenous knowledge and ecological methods for assessing and monitoring human impacts on the environments of northern Kenya is in focus. There is an in-depth analysis made on indicator selection processes and three governance levels are approached in the empirical part; the global, national and local levels. From the results it is concluded that local community participation in assessment and monitoring of environment change in the grazing lands of northern Kenya contributes to the successful implementation of global environmental conventions at community levels. The thesis also shows that ability and knowledge of local herds for selecting sensitive indicators that meet the criteria defined in CBD.

Human activities in the form of land use changes are major threats to biodiversity [49]. Environmental impact assessment (EIA) and strategic environmental assessment (SEA) play a central role in identifying, predicting and managing the impacts of human activities on biodiversity. Spatial aspects of the assessment and the lack of information on scale-related issues are particular problems affecting the appropriate assessment of cumulative effects. The author argues that the entire landscape needs to be encompassed in the assessment framework in order to combat the problem of effects of land-use on biodiversity. The proposed methods allow areas of high ecological value and the surrounding landscape to be considered in the

same assessment, thereby contributing to better integration of biodiversity issues in physical planning

Governance and accountability

Articles

An article on changes in governance of protected areas in over 40 countries, between 1992 and 2002, concludes that a trend towards increased participation of more stakeholders, greater use of formal accountability mechanismsm, and a wider range of participatory techniques had taken place. Protected areas were becoming more influenced by global forces. A majority reported increased involvement of the private sector, and a smaller proportion if the funding from government sources over time. A vast majority felt that protected area governance had improved over the last decade and many felt that this had also led to improved management effectiveness [27].

One article adresses the issue of accountability and legitimacy from a more theoretical standpoint. The author argues that before developing more proposals on how to enhance legitimacy and accountability of polycentric regulatory regimes, we need to pay more attention to the dynamics of accountability and legitimacy relationships, and how those in regulatory regimes respond to them. The key to understanding both how accountability and legitimacy are forged, it is argued, lies in recognizing three key elements: (i) the institutional embeddedness of regulators, be they at the national, sub-national, supranational, or global level and the role of that institutional environment in the construction and contestation of legitimacy; (ii) the dialectical nature of accountability relationships; and (iii) the communicative structures in which legitimacy claims and accountability relationships are articulated and constituted. Legitimacy lies as much in the values, interests, expectations, and cognitive frames of those who are perceiving or accepting the regime as they do in the regime itself. In order to assess the accountability of a regulatory regime as a whole, to the extent this can be done at all, the focus has to be on holding the outcomes of a regime as a whole accountable [33].

Four articles relate to marine conservation or resource management. A 2004 Australian article states that international organisations with responsibility for high seas living resource management have proven to be of limited utility in the sustainable management of high seas resources. The traditional norm of flag State jurisdiction, while still dominant, was being joined by the use of supra-national management in the context of regional fisheries organisations under the United Nations Fish Stocks Agreement. The paper explores what mechanisms exist within international law that would permit a more effective management of high seas biodiversity conservation, and how these may be used to combat the erosion of the effectiveness of measures by individual State interests. The conclusion is that recognition of geopolitical factors that undermine cooperation in biodiversity conservation, and active efforts to address those, will prove essential in the establishment of a successful regime for high seas areas. There are a number of substantial obstacles facing any attempt to create a regime for the implementation of biodiversity protection in high seas areas. These obstacles are essentially economic and strategic concerns that are likely to be concentrated in a relatively small number of States. Second, while the State interests adversely affected by any proposal are small in number, this is balanced by the relative strength and influence of the States concerned. Those affected include the United States, Russia, Japan, China, and the European Union [26].

A European article two years later states that harmonizing European and international law in the context of trade, biological conservation and invasive species policy is a global necessity.

The process is likely to be difficult but fundamental in order to retain international respect and compliance with invasive species legislation [29].

There are two recent articles on Marine Spatial Planning (MSP). The first article explores rights and duties towards exploitation and protection of the marine environment. The Convention on Biological Diversity and the Convention on the Law of the Sea provide the main legal framwork for marine spatial planning and need to be taken into account when planning at regional and national level, and the ecosystem approach is gradually being introduced in national law. Implementation is less successful. The management is mainly characterized by sectoral planning or zoning. The second article states that the need for MSP is strongly influenced by a need for a framework that allows management of an increasing demand for ocean space and ecologically responsible decision-making about new uses of the sea. Three cases are studied and the conclusion is that the goals of the plans are fairly general and not really translated into concrete objectives whose effectiveness can be measured over time. There is also a lack of an international perspective [35, 39].

A 2007 review describes a hierarchical framework that incorporates the marine objectives and delivery statements of ecological, social and economic sectors in the U.K. The framework leads from the UK's guiding principles for sustainable development, through visionary statements and strategic goals for high level delivery, to operational objectives and statements of action which deliver management. Parts of the hierarchy could be populated for the UK, especially those at the higher levels. At the operational level, however, there was less clarity. In a review of 13 social and economic sectors, few provided a clear breakdown of objectives leading from a high level vision or a sustainable development principle. Recent proposals in Europe to create an integrated framework for social, economic and environmental activities will need to carefully balance the development of a strong and competitive marine economy with existing international obligations to environmental protection. There are several important steps to achieving fully integrated management. The first is the recognition that the economic, social and environmental pillars of sustainable development should be treated equally within the management system. A summary of the high level delivery statements for major UK socio-economic sectors showed that relatively few used specific expressions of intent ('goal', 'target' or 'objective') and more frequently were phrased as general and aspirational statements of purpose. With large numbers of operational objectives and indicators, it is not efficient or sensible to discuss every set of potentially incompatible objectives at the policy level. To deal with potential conflicts, a series of rules is necessary so that the framework operates efficiently and delivers its potential benefits of good governance. [30]

Eight articles adress the issue of implementation or management problems at lower governance levels, in one way or the other. One of them is more theoretical and identifies 10 common 'mistakes' in developing and using forest biodiversity indicators from the standpoint of making better forest management choices. The mistakes relate to a failure to clarify the values-basis for indicator selection and a failure to integrate science and values to design indicators that are concise, relevant and meaningful to decision makers. The combined effects of these ten mistakes include inconsistent and indefensible on-ground management strategies and hidden trade-offs at a policy level. According to the authors, they result in frustrated professionals, a confused public, an inability to assess performance with respect to key forest policy objectives and, almost certainly, types and amounts of biodiversity conservation that fail to achieve either scientifically or socially preferred levels. Mistake 1: failing to define endpoints Mistake 2: mixing means and ends Mistake 3: ignoring the management context Mistake 4: making lists instead of indicators Mistake 5: avoiding importance weights for individual indicators Mistake 6: avoiding summary indicators or indices because they are

considered overly simple Mistake 7: failing to link indicators to decisions Mistake 8: confusing value judgments with technical judgments Mistake 9: substituting data collection for critical thinking Mistake 10: oversimplifying: ignoring spatial and temporal trade-offs. The clarification of endpoints and careful selection of indicators based on endpoints is relevant because on-ground forest management decisions often involve not just trade-offs between biodiversity objectives and other objectives (e.g. biodiversity vs. timber values, etc.), but also involve tradeoffs among attributes of biodiversity (e.g. preservation of keystone or charismatic species vs. maintaining broader species richness or diversity [16]

An evaluation of Swedish environmental quality objectives exemplifies system problems, and the author concludes that no comprehensive attempt seems to have been made to identify actual or potential goal conflicts. As a consequence, the objectives are not able to guide action towards environmental quality sufficiently well. The environmental objectives also tend to differ in their degrees of operationalizability, and the priority-setting between different goals is often unclear. This contributes to insufficient goal realization since the objectives cannot be used to direct and control the activities of the public sector in an efficient way [19].

Six of the eight articles relate more concrete examples of on-the-ground implementation issues. Two concern nature conservation in Germany. A 2001 article states that Germany is particularly plagued in its nature conservation strategies by widespread and persistent opposition to the designation and management of protected areas through local resistance. The paper seeks to explain why this opposition is so coherent and so protracted with reference to research into the attitudes of residents, landowners and managers on both sides of the debate. The conclusion is that opposition to nature conservation in Germany was rooted neither in economic conflict nor priorities over land use. It was rather a function of social identity, stereotyped images, and how particular social groups were regarded and approached. A lack of knowledge on the part of the conservationists concerning the importance of these social-psychological processes led to an escalation of opposition. [25]. A 2004 article on the other hand, on the development of greenways and habitat networks in Germany, concludes that the state responsibility for nature conservation explained why Germany had the worst record in the EU for identifying and notifying the sites which fulfil the Habitats Directive. The identification of the habitats took years and was still not complete because the states were reluctant to tackle the conflicts with landowners and development interests. Only after receiving pressure from the EU Commission, which threatened to deny financial support in other areas of regional development, did the German states identify the relevant habitat sites. The conceptualisation of the networks must not be restricted to the boundaries of the individual German states because the networks should have an interstate character and also contribute to the European network of Natura 2000, but the framework legislation had to be passed as nature conservation laws at the state level, while concrete implementation took place at the regional and local levels. There the implementation was hampered primarily by property ownership considerations or conflicting interests of landowners. This situation hindered the implementation of national and European objectives for habitat networks. In order to create a forward looking network strategy for Germany, more authority should, according to the authors, be transferred to the national level [28].

Ecosystem Management is a leading approach in forest policy and management. However, the concept lacks a clear definition an this may lead to different interpretations and meanings. At a national level the use and interpretation of Ecosystem Management shows differences between countries, especially regarding social and economic elements. It can be concluded that, although at an international level there seems to be consensus on the meaning of Ecosystem Management, at the national level it is interpreted and implemented differently between countries. [32]. A manifestation of such vagueness of definitions is exemplified in an

article on wolf management in Finland, which concludes that the range of interpretations enabled by the EU's species-specific legislation on conservation is itself one major source of conflict. The concepts of favourable conservation status and social sustainability are interpreted by each party according to its own interests. It seems impossible to create a policy that would be universally supported. People living in areas where wolves occur feel they can no longer influence policy and are not heard [31].

Dutch environmental policy follows a pragmatic line by adopting a flexible approach for compliance, rather than aiming at further reduction at the source of emission. This may be politically useful in order to adequately reach EU targets, but restoration of environmental conditions may be delayed. Due to the complexity of today's environmental issues, the restoration of environmental conditions might not be the only standard for a proper policy approach. Consequently this raises the question how the Dutch pragmatic approach to compliance qualifies in a broader policy assessment. In order to answer this question, this article adapts a policy assessment framework, based on the dimensions of legitimacy and policy logic and applies it to three environemtal policies. The combination of the two dimensions legitimacy and policy logic, introduces four questions of policy assessment: 1.Is it right? 2.Does it work? 3.Is it allowed? 4.Does it fit in? These four questions relate to four criteria of assessment, respectively on lawfulness, functionality, acceptability and feasibility. The authors argue that ex ante assessments along the lines of the framework criteria could make a significant contribution to the consideration of applying policy instruments. Neglecting any one of the criteria allows opposition groups in society to deploy a lobby strategy to debate legitimacy along the lines of the poorly addressed criterion. A broad ex ante policy assessment on all criteria could greatly help increase the legitimacy of policy instruments from a wide range of perspectives. [40]

Restoration changes existing land use and can therefore be controversial. Some restoration projects negatively affect surrounding landowners, creating social constraints to restoration success. Just as negative off-site impacts (i.e., negative externalities) flow from industrial areas to natural areas, restoration projects can generate negative externalities for commercial land uses, such as agriculture. An effective approach for contested situations will involve open acknowledgment of concerns and problem solving with extensive community involvement. When direct, zero-sum conflicts occur, restorationists must be willing to compromise and recognize the legitimacy of the concerns of others. The negative externalities of restoration that are perceived to be the direct result of specific goals, such as endangered species management, are likely to be more contentious than externalities arising from unintended phenomena such as weed invasion. Restoration planners should give equal consideration to off-site characteristics as to on-site characteristics when choosing sites for restoration and designing projects. Efforts to control externalities can lead to off-site ecological benefits [36].

Three articles focus more on proposed solutions. CBD and EU legislation requiers member states to monitor biodiversity. Despite these legal requirements, resources are scarce, requiring a prioritization of conservation actions, including e.g. monitoring. The existing methods are country specific and mainly incomparable on an international scale. This article presents a method applicable to any taxonomic group or geographic range. It allows for automatization, given database availability, and is readily adjustible to future data improvements. It has comparably low data demands by exploiting by exploiting distribution maps. The authors believe that this method allows the allocation of the limited resources in nature conservation in the most sensible way, e.g. the sharing of monitoring duties, effectively selecting networks of protected areas, improving knowledge on biodiversity and closing information gaps in many species groups [34].

Systematic conservation planning typically requires specification of quantitative representation targets for biodiversity surrogates such as species, vegetation types, and environmental parameters. Targets are usually specified either as the minimum total area in a conservation-area network in which a surrogate must be present or as the proportion of a surrogate's existing spatial distribution required to be in the network. This study focuses on how the total area of conservation-area networks depends on percentage targets. The results of this study illustrate the importance of choice of spatial resolution in conservation planning. Specifically, because conservation-area networks at coarser resolutions contain larger areas, and larger areas may better ensure the persistence of species surrogates, a sufficiently concave resolution–area relationship may justify increasing the land-acquisition budget b to conduct conservation planning at coarser spatial resolutions [37].

This article reviews the current information on global forest cover and condition, examine the international processes that relate to forest protection and to sustainable forest management, and look at the main forest certification schemes. It considers the link between the international processes and certification schemes and also their combined effectiveness. The authors suggest that there is a need to improve the cooperation between the various international initiatives and processes, so that the international framework is more effective and its influence is extended geographically. In some regions of the world neither mechanism is achieving forest protection, while in others local or regional implementation is occurring and is having a significant impact. Choice of certification scheme and implementation of management standards are often influenced by a consideration of the associated costs, and there are some major issues over the monitoring of agreed actions and of the criteria and indicators of sustainability [38].

The effectiveness of a decision-support tool created to identify protected-area potential within the Nova Forest Alliance (NFA) of Nova Scotia, Canada is assessed from the perspective of a public participatory geographic information system (PPGIS) approach. The application sought To create an integrated GIS based decision-support tool for community-focused communication and conservation assessment among NFA partners and potential application within other model forests in Canada. Effective participatory technical systems for community-based decision support must be developed in ways that meet the needs of participants without being so complex as to erect barriers to their use. Creating decisionsupport tools, information and knowledge that integrate community objectives and reflect community capacities are critical elements in both the development and ongoing application stages. [41]

Dissertations

Not surprisingly the dissertations found in this category represent subjects of social sciences to a larger degree than the other two categories. Examples of subjects are; law, economy, political science and life sciences. Common themes adressed are tensions in governance between Government and industry, international law versus local needs and the role of science in policy making.

From a legal perspective, the international biodiversity law and targets that the international community has agreed upon may seem unproblematic [53]. However, when viewed as an overarching control system the international legal order faces problems as it is in fact composed by several multi-levelled and interacting legal systems, at international as well as national level.In the light of this complex reality, the dissertation analyse the probability for a realisation of ecological sustainability and the 2010 biodiversity target (set out in the CBD).

Another study [55] focuses on the social and institutional aspects of the implementation of the CBD in five agro-biodiversity projects in developing countries. In particular it is the Community Biodiversity Conservation and Development (CBDC) Programme that focuses on globally co-ordinated research which is the focus of the study. CBDC is above all considered an institutional experiment bringing together a diversity of locally operating organisations in an interactive and "bottom-up organised" programme. Theories of social learning such as adaptive management and ecological knowledge systems are used as analytical frames when approching the empirical observations. The study results in four “windows of reflection” which aim to guide the the projects in their work, the windows adress actors involved; flows of germplasm, knowledge and information; the social organisation of projects, organisations and the strategy's development; and the social construction of the strategy and efforts to link conservation and development.

Scientific expertise has always played an important role in environmental policy making, the objective of this disseration is to investigate and better understand the science-policy interface in evironmental politics [57]. The study aims to explore the role of scientific expertise in environmental diplomacy by analyzing recent international agreements in the transboundary air pollution (LRTAP) regime. The concept of critical loads i.e. scientific assessment of ecosystem sensitivity, provides a framework for decisions in the efforts to counter air pollution. The theoretical contributions of the study are among others the development of a discursive framework for analyzing the interplay between discourses, practices and actors as scientific knowledge is framed into policy instruments. Furthermore, the study investigates the role of modelers and scientific experts as knowledge brokers and knowledge translators and scientific practices such as modeling in synthesizing and framing scientific discourses into a comprehensible policy instrument.

Economic perspectives on strategic incentives in the management of natural resources is the line of argument in one of the disserations [54]. One part of the analysis focuses on the problem of natural resource stock decline despite a governmental conservation programme in place. One explanation according to the author is that the increase in the variance of the natural growth process does not lead to an increase in investment in the emission-generating industry. Another case in the study shows that when a marine natural stock is damaged by pollution and exposed to harvest from N countries, the different strategic incentives for the countries in order to reduce pollution may cause an extreme case of the “tragedy of the commons” problem.

In order to protect the biodiversity in forestry, the landscape perspective has come to play an important role. In one dissertation [56] the author points to the potential problem of introducing this perspective in forestry planning among non-industrial private forest (NIPF) owners. In order to increase understanding of the planning processes involving NIPF owners the study departures from the owners biodiversity values, which to a large extent concerns setting aside forest areas for conservation purposes. Despite some reluctance fom the NIPF owners regarding using a landscape perspective in the planning process, the thesis concluded that in the studied cases a common view existed among the owners regarding areas to voluntarily set aside from commercial forestry. Yet, the autor argues that in areas dominated by NIPF ownership, a system for cooperation over the borders of estates should be introduced to facilitate the process of setting aside areas for biodiversity pruposes.

In the final dissertation [58] the issue of adapting to climate change in contemporary forest management is analysed. One of the articles uses the “political and economic game” involving the global institutions; Organization of the Petroleum Exporting Countries (OPEC) and the Organization for Economic Co-operation and Development (OECD), as empirical

cases to analyse the exhaustion of oil resorces. The former represents the producers of oil and the latter represents the consumers of oil. Other parts in the study focuses on timber production and population impact om forests in China. The line of argument througout the study is cost-benefit analyses of forest management in the light of the climate change debate.

Conclusions

The aim of the review was to identify possible knowledge gaps regarding biodiversity targets in the scientific literature. We have broken down the three dimensions; target setting, conflicts between targets and governance level and accountability into more specific questions based on the ones formualted in the concept notes for the conference in Visby to be able to sort the information from the articles and dissertations. Hense, if the question is not adressed by the reviewd material we identify is as representing a potential knowledge gap in research.

Target setting

Within the target setting framework we have identifed these questions to be relevant; Role of targets in relation to how they have been formulated? How can the process leading up to target setting pave the wave for achieving legitimacy? How far into the future should targets extend? Can targets become self-defeating (work towards targets as paper exercise rather than field change? Are there alternatives to target setting that might be more effective?

The review of the literature confirms that most of the above questions and issues are adressed by the scientifica community. Several of the articles and dissertations focus on methods of taregt setting processes and most often they link this discussion to the issue of targets role in relation t how they have been formulated. In several of the cases, reasonings about the risk of target setting becoming only paper excecise rather than usable tools in the policy work is also adressed and interlinked with the formulation phase of target setting. The time and scale issue of long-term versus short-term goals are also discussed and put in relation to the sustainability paradigm. Achieving legitimacy for the targets is closely related to the process of defining the targets, according to several of the authors. Particiaptory methods at local level involving several stakeholders and citizens seems to be a successful way in obtaining legitimacy and receiving support for policies. However, the one issue missing is possibly adressing alternative strategies to setting targets at all. We have not found any author/scientist raising this question on any level so obviously this seems to be potential knowledge gap.

Conflicts between targets

Here we would like to know wheter science adress these questions; How are conflicts between different/various policy/political targets dealt with? Are there institutional arrangements in place dealing with conflicts and trade-offs? Conflicts between different and shifting approaches to methods for safe-guarding biodiversity?

Among the three identified questions both the ones adressing the issue of dealing with conflicts between different policy targets and wheter there are institutional arrangements in place dealing with potential conflicts are quite widely covered in the literature. Several of the texts suggest methods to use in order to avoid or at least reduce possible conflicts between targets. Calculations on trade-offs and cost-benefit analyses are examples of instruments that could be used in the process when there is a need for prioritisation among the targets. It is argued that trade-offs may make percieved conflict visible o those involved in the process. This in turn can lead to a greater understanding among those not favoured by the decision. Stream-lining data sets and linear programming are suggested as technical solutions

contributing to a less conflict-shaped planning process. Several of the studies adress the institutional arrangement issue by pointing to the lack of institutional arrangements in place dealing with conflicts. We have not really found any articles dicussing the institutional perspective in terms of whether there are satisfying "physical" institutions (like political) in place rather we interpret the discussion to be about the rules and norms part of the institutional theory. For example, the lack of EPI success stories (in this context) as well as the potential of involving the local community (and knowledge) already in the formualtion stage of the process in order to gain legitimacy. The only text we can see adressing the issue of conflicts between shifting approaches to safe-guarding biodiversity may be found in a disseration pointing to the differences in ecological and institutional aspects of biodiversity conservation in the forest policy context. But analyses of approaches on a more meta- and system level (conservation vs ecosystem approach, ecosystem services and economic valuation) are not found in this review. A potential knowledge gap can thus be identified regarding the issue of meta-approaches to conflicts in biodiversity target formualtion as well as implementation.

Governance level and accountability

Relevant identified questions; levels of governance in relation to ecological scales and boundaries? Overlapping international agreements/EU directives? How do national legal systems correspond to international biodiversity law? Distance between international agreements/targets and the local management level? Democratic deficit in international agreements/targets?Accountability in relation to international agreements and targets? How does the EU coordinate its implementation of and participation in international conventions? Cases of tragedy of the commons?

The governance dimensions hold most questions, which is not really surprising since social science aspects on biodiversity questions have strongly grown within research. The need for new aspects of how to understand environmental policy making at large increases with new environmental problems formualted.

Even though there were many issues to look for in the literature most of them are covered in this review. Several studies point to the issue of the lack of correspondence between international law and national legal systems in place. Many examples are taken from the area of marine conservation, here it seems particularly difficult to obtain good governance in terms of correspondece between international law and national strategies. The distance between governing levels in practice is also the subject of many studies. However, it is not only the distance between the international and national level that are analysed but also the distance between national ad sub-national levels. Germany serves as the case for the latter problem. Lack of institutional arrangements to deal with conflicts between stakeholders may be one explanation to their poor record in the field. In Germany, as well as in other coutries, individuals owning property constitutes a strong interest group in society. Conflicts between private land owners and the government is a well known dilemma, certainly when it comes to forestry. The tragedy of the commons problem is actually adressed in one dissertation, dealing with damaged marine natural stocks. A potential democratic deficit in policy making is analysed from several perspectives in a number of studies. Local particiaption and indegenous knowledge as well as the scientification of politics are examples of issues found in the texts dealing with a potential democratic deficit both at local and international level.

It has been difficult finding studies focusing explicitly on the issues of; levels of governance in relation to ecological scales and boundaries and how the EU coordinates its implementation of and participation in international conventions. Scale dimensions in relation to governance

as well as a scrutiny of how the EU works in pactice when coordinating implementation of biodiversity strategies at national level seems to be missing spots in contemporary scientific research.

Part III – Case studies in Europe

Introduction

Method/material and delimitations

Tha aim of the case study is to study how, and to what extent, national political objectives for biological diversity have been defined in a European context, and to what extent the EU targets on radically improving the conditions for biological diversity till 2010 have had an impact at European and national level. The contribution of the case study is primarily descriptive.

The work has been guided by tentative questions on the types of objectives used, who has approved the objectives, where is adminstrative responsibility located, how do national objectives relate to European and/or national policies for biodiversity, what correspondence is there between national objectives and the international 2010 target, and whether it is possible to identify any goal conflicts between levels or geographic scales.

The four cases, the Czech Republic, Germany, Italy and Norway, were chosen on the basis of a number of characteristics. We wanted to cover Europe geographically from north to south and from west to east, including the former east/west political dimension. Furthermore we wanted to cover both EU members and non-members, as well as unitary and federative states. Based on an overall mapping of the existence of national biodiversity objectives, and an initial assessment of the availability and accessibility of information, our four cases were subsequently chosen.

The primary material used has been official strategy documents, reports and articles accessible on the internet. We have also contacted EPBRS official delegates and national SBSTTA[3] representatives, informing them of the case studies and the questions to be answered in the study, asking them to supply us with any additional information they saw relevant.

The amount of accessible material varies between countries, partly since the level and/or stage of biodiversity work varies, and partly because of language barriers. For both these reasons in combination, the case of Norway has been somewhat more accessible to us than the other countries.

Results

Europe

In 2006 the European Commission produced an Action Plan to halt biodiversity loss by 2010. The plan set out concrete actions and outlined the responsibility of Community institutions and member states. In December 2008 a mid-term evaluation presented progress made and the most important measures implemented by the EU and the member states. It also showed that EU was probably not going to reach its target of halting the loss of biodiversity by 2010. Globally the loss of biodiversity is catastrophic and new challenges present themselves, e.g.

[3] SBSTTA: In the context of the Convention on Biological Diversity (CBD), the Subsidiary Body for Scientific, Technical and Technological Advice. Advises the Conference of the Parties to the Convention and/or the Meeting of the Parties to the Biosafety Protocol in the form of recommendations.

the expansion of agriculture to meet growing demands for food, or the development of alternative marketing opportunities in bio fuels.

A European Commission Conference on biodiversity in Athens this year presented an eight-point plan for nature protection that included these main points:

A better understanding is needed of the fact that healthy ecosystems deliver tangible benefits – a vision of why biodvesity matters; we need a better understanding of where we are and what we need to do; we need a fully functioning network of protected areas; we need to protect ordinary biodiversity in Europe; we need to adress our biodiversity footprint in the rest of the world and protect global diversity; we need to integrate biodiversity into other policy areas; we need to provide funding for biodiversity protection; we cannot solve biodiversity loss wothout adressing climate change and vice versa.

Out of 32 European countries, nine seem to lack a national biodiversity strategy. Four of these nine are EU members. Some of these countries still have biodiversity objectives, established in sustainability or environmental strategies, or in sector policies of different kinds, but these objectives are generally limited in numbers. The vast majority of the national objectives also conform fairly well to the objectives and/or policy areas of the European Action Plan and the focus areas of the CBD 2010 target. The more recent the biodiversity strategy, the more obvious the inspiration from European and CBD structures. However, objectives at the national strategic level that are time limited, quantified or relate to climate change or invasive alien species are rare.

Below, our four cases are presented in abbreviated form to give an overview. More in depth presentations can be found in appendix B.

Czech Republic

Basic facts:	
Number of inhabitants:	10 200 000 (2008)
Constitution:	Republic, unitary state
Area:	78 900 km²
Capital, and number of inhabitants:	Prague 1 165 000 (estimation 2004)
GNP per capita:	21 040 US dollar (2008)
Most important export goods:	Machinery, Transport equipment, industrial goods (steel, glass, textiles)
Number of inhabitants per square kilometre:	129
Membership in inter-national organizations:	EAPC, EU, Council of Europe, UN, NATO, OECD, OSSE, WTO

Source: The Swedish Institute of International Affairs, http://www.ui.se

The *National Biodiversity Strategy of the Czech Republic* was approved by the Czech Government in May 2005 and is legally binding for all ministries. They are requested to take into consideration goals of the Strategy in all programmes and sectoral materials, policies, strategies, concepts and legal enactments. The strategy was prepared by the Ministry of Environment and other ministries, and consulted with experts in organizations under other ministries. It was prepared according to the structure and in accordance with the European Union Strategy. The ministers of Environment and Agriculture respectively were given the responsibility of preparing action plans following the Strategy by 2008. Judging from the Czech CHM website, these actions plans are not yet in place, or not translated into English.

The *National Biodiversity Strategy* details 158 objectives that relate to the strategic goal of the *National Sustainable Development Strategy*, to preserve and not reduce biological diversity, and partial goals to protect landscape diversity and increase biological diversity at all three levels (genetic, generic and ecosystemic). The *National Biodiversity Strategy* is divided into twelve strategic themes and eleven sectoral areas, with a number of objectives specified for each. They are fairly specific, but neither time limited nor quantified. According to the Strategy document, the initial intention when developing the strategy was to define very concrete and detailed targets and actions for later implementation. However, that process was not entirely accepted by other ministries. An example of what Czech biodiversity goals and targets look like is presented in the table below.

The *National Biodiversity Strategy* is based on both the *Convention on Biological Diversity (CBD)* and the *European Community Biodiversity Strategy*, and the introduction explicitly states that all of the objectives of the Strategy are directed towards achieving the 2010 target. The document covers most of the CBD Thematic Programmes and Cross-Cutting Issues and there are also activities and targets directly taken from the Conference of the Parties (COP)[4].

[4] The Conference of the Parties (COP) is the governing body of the Convention, and advances implementation of the Convention through the decisions it takes at its periodic meetings. To date the Conference of the Parties

Table 1. Examples of biodiversity goals and targets in the Czech Republic

Sustainable Development Strategy	
Strategic goal	**Partial goals**
In the territory of the Czech Republic, safeguard the good quality of all components of the environment and the functioning of their basic relations, as well as harmonic relations between ecosystems, and also preserve, to the largest extent acceptable in economic and social terms, the natural resources of the Czech Republic so as to ensure that they can be delivered to future generations, and preserve and not reduce biological diversity.	As regards the protection of biological and landscape diversity, and in the framework of spatial planning procedures, to support the development of natural and landscape infrastructure along with a reinforcement of the retention capacity of the landscape, and to protect valuable areas by appropriate measures.
	With regard to the protection of biological diversity, to continuously increase biological diversity at all three levels (genetic, generic and ecosystemic).
National Biodiversity Strategy	
Sustainable use of biodiversity components, objectives	
Include sustainable use of the components of biological diversity and unify understanding of this concept in the policy materials of the other sectors, related to various degrees to conservation and management of biological diversity and sustainable use of its components. For this purpose, apply the practical principles and detailed guidelines for sustainable use of the components of biodiversity (Addis Ababa Principles).	
Apply the practical principles and detailed guidelines for sustainable use of the components of biological diversity in case studies on sustainable use of selected populations of wild flora and fauna, breeds of farm and domestic animals and varieties and cultivars of cultural crops. Apply the experience obtained in broader practice.	
Rural development plan	
Axis II, Objective	**Sub-measure grassland management: Objectives**
Promotion of environmentally friendly farming methods leading to biodiversity and promotion of suitable farming systems to preserve rural landscape. Promotion of the protection of the environment on agricultural land and in forest areas of high nature value.	The aim is ensuring the cultural landscape maintenance, especially by pasture animal farming and support of biological diversity at valuable habitats. Scheme Bird habitats on grassland – waders‘ nesting site, possibly corncrake’s nesting site in the framework of this sub-measure has the aim to maintain and increase population of these bird species by creating of suitable breeding conditions and other conditions necessary to existence of these valuable species.
Rural Development Programme	
Natura 2000 payments: Quantification of operative goals (outputs)	
Resolution of specific disadvantages of forest holders: Number of holdings receiving aid in Natura 2000: 350 enterprises annually. Supported forest land (ha) in Natura 2000 area: 35 thousand ha annually	

There are a number of national sectoral strategies and plans that relate to the issue of biodiversity. Strategies and plans on sub-national (regional or local) levels however, have not been accessible for the study. The material available (the Biodiversity Strategy as such, the

has held 8 ordinary meetings, and one extraordinary meeting (the latter, to adopt the Biosafety Protocol, was held in two parts).

example of sectoral strategy we have consulted, the Fourth National Report to CBD, articles etc) make no mention of conflicting goals between levels in the Czech Republic.

Germany

Basic facts:	
Number of inhabitants:	82 500 000 (2008)
Constitution:	Republic, federative state
Area:	357 000 km²
Capital, and number of inhabitants:	Berlin 3 400 000 (estimation 2007)
GNP per capita:	46 500 US dollar (2008)
Most important export goods:	Cars and other engineering industry products, chemical products, electronics and household appliances
Number of inhabitants per square kilometre:	231
Membership in inter-national organizations: of	EAPC, EU, Council of Europe, UN, NATO, OECD, Western European Union (WEU), OSSE, WTO, Council the Baltic Sea States

Source: The Swedish Institute of International Affairs, http://www.ui.se

In november 2007, the German Federal Government passed a comprehensive *National Strategy on Biological Diversity*. The National Strategy serves to implement the Convention on Biological Diversity at national level and also outlines Germany's contribution to the conservation of biological diversity worldwide by placing it in a European context. It addresses all government institutions at Federal, state and local government level, as well as all social players. The German Federal Nature Conservation Agency (BfN) is Germany's central scientific authority for both national and international nature conservation. The Agency reports to the German Environment Ministry (BMU) and has key enforcement functions under international species conservation agreements, marine conservation law, the Antarctic Treaty and the German Genetic Engineering Act. One of the objectives of the German Federal Agency for Nature Conservation (BfN) is conservation and promotion of biodiversity. This ranks equally with the objectives of promoting sustainable use of biodiversity and promoting nature conservation as an overall responsibility of society (www.bfn.de).

Each sub-area in the biodiversity strategy expresses a visionary statement, quality targets, justifications, and aspirational statements or action targets. The visions provide a visual impression of the aspired future status and serve as ideals. Based on the existing threats to biological diversity, concrete future-oriented quality targets are defined, outlining an aspired long-term status as the basis for political and social action. The majority of these close to 80 targets have a timeframe, and several are also quantified. Brief justifications are provided which explain the necessity for these objectives. Concrete future-oriented action targets indicate the steps which must be taken to work towards these quality targets (*National*

Strategy on Biological Diversity 2007). An example of what German biodiversity goals and targets look like is presented in the table below.

Table 2. Examples of biodiversity goals and targets in Germany

<table>
<tr><th colspan="3">National Strategy on Biological Diversity</th></tr>
<tr><th>Coastline and Oceans: Vision</th><th>Coastline and oceans: Aims</th><th>Coastlines and oceans: We aspire to the following</th></tr>
<tr><td rowspan="3">Natural coastal and marine regions are fascinating natural landscapes. The interlinked natural and near-natural coastal and marine ecosystems, in their diversity and natural momentum, support the unthreatened existence of all typical species and habitats. They exhibit a favourable conservation status.</td><td>By 2015 a good ecological and chemical quality status has been achieved for all waters in the coastal region.
By 2021 marine waters have achieved a good anvironmental quality</td><td>To apply the ecosystem approach (HELCOM, OSPAR) while preserving the precautionary and polluter-pays principles from 2010 at the latest
To implement an integrated coastal zone management system based on the national
Integrated Coastal Zone Management (ICZM) strategy of 22 March 2006</td></tr>
<tr><td>By 2010 the decline in species and the degradation of habitats has been halted.</td><td>To enforce sustainable and ecosystem-compatible fishing practices by 2010 “Good environmental quality” as defined in Annex 5 of the Water Framework Directive (WFD) Concrete vision</td></tr>
<tr><td>By 2020 a significant improvement in the conservation status for all species and habitats has been achieved.</td><td>To realise a joint OSPAR/HELCOM network of well-managed coastal and marine protected areas, including core zones of natural development, by 2010, and to ensure its integration into international networks
To protect semi-natural coastal and marine regions by means of species and biotope conservation measures</td></tr>
<tr><th colspan="3">National Strategy for the Sustainable Use and Protection of the Seas</th></tr>
<tr><th colspan="3">Goals</th></tr>
<tr><td colspan="3">A network of well managed Coastal and Marine Protected Areas, in international as well as national waters, that include core zones of natural development of an adequate size should be set up. Their integration into onternational networks should be completed by 2012.</td></tr>
<tr><td colspan="3">The typical character of marine habitats with their characteristic species should be preserved or, if necessary, developed with a view to achieving at least a “good status of the marine environment” by 2015 as defined in the WFD or by 2020 as required under the MSFD</td></tr>
</table>

In terms of structure, the *National Strategy on Biological Diversity* is based on the European Union’s biodiversity strategy, with links to a number of related national sector strategies. The Strategy also details all connections between the strategy and relevant EU and international convention objectives and decisions in an extensive appendix. The *National Strategy on Biological Diversity* is also anchored in the national sustainability strategy (*National Strategy on Biological Diversity,* 2007).

Two articles on state implementation of biodiversity policy in Germany were found in the course of the literature study (see articles 25 and 28 in appendix A). The first article, published in 2001, concluded that opposition to nature conservation in Germany was rooted neither in economic conflict nor priorities over land use. It was rather a function of social identity, stereotyped images, and how particular social groups were regarded and approached. A lack of knowledge on the part of the conservationists concerning the importance of these social-psychological processes led to an escalation of opposition. The second article however, published in 2004, attributed the failure of implementation to the lack of national authority to provide and implement regional nature conservation targets and to the land ownership structure in Germany. Nature conservation was so weak at the national level that it had not been possible to align the different state habitat classifications or to provide a satisfactory national information system. The state responsibility for nature conservation explained why Germany had the worst record in the EU for identifying and notifying the sites

which fulfil the Habitats Directive. The states were reluctant to tackle the conflicts with landowners and development interests. According to a recent press release, uniform nature conservation and water management legislation will now come into force which will be directly applicable in the whole country. In nature conservation the former framework law, which just set out more general requirements for the states, is being replaced. The new nature conservation act applies to the whole Federal Republic and stipulates that any damage done to nature must be compensated in kind. In water legislation it is now also possible to put into place uniform federal requirements for the management of surface and coastal waters and for ground water. These provisions achieve a balance between the use and the protection of water bodies (BMU-Pressedienst No. 233/09. Berlin, 10.07.2009).

Italy

Basic facts:	
Number of inhabitants:	58 900 000 (2008)
Constitution:	Republic, unitary state
Area:	301 309 km²
Capital, and number of inhabitants:	Rome 2 500 000 (estimation 2008)
GNP per capita:	40 450 USD (2008)
Most important export goods:	industrial machinery and other industry products, transport products, clothing, shoes and leather products, food.
Number of inhabitants per square kilometre:	195,5
Membership in inter-national organizations:	EAPC, EU, Council of Europe, UN, NATO, OECD, OSSE, WTO, Western European Union (WEU)

Source: The Swedish Institute of International Affairs, http://www.ui.se

Italy's commitment in relation to the Convention on Biological Diversity (CBD) was put into effect by law in February 1994, ratifying the convention. Upon ratification, the document entitled *Strategies and Preliminary Programme to Implement the Convention on Biodiversity in Italy* was drawn up, and then approved by the CIPE (Interministerial Committee for Economic Planning) a month later. There have been different attempts to define a national plan for biodiversity, but it has not been possible to reach an agreement and currently Italy lacks both a national biodiversity strategy and a national sustainable development plan. However, an *Environmental action strategy for sustainable development* (ICEP Deliberation No. 57/2002) includes conservation of biodiversity as one of its main objectives, and defines specific targets, instruments and indicators. Sustainability projects at local, regional, provincial, town council, mountain community, association, park etc level have often departed in an integrated approach to sustainability and both explicitly and implicitly taken biodiversity conservation into account. Regional councils are responsible for governing their territories and the state is responsible for biodiversity. The State-Region Conference is the institutional office in which the National Biodiversity Strategy will be approved by 2009 and officially presented during the First National Biodiversity Conference.

The 1994 strategy is no longer relevant according to the *4th Italian National Report to the CBD* (2009), which states that 1994 Strategic Lines have now been overcome by new

international, and that conservation policies are currently carried out in accordance with the European Strategy and in detail following the *European Action Plan for Biodiversity*. The *Environmental action strategy for sustainable development* (ICEP Deliberation No. 57/2002 *Strategia d'azione ambientale per lo sviluppo sostenibile in Italia*) includes conservation of biodiversity as one of its main objectives, and defines specific targets, instruments and indicators. There are five general biodiversity objectives that are mainly expressed as directions in which to go (reduction of pressures etc), and twentyone more specified objectives. Seven of these are further specified with targets that are in some cases both time limited and quantified. An example of what Italian biodiversity goals and targets look like is presented in the table below.

Table 3 Examples of biodiversity goals and targets in Italy

Environmental Action Strategy for Sustainable Development		
General ojective	**Specific objective**	**Target**
Conservation of biodiversity	Complement scientific and ecosystemic knowledge, especially on pressures on the biosphere (flora and fauna) and coherence of territories Improvement of the efficiency of monitoring and protection systems	
	Conservation , protection and sustainable use of natural, biotic and abiotic, resources Protection and conservation of cultural and social heritage, especially in the mediterranian region Making use of traditional techniques and/or improved territorial management for the conservation of biodiversity Promote biosecurity Prevention and reduction or elimination of the impact on ecosystems, habitats and species by introduction of invasive species	Reduce the number of threatened species by at least 1% of the total number of species in each class. Reach the 2000 objective of 10%, and reasonably formulate for 2012 an equivalent objective, with an anlysis of environmental benfits and an extensive stakeholder involvement.

Reporting (*4th national report to the CBD*) conforms to the *European Action Plan for Biodiversity*, and so does implementation according to the same report. To idependently verify that is beyond the scope of this study.

There is no explicit mention of conflicts in the available material, apart from the failure to reach an agreement on a national plan for biodivesity. Whether that is related to difficulties in agreeing on goals and targets amongst levels is not clear.

Norway

Basic facts:	
Number of inhabitants:	4 700 000 (2008)
Constitution:	Monarchy, unitary state
Area:	323 878 km²
Capital, and number of inhabitants:	Oslo 522 000 (2004)
GNP per capita:	102 525 USD (2008)
Most important export goods:	oil, natural gas, metals, machinery, fish, chemical products
Number of inhabitants per square kilometre:	14,5
Membership in inter-national organizations:	EAPC, Council of Europe, UN, NATO, Nordic Council, OECD, OSSE, WTO, Council of the Baltic Sea States

Source: The Swedish Institute of International Affairs, http://www.ui.se

The three documents *Norwegian Biodiversity Policy and Action Plan – Cross-sectoral Responsibilities and Coordination* (St.Meld 42 (2000/2001)); and *The Government's Environmental Policy and the Environmental State of the Nation* (St.Meld. 21 (2004/2005) and St.Meld. 26 (2006/2007)) set the framework for Norwegian biodiversity policy. Objectives and targets are also described in the National Budget, endorsed in parliament. The Ministry of the Environment has a particular responsibility for carrying out the environmental policies of the Government. In addition to initiating, developing and carrying out its own measures through its own instruments, the Ministry of the Environment has an important role in influencing sectoral Ministries at the national level. The Ministry of Agriculture and Food, the Ministry of Fisheries and Coastal Affairs, the Ministry of Education and Research and the Ministry of Foreign Affairs also have important roles in the work for biodiversity. The responsibility for different issue areas on biological diversity are placed at various governmental instituions at the national level. Regional and thematic protection plans make up the core of protective work in line with the Nature Conservation Act. At regional level the County Governor works to implement national environmental policies. The municipalities have key roles in the environment protection efforts, and the Governor informs and guides them, translating the national policies into local action.

In the Norwegian Biodiversity Policy and Action Plan, one strategic goal is followed by seven relatively broad/general national biodiversity targets (resultatmål), targets that are neither time limited nor quantified. In chapters from the various ministries, some objectives/targets are further specified, along with measures. These are not quantified or timed either, but rather qualitative in character. In *The Government's Environmental Policy and the Environmental State of the Nation*, these objectives and targets are followed-up on, and some time limited targets are found among the governement aspirational statements. More specified, time limited and quantified targets are found in more specialized plans or ministerial budgets, where the timeframe of the targets is rather short. An example of what Norwegian biodiversity goals and targets look like is presented in the table below.

Table 4. Examples of biodiversity goals and targets at different levels in Norway

Norwegian Biodivesity Policy and Action Plan	
Strategic goal	**National target**
The environment shall be managed in a way that maintains the diversity of habitats and landscape types and ensures that there are viable populations of naturally-occurring species: this will ensure that biological diversity can continue to evolve. In addition, Norway aims to halt the loss of biodiversity by 2010.	A representative selection of Norwegian habitats shall be protected for future generations
The Governments's Environmental Policy and the Environmental State of the Nation	
National target	**Targets for Nature diversity and outdoor activites, subarea: Sustainable use and protection of habitats: The Government wants…**
A representative selection of Norwegian habitats shall be protected for future generations	Implement existing protection plans
National yearly budget, Ministry of the Environment	
National target	**Sub-area 1: Sustainable use and protection of habitats: work target**
A representative selection of Norwegian habitats shall be protected for future generations	Implement work program on area protection from CBD and establish network of protected areas on land by 2010
	Implement the White Paper on National parks through the establishment of 40 new and the extension of 14 existing protected areas by 2010.

Nature protection is not part of the EEA Agreements. However, the Norwegian government aims at adapting to the majority of European Union environmental law, even when it is not part of the EEA Agreement, in order to harmonize Norwegian work on nature protection to that of the rest of Europe. The *Norwegian Biodiversity Policy and Action Plan* is a political tool for use in Norway's efforts to follow up the Convention on Biological Diversity. It is subtitled «Cross-sectoral responsibilities and coordination» in direct reference to Article 6 of the convention, which states that all sectors must take responsibility for integrating biological diversity considerations into their administrative tasks The seven goals of the *National Biodiversity Policy and Action Plan* relate mainly to the first three focal areas that clarify the 2010 target.

We have found no mention of conflicts directly related to different management levels or different geographic scales. The conflicts identified in the *4th Norwegian National Report to CBD* and by contacts in Norway concern marine/water management, acquaculture (escaping fish), local/regional development and land use, top carnivores versus domestic animals, trade-offs between bioenergy, landuse and biodiversity, and trade-offs between short-term economic interest and biodiversity in general (*4th Norwegian National Report to CBD*, 2009; Backe-Hansen, 2009).

Thematic summary and discussion

The oldest, still relevant, biodiversity strategy among our cases is that of Norway, approved in 2000/2001. The youngest is Germany's, approved in 2007. Italy still lacks a national biodiversity strategy and action plan.

Target setting

The theme of target setting is the area with the greatest variation between our cases. The number of biodiversity objectives and/or targets specified on a national strategy level differs significantly between cases. Italy still lacks a national biodiversity strategy but has five general biodiversity objectives in its *Environmental action strategy for sustainable development*. Objectives that are further specified in 21 more specific objectives. The Norwegian strategy specifies seven national biodiversity targets, with further specifications under the headings of different ministries. Germany and the Czech Republic have biodiversity strategies that present an extensive number of objectives and targets, between 80 and 160.

Traditional conservation objectives and targets dominate in all cases. Germany is the only case with clearly visionary goals for each sub-area of the strategy. The quantification of objectives and targets takes place at different levels and arenas in different countries. In both the Norwegian and the Czech cases, quantified targets with timeframes are primarily found in sectoral and/or regional strategies and plans. Germany on the other extreme has in its national biodiversity strategy close to 80 concrete future-oriented quality targets, the majority of which have a timeframe and several are also quantified. The target years are in the case of Germany a mixture of short and medium term, mainly 2020 or 2015, and in some cases 2010. In the case of Norway, where quantified targets are found in for instance the ministerial budgets, the timeframed targets are for obvious reasons generally short term. Quantified and time limited targets in sectoral strategies and plans have not been mapped sufficiently to asses the time span. The Czech biodiversity strategy contains no timeframed or quantified targets, due to difficultiess reaching an agreement between ministries.

Conflicts between objectives/targets

All the cases make connections between biodiversity issues and climate change, and three have also set objectives relative to that connection. However, the connection is not primarily made in the sense that targets for climate change and biodiversity are seen to be in conflict. The issue of bioenergy measures to fight climate change and their potential effects on biodiversity are mentioned in passing. Rather, care is taken to formulate goals and targets that take the interconnectedness of the issues into account.

The conflicts between objectives/targets that are mentioned are rather implementational and relate to the fact that potential goal conflicts with other policy areas play out at the regional or local levels. In the case of Germany, two articles on the implementation of nature conservation and protection discuss the federal versus state roles. The earlier article concluded that social-psychological processes were the drivers of opposition, while the second article focused more on the different management levels and their respective roles and concluded that states were reluctant to handle conflicts with landowners and development interests. Corresponding implementation problems are not frequently raised in the official documents for other countries. However, the Norwegian Fourth National Report (CBD) mentions marine/water management, aquaculture (escaping fish), local/regional development and land-use, trade-offs between short-term economic interests and biodiversity in general. In the case

of Italy, the fact that an agreement on a national plan for biodiversity has not been possible to reach is difficult to interpret based on available information.

Governance level and accountability

The formal structure for adopting the national biodiversity strategies and enforcing them is rather uniform in our four cases. The national governments or parliaments have approved the strategies and the national ministries of the environment have key functions in implementing them, even though the strategies adress all ministries and levels of government, as well as non-governmental actors.

Targets in all cases relate to the international 2010 target, and more clearly so to the initial three focus areas (sub-goals 1-7), even though the other focus areas are covered as well to a varying extent. The Czech strategy is based on both the CBD and the European Community Biodiversity Strategy and explicitly states that all the objectives of the strategy a directed towards achieving the 2010 target. The German strategy also explicitly relates in both structure and numerous references to both the European strategy and international Conventions. Both these are more recent strategies. The Norwegian strategy is stated to be a direct instrument in national implementaion of the CBD. Explicit links to national sustainability or environmental strategies also occur in all cases, as well as connections to various sectoral policies and legislation.

Part IV – Final reflections

This final part of the report will adress issues and thoughts that have come to our minds during the work with the review and the case studies. For sure, the biodiversity target issue as discussed in this report opens up for many interesting discussions regarding for example target setting in general, challenges for environmental policy making at different levels and intra state conflict management.

When deciding upon targets and related indicators and assessment methods the issue of levels should be in focus. In order to reach implementation the level dimension regarding I) the governance level and II) the target/indicator level must be clear. Usually the level of implementation of biodiversity goals is at the local level, and when the concretisation of the targets is made at the level of implementation, namely the local, the possibilites for targets to meet the local needs increas. To define what to do at the level of implementation surely increases the rate of implementation and it becomes clear where to wreak accountability. Yet, it may lead to different goals in different local settings which in turn makes it impossible to aggregate data to a higher level in order to make comparisions of results.

The connection between several governance levels, the apparent lack of conflict assessment in the strategic documents and identified conflicts at the implementaion levels, is worth pondering. In general, while the emphasis that the sustainability concept and Environmental Policy Integration (EPI) puts on 'win-win' scenarios (with regard to the environment and the economy) is persuasive from an aggregate and long-term perspective, this 'win-win' logic breaks down on less aggregate levels. The paradigm of sustainable development implies a restructuring of the economy with redistributive effects, where not every producer or consumer will gain. This implies that the EPI principle is more likely to gain acceptance on top levels, or among conceptually working persons, but will face resistance where immediate trade-offs are being felt. The tools needed to facilitate EPI, e.g. indicators and targets, are still often underdeveloped which leaves sectoral policy-makers overtaxed in assessing the environmental impacts of their programmes and projects and in evaluating sustainable practice (Lenschow 2002).

Vague goals at EU level leads to nation specific interpretations of the strategies, which may sometimes be necessary in order to achieve impementation. But for the EU it becomes impossible to measure progress on equal terms, since control over the issue is transposed from the EU level to the state level. Another aspect of vaguness of target setting at higher governing levels is the obvious risk of pressing down potential conflicts to the local level. Several examples of that can be found in the review. In order to handle conflicts, a well developed institutional capacity must be in place. It is important that the institutional capacity of all involved governing levels is recognized from the beginning. Implementaion failure can be a direct effect of a poorly developed institutional capacity at relevant levels.

When implementation failure occurs at any level it may simply be linked to a lack of legitimacy for the issue. Democratic deficit is stronly linked lack of legitimacy. Several of the studies in the review discuss and assess different cases where a participatory approach to the target setting process has been used. Local knowledge is relevant not only because it may bring new dimensions and insights to the work but because it involves the target group (not only stakeholders) but the recievers (inhabitants, land-owners etc) of the measure taken. We do not know enough about the degree of participatory methods and strategies used in the development of the biodiversity targets in our four cases. However, involvement of target groups in the target design process is closely connected to success in communication, acceptence for decisions and possible trade-offs between different goals.

Another aspect of legitimacy in the work with targets and indicators is the importance of understanding the two dimensions of scientific and functional characterstics. Even though targets and related indicators in most cases need to be designed on basis of scientific standards (they need to be measurable, objective, comprehensive, possible to quantify etc) in order to obtain legitimacy, it is also necessary to take the functional dimension ito account. In a political reality, targets and indicators need to be understandable (linked to level of aggregation, availability, policy relevant and comparability etc.). Otherwise there is a risk for lack of legitimacy and transparancy, and in the end they may be impossible to implement since they do not correspond to the prerequsites at the policy making level.

Part V. References

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3rd German National Report to CBD, 2005.

4th Czech National Report to CBD, 2009.

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The National Biodiversity Strategy of the Czech Republic, 2005. Ministry of the Environment of the Czech Republic

Rural Development Programme of the Czech Republic for 2007 – 2013. Working document.

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Apart from these direct references, we have consulted a wide variety of EU, CBD, EPBRS and national web sites and documents.

Appendix A. References Literature Study

Nr	Abstract excerpt	References
	Articles	
	Target setting	
1	This paper concentrates on the concept of setting targets for river restoration as exemplified by the Meuse River. A modelling exercise shows the restraints of current habitat configuration and the potential for habitat restoration along the river. A policy analysis, using a strategic approach, illustrates the influence of the decision making process on the targets for natural river development. River dynamics play a key factor in determining the potential for persistent populations of target animal species along the river, with the help of an expert system (LARCH, Landscape ecological Analysis and Rules for the Configuration of Habitat).	*Setting targets in strategies for river restoration.* Bas Pedroli, Geert de Blust, Kris van Looy and Sabine van Rooij. The authors are working at the Landscape Ecology Deptartment, Alterra Green World Research, Wageningen, The Netherlands; and the Institute for Nature Conservation of the Flemish Community, Brussels, Belgium Landscape Ecology 17 (Suppl. 1): 5–18, 2002. Printed in the Netherlands.
2	The relatively high degree of scientific uncertainty with respect to the status of the stocks and the relatively short lengths of political terms of office, generally give rise to the short-run view taking the highest priority when defining policy objectives. In this paper, a multi-objective model of the North Sea is developed that incorporates both long-term and short-term objectives. Optimal fleet sizes are estimated taking into consideration different preferences between the defined short-term and long-term objectives. The subsequent results from the model give the short-term and long-term equilibrium status of the fishery incorporating the effects of the short-term objectives.	*Modelling the effects of trade-offs between long and short-term objectives in fisheries management* Simon Mardle and Sean Pascoe, Centre for the Economics and Management of Aquatic Resources (CEMARE), University of Portsmouth, UK. Published by Journal of Environmental Management (2002) 65, 49-62
3	The Nature Conservancy (USA) and its partners have developed a “measures of success” framework with four core components: (1) identifying a limited number of local conservation targets, (2) identifying key ecological attributes for these targets (3) identifying an acceptable range of variation for each attribute as measured by properly selected indicators (4) rating target status based on whether or not the target’s key attributes are within their acceptable ranges of variation. A target cannot be considered “conserved” if any of its key ecological attributes exceeds its acceptable range of variation.	*Are We Conserving What We Say We Are? Measuring Ecological Integrity within Protected Areas* Jeffrey D Parrish, David P Braun, Robert S Unnasch. Jeffrey D Parrish is the director of conservation planning for the Global Priorities Group, The Nature Conservancy, Denver, CO. David P Braun is a senior biohydrologist for the Freshwater Initiative, The Nature Conservancy, New York. Robert S Unnasch is a senior ecologist for the Adaptive Management Program, The Nature Conservancy, Boise, ID. Published in BioScience, September 2003. Vol 53, no 9.

4	This article develops guidelines to help steer conservation biologists and practitioners through the process of objective setting. It provides three case studies to highlight the practical challenges of objective setting in different social, political, and legal contexts. It also identifies crucial gaps in our science, including limited knowledge of species distributions and of large-scale, long-term ecosystem dynamics, that must be filled if we hope to do better than setting conservation objectives through intuition and best guesses.	*How Much Is Enough? The Recurrent Problem of Setting Measurable Objectives in Conservation* Timothy H. Tear, Peter Kareiva. Paul L. Angermeier, Patrick Comer, Brian Czech, Randy Kautz, Laura Landon, David Mehlman, Karen Murphy, Mary Ruckelshaus, J. Michael Scott And George Wilhere. Published by BioScience October 2005 / Vol. 55 No. 10
5	Legal restrictions are often inadequate to prevent loss of habitat and encourage private forest owners to manage areas for biodiversity, especially when these management actions require time, money, and other resources. Environmental programs encouraging these actions through economic incentives can be used instead of additional legal restrictions. This article focus on programs which target forests explicitly with economic incentives for private forest owners, and have biodiversity conservation as a primary or secondary (indirect) goal. It introduces a sample of voluntary incentive programs for private forests in Europe and North America. It briefly describes the economic, social, and ecological characteristics of the programs and the forests they aim to conserve, and evaluate the success of these programs with respect to their explicitly stated goals and the ecological status of the forests in that country or state. Important factors contributing to program success include an allowance for some economic productivity in enrolled forests, a long period since time of program inception, and little interference from other incentive programs.	*Biodiversity conservation incentive programs for privately owned forests* Audrey L. Mayer, Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, USA, & Paivi M. Tikka, University of Helsinki, Department of Biological and Environmental Sciences, Finland. Published in Envronmental science & policy 9 (2006) 614 – 625.
6	Percentage targets for conservation have become a popular tool (advocated in both the scientific literature and the conservation community) for setting minimum goals for the amount of land to be set aside as protected areas. However, there is little literature to support a consistent percentage target that might be widely applied. Moreover, most percentage targets have not taken into account issues of species persistence. A recent study of herbivores in Kruger National Park took into account issues of representation and persistence in setting conservation targets and found that results were consistently about 50% and were unaffected by different permutations of the reserve selection process. Here, we carry out a similar analysis for representation of mammals within sites that are predicted to allow for their persistence, across eight ecologically defined regions in Canada to test whether we see similar consistent patterns emerging	*Conservation targets for viable species assemblages in Canada: are percentage targets appropriate?* Yolanda F. Wiersma and Thomas D. Nudds, Ecology Group, Department of Integrative Biology, University of Guelph, Canada. Published in Biodiversity and Conservation (2006) 15:4555–4567
7	In this paper, five Swedish environmental quality objectives are investigated through an application of the suggested criteria: (1) a balanced marine environment, flourishing coastal areas and archipelagos; (2) a magnificent mountain landscape; (3) a non-toxic environment; (4) natural acidification only; and (5) a good built environment. To guide decision making toward improved environmental quality, objectives should satisfy a set of rationality (functionality) criteria; they should be precise, evaluable, approachable, motivating and coherent. The aim of the paper is to bring the rationality of the objectives up for discussion, and to illustrate the range of issues and difficulties that are involved in choosing and assessing environmental policy goals.	*Setting Rational Environmental Goals: Five Swedish Environmental Quality Objectives* Karin Edvardsson, Department of Philosophy and the History of Technology, Division of Philosophy, Royal Institute of Technology, Stockholm, Sweden. Published in Journal of Environmental Planning and Management, Vol. 50, No. 2, 297 – 316, March 2007.

8	Despite increasing efforts to reach sustainability, key global biophysical indicators such as climate change and biodiversity loss continue to deteriorate rather than improve. Ongoing failure to move towards sustainability calls into question the focus of current research and policy. Some scholars have pleaded for scientists and economists to overcome their language barriers to ensure the conservation of biodiversity . Although we endorse this plea, the sustainability challenge goes far beyond finding a common language. Indeed, the superficial use of a common language can easily mask incompatible worldviews. Both within and beyond the realm of academia, we must work together to construct conceptual frameworks that foster a deeper understanding of the dynamics of our complex world. Academics can have key roles in initiating, focusing and fostering this discussion, and helping to translate it into behavioral change and policy action. Ultimately, the task of closing the sustainability gap, rather than watching it grow ever larger, must become the core business of all modern societies in the 21st century.	*Mind the sustainability gap* Joern Fischer, Adrian D. Manning, Will Steffen, Deborah B. Rose, Katherine Daniell, Adam Felton, Stephen Garnett, Ben Gilna, Rob Heinsohn, David B. Lindenmayer, Ben MacDonald, Frank Mills, Barry Newell, Julian Reid, Libby Robin, Kate Sherren and Alan Wade. All from The Fenner School of Environment and Society, The Australian National University, except Stephen Garnett from Institute of Advanced Studies, Charles Darwin University, Australia. Published in TRENDS in Ecology and Evolution Vol.22 No.12, 2007.
9	There is unlikely to be a generic set of recommendations that is applicable everywhere because actions need to be matched to the particulars of site and situation. However, there is a generic set of questions that can be asked, which can help guide the process of deciding which restoration actions are most important and contribute most to the reestablishment of desirable habitat characteristics within a given project area.	*Habitat Restoration—Do We Know What We're Doing?* James R. Miller, Department of Natural Resource Ecology and Management, Department of Landscape Architecture Iowa State University, USA, and Richard J. Hobbs, School of Environmental Science, Murdoch University, Murdoch, Australia. Published in Restoration Ecology Vol. 15, No. 3, pp. 382–390, 2007
10	The use of indicators within marine policy and legislation is a developing phenomenon worldwide. As governments begin to take a more holistic approach to marine management, it is inevitable that economic and social goals will increasingly become enshrined in environmental regulations. It is imperative to reach an understanding as to how scientific, economic, and social goals are interconnected, and how they influence indicator development. Additionally, we explore the depth to which interfacing occurs between various policy goals (i.e. scientific, social, economic, and legal). The study highlights the importance of good communication between the various government agencies and disciplines to better achieve sustainable-development objectives	*The regulatory framework for marine dredging indicators and their operational efficiency within the UK: a possible model for other nations?* Elizabeth Bayer, Richard A. Barnes, and Hubert L. Rees. Published in ICES Journal of Marine Science, 65: 1402–1406, 2008.
11	In highly developed regions, ecosystems are often severely fragmented, whereas the conservation of biodiversity is highly rated. Regional and local actor groups are often involved in the regional planning, but when making decisions they make insufficient use of scientific knowledge of the ecological system that is being changed. The ecological basis of regional landscape change would be improved if knowledge-based systems tailored to the cyclic process of planning and negotiation and to the expertise of planners, designers and local interest groups were available. If regional development is to be sustainable, goals for biodiversity must be set in relation to the actual and demanded patterns of ecosystems. We infer a set of prerequisites for the effective use of biodiversity goal-setting methods in multi-stakeholder decision making.	*Setting Biodiversity Targets in Participatory Regional Planning: Introducing Ecoprofiles* Paul Opdam, Rogier Pouwels, Sabine van Rooij , Eveliene Steingröver , and Claire C. Vos. Published in Ecology and Society 13(1): 20, 2008.

12	The adoption of suitable indicators is fundamental to implement sustainable development at the local level. It helps in the analysis and evaluation; supports the decisional process and helps the communication between the citizens and the society, in general. Furthermore, the aggregated indexes – by representing the observed context in a simple way – may help the community in the definition of effective improvement goals and also serve as important tools to monitor the fulfillment of the planned objectives. The Dashboard of Sustainability (DS) is a mathematical and graphical tool designed to integrate the complex influences of sustainability and support the decision-making process by creating concise evaluations.	*The Dashboard of Sustainability to measure the local urban sustainable development: The case study of Padua Municipality* Antonio Scipioni , Anna Mazzi, Marco Mason, Alessandro Manzardo. Published in Ecological indicators 9 (2009) 364 – 380.
13	Sustainability assessment (SA) is a holistic and long-range strategic instrument capable of assisting policymaking in electing, and deciding upon, future development priorities. The outcomes of an SA process become more relevant and strengthened when conducted with multistakeholder engagement, which provides for multiple dialogues and perspectives. This article tells how SA was used, what sustainability meant in each study area through different objectives of sustainability considered, discusses the methods used in SA, and the benefits arising. The SA was conducted by a team independent of any study area, who developed and oversaw the application of the SA methodology, assisting national teams, and developing a cross-country understanding of the sustainability of proposed scenarios in the different geographical and social contexts, and their implications for policy-making. Finally, it reflects on the persistent challenges of interdisciplinary research, compounded by multi-cultural teams, and concludes on the BioScene's lessons for the further development and application of SA.	*Sustainability Assessment for Agriculture Scenarios in Europe's Mountain Areas: Lessons from Six Study Areas* Maria Rosário Partidário, William R. Sheate, Olivia Bina, Helen Byron and Bernardo Augusto. Published by Environmental Management (2009) 43:144–165.
	Conflicts between objectives/targets	
14	The analytical framework of this paper draws on theoretical traditions within the sociology of law and legal theory, and analyses some recent national legislation and international law with respect to participation. It proposes a set of guidelines that aim to facilitate participation (as opposed to merely pro forma consultation) with particular reference to the formulation and implementation of National Forest Programmes (NFPs).	*Participation and societal values: the challenge for lawmakers and policy practitioners* Marie Appelstrand. Published by Forest Policy and Economics 4 (2002) 281–290.
15	Biodiversity conservation planning requires trade-offs, given the realities of limited resources and the competing demands of society. If net benefits for society are important, biodiversity assessment cannot occur without other sectoral factors "on the table". In trade-offs approaches, the biodiversity value of a given area is expressed in terms of the species or other components of biodiversity that it has that are additional to the components protected elsewhere. That "marginal gain" is called the complementarity value of the area. Two international biodiversity programs provide important new opportunities for biodiversity trade-offs taking complementarity into account. Both the Millennium Ecosystem Assessment and the Critical Ecosystems or "hotspots" programs can benefit from an explicit framework that incorporates tradeoffs, in which a balance is achieved not only by land-use allocation among areas, but also by the crediting of partial protection of biodiversity provided by sympathetic management within areas.	*The role of trade-offs in biodiversity conservation planning: linking local management, regional planning and global conservation efforts* Daniel P Faith and P A Walker. Published by J. Biosci. 27 (Suppl. 2) 393–407, 2002.

16	This paper identifies 10 common 'mistakes' in developing and using forest biodiversity indicators from the standpoint of making better forest management choices. The mistakes relate to a failure to clarify the values-basis for indicator selection and a failure to integrate science and values to design indicators that are concise, relevant and meaningful to decision makers. The combined effects of these ten mistakes include inconsistent and indefensible on-ground management strategies and hidden trade-offs at a policy level. They result in frustrated professionals, a confused public, an inability to assess performance with respect to key forest policy objectives and, almost certainly, types and amounts of biodiversity conservation that fail to achieve either scientifically or socially preferred levels.	*Ten common mistakes in designing biodiversity indicators for forest policy* Lee Failing, Robin Gregory. Published by Journal of Environmental Management 68 (2003) 121–13.
17	This article argues that changing governance modes in the European Union (EU), including territorial multi-level governance and the dispersion of decision-making authority in policy networks, along with the separation of functions at all governance levels, is often characterised by fragmentation in the policy process. This causes difficulties for policy makers in identifying and avoiding unintended *ex post* policy outcomes, including 'trade-offs' between economic, social and environmental objectives that, in the context of sustainability, are sub-optimal.	*Governance and sustainability: an investigation of the role of policy mediators in the European Union policy process* Andrew Williams. Published by Policy & Politics vol 32 no 1 95–11, 2004.
18	Population pressure, soil loss, over-use of marginal lands, and poverty and food insecurity problems. Alleviation of these problems needs an integrated consideration of different objectives. To learn about the potentials and limitations of agricultural development and conflicts between objectives, this study conducted a systematic and trade-off analysis of different policy objectives, based on a land use optimization model (linear programming) integrating biophysical, agro-technical and socio-economic information. The results can serve two purposes, i.e., to reveal the solution space for each of the objectives and to analyze trade-off relationships between pairs of objectives.	*A trade-off analysis of policy objectives for Ansai, the Loess Plateau of China*. C.H. Lu, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences & M.K. van Ittersum, Plant Production Systems, Wageningen University, Wageningen, Netherlands. Published in Agriculture, Ecosystems and Environment 102 (2004) 235–246.
19	In Sweden, environmental policy is essentially carried out through a system of environmental objectives adopted by Parliament in the late 1990s. This system contains principles, objectives, interim targets, strategies, and follow-up mechanisms, which together provide a solid ground for increased efficiency and improved prioritization in environmental policies. Despite the ambitious approach of the Swedish Parliament, the system of environmental objectives suffers from certain shortcomings. Some of the objectives are imprecise and difficult to evaluate, and there are no rules or principles that may be used to solve goal conflicts and to prioritize between different objectives. As a consequence, the environmental objectives tend to differ in their degrees of operationalizability, and the priority-setting between different objectives is often unclear.	*Using Goals in Environmental Management: The Swedish System of Environmental Objectives* Karin Edvardsson. Published in DOI: 10.1007/s00267-004-3073-3 2004
5	Legal restrictions are often inadequate to prevent loss of habitat and encourage private forest owners to manage areas for biodiversity, especially when these management actions require time, money, and other resources. Environmental programs encouraging these actions through economic incentives can be used instead of additional legal restrictions. This article focus on programs which target forests explicitly with economic incentives for private forest owners, and have biodiversity conservation as a primary or secondary (indirect) goal. We introduce a sample of voluntary incentive programs for private forests in Europe and North America. We briefly describe the economic, social, and ecological characteristics of the programs and the forests they aim to conserve, and evaluate the success of these programs with respect to their explicitly stated goals and the ecological status of the forests in that country or state. Important factors contributing to program success include an allowance for some economic productivity in enrolled forests, a long period since time of program inception, and little interference from other incentive programs.	*Biodiversity conservation incentive programs for privately owned forests* Audrey L. Mayer, Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, USA, & Paivi M. Tikka, University of Helsinki, Department of Biological and Environmental Sciences, Finland. Published in Envronmental science & policy 9 (2006) 614 – 625.

20	Conservation management in Europe is often geared towards restoring semi-natural ecosystems, where the objective is to reverse succession and re-establish early- successional communities, to comply with national and international conservation targets. At the same time, it is increasingly recognised that ecosystems provide services that contribute to other, possibly conflicting policy requirements. Few attempts have been made to define these conflicts. Here, we assess some potential conflicts using a *Calluna vulgaris*-dominated moorland invaded by bracken (*Pteridium aquilinum*) as a model system, where the current policy is to reverse this process and restore moorland.	*Competing conservation goals, biodiversity or ecosystem services:Element losses and species recruitment in a managed moorland–bracken model system* R.H. Marrsa, K. Galtressa, C. Tonga, E.S. Coxa, S.J. Blackbird, T.J. Heyesa, R.J. Pakemand, M.G. Le Duca. Published by Journal of Environmental Management 85 (2007) 1034–1047.
21	Many conservation and restoration efforts in developed countries are increasingly based on the premise of recognising and stimulating more 'multifunctionality' in agricultural landscapes. Public policy making is often a pragmatic process that involves efforts to negotiate trade-offs between the potentially conflicting demands of various stakeholders. Conservationists' efforts to influence policy making, can therefore benefit from any tool that will help them to identify other socio-economic functions or values that coincide with good ecological conservation options. This paper explores the potential occurrence of such synergies within the agricultural landscape of northeast Scotland and evaluates an existing woodland planting policy using and combining three different policy objectives.	*Mapping hotspots of multiple landscape functions: a case study on farmland afforestation in Scotland* Alessandro Gimona and Dan van der Horst. Published in Landscape Ecol (2007) 22:1255–1264.
22	Intensively managed agricultural areas in North-Western Europe have been undergoing a shift from solely production oriented use to provision of multiple services and functions. Design and assessment of multifunctional agricultural landscapes could be supported by exploration of trade-offs between financial returns from agriculture, landscape quality, nature conservation and environmental quality. This paper presents the Landscape IMAGES methodology for spatially explicit exploration of options for multifunctional agriculture in landscapes at a scale of a few km2.	*Exploring multi-scale trade-offs between nature conservation, agricultural profits and landscape quality—A methodology to support discussions on land-use perspectives* Jeroen C.J. Groot , Walter A.H. Rossing, Andre´ Jellema, Derk Jan Stobbelaar, Henk Renting, Martin K. Van Ittersum. Published by Agriculture, Ecosystems and Environment 120 (2007) 58–69.
23	On-ground natural resource management actions such as revegetation and remnant vegetation management can simultaneously affect multiple objectives including land, water and biodiversity resources. However, planning the location of management actions in the landscape often treats these objectives individually to reduce the process and spatial complexity inherent in human-modified and natural landscapes. This can be inefficient and potentially counterproductive given the linkages and trade-offs involved. The focus of this study is the human-modified landscape of the River Murray, South Australia. However, the methodology and analyses presented here can be adapted to other regions requiring more efficient and integrated planning for the management of natural resources.	*Systematic regional planning for multiple objective natural resource management* Brett A. Bryan and Neville D. Crossman. Published by Journal of Environmental Management 88 (2008) 1175–1189.
24	Progress in implementing ecosystem approaches to conservation and restoration is slowed by legitimate concerns about the effects of such approaches on individual imperiled species. The perceived conflict between the restoration of fire-excluded forests and concomitant reduction of dense fuels and high-severity wildfire, versus the recovery of endangered species, has led to a policy ambiguity that has slowed on-the-ground action at a time when active management is urgently needed, both for ecosystem restoration and species conservation.	*Real versus perceived conflicts between restoration of ponderosa pine forests and conservation of the Mexican spotted owl* John W. Prather, Reed F. Noss, Thomas D. Sisk. Published by Forest Policy and Economics 10 (2008) 140–150.

	Governance level and accountability	
25	Germany is particularly plagued in its nature conservation strategies by widespread and persistent opposition to the designation and management of protected areas through local resistance. This opposition is continuing, despite Germany's commitment to international and European mandates to enhance biodiversity within its borders. This paper seeks to explain why this opposition is so coherent and so protracted with reference to research into the attitudes of residents, landowners and managers on both sides of the debate.	*Barriers to nature conservation in Germany: A model explaining opposition to protected areas* Susanne Stoll-Kleeman, Global Change & Social Systems, Potsdam Institute for Climate Impact Research (PIK). Published in Journal of Environmental Psychology (2001) 21, 369-385.
16	This paper identifies 10 common 'mistakes' in developing and using forest biodiversity indicators from the standpoint of making better forest management choices. The mistakes relate to a failure to clarify the values-basis for indicator selection and a failure to integrate science and values to design indicators that are concise, relevant and meaningful to decision makers. The combined effects of these ten mistakes include inconsistent and indefensible on-ground management strategies and hidden trade-offs at a policy level. They result in frustrated professionals, a confused public, an inability to assess performance with respect to key forest policy objectives and, almost certainly, types and amounts of biodiversity conservation that fail to achieve either scientifically or socially preferred levels.	*Ten common mistakes in designing biodiversity indicators for forest policy* Lee Failing, Robin Gregory. Published by Journal of Environmental Management 68 (2003) 121–13.
19	In Sweden, environmental policy is essentially carried out through a system of environmental objectives adopted by Parliament in the late 1990s. This system contains principles, objectives, interim targets, strategies, and follow-up mechanisms, which together provide a solid ground for increased efficiency and improved prioritization in environmental policies. Despite the ambitious approach of the Swedish Parliament, the system of environmental objectives suffers from certain shortcomings. Some of the objectives are imprecise and difficult to evaluate, and there are no rules or principles that may be used to solve goal conflicts and to prioritize between different objectives. As a consequence, the environmental objectives tend to differ in their degrees of operationalizability, and the priority-setting between different objectives is often unclear.	*Using Goals in Environmental Management: The Swedish System of Environmental Objectives* Karin Edvardsson. Published in DOI: 10.1007/s00267-004-3073-3 2004
26	International organizations with responsibility for high seas living resource management have proven, in many cases, to be of limited utility in the sustainable management of high seas resources. This traditional norm of flag State jurisdiction, while still dominant, is now being joined by the use of supra-national management in the context of regional fisheries organizations under the United Nations Fish Stocks Agreement. The paper explores what mechanisms exist within international law that would permit a more effective management of high seas biodiversity conservation, and how these may be used to combat the erosion of the effectiveness of measures by individual State interests.	*Implementing high seas biodiversity conservation: global geopolitical considerations* Stuart Kaye, Australia. Published in Marine Policy 28 (2004) 221–226.
27	This study reports on a global survey to assess changes in governance of protected area systems between 1992 and 2002 based on responses from 41 countries.	*Trends in Global Protected Area Governance, 1992–2002* Philip Dearden, Michelle Bennett and Jim Johnston. Published by Environmental Management Vol. 36, No. 1, pp. 89–100, 2005.

28	The traditional concept of protecting isolated remnants of endangered habitats as nature reserves could not stop the continuing decline of endangered species and the regional losses in biodiversity sufficiently. During the last century, different approaches to protect open space, species, and habitats have been developed. Based on a literature review, an analysis of the legal framework and a representative case study, this paper tries to characterize the development of greenways and habitat networks in Germany and to discuss the general possibilities and limitations in an European context.	*The German way to greenways and habitat networks* Christina von Haaren and Michael Reich. Published by Landscape and Urban Planning 76 (2006) 7–22.
29	The management of invasive non-native species is a frequent cause of conflict in the field of biodiversity conservation because perceptions of their costs and benefits differ among stakeholder groups. A lack of cohesion between scientific researchers, the commercial sector and policy makers lies at the root of a widespread failure to develop and implement sustainable management practices for invasive species. The crisis of this situation is intensified by drivers stemming from international conventions and directives to address invasive species issues. Using primarily Irish examples in this review, we emphasize the importance of approaching risk assessment, risk reduction and control or eradication policies from a cost-efficient, highly flexible perspective, incorporating linkages between environmental, economic and social objectives.	*The importance of stakeholder engagement in invasive species management: a cross-jurisdictional perspective in Ireland* K.E. Stokes, K.P. O'Neill, W.I. Montgomery, J.T.A. Dick, C.A. Maggs and R.A. McDonald. Published by Biodiversity and Conservation (2006) 15:2829–2852.
30	This review describes a hierarchical framework that incorporates the marine objectives and delivery statements of ecological, social and economic sectors. The framework leads from the UK's guiding principles for sustainable development, through visionary statements and strategic goals for high level delivery, to operational objectives and statements of action which deliver management. Parts of this hierarchy can already be populated for the UK, especially those at the higher levels. At the operational level, however, there is less clarity.	*Review: Ecosystem objectives to support the UK vision for the marine environment* S.I. Rogers M.L. Tasker, R. Earll, S. Gubbay. Published in Marine Pollution Bulletin 54 (2007) 128–144.
31	This article is based on the preparation process of the wolf management plan in Finland. As a part of the process, a nationwide hearing was arranged in 2004. Fear of wolves is widespread and even more common in areas with low wolf population. People living in areas where wolves occur feel that they can no longer influence decision making which affects them and that the authorities, conservationists, and the EU do not listen to their opinions.	*Human dimensions of wolf (Canis lupus) conflicts in Finland* Jukka Bisi & Sami Kurki & Marko Svensberg & Tuija Liukkonen. Published in European Journal of Wildlife Research (2007) 53:304–314
32	Ecosystem Management is a leading approach in forest policy and management. However, the concept lacks a clear definition and this may lead to different interpretations and meanings. Still, some commonalities have been identified in the literature leading not so much to a precise definition but rather to the general observation that EM, in addition to traditional technical–scientific elements, includes important social and economic considerations.	*Interpretation and implementation of Ecosystem Management in international and national forest policy* M. Dekker, E. Turnhout , B.M.S.D.L. Bauwens, G.M.J. Mohren. Published in Forest Policy and Economics 9 (2007) 546–557.

33	The legitimacy and accountability of polycentric regulatory regimes, particularly at the transnational level, has been severely criticized, and the search is on to find ways in which they can be enhanced. This paper argues that before developing even more proposals, we need to pay far greater attention to the dynamics of accountability and legitimacy relationships, and to how those in regulatory regimes respond to them. The article thus first seeks to develop a closer analysis of three key elements of legitimacy and accountability relationships which it suggests are central to these dynamics: The role of the institutional environment in the construction of legitimacy, the dialectical nature of accountability relationships, and the communicative structures through which accountability occurs and legitimacy is constructed. Second, the article explores how organizations in regulatory regimes respond, or are likely to respond, to multiple legitimacy and accountability claims, and how they themselves seek to build legitimacy in complex and dynamic situations.	*Constructing and contesting legitimacy and accountability in polycentric regulatory regimes* Julia Black, Department of Law, London School of Economics and Political Science, London, UK. Published by Regulation & Governance (2008) 2, 137–164
34	The Convention on Biodiversity (CBD) commits its signatories to the identification and monitoring of biodiversity. The European Union has implemented this commitment into its legislation. Despite the legal requirement resources are scarce, requiring a prioritization of conservation actions, including e.g. monitoring. The existing methods are country specific and mainly incomparable on an international scale. Here, we present a newly developed method, which is applicable to any taxonomic group.	*Determination of national conservation responsibilities for species conservation in regions with multiple political jurisdictions* Dirk S. Schmeller, Bernd Gruber, Bianca Bauch Æ Kaire Lanno, Eduardas Budrys, Valerija Babij, Rimvydas Jus˘kaitis Æ Marek Sammul, Zoltan Varga, Klaus Henle. Published in Biodivers Conserv (2008) 17:3607–3622.
35	This article explores the rights and duties towards exploitation and protection of the marine environment under the jurisdiction of coastal states as reflected in two important global conventions, the United Nations Convention on the Law of the Sea and the Convention on Biological Diversity. Both Conventions provide the main legal framework for marine spatial planning that have to be taken into account in planning at the regional and national level.	*The international legal framework for marine spatial planning* Frank Maes. Published by Marine Policy 32 (2008) 797– 810.
36	Ecological restoration is a key component of biological conservation. Nevertheless, unlike protection of existing areas, restoration changes existing land use and can therefore be more controversial. Some restoration projects negatively affect surrounding landowners, creating social constraints to restoration success. Just as negative off-site impacts (i.e., negative externalities) flow from industrial areas to natural areas, restoration projects can generate negative externalities for commercial land uses, such as agriculture.	*Negative Off-Site Impacts of Ecological Restoration: Understanding and Addressing the Conflict* Mark C. Buckley & Elizabeth E. Crone Published in Conservation Biology, Volume 22, No. 5, 1118–1124, 2008.
37	Systematic conservation planning typically requires specification of quantitative representation targets for biodiversity surrogates such as species, vegetation types, and environmental parameters. Targets are usually specified either as the minimum total area in a conservation-area network in which a surrogate must be present or as the proportion of a surrogate's existing spatial distribution required to be in the network.	*Influence of Representation Targets on the Total Area of Conservation-Area Networks* James Justus, Trevon Fuller, & Sahotra Sarkar from Biodiversity and Biocultural Conservation Laboratory, Section of Integrative Biology, University of Texas at Austin, U.S.A. Published in Conservation Biology, Volume 22, No. 3, 673–682, 2008.

38	The loss of forest area globally due to change of land use, the importance of forests in the conservation of biodiversity and in carbon and other biogeochemical cycles, together with the threat to forests from pollution and from the impacts of climate change, place forestry policy and practice at the center of global environmental and sustainability strategy. Forests provide important economic, environmental, social, and cultural benefits, so that in forestry, as in other areas of environmental policy and management, there are tensions between economic development and environmental protection. In this article we review the current information on global forest cover and condition, examine the international processes that relate to forest protection and to sustainable forest management, and look at the main forest certification schemes. We consider the link between the international processes and certification schemes and also their combined effectiveness.	*The Sustainable Management and Protection of Forests: Analysis of the Current Position Globally* Peter Freer-Smith and Jean-Michel Carnus. Published by Ambio Vol. 37, No. 4, June 2008.
12	The adoption of suitable indicators is fundamental to implement sustainable development at the local level. It helps in the analysis and evaluation; supports the decisional process and helps the communication between the citizens and the society, in general. Furthermore, the aggregated indexes – by representing the observed context in a simple way – may help the community in the definition of effective improvement goals and also serve as important tools to monitor the fulfillment of the planned objectives. The Dashboard of Sustainability (DS) is a mathematical and graphical tool designed to integrate the complex influences of sustainability and support the decision-making process by creating concise evaluations.	*The Dashboard of Sustainability to measure the local urban sustainable development: The case study of Padua Municipality* Antonio Scipioni , Anna Mazzi, Marco Mason, Alessandro Manzardo. Published in Ecological indicators 9 (2009) 364 – 380.
39	Several European countries, on their own initiative or driven by the European Union's Marine Strategy and Maritime Policy, the Bergen Declaration of the North Sea Conference, and the EU Recommendation on Integrated Coastal Zone Management, have taken global leadership in implementing marine spatial planning. Belgium, The Netherlands, and Germany in the North Sea, and the United Kingdom in the Irish Sea, have already completed preliminary sea use plans and zoning proposals for marine areas within their national jurisdictions. This paper discusses the nature and context of marine spatial planning, the international legal and policy framework, and the increasing need for marine spatial planning in Europe. In addition, the authors review briefly three marine spatial planning initiatives in the North Sea and conclude with some initial lessons learned from these experiences.	*New perspectives on sea use management: Initial findings from European experience with marine spatial planning* Fanny Douvere, and Charles N. Ehler, Published by Journal of Environmental Management 90 (2009) 77–88.
40	Despite a general decrease in Dutch environmental emission trends, it remains difficult to comply with European Union (EU) environmental policy targets. Furthermore, environmental issues have become increasingly complex and entangled with society. Therefore, Dutch environmental policy follows a pragmatic line by adopting a flexible approach for compliance, rather than aiming at further reduction at the source of emission. This may be politically useful in order to adequately reach EU targets, but restoration of environmental conditions may be delayed. However, due to the complexity of today's environmental issues, the restoration of environmental conditions might not be the only standard for a proper policy approach. Consequently this raises the question how the Dutch pragmatic approach to compliance qualifies in a broader policy assessment. Three environmental policy assessments: flexible instruments in climate policy, fine-tuning of national and local measures to meet air quality standards, and derogation for the Nitrate Directive.	*Pragmatics of Policy: The Compliance of Dutch Environmental Policy Instruments to European Union Standards* Sonja Kruitwagen, Melchert Reudink, Albert Faber. Published in Environmental Management (2009) 43:673–681.
41	The effectiveness of a decision-support tool created to identify protected-area potential within the Nova Forest Alliance (NFA) of Nova Scotia, Canada is assessed from the perspective of a public participatory geographic information system (PPGIS) approach. The application sought to create an integrated GIS based decision-support tool for community-focused communication and conservation assessment among NFA partners and potential application within other model forests in Canada.	*Lessons for PPGIS from the application of a decision-support tool in the Nova Forest Alliance of Nova Scotia, Canada* Candace Anderson , Karen Beazley , James Boxall. Published in Journal of Environmental Management 90 (2009) 2081–2089.
	Dissertations	

	Target setting	
42	The global biodiversity loss within forest ecosystems has attracted attention during the last decades. Awareness increased both world-wide and in Sweden, which led to changes in the Swedish forests policy. In the Swedish Forestry Act of 1993 the environmental and production goals became equally important, and several new policy implementation instruments were taken into use. Paper III and IV evaluate the forest owners' intentions and knowledge of nature conservation, as well as their attitudes towards it. Those occupied with land-use had a more negative attitude towards conservation than others. Also, in the ranking of operational goals for their own conservation efforts, only 7% of the respondents ranked 'long-term species survival' as their first priority, while the vast majority ranked 'forest health' as number one.	*Forest biodiversity maintenance: Instruments and Indicators in the Policy Implementation* Uliczka, Helen Dept. of Conservation Biology, SLU. Acta Universitatis agriculturae Sueciae. Silvestria (2003) vol. 291.
43	The thesis approaches the concept of urban biodiversity from different angles in an attempt to explain its significance.In a study from the constructed Toftanäs wetland park, methods of affecting local biodiversity are demonstrated as integrated with other functions. Theoretical aspects of urban biodiversity are studied in-depth and the different views on biodiversity in general and urban biodiversity in particular are scrutinised. It is concluded that a holistic view on urban biodiversity probably reflects the true conditions best. In a method study, a few different kinds of biodiversity mapping were tested. It was concluded that the biotope-mapping model tested was easy and rapid, but incomplete. Patch mapping was more time-consuming, but possibly more informative. Patch shape was com-pared to species diversity, but there was no correlation. It was concluded that both kinds of mapping need to be calibrated with biological data, and that the human function of urban environments should be an integrated part of urban biodiversity studies. A method of assessing the perception of biodiversity was tested using a semantic test on-site. An index for biodiversity experience was created and later tested also in a photo-based study. Both studies comprised laymen as well as experts. It was concluded that there were differences between photo-based and on-site ratings, but the biggest difference was detected with the on-site experts. As a general conclusion of the thesis it can be stated that urban biodiversity is an integral part of the urban environment, and that it is impossible to regard the city without its bio-logical component, as well as it is impossible to regard the biological component without its human connection.	*Biological diversity in urban environment.* Gyllin, Mats Dept. of Landscape Planning, Alnarp, SLU. (2004) Acta Universitatis agriculturae Sueciae. Agraria vol. 461.
44	To achieve a sustainable development, impacts on biodiversity of urbanisation, infrastructure, land use changes and other developments must be considered on a landscape and regional scale. Landscape ecology can provide a conceptual framework for the assessment of consequences of long-term development processes like urbanisation on biodiversity on a landscape scale, and for evaluating the impacts of alternative planning scenarios. The aim of this study was to explore the effects of habitat quality, quantity and connectivity on forest bird diversity in an urban-rural gradient. The purpose of the analyses was to develop knowledge and methods for integrating biodiversity issues in planning and assessments in an urbanising environment, on landscape and regional scales.	*Landscape ecological analysis and assessment in an urbanising environment : forest birds as biodiversity indicators* Mörtberg, Ulla Dept. of Land and Water Resources Engineering, KTH (2004)
45	This thesis takes its departure in seeing indicators as socially constructed, and aims to explore the role(s) indicators play in governance for local sustainable development. The traditional environmental policy discourse characterised by rationality and efficiency became challenged in the 1990s by the Agenda 21 discourse, emphasizing the need for citizen participation for environmental governance. Notions of efficiency and participation are, however, often in conflict since achieving participation is time consuming and efficiency requires results within short time frames. Thus, a tension in governance is created which is especially apparent at the local level and in politics relating to sustainable development. In this study, Sweden is seen as an extreme case in terms of implementing sustainable development policies. Swedish local authorities have been at the international forefront in developing sustainability indicators. Here, the work surrounding seven different sustainability indicator systems in three Swedish municipalities is analysed. The analysis shows that local sustainability indicators vary to a great extent regarding their scope, which implies that sustainable development is interpreted differently depending on the local context. In general, goals linked to 'soft' issues like democracy, awareness raising and learning tend to be less indicated than 'hard' issues such as pure natural scientific measures. These latter type of systems are therefore most likely to be used and implemented.	*Towards Sustainable Development: Indicators as a tool of local governance* Mineur, Eva Dept. of political science, Umeå university (2007)

46	Semi-natural grasslands, which are a declining and fragmented habitat in Europe, contain a high biodiversity, and are therefore of interest to conservation. This thesis examines how plant diversity is influenced by the landscape context, and how plant and fungal diversity can be targeted by practical conservation using indi-cator species and congruence between species groups. Reproduction and recruitment of the dioecious herb Antennaria dioica was also investigated, providing a case-study on how fragmentation and habitat degradation may affect grassland plants.Grassland size and heterogeneity were of greater importance for plant diversity in semi-natural grassland, than present or historical connectivity to other grasslands, or landscape characteristics. Larger grasslands were more heterogeneous than smaller grasslands, being the likely reason for the species-area relationship.detailed study on A. dioica discovered that sexual reproduction and recruitment may be hampered due to skewed sex-ratios. Sex-ratios were more skewed in small populations, suggesting that dioecious plants are likely to be particularly sensitive to reduced grassland size and fragmentation.A study on indicators of plant species richness, used in a recent survey of remain-ing semi-natural grasslands in Sweden, revealed several problems. A high percent-age of all indicator species were missed by the survey, removing an otherwise sig-nificant correlation between indicator species and plant species richness. Also, a null model showed that the chosen indicator species did not perform significantly better than species chosen at random from the available species pool, questioning the se-lection of the indicators in the survey. Diversity patterns of the threatened fungal genus Hygrocybe were not congruent with plant species richness or composition. Plants are thus a poor surrogate group for Hygrocybe fungi, and probably also for other grassland fungi. Implications from this thesis are that conservation of semi-natural grasslands should target several species groups, and that an appropriate scale for plant conservation may be local rather than regional.	*Biological diversity values in semi-natural grasslands: indicators, landscape context and restoration* Öster, Mathias Dep. of Botany Stockholm university (2006)
	Conflicts between objectives/targets	
47	Long and intensive forest management has made conservation measures in the forest landscape necessary to maintain forest biodiversity. The most common measure is to set aside land for conservation purposes. This, however, requires large financial resources and available budgets are generally insufficient. In this thesis, a set of key factors affecting the cost-efficiency when selecting conservation areas were investigated; (1) the conservation quality and economic land value of three common types of conservation areas: nature reserves, woodland key habitats, and retention patches on harvested areas; (2) the capacity of retention patches to harbour bryophytes and lichens over time; and (3) factors determining what information should be used when selecting conservation areas, including the conservation goal, correlation and variability of different types of data, and the costs for collecting information. Two large field studies formed the basis for the studies, where data on bryophytes, lichens and structural characteristics were collected, and economic land values were calculated. Site-selection analyses were used in combination with other analytical tools to investigate and compare efficiency of different conservation strategies. The results showed that woodland key habitats had a very high conservation quality, and were generally also the most cost-efficient type of conservation area for the measures of biodiversity used in the studies. Different types of retention patches complemented each other in terms of species composition and the variation in conservation quality and economic value was large among patches. Many bryophytes decreased in retention patches following harvesting, while some lichens decreased and others increased. The costs for obtaining information on conservation quality of areas were generally low compared to the economic land values. The studies indicate that a conservation strategy based on many types of conservation areas is most likely efficient for long-term conservation of forest biodiversity. To increase cost-efficiency, systematic selection of areas within each conservation area type should be carried out, where both conservation quality and economic values of areas are taken into account.	*Cost-efficient conservation strategies for boreal forest biodiversity* Perhans, Karin Dept. of Ecology, SLU. Acta Universitatis agriculturae Sueciae (2008) vol. 2008:39.
48	The role of forests and forestry is changing in the contemporary society. For a long time forestry and forest sciences were able to establish and maintain an own identity as a professional guild. However, in present days, communication and co-ordination of activities with other sectors and interests have become a prerequisite in many parts of densely populated Europe, and this trend is spreading.To accommodate and address this change in forestry/forest research, tools from both the natural and social sciences are needed and should be used to: (i) evaluate the needs of society in particular landscape in order to be able to develop applications of conventional forest science knowledge base; and (ii) communicate to the society, policymakers and decision-	*Connecting social and ecological systems* Lazdinis, Marius Dept. of Conservation Biology, SLU. Acta Universitatis agriculturae Sueciae. Silvestria (2004) vol. 315.

	makers the key issues of importance for the forest sector. In this study, an attempt is made to combine ecological and social (institutional) aspects of biodiversity conservation in the forest policy process. The methods, experiences and general knowledge from the relevant fields are combined in designing and applying a simple-to-use toolbox for facilitating the process of biodiversity conservation in the context of forest policy implementation. Forested landscapes in Sweden, Lithuania and Komi Republic in Russia served as study area for this dissertation.The integrated toolbox developed in this dissertation provides an example of and a framework for evaluation and facilitation of biodiversity conservation in the context of forest policy processes. This set of tools explicitly recognizes the connectedness, complexity, and ideological differences of ecological and social systems, and employs individual features relevant to these systems in an integrated manner to the benefit of facilitating policy implementation. With the use of "two-dimensional gap analyses", the needs of society in particular landscape can be evaluated in order to ensure the provision of ecological, economic and social functions of forest in an optimal way.	
49	Human activities in the form of land use changes, urbanisation and infrastructure developments are major threats to biodiversity. The loss and fragmentation of natural habitats are great obstacles for the long term preservation of biodiversity and nature protection measures alone may not be sufficient to tackle the problem. Environmental impact assessment (EIA) and strategic environmental assessment (SEA) play a central role in identifying, predicting and managing the impacts of human activities on biodiversity. The review of current practice suggests that the complexity of the task is underestimated and that new methodological approaches encompassing the entire landscape are needed. Spatial aspects of the assessment and the lack of information on scale-related issues are particular problems affecting the appropriate assessment of cumulative effects. In parallel with the development and establishment of EIA and SEA, spatial modelling is an expanding field in ecology and many derived applications could be suitable for the prediction and assessment of biodiversity-related impacts. The diversity of modelling methods suggests that a strategy is needed to identify prediction methods appropriate for EIA and SEA. The relevance and potential limitations of GIS-based species distribution and habitat models in predicting impacts on biodiversity were examined in three studies in the greater Stockholm area. Distinct approaches to habitat suitability modelling were compared from the perspective of environmental assessment needs and requirements. The results showed that model performance, validity and ultimate suitability for planning applications were strongly dependent on empirical data and expert knowledge. The methods allowed visual, qualitative and quantitative assessment of habitat loss, thus improving decision support for assessment of impacts on biodiversity. The proposed methods allowed areas of high ecological value and the surrounding landscape to be considered in the same assessment, thereby contributing to better integration of biodiversity issues in physical planning.	*Spatial prediction tools for biodiversity in environmental assessment* Gontier, Mikael Dept. of Land and water resources engineering, KTH (2008)
50	For a long time the primary aim of forestry in Sweden has been the production of timber, but in recent decades other functions, such as biodiversity, have been increasingly recognised by society. Sweden has ambitious goals for forest management, aimed at serving public interests, providing valuable timber yields and preserving biodiversity. Achieving the level of various goods that forests shall provide, under such goals, is thus rather complex. This thesis focuses on trade-offs between production of timber and the maintenance of biodiversity in forests, and the effects of information on benefits, costs and biological traits. In Paper I the benefit of forest land protection was estimated based on a nation wide contingent valuation survey. Paper II examined and compared, through survey data, the attitudes among private forest owners and forest officers. Papers III and IV used data from a field inventory in old growth forests (>110 years of age) of Norway spruce (Picea abies [L.] Karst.) in the county of Gävleborg, Sweden. In Paper III the relative importance of information about costs and biological traits in reserve selection was examined. In Paper IV the cost-efficiency of different strategies for setting aside forests, using different biodiversity targets, were analysed. The thesis revealed a positive willingness to pay for forest land protection among Swedish citizens, and also a positive attitude among private forest owners to biodiversity as well as timber production. The views of forest owners and forest officers did not always coincide. Moreover, the relative importance of including data on costs and conservation benefits depended on how the conservation goal of the reserve network was formulated. There was also a difference in cost-effectiveness between different nature conservation strategies and biodiversity targets. The results emphasise the importance of achieving cost-effective solutions in biodiversity conservation through the proper use of information about biological traits and costs, as well as considering values and attitudes held by different interest groups in society.	*On trade-offs between timber and biodiversity* **Kindstrand, Claes** Alnarp : Southern Swedish Forest Research Centre, Swedish University of Agricultural Sciences (2008)

51	This thesis examines: (1) effects of *Dryas* on the population dynamics of other species; (2) how biotic impacts from *Dryas* and dispersal limitations of other species may determine local diversity; (3) how climate change may affect (1) and (2); and (4) how climate change may affect *Dryas* heath diversity. The main study site is Sandalsnuten (1550 m elevation) at Finse in the western part of Hardangervidda, southern Norway. Results indicated that the role of *Dryas* on community structure and diversity may shift between habitats of contrasting environmental conditions. *Dryas* functioned as a nurse plant for some species in the high arctic Svalbard, but was mainly a competitor that reduced species diversity at alpine Finse. Removal manipulations in the *Dryas* heath at Finse showed that *Dryas* both protected other species from low temperatures, and at the same time competed for nutrients. Furthermore, interactions between the removal treatment and the environmental factors (warming and nutrients) suggested an increased role of competition from *Dryas* under climate change. However, an up-scaling of the simulated climate change from population- to community-level showed that four years of nutrient addition and warming combined with nutrient addition increased the abundances of graminoids and forbs at the expense of *Dryas*. Moreover, community diversity decreased dramatically, primarily due to losses of bryophytes and lichens, most likely because of the changes in dominance hierarchies from low-stature *Dryas* heaths to meadows of tall graminoids and forbs, which increased competition for light and space considerably. Results from a propagule addition experiment showed that colonization and diversity of the *Dryas* heaths were strongly limited by both the dispersal abilities of the regional species and interspecific competition from *Dryas* and other species already established in the community. Experimental warming had only minor short-term effects on the colonization and diversity of the *Dryas* heaths. However, higher establishment frequency, increased colonization of bare soils and increased competition from established plants on emerging seedlings under experimental warming, suggests that climate change effects on recruitment and on community-level interactions, may affect the long-term colonization processes and diversity of alpine plant communities. This thesis shows that indirect effects of climate change, such as changes in the biotic environment caused by the changes in the abiotic environment, may be more important for alpine plant community structure and diversity than the direct effects of changed temperature and nutrient availability. Moreover, it highlights the importance of including species interactions in climate change experiments and models if one is to predict plant community responses to climate change with greater precision?	*Direct and indirect effects of climate change on alpine plant community diversity : the abiotic environment modifies species interactions* Kari Klanderud Ås Dept. of Ecology and Natural Resource Management, Norwegian University of Life sciences, (2005)
52	This thesis is about testing a methodological framework for integrating indigenous knowledge and ecological methods for promoting local communities' participation in the implementation of Global Environmental Conventions (GECs) such as the Convention on Combating Desertification (CCD) and the Convention on Biological Diversity (CBD) at local community levels. The thesis (divided into Part A and Part B) tackles the integration of indigenous knowledge and ecological methods for assessing and monitoring human impacts on the environments of northern Kenya around sedentarized settlements that was associated with land degradation and desertification as well as the loss of biodiversity. Development of the framework is based on in-depth analysis of theoretical and methodological analysis of environmental indicator selection. The implementation of the framework is approached at three levels: the global level related to the articles of the GECs, the national level concerned with the prioritizing of the action programs and finally, the local community levels where the actions of implementations of the conventions take place. In implementing the framework, the thesis focused on the third part which involved local communities in participatory research. From the results we may conclude that local community participation in assessment and monitoring of environment change in the grazing lands of northern Kenya would contribute to the successful implementation of GECs at community levels. The thesis showed that integrated methods would improve local communities' participation in the implementation of GECs. The most important contribution of this thesis is the evidence about the ability of herders to assess and monitor environmental change, and the use of herder knowledge for selecting sensitive indicators that meet the criteria defined in the articles of GECs, particularly those related to the CCD and the CBD. The thesis makes specific recommendations for achieving the global goals through local actions that are linked to traditional pastoral production in northern Kenya.	*Global goals, local actions : a framework for integrating indigenous knowledge and ecological methods for rangeland assessment and monitoring in Northern Kenya* Roba, Hassan G Ås Dept. of International Environment and Development Studies, Norwegian University of Life Sciences (2008)
	Governance level and accountability	
53	The legal operationalisation of ecological sustainability concerns all levels of legal control. The ensuring of full biodiversity is an indispensible component of ecological sustainability. At the same time, biodiversity losses continue to be a serious problem	*The significance of the default: A study in environmental law methodology with emphasis on ecological*

	in many regions of the world. The international community has responded to this dilemma by strengthening international biodiversity law as well as agreeing upon a particular biodiversity target. The aim is to reduce biodiversity losses at all levels by the year 2010. From a legal point of view this seems unproblematic. When, however, the international legal order is viewed as an overarching control system, composed of several multi-levelled and interacting international and national legal systems (controlling programs), questions on whether the order can actually work for biodiversity seem inevitable. By applying and developing further environmental law methodology (ELM) the study argues that some fundamental principles of the international legal order are either diminishing or counteracting the possible realisation of ecological sustainability and the 2010 biodiversity target of halting and reversing the biodiversity loss. This, as will be argued, is due to rule of law and to how the default actually functions in the international legal system. In line with the above, the prime objective of the study is to develop and elaborate a theory framework on which the theory of the significance of the default is based; second, to evaluate and discuss some fundamental principles of the international legal order and international biodiversity law in the light of the theory, and finally to evaluate and discuss the possible realisation of ecological sustainability and the 2010 target. The study's method is to a certain extent pluralistic, but it is basically an adapted version of ELM.	*sustainability and international biodiversity law* Jóhannsdóttir, Aðalheiður Faculty of Law Uppsala university (2009)
54	The thesis consists of four theoretical articles that can be read independently of each other on the common topic - strategic incentives in the management of natural resources. Article I concerns biodiversity conservation of essential species in sustaining the ecosystem. The issue is what forces that may explain why a natural resource stock declines although the government is running a conservation programme in a second-best solution. The focus is on the government's strategic behaviour against the industry being a polluter. Ten forces are identified that explains why a resource may decline under a conservation programme. One result is that an increase in the variance of the natural growth process does not lead to an increase in investment in the emission-generating industry in the second-best solution, as in the first-best solution. In article II, a marine natural resource stock is exposed to harvest as well as damage by pollution from N countries. Each country has four decision variables: harvest effort, domestic production (generating transboundary pollution), abatement and research in environmental technology. It is shown that the marine resource is damaged `twice' as a result of a `chain effect' in the strategic incentives among the countries. A harvest function is introduced, which results in `tough' harvest efforts, implying that agents' effort increases the smaller the expected stock size as an extreme case of the `tragedy of the commons'. In article III, the classical upstream-downstream case is analyzed under the assumptions of the Coase theorem in a dynamic model. Different assignments of rights to determine the level of externality are compared to the case of no-cooperation. It is shown that the `efficiency proposition' does not necessarily hold. Specifically, a bargaining outcome may not be possible when downstream society has the right to determine the level of externality in the dynamic model as it may violate individual rationality of upstream society. In the fourth article - a technical note - it is shown in a that in most models with private provision of public goods, there exists a simple mechanism determining the reaction functions of the players.	*On strategic incentives and the management of stochastic renewable resources.* Hennlock, Magnus Dept. of Economics, SLU. Acta Universitatis agriculturae Sueciae (2005) vol. 2005:124
55	In 1992, the Convention on Biological Diversity (CBD) was signed by a large number of countries in Rio de Janeiro. This Convention constitutes a framework linking biodiversity conservation and development. CBD also emphasises the *in situ* strategy for biodiversity conservation. In the years following CBD, the strategy and agro-biodiversity management received much attention. This book reports on some of the initial efforts to develop and implement *in situ* conservation through the support of farmer management of agro-biodiversity. Because of the dynamic nature of the human and natural components of agro-biodiversity the strategy aims to maintain, it is referred to as "on-farm management" of agro-biodiversity. While studying efforts to develop the strategy, social and institutional aspects of the strategy's development are addressed; these are referred to as the strategy's social construction and social organisation. The book reflects on experiences of a team that worked at the Centre for Genetic Resources, the Netherlands between 1990 and 1998. The team was involved in the development of agro-biodiversity projects in many developing countries. The experiences of the author, the team and their colleagues from the South form the foundation to the book. The strategy has been studied within a framework of experiential learning. Two socio-ecological perspectives have been used to provide the theoretical framework for reflection. These perspectives are used for the development of "windows of reflection" that guide and structure five case studies on agro-biodiversity projects and organisations. Adaptive management is the first socio-ecological perspective used. It has been developed by ecologists involved in the management of large ecosystems. Policy and management organisations form a triangle with citizens in an adaptive framework for ecosystem	*Tales of the unpredictable : learning about institutional frameworks that support farmer management of agro-biodiversity* Boef, Walter .S. de Dept. of Life Sciences, Wageningen Universwity, NL (2000)

	management. Research provides feedback between the management system and the ecosystem and facilitates linkages between components. Social learning is considered an important attribute to adaptive management, as it strengthens management and policy organisations and citizens in their capacity to adapt management practices and policies to the managed ecosystem's ecological and social dynamics. The second socio-ecological perspective is based on the ecological knowledge system. It addresses the social and institutional aspects for the development of sustainable agriculture. Its dimensions are farmers' practices, learning, facilitation, supportive institutions and networks and conducive policies. The book uses these perspectives in an area application foreign to the field in which they have been developed. The perspective's dimensions have been used in the development of four "windows of reflection" that have guided the organisation of information gathered. The four "windows" guide and focus the case studies on (i) actors involved; (ii) flows of germplasm, knowledge and information; (iii) the social organisation of projects, organisations and the strategy's development; and (iv) the social construction of the strategy and efforts to link conservation and development. The fifth case study describes and analyses efforts of the Community Biodiversity Conservation and Development (CBDC) Programme to develop and construct the in situ and on-farm conservation strategies. This programme is implemented by a group of NGOs complemented by some governmental genebanks, research organisations and university groups. It is operational in 16 countries on five continents. CBDC's focus is on strengthening community agro-biodiversity management. The case study illustrates CBDC's effort to develop a protocol for collaboration linking a diversity of organisations in one programme. It also illustrates attempts to link global and local objectives to support farmer management of agro-biodiversity. It is concluded that the programme in its initial years emphasised local capacity building and community empowerment. In its local orientation, CBDC is complementary to the IPGRI in situ project that operates within national frameworks and focuses on globally co-ordinated research. CBDC is above all considered an institutional experiment bringing together a diversity of locally operating organisations in an interactive and "bottom-up organised" programme.Conclusions have been drawn on the socio-ecological perspectives and institutional frameworks that support farmer management of agro-biodiversity. A key output is that "on-farm management" of agro-biodiversity should be considered by actors in the institutional crop development system an emergent property of an agro-biodiversity system formed by farmers and other actors involved. In the initial technical efforts, conservationists had considered it difficult to develop the strategy. When considering "on-farm management" a human activity system, it is evident that these conservationists were constrained by their "hard" and technical approach.	
56	The landscape perspective has come to play an important role in efforts to achieve sustainable forestry, especially regarding the protection of biodiversity. However, introducing such a perspective in forestry planning can be difficult in areas where forestry is dominated by non-industrial private forest (NIPF) owners, such as southern Sweden. In this part of Sweden most of the biodiversity values are associated with deciduous trees, and forest owners as well as society have expressed an interest in increasing the proportion of these tree species. The major objective of the thesis is to achieve a better knowledge and understanding of the problems and possibilities of forest landscape management in southern Sweden. This was approached by addressing problems concerning the setting aside of forest areas, assessment of biodiversity and strategies for increasing the amount of deciduous trees in the landscape. In the thesis it was concluded that, in two investigated landscapes, a common view existed among the NIPF owners regarding what areas to voluntarily set aside from commercial forestry. It was suggested that such a common view could be the basis of a planning process involving a landscape perspective in areas with NIPF ownership. The process of setting aside areas for biodiversity purposes was scrutinised. It was argued that in areas dominated by NTPF ownership this could be done in a more efficient way if a system for cooperation over the borders of estates was introduced. Tn the search for methods to assess biodiversity, stand characteristics interpreted in colour-infrared aerial photographs was correlated to the occurrence of epiphytic lichens in a landscape. Tt was concluded that this methodology could be a useful tool for achieving landscape-covering data on forest biodiversity. Finally, a simulation study of different strategies for increasing the proportion of deciduous trees was performed in two different forest landscapes.	*Biodiversity and deciduous forest in landscape management : studies in southern Sweden* Ask, Peter Dept. of Swedish Univ. of Agricultural Sciences, Alnarp (2002)
57	Long-range transboundary air pollution generates pressing environmental problems such as the acidification of lakes and soils, forest decline and loss of biodiversity as well as threats to human health across Europe. The overall aim of this study is to explore the role of scientific expertise in environmental diplomacy by analyzing recent international agreements in the transboundary air pollution (LRTAP) regime. The concept of critical loads, i.e. scientific assessment of ecosystem sensitivity,	*What Can Nature Withstand? Science, Politics and Discourses in Transboundary Air Pollution Diplomacy* Bäckstrand, Karin

	and the practice of integrated assessment modelling provide a decision framework in the diplomatic effort to counter air pollution. First, a discursive framework for understanding the science–policy interface in environmental policy–making is built by drawing on the post–positivist research agenda in constructivism, discourse analysis, international environmental politics and science studies. The theoretical contributions of the study are the development of a 1) a constructivist account of the science–policy interplay stressing the mutual construction of the scientific and policy agenda as a hybrid endeavour; 2) a discursive framework for analyzing the interplay between discourses, practices and actors as scientific knowledge is framed into policy instruments. Secondly, in applying the framework above this study covers new empirical ground in providing an in–depth analysis of the role of science in the evolution of critical–load–based regional air pollution agreements. The discursive and institutional shift toward an effect–oriented discourse relying on the critical loads approach in the LRTAP regime is traced. The study analyzes the employment of regulatory science in the negotiation of the 1999 Gothenburg Protocol, which incorporates a multipollutant–multieffect approach, has been appraised as the most complex science–policy endeavour hitherto undertaken. The various discourses surrounding the concept of critical loads as it was tailored into a multidisciplinary and multinational research agenda are explored. The competing discourses – effect–oriented, technology–oriented and cost–oriented – in the pre–negotiations and 'political negotiations are examined. The study investigates role of modellers and scientific experts as knowledge brokers and knowledge translators and scientific practices such as modelling in synthesizing and framing scientific discourses into a comprehensible policy instrument. Thirdly, this study critically reflects upon the rise of regulatory science in transboundary air pollution diplomacy in the light of three green perspectives, namely ecofeminism, reflexive modernization and postmodern cultural critique, which all in different ways examine the link between modernity, science and the environmental crisis. From these perspectives, the effect–oriented discourse is embedded in a larger discourse on ecological modernization paving the way for the scientization of environmental politics.	Dept. of political science Lund university (2000)
58	Paper I analyses the exhaustion of oil resources, and the transition to a backstop technology as a strategic game between two blocks: the consumers and producers of oil which we simply refer to as "OPEC" and "OECD". The OECD has two instruments: it can tax fuel consumption and decide when to switch to the carbon neutral backstop technology. The tax in the OECD is found to serve the purpose to both reduce climate damage and to access some of the resource rent. OPEC on the other hand can retaliate by choosing a strategy of price discrimination selling oil cheap on domestic markets and of course they can implicitly determine the price and thus the timing of resource depletion. The results show that price discrimination enables OPEC to better avoid the adverse consequences from the tax and backstop technology in OECD by consuming a larger share of the oil in their domestic market. Paper II studies the effects of reputation on compliance with social norms of behaviour, and in particular, the role of information in mediating this relationship. A prevailing view in the literature states that social sanctions can support, in equilibrium, high levels of obedience to a costly norm. In contrast, the model introduced in this paper shows that imperfect observability causes the expected social sanction to be at its lowest precisely when obedience is more common. Unless actions are fully observable, society finds it hard to conceive that someone is in disobedience when disobedience is rare. In this line of argumentation, the failure of an environmental norm as an internalization mechanism can be explained. Paper III uses forest data across 28 provinces during the reform period to examine some frequently discussed questions about macroeconomic and population impacts on the forest. The data support a theoretical argument for separating forests into four components, managed and natural forests administered by either state or private agents. Our regressions suggest as incomes rise, the natural forest is first drawn down then, when incomes rise above some level, the natural forest begins to recover. As incomes continue to rise, the managed forest eventually grows even more rapidly and offsets any continuing draw on the natural forest—with an aggregate impact of net expansion for all forests, managed and natural combined. Paper IV uses firm level data in China's timber industry to evaluate the impact of manager turnover on firm productivity. We find that due to differences in selecting and screening manager candidates, the impacts of manager change on firm productivity are heterogeneous across ownership types. In state-owned firms, manager change is mainly driven by bureau leaders who may want to control the rent from firms and hence appoint new managers loyal to them. Consequently, deterioration of firm productivity can be observed following a change. For private firms, it is found that manager selection is based on the human capital of candidates. Therefore, firm productivity improves after a change. The results from both a regression analysis and a matching approach provide similar evidence.	*Essays in Climate Change and Forest Management* Jiegen Wei Dept. of economics and statistics, School of Business, economy and law, Gothenburg university, (2009)

Appendix B. Full case studies

Czech Republic

Basic facts:	
Number of inhabitants:	10 200 000 (2008)
Constitution:	Republic, unitary state
Area:	78 900 km²
Capital, and number of inhabitants:	Prague 1 165 000 (estimation 2004)
GNP per capita:	21 040 US dollar (2008)
Most important export goods:	Machinery, Transport equipment, industrial goods (steel, glass, textiles)
Number of inhabitants per square kilometre:	129
Membership in inter-national organizations:	EAPC, EU, Council of Europe, UN, NATO, OECD, OSSE, WTO

Source: The Swedish Institute of International Affairs, http://www.ui.se

The *Czech National Strategy for Sustainable Development* claims that the main challenge for the environmental pillar of Czech sustainable development is to take into account the requirements of the present population and future generations in the framework of the entire ecosystem; to ensure the satisfactory quality of all components of the environment, ecosystems, and their mutual relations; to minimise conflicts of interests between protection of the environment and economic development; and to contribute to solutions to global environmental problems (in particular the protection of the climate and the protection of biodiversity) and social problems (employment, health care) (*National Strategy for Sustainable Development*, 2004).

According to the IUCN categorization, 19% of mammals, 50% of birds, 55% of reptiles, 43% of amphibians, 40% of fresh water fish and 43% of vascular plants are threatened. Only approximately ¼ of the estimated total area of wetlands remains due to extensive drainage of the landscape for agriculture and forestry. The country has designated 12 Ramsar Sites. However, in evaluating the state of nature in the Czech Republic from a pan-European point of view, it is necessary to stress that intensive agriculture and intensive industrial development have detrimentally affected the overall state of the environment.

There are 4 National Parks and 25 Protected Landscape Areas in the Czech Republic, a third of which have been declared as UNESCO Biosphere Reserves or Wetlands of International Importance. Furthermore, there are more than 2,000 small-scale protected areas of national, regional and local importance. Overall, protected areas cover 15.9% of the Czech territory (in 2003). (www.cbd.int).

Decision-making and adminstrative responsibility

The *National Biodiversity Strategy of the Czech Republic* was approved by the Czech Government in May 2005 and is legally binding for all ministries. They are requested to take into consideration goals of the Strategy in all programmes and sectoral materials, policies,

strategies, concepts and legal enactments. Elaboration of a National Action Plan elaborating the strategic objectives into specific measures was required by May 2008. Judging from the Czech CHM website, these actions plans are not yet in place, or not translated into English.

The *National Biodiversity Strategy* was prepared by the Ministry of Environment and other ministries, and consulted with experts in organizations under other ministries. The ministers of Environment and Agriculture respectively were given the responsibility of preparing action plans following the Strategy by 2008.

The Ministry of the Environment, the Department for the International Conservation of Biodiversity, in cooperation with the Ministry of Agriculture were the primary agents involved in preparing the strategy. There were no printed guidelines for the Strategy development. The European Community Biodiversity Strategy was the guidebook and also all the CBD Thematic Programmes and Cross-Cutting Issues which inspired the structure.

There is to be one person at every ministry dealing with the implementation of the Strategy, securing that the goals and targets are incorporated into other documents (as the Governmental Decree stipulates). There was supposed to be a person at the Ministry of Environment dealing only with the Strategy and the implementation assessment and who therefore would be fully involved in the development of action plans, such as securing funding. However, the reality is that the person responsible at the Ministry had very limited time for the implementation of the Strategy.

There are a number of national strategies and plans concerning the issue of biodiversity in the Czech Republic. The state environmental policy, the Strategy for Sustainable development, the State Nature Conservation and Landscape Protection Programme, the National Strategy Plan for Rural Development, the Rural Development Programme, the National Programme on Conservation and Utilisation of Plant, Animal and Microbial Genetic Resources for Food and Agriculture, the National Forest Programme etc (*National Biodiversity Strategy of the Czech Republic*, 2005).

Types of objectives/targets

The *National Biodiversity Strategy* details 158 objectives that relate to the strategic goal of the *National Sustainable Development Strategy*, to preserve and not reduce biological diversity, and partial goals to protect landscape diversity and increase biological diversity at all three levels (genetic, generic and ecosystemic). The *National Biodiversity Strategy* is divided into twelve strategic themes and eleven sectoral areas, with a number of objectives specified for each. They are fairly specific, but neither time limited nor quantified. According to the Strategy document, the initial intention when developing the strategy was to define very concrete and detailed targets and actions for later implementation. However, that process was not entirely accepted by other ministries. An example of what Czech biodiversity goals and targets look like is presented in the table below.

Role in relation to European and national policies and 2010 target

The *National Biodiversity Strategy* is based on the Convention on Biological Diversity, and the introduction explicitly states that all of the objectives of the Strategy are directed towards achieving the 2010 target. The Strategy covers most of the CBD Thematic Programmes and

Cross-Cutting Issues and there are also activities and targets directly taken from the Conference of the Parties (COP)[5] (*National Biodiversity Strategy,* 2005).

Table 1 Examples of biodiversity goals and targets in the Czech Republic

Sustainable Development Strategy	
Strategic goal	**Partial goals**
In the territory of the Czech Republic, safeguard the good quality of all components of the environment and the functioning of their basic relations, as well as harmonic relations between ecosystems, and also preserve, to the largest extent acceptable in economic and social terms, the natural resources of the Czech Republic so as to ensure that they can be delivered to future generations, and preserve and not reduce biological diversity.	As regards the protection of biological and landscape diversity, and in the framework of spatial planning procedures, to support the development of natural and landscape infrastructure along with a reinforcement of the retention capacity of the landscape, and to protect valuable areas by appropriate measures.
	With regard to the protection of biological diversity, to continuously increase biological diversity at all three levels (genetic, generic and ecosystemic).
National Biodiversity Strategy	
Sustainable use of biodiversity components, objectives	
Include sustainable use of the components of biological diversity and unify understanding of this concept in the policy materials of the other sectors, related to various degrees to conservation and management of biological diversity and sustainable use of its components. For this purpose, apply the practical principles and detailed guidelines for sustainable use of the components of biodiversity (Addis Ababa Principles).	
Apply the practical principles and detailed guidelines for sustainable use of the components of biological diversity in case studies on sustainable use of selected populations of wild flora and fauna, breeds of farm and domestic animals and varieties and cultivars of cultural crops. Apply the experience obtained in broader practice.	
Rural development plan	
Axis II, Objective	**Sub-measure grassland management: Objectives**
Promotion of environmentally friendly farming methods leading to biodiversity and promotion of suitable farming systems to preserve rural landscape. Promotion of the protection of the environment on agricultural land and in forest areas of high nature value.	The aim is ensuring the cultural landscape maintenance, especially by pasture animal farming and support of biological diversity at valuable habitats. Scheme Bird habitats on grassland – waders‘ nesting site, possibly corncrake’s nesting site in the framework of this sub-measure has the aim to maintain and increase population of these bird species by creating of suitable breeding conditions and other conditions necessary to existence of these valuable species.
Rural Development Programme	
Natura 2000 payments: Quantification of operative goals (outputs)	
Resolution of specific disadvantages of forest holders: Number of holdings receiving aid in Natura 2000: 350 enterprises annually. Supported forest land (ha) in Natura 2000 area: 35 thousand ha annually	

Special protection of critically endangered species is legislated and species survival/recovery programmes and conservation plans for some species have been developed. In terms of

[5] The Conference of the Parties (COP) is the governing body of the Convention, and advances implementation of the Convention through the decisions it takes at its periodic meetings. To date the Conference of the Parties has held 8 ordinary meetings, and one extraordinary meeting (the latter, to adopt the Biosafety Protocol, was held in two parts).

genetic diversity, the *National programme on conservation and use of plant and farm animal genetic resources and microorganisms important for nutrition, agriculture and forest management* has been in place since 2003. To promote sustainable biodiversity use, organic farming is being developed through various initiatives. Targets in organic farming have been incorporated into the *State Environmental Policy* (2004-2010), the *Strategy of sustainable Development*, the *Concept of Agrarian Policy of the Czech Republic* (2004-2013) and many other documents related to specific aspects of sustainable development and agriculture.

The expansion of protected areas is under way and coverage is expected to increase to 20.4%. 863 proposed Sites of Community Importance and 38 Specially Protected Areas have been approved in the Czech (www.cbd.int).

Goal conflicts between levels

There are a number of national sectoral strategies and plans that relate to the issue of biodiversity. Strategies and plans on sub-national (regional or local) levels however, have not been accessible for the study. The material available (the Biodiversity Strategy as such, the example of sectoral strategy we have consulted, the Fourth National Report to CBD, articles etc) make no mention of conflicting goals between levels in the Czech Republic.

Germany

Basic facts:	
Number of inhabitants:	82 500 000 (2008)
Constitution:	Republic, federative state
Area:	357 000 km²
Capital, and number of inhabitants:	Berlin 3 400 000 (estimation 2007)
GNP per capita:	46 500 US dollar (2008)
Most important export goods:	Cars and other engineering industry products, chemical products, electronics and household appliances
Number of inhabitants per square kilometre:	231
Membership in inter-national organizations: of	EAPC, EU, Council of Europe, UN, NATO, OECD, Western European Union (WEU), OSSE, WTO, Council the Baltic Sea States

Source: The Swedish Institute of International Affairs, http://www.ui.se

Based on the results of an assessment of biodiversity in Germany, a considerable number of species have been identified as endangered or critically endangered. 69% of biotopes are considered endangered. Of the 788 plant communities in Germany, 48.4% are currently considered endangered. Approximately 38% of mammals are regarded as endangered and 13% as extinct or lost while 37% of breeding birds are regarded as endangered and 6% as extinct or lost. The most threatened group is that of amphibians and reptiles, with 71.4% of them considered endangered or extremely rare, closely followed by freshwater fish with 68.6% of them endangered. The main factors endangering terrestrial biotopes are intensive land use, eutrophication of soil and water and encroachments on the water balance. The threats to flowering plants include site destruction and intensification of agricultural land use (www.cbd.int).

Although the first comprehensive German biodiversity strategy was approved in 2007, in the past the German government has been extensively involved in fleshing out the Convention on Biological Diversity at national level. Implementation of the CBD in Germany is based on a range of statutory, institutional and organisational instruments, responsibility for which is shared between a large number of government and non-government institutions and organisations. In this regard, consideration must be given to the distribution of competencies between the Federal Government and the states. Changes have arisen as a result of the federalism reform which became effective on 1 September 2006, not only in the field of nature conservation and landscape management, but also throughout the environmental sector as a whole. Nature conservation became the concurrent responsibility of the Federal Government, while the states were granted divergent rights for selected regulatory fields. As a result of these changes, the prerequisites were put into place for a uniform Environmental Code.

Implementation of the Habitats Directive and the creation of the coherent network of protected areas, Natura 2000, necessitates a particularly high level of input from the states.

Germany's contribution to the creation of Natura 2000 has been submitted in full to the EU. Natura 2000 covers all designated areas under the Habitats and Birds Directives, which may overlap. Together, they cover approximately 13.5 % of Germany's terrestrial territory, and 41 % of its marine territory (*National Strategy on Biological Diversity,* 2007).

One of the central objectives of the German NBSAP is to reduce the number of highly threatened and endangered species listed in the National Red Data Books, and to improve the current status of most of the species by at least one category by 2020. Within the same timeframe, the area of forests with natural development (natural forests) shall increase to 5% (currently only 1%) and the storage capacity for CO2 within terrestrial ecosystems shall be increased by 10%. This shall be achieved through a combined effort: increasing natural forest cover as well as restoring mires and peat bogs.

Development funds for development projects, whose goals include the conservation, sustainable use and benefit-sharing of biological diversity, shall increase by 50% with respect to the total development budget until 2015. Public spending in the procurement sector as well as in public building trade shall act as a special role model in respecting certain conservation standards regarding species and habitats. Until 2020, at least 25% of all imported natural goods shall be of ecologically-sound and socially-friendly origin (www.cbd.int).

Decision-making and adminstrative responsibility

In November 2007, the German Federal Government passed a comprehensive *National Strategy on Biological Diversity*. The National Strategy serves to implement the Convention on Biological Diversity at national level and also outlines Germany's contribution to the conservation of biological diversity worldwide by placing it in a European context.

It addresses all government institutions at Federal, state and local government level, as well as all social players. The strategy is designed to mobilise and pool all social forces with the aim of significantly minimising, and eventually halting altogether, the threat to biological diversity in Germany, the ultimate aim being to reverse the trend in favour of an increase in biological diversity, including its typical regional peculiarities. A further aim is that Germany should take greater responsibility for global sustainable development (www.cbd.int; *National Strategy on Biological Diversity*).

The German Federal Nature Conservation Agency (BfN) is Germany's central scientific authority for both national and international nature conservation. The Agency reports to the German Environment Ministry (BMU) and has key enforcement functions under international species conservation agreements, marine conservation law, the Antarctic Treaty and the German Genetic Engineering Act. One of the objectives of the German Federal Agency for Nature Conservation (BfN) is conservation and promotion of biodiversity. This ranks equally with the objectives of promoting sustainable use of biodiversity and promoting nature conservation as an overall responsibility of society (www.bfn.de). Information in English, on the administrative structure for biodiversity issues at state level has been hard to come by.

Types of objectives/targets

In terms of structure, the national strategy on biological diversity is based on the European Union's biodiversity strategy, with links to a number of related national sector strategies. The national strategy on biological diversity is also anchored in the national sustainability strategy.

Each sub-area in the biodiversity strategy expresses a visionary statement, quality targets, justifications, and aspirational statements or action targets. The visions provide a visual

impression of the aspired future status and serve as ideals. Based on the existing threats to biological diversity, concrete future-oriented quality targets are defined, outlining an aspired long-term status as the basis for political and social action. The majority of these close to 80 targets have a timeframe, and several are also quantified. Brief justifications are provided which explain the necessity for these objectives. Concrete future-oriented action targets indicate the steps which must be taken to work towards these quality targets (*National Strategy on Biological Diversity,* 2007). Examples of biodiversity goals and targets in Germany are found in the table below.

Table 2. Examples of biodiversity goals and targets in Germany

<table>
<tr><th colspan="3">National Strategy on Biological Diversity</th></tr>
<tr><th>Coastline and Oceans: Vision</th><th>Coastline and oceans: Aims</th><th>Coastlines and oceans: We aspire to the following</th></tr>
<tr><td rowspan="3">Natural coastal and marine regions are fascinating natural landscapes. The interlinked natural and near-natural coastal and marine ecosystems, in their diversity and natural momentum, support the unthreatened existence of all typical species and habitats. They exhibit a favourable conservation status.</td><td>By 2015 a good ecological and chemical quality status has been achieved for all waters in the coastal region.
By 2021 marine waters have achieved a good anvironmental quality</td><td>To apply the ecosystem approach (HELCOM, OSPAR) while preserving the precautionary and polluter-pays principles from 2010 at the latest
To implement an integrated coastal zone management system based on the national
Integrated Coastal Zone Management (ICZM) strategy of 22 March 2006</td></tr>
<tr><td>By 2010 the decline in species and the degradation of habitats has been halted.</td><td>To enforce sustainable and ecosystem-compatible fishing practices by 2010 “Good environmental quality” as defined in Annex 5 of the Water Framework Directive (WFD) Concrete vision</td></tr>
<tr><td>By 2020 a significant improvement in the conservation status for all species and habitats has been achieved.</td><td>To realise a joint OSPAR/HELCOM network of well-managed coastal and marine protected areas, including core zones of natural development, by 2010, and to ensure its integration into international networks
To protect semi-natural coastal and marine regions by means of species and biotope conservation measures</td></tr>
<tr><th colspan="3">National Strategy for the Sustainable Use and Protection of the Seas</th></tr>
<tr><th colspan="3">Goals</th></tr>
<tr><td colspan="3">A network of well managed Coastal and Marine Protected Areas, in international as well as national waters, that include core zones of natural development of an adequate size should be set up. Their integration into onternational networks should be completed by 2012.</td></tr>
<tr><td colspan="3">The typical character of marine habitats with their characteristic species should be preserved or, if necessary, developed with a view to achieving at least a “good status of the marine environment” by 2015 as defined in the WFD or by 2020 as required under the MSFD</td></tr>
</table>

Role in relation to European and national policies and 2010 target

In terms of structure, the national strategy on biological diversity is based on the European Union’s biodiversity strategy, with links to a number of related national sector strategies. The Biodiversity Strategy also details all connections between the strategy and relevant EU and international convention objectives and decisions in an extensive appendix. The national strategy on biological diversity is also anchored in the national sustainability strategy (*National Strategy on Biological Diversity,* 2007).

Goal conflicts between levels

Two articles on state implementation of biodiversity policy in Germany were found in the course of the literature study (see articles 25 and 28 in appendix A). The first article

concluded that opposition to nature conservation in Germany was rooted neither in economic conflict nor priorities over land use. It was rather a function of social identity, stereotyped images, and how particular social groups are regarded and approached. A lack of knowledge on the part of the conservationists concerning the importance of these social-psychological processes led to an escalation of opposition.

In an article published in Landscape and Urban Planning in 2004, Christina von Haaren and Michael Reich concluded that a common problem in Germany was the implementation of large-scale concepts such as the Natura 2000 Habitat Network, being hindered by politiccal structures. The 16 federal states had either developed independent, unrelated concepts, which were initiated at different times, or they had ignored the issue completely. The failure of the national concept could according to the authors be attributed to the lack of national authority to provide and implement regional nature conservation targets and to the landownership structure in Germany. Nature conservation was so weak at the national level that it had not been possible to align the different state habitat classifications or to provide a satisfactory national information system. According to the principles of the German constitution, nature conservation was the responsibility of the state, within the boundaries of the federal framwork law. This discouraged interstate nature and water conservation because ecologically defined landscape units obviously do not conform to state boundaries. The state responsibility for nature conservation explained why Germany had the worst record in the EU for identifying and notifying the sites which fulfil the Habitats Directive. The states were reluctant to tackle the conflicts with landowners and development interests. Only after receiving pressure from the EU Commission, which threatened to deny financial support in other areas of regional development, did the German states identify the relevant habitat sites (von Haaren and Reich 2004). This issue was also recognized in the *3rd National Report to the CBD*[6].

In the National Biodiversity Strategy the issue is refered to both in aspirational terms - to avoid conflict with the transboundary system of interlinked biotopes in future plans and projects (such as human settlement development, transport routes, resource use) – and in method descriptions where Integrated coastal zone management (ICZM) is put forward as a method that aims to jointly and promptly identify development opportunities, conflict potential and conflict solutions. Germany's coastal and marine regions are under pressure from competing usage forms such as energy extraction, tourism, transport, fishing and nature conservation. Striking a good balance between the associated ecological, economic and social impacts is the central challenge faced by ICZM (*National Strategy on Biological Diversity,* 2007).

Uniform nature conservation and water management legislation will now come into force which will be directly applicable in the whole country. In nature conservation the former framework law, which just set out more general requirements for the states, is being replaced. The new nature conservation act applies to the whole Federal Republic and stipulates that any damage done to nature must be compensated in kind. In water legislation it is now also possible to put into place uniform federal requirements for the management of surface and coastal waters and for ground water. These provisions are hoped to achieve a balance between the use and the protection of water bodies. The so-called Consolidation of Laws Act (Rechtsbereinigungsgesetz) is another new countrywide provision regulating, the necessity of environmental impact assessments for certain water management and forestry projects. (BMU-Pressedienst No. 233/09. Berlin, 10.07.2009).

[6] No 4th National Report to CBD has yet been published.

Italy

Basic facts:	
Number of inhabitants:	58 900 000 (2008)
Constitution:	Republic, unitary state
Area:	301 309 km²
Capital, and number of inhabitants:	Rome 2 500 000 (estimation 2008)
GNP per capita:	40 450 USD (2008)
Most important export goods:	industrial machinery and other industry products, transport products, clothing, shoes and leather products, food.
Number of inhabitants per square kilometre:	195,5
Membership in inter-national organizations:	EAPC, EU, Council of Europe, UN, NATO, OECD, OSSE, WTO, Western European Union (WEU)

Source: The Swedish Institute of International Affairs, http://www.ui.se

In order to achieve the 2010 target, the Ministry of the Environment Land and Sea's Nature Protection Directorate - as National Focal Point of the CBD – commissioned a publication entitled *Status of Biodiversity in Italy – Contribution to National Biodiversity Strategy* in 2005., This report was written by over 100 researchers and experts (botanists, zoologists, forestry officers, etc.) and illustrates the status and trend of Biodiversity in Italy, providing a basic scenario in line with the ecosystem approach. In part it was a preparation for developing a National Biodiversity Strategy.

The current lack of a national biodiversity strategy has, according to the 4th Italian National Report to CBD, not hindered implementation of the commitments made through the ratification of the International Conventions and Agreements. However, because of the transversal nature of Biodiversity, the need to institutionalize coordination among the various sector-based policies and among the various levels of action strongly emerged and from all sectors. According to the Fourth National Report to CBD, Italy also lacks a National Sustainable Development Plan. However, an *Environmental action strategy for sustainable development* (ICEP Deliberation No. 57/2002) includes conservation of biodiversity as one of its main objectives, and defines specific targets, instruments and indicators.

Acknowledging that factors affecting ecosystems, an approach focusing solely on biodiversity is no longer sufficient; the analytical process must take into account social, cultural and economic factors: integrated examination of conservation and development needs is the key to a new approach to sustainability in which economic, biological and cultural diversity play an essential role. The Post-2010 National Biodiversity Strategy shall be built on this multi-disciplinary approach involving cooperation between political decision-makers, administrations, agencies, academic world and stakeholders (*4th Italian National Report to CBD*, 2009).

Although there is not yet a national official red lists, within a selection of 10,000 species of terrestrial and inland water fauna, 4.4% was estimated to be endangered, 8.5% vulnerable, and approximately 20% very rare and considered nearly threatened. Finally, 46 species within this small selection are to be considered regionally extinct. Different studies have been undertaken

to prepare national lists of endangered species of vascular plant, lichens, bryophytes, fungi and freshwater algae. The total land surface of protected areas amounts to 9.7 percent of the total national land surface. In total, the Italian territory protected by different types of protected areas covers around 20% of the country (www.cbd.int).

Decision-making and adminstrative responsibility

Italy's commitment in relation to the Convention on Biological Diversity (CBD) was put into effect by law in February 1994, ratifying the convention. Upon ratification, the document entitled *Strategies and Preliminary Programme to Implement the Convention on Biodiversity in Italy* was drawn up, and then approved by the CIPE (Interministerial Committee for Economic Planning) a month later. The objectives of the strategy are grouped into 9 work areas and specific actions are associated with each objective. The work areas are: (i) knowledge of Italian biodiversity heritage, (ii) monitoring of the state of biodiversity, (iii) education and training, (iv) in-situ conservation, (v) promotion of sustainable activities, (vi) containment of risk factors, (vii) ex-situ conservation, (viii) biotechnology transfer and safety, and (ix) international cooperation and eco-diplomacy. There have been different attempts to define a national Plan for Biodiversity, but it has not been possible to find an agreement. Lately there have been different actions to improve and spread the knowledge on biodiversity as well as to sensitize different stakeholders regarding the objectives of the Convention. These actions allowed a "new deal" including a new national coordination of initiatives on biodiversity.

There have been different attempts to define a national plan for biodiversity, but it has not been possible to reach an agreement and currently Italy lacks both a national biodiversity strategy and a national sustainable development plan. However, an *Environmental action strategy for sustainable development* (ICEP Deliberation No. 57/2002) includes conservation of biodiversity as one of its main objectives, and defines specific targets, instruments and indicators. Sustainability projects at local, regional, provincial, town council, mountain community, association, park etc level have often departed in an integrated approach to sustainability and both explicitly and implicitly taken biodiversity conservation into account. Regional councils are responsible for governing their territories and the state is responsible for biodiversity. The State-Region Conference is the institutional office in which the National Biodiversity Strategy will be approved by 2009 and officially presented during the First National Biodiversity Conference (*4th Italian National Report to CBD*; www.cbd.int).

A Framework Law on protected Areas (Law 394/91) and the *Law for protecting the sea* (Law 979/82) and subsequent amendments and integrations respectively comprise the main regulatory principles for terrestrial and marine protected areas in Italy.

The Ministry of the Environment, Land and Sea is responsible for ensuring promotion, conservation and recovery of environmental conditions. The Ministry's General Administrative Office for the Protection of Nature is also responsible for identifying, conserving and valorising protected natural areas, as well as knowledge, monitoring and safeguarding of terrestrial and marine biodiversity. Since the early nineties a period of reform is transferring roles and competences from the state to local government (regions and provinces). Among these competences is environmental protection. Due to this organisation fundamental contributions for the fourth National Report came from the Regions, which reported on their engagement for biodiversity conservation in relation to the *European Action Plan for Biodiversity* (*4th Italian National Report to CBD*, 2009).

Types of objectives/targets

In *Strategy and Preliminary Programme for the Implementation of the Convention of Biodiversity in Italy* (1994) just over 20 objectives with associated actions were presented. These objectives were neither time limited nor quantified. However, the strategy is no longer relevant according to Italy's Fourth National Report to the CBD (2009), which states that 1994 Strategic Lines have now been overcome by new international. The conservation policies are currently carried out in accordance with the European Strategy and in detail following the European Action Plan for Biodiversity.

The *Environmental action strategy for sustainable development* (ICEP Deliberation No. 57/2002 *Strategia d'azione ambientale per lo sviluppo sostenibile in Italia*) includes conservation of biodiversity as one of its main objectives, and defines specific targets, instruments and indicators. There are five general biodiversity objectives that are mainly expressed as directions in which to go (reduction of pressures etc), and twentyone more specified objectives. Seven of these are further specified with targets that are in some cases both time limited and quantified.

Sustainability projects at local, regional, provincial, town council, mountain community, association, park etc level have often departed in an integrated approach to sustainability and both explicitly and implicitly taken biodiversity conservation into account.

Table 3. Examples of biodiversity goals and targets in Italy

Environmental Action Strategy for Sustainable Development		
General ojective	**Specific objective**	**Target**
Conservation of biodiversity	Complement scientific and ecosystemic knowledge, especially on pressures on the biosphere (flora and fauna) and coherence of territories Improvement of the efficiency of monitoring and protection systems	
	Conservation , protection and sustainable use of natural, biotic and abiotic, resources Protection and conservation of cultural and social heritage, especially in the mediterranian region Making use of traditional techniques and/or improved territorial management for the conservation of biodiversity Promote biosecurity Prevention and reduction or elimination of the impact on ecosystems, habitats and species by introduction of invasive species	Reduce the number of threatened species by at least 1% of the total number of species in each class. Reach the 2000 objective of 10%, and reasonably formulate for 2012 an equivalent objective, with an anlysis of environmental benfits and an extensive stakeholder involvement.

Role in relation to European and national policies and 2010 target

Reporting (Fourth national report to the CBD) conforms to the *European Action Plan for Biodiversity*, and so does implementation according to the same report. To idependently

verify that is beyond the scope of this study. In order to achieve the 2010 objectives, Italy has undertaken a direction in line with the federalism process underway, whereby Regional councils are responsible for governing their territories and the State is responsible for Biodiversity. The State-Region Conference is the institutional office in which the National Biodiversity Strategy will be approved by 2009 and officially presented during the First National Biodiversity Conference, an important opportunity to raise awareness of the year 2010 – the World Biodiversity Year.

Goal conflicts between levels

There is no explicit mention of conflicts in the available material, apart from the failure to reach an agreement on a national plan for biodivesity. Whether that is related to difficulties in agreeing on goals and targets amongst levels is not clear.

Norway

Basic facts:	
Number of inhabitants:	4 700 000 (2008)
Constitution:	Monarchy, unitary state
Area:	323 878 km²
Capital, and number of inhabitants:	Oslo 522 000 (2004)
GNP per capita:	102 525 USD (2008)
Most important export goods:	oil, natural gas, metals, machinery, fish, chemical products
Number of inhabitants per square kilometre:	14,5
Membership in inter-national organizations:	EAPC, Council of Europe, UN, NATO, Nordic Council, OECD, OSSE, WTO, Council of the Baltic Sea States

Source: The Swedish Institute of International Affairs, http://www.ui.se

Despite extensive conservation measures and positive developments in certain areas, there have been serious losses of various types of ecosystems in Norway during the last fifty years. The Norwegian Red List contains 3062 species, of which 864 species are considered endangered or vulnerable. Specific species of conservation interest in Norway include Atlantic salmon (*Salmo salar*), Wild reindeer (*Rangifer tarandus*), Arctic fox (*Alopex lagopus*) and large predators such as bear, wolf, wolverine and lynx.

Some of the main threats to biodiversity in Norway relate to human physical impact on natural areas and land use changes relating to increased efficiency in agriculture. Even though only about 1 % of Norway is built-up and about 3 % is agricultural land, the proportion of wilderness areas decreased from 48 % of Norway's total area in 1900 to 12 % in 1994 (www.cbd.int).

An Auditor General's report, on the work of the authorities on mapping and supervision of biological diversity and management of protected areas (Dokument nr: 3:12 (2005-2006)) and the Parliament discussion of it, showed that up to 30 percent of protected areas were threatened, and that the administration of these areas had shortcomings. As a direct consequence a working group presented a report on the continued work for sustainable use, administration and management of protected areas. The working group pointed out that a framework for future development in protected areas must be established, and that a series of measures had to be implemented so that protected values are not reduced or destroyed (*The Government's Environmental Policy and the Environmental State of the Nation,* St.meld 26 (2006/2007)).

Norway's Biodiversity Strategy is incorporated in the Report to the Storting No. 58, adopted in 1997, and its Biodiversity Action Plan in the Report to the Storting No. 42, adopted in 2001. While these reports deal with the government's environmental policy as a whole,

priority has been given to implementation of measures to halt biodiversity loss by 2010 at both national and international levels (www.cbd.int).

Decision-making and adminstrative responsibility

The three documents *Norwegian Biodiversity Policy and Action Plan – Cross-sectoral Responsibilities and Coordination* St.Meld 42 (2000/2001); and *The Government's Environmental Policy and the Environmental State of the Nation* St.Meld. 21 (2004/2005) and St.Meld. 26 (2006/2007) set the framework for Norwegian biodiversity policy and define national goals. In addition to these Parliamentary Reports, objectives and targets for biological diversity are also described in the yearly National Budget that is endorsed in parliament. Objectives and targets for biological diversity will mainly be found in the budget of the Ministry of the Environment, but other sector ministries have also set targets for biodiversity. The most relevant are the Ministry of Fisheries and the Ministry of Agriculture (Setsaas 2009).

The Ministry of the Environment has a particular responsibility for carrying out the environmental policies of the Government. In addition to initiating, developing and carrying out its own measures through its own instruments, the Ministry of the Environment has an important role in influencing sectoral Ministries at the national level. The Ministry is responsible for coordinating the environmental policy objectives of the Government, and ensuring follow-up and monitoring results of environmental policies. The Ministry of the Environment has the main responsibility for the Convention on Biological Diversity (National Focal point). The Ministry of Agriculture and Food, the Ministry of Fisheries and Coastal Affairs, the Ministry of Education and Research and the Ministry of Foreign Affairs also have important roles in the work for biodiversity.

The responsibility for different issue areas on biological diversity are placed at various governmental instituions at the national level, e.g. the Directorate for Nature Management, the Norweigan Polar Institute, the Directorate for Cultural Heritage, the Norwegian Mapping and Cadastre Authority, the Norwegian Pollution Control Authority and the Norwegian Agency for Development Cooperation (Norad). Regional and thematic protection plans (wetlands, sea birds etc), state plans on national parks, forest protection and marine protection make up the core of protective work in line with the Nature Conservation Act (Norway CHM Focal Point, 2009; *The Government's Environmental Policy and the Environmental State of the Nation,* St.meld 26 (2006/2007)).

At regional level the County Governor is the chief representative of the Government in the county, and works for the implementation of Parliament and central government decisions. The County Governor works to implement national environmental policies, and derives his tasks from the Ministry of Environment, the Norwegian Pollution Control Authority and the Directorate for Nature Management. The municipalities have key roles in the environment protection efforts, and the Governor informs and guides them, translating the national policies into local action. There is close co-operation with other state authorities, the county municipality and NGOs. The regional level has, with its competence in different sectors, an important task in helping miunicipalities with their plans and spatial management (Norway CHM Focal Point, 2009; *The Government's Environmental Policy and the Environmental State of the Nation,* St.meld 26 (2006/2007)).

An example of the chain of sectoral strategy documents, plans and goal structures are the Agriculture agreements (Jordbruksavtalen). These are organized in a National Environmental

programme, Regional Environmental programmes (one for each *fylke*) and a municipal venture. Each region has its own objectives, strategies and measures (*The Government's Environmental Policy and the Environmental State of the Nation,* St.meld 26 (2006/2007)).

Over all, legislation related to biological diversity include the Environmental Information Act, the Planning and Building Act, the Nature Conservataion Act, the Outdoor Recreation Act, the Motor Traffic in Uncultivated Land and in Watercourses Act, the Cultural Heritage Act, the Wildlife Act, the Salmonoids and Fresh-Water Fish Act, and the Svalbard Environemntal Protection Act (Norway CHM Focal Point, 2009).

Types of objectives/targets

16 ministries and the Sami parliament were actively involved in the preparation of the *Norwegian Biodiversity Policy and Action Plan – Cross-sectoral Responsibilities and Coordination,* St.Meld 42 (2000/2001), which presents one strategic biodiversity goal:

> *The environment shall be managed in a way that maintains the diversity of habitats and landscape types and ensures that there are viable populations of naturally-occurring species: this will ensure that biological diversity can continue to evolve. In addition, Norway aims to halt the loss of biodiversity by 2010*.

Seven relatively broad/general national biodiversity targets (resultatmål) follow, targets that are neither time limited nor quantified. In chapters from the various ministries, some objectives/targets are further specified, along with measures. These are not quantified or timed either, but rather qualitative in character. No specific marine objectives are presented in the *Norwegian Biodiversity Policy and Action Plan*.

In *The Government's Environmental Policy and the Environmental State of the Nation*, St.Meld. 21 (2004/2005) and St.Meld. 26 (2006/2007) respectively, these objectives and targets are followed-up on, and references are made to quantified targets, e.g. national minimum targets for the population levels and rejuvenations of predatory species per administrative region, established in *Rovvilt i Norsk Natur* St.meld. 15 (2003-2004) on protection of predatory species.

Some timed targets, or intentions, are found among the "the Government wants" aspirational statements in St.Meld 26 (2006/2007). More specified, time limited and quantified targets, are found in more specialized plans such as *Rovvilt i Norsk Natur* St.Meld 15 (2003-2004) on protection of predatory species, or the ministerial budgets, where the timeframe of the targets is rather short. An example of the goal and target structure are found in the table below.

The Norwegian CHM Focal Point web site states that effects of climate change on the Norwegian environment is already becoming apparent, and major changes in habitats and species composition are expected. The relationship between climate issues and biodiversity is in St.Meld 26 (2006/2007) exemplified by forests providing carbon sequestration and the amount is related to national emission levels. A basic approachment is said to be to prioritize climate measures in the Norwegian forest that simultaneously have a positive effect on biological diversity and other environmental values. In a section specifying the government's aspirations/intentions it is said that the government wants to work for synergy opportunities between management of biodiversity and climate measures both nationally and

internationally, and furthermore secure efficient communication on effects of climate change on biological diversity.

Table 4. Examples of biodiversity goals and targets in Norway

Norwegian Biodivesity Policy and Action Plan	
Strategic goal	**National target**
The environment shall be managed in a way that maintains the diversity of habitats and landscape types and ensures that there are viable populations of naturally-occurring species: this will ensure that biological diversity can continue to evolve. In addition, Norway aims to halt the loss of biodiversity by 2010.	A representative selection of Norwegian habitats shall be protected for future generations
The Governments's Environmental Policy and the Environmental State of the Nation	
National target	**Targets for Nature diversity and outdoor activites, subarea: Sustainable use and protection of habitats: The Government wants…**
A representative selection of Norwegian habitats shall be protected for future generations	Implement existing protection plans
National yearly budget, Ministry of the Environment	
National target	**Sub-area 1: Sustainable use and protection of habitats: work target**
A representative selection of Norwegian habitats shall be protected for future generations	Implement work program on area protection from CBD and establish network of protected areas on land by 2010
	Implement the White Paper on National parks through the establishment of 40 new and the extension of 14 existing protected areas by 2010.

Role in relation to European and national policies and 2010 target

Norway is a partner to several conventions that are of importance to the protection of nature. The most comperehensive is the Convention on Biological Diversity (CBD). The European Environmental Ministers, including the Norwegian, approved the goal "to halt the loss of biodiversity by 2010" at its ministerail conference in Kiev in 2003. The Norwegian parliament adopted this goal in 2003.

Nature protection is not part of the EEA Agreements. However, the Norwegian government aims at adapting to the majority of European Union environmental law, even when it is not part of the EEA Agreement, in order to harmonize Norwegian work on nature protection to that of the rest of Europe. The European Union's work on NATURA 2000 is an example of such an area where an adjustment of Norwegian national nature protection regulation is being made. Protected areas in Norway have a high representation of alpine areas (>20%), but lower representation of the southern boreal and boreonemoral zones. Lowland forests and coastal areas are underrepresented while marine protected areas are being developed.

The establishment of the unique Svalbard Global Seed Vault in 2007 is another important measure in Norwegian international cooperation. The vault will store doublets as a security for gene banks in a world threatened by both natural disasters and unstable societal conditions, and it will be particularly important to developing nations.

Current status for threatened species is reflected in the 1998 Norwegian Red List. Protection targets have been established for species of special conservation interest. Targets for the protection of genetic diversity have been established for agricultural plants and livestock, wild atlantic salmon and forest trees. Sustainable use of resources is of particular importance for the fishery industry in Norway, so it has been embedded in legislation and management practice for salmonids and freshwater fish (www.cbd.int; *The Government's Environmental Policy and the Environmental State of the Nation,* St.meld 26 (2006/2007)).

Goal conflicts between levels

We have found no mention of conflicts directly related to different management levels or different geographic scales. The conflicts identified in Norway's Fourth National Report (CBD) and by contacts in Norway concern marine/water management, acquaculture (escaping fish), local/regional development and land use, top carnivores versus domestic animals, trade-offs between bioenergy, landuse and biodiversity, and trade-offs between short-term economic interest and biodiversity in general (4th Norwegian National Report to CBD, 2009; Backe-Hansen, 2009)

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