Policy options for a future EU biodiversity strategy

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Ecorys
In cooperation with Alterra, Wageningen UR

Authors:
Koen Rademaekers, Ecorys
Leon Braat, Alterra
Lisa Eichler, Ecorys
Oscar Widerberg, Ecorys

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ECORYS Nederland BV
Watermanweg 44
3067 GG Rotterdam

P.O. Box 4175
3006 AD Rotterdam
The Netherlands

T +31 (0)10 453 88 00
F +31 (0)10 453 07 68
E netherlands@ecorys.com
Registration no. 24316726

W www.ecorys.nl

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1 Introduction

1.1 Background to this report

This section briefly explains the overall objectives and rational for the study and how the focus has changed over time, given the dynamic interactions with other parallel processes that were evolving continuously over the project implementation period.

The original assignment as described in the Terms of Reference

This study was commission by DG Environment under the Framework Contract for economic analysis of environmental policies in order to assist the European Commission in shaping the post-2010 EU biodiversity policy and the development of the post-2010 EU biodiversity strategy. The primary objectives of the study – as set out in the Terms of Reference – were to (a) review the strengths and weaknesses of the current (up to 2010) biodiversity policy; and (b) to develop options for the future (post 2010) biodiversity policy to achieve newly set targets and assess these options in terms of their likely environmental, economic and social impacts.

More specifically, these overall objectives translated into 3 tasks:

1. **Assessment of current policy measures**
2. **Analysis of new policy options**
3. **In-depth analysis of the favoured target**

For **Task 1**, the provision of an overview of current policy measures targeting biodiversity loss was expected, including an assessment of the extent to which current policy and policies currently in the pipeline (including those in other areas such as climate change, fisheries, agriculture, etc.) will help tackle the biodiversity problem. Additionally, the first task was to provide an assessment of the policy failures that lead the EU to miss its 2010 target.

For **Task 2**, a set of potential policy options for the post-2010 biodiversity strategy development were outlined in the Terms of Reference, namely:

- Maintenance of current legislative system and the voluntary based approach of the BAP;
- Completion of the current legislation through filling the existing gaps (e.g. regards invasive species, soil protection) and maintenance of the voluntary based approach of the BAP;
- Amendment of the existing pieces of legislation (e.g. the Birds (79/409/ECC) and the Habitats Directives (92/43/EEC)) in order to broad their perspective in line with the new emerging issues and to better support the achievement of the new biodiversity target;
- Putting in place a new legislative tool, based on the experience and strengths of the already existing ones but through the development of an overarching frame, such as a biodiversity framework directive.

Criteria for comparison of these options were supposed to be defined prior to carrying out the actual comparison. Additionally, the Task needed to define and evaluate the role and importance of key emerging issues (e.g. climate change, green infrastructure, and TEEB). Finally, the assessments carried out in this task should always refer back to the extent to which the policy options deal with / address the direct and indirect drivers of biodiversity.

For **Task 3**, impact assessment criteria were to be defined in the fields of environmental, social and economic effects of newly proposed policy options. If a concrete EU biodiversity target were to be agreed upon at this time of the study, then the analysis could be carried out with this specific target

in mind. If not, an overview of information should be provided to identify the “best policy option” at a later stage.

Linkages and inter-dependencies with other ongoing processes

From the initial phase of project implementation it became clear that this project required a dynamic and flexible approach with close interactions not only with the client, but also with various other simultaneous processes. As 2010 is the International Year of Biodiversity and the year that the current EU biodiversity policy runs out, the Spanish Presidency had made the topic a priority from the beginning of 2010. As a consequence, the new EU biodiversity target for 2020 was agreed upon already in the spring. This allowed for more concrete steps to follow up this new target by developing a corresponding new EU Biodiversity Strategy that would offer the necessary policy measures to help meet the new target.

The study, thus became very closely linked to this internal EC process of developing a new Biodiversity Strategy and the corresponding impact assessment. Due to this interdependence, the various timelines of the policy process, interactions with Member States, deliverables for this study, etc. also became highly interdependent and needed to be coordinated in the best possible way.

Consequent changes in the scope of the assignment

As a consequence, consultants and the client agreed that deliverables should be adapted in order to deliver the greatest value added to the EC’s process as possible. The following box provides an overview of the draft impact assessment structure (table of contents). This helps the reader understand how the deliverables presented in this report fed into the overall impact assessment and new strategy development process.

Box 1 Draft Impact Assessment – Table of Contents

1. Introduction

2. Procedural issues and consultation

2.1 Background

2.2 Consultation and expertise

3. What is the problem?

3.1 Where are we now from the 2010 EU target?

3.2 Drivers and pressures

3.3 Why did we fail the 2010 target?

3.3.1 Slow/Inadequate implementation of existing legal and policy provisions

3.3.2 Legal and policy gaps

3.3.3 Insufficient integration of biodiversity and ecosystem services into other policies

3.3.4 Insufficient funding

3.3.5 Insufficient Awareness and political will

3.4 Consequences of not reaching the target

3.4.1 The intrinsic value of nature

3.4.2 Economic impacts

3.4.3 The social impacts

3.4.4 Biodiversity loss and its impacts at global level

4 Measuring progress

5 SUBSIDIARITY ANALYSIS - Why should the EU get involved?

6 POLICY PROPOSAL

6.1 Policy Baseline

6.2 Gap analysis

6.3 EU biodiversity objectives

6.4 Proposed options on how to achieve the EU 2020 biodiversity target

6.4.1 Option 1: ‘No EU action’

6.4.2 Option 2: Business as Usual (BAU)
6.4.3 Option 3: Enhanced policy
6.4.4 Comparison / assessment of implementation options
6.5 Analysis of impacts of option 3 per sub-target
6.6 Cross-cutting issues of proper implementation

What did this interactive approach imply when compared to the original tasks?

1. Task 1 was carried out and part of it was transformed in the so-called policy baseline to compare all new policy options against. The other part (analysis of past failures) has now been retained in an annex in case it is of further use some time in the future;
2. Task 2 has changed in focus given the overall approach that was chosen for the EC impact assessment. It now consisted of a gap analysis between the policy baseline and the newly agreed target. And as a second step, economic, social and environmental impact criteria were applied to three overall policy options in order to make a first judgment of determining which policy option is the most desirable one for reaching the new target (business as usual vs. no action vs. enhanced policy);
3. As a third step, the in-depth impact analysis then focussed on the detailed policy measures proposed under the enhanced policy scenario (i.e. the new biodiversity strategy). For this, Ecorys was asked to pilot such analysis for sub-targets 1 and 2.

1.2 Reporting process

Given the study approach described in section 1.1, the reporting process for this project was also very interactive and based on individual deliverables, rather than working towards one coherent Final Report. As a result, the chapters presented in this compiled Final Report represent individual deliverables, but are not necessarily linked in a logical manner.

The gap analysis in Chapter 3 certainly builds on the inputs from the policy baseline presented in Chapter 2. The impact assessment tables of the overall policy options presented in Chapter 4 were generated in response to the three policy options agreed upon during the EC's internal drafting of the impact assessment and our feedback on their proposed impact assessment criteria. Finally, the detailed impact analysis for measures proposed under sub-targets 1 and 2 of the new biodiversity strategy should be read as a first input towards the impact assessment of all sub-targets.

Finally, other deliverables that had been produced throughout the course of this study, but that have ended up not being used directly for the internal impact assessment process have been attached as annexes to this Final Report. Namely, these include the assessment of past failures (additional analysis of the 2010 target) in Annex A and a pilot impact assessment of sub-target 1, which helped the EC to discard an approach to the impact assessment structure that had first been chosen.

1.3 Structure of this report

As highlighted before, the individual chapters presented in this report do not necessarily have a chronological or logical link; they are individual/separate deliverables that have been produced throughout the timeframe of this study. As a consequence, there is no executive summary, methodology or conclusions chapter, as would normally be the case in a Final Report.

- Chapter 1 reviewed the scope of this study;

- Chapter 2 presents a detailed policy baseline of current biodiversity related policies across the EU;
- Chapter 3 provides a gap assessment comparing the current baseline to the new targets for 2020;
- Chapter 4 contains the impact tables that were produced for the overall policy option assessment;
- Chapter 5 offers the detailed impact analysis of the measures proposed under sub-targets 1 and 2;
- Annex A provides additional information on the assessment of failures of current (up to 2010) policies that had been gathered in the early stages of this project;
- Annex B includes the pilot impact assessment on sub-target 1 that was eventually discarded as a non-functioning approach to the overall impact assessment of the new biodiversity strategy.

2 Development of the policy baseline

This chapter provides the policy baseline, which was developed as the first deliverable for this study. It contains a review of current biodiversity-related policies and how they have contributed / are contributing towards improving biodiversity or counter-acting it.

2.1 Introduction

The Biodiversity Policy Baseline is defined here as: *"The total of results towards achievement of the EU Biodiversity 2020 target (and its sub-targets) which can be expected from eventual full implementation of the Current Biodiversity Policies, the Biodiversity Policies in the Pipeline, and the current (including pipeline) biodiversity (and ecosystem services relevant) sections of Policies in other sectors*."

In order to develop this Policy Baseline, this chapter contains the following information:

- **Section 2.2**: A summary overview of current biodiversity policy (including measures proposed, communicated and (partly) implemented) for the EU 2010 -target to halt biodiversity loss;
- **Sections 2.3 – 2.11:** Summary reviews of policies in other areas such as climate change, fisheries, agriculture etc. and examples of specific national actions that have been put in place or stemming from the EU Biodiversity Strategy and Action Plan:
  - In each of the summary review sections the (historical) policy background and current situation is sketched, where relevant, and the key policies/ measures are listed which have contributed or are expected to contribute positively or negatively to the Post 2010 EU Biodiversity Target;
  - In Annex B an analysis is given of successes and failures of European policies including those of Member State governments, societal stakeholders and the scientific community, in achieving the 2010 biodiversity target. This has been examined in some detail to learn about the effectiveness of different steps and instruments in the policy process, so as to support estimates of future successes and risks of obstruction or delay.
- **Section 2.12:** The Policy Baseline:
  - The policy baseline is presented in an extended table format, integrating the findings per policy sector, summarising these in "qualitative" ranking scores with explanation;
  - The formal reference point in terms of "status" of biodiversity in the European Union for the description of the policy baseline, in terms of the status and trends of biodiversity is provided by the EEA in the so-called "Biodiversity Status Baseline". To frame the expected future results of current (and new) policies it is relevant to define the reference situation, which of course is partly the result of historical ecological, social and economic dynamics and policy actions.

2.2 Biodiversity policy

The *framework* for current EU Biodiversity policy may be the United Nations (UN) Convention on Biological Diversity (CBD), which the EU ratified in 1993. However, both the EU and several member states have been developing and implementing biodiversity (or nature) policies years before 1993.

1. ***The current EU biodiversity policy is based on two main pieces of legislation — the 1979 Birds Directive and the 1992 Habitats Directive.*** The purpose of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of Community interest. The achievement of favourable conservation status requires successful (implementation of) policies dealing with reducing threats from pollution, hydrological change, over-exploitation and habitat fragmentation. The EU policy includes, based on the legislation, the ambition to build a European ecological network of special areas of conservation, called Natura 2000. In addition to providing a sanctuary for vulnerable habitats and species, the Natura 2000 areas also help to maintain populations of non-target species, and in this way further support the different forms of diversity within ecosystems.[1]

2. In 1998, the EU adopted a biodiversity strategy. At the UN World Summit on Sustainable Development, at Johannesburg in 2002, governments committed themselves to significantly reducing the rate of biodiversity loss by 2010. ***The EU has committed itself to halting the loss of biodiversity in the EU by 2010.*** Today, in 2010, nature and biodiversity are one of the four priorities of the EU's sixth environment action programme (2002–12), together with climate change, resource and waste management and health in relation to the environment. EU Heads of State or Government have endorsed the EU Sustainable Development Strategy, which further requires the EU to 'protect and restore habitats and natural systems'.

3. In May 2006, the Commission adopted a ***communication on "Halting Biodiversity Loss by 2010 – and Beyond: Sustaining ecosystem services for human well-being".***[2] The Communication underlined the importance of biodiversity protection as a pre-requisite for sustainable development, as well as setting out a detailed ***Biodiversity Action Plan*** to achieve this.[3] In 2008 the European Council restated its commitment to strengthening efforts aimed at halting biodiversity loss by 2010 and beyond, and highlighted the essential role of Natura 2000 in achieving this objective. The EU Biodiversity Action Plan addresses: (1) the challenge of integrating biodiversity concerns into other policy sectors; (2) a comprehensive plan of priority actions; and (3) outlines the responsibility of community institutions and Member States.

The Biodiversity Action Plan also deals with protection of species and habitats within the wider environment, i.e. the broader countryside and marine areas. For example, increasing attention has been given to the conservation of high nature value (HNV) farmland and forest areas within the EU. Significant proportion of HNV areas are however outside Natura 2000 sites, therefore additional targeted measures are needed to maintain and/or restore their conservation status.[4] The EU Nature Directives also provide for measures to increase the connectivity within the Natura 2000 network and in the broader environment, in this way helping to create an ecologically functioning network of protected areas. The Member States are required to take measures to maintain or restore the ecological coherence of the Natura 2000 network. Member States should also promote the implementation of connectivity measures where these are more broadly required to maintain or restore the favourable conservation status of species or habitats, irrespective of their contribution to the coherence of the Natura 2000 network.[5]

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1 Kettunen, M., Baldock, D., ten Brink, P., Lutchman, I., Tucker, G., Baumueller, A. & Arroyo, A. 2010. EU Biodiversity Policy Post-2010. Exploring the possibilities for safeguarding broader ecosystems – A scoping paper. WWF & Institute for European Environmental Policy (IEEP), London / Brussels. 53 pp.

2 EC, 2006.

3 The Biodiversity Action Plan; EC, 2006.

4 Kettunen, M., Baldock, D., ten Brink, P., Lutchman, I., Tucker, G., Baumueller, A. & Arroyo, A. 2010. *EU Biodiversity Policy Post-2010. Exploring the possibilities for safeguarding broader ecosystems – A scoping paper*. WWF & Institute for European Environmental Policy (IEEP), London / Brussels. 53 pp.

5 Ibid.

2.2.1 *The current state of biodiversity*

Evidence for the current state and trends of biodiversity is based on the latest European reports available from amongst others, the EEA and the EU's Health Check for Europe's Protected Nature report[6]. The EEA has reported[7] that "the target of halting biodiversity loss in Europe by 2010 will not be achieved". The EEA assessment also shows that European biodiversity continues to be under serious pressure and that the policy response, although successful in some areas, is not yet adequate to halt the general decline. Similar reports have been published by EPBRS (2010)[8], and a recent publication in Science by Butchart et al.(2010).[9]

The EEA gives also a general indication of the effectiveness of environmental policies in the past years: "Progress has been made in reducing some pressures through specific legislation on atmospheric emissions, freshwater quality and waste water treatment". As for sectoral policies they summarise: "pressures from the agricultural sector have been addressed directly by reducing nitrogen losses and indirectly by increasing organic farming, with varying success; fisheries, however, remains a problematic sector needing wider recognition of sustainability issues."

In 2010, the Commission and the Council have clearly stated the conclusion that the EU target of halting biodiversity loss in 2010, as agreed with the Member States in the Council of Goteborg 2002, has not been achieved.

> "In 2001, the EU set itself the target to halt biodiversity loss in the EU by 2010. In 2002, it signed up to a global target of significantly reducing biodiversity loss worldwide by 2010. Efforts to tackle biodiversity loss were subsequently stepped up, and an EU Biodiversity Action Plan (BAP) was adopted by the Commission in 2006 to accelerate progress. Despite the efforts to date, however, there are clear indications that the EU will not achieve its target".[10]

> "….Seriously concerned that both the EU and the global biodiversity 2010 targets have not been met, that biodiversity loss continues at an unacceptable rate entailing very serious ecological, economic and social consequences, while stressing that these targets have however been essential in generating useful actions in favour of biodiversity ….".[11]

Although the EU 2010 biodiversity target may not have been achieved in full, some degree of reduction in the rate of loss within Europe has been achieved. For some (species) groups and habitats this has been quantified. The differences between the status of habitats and species across the various bio-geographical regions, may follow from (a) differences in "initial condition" of the areas, i.e. the status at the start of the Natura2000 process, (b) from human factors (intensive agriculture, urbanisation, with associated pollution and habitat fragmentation) in the past 20 years and (3) from a lack of implementation of the Natura2000 protection status. In addition, with respect to the progress being made to implement Natura2000, the "Mid-term Assessment of Implementing the EC Biodiversity Action Plan" ranges from alarming, via cautiously optimistic to positive.

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6 EU, 2010. *Health-check for Europe's protected nature*. Luxembourg: Publications Office of the European Union, 2010

7 EEA, 2009. *Progress towards the European 2010 biodiversity target*. EEA Report. No 4/2009

8 European Platform Biodiversity Research Strategy (2010). *European Biodiversity Research Strategy 2010-2020*. Palma de Mallorca.

9 Stuart H. M. Butchart, et al (2010). Global Biodiversity: Indicators of Recent Declines. www.sciencexpress.org / 29 April 2010 / Page 1 / 10.1126/science.1187512

10 EC, 2010. Options for an EU vision and target for biodiversity beyond 2010. COM (2010) 4

11 EU, 2010. Biodiversity: Post-2010 EU and global vision and targets and international ABS regime - Council conclusions. Council of the European Union 7536/10

In the "Health Check for Europe's protected nature"[12] the situation in the European Union is summarized. A more detailed "Biodiversity Status Baseline" is being finalized by the EEA.. The overall findings are that only a small proportion of the habitats and species looked at were in a *favourable conservation* state. Overall, only 17% of both habitats and species assessments were deemed favourable. For habitats, some 37% of assessments indicated bad status and a further 28% were inadequate. Out of the 701 habitat assessments made, there were substantial variations across the different biogeographical regions. Dunes, bogs/mires/fens and grasslands were the habitat groups reported to have the worst conservation status. Rocky habitats such as scree slopes or caves have the best conservation status. A higher percentage of 'priority' habitats – those where the need for conservation has been identified as particularly high – were evaluated as in bad status, compared with non-priority habitats. This was most noticeable in coastal habitats. 'Future prospects' is one of the four parameters of conservation status. It was assessed as unfavourable for more than 50% of the habitat assessments. Meanwhile for species, 22% were assessed as bad and 30% inadequate. In addition, there was a significant proportion of uncertainty, with the status of some 18% of habitats and 31% of species assessments classified as unknown.

For most bio-geographical regions, over 20% of species assessments indicated bad status. The highest percentage of the favourable assessments was for vascular plants. The Alpine region had the highest proportion of favourable habitats and the Atlantic region the lowest. For species, the Boreal region had the highest proportion of favourable assessments and the Continental region the lowest. There was less variation between the biogeographical regions for species than for habitats. The Boreal region had the highest proportion of favourable species assessments, at 32%, while the Atlantic had the lowest at 7%. The Atlantic also had the highest proportion of bad assessments for species, while the Pannonian region had the highest proportion of unfavourable (inadequate or bad) assessments. Some 33% of habitat assessments in the Alpine region were favourable, the highest of any terrestrial area, and the area also had the lowest percentage of bad and unfavourable assessments. At the other end of the scale, the future prospects for habitats in the Atlantic area were not good, with no favourable assessment.

2.2.2 Other sources of "trends and status" of biodiversity in the EU

In an IEEP and Alterra (2010) study on the effects of land use changes in the past decades on land services (ecosystem services) the consequences for biodiversity across Europe have been described. The analysis involved tracking the roles of land use changes, in particular soil sealing, intensification, extensification and marginalisation in agriculture and fragmentation of the landscape. The analysis of land cover trends in the EU revealed that the changes from 1960 to 1990 were dramatic: substantial losses of grassland (from 19% to 7% coverage) while increases were recorded for total forest cover (from 25% to 33%), and a smaller but significant increase in arable land (from 38% to 40% cover). Forest expansion was associated with significant losses of grasslands in many parts of Europe, including central Europe, parts of France, the UK and Portugal, and northern Spain. Over the following 10 years, the rates of change in land cover declined considerably. It is difficult to assess pre-1990 urban land cover accurately but the available data suggest that there was considerable urban growth from 1960 to 1990, which continued after 1990 but at a slower rate. Loss of agricultural land to urban development has been most prevalent in north-western Europe but it has only affected a small proportion of land.

The maintenance and restoration of biodiversity corridors, usually as part of an ecological network, has been long proposed as an approach to tackling fragmentation. But there is little evidence that

[12] EU, 2010. *Health-check for Europe's protected nature*. Luxembourg: Publications Office of the European Union, 2010.

many ecological network initiatives have been adequately implemented or provided significant biodiversity conservation benefits. A review of case studies[13] revealed that biodiversity corridors have been incorporated extensively into spatial plans. However, in many cases most effort has been put into the design of the proposed networks rather than their implementation, with the result that most corridors exist more on paper than in practice.

Given the evidence from various sources as described in this section, one can state that not only the EU Biodiversity target has not been achieved by 2010, but that there several authors expect that terrestrial biodiversity will continue to decline in the EU, and therefore any potential post-2010 target of halting biodiversity loss, or even reducing the rate of loss, will be very difficult to achieve without further urgent, widespread and more effective biodiversity conservation actions. The main reasons for this expected continuation of the decline are the increases in the main pressures on biodiversity.

2.2.3 Key measures with a likely positive impact on biodiversity

Of course, all biodiversity policies proposed by the EC are intended to produce positive impacts on biodiversity. Obvious successes are:

- *Targeted measures* under EU nature conservation legislation have proved capable of *reversing the decline* in some threatened species and habitats;
- So far, at EU level, related requirements of *cross-compliance* have been established under the common agricultural policy;
- EU regulations contribute to ensuring that the *environmental impacts of infrastructure development and spatial planning at EU level are minimized (or positive*) – Europe has well-established protocols for assessing the environmental impacts of projects and policies through mandatory processes such as EIA and SEA;
- Work is now gathering *pace to develop a baseline and related indicators* within the EU and at global level. A set of European indicators are being developed which, together with the data gathered for implementation of the Habitats Directive, which are likely to be the most advanced in the world;
- At global level, the EU is supporting *efforts to establish an Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)* to replicate the success of the Inter Governmental Panel on Climate Change (IPCC). The EU is further committed to securing a successful outcome in 2010 from ongoing negotiations under the UN CBD on access to genetic resources and the fair and equitable sharing of benefits derived from their use;
- EC is also *committed to making a success of negotiations on reducing emissions from deforestation and forest degradation* and including conservation as an essential first step towards a broader approach to valuating and rewarding ecosystem services.

In addition to the three key measures described in section 3.1.1 (Bird and Habitat Directives with Natura2000, the 2010 Biodiversity headline target and the Biodiversity Action Plan) the following key measures are now being prepared by the European Commission:

1. In June 2009, the Environment Council adopted the Commission Communication “Towards an EU Strategy on Invasive Alien Species”. In the Communication the evidence regarding the ecological, economical and social impact of invasive species in Europe is examined and the effectiveness of the current legal situation for tackling this problem is analysed. It describes 4

[13] IEEP and Alterra (2010) Reflecting Environmental Land Use Needs Into EU Policy: Preserving And Enhancing The Environmental Benefits Of Land Services”: Soil Sealing, Biodiversity Corridors, Intensification / Marginalisation Of Land Use And Permanent Grassland. Env.B.1/Etu/2008/0030; Final Report, 31st January 2010; Brussel /London /Wageningen.

possible options for a future EU strategy. Currently actions are taken to develop an EU Strategy on Invasive Species.

2. In June 2007 the European Commission adopted its first policy document on adapting to the impacts of climate change. This Green Paper "adaptation to climate change in Europe - options for EU action", builds upon the work and findings of the European Climate Change Programme. Following its 2007 Green Paper, the Commission is producing a White Paper on adapting to climate change. This will address, inter alia, the relationship between biodiversity and climate change. Protection of biodiversity can help limit atmospheric greenhouse gas concentrations because forests, peat lands and other habitats store carbon. Additional policies will also be needed to help biodiversity adapt to changing temperature and water regimes. This requires in particular securing coherence of the Natura 2000 network. Care must also be taken to prevent, minimise and offset any potential damages to biodiversity arising from climate change adaptation and mitigation measures. To some extent adaptation is current policy as one of the 10 objectives of the Biodiversity Action Plan is to support biodiversity adaptation to climate change.

3. The 6th Environmental Action Programme of the Community considered the conservation and the protection of the marine environment a complex issue that required a broad and multidimensional approach and requested the Commission to prepare a Thematic Strategy dealing with it. The Commission adopted the Marine Thematic Strategy, including a proposal for legislative action, in 2005. In June 2006, the European Commission adopted a Green Paper on a Future Maritime Policy for the European Union. The need for such a policy stems from the economic, social, and environmental importance of the maritime dimension in Europe. The strategy for the protection and the conservation of the marine environment will directly contribute to the work on the future EU Maritime Policy.

2.2.4 Key measures with a likely negative impact on biodiversity policy

It is of course not to be expected and would be illogical if within the domain of biodiversity policy, measures would be proposed which are expected to have a likely negative impact on biodiversity policy. However, in the process of developing and implementing biodiversity policy a number of shortcomings have been noticed which are now considered as useful lessons for the future stage of biodiversity policy. They are briefly mentioned here and more fully described in ANNEX 3.1.

2.2.5 Shortcomings of the Biodiversity Action Plans

The following shortcomings of the Biodiversity Action Plans have been identified:

- a lack of prioritisation in addressing *key pressures* on biodiversity and related sectoral activities;
- *underlying causes* of biodiversity loss are not clearly addressed - if at all. The underlying causes of biodiversity loss have been systematically addressed in a study by ECORYS and Alterra;[14]
- as many of the plans were to a large extent *voluntary*, they lacked 'teeth' to guarantee results;
- *absence of a baseline and measurable targets* against which progress could be measured;
- *absence of evaluation of the potential of the actions* to achieve the final objectives.

2.2.6 Other policy shortcomings

The following additional overall shortcomings have been identified:

[14] Slingenberg,A., L. Braat, H. van der Windt, K. Rademaekers, L. Eichler, K.Turner (2009) *Study on understanding the causes of biodiversity loss and the policy assessment framework* In the context of the Framework Contract No. DG ENV/G.1/FRA/2006/0073; Specific Contract No. DG.ENV.G.1/FRA/2006/0073. Brussels

- *insufficient integration* (mainstreaming)of biodiversity concerns in *other policy areas* and in the *financial* perspectives and financing cycles;
- *insufficient and inconsistent implementation* of EU nature legislation;
- *delayed benefits of other biodiversity relevant legislation* (e.g. Water Framework Directive; Marine Strategy Framework Directive);
- *insufficient funding* provided for biodiversity protection coupled with harmful subsidies;
- *insufficient resources* allocated to monitoring and evaluation tools;
- *policy gaps* in certain areas - e.g. invasive species, soil legislation;
- *insufficient use of economic incentives and economic instruments*;
- *insufficient focus on ecosystem services*;
- *implementation problems with aspects of some existing practical measures*, such as the unfulfilled potential of some agri-environment schemes;
- *insufficient advice and training* due to limited capacities in conservation agencies; and
- *information failures*, such as incomplete monitoring of many habitats and species of Community Interest (especially outside protected areas), inadequate monitoring of the impacts of developments and effectiveness of mitigation and compensation measures, and inadequate monitoring of the effectiveness of conservation management measures (e.g. agri-environment schemes).

2.3 Agricultural policy

Some 34% of EU land is used for crop production and 14% is grassland, and an estimated “50 % of all species in Europe depend on agricultural habitats”[15]. Agricultural practices as a consequence of economic, international trade and policy factors, therefore play a very important role in the EU ambitions to maintain and possibly restore biodiversity levels in Europe, some with negative and some with positive consequences.

[15] Kristensen, P., 2003. *EEA core set of indicators: revised version April 2003*. Technical report. European Environment Agency, Copenhagen.

2.3.1 *Key measures with a likely positive impact on biodiversity*

There are well-established policy prescriptions within the field of agriculture and rural development that the EU has implemented in recent years. The European Union integrated the concerns regarding environmental quality when developing the common agricultural policy (CAP) reforms and promoting sustainable agriculture. The Biodiversity Action Plan for Agriculture was created in 2001, and the 2003 CAP reform made the granting of community funding conditional upon compliance with environmental standards.

However, for biodiversity preservation to work it is essential to go beyond compliance and create further economic incentives for eco-friendly practices like HNV farming. Paying farmers to create suitable habitats on private land to encourage wildlife and a diversity of species in the area: *so-called 'agri-environment schemes'* (AES) is one well-established initiative to conserve biodiversity implemented in Member States. The range of measures taken to implement this approach obviously varies from Member State to Member State, but in essence still remains a prescribed policy intervention for achieving dedicated biodiversity improvement goals. Although it has been widely acknowledged that there is sufficient ecological insight and geographical information to identify the objectives, outcomes and targeting for potential agri-environment prescriptions, results having not always been satisfactory.[16] Ecological insights have often been lacking for spatial scale effects and for temporal and ecosystem service effects (i.e. those services such as the facilitation of biodiversity and landscape diversity).

One suggestion to improve this situation is to link wide-scale ecological evaluations to specific case studies on the causes of (in) effectiveness of agri-environmental schemes), which could, in some cases, reveal specific situations that deserved subsidies. In general, it is agreed that there are a few main areas where research is needed to improve the cost-effectiveness of such agri-environment schemes, namely the development of decision support tools for designing cost effective agri-environmental schemes, comparative research identifying best practice, and research to investigate how institutions and governance structures have to be designed to ensure that the available money is spent in the interest of conservation.

First, the effectiveness of AES in protecting biodiversity could be considerably augmented "if a smaller number of larger resource patches [were] provided, in contrast to current practice that promotes many small fragmented areas of environmental resource"[17]. Such disjointed patches of land do not provide sufficiently big habitats for many species, and consequently have only limited potential in conserving biodiversity.[18] Hence AES should prioritize sizable farmland and the integration of neighboring farms into joint HNV areas.

Another measure to improve the cost-effectiveness of agri-environment schemes could be the usage of larger moths as bio indicators of landscape-scale quality as well as providing more

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16 --- Kleijn,D, R. A. Baquero, Y. Clough, M. Díaz, J. De Esteban, F. Fernández, D. Gabriel, F. Herzog, A. Holzschuh, R. Jöhl, E. Knop, A. Kruess, E. J. P. Marshall, I. Steffan-Dewenter, T. Tscharntke, J. Verhulst, T. M. West, J. L. Yela 2006. *Mixed biodiversity benefits of agri-environment schemes in five European countries.* Ecology Letters Volume 9, Issue 3, pages 243–254, March 2006
--- Stoate, C., A. Ba' ldi, P. Beja, N.D. Boatman, I. Herzon, A. van Doorn, G.R. de Snoo, L. Rakosy, C. Ramwell (2009) *Ecological impacts of early 21st century agricultural change in Europe – A review.* Journal of Environmental Management 91 (2009) 22–46

17 Whittingham 2007. *Will agri-environment schemes deliver substantial biodiversity gain, and if not why not?* Journal of Applied Ecology 2007 44 , 1–5

18 Reijnen, M.J.S.M. 2007. Indicators for the 'Convention on Biodiversity 2010' Connectivity/fragmentation of ecosystems: spatial conditions for sustainable biodiversity. Werkdocument 53.9. WOT project: Evaluating the biodiversity target for the Netherlands

appropriate financial rewards to farmers for different landscape features, and lastly, through landscape-scale targeting of farmers to encourage participation in AES.[19]

Community initiatives also aim to limit all pollution of agricultural origin, to promote the development of the production and use of biofuels (see energy and climate policy section for case on biofuels), and to protect biodiversity. The Union also optimises the benefits of forests and supports initiatives aimed at safeguarding wildlife, natural habitats and birds.

2.3.2 Key measures with a likely negative impact on biodiversity

First, the land used for agriculture competes with land that could potentially be used for natural habitats with endemic flora and fauna. Secondly, agricultural techniques that rely on intensive farming and high turn-over of fertilisers cause pollution that can have negative direct and indirect effects on biodiversity. Thirdly, abandonment, intensive farming and irrigation have all had negative effects for the so-called agro-biodiversity, the biodiversity associated with historical agricultural practices, with surplus nitrogen from fertilisers for example contributing significantly to the deterioration of both terrestrial and aquatic systems.

Available information suggests that over the last few decades abandonment has been relatively widespread in areas with extensive production and small farms, especially in mountainous regions and/or on poor soils. Elsewhere abandonment can be very localised and relatively small-scale. Intensification indicators suggest that over the 1990-2000 period the main areas of intensification were in Ireland, Spain and parts of North Western Europe, and during the later part of the decade in the former GDR, Hungary, and the Baltic States (following earlier extensification and widespread abandonment of agriculture). Losses of permanent grassland as a result of both intensification and abandonment are projected to be widespread across the EU, with particularly large declines predicted in Portugal, Greece, Spain and Estonia.[20]

It is evident that the land-use related pressures have had and will continue to have significant impacts on biodiversity in the EU. In particular, many of the most valuable remaining areas of semi-natural habitat in Europe are likely to be threatened by agricultural intensification or abandonment. Such impacts will be especially severe in parts of Central and Eastern Europe where intensification will probably predominate in areas that are favourable for agriculture, whilst abandonment will be commonplace in the extensive areas of HNV farmland within the region. Abandonment will also be a significant threat to HNV farmland habitats in southern and south-eastern Europe (IEEP and Alterra, 2010)

Furthermore, these pressures will also interact with each other. Fragmentation resulting from urbanisation and infrastructure developments (which also cause soil sealing) has exacerbated further losses of already fragmented patches of semi-natural habitat. The withdrawal of extensive grazing as a result of abandonment is a particular concern, because of the potential loss of valuable semi-natural grasslands to self-regenerating scrub and forest. Although it is expected that some new semi-natural habitats will develop, without strategic placement and proactive restoration management, most will be of low biodiversity value, at least for many decades. All of the pressures

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[19] Merckx et al. Optimizing the biodiversity gain from agri-environment schemes, Agriculture, Ecosystems and Environment 130 (2009) 177–182.

[20] IEEP and Alterra (2010) Reflecting Environmental Land Use Needs Into EU Policy: Preserving And Enhancing The Environmental Benefits Of Land Services": Soil Sealing, Biodiversity Corridors, Intensification / Marginalisation Of Land Use And Permanent Grassland. Env.B.1/Etu/2008/0030; Final Report, 31st January 2010; Brussel /London /Wageningen.

on biodiversity will be further exacerbated by climate change, which will make habitats and species more susceptible to the impacts of habitat loss, degradation and fragmentation.

Despite the CAP's focus on improving the profitability of low-intensity farming, it becomes "ever more clearly a loss-making operation"[21]. In fact, subsidies under pillars 1 and 2 of the policy are largely based on production volume, and ultimately drive farmers towards higher intensity practices.[22] The policy therefore undermines the objective of reducing the intensity of current farming practices, and has to be evaluated as a counterproductive measure endangering biodiversity. (Spatial separation of clustered intensive from extensive farming practices may however help in protecting most vulnerable biodiversity). Moreover, small farms rarely receive subsidies, which can partly be attributed to unprofessional management of many micro-agricultural businesses, and partly to the method of fund allocation. While small farms often deploy relatively eco-friendly, low intensity farming techniques, they often do not fulfil the reporting requirements for subsidies or simply do not apply for them. Consequently, biodiversity could benefit greatly if small farmers were educated to engage in active seeking of subsidies.

2.4 Air policy

The atmosphere, lithosphere, and hydrosphere are all negatively affected by pollution[23]. Air pollution has wide-ranging environmental impacts including loss of biodiversity, reduced crop yields and a contribution to climate change. Air pollution affects lower life forms more than higher life forms while plants are generally more affected than terrestrial animal species. A decline in species abundance in various ecosystems due to pollution is well documented in the ecological scientific literature.

Air pollution and air quality are regulated by many directives and initiatives in Europe. The following list comprises some of the most important in terms of achieving improved air quality:

- Large Combustion Plant Directive (LCPD);
- Air Quality Framework Directive;
- Clean Air For Europe Programme (CAFE);
- National Emission Ceiling Directive (NECD);
- Vehicle emissions standards (e.g., amended directives for light (Directive 98/69/EC) and heavy duty vehicles (Directive 2005/55/EC));
- Integrated Pollution Prevention and Control Directive (IPPCD) (covered as part of the integrated policies).

Following the very large reductions in sulphur emissions across Europe since the 1970s, NOX, ammonia and ground level ozone now have the most significant impact on the environment. Air quality is closely linked to transport and industrial policy and as such, improvement in air quality must be tackled in these policy domains as well. Any post 2010 strategy must aim to speed up the development of alternative transport modes that do not emit dangerous chemicals and pollute air, and which factor in possible effects on air quality. Nitrogen deposition in some areas in Europe still far above no-effect levels; so continuation of policies with respect to NH3 emissions is crucial.

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[21] Beaufoy, et al 2009. Distribution and targeting of the CAP budget from a biodiversity perspective. Technical report. European Environment Agency, Copenhagen.

[22] Farm subsidies based on Peildatum 2005/2006 ; pers comm. F. Brouwer.

[23] McNeely, J.A., Gadgil, M., Lévêque, C., Padoch, C. and Redford, K. (1995). Human influences on biodiversity. In: Global biodiversity assessment, V.H. Heywood (ed.), Cambridge University Press, Cambridge, pp. 711—821. 0-521-56481-6 ISBN.

Discussion on exact amounts, distances and gradients are relevant to conservation status and management plans of Natura 2000.

2.4.1 Key measures with a likely positive impact on biodiversity

All air quality improvement is basically good for biodiversity.

2.4.2 Key measures with a likely negative impact on biodiversity

None.

2.5 Consumption and production policy

In general, sustainable consumption and production maximises business' potential to transform environmental challenges into economic opportunities and provides a better deal for consumers. The challenge is to improve the overall environmental performance of products throughout their life-cycle, to boost the demand for better products and production technologies and to help consumers in making informed choices. On 16 July 2008 the European Commission presented the "Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan". It includes a series of proposals on sustainable consumption and production that will contribute to improving the environmental performance of products and increase the demand for more sustainable goods and production technologies. The Council endorsed the Action Plan on 4 December 2008.

A range of policies at EU and national level currently foster resource efficient and eco-friendly products and raise consumer awareness. The proposals complement these policy instruments and provide measures where gaps exist.

The key components of the European Union's policy on sustainable consumption and production include:

- Integrated Product Policy (IPP);
- Thematic Strategy on the Sustainable Use of Natural Resources;
- Thematic Strategy on Waste Prevention and Recycling;
- Eco-Management and Audit Scheme (EMAS);
- Ecolabel Scheme;
- Environmental Technologies Action Plan (ETAP);
- Green Public Procurement (GPP);
- Eco-design of Energy-related Products Directive (EuP); and
- European Compliance Assistance Programme - Environment and SMEs.

2.5.1 *Key measures with a likely positive impact on biodiversity*

One of the main overall goals of the EU's sustainable production and consumption policies is to focus on products that have significant potential for reducing environmental impacts.[24] This overall policy aim should trigger actions with likely indirect positive impact on biodiversity.

A concrete activity for stimulating smarter consumption, for example, is a focus on retailers and producers for "greening" their own activities and supply chains, as well as raising the awareness of consumers.[25] Such initiatives link in with already increasing local efforts of businesses to establish their corporate social responsibility strategies. This should also contribute to improved biodiversity protection efforts over the long run. Similarly, the promotion of Green Public Procurement[26] should positively affect biodiversity as environmental performance benchmarks will play a more significant role next to other economic and social criteria for procurement. The European Commission's efforts to develop indicators for an Integrated Product Policy included biodiversity change indicators as one of the main themes for assessing various product groups.[27] There is an increasing emphasis in environment policy on integrated approaches and linkages between environment media (air, water, soil) and in developing policies on cross-cutting environment themes that pay more attention to sustainable resource use (e.g. climate change, biodiversity etc.). This lifecycle thinking is reflected in particular in the Thematic Strategy on the Prevention and Recycling of Waste.[28] This strategy also represents a core component of the EU consumption and production policy. Progress achieved under this strategy implies positive impacts for biodiversity as less raw material has to be extracted for production cycles.

On a more global scale, the initiative to promote international trade in environmentally friendly goods and services[29] has the potential to benefit global biodiversity conservation via the dissemination of greener technologies, improved international environmental standards under the WTO, etc.

2.5.2 *Key measures with a likely negative impact on biodiversity*

While the EU sustainable consumption and production policies intend to have a rather positive environmental impact, and thus indirectly a positive impact on biodiversity, the timeframe of implementation may pose a challenge for the new EU biodiversity strategy. As most initiatives are only being developed now and there is a likely delay of several years until positive impacts can be felt in the environment, it remains doubtful whether these policies would already be able to contribute significantly for a new 2020 biodiversity target.

2.6 Energy policy and Climate policy

Energy Policy and Climate policy have historically been tightly related and developed in a common framework. Only with the new European Commission in 2010, a separate Climate Commissioner was appointed and the climate issues were combined into a separate Directorate General. We discuss the policy domains here and in the Policy Baseline (table 1) still on one sub-section, fully realising that this is no longer the current reality.

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24 COM(2008) 397 Final
25 COM(2008) 397 Final
26 COM(2008) 397 Final
27 IPU, CASA, IÖW for the European Commission (2005), "Development of Indicators for an Integrated Product Policy: Final Report".
28 COM(2005) 670 Final
29 COM(2008) 397 Final

Energy policy

EU Energy policy is based on three pillars: security of supply, competitiveness, and sustainability and respect of the environment. Previously introduced EU directives on energy efficiency and energy taxation have contributed to greenhouse gas reductions though they might have been introduced with some of the other objectives in mind, for example related to energy supply and security.

In general, energy production can per se be regarded as negatively impacting biodiversity, as it consumes vast amounts of resources, produces air pollutants (especially fossil fuels), water pollution (coal mining) and uses space on land or in the coastal zones (wind parks; solar parks). Therefore the measures discussed below mainly differ in the extent to which they damage biodiversity, as biodiversity enhancements are practically impossible through energy production. A very controversial part of European energy policy in relation to biodiversity is the topic biofuels, which will therefore be addressed separately at the end of this section.

Climate Policy

A clear link between the energy and climate policies is that to support the development of the low carbon energy economy of the future, the Commission's Communication "An Energy Policy for Europe", endorsed by the Council in November 2007 provides an ambitious concrete set of targets for 2020, the so-called 3 x 20:

- 20% reduction of greenhouse gases compared to 1990 levels (and a vision to reduce them by 60 to 80% for 2050);
- 20% increase in energy efficiency;
- 20% share of renewable energy in overall EU energy consumption (only binding target).

As these are relatively new targets, there is little ex-post evidence to support any assessment of their effect on biodiversity. Nevertheless, it is possible to outline expected impacts and explain their nature, whereas quantification is not feasible at present.

Climate policy involves the much disputed biofuels as well as the development of renewable energy sources as a mitigation of energy policies, as well as conservation of natural ecosystems to prevent CO2 and other Green House Gas emissions. This would include REDD and REDD ++ schemes.

2.6.2 *Key measures with a likely positive impact on biodiversity*

The aim of increasing energy efficiency by 20% indirectly benefits biodiversity, as it reduces the amount of resources required and the land-use intensity of energy production. Moreover, the improved energy efficiency lessens GHG emissions, thereby mitigating climate change and its effect on biodiversity. Two technologies that can support this development are solar water heating and ground source heat pumps (GHSP), as they reduce the need for electricity of heating and cooling systems. To some extent, adaptation strategies within the Climate Change policies offer opportunities for biodiversity of specific habitats, e.g. floodplain forests and marshes along rivers to absorb high water levels, for instance in the Netherlands.

On REDD, the European Commission recently emphasised the climate change – forestry link in a Green Paper on Forest Protection and Information in the EU: Preparing forests for climate change and the EU Forest Action Plan (FAP) aims *inter alia* to maintain and enhance biodiversity, carbon

sequestration, integrity, health and resilience of forest ecosystems. [30] Moreover, linkages between REDD and biodiversity were recently explored in a CBD working group which estimated that land-use management activities could potentially sequester 0.5-4GtCO2-equivalent per year for forestry related activities (REDD, aforestation, forest management and agroforestry). Additionally, restoration of degraded land using native species can enrich biodiversity while increase its CO2 uptake.[31]

2.6.3 *Key measures with a likely negative impact on biodiversity*

In a review of renewable energy *technologies* on biodiversity levels in the UK[32] some negative effects on local biodiversity were flagged. These effects were sometimes slight and often temporary, such as disturbance of feeding patterns of fauna during construction operations, or were considered highly significant, permanent and with widespread impacts, such as loss of a habitat through flooding for small-scale hydroelectric schemes. This loss of habitat caused by increased land-use for energy production, so-called energy sprawl, is the most significant shortfall of renewable energies. In comparison to conventional energy production, all renewable energies require significantly more space, as a recent study on energy policy impacts on natural habitats in the US shows[33]. Consequently every step towards increased energy sourcing from renewables automatically leads to considerable habitat and biodiversity loss.

In this light is questionable whether the envisioned share of 20% renewable energy and the resulting reduction in emissions can offset the negative effects on biodiversity. In particular, energy generated by biomass, wind, and water entails enormous spatial spread of production facilities. “Novel technologies [e.g. photovoltaics, solar water heating, and ground source heat pumps] appear to present least risk to […] biodiversity”, as they are the renewable technologies that require the least space and can often be located in areas of low biodiversity interest.[34] However, the impacts of sourcing, production, and disposal of the necessary materials for these technologies are unclear as of yet, and will have to be addressed in future research and policies.

The case of biofuels

The EU promotes the production of biofuels and has set a target of 5.75% share of biofuels in the transport sector for all EU Member States by 2010, and a target of 10% to be reached by 2020. Currently, the biofuels crops consist mainly of commonly known arable crops, such as cereals, maize or rape seed. As indicated above, increasing the share of these crops could lead to the expansion of cultivated areas, and in turn, to an increasing pressure on habitats and biodiversity, especially if forest, grassland, peatland and wetlands are converted into monoculture plantations for biofuels crops.

The so-called second generation biofuels crops, produced from non-food, ligno-cellulosic materials such as wood, energy grass or any other cellulosic biomass, which are being developed, have a

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30 EC 2010 Green Paper on Forest Protection and Information in the EU: Preparing forests for climate change. SEC(2010)163 Final.

31 Secretariat of the Convention on Biological Diversity, 2009 Connecting biodiversity, climate change, mitigation and adaptation: Key Messages from the Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change. Montreal, Canada.

32 + [8] Potential Impacts of future Renewable Energy Policy on UK Biodiversity: Final Report to the Department for Environment, Food and Rural Affairs (Defra) and the Scottish Executive Environment and Rural Affairs Department (SEERAD) as part of the Defra Horizon Scanning Programme ADAS 2006.

33 McDonald et al 2009, *Energy Sprawl or Energy Efficiency: Climate Policy Impacts on Natural Habitat for the United States of America.* PLoS ONE 4(8): e6802. doi:10.1371/journal.pone.0006802.

less drastic effect than that of regular arable crops. A recent report by Eggers et al.[35] presents a new method of assessing biodiversity impacts resulting from changing land use due to the production of biofuels crops in Europe, distinguishing between arable (first generation) and woody (second-generation) crop types. In particular, Eggers et al. focus on two questions: (1) what might happen if we doubled the current EU biofuel target of 5.75%, and (2) what might happen if we abolished the current biofuels target. While biodiversity as such includes all forms of life, their impact assessment was restricted to a set of 313 species pertaining to four taxonomical groups.

The results indicate that more species might suffer from habitat losses rather than benefit from a doubled biofuels target, while abolishing the biofuels target would mainly have positive effects. However, the possible impacts vary spatially and depend on the choice of biofuels crop, with woody crops being less detrimental than arable crops. Small-scale cultivation and burning of biomass can be regarded as being more beneficial to biodiversity than large-scale operations, because it is less intensive and significantly more efficient[36]. These results give an indication for policy and decision makers of what might happen to biodiversity under a changed biofuels policy in the European Union.

2.7 Fisheries policy

According to a Food and Agriculture Organization (FAO) estimate, over 70% of the world's fish species are either fully exploited or depleted. The dramatic increase of destructive fishing techniques worldwide destroys marine mammals and entire ecosystems. FAO reports that illegal, unreported and unregulated fishing worldwide appears to be increasing as fishermen seek to avoid stricter rules in many places in response to shrinking catches and declining fish stocks. In Europe the picture looks very bleak: almost nine out of ten commercial stocks in the north-east Atlantic, Baltic and Mediterranean Seas are overfished. About one-third of those are so heavily overfished that the stock risks losing its reproductive capacity[37].

The core principles on which the European Union's Common Fisheries Policy currently rests are clearly stated in the legal text (adopted in 2002), *Council Regulation (EC) No 2371/2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy.* This text has provided the main legal basis for all subsequent fisheries legislation at EU level. According to this text, agreed by the Fisheries Ministers of the 15 countries who were then members of the EU, the aim of the CFP is to promote: sustainable fisheries and aquaculture in a healthy marine environment which can support an economically viable industry providing employment and opportunities for coastal communities.

In Europe, current re-evaluation of the Common Fisheries Policy[38] is taking a fresh look at fisheries from a broader maritime and environmental perspective[39]. There will be a far greater emphasis on

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35 Eggers, J., Troltszch, K.,, Majorano, L, Verburg, P.H., Framstad E., Louette, G., Maes, D., Nagy, S., Ozinga, W., Delbaere, B. "Is biofuel policy harming biodiversity in Europe?" Glaboal Change Biology: Bioenergy. Volume 1 Issue 1, Pages 18 – 34 Febraury 2009.

36 Potential Impacts of future Renewable Energy Policy on UK Biodiversity: Final Report to the Department for Environment, Food and Rural Affairs (Defra) and the Scottish Executive Environment and Rural Affairs Department (SEERAD) as part of the Defra Horizon Scanning Programme ADAS 2006.

37 EEA 2009. Biodiversity, Climate Change and You: EEA Signals 2010.

38 The EU treaties establish fisheries management as one of the exclusive competences of the Community. This is because fish move across national jurisdictions and fishermen have followed them long before Exclusive Economic Zones were introduced and the Common Fisheries Policy born. In 2009, the CEC published a green paper outlining the changes needed to address some of the most critical problems facing European fisheries. Reform of the Common Fisheries Policy, Brussels, 22.4.2009. COM(2009)163 final.

the ecological sustainability of fisheries outside Europe and the need to manage and exploit natural resources responsibly without jeopardising their future. It will be important to see just how this new approach to securing Europe's fisheries will fit into the existing international regime and the proposed regular process for assessing the global marine environment[40]. In particular, it will be crucial to overcome the five key structural failings of the policy[41]: (a) a deep-rooted problem of fleet overcapacity; (b) imprecise policy objectives resulting in insufficient guidance for decisions and implementation; (c) a decision-making system that encourages a short-term focus; (d) a framework that does not give sufficient responsibility to the industry; and (e) a lack of political will to ensure compliance and poor compliance by the industry.

2.7.1 Key measures with a likely positive impact on biodiversity

A first analysis of the key policy documents showed that, for example, the long term principles[42] of the fisheries policy should likely offer positive impacts on aquatic biodiversity.

The detail of the multi-annual plans proposed by the Commission vary from one stock to another, but they all share certain core principles: they set harvest control rules for the stock, based on clear quantifiable biological targets, and a graduated approach to achieving them over time; they usually limit the maximum year-on-year variation in TACs to 15 % in either direction, unless there is an imminent risk of the stock collapsing, so as to provide a minimum stability for the industry; and TACs and quotas are accompanied by a scheme to limit effort in line with annual changes in fishing possibilities. Following recent advice from STECF, the Commission now proposes that the limits on year-on-year variation in TAC be made more flexible in 2009, to allow both for more effective action for stocks at risk of collapse, and for fishers to reap greater benefits in the case where a stock is clearly thriving.

2.7.2 Key measures with a likely negative impact on biodiversity

Some fisheries sector related decisions and policies have potential direct and indirect negative impacts on biodiversity. For example, the recent failure to protect an endangered fish species (Atlantic Bluefin Tuna) under CITES will likely have negative biodiversity impacts should the species become extinct in the coming years due to the lack of protection under the international trade regime and fisheries policy.

Additionally, issues such as potential perverse subsidies in the fisheries sector as well as a lack of control on the European fleet fishing outside of European waters, especially high seas, can have negative impacts on European and global biodiversity. Unfortunately, however, little evidence in terms of studies, etc. currently exists to highlight this type of negative contribution to biodiversity protection.

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39 Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing the framework for Community action in the field of marine environmental policy (Marine Strategy Framework Directive) (OJ L 164, 25.6.2008).

40 Taken from "Marine — biodiversity under pressure." EEA March 2010.

41 COM(2009) 163 Final.

42 "The Common Fisheries Policy – A User's Guide" (2009).

2.8 Forestry policy

Of all terrestrial ecosystems, natural forest ecosystems contain the greatest diversity in terms of species (flora plus fauna), genetic material and ecological processes. With their multiple layers of vegetation (herbs, shrubs, young and mature trees) they provide the greatest number of niches on land. In Europe, very few of these "semi-natural" forests are left. Most forests have been planted by man for timber and pulp, and are relative underachievers in biodiversity targets. The preservation of biodiversity and the provision of ecosystem services are therefore two of the most important functions of forests; as such forest policy is intricately linked with biodiversity impacts.

The Council Resolution of 15 December 1998 on a Forestry Strategy for the European Union was the first effort to establish a framework for forest-related actions in support of sustainable forest management (SFM), based on the co-ordination of forest policies of the Member States and Community policies and initiatives relevant to forests and forestry. The Strategy emphasises the importance of the multifunctional role of forests and SFM for the development of society, and identifies a series of key elements, which form the basis for its implementation.

As an additional step, the EU Forest Action Plan[43] was adopted on 15 June 2006. It builds on the report on implementation of the EU Forestry Strategy and consequent conclusions by the Council. The Action Plan focuses on four main objectives:

1. to improve long-term competitiveness;
2. to improve and protect the environment;
3. to contribute to the quality of life; and
4. to foster coordination and communication.

Eighteen key actions were proposed by the Commission to be implemented jointly with the Member States during the period of five years (2007–2011).

In the light of European action on adapting to climate change[44] and an expiring forest strategy in 2011, the Commission in September 2010 opened up for public consultations on how to prepare European forests for future challenges and especially climate change.[45] The communication recognises the primary competence of Member States regarding forest policy and outlines aims the make a contribution to where EU can assist. The EU forest program is designed for: monitoring and reporting; anticipating global trends and risks; and, proposal and possible coordination of early action programmes. With this background, the green paper outlines the general state of forests, the challenges and risks, climate change effects and which tools that are available for policy-makers.

The status of the final measures from EU level are still unclear. However, current discussions emphasise the coupling of forests and climate change and the consultations should enable the Commission to evaluate whether an EU Forest Directive is needed.

2.8.1 Key measures with a likely positive impact on biodiversity

The importance of Sustainable Forest Management for the conservation and enhancement of biological diversity is identified under Article 2-g of the EU Forestry Strategy. Article 11 assigns an essential role to forest biodiversity in SFM and considers that appropriate measures should be integrated in the forest programmes or equivalent instruments of the Member States in line with the

[43] EU Forest Action Plan (2006).
[44] COM(2009) 147 Adapting to Climate Change: towards a European Framework for action.
[45] COM(2010) 66 On Forest Protection and Information in the EU: Preparing forests for climate change.

Pan-European "Work Programme on the Conservation and Enhancement of Biological and Landscape Diversity in Forest Ecosystems 1997–2000". Article 12 recognises the importance for biodiversity of protected forest areas, notably through the establishment of Natura 2000. The EU has taken a major step to preserve forest biodiversity through the creation of the Natura 2000 network (see Section 3.1). Almost 30 % of designated Natura 2000 sites comprise forest habitats and another 30 % partly contain woodland elements and associated species.

The most direct action under the Forest Action Plan aimed at positively contributing to reaching biodiversity policy goals is ***key action 7***[46]: contribute towards achieving the revised Community biodiversity objectives for 2010 and beyond[47].

Under this key action, the Commission will propose to the Standing Forestry Committee to:

- exchange experiences on implementation of Natura 2000 in forest areas;
- consider forest biodiversity monitoring as a pilot exercise in the framework of the current work on EU biodiversity indicators[48];
- consider monitoring of the fragmentation of forests and of the effects of forest expansion on biodiversity;
- evaluate existing information and scientific studies on the necessary area coverage of and modalities for protection of forests undisturbed by man;
- follow the implementation of CBD[49] and other decisions regarding forest biodiversity.

In addition, the Commission will periodically organise joint meetings of the EU Forest and Nature Directors and promote active participation by forest administrations in informal exchanges between Member States on implementation of nature protection legislation in the EU ("GreenEnforce Network").

Another Forest Action Plan activity – ***key action 8***: work towards a European Forest Monitoring System[50] – should also positively contribute towards improved biodiversity, even if only indirectly via better monitoring mechanisms to evaluate future progress. Over the 2007-2013 period it is possible to support EU-level environmental monitoring under the new LIFE+ instrument. Harmonised information on forest is needed to fulfil the Commission's and the Member States' commitments under international agreements and to implement EU Directives, such as Natura 2000 and the Water Framework Directive. The European Commission, together with Member States and relevant international organisations, will work towards establishing a European Forest Monitoring System that draws on existing forest databases and monitoring systems. A coherent system based on existing and soon available[51] data collection schemes and on the expertise of the Member States, the Commission (Joint Research Centre, Eurostat), the EEA, and international organisations (e.g. UNECE, FAO) is the best way to meet the reporting needs for both scientific and policy purposes. A European Forest Data Centre will be established by the Joint Research Centre.

A third key action under the Forest Action Plan theme "improving and protecting the environment" is ***key action 9***: enhance the protection of EU forests.[52] As protection of forests against biotic and

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46 COM(2006) 302 Final.

47 COM(2006) 216.

48 "SEBI 2010" ("Streamlining European 2010 Biodiversity Indicators" process with the European Environment Agency and UN Environment Programme).

49 UN Convention on Biological Diversity.

50 COM(2006) 302 Final.

51 The EU is pursuing two initiatives to provide advanced, timely and coherent geospatial information until 2008: the navigation system "Galileo" and the Earth observation system "GMES" (Global Monitoring for Environment and Security).

52 COM(2006) 302 Final.

abiotic agents is one of the main priorities of forest policy, it is essential to have up-to-date information about the state of forests in the EU. To this end, the Commission will:

- work towards the further development of the European Forest Fire Information System;
- carry out a study which will analyse the main factors influencing the evolution of forest condition in Europe (including forest fires), the efficiency of current Community instruments and measures for forest protection, and potential future options to improve the efficiency of the measures;
- encourage Member States to form groupings to study particular regional problems with the condition of forests;
- support research on protection of forests and phytosanitary issues under the 7th Research Framework Programme.

In addition, with support from the EARDF and the Life+ instrument, the **Member States** may:

- develop national afforestation guidelines and promote afforestation for environmental and protective objectives;
- promote agroforestry systems;
- promote Natura 2000-forest measures;
- promote schemes for forest owners to engage in voluntary environmental commitments;
- promote investments which enhance the ecological value of forests;
- support forest fire prevention measures;
- support restoration of forests damaged by natural disasters and fire;
- support studies on the causes of forest fires, awareness raising campaigns, training and demonstration projects; and
- review and update broader protection strategies against biotic and abiotic agents, including studies on risk assessment in relation to harmful organisms and invasive species.

2.8.2 Key measures with a likely negative impact on biodiversity

Potentially negative impacts on biodiversity could be felt if some of the Forestry Action Plan activities are not implemented in a truly sustainable manner. For example, some actions under the "improving long-term competitiveness"[53] theme, such as promoting the use of forest biomass for energy generation (key action 4) need to be carefully assessed and implemented in order to not negatively affect biodiversity levels.

[53] COM(2006) 302 Final.

2.9 Regional policy

Europe's regional policy is destined to augment growth and employment by increasing cohesion between member states. While regional development is generally the responsibility of the member states, the EU provides guidance, financial support and targets to be achieved. As part of the 2007-2013 policy, each MS is obliged to issue a 'National Strategic Reference Framework' and 'Operational Programmes' according to guidelines set by the European Commission. The 423 Operational Programmes are largely funded by the Structural and Cohesion funds, and together aim to generate 2 million new jobs in the 7 year period.

Environmental measures account for almost one third (30%) of regional spending, whereof 50 percent are allocated to infrastructural initiatives and 50 percent to promotion of environmental management and business practices[54]. Eco-infrastructure measures focus on waste and water treatment as well as rehabilitation of soil and air in order to mitigate pollution in urban areas.

Eco-friendliness of all regional initiatives is monitored by obligatory environmental impact assessments (European Directive on Strategic Environmental Assessment [SEA]) and close co-operation with environmental advisors.

Although biodiversity concerns are a compulsory part of the assessments and guidelines for their inclusions have been issued (SEA and Biodiversity, guidance for practitioners), the topic of biodiversity has been largely overlooked in regional policy measures and reports. The 2008 review ("Regional Policy, sustainable development and climate change") identified biodiversity as a "real concern", concluding that "there is an urgent need for projects that can help provide the right policy guidance and tools and which will help to build effective transnational and sub-national networks" for knowledge acquisition and sharing.

Despite this call for integrating biodiversity considerations into regional policy, recent reviews of past as well as current regional policy (Evaluating Regional Policy 2010, EX-POST EVALUATION OF COHESION POLICY PROGRAMMES 2000-2006) fail to even mention biodiversity as a topic of concern. Urban development, as part of regional policies, has not given much consideration to the topic either, merely conceding that improved land-use planning could limit urban sprawl and thereby leave more room for natural habitats ("Promoting sustainable urban development in Europe" 2009).

2.9.1 Key measures with a likely positive impact on biodiversity

The Greening Regional Development Programmes (GRDP) aim at realizing the envisioned shift towards an environmentally conscious and sustainable development of regions. The project consists of a variety of international partners from research, governments of all levels and developmental and environmental NGOs. The main output of the GRDP so far was the "Handbook on Strategic Environmental Assessment (SEA) for Cohesion Policy 2007-13", which provides practical advice on how to carry out SEAs for regional development initiatives. Biodiversity features as one of the main topics, and detailed advice on its inclusion in projects is provided.

A further successful project related to regional policy is BRANCH (Biodiversity Requires Adaptation in Northwest Europe under a Changing climate), which has already been elaborated on in section 3.1. BRANCH represents a best practice example in integrating environmental concerns into policies. For regional development in particular, the project stresses the importance of sustainable

[54] EU Regional Policy 2007-2013.

spatial planning and land-use as measures to reverse biodiversity loss and install eco-infrastructure.

2.9.2 *Key measures with a likely negative impact on biodiversity*

The main negative impacts on biodiversity that originate in regional policy are caused by the urban sprawl and the construction of new infrastructure and transport. Since the impacts of these factors are the same as for the respective policies on larger scale, they will not be elaborated upon here but in the sections dedicated to the topic the activity belongs to (e.g. transport).

2.10 Transport and infrastructure policy

The current transportation modes, with a bias towards combustion engine driven cars and trucks continue to contribute disproportionally to Europe's greenhouse gas emissions, poor air quality and noise; it still is mainly based on the least efficient modes to move people and goods. Transport infrastructure can have a wide range of impacts on biodiversity, including direct effects such as habitat loss from transport location and development and indirect effects such as water and air pollution, fragmentation and disturbance from the operation of transport. In addition, secondary/induced effects, such as the impacts of urban development 'encouraged' by the transport networks and cumulative effects.

Despite the huge impact of transport policy on biodiversity, the topic has been receiving relatively little attention in policy making. Even the latest policies striving to improve the environmental sustainability of the transport sector fail to address the issue adequately. For example, the Strategy for an internalisation of external costs 2008 only mentions biodiversity as a field of study that "may be included in the analysis" in 2013[55]; and the Commission's communication Greening Transport does not address biodiversity at all[56]. While ecological assessment has always been an integral component of Environmental Impact Assessments (EIAs), explicit treatment of biodiversity impacts in road EIAs is often poor or non-existent[57]. In spite of transport policy's oblivion of biodiversity, its measures can be analyzed superficially for their potential impact on biodiversity.

2.10.1 *Key measures with a likely positive impact on biodiversity*

All recent EU transport policies strive to improve the eco-friendliness of transport modes and infrastructure. Most prominently, the strategy for internalizing external costs aims at passing traditionally neglected costs to society and the environment on to the user. Through increased taxes and road tolls the behaviour of business and citizens will change towards environmentally conscious usage of transport modes, according to the logic of the strategy. Ultimately, this would result in lower levels of pollution and noise, as well as reduced demand for transport infrastructure in general. Clearly, the aims of this policy, while not directly targeting biodiversity, widely correspond with biodiversity conservation objectives. The same argument holds for the current strategy of rail noise abatement. The above mentioned policies can be assumed to have a rather indirect, diffuse positive impact on biodiversity. Only two alternative environmental transport policy

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55 European Commission 2008, ***Strategy for an internalisation of external costs*. Brussels, 8.7.2008 COM(2008) 435 final.**

56 European Commission 2008, **Greening Transport. Brussels, 8.7.2008 COM(2008) 433 final.**

57 Byron. H, ***BIODIVERSITY ISSUES IN ROAD ENVIRONMENTAL IMPACT ASSESSMENTS: GUIDANCE AND CASE STUDIES,*** Environmental Policy and Management Group, TH Huxley School of Environment, Earth Sciences and Engineering, Imperial College, London, UK.

measures have a readily attributable positive impact on biodiversity[58]. In particular, improved physical planning as well as effective demand management have vast potential to prevent unnecessary habitat destruction.

2.10.2 Key measures with a likely negative impact on biodiversity

Quite obviously, traffic growth and the entailed construction of infrastructure as well as increased pollution and noise adversely affect biodiversity. Introducing more efficient transport modes has significant potential in emission reduction, but this effect is partly offset by the often necessary additional construction of infrastructure.

The TEN-T is the European Union's Transport Infrastructure Framework. Initially adopted in 1990 it now includes Priority Projects on 30 international axes plus wider transport projects. By 2020 it is envisaged that the TEN-T will include 89,500 km of roads, 94,000 km of railways, 11 250 km of inland waterways including 210 inland ports, 294 seaports and 366 airports. However, according to a report published in 2009[59] 379 SPAs (8.0% of all the SPAs in the EU25) and 935 Sites of Community Importance/potential Sites of Community Importance (SCIs/pSCIs) (4.4% of all SCIs/pSCIs in the EU25) are likely to be negatively affected by the twenty-one TEN-T Priority Projects analysed.

2.11 Water policy

Water is at once an essential condition for life, and thus for biodiversity, and in the form of water bodies, the home of aquatic biodiversity. Water is also an integral aspect of agriculture and ecosystem services, but increasing demand has put serious pressures on its provision, availability and quality. Today, freshwater withdrawals from lakes and rivers have doubled (since 1960) with 70% used for agriculture, with negative impacts on biodiversity[60]. Reduced availability of water in many areas constrains food production, exacerbating hunger and poverty, and reduces other ecosystem services provided or supported by water flows. Human pressures on water resources can have negative impacts through lowering of water tables, salinisation, eutrophication, species loss, all of which can adversely affect the provision of water resources, particularly in the south of Europe[61]. The key EU directives for water quality include:

- Urban Wastewater Treatment Directive;
- Nitrates Directive;
- Water Framework Directive;
- Groundwater Directive;
- Flood Prevention Directive; and
- a number of directives addressing specific types of water or issues such as the Bathing Water Directive, Shell Fish Directive, etc.[62]

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58 EEA Technical Report. No 3/2009. *Transport at a crossroads TERM 2008: indicators tracking transport and environment in the European Union.*

59 Birdlife International 2009. *TEN-T AND NATURA 2000:* ***THE WAY FORWARD, Integrating biodiversity into transport planning to prevent impacts on Natura 2000.***

60 Pimentel, D., B. Berger, D. Filberto, M. Newton, B. Wolfe, E. Karabinakis, S. Clark, E. Poon, E. Abbett, and S. Nandagopal, 2004. "Water Resources: Agricultural and Environmental Issues". Bioscience (54): 909–918.

61 IPCC, 2007. Climate Change 2007: Synthesis Report.

62 The Drinking Water Directive is considered as a mainly health driven legislation, though part of it is related to protection of drinking water resources. This element will be part of the WFD in the future.

2.11.1 Key measures with a likely positive impact on biodiversity

It is generally recognized and acknowledged that the EU's directives have worked well in helping to promote high surface water quality and generally avoiding water scarcity, which has positive implications for maintaining biodiversity. In broad terms, these policies need to be continued post 2010, and refined to adapt to specific environmental and contextual conditions in different Member States. Other appropriate policy responses might include reducing water demand through water savings from all sectors including irrigation practices in agriculture, relocating intensive farming to less environmentally sensitive areas, and restoring riparian vegetation. Adaptation responses to water scarcity in terms of management of biodiversity and associated ecosystem services can be aimed at reducing stress on species and ecosystems, although this may be difficult in areas with high population density. Effective responses to these stresses depend on an understanding of likely regional climatic and ecological changes[63]. There is also still a great deal of uncertainty as to how adaptation responses by biodiversity to climate change (i.e. changes to species and species compositions) will impact on the provision of hydrological services.

2.11.2 Key measures with a likely negative impact on biodiversity

None.

2.12 Summary of the policy baseline

The policy baseline is defined as: "the total level of achievement towards reaching the new EU 2020 biodiversity target (and its sub-targets) which can be expected from eventual full implementation of the current biodiversity policies and the biodiversity (and ecosystem services relevant) sections of policies in other sectors."

In Section 2.1 the current biodiversity policies and policy initiatives have been reviewed, with their (expected future) successes and failures and in Sections 2.2 through 2.11 the current policies in other sectors with relevance for biodiversity and ecosystem services have been examined, with special attention for the positive and negative (expected) results. From the "Health Check of Biodiversity in the EU" and the more recent EEA "Biodiversity status baseline in 2010" a quantitative description of the current biodiversity status situation is available, which allows us to deduce the remaining challenge in ecological terms (conservation status). The combined analysis of existing policies and the current biodiversity status allows for an assessment of the remaining policy gap towards achieving the new 2020 biodiversity target.

This *policy gap* is thus the difference between:

a. the 2020 EU biodiversity target[64], and
b. the situation in 2020 which would be achieved with the policy baseline only, assuming successful implementation of the policies currently in place[65].

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63 IPCC, 2007. Climate Change 2007: Synthesis Report.

64 At this stage, no sub-targets have been established (although there is a draft text of the Post 2010 EU Biodiversity Strategy with an outline of 6 sub-targets). It would appear to be useful to define "gaps" per sub-target in a later stage, when these sub-targets have been agreed upon.

65 To assess the gap, the dimensions of the target (and sub-targets) should match the dimensions of the description of the biodiversity status and policy processes. The dimensions of the biodiversity status most likely would be identical to or derived from the set of indicators in the SEBI2010 process. The dimensions of the policy process could be derived from the phases of the policy life cycle.

The policy challenge for developing a suitable post-2010 biodiversity strategy is to close this gap. The policy baseline determines which part of the gap will be closed with current policies, and the remainder of the gap should then be closed with additional policies, some already under development, some under discussion and some not yet initiated.

2.12.1 The role of direct and indirect drivers of biodiversity loss

The current biodiversity status situation is of course not only the result of (the implementation of) biodiversity and other sectoral policies, but also of a wide array of international, national and local direct and indirect "external forces", which are considered as causes of biodiversity loss, some of which have been countered to some extent by effective policies[66]. A number of frameworks for assessing the complex interplay of pressures and drivers affecting biodiversity have been developed in the past. The common thread amongst these frameworks is that most of the pressure on biodiversity stems from human-induced disturbance to ecosystems via a number of complicated pathways across different physical and temporal scales. Specific mechanisms whereby biodiversity is lost differ according to biome, geography, climate, type of pressure (i.e. over-exploitation of wildlife as opposed to habitat conversion), economic context in the biodiversity host country, trade patterns, type of governance structure, and other factors. Based on an extensive review of the data relating to pressures and drivers of biodiversity loss, a study by Slingenberg[67] et al has identified:

- the major direct causes of biodiversity loss to be: land use change and conversion of habitat to other land uses, pollution, unsustainable natural resources use, climate change and invasive alien species;
- Underlying these causes are failures in governance, appropriate decision-making and institutional functioning, as well as economic and market failures. Lack of adequate knowledge and understanding of the processes in ecosystems which conserve biodiversity and provide ecosystem services is pervasive throughout all interference of humans with ecosystems.

Naturally, various direct and underlying causes play a more or less significant role depending on the ecosystem under review:

- Habitat change, overexploitation as well as nitrogen and phosphorus pollution have had the greatest and an increasing impact on biodiversity loss in forest ecosystems over the past 100 years;
- For inland wetlands as well as coastal ecosystems habitat change and pollution have been the most influential drivers for biodiversity loss over the past century. Furthermore, invasive species have also had a high impact on biodiversity in these biomes;
- For marine ecosystems on the other hand, over-exploitation has been the single most influential driver of biodiversity loss in the past, followed by habitat change.

2.12.2 Assumptions for the policy baseline

To assess the potential of the current policies for achieving the post-2010 EU biodiversity target by 2020, some kind of Business as Usual scenario has to be assumed with respect to the economic, institutional and other external forces, which then produces an "estimated 2020 biodiversity status". An example of this for the global biodiversity is presented by Braat and Ten Brink (2008) in the "Cost of Policy Inaction" study for the EC, based on the OECD business as usual economic

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[66] For a review and analysis, see Slingenberg et al, 2009. Study on understanding the causes of biodiversity loss and the policy assessment framework, ECORYS 2009. On behalf of the European Commission DG Environment.

[67] Slingenberg et al, 2009. Study on understanding the causes of biodiversity loss and the policy assessment framework, ECORYS 2009. On behalf of the European Commission DG Environment.

scenario. This study does however not provide detailed biodiversity status estimates for 2020 for the EU, but rather aggregate measures of biodiversity loss across all of Europe.

A very much simplified approach would be that the current legal obligations in all policy domains will be implemented, whatever external forces are in place in the period towards 2020. In such an approach it is assumed that all obstacles in implementing the current legislative obligations will be dealt with adequately. We have chosen use this approach, except that we have examined the strong and weak points of the current policies (and related opportunities and risks) with respect to the "external forces", which may delay or obstruct the intended implementations.

2.12.3 Structure of the Policy Baseline

The post 2010 biodiversity headline target consists of 4 elements: (a) to halt the loss of biodiversity and (b) the degradation of ecosystem services in the EU by 2020, (c) restore them in so far as feasible, (d) while stepping up the EU contribution to averting global biodiversity loss. These 4 elements are used to check the effectiveness of current policies against.

The precise relationships between element (1) the biodiversity levels, as measured by a variety of indicators, and element (2) the various ecosystem services is still a topic of scientific discussion and ongoing research, but there is a general agreement about the essential role of biodiversity in ecosystem functioning and subsequently for ecosystem services[68]. Many of the aspects of sectoral policies with biodiversity relevance can therefore also be considered as relevant for the ecosystem services aspect of the new target. In the same spirit the contributions of current policies (biodiversity and other) can be checked for their potential to contribute towards the post-2010 target elements of restoration and global biodiversity.

The difficulty inherent to undertaking an analysis of current policy measures is that all policies may reinforce, or work against, each other and make up a complex web of interactions, all having an impact on biodiversity levels in the EU. Nevertheless, we endeavour in Table 1 (see below) and the explication sections following the table, to elaborate what the policy baseline is and to describe how far these policies go in meeting the new 2020 target. We do so by describing in Block A the expected successes and possible risks, and summarise these in a table with scores of "+" and "-" for each of the 4 elements of the new headline biodiversity target, namely:

1. halting biodiversity loss:
   a. in protected areas (Natura 2000, Member State Protected Areas);
   b. on land, including freshwater, outside protected areas (the wider landscape);
   c. in marine ecosystems.
2. halting the degradation of ecosystem services;
3. restoration of biodiversity and ecosystem services; and
4. counteracting the increased loss of biodiversity outside the EU.

In addition, in Block B, of Table 1, the contributions of the various policies towards reduction of the environmental pressures Overexploitation, Fragmentation, Climate Change, Invasive Alien Species and Pollution are scored, again with + (reducing the pressure) and/ or – (enhancing the pressure).

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[68] Braat and Ten Brink, 2008. The Cost of Policy Inaction: the case of not meeting the 2010 Biodiversity target. Report to the European Commission.
Harrison et al., 2010. Identifying and prioritising services in European terrestrial and freshwater ecosystems. Biodiversity Conservation (2010) 19: 2791- 2821.
Haslett et al., 2010. Changing conservation strategies in Europe: a framework integrating ecosystem services and dynamics. Biodiversity Conservation (2010) 19: 2963 – 2977.

Table 1 Summary overview of policy baseline and gap identification

Key EU policy area relevant for biodiversity	A. Relevance for and expected results of policy fields (1-10) for post-2010 Target elements (1a,1b,1c,2,3,4)						B. Contribution of the policy area to reduce environmental pressures from drivers on biodiversity					Explication and summary integrated assessment of scores for (A) Headline Target elements (B) Environmental Pressures (numbers refer to References in list following the Table)
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ESS)	3. Restoration of biodiversity and ecosystem services	4. Counter-acting increased loss of biodiversity at global level	Overexploitation	Fragmentation	Climate change	Invasive species	Pollution	
	a. Protected land area/ species	b. Other land / fresh water	c. Marine environment									
	+++	+/-	+/-	++	+	+/-	+ + +	+ +	+	+ +	+	
1. Biodiversity policies (see Section 3.1) Bird (1979) and Habitat (1992) Directives; Natura2000; BAP (2006)	**P:** Core of EU biodiversity policy is protected area policy via Natura 2000, based on strong legal basis in Habitat and Bird	**P:** Protection outside Natura 2000 not as effective, Pollution, fragmentation risks from agriculture, urbanisation and	**P:** Not all Marine Natura 2000 areas not yet confirmed. Potentially positive factor for marine biodiversity.	**P:** Natura2000 areas provide multiple ESS. Many ESS dependent on good biodiversity, either aboveground or in soils.	**P:** Protected areas help restore quality of biodiversity. Not geared towards turning agricultural land into biodiversity reserves.	**P:** Protection of EU biodiversity helps global average, but risk of putting burden of agro-production in developing						**A.** Biodiversity policy leads to allocation of significant areas of land for conservation purposes, i.e. NATURA 2000. Outside protected areas biodiversity targets are at risk. Marine policies still incomplete; Although there are not yet specific ecosystem services (ESS) policies available, protection of biodiversity contributes to regulating and cultural ESS, (and environmental policies to provisioning ESS, see below). This also holds for restoration efforts. There is a risk of increasing global ecological footprint by EU protection of biodiversity and ESS, if agro, forest etc production is increased in high biodiversity developing countries to compensate reduced production areas in EU. [69] **B.** The EU biodiversity policies have contributed to reduction of all pressures inside Protected Areas, except for cross boundary

[69] See references 0 through18 from reference list for supporting evidence.

[70] See references 19,20,21,22,23,24,25,26,27,28,29,30,31,32 from the reference list for supporting evidence.

	Directives.	transport.				nations with high original biodiversity.						pressures from outside sources like climate change and pollution. Biodiversity is positive factor in Climate and Pollution management through C-sequestration (= ecosystem service). Outside Natura2000, biodiversity still under threat of all pressures. Over-exploitation risk in Marine areas. [70]
2. Agricultural policies (Section 3.2) CAP(2003, 2008)- AES Plant Health Regime	**+** **P**: HNV farming important for many EU-species. Cross-compliance requirements	**+/-** **P**: Agri-environment schemes; Cross-compliance req. ; organic farming **N:** Intensifi-cation; margi-nalisation	**+/-** **P:** Cross-compliance req. reduces nutrients in river effluent to sea **N:** Intensifi-cation; margi-nalisation	**+/-** **P:** Increasing interest and funds for regulating ESS (compliance)and Cultural ESS (landscape recreation) **N:** Focus still on single service land use (food, biofuel).	**+/-** **P:** Restoration of habitats in abandonment areas is option, if funded. **N:** compe-tition for land	**?**	**+/-**	**-**	**+/-**	**+++**	**+/-**	**A.** Agri-environment schemes contribute to general rural biodiversity, but need to be targeted more towards biodiversity goals. Intensive agriculture is usually detrimental for above and belowground biodiversity and other ecosystem services. Extensive agriculture and HNV practices are promising. Landscape level (cultural) services generally positive, some regulating services still at risk. Land claim competition with restoration ambition, but opportunities in abandonment areas, also for farmers as landscape / biodiversity managers. Complex relationship with ecological footprint issues.[71] **B.** Overexploitation risk of soil biodiversity in intensive agri regions. Fragmentation and lack of interconnectedness on agricultural land is problematic. Conversion to biofuels of most grasslands and forest are negative for climate issue. Pollution combating via cross compliance is positive, intensification / continued fertiliser negative for air / water quality. Plant health regime positive for IAS pressures.[72]
3. Air policies (Section 3.3)	**++** **P:** local reduction of	**+** **P:** general reduction of	**+** **P:** general reduction of	**+** **P:** general improveme	**+** **P:** general improveme	**+** **P:** general improveme			**++**		**+**	**A**. Air pollution policy has been quite successful in improving general air quality in Europe and has many potential synergies with EU climate policy. This will reinforce positive benefits for biodiversity and ecosystem services.[73]

[71] See references 19,20,21,22,23,24,25,26,27,28,29,30,31,32 from the reference list for supporting evidence.

[72] See references 27,28,29,31,32 from the reference list for supporting evidence.

Air Quality FWD, CAFÉ, NECD, VES, IPPCD	N-deposition in PA's	deposition on land	deposition on sea	nt of air quality good for all services	nt of air quality good for restoration initiatives	nt of air quality good for global biodiversity						**B.** Local threats from nitrogen (deposition) above no-effect levels continue and limit biodiversity and restoration opportunities.[74]
4. Consum-ption / Production policies (see Section 3.4) IPP, EMAS, Ecolabel, ETAP, GPP, EuP, SICP/SIP action plan a.o.		**(+)** **P:** indirect effect may be expected through demand for / supply of eco-products	**(+)** **P:** indirect effect on marine biodiversity may be expected through demand for / supply of sustainable fisheries	**(+)** **P:** indirect effect via eco-market on increase of multiple services in forestry, agri- and aqua-culture	**?**	**(+)** **P:** eco-labels, certifi-cation of forest, fish and food reduces ecological footprint			**+**		**+ +**	**A**. Consumption and production policy has to stimulate decoupling, and can save many natural resources from over- use. Currently not enough is done to ensure that win-win scenarios such as material efficiency and reduced costs for business are factored into sectoral policy. Increasing certification of products should lead to reduction of ecological footprint / improve biodiversity in countries from which EU obtains resources.[75] **B.** . Possibility to reduce climate impacts in developing countries of conversions of tropical forests for plantations. Eco-friendly production reduces pollution (waste).[76]
5. Energy and Climate policies (see Section 3.5) 20/20/20	**++** **P:** general slow down of climate change; especially important in	**+/-** **P:** general slow down of climate change **N:** conver-sion of	**+** **P:** general slow down of climate change	**+/-** **P:** general slow down of climate change **N:** biofuel plantations	**+/-** **P:** general slow down of climate change **N:** competition	**++** **P:** general slow down of climate change; REDD funding to	**+**	**+ +**	**+ + +**		**+ +**	**A**. Energy policy drives from the EU towards more sustainable production and consumption is important in the long-run for biodiversity. Competition for land, outside protected areas with Bio-Fuels is risk. Increased self sufficiency is on the other hand good for reducing footprint outside EU.[77] **B.** Climate policies of course good for Climate change, also good for adaptation by species to fragmented landscape. Contributes to

[73] See references 59, 60, 61, 65 from the reference list for supporting evidence.
[74] See references 62, 63, 64 from the reference list for supporting evidence.
[75] See references 66, 67, 68 from the reference list for supporting evidence.
[76] See references 67 from the reference list for supporting evidence.
[77] See references 33,34,35,36,37,38 from the reference list for supporting evidence.
[78] See references 33,34,35,36,37,38 from the reference list for supporting evidence.

policy Deforestion /REDD	isolated PA's for adaptation	grass and forest to biofuel plantations		have low level of other services	with biofuel plantations	stop defores-tation in biodiversity hotspots						reduction of pollution (Nox). Energy saving in general reduces overexploitation of natural resources.[78]
6. Fisheries policies (see Section 3.6) CFP(2002,2009), EC 2371/ 2002, Marine Strategy FWD (2008); CITES (2010) Coastal Zone ??			**+/---** **P:** TAC and Quota **N:** No clear information on status of/ restriction on fishing in candidate Natura2000 areas**;** CITES agreement of Bluefin Tuna a.o.	**+/---** **P:** TAC and Quota **N:** Other uses of marine ecosystem (recreation) degraded	**?**	**-** **N:** EU / MS subsidies and lack of control on EU fleet allows fishing in grounds of developing countries	**--**			**--**	**--**	**A**. EU fisheries policy has potentially large impacts on marine biodiversity. Current structure and policies in the sector in many MS is short term economic gains, in spite of clear detrimental effects on long term future. Currently the priorities of commercial fisheries outweigh the aims for conservation measures. Natura2000 still in infant stage. Ecosystem services (commercial provisioning and recreational) at risk. OTC include many marine and coastal habitats at risk. Fishing in coastal zones (breeding chambers) detrimental for future ambitions of sustainable fisheries.[79] **B.** Overexploitation of a number of stocks, in spite of warnings. Lack of reliable information system and limited possibility to control catch allows risky strategies to continue. Fleet fishes in non-European waters (off the coast of Africa etc.). Fishing down the food chain effects, increases risk of alien species to take over. Future depends on implementation of recent policies.[80]
7. Forestry	**++**	**+/-**		**++**	**+/-**	**?**	**+**	**+**	**+**	**+**	**+**	**A**. Forestry policy if implemented fully will provide co-benefits for

[79] See references 39,40,41,42,43,44,45,46,47,48, 48b from the reference list for supporting evidence.

[80] See references 46,47,48 from the reference list for supporting evidence.

[81] See references 49,50,51,52,53 from the reference list for supporting evidence.

[82] See reference 53 from the reference list for supporting evidence.

policies (see Section 3.7) EU Forestry Strategy (1998); EU-FAP(2006) EARDF;LIFE +	**P:** FAP-Key actions; #7;Natura2000/ forest info exchange	**P:** FAP actions in general **N:** slow implementation		**P:**FAP good for multiple ecosystem services	**P:** FAP creates option for restoration. MS stimulated with funds		**+ +**		**+ +**		**+**	biodiversity. Plantations have low biodiversity though. Good for most ecosystem services and for some types of restoration. More self-sufficiency in EU for timber is positive in ambitions to reduce ecological footprint outside EU.[81] **B.** Overexploitation in Forestry in EU is on the way out. FAP may contribute to connectivity for forest species. Afforestation and forest conservation enhances climate change combating policies. Forest contributes to clean air. Sustainable management reduces opportunities for IAS.[82]
8. Regional policies (see Section 3.8) EU Regional Policy(2007-13), GRDP * EIA/SEA		**+/-** **P:** contribu-tions to environmental quality **N:** infra-structure and urban development	**?**	**+/-** **P:** environ-mental quality improvement facilitates EES **N:** land for urban / infra	**-** **P:** environ-mental quality improvement facilitates EES **N:** land for urban / infrastructure			**-**	**-**		**+ +**	**A**. Regional policy should set clear priorities for stopping biodiversity loss (GRDP, Greening Regional Development Programmes). Funding from EU for regional development can be better tied to achieving outcomes related to conservation and NATURA 2000. **B.** Still much focus on urbanisation and infrastructure, which enhances fragmentation, and volume of energy use. Eco-infrastructure measures focus on pollution/ waste treatment.
9. Transport/ Infrastructure policies (see Section 3.9) TEN-		**+/-** **P:** new technology with lower pollution and noise levels	**?**	**+/-** **P:** new technology with lower pollution and noise levels	**?**	**?**		**-**	**-**		**+/ -**	**A**. Potential to incorporate biodiversity concerns more effectively in planning and designing eco-friendly transport systems. Sustainable transport will have large impacts on biodiversity as will be less polluting and more efficient mobility. TEN-T has rather good score for understanding biodiversity impacts, but more can be done to be holistic in its approach to designing mobility solutions.[83] **B.** higher total volumes are not (completely) abated with the

[83] See references 54,55,56,57.58 from the reference list for supporting evidence.

[84] See reference 58 from the reference list for supporting evidence.

T(1990),		**N**: expected increase in total transport volume		**N**: expected increase in total transport volume								transportation policies; more infrastructure means generally more fragmentation with negative biodiversity effects. Rural landscapes will lose attractiveness while gaining accessibility. More transportation negative for climate issue. Trade off between less pollution per distance, but miles in total.[84]
10. Water policies (see Section 3.10) Groundwater, Urban Waste-water, Nitrate and WF Directives…	**+++** **P:** improving ecological quality in aquatic PA's	**+** **P:** improving ecological quality in aquatic systems in rural areas	**+** **P:** in the long run improved ecological quality in marine systems	**++** **P:** regulating and cultural services improving (recreational swimming, sport fishing)	**++** **P:** enhances restoration projects	**?**		**++**		**++**	**+++**	**A**. The WFD is a good approach to maintaining hiqh (ecological) quality water in all areas, including areas with high nature value. Full implementation of WFD will be beneficial for biodiversity, water based ecosystem services, and restoration. **B.** Good water quality management may well reduce opportunities for IAS and of course good against pollution.
A: +++, ++, + = relevant; most, many and some positive results expected (policy present and effective); B: Policy reduces environmental pressure factor A: -, --, --- = relevant; generally negative results expected (policy not present, or in-effective); B: Policy enhances the environmental pressure factor A: +/- = relevant; positive and negative results (vary across Europe; across policies ; across species or habitats; or services;); B: partly reduces, partly enhances pressure A: ? = deemed relevant, but not (yet) known A: () between brackets : biodiversity impact indirect. No symbol = irrelevant; P= positive; N= Negative											

2.12.4 References to supporting documents for the Policy Baseline Table

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2.12.5 Score analysis for policy baseline - per target component

This section provides a more detailed background analysis for the scores provided in Table 1 for the policy baseline per sub-targets, i.e. reading the columns top to bottom.

Post-2010 headline target component (1a): halt of the loss of biodiversity in protected areas

The objective of *halting biodiversity loss in protected areas* is the target component that is addressed with the most clearly defined current policies, in particular the Birds and Habitats Directives with the associated Natura 2000 mechanism. This very concrete link of policies and measures with the sub-component of the Post 2010 target allows current policies to contribute a relatively significant percentage toward achieving the 2020 target.

Strengths of current policies, opportunities with continuation of current policies

The Biodiversity in Protected Area Policies (Natura 2000 for Europe; several national protected area regulations) are SMART (see Section 2.2). The protected species policies which link with protected areas are strong too. There is a clear legal structure (Bird and Habitat Directives) , and

the commitment at EU and MS level is strong. The implementation process is progressing, although not everywhere in Europe at “maximum possible speed (see BAP Interim report and MS reports). The direct threats from economic and social activities are minimal, although in some areas the “historical” use of the habitats involved potentially damaging activities (hunting, fishing, recreational boating etc.).

Weaknesses of current policies, threatened (at risk) in the next decade

The weak spots towards protected areas and species in protected areas are in the indirect threats from air pollution (especially nitrogen in some parts of Europe for terrestrial habitats) which are partly covered by Air Quality policies. However, due to the fragmented character of Natura2000 in some countries, many areas are confronted with pollution and disturbance (noise) from all sides. Areas that are located in large agricultural regions may be influenced by “sideflows” through air and groundwater of fertilizers and pesticides. Another weak spot is that the funding for the development of adequate management is not secure in all regions. This is largely a problem within the Member states. The challenge to achieve the target by 2020 is not equally large across Europe. New member states may have a greater policy cap to close than those countries which have been working on Natura2000 for more years.

Post-2010 headline target component (1b): halt the loss of habitat and species on land outside protected areas

The objective of halting biodiversity loss on land outside protected areas involves a much larger array of policy measures in a variety of policy sectors that directly or indirectly influence the target achievement.

Strengths of current policies, opportunities with continuation of current policies

Habitats and species *outside* Natura 2000 are partly benefitting from policies for protected areas as species population may find refuge there, while feeding outside the protected areas. Implementation of additional measures to facilitate populations to migrate and travel to breeding and feeding places is put in place now in some countries (corridors, wildlife bridges across highways). Continuation of improvement of Natura2000 habitat quality and the connectivity programs (e.g. blue-green vein type of programs in Member states) is an opportunity towards the Post 2020 target.

Air and freshwater quality have improved over the past few decades in the European landscape, but are locally still cause for concern (see Sections 2.3 and 2.4). Water management in terms of flood control and drought mitigation (possibly related to climate change) require increasingly more investment. HNV policy, and agri-environment schemes with associated financial compensation (payment) have mitigated the loss to some extent. Continuation is necessary to provide a basic protection. In urbanised areas, several species find new habitats (foxes, crows, seagulls) but these tend to develop to pest-levels.

Weaknesses of current policies, threatened (at risk) in the next decade

The species protection levels are limited in the wider landscape (rural and urban) areas. Indicators like Farmland Birds and Butterflies in Europe have shown dismal trends (EEA, 2009). The legal basis for biodiversity conservation in these areas is still weak, resting on prohibitions to hunt and disturb, which are relatively hard to enforce. The “unprotected areas” are under development in alls parts of Europe, to some extent even aided by the Regional Development funding schemes (see Section 2.11).

The agricultural areas are changing in two ways, intensification of some regions (mega-stables, high density, high energy input crops), and marginalisation with abandonment risks in other regions,

with associated development of pioneer vegetations of “natural” habitats, which cause degradation of the biodiversity of the agricultural landscape (this can be considered as a trade-off with low conservation management costs; see IEEP / Alterra, 2010). Afforestation is successful in many EU countries, but only marginally increases species richness as mostly plantation forest is the result. The development of woody (bio)fuel plantations is an widely discussed negative measure for biodiversity.

Post-2010 headline target component (1c): halt biodiversity loss in marine ecosystems

One of the key challenges of assessing the policy gap for this target component is the fact that the current state of marine biodiversity is not well established yet and therefore it is also difficult to estimate in how far direct marine policies as well as more indirect contributors from other sectoral policies influence the rate of marine biodiversity loss.

Strengths of current policies, opportunities with continuation of current policies

When the current broad marine policies are continued, a slight improvement in the stocks of marine species populations may occur. The literature on the future of commercial fish populations is generally gloomy.[85] The Habitat Directive / Natura 2000 for Marine habitats is still in its infancy across Europe, so the protected area biodiversity policies may lead to some “recovery” of degraded populations, but uncertainty is big here.

Water and air quality policies have been rather effective in the past and are expected to continue to influence the marine environment positively, as is Energy /Climate policy (less acidification from CO2 in the future).

Weaknesses of current policies, threatened (at risk) in the next decade

The causes of biodiversity degradation are mostly unsustainable commercial fishing and pollution in coastal areas which are crucial as breeding ground and hatcheries. The North Sea is heavily fished, the Baltic has historically pollution problems and the Mediterranean has both problems.[86] The degradation of the marine ecosystem is considered to be very much progressed, believed by some to be beyond repair in many places (Pauly, 2006). Restoration through moratoria on fishing and coastal development may be the only way, but this has not been put in place yet. The EU fisheries policies are in place are only partially effective. CITES agreement on Atlantic Bluefin tuna is an example of limited influence of the EC.[87]

Post-2010 headline target component (2): halting the degradation of ecosystem services

One of the key challenges with assessing the policy baseline and associated gap for this target component is the fact that relatively little focus has been spent in the past on ecosystem service specific policies. Nevertheless, many sectoral policies influence the delivery of ecosystem services.

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85 Pauly, D., et al. 2006. World Fisheries: the Next 50 Years, p. 29-36 In: D. Kennedy et al. (eds.) Science Magazine’s State of the Planet, 2006-2007. AAAS and Island Press, Washington, DC. [Updated reprint from “The Future for Fisheries”, Science 302: 1359-1361].

86 Millennium ecosystem Assessment, 2005; Sea around us project, in Braat and Ten Brink, 2008.

87 ECORYS Socio-economic impact assessment on the consequences of listing Atlantic Bluefin Tuna in Annex I of CITES. Study for DG ENV, 2010.

Strengths of current policies, opportunities with continuation of current policies

Following the reasoning about the relationship between biodiversity and ecosystem services discussed in Braat and Ten Brink (2008), the current policies which protect biodiversity and provide opportunities for recovery of lost biodiversity, shall lead to a halt of the degradation of many of the "regulation" services, especially those based on habitats and species in protected areas. In line with this the "cultural services" (both *used, but not consumed* in outdoor recreation and the information content dependent services) shall be protected.

As to the "provisioning services" the expected contribution of the current policies is very much dependent on the possibility to achieve "sustainable use" in the renewable resource use fields such as agriculture, forestry and fisheries.

Weaknesses of current policies, threatened (at risk) in the next decade

There are initiatives to conservation and sustainable use of ecosystem services in all the renewable resource use areas, but economic demand and competing claims for productive land (e.g. biofuels versus food) put pressure on the implementation of these policies. Lack of clear policies as to protection of soil biodiversity in the non-protected areas may cause (further) degradation of these services. In line with the policy challenges in the biodiversity elements of the new target, the ecosystem services challenge will be greater if there is a gap in these biodiversity issues**.**

Post-2010 headline target component (3): restoration of biodiversity and ecosystem services

While existing policies directly targeted at restoration of biodiversity are relatively easy to point out, it remains a challenge to establish the exact status baseline for this target to determine the gap and progress towards the target over the coming 10 years.

Strengths of current policies, opportunities with continuation of current policies

The positive expectations as to restoration of biodiversity and associated ecosystem services are based on the improvement of environmental quality in existing protected areas, through effective countering of causal factors and conservation management. It is assumed that some of the restoration will not need human investment and management on the sites, but will occur as a natural process, if the environmental conditions and protection against intrusion by human activities are taken care of.

Weaknesses of current policies, threatened (at risk) in the next decade

The negative expectations are based on the observation that land for restoration in terms of quantity (area) of certain habitats will be a scarce resource and because of competing claims costly and if available probably scattered (e.g. through availability in abandonment areas). In addition restoration policies with adequate funds are scarce. Dependent on the tasks of restoration, which have to be set at different political levels, the gap may be large.

Post-2010 headline target component (4): counteract increased loss of global biodiversity

The objective of reaching the target component of counteracting increased biodiversity loss worldwide is very broad by definition. As a consequence it is extremely difficult to make any precise estimations of the level of contribution of the policy baseline as well as the potential gap. Potential contributing factors will need to be analysed in much more detail.

Strengths of current policies, opportunities with continuation of current policies

The Council decision on the post-2010 target includes a number of conclusions and recommendations which illustrate that the current policies (1 -10 in the table; described in sections 3.2- 3.11) are not considered sufficient, and the formulation is chosen to "step up" the efforts. The current biodiversity and environmental quality policies (including climate) are contributing to some

extent, as they provide cross-(EU) boundary improvements (e.g. fly ways, breeding and feeding areas for migratory birds; reduction of pollutants including CO_2).

Weaknesses of current policies, threatened (at risk) in the next decade

Most of the more effective improvements towards global biodiversity require changes in import and export policies of member states on renewable resources (imports of timber, soy, palm oil etc.). These are to a great extent outside the control of the European Commission. Also there are complications in the WTO agreements and very different attitudes towards foreign aid and biodiversity protection as part of those aid programs[88].

2.12.6 Score analysis for policy baseline - per policy area

This section provides a more detailed background analysis for the scores provided in Table 1 for the policy baseline per policy area, i.e. reading the rows left to right.

Biodiversity policies and their contribution to the policy baseline

Target component (1): The core of biodiversity policy in the EU is very much a "protected area" policy via Natura2000, based on Habitats and Species identified in the Habitat and Bird Directives. The protection is not restricted to the Natura 2000 areas, but is most effective there. These policies are formulated in SMART terms, have a strong legal structure which is being embedded in the Member State legal frameworks. Outside protected areas the influence of sectoral development in agriculture, urbanisation and transport bring risks to biodiversity targets, especially by fragmentation.

Target component (2): Most protected areas in the EU have a multiple uses, even most Natura2000 areas. Outside the protected areas biodiversity conservation and sustainable use competes in with claims on land (including soils), on fresh water and on the marine areas for all sorts of social and economic activities. In the competition, biodiversity has increasingly become an important factor, among others through EIA and SEA requirements. Current biodiversity policy is for its implementation to a large extent dependent on other policy sectors and the Member states. This is also true for the ecosystem services which are dependent on high biodiversity levels (not those associated with single crop systems).

Target component (3): Restoration opportunities are available, but require stimulus from compensation and habitat banking initiatives. Funding is problematic.

Target component (4): The impacts of economic production and consumption on biodiversity outside Europe have not yet been included in the legal framework of the EU and therefore success in this area is still completely dependent on Member State and other DG policies.

Contribution to reduce pressures: The EU biodiversity policies have contributed to reduction of all pressures inside Protected Areas, except for cross boundary pressures from outside sources like climate change and pollution. Biodiversity is positive factor in Climate and Pollution management through C-sequestration (= ecosystem service). Outside Natura2000, biodiversity still under threat of all pressures. Over-exploitation risk in Marine areas

[88] e.g. the Dutch Biodiversity Policy Program, Ministry of Agriculture, Nature and Food Quality, 2008; and a policy assessment by PBL, 2010.

Agricultural policies and their contribution to the policy baseline

Target component (1): While agricultural policy was an early mover in integrating biodiversity considerations, the various changes in European agriculture cause it to remain a major contributor to habitat loss and pollution of terrestrial and aquatic habitats, mostly through nitrogen. Subsidies aimed at reducing the pace of intensification have proven to be imperfectly designed, sometimes even counterproductive. In order to further alleviate agriculture's impact on biodiversity, biodiversity indicators have to become (part of) the allocation base of subsidies. At the same time, policies need to leave room for the diversity of farmland and farming practices by encouraging "regional differentiation" to "sustain specific ecosystem services" (EEA 2009)[89]. Notably, this would necessitate to further integrate regional policy, environmental policy and agricultural policy in order to tackle the issue with coherent solutions instead of the current policy measure patchwork.

Target component (2): Even though there is serious concern across Europe (especially in NGO and scientific reports) about the contribution of current agricultural policy schemes to biodiversity objectives, the cross compliance policies seem to enhance the "provisioning" part of ecosystem services through better soil and water management, and regulated use of nitrogen and phosphorus fertilisers and pesticides. The contributions of agri-environment schemes and HNV policies to "cultural services", i.e. landscape recreational use, are generally considered positive, with more "natural" elements in the agricultural fields. The regulation services (water and nutrient cycling) are often under stress in production oriented land use, but some Carbon sequestration takes of course place, and more in organic farming and extensive grazing areas.

Target component (3): Competition for land is major threat to implementation of restoration plans.

Target component (4): ?

Contribution to reduce pressures: Overexploitation risk of soil biodiversity in intensive agricultural regions. Fragmentation and lack of interconnectedness on agricultural land is problematic. Conversion to biofuels of most grasslands and forest are negative for climate issue. Pollution combating via cross compliance is positive, intensification / continued fertiliser negative for air / water quality. Plant health regime positive for IAS pressures

Air policies and their contribution to the policy baseline

Target component (1): In protected areas the air quality is expected to be hardly a problem anymore, except for those areas that are very small and located in intensive agricultural areas or near urban areas. The local concentrations and depositions of ammonium compounds on short distance of farms may be problematic for Natura2000 areas which contain both sensitive types of vegetation, and are small and "open" (not protected by wind breaking trees etc.). Management plans for these sites should consider this particular situation. In the wider landscape air quality is very variable. Impacts on marine environments will generally be improving, except maybe for CO_2.

Target component (2): With improving air quality, ecosystem services will generally improve.

Target component (3): Restoration opportunities will increase with improved air quality.

Target component (4): ?

[89] EEA Technical report No 12/2009, *Distribution and targeting of the CAP budget from a biodiversity perspective,* European Environment Agency, Copenhagen.

Contribution to reduce pressures: Local threats from nitrogen (deposition) above no-effect levels continue and limit biodiversity and restoration opportunities.

Consumption/production policies and their contribution to the policy baseline

Target component (1): Mostly indirect threats and indirect contributions to reduction of threats result from consumer and producer oriented policies. There are relatively long delays between initiatives and results.

Target component (2): A similar perception goes for ecosystem services. Important issue is the visible waste in the landscape, nature areas and surface water which affects the cultural services negatively.

Target component (3): ?

Target component (4): Consumer awareness may improve situation via preference for certified products.

Contribution to reduce pressures: Possibility to reduce climate impacts in developing countries of conversions of tropical forests for plantations. Eco-friendly production reduces pollution (waste).

Energy/climate policies and their contribution to the policy baseline

Target component (1): There is still considerable uncertainty about the potential impacts of energy generation on biodiversity, and more research on the impacts of various energy sources in EU countries is needed. Especially the domains of marine, biomass, and wind energy require further research.

Target component (2): Next to positive opportunities for ecosystem services there are negative image of modern windmills in the landscape.

Target component (3): Competition for land with biofuels, windmills.

Target component (4): Self sufficiency good in reducing ecological footprint

Contribution to reduce pressures: Climate policies of course +++ for Climate change, also good for adaptation by species to fragmented landscape. Contributes to reduction of pollution (NO_x). Energy saving in general reduces overexploitation of natural resources.

Fisheries policies and their contribution to the policy baseline

Target component (1): Data on species richness in the marine environment are scarce, but commercial as well as recreational fish catch data are indicative. With the depletion of stocks there will be depletion of the biodiversity in terms of the mean species abundance indicator (a combination of SEBI and CBD indicators). The “death of unintended catch”, including marine mammals may also be a factor affecting marine biodiversity. A different story is the degradation of biodiversity in “overseas” territories, including several threatened coastal habitats and coral reefs.

Target component (2): Provisioning service levels at risk for number of species, and some marine and coastal habitats. Recreational fishing is big economic activity, but mostly in freshwater systems.

Target component (3): No plans explicit; essential is the restoration of coastal habitats, but competition from other user sectors is strong.

Target component (4): Impact of lack of marine protection policies for overseas areas, and lack of legal basis to stop fishing outside European zones.

Contribution to reduce pressures: Overexploitation of a number of stocks, in spite of warnings. Lack of reliable information system and limited possibility to control catch allows risky strategies to continue. Fleet fishes in non-European waters (off the coast of Africa etc.). Fishing down the food chain effects[90], increases risk of alien species to take over.

Forestry policies and their contribution to the policy baseline

Target component (1): All forest development activities should be viewed as long term investments with "biodiversity pay-off" in a distant future, although some animals species do not mind the single species plantation stands, and thus already start increasing biodiversity, even in these low tree-biodiversity forests.

Target component (2): Apparently, just like in agriculture, the FAP may support the "provisioning" part of the Ecosystem Services, and any afforestation and biofuel plantation can be considered contributions to the "regulation" part of the Ecosystem Services.

Target component (3): Competition for land is risk factor.

Target component (4): Self sufficiency in timber is good for reduction of ecological footprint.

Contribution to reduce pressures: Overexploitation in Forestry in EU is on the way out. FAP may contribute to connectivity for forest species. Afforestation and forest conservation enhances climate change combating policies. Forest contributes to clean air. Sustainable management reduces opportunities for IAS.

Regional policies and their contribution to the policy baseline

Target component (1): In general, regional policy appears to have largely ignored the impact of its initiatives on biodiversity in the past. While awareness is increasing and environmental policies are stressing the importance of the matter, key regional and cohesion policy documents still fail to address biodiversity sufficiently, if at all. Although reporting and acting on biodiversity is a requirement for all regional policy measures, it does not play a considerable role in practice. Successful programs like GRDP and BRANCH have shown that mutual effort of NGOs, governments, research institutions and communities is necessary to make regions work for biodiversity, not against it. It is not enough to make biodiversity reporting and protection compulsory and provide rough guidance; an interactive approach involving all stakeholders needs to be adopted to achieve actual improvements on the ground.

Target component (2): Importantly, regional authorities have to understand that protecting biodiversity is not a burden of the economy, but can stimulate economic development. The regional policy review of 2010 already suggested investigating "how regions can take advantage of the challenges stemming from […] the protection of the environment to enhance the competitive position of their enterprises". If biodiversity is to be properly integrated into regional policy, it must receive considerable attention in this study.

[90] Pauly, D., et al. 2006. World Fisheries: the Next 50 Years, p. 29-36 In: D. Kennedy et al. (eds.) Science Magazine's State of the Planet, 2006-2007. AAAS and Island Press, Washington, DC. [Updated reprint from "The Future for Fisheries", Science 302: 1359-1361]

Finally, increased involvement of the public is a potentially effective measure and should be further evaluated. A “greener” environment is widely regarded as desirable and citizens are often willing to contribute, provided there is clear guidance and a visible impact on their direct surroundings. Especially with regard to the objective of improving management practices, the local community can exert considerable pressure on businesses.

Target component (3): Competition for land needed for urban and infra initiatives may obstruct restoration opportunities.

Target component (4): ?

Contribution to reduce pressures: Still much focus on urbanisation and infrastructure, which enhances fragmentation, and volume of energy use. Eco-infrastructure measures focus on pollution/ waste treatment.

Transport/infrastructure policies and their contribution to the policy baseline

Target component (1): The neglect of biodiversity considerations in transport policy represents a major concern for nature conservation objectives. The industrial importance of a functioning infrastructure is detrimental to the goals of biodiversity, as economic considerations are commonly prioritized over environmental considerations in transport policy.

Target component (2): Fragmentation of the landscape by infrastructure has a negative impact on the regulating services which are dependent on large scale connectivity of groundwater systems. The loss of large habitats often means not only loss of species populations (especially land based larger mammals), but also of loss of landscape level cultural services (outdoor recreation).

Target component (3): ?

Target component (4): ?

Contribution to reduce pressures: higher total volumes are not (completely) abated with the transportation policies; more infrastructure means generally more fragmentation with negative biodiversity effects. Rural landscapes will lose attractiveness while gaining accessibility. More transportation negative for climate issue. Trade-off between less pollution per distance, but miles in total.

Water policies and their contribution to the policy baseline

Target component (1): Health related policies for water quality (drinking, swimming) are generally successful and have positive spin-off for biodiversity (low nutrient and low pesticide levels).

Target component (2): Economic processes which are affected by water quality and availability have large impact (agriculture, golf links); vice versa, water with improved water quality can provide better services to economic users. Biodiversity of water bodies is relevant to large groups of stakeholders, so much interest (recreational fisheries, boating, swimming, bird watching (Bird life is largest NGO).

Target component (3): Conditions for successful restorations are expected to improve more and more.

Target component (4):?

Contribution to reduce pressures: Good water quality management may well reduce opportunities for IAS and of course good against pollution.

3 Gap assessment

This chapter provides a brief gap assessment, analyzing the remaining gap between what can be achieved with ongoing policy efforts (as described in the policy baseline) and what is needed for the new 2020 biodiversity target. This gap assessment identifies the fields which are already relatively well covered by existing policy and the areas in which significant further effort needs to be undertaken in order to achieve progress by 2020, and thus which areas require dedicated sub-targets with concrete measures for action.

3.1 Introduction

With the currently available information, it is not possible to establish clear percentages as regards the degree to which the 2020 target can be reached with full implementation of the current policies and how large the remaining gap is. This is even more so because many of the relevant policies have been initiated, adopted and accepted only relatively recently (in the last few years).

However, it is still possible and relevant to summarise where (for which part of the new headline target) the policy baseline is the most promising and where it is the weakest, i.e. the gap is the biggest. Such a conclusion will then allow for a better focus of the new strategy, the sub-targets and the associated policy options developed currently by the Commission, and present a background for the Impact Assessment of the policy options for post-2010.

3.2 Headline target component 1

Reviewing the policy baseline in its table format (see Table 1) , the situation looks rather promising with respect to the headline target component of halting *biodiversity* loss in protected areas (1a).

a. Within the Biodiversity policy domain positive effects are expected of the processes initiated in the past decade, under the assumption that the Member States will fully implement the Biodiversity Action Plan. Some of the remaining threats can be addressed via stimulus of the Natura2000 management plans (by the Member States), in some case involving compensation to stakeholders[91] and an improved Monitoring strategy to provide adequate feedback to Member States and site managers, as well as a basis for legal action. One of the important shortcoming of the biodiversity policies in the past, i.e. the "*absence of a baseline and measurable targets against which progress could be measured*", is now being addressed and should no longer be a "gap" in the next decade. In spite of many initiatives taken within the Agricultural policy domain (see section 2.3), this is still the area with the largest gap, as long as one of the shortcomings of the past period (see 2.4) "*implementation problems with aspects of some existing practical measures*, *such as the unfulfilled potential of some agri-environment schemes*" has not been addressed properly. The voluntary basis has been mentioned (see 2.2) as one of the weaker links. Air policies at the local level have not reached maximum protection levels, as Nitrogen still exceeds critical loads and concentrations in many places (see 2.4). In the Climate policy domain, the major risk of a continued "gap" between ambition and realisation is in full implementation of climate policies across all of Europe.

[91] See Bouwma, I. et al. 2010. Effective conflict resolution in the Natura 2000 Network. Alterra report for the European Commission.

b. Halting biodiversity loss in non-protected areas (Column 1b in Table 1), on the other hand, poses some greater risks and challenges as there are less legal regulations currently in place. In many of the policy domains there are still aspects or regions where fragmentation due to further urbanization with associated infrastructure continues to be a risk. Fresh water systems should be increasingly protected under the Water Framework Directive, but enforcement in the water management domain is still an issue of concern. Integrated policies in the wider rural landscape addressing the threats of fragmentation (especially in combination with the long term changes due to Climate Change) and local pollution, such as now proposed in the studies on Green Infrastructure for the rural areas of the EU should be able to provide the necessary policies to counteract these risks.

c. The greatest gap between what can be achieved under the current policies, as summarized in the Policy Baseline, and the Post 2010 EU Biodiversity target for 2020 in Halting the Biodiversity loss is in the marine domain. Checking the Column (1c) in Table 1, major threats continue to exist and as well as unknowns of future impacts of policies (transportation, regional) on marine and coastal habitats. Further development of the designation and confirmation of the Marine Natura2000 areas should of course provide better perspectives for marine biodiversity. The experience in the past few years with the opposition to the designation and implementation of these protection regimes is however reason for concern. This all implies considerable future risks for the target of halting the loss of biodiversity in marine areas (1c). Strong emphasis on the rather recent fisheries policies (Marine Framework Directive) could provide the necessary stimulus.

3.3 Headline target component 2

The second headline target component, on ecosystem services, is only indirectly addressed in the current set of policies under the policy baseline. As such, a major gap exists, i.e. the development of specific policies addressing specific ecosystem services. This should have a dual result, (1) protection the biodiversity as such in those systems involved in providing the services and (2) generating economic benefits to the stakeholders associated with these ecosystem services. However, if biodiversity loss is indeed stopped, this should already contribute positively towards halting the degradation of many of the ecosystem services. The relationship between biodiversity loss and ecosystem services loss is quite clear for the regulating and cultural services[92], and of course for the ecological processes responsible for developing and maintaining biodiversity (called supporting services by the Millennium Ecosystem Assessment), so for these services the remaining gap is essentially the sum of all gaps towards the 2020 biodiversity target. The recommended approach in the next decade is therefore rather basic: stop biodiversity loss, inside and outside protected areas, above ground and in soils, in freshwater and marine ecosystems alike, and the degradation of these types of ecosystem services will be stopped. On the other hand, for provisioning ecosystem services (e.g. in agriculture, fisheries, forestry, horticulture, medicine), a minimum amount of biodiversity is required (at genetic, species and system levels) to make biomass production possible. Some types of desired services require very specific protection, e.g. the potential of some plant species to provide medicines. The optimal quantities and best mixes of species per system are not that easy to define. Mapping, quantification and valuation of the current ecosystem services in the EU is a necessary requirement to direct efforts and monitor progress.

[92] See e.g. Braat and Ten Brink, 2008. The Cost of Policy Inaction: the case of not meeting the 2010 Biodiversity target. Report to the European Commission.

3.4 Headline target component 3

An important gap exists with respect to the Restoration component of the Headline Target. The restoration of the "quality" (e.g. species richness, viable populations) of the biodiversity in current protected areas is partially addressed via the direct biodiversity protection policies, but an assessment of the contribution of other sectors has so far proven inconclusive as to how much of the target they could help achieve. As such, knowledge about cost-effectiveness of biodiversity and ecosystem service restoration projects and a clear overview of the best opportunities across Europe to develop restoration projects is also missing[93], and constitutes knowledge gap. To close remaining gaps between target and the policy baseline, it should help to develop measures on quality improvement possibilities in protected areas but the creation of new biodiversity remains subject to competition on land and will thus rather have to be addressed via various sectoral measures.

3.5 Headline target component 4

The fourth headline target component on the global dimension is broadly approached by developing more sustainable use and resource efficiency in the EU itself, as well as with certification of product-chains with renewable resource imports and furthermore indirectly addressed via some of the sectoral policies, such as REDD++, but it can be seen from the current policy baseline that a major gap still exists in this area, and the new biodiversity strategy has to focus on developing clear measures towards achieving this component of the target.

3.6 Cross cutting gaps

In the review of then past decade's efforts, the European Commission has identified a number of shortcomings, which should be dealt with in the new Post 2010 EU biodiversity strategy. A number of these shortcomings will indeed disappear with full implementation of the currently existing policies, i.e. if the policy baseline is materialising its expected results. Some have been identified above, as being resolved if extra efforts are developed in some of the police domains, but there are a number of so called "cross cutting" gaps which will continue to exist, even if the policy baseline is fully successful, unless the new biodiversity strategy deals with them explicitly:

- *insufficient integration (mainstreaming) of biodiversity concerns in other policy areas and in the financial perspectives and financing cycles, and insufficient use of economic incentives and economic instruments.*

  This is a complicated area of policy as it crosses traditional sectoral and disciplinary (ecological and economic) boundaries, especially the case in the fisheries sector, and to a much lesser extent in the agricultural sector, but also in regional development and the transportation sector. There is a need of very creative economic stimulus measures, possibly related to the better understanding of the benefits of ecosystem services;
- *insufficient funding provided for biodiversity protection coupled with harmful subsidies*

  The fisheries sector is the prime example. However, insufficient funds are a problem across the whole European Union, especially for compensation and payment for ecosystem services to particular stakeholders;
- *information failures*, such as incomplete monitoring; *insufficient resources* allocated to monitoring and evaluation tools, and *insufficient advice and training* due to limited capacities in conservation agencies.

[93] See Aronson et al. 2009. One Hundred Questions of Importance to the Conservation of Global Biological Diversity. Conservation Biology, Volume 23, Issue 3, pages 557-567.

This cross cutting gap cannot be linked to any specific sector. It is a gap which is uneven across Europe, some Member States have implemented rather adequate monitoring, evaluation and reporting systems, but other Member States still in early stages of development and implementation. The Post 2010 Biodiversity Strategy is very dependent for its success on major progress in closing this gap.

This summary of the "gaps" provides a justification of the chosen sub-targets of a future EU biodiversity strategy for achieving the headline target. The current policy baseline, the continuing pressures on biodiversity and the remaining gaps to be addressed outline the type of smart sub-targets and associated policy measures needed to ensure a successful implementation of a post-2010 EU biodiversity strategy.

4 Impact assessment of overall policy options

This chapter contains the impact assessment tables that were generated for the three proposed policy options of addressing the new 2020 biodiversity target. The impact assessment tables rate the anticipated impact in terms of a very negative (- - -) to very positive (+++) range and provide short explanations. Environmental, economic and social impacts are evaluated. In addition, brief statements are provided on feasibility and potential risks.

4.1 Policy Option 1: No Action

Table 2 Impact Assessment of Policy Option 1 (No Action)

	Anticipated impact (rated from - - - to +++)	Explanation of rating and aspects of the policy option necessary to achieve impact
Environmental impacts		
Contribution to reduction of pressures		
- Overexploitation	- - -	Very negative impact expected as some of the direct sustainable use / protection measures would disappear. Additionally, indirect negative impacts are expected as well: for example, current fisheries policies CFP etc do not put a serious stop to current exploitation practices; with the cessation of biodiversity policies, the cross-linkage and encouragement of biodiversity-aware policies in other sectors will also disappear and therefore no improvement in relevant other policy sectors can be expected.
- Habitat Destruction / Fragmentation	- - -	Very negative impact expected once Natura2000 legislation would run out. Current development of site management plans may stall; loss of current ambitions to increase connectivity will increase fragmentation.
- Climate Change	0 / -	Likely no significant impact on global climate as other sectoral policies (and DGs) are primarily responsible for addressing climate change targets (DG CLIMA and DG ENERGY). However, contribution to C-sequestration in protected areas would be reduced, which in turn reduces EU contribution to combating climate change at global scale.
- Invasive species	0 / -	Likely no significant economic impact as other sectoral policies (and DGs) are primarily responsible for addressing invasive species (DG SANCO / DG AGRI). Loss of “biodiversity protection incentive” would however contribute to threat of species populations at risk.
- Pollution	0 / - -	Likely no significant impact on environmental quality as other policies are primarily responsible for addressing pollution. However, as nitrogen deposition, and nitrogen in run-off in many places and phosphate in agricultural soils still exceed critical loads / concentrations the biodiversity in terrestrial, aquatic and soil, and the incentives disappear, ecosystems will not improve, and run increasing

		risk of loss.
Contribution to the 2020 EU target		
- Biodiversity	- - -	Lack of biodiversity specific policy continuation, especially protected areas and connectivity policies, would likely contribute very negatively to achieving this aspect of the target.
- Ecosystem services	- - -	Likely very negative impact, especially to regulating services (regional climate, water and nutrient cycles, flooding, pollination) and cultural services (outdoor recreation, landscape quality); some other sectoral policies could also address ecosystem services as they rise in importance. However, the "free" ecosystem contribution in provisioning services would decrease and require extra human, fossil fuel based inputs (fertiliser, water purification, commercial pollination).
- Global biodiversity	- -	EU biodiversity legislation has been one of the frontrunners worldwide. Assumption is that no concerted action on European level would likely also negatively impact the global efforts towards better biodiversity protection. Policies with respect to ecological footprint and certification of imported natural resources are being developed and implemented. Lack of incentives will slow down or halt these efforts.
Economic impacts		
Financial costs to EU budget	+++ / -	Due to the cessation of an EU-level policy, financial costs to EU budget would reach 0 once ongoing legislation runs out. It may however lead to claims from stakeholders at EU level to compensate for losses and expected incomes from biodiversity and ecosystem services.
Financial costs to Member States and other public authorities	0 / -	Either no impact, or potential increase in costs for MS / public authorities if they want to keep up their own biodiversity targets, but will not be able to receive EU funding anymore once EU-level policies run out. It may however lead to claims from stakeholders at MS level to compensate for losses and expected incomes from biodiversity and ecosystem services.
One-off costs	0 / -	No new one-off costs since no new policy / legislation will be introduced. However, potential one-off costs to restructure DG ENV to accommodate for the cessation of biodiversity as an EU level policy?
Recurrent costs	+++	No new recurrent costs since no new policy / legislation will be introduced. It may however lead to claims from stakeholders to compensate for losses and expected incomes from biodiversity and ecosystem services.
Benefits (avoided costs)	- -	Since there would be no EU-level biodiversity policy, no benefits could be generated / no costs avoided.
Social impacts		
Impacts on different social and economic groups		
- Who benefits (e.g. through new jobs)	- / +	Likely negative impact on nature conservation / biodiversity related groups / NGOs across Europe as they will not be able to receive funding / support from EU-level policies anymore. On the other hand,

		benefits may fall to some development sectors (infrastructure, construction, trade of natural resources from developing countries) when EU and MS policies of biodiversity protection fade away.
- Who bears the costs?	- -	European society as a whole is bound to bear the costs of the likely impacts caused by the 'no action' scenario. In particular, biodiversity-dependent people in MS that do not have strong national biodiversity policies are bound to bear the heaviest burden. Stakeholders may have to deal with losses of expected incomes from biodiversity and ecosystem services (recreation, agriculture, forestry, fisheries).
- Level of flexibility for dealing with local issues	0	Local and national initiatives would increase in importance in the absence of a EU-wide policy. However, it is questionable whether these would continue with the same level of support without the EU backing. Priorities across Europe are very different, given the different situation in income distribution, employment opportunities and economic growth. Therefore biodiversity and ecosystem services are expected to degrade differentially, with above mentioned costs for different social groups, especially in central and Eastern Europe.
Relationship to existing measures		
- To what extent is this done already, so it builds on them?	- -	This policy option would let existing biodiversity legislation run out and as such discontinue what has already been set up as existing measures. When natural capital is no longer protected, destruction may follow, as will destruction of related economic capital (investments), intellectual capital (knowledge about ecosystem services contributions from biodiversity) and social capital (commitment from stakeholders at all geographical levels to develop quality of life).Any start-up in the future, would then be much more difficult politically and more costly as existing measures and implementation tools will have been stopped.
- Effectiveness of existing measures	- -	The policy option would have a negative impact on currently existing measures – both direct EU biodiversity measures as well as broader related policies. First of all, still ongoing biodiversity legislation would lose its "teeth" (incentive) for implementation as governments would know that there is no follow-up legislation once the current one runs out. Also, commitment of stakeholders would probably rapidly diminish as perspectives for improvement of quality of environment, ecosystem benefits and life disappear. Second, any related measures, such as international biodiversity policy negotiations or national level policies would likely also suffer if the EU withdraws its support for a concrete biodiversity policy for reaching the 2020 target.
Risks	Discontinuation of policies which have been perceived as ambitious, generally beneficial to the public, though restrictive to some sectors, may spill over to other policy domains (agriculture, fisheries, international trade), as issues of trust and reliability will be raised by stakeholders at all levels.	
Feasibility	Stopping current policies with related subsidies and social processes may be difficult due to political opposition on regional and national level. Technical feasibility of this option with respect to reaching the 2020 biodiversity target is insufficient as biodiversity	

	levels are expected to further degrade rather than improve under this policy option.
Stakeholders' views	It is very likely (based on experience in stakeholder surveys for Natura2000) that the split in society between stakeholders which pursue short term private benefits and those that value long term and social benefits will become very evident.
- - - = very negative impact; - - = negative impact; - = likely negative impact; 0 = no significant impact; + = likely positive impact; + + = positive impact; + + + = very positive impact	

4.2 Policy Option 2: Business As Usual[94]

Table 3 Impact Assessment of Policy Option 2 (Business As Usual)

	Anticipated impact (rated from - - - to + + +)	**Explanation of rating and aspects of the policy option necessary to achieve impact**
Environmental impacts		
Contribution to reduction of pressures		
- Overexploitation	- -	Negative impact expected as current policies are likely not far-reaching enough to sufficiently address current/expected levels of overexploitation. This holds especially for fisheries sector.
- Habitat Destruction / Fragmentation	- -	(Slightly) negative impact expected as current measures are not sufficiently addressing fragmentation issues. Connectivity studies across the EU have clearly indicated that the current and planned Natura2000 effort will not be enough to stop degradation of populations (mostly small fauna which is already at risk) which are isolated (IEEP / Alterra, 2010). The quality of refugia in the rural landscape need to be improved and protected. Impacts of climate change are expected to be most visible in these populations.
- Climate Change	0	Likely no significant impact as other sectoral policies (and DGs) are primarily responsible for addressing climate change targets (DG CLIMA and DG ENERGY). If biodiversity policies are implemented some contributions can be expected in natural carbon sequestration in protected areas. The full potential is however not exploited yet.
- Invasive species	0	Likely no significant impact as other sectoral policies (and DGs) are primarily responsible for addressing invasive species (DG SANCO / DG AGRI). Policies still need to be implemented across Europe. Additional incentives may be required where economic benefits of introducing alien species cause risks to EU biodiversity.
- Pollution	0 / -	Likely no significant impact on environmental quality as other policies are primarily responsible for addressing pollution. Instances of exceeding critical loads and concentrations still require attention, especially in some north-western regions of Europe with intensive agriculture practices.

[94] For more detailed overview of impacts, see the Policy Baseline Table 1.

Contribution to the 2020 EU target		
- Biodiversity	- -	Current policies, thus, the BAU scenario, are deemed insufficient for helping the EU reach the 2020 headline target on halting biodiversity loss. The protected area policies may achieve some successes, especially where Natura2000 management plans are rapidly implemented by the Member States. The policies are insufficient, however, in the rural landscape and urbanised regions, due to fragmentation, competing claims for land and natural resources. Restoration ambitions are currently not part of EU or MS spatial policies.
- Ecosystem services	-	Ecosystem services are not specifically covered by existing legislation. Therefore, the BAU would likely have a negative impact towards reaching this 2020 target component. Of course it should be noted that some other sectoral policies could also address ecosystem services as they rise in importance. However, this would imply additional policy development and implementation in many of the EU DG's and Member States, e.g. in fisheries, agriculture, water management.
- Global biodiversity	- -	Without additional legislation, the current policies are not sufficient in helping the EU reach the global dimension of the 2020 target. Current development of certification of natural resource imports is slow and incomplete. The ecological footprint of the EU is large and increasing.
Economic impacts		
Financial costs to EU budget	-	Potentially a slightly negative impact because some of the policies currently in the pipeline (but not operational yet) will have to be implemented over the coming years.
Financial costs to Member States and other public authorities	- -	A negative impact because of the implementation of the current pipeline policies to be expected over the coming years.
One-off costs	0	No new one-off costs since no new policy / legislation will be introduced.
Recurrent costs	-	Slightly increasing recurrent costs as the pipeline policies will have to be implemented.
Benefits (avoided costs)	0 / +	Potentially some avoided costs due to improvements achieved over coming years resulting from implementation of current policies. Benefits are expected to increase as ecosystem service levels improve with implementation of BAU policy packages. Especially in outdoor recreation (an important economic revenue sector) and quality of life. The avoided costs in climate policies, water management and agriculture are substantial, but traditionally not included in the policy benefits.
Social impacts		
Impacts on different social and economic groups		
- Who benefits (e.g.	0	No significant change in impact is expected. Some benefits, including

through new jobs)		jobs, which were traditionally overlooked, may develop with biodiversity and ecosystem services improvement.
- Who bears the costs?	0	No significant change in impact is expected.
- Level of flexibility for dealing with local issues	0	No significant change in impact is expected.
Relationship to existing measures		
- To what extent is this done already, so it builds on them?	++	This policy option does build on existing measures (i.e. it would ensure the continued implementation of them).
- Effectiveness of existing measures	++	Given the fact that current measures would be continued under this option, it is expected that the policy option will help increase the effectiveness of existing measures.
Risks	The main risk of a BAU scenario is the obstruction to further implementation of current initiatives and plans from stakeholders which do not recognise the social benefits (versus private and short term benefits) of investing in biodiversity and ecosystem services. The concept of ecosystem services is not yet fully understood by many of the relevant stakeholders. This will not improve under the BAU, as no further awareness and education initiatives are included. Implementation is therefore not depending on the quality of the current policies but on the willingness to change attitude from short term to long term benefits and to dedicate the necessary resources required for full policy implementation.	
Feasibility	The continuation of current policies is in theory feasible in political and financial terms. However, when looking at feasibility with respect to the more technical feasibility of meeting the 2020 target, the BAU option also is not far-reaching enough to meet the desired impacts by 2020.	
Stakeholders' views	Widely differing views exist. Current attempts by EU in projects to improve understanding of social and economic benefits of biodiversity policy show a lack of a basic understanding among many of the stakeholders regarding the relevance of protection and the necessity of investing in ecosystem quality.	
- - - = very negative impact; - - = negative impact; - = likely negative impact; 0 = no significant impact; + = likely positive impact; + + = positive impact; + + + = very positive impact		

4.3 Policy Option 3: Enhanced Policy

Table 4 Impact Assessment of Policy Option 3 (Enhanced Policy)

	Anticipated impact (rated from - - - to + + +)	**Explanation of rating and aspects of the policy option necessary to achieve impact**
Environmental impacts		

Contribution to reduction of pressures		
- Overexploitation	+++	Enhanced policy, especially sub-targets 1 and 2 - with restrained, sustainable harvests as main ingredient - would significantly contribute to reducing overexploitation problems and by implication, reduce the need for effort and associated costs in protection schemes.
- Habitat Destruction / Fragmentation	+++	Enhanced policy would significantly reduce habitat destruction and fragmentation levels via the specific sub-target (green Infrastructure, nature conservation) and corresponding policy measures, thus leading to significantly reduced pressures on biodiversity. The enhancement may require streamlining of agricultural and rural development funds to maximise return on investments in the rural landscape of Europe.
- Climate Change	0 / +	Likely no significant impact as other sectoral policies (and DGs) are primarily responsible for addressing climate change targets (DG CLIMA / DG ENERGY). Potentially some indirect positive effects on climate change adaptation via improved habitat protection, restoration activities, and maximising C-sequestration in protected areas and even the wider rural landscape.
- Invasive species	+	Sub-target focussing on invasive species would likely positively impact the fight against invasive species; even though enhanced policy cannot directly be steered by DG ENV and would need to also be supported / implemented via other sectoral policies and DGs (DG SANCO / DG AGRI). A substantial reduction in costs in economic sectors may parallel the reduction in risk to endangered species populations.
- Pollution	0	No significant impact is expected as pollution is addressed by other policies outside the scope of enhanced biodiversity policy. It is assumed that the proper implementation of these existing policies is sufficient to reduce pollution to a level of clearly reduced pressure to biodiversity. Pressure from the biodiversity policy domain to reduce local exceedance of critical loads and concentrations may lead to further improvement.
Contribution to the 2020 EU target		
- Biodiversity	+++	This is the part of the 2020 target that can most directly be influenced via enhanced policy. The implementation of all policy measures under the various sub-targets would significantly aid towards closing the gap between the current biodiversity status and the 2020 goals. The focus on full implementation would involve preparing for compensation of stakeholders at site level, which can involve social and economic losses.
- Ecosystem services	++	Enhanced policy with a focus on including ecosystem services would significantly contribute towards approaching the 2020 target on ecosystem services. Success is very much depending on widespread awareness of the relevance, social and economic benefits of managing the contribution of ecosystems in economic processes. This would imply development of a system, parallel to biodiversity as

		such, of indicators, monitoring, valuation and payment to stakeholders who manage ecosystem services for society (see TEEB). Though much of the success would also depend on other sectoral policies to follow suit in the implementation of the respective policy measures.
- Global biodiversity	+	Under the enhanced policy scenario, chances for reaching the global biodiversity target component for 2020 would improve. Sub-target 6 would have targeted policy measures that should trigger a positive impact. The degree of the success is in part dependent on actors outside the direct influence of biodiversity policy / legislation. The focus should be on explicitly linking certification of import flows to the EU of natural resources, thereby reducing the ecological footprint and developing a trade related system of payment for ecosystem services (see TEEB).
Economic impacts		
Financial costs to EU budget	- - / (+)	Enhanced policy will require the introduction of new legislation and associated additional costs to the EU budget. Smart streamlining of biodiversity objectives with sectoral objectives and financial programs may limit these costs.
Financial costs to Member States and other public authorities	- - / (+)	Enhanced policy will also require the implementation of the new policies by MS and therefore increase financial costs to public authorities. Smart streamlining of biodiversity objectives with sectoral objectives and financial programs may limit these costs.
One-off costs	- -	The incurred additional costs will be a mix of initial set-up costs, which are one-off, as well as more continuous annual costs for implementation throughout the coming years.
Recurrent costs	- -	The incurred additional costs will be a mix of initial set-up costs, which are one-off, as well as more continuous annual costs for implementation throughout the coming years.
Benefits (avoided costs)	++	Enhanced policy is expected to generate significant benefits (avoided costs). For example, improved and better protected ecosystem services will ensure continued benefits in the future. Reduced fragmentation could save tremendous costs by helping areas to adapt to climate change, etc. A standardised system for quantification and valuation (monetisation) of the benefits needs to be developed to facilitate the introduction of the policies.
Social impacts		
Impacts on different social and economic groups		
- Who benefits (e.g. through new jobs)	++	The enhanced policy scenario would likely create significant positive benefits in social terms. The implementation of new legislation would require the creation of new jobs, etc. On a wider societal level, the implementation of enhanced policy would also bring social benefits of opportunities for recreation, protected ecosystem services, etc.
- Who bears the costs?	+	Some stakeholder groups may initially be bearing the costs (e.g. if road cannot be built due to habitat fragmentation), however, on an overall societal level, societal benefits should clearly outweigh costs.

		Compensation schemes may be developed.
- Level of flexibility for dealing with local issues	+	Local issues can be better addressed under the enhanced policy scenario because the sub-targets and new policy measures allow for the inclusion of local specificities, etc.
Relationship to existing measures		
- To what extent is this done already, so it builds on them?	+++	The enhanced policy scenario is heavily built on existing biodiversity policy as well as ongoing policy efforts in other sectors. Policy measures for the various sub-targets have been carefully developed so that they build on existing legislation or feed into ongoing policy revision efforts.
- Effectiveness of existing measures	+++	Due to the fact that the enhanced policy scenario has been closely linked to ongoing efforts, the effectiveness and importance of these ongoing measures should also increase significantly.
Risks	The major risks to future success of an enhanced policy scenario are (1) economic (financial) crises and political focus on other issues, which divert attention and funds, and (2) erosion of social support (stakeholders) due to lack of investment in raising awareness and compensation schemes.	
Feasibility	Political and financial feasibility of the enhanced policy option still need to be explored once the EU policy proposal has been made for a post-2010 biodiversity strategy. However, if clear financing options and a division of the implementation burden can be offered, acceptance of this option should be feasible. With respect to technical feasibility, this policy option – assuming the proper implementation of the various policy measures – would allow the EU to reach (or at least get close to reaching) the newly set 2020 biodiversity target.	
Stakeholders' views	See under risks.	
- - - = very negative impact; - - = negative impact; - = likely negative impact; 0 = no significant impact; + = likely positive impact; + + = positive impact; + + + = very positive impact		

4.4 Comparison of the three options

Table 5 Comparison of the three overall policy options

	Option 1: No Action	Option 2: BAU	Option 3: Enhanced Policy
Environmental impacts			
Contribution to reduction of pressures			
- Overexploitation	- - -	- -	+++
- Habitat Destruction / Fragmentation	- - -	- -	+++
- Climate Change	0 / -	0	0 / +
- Invasive species	0 / -	0	+

- Pollution	0 / - -	0 / -	0
Contribution to the 2020 EU target			
- Biodiversity	- - -	- -	+++
- Ecosystem services	- - -	-	++
- Global biodiversity	- -	- -	+
Economic impacts			
Financial costs to EU budget	+++ / -	-	- - / (+)
Financial costs to Member States / other public authorities	0 / -	- -	- - / (+)
One-off costs	0 / -	0	- -
Recurrent costs	+++	-	- -
Benefits (avoided costs)	- -	0 / +	++
Social impacts			
Impacts on different social and economic groups			
- Who benefits (e.g. through new jobs)	- / +	0	++
- Who bears the costs?	- -	0	+
- Level of flexibility for dealing with local issues	0	0	+
Relationship to existing measures			
- To what extent is this done already / it builds on them?	- -	++	+++
- Effectiveness of existing measures	- -	++	+++
Risks	• Discontinuation of EU biodiversity policies may also generate negative spillover effects for implementation and/or buy-in of policies in other policy areas (trust and reliability of EU efforts may be questioned by stakeholders)	• Implementation is not depending on the quality of the current policies but on the willingness to change attitude from short term to long term benefits and to dedicate the necessary resources required for full policy implementation.	• The major risks to future success of an enhanced policy scenario are (1) economic (financial) crises and political focus on other issues, which divert attention and funds, and (2) erosion of social support (stakeholders) due to lack of investment in raising awareness and compensation schemes.

Feasibility	• Stopping current policies with related subsidies and social processes may be difficult due to political opposition on regional and national level. Technical feasibility of this option with respect to reaching the 2020 biodiversity target is insufficient as biodiversity levels are expected to further degrade rather than improve under this policy option.	• The continuation of current policies is in theory feasible in political and financial terms. However, when looking at feasibility with respect to the more technical feasibility of meeting the 2020 target, the BAU option also is not far-reaching enough to meet the desired impacts by 2020.	• Political and financial feasibility of the enhanced policy option still need to be explored once the EU policy proposal has been made for a post-2010 biodiversity strategy. However, if clear financing options and a division of the implementation burden can be offered, acceptance of this option should be feasible. • With respect to technical feasibility, this policy option – assuming the proper implementation of the various policy measures – would allow the EU to reach (or at least get close to reaching) the newly set 2020 biodiversity target.
Stakeholders' views	• It is very likely (based on experience in stakeholder surveys for Natura2000) that the split in society between stakeholders which pursue short term private benefits and those that value long term and social benefits will become very evident.	• Widely differing views exist. Current attempts by EU in projects to improve understanding of social and economic benefits of biodiversity policy show a lack of a basic understanding among many of the stakeholders regarding the relevance of protection and the necessity of investing in ecosystem quality.	• See risks.
- - - = very negative impact; - - = negative impact; - = likely negative impact; 0 = no significant impact; + = likely positive impact; + + = positive impact; + + + = very positive impact			

5 Detailed impact analyses of measures for sub-targets 1 and 2

This chapter provides the deliverables offering a more detailed impact analysis for the concrete policy measures proposed under sub-targets 1 and 2 of the draft biodiversity strategy / impact assessment thereof. It should be noted that the analysis is based on the measures that had been circulated by August 27, 2010.

5.1 Sub-Target 1: agriculture and forestry

The draft version of the impact assessment proposes the following definition for sub-target 1:

Definition

ST1 – % of land under a contract to deliver HNV related farming and forestry within and outside HNV areas or % of CAP direct support directed to HNV (area/farming to be determined) to contribute to good conservation status

Agriculture accounts for almost half of European land-use[95] and it is estimated that "50 % of all species in Europe depend on agricultural habitats". [96] Hence, agricultural practices and policy play an important role in maintaining biodiversity levels in Europe. Yet, biodiversity in rural landscapes has declined.[97] Three major reasons should be mentioned: first, agricultural land competes with land that is or could be natural habitats with endemic flora and fauna. Secondly, agricultural techniques that rely on intensive farming and high turn-over of fertilisers cause pollution with often negative direct and indirect effects on biodiversity. Thirdly, abandonment, intensive farming and irrigation have all had negative effects for the so-called agro-biodiversity, the biodiversity associated with traditional agricultural practices, with surplus nitrogen from fertilisers for example contributing significantly to the deterioration of both terrestrial and aquatic systems.

Through legislation, the EU has achieved varying success in reducing pressure from agriculture on biodiversity. Direct effects are observed through control of nitrogen losses and indirect effects come from organic farming (21% increase from 2005-2008). However, over the last few decades abandonment has been relatively widespread in areas with extensive production and small farms, especially in mountainous regions and/or on poor soils. Elsewhere abandonment can be strongly localised and relatively small-scale. Moreover, intensification indicators suggest that over the 1990-2000 period the main areas of intensification were in Ireland, Spain and parts of North Western Europe, and during the later part of the decade in the former GDR, Hungary, and the Baltic States (following earlier extensification and widespread abandonment of agriculture). Losses of permanent grassland as a result of both intensification and abandonment are projected to be widespread across the EU, with particularly large declines predicted in Portugal, Greece, Spain and Estonia.

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95 Farmer, M, Cooper, T., Swales, V. 2008. Funding for Farmland Biodiversity in the EU: Gaining Evidence for the EU Budget Review. Institute for European Environmental Policy (IEEP). A report for the RSPB.

96 Kristensen, P., 2003. EEA core set of indicators: revised version April 2003. Technical report. European Environment Agency, Copenhagen.

97 See e.g. IEEP & Alterra, 2010.

Stopping continued loss of biodiversity in agricultural landscapes is a priority for a post-2010 biodiversity policy for Europe. Recent changes in the political landscape have created convergence towards the concept of High Nature Value (HNV) farming which generally means low intensity farming, enabling relatively high levels of biodiversity.

The key instrument in EU for agricultural policy is the Common Agricultural Support (CAP) which also becomes central for maintaining HNV farmland and avoid abandonment or intensification. The CAP is divided into two pillars (see Table 6):

Table 6 The CAP pillars

Pillar 1	Pillar 2
The first pillar is a commodity-based regime. Originally it was a market intervention mechanism, providing price guarantees, production incentives and export subsidies for certain crops and livestock products. As such it was a catalyst of agricultural productivity. Through successive reforms, the first pillar subsidies have become more and more decoupled from production. Subsidies are now provided through either direct payments on the basis of historic production levels via Single Payment Schemes (SPS) or Single Area Payment Schemes (SAPSs), or, through market interventions including tariffs, intervention purchasing, or output quotas. First pillar payments are subject to environmental conditions in so called 'cross-compliance'. **First pillar payments are taken 100% from EU budget.**	The second pillar of the CAP addresses rural development and allows Member States to implement measures under the European Agricultural Fund for Rural Development (EAFRD) in, for example, alleviating or improving the ecological impacts of agriculture. It is divided into three thematic 'axes': (1) competitiveness, (2) environment, and (3) quality of life/diversification. Within these pillars there is an array of measures that can be used to support low intensity farming and the main elements relevant to HNV farmland conservation are agri-environment schemes and less favoured area payments. **Second pillar payments are partially co-financed by Member States and regions.** *(based on: EEA, 2004 and 2009)*

Most of the measures proposed under sub-target 1 focus on CAP and how it should be adjusted to support HNV farmers more appropriately. Measure 1 is a general "greening" of the CAP aimed to boost Pillar 1 payments towards HNV farming and to increase the relevance of Pillar 2 measures. Measure 2 is focusing on the current CAP period – 2007-2013 – and the efforts of Member States to increase the uptake of Pillar 2 funding and other biodiversity related measures. Measure 3 and 4 focuses on the 2014-2020 budget period which follows an expected revision of the CAP in 2013. Both measures elaborate further on what EU and Member States can do to increase funding, uptake and targeted actions. They also focus on improvements in monitoring and reporting.

5.1.1 Measure 1: Gear the CAP support towards biodiversity

Pillar one payments in the current CAP are disfavouring small-scale, low-intensive farming and even supports (high-intensity) farms viable without EU funds.[98] Resources from already economically viable farms could be freed up to sustain farming considered important for biodiversity purposes.

The first proposed measure for achieving sub-target one is: to adjust the CAP and direct its first pillar towards measures that reduces the risk of land abandonment or intensification of farming

[98] LEI 2010. Farm viability in the European Union: assessment of the impact of changes in farm payments, http://www.lei.dlo.nl/publicaties/PDF/2010/2010-011.pdf.

practices and substantially increase the funding in second pillar for agri-environment measures that would target HNV areas and Natura 2000 area and would deliver benefits for biodiversity.

Definition of Measure 1

Ensure that direct payments (Pillar 1 of the current CAP) are dedicated to biodiversity set-aside and other farmland features, to permanent grassland, to green (vegetation) cover, to crop rotation, to Natura 2000 and to HNV as a form of Payment for ecosystem services, and, substantially increase the funding in Second Pillar for agri-environment measures that would target HNV areas and Natura 2000 area and would deliver benefits for biodiversity.

In the current CAP system, funds from pillar one are allocated largely based on productive areas which create a bias against low-intensity farming. For example, in a number of case studies EEA found that between only 1.3 – 4 % of total CAP expenditure was spent on agri-environmental schemes that could benefit HNV farming[99] and in EU-15 cases, 85% of total CAP expenditure was spent under Pillar 1. Considering the uneven CAP spending, favouring pillar one measures, the large funding potentials are geared away from contributing to biodiversity.

Beaufoy *et al*.[100] suggest two options of shifting pillar 1 expenditure towards HNV farming:

1. Introduce a flat rate system, where farmers receive a flat rate for their amount of land. It would increase subsidy levels for HNV farmers at no cost for the CAP. However, under the current Single Payment Scheme (SPS), several sectors would suffer significantly from a flat rate system, making it a rather radical option;
2. The second option would be to propose an arbitrary cap of highest possible payment per hectare across sectors. The funds made available through cutting subsidies could then be reinvested in HNV farming.

Shifting pillar one support towards biodiversity-friendly agriculture does not imply that pillar two measures should continue on the current trajectory. Pillar two subsidies are supporting farmers to create suitable habitats on private land to encourage wildlife and a diversity of species in the area: so-called agri-environment schemes (AES). The range of measures taken to implement this approach obviously varies but remains a prescribed policy intervention for achieving dedicated biodiversity goals. These needs to be substantially increased.

Economic impacts

In a recent report[101] on farm viability, i.e. the dependency on subsidies to survive, the economic impacts on farms from an abolishment of (decoupled) payments were assessed. It shows that farmers that belong to certain crop or cattle categories are far more vulnerable to changes in the CAP than others.[102] Clearly, there are risks and impacts involved with shifts in subsidy allocation for these farms, however, the study also recognizes that farmers are often good in adapting to new realities and changes in the system, by changing crops or techniques for example. It is therefore expected that non-HNV farms could remain economically viable in case less productive but more biodiversity beneficial farms were supported under pillar one.

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99 EEA, 2009 Distribution and targeting of the CAP budget from a biodiversity perspective. European Environment Agency Technical Report No 12/2009.

100 See Beaufoy, et al 2009. Distribution and targeting of the CAP budget from a biodiversity perspective. Technical report. European Environment Agency, Copenhagen. p. 20.

101 LEI 2010. Farm viability in the European Union: assessment of the impact of changes in farm payments, http://www.lei.dlo.nl/publicaties/PDF/2010/2010-011.pdf

102 It should be noted that differences between and within countries are large. Farmers in countries such as Sweden, UK, Finland, France and Denmark would be heavily affected.

Even if Pillar 1 funding should represent the bulk of HNV support, Pillar 2 measures have an important role to play by targeting certain groups and practices. Agri-environmental schemes under Axis 2 could support certain biodiversity friendly farming techniques and Axis 1 measures could help to address the many socio-economic problems associated with HNV farming.

It is noteworthy that option two does not entail lowering the CAP but simply shifting the criteria for payments.

Social impacts

Abandonment and intensification leading to the loss of HNV farmland are essentially the dependent on socio-economic factors. The key problem is that pillar one subsidies are biased toward intensive farming, thus, in case the HNV target is to be reached it must come from changes in the socio-economic environment of farmers.

Existing studies suggests that HNV farms have lower net incomes than non-HNV farms, partly because of lower shares of arable land. This could create significant social effects where intensification of farming is associated with higher income levels. Currently, poor land with poor return of labour is often unviable, leading to abandonment. In some cases, the return on labour input is even below the legal minimum wages.[103] Hence, if successful, the HNV programme can provide substantial benefits for farmers working poor fields in often distant rural areas. Moreover, Article 68, introduced in the Health Check, was meant to boost funds going to HNV farmers. However, to this date it appears to have little effect.

Current CAP amounts to roughly €53 billion a year (48% of the EU budget). It equates a distribution of €290 per hectare of Utilised Agricultural Area (UAA).[104] About 1/5 of the CAP expenditure is spend on under the 2nd pillar which includes agri-environmental schemes. It is not easy, however, to establish the actual income levels of HNV farms compared to non-HNV farms.

Social impact from a successful implementation of biodiversity related measures are overall expected to be positive. Farmers in remote places, especially in HNV areas, are often sensitive to market changes, weather events, generational shifts and more intense competition. Poor income also hinders investments in new techniques and might even "force" farmers to use unsustainable methods. By supporting both the livelihood and opportunities of HNV farming, as well as the continued use of low-intensity techniques, the social impacts of increased CAP support to these areas are creating a win-win situation with growing levels of wellbeing for farmers and reduced losses of HNV farmland.

Environmental impacts

To quantify the environmental impact of 2003's CAP reform on biodiversity poses large methodological hurdles which is supported by the diverging opinions among scientists. Osterburg *et al*. (2007)[105] expected the decoupling part to mainly concern land falling out of production, and extensification of land use (especially on grassland) and other forage area. Also, the inclusion of certain landscape elements into the eligible area, (depending on the implementation rules at Member State level) which might facilitate the creation of hedges and other landscape features, as

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103 Jones, G. (2010) Socio-economic challenges to HNV farming and farming communities. Presentation at Vilm, Germany, June 14th to 18th 2010.[103]

104 Beaufoy et al 2009.

105 Osterburg et al 2007 Analysis of policy measures for greenhouse gas abatement and compliance with the Convention on Biodiversity. MEACAP WP6 D16a.

the area related payments are not lost any more in case of land use changes. Schmid, Sinabell and Hofreither (2007) argue that impacts are at least better with the CAP reform than without, whereas, Brady (2010) in a working paper zoom in on the decoupling part of the reform and conclude that impacts have been small to negative on biodiversity and nature conservation (see textbox).[106]

Moreover, the environmental impact on agri-environmental schemes (AESa) has received mixed reviews.[107] Evaluations in terms of biodiversity gains are scarce but some studies argue that they have considerable impacts.

In terms of biodiversity gains resulting from the CAP 2003, results are unclear whether any real benefits have been made. Still, the continued bias towards intense farming and unclear impacts on the environment, one could conclude that increased funding opportunities for HNV farms to remain viable, should at least have reduce the negative impact of continued abandonment or intensification.

Box 2 Supporting evidence and references

In a modelling exercise with Austria as a case study Schmidt, Sinabell and Hofreither (2007) show how the environmental impacts of the CAP 2003 reform can be estimated and conclude that intensive farming will decline and potentially harmful agricultural inputs will be reduced.

Figure: Environmental impacts of the CAP 2003 reform

	Council decoupling	Austrian implementation	Complete decoupling
	Percentage versus Agenda 2000 scenario		
Economic, factor use and output indicators			
Gross value added plus other subsidies	+1.2	+0.7	+1.4
Variable cost livestock products	+0.5	+2.5	−3.4
Variable cost crops	−1.0	−0.8	−5.6
Arable land	−1.5	−1.7	−7.0
Meadows and pastures	+2.8	+3.1	−2.6
Output of beef	−5.0	−3.3	−6.8
Output of pork	+0.1	+0.0	−2.1

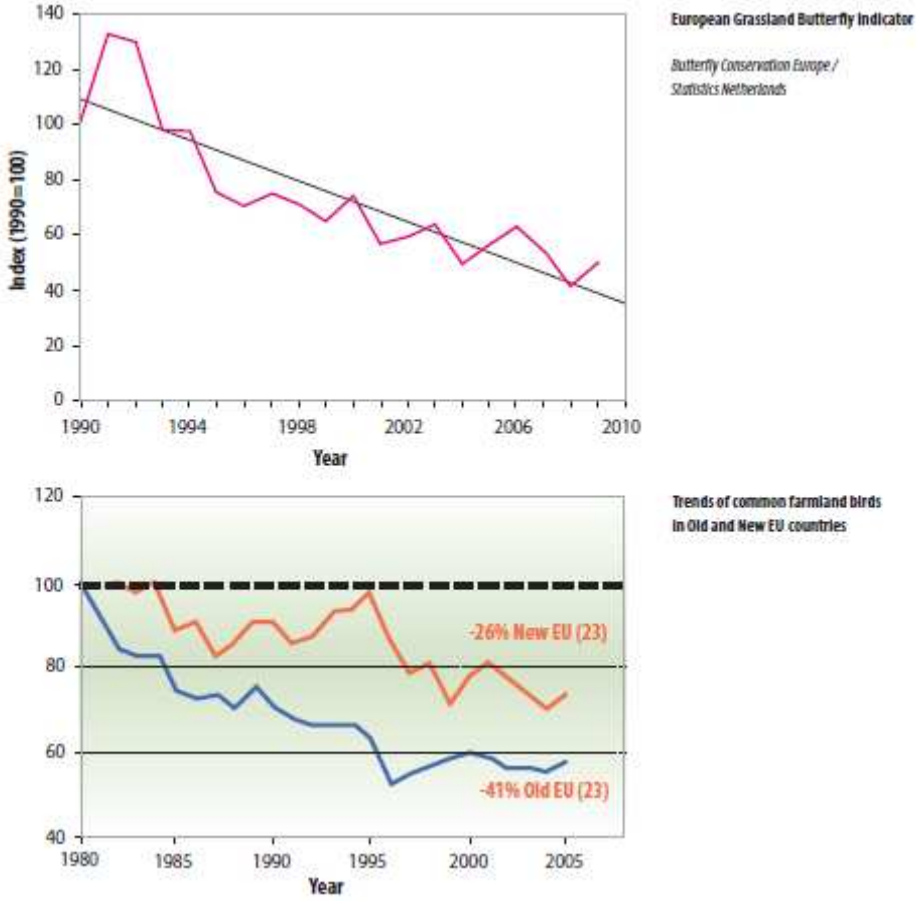
[106] Brady, M. (2010) Impact of CAP reform on the environment: some regional results. Paper presented to OECD Workshop on the Disaggregated Impacts of CAP Reform 10-11 March 2010, Paris, France. Accessed via: http://www.agrifood.se/Files/AgriFood_WP20103.pdf.

[107] Kleijn, D, R. A. Baquero, Y. Clough, M. Díaz, J. De Esteban, F. Fernández, D. Gabriel, F. Herzog, A. Holzschuh, R. Jöhl, E. Knop, A. Kruess, E. J. P. Marshall, I. Steffan-Dewenter, T. Tscharntke, J. Verhulst1, T. M. West, J. L. Yel. (2006) Mixed biodiversity benefits of agri-environment schemes in five European countries. Ecology Letters Vol. 9 Issue 3. 243-254.

Farm management and environmental indicators			
Organic farming on arable land	−0.8	−1.0	−2.7
Organic farming subsidies	+0.7	+1.0	−2.6
Soil cover during winter	−1.4	−1.6	−7.3
Livestock units (total)	−1.1	−0.3	−3.1
Average livestock units per hectare	−2.0	−1.0	+1.9
Methane emission	−1.3	−0.5	−3.5
Carbon storage in soil	+0.1	+0.1	+1.1
Nitrate from manure	−1.0	−0.1	−3.1
Nitrate from mineral fertilizers	−1.0	−0.9	−7.2
Nitrogen surplus (OECD method)	−0.7	±0.0	−2.8

Many species in the European rural landscape – such as birds and butterflies - thrive on areas with HNV farmland characteristics. The decline in their population is often therefore been used as an indicator for HNV farmland status:

Figure: Butterfly and bird indexes



Source: Beaufoy and Marsden (2010) CAP reform 2013 last chance to stop the decline of Europe's High Nature Value farming? EFNCP, BirdLife International, Butterfly Conservation Europe and WWF joint paper. http://www.efncp.org/download/policy-cap-reform-2013.pdf

Relevant sources

- Osterburg et al 2007 Analysis of policy measures for greenhouse gas abatement and compliance with the Convention on Biodiversity. MEACAP WP6 D16a
- Boatman, L., J. Dwyer, J. Ingram (2006) OBS 04: The environmental implications of the 2003 CAP reforms in England. Agricultural Change & Environment Observatory Programme.
- Boatman et al. 2008 A review of environmental benefits supplied by agri-environment schemes. Land-use and policy group FST20/79/041.
- Gay, S.H., B. Osterburg, D. Baldock., A. Zdanowicz 2005. Recent evolution of the EU Common Agricultural Policy (CAP): state of play and environmental potential. MEACAP WP6 D4b
- Schmid, E. F. Sinabell, M. F. Hofreither (2007) Phasing out of environmentally harmful subsidies: Consequences of the 2003 CAP reform. Ecological Economics, 60 pp. 596-604

Feasibility

Any solution which redistributes funding within the CAP system is bound to meet resistance from current beneficiaries, especially in EU-15 as: "The widespread use of a historic basis for allocating payments under the current Single Farm Payment Scheme (SPS) has largely fossilised the pre-existing funding pattern, generally favouring more intensive production systems". [108]

Risks

As mentioned in the preceding section, European agricultural policy has benefited certain groups and created vested interests in some agricultural sections. These groups have exerted potent pressure often on national governments to resist large-scale changes in the CAP. Earlier attempts to make large changes in the CAP have resulted in demonstrations and strikes both in Brussels and in Member States. Hence, in case there comes a push for even stronger environmental criteria linked to payments or shifts in distribution does bring about real risks in causing unrest among some current CAP beneficiaries. It should also be noted that the farms most vulnerable to changes, i.e the ones with the highest level of CAP-subsidies – such as arable, dairy and other grazing and mixed – represents the majority of both farms and about 95% of farmland in Europe. [109]

5.1.2 *Measure 2: Encourage Member States to allocate money to projects with biodiversity benefits (for the 2007-2013 period)*

With the 2003 CAP reform, a number of instruments were introduced or adjusted to facilitate and even oblige Member States (MS) to spend more from the CAP on rural development and environmentally sound projects. For example, MS possibilities to transfer funds from pillar one to pillar two (called modulation) were significantly improved and so-called cross-compliance was introduced which requires farmers to comply with a set of Statutory Management Requirements (SMRs) and keep their land in Good Agricultural and Environmental Condition (GAEC) to be eligible support. In the latter case, failure to comply with the SMRs and GAEC could result in deduction or even cancellation of payments for farmers.

The European Agricultural Fund for Rural Development (EAFRD) and the regional development funds (European Fund for Regional Development) constitute the key funding opportunities for Member States to allocate resources in favour of biodiversity in the 2007-2013 budget period. The EAFRD, for example, funds the second pillar of the CAP with a budget of € 96.2 billion from which

[108] See Beaufoy, et al (2009) Distribution and targeting of the CAP budget from a biodiversity perspective. Technical report. European Environment Agency, Copenhagen. p. 20.

[109] LEI (2010) Farm viability in the European Union: Assessment of the impact of changes in farm payments. LEI report 1020-011, LEI part of Wageningen UR, the Hague.

€43.7 billion is ear-marked for environment and land management.[110] On top of that, private investments, national co-finance schemes and top-ups increase the figures further. Nevertheless, uptake and usage of these funds have been limited and all in all, the current financial possibilities are under-funded.[111]

This uptake needs to be increased under the current budget period 2007-2013 to utilise the full potential of the funding possibilities. Impetus from inducing this process needs to come from Member States as they are the prime managers of allocating the funding since the EU is only responsible for outlining Strategic Guidelines which then should be translated or at least reflected in the basis of national context.

The second measure to improve Member State spending uptake of biodiversity related activities is to encourage Member States to close the gap in resources available and concrete measures on the ground.

Definition of Measure 2

Within the 2007-2013 budget period – On an EU level: to encourage Member States to allocate more money to biodiversity through modulation and other measures; improve absorption of money delivering biodiversity benefits. On MS level: make the most benefit of the European Agricultural fund for Rural Development for biodiversity: improved cross-compliance; increased modulation to biodiversity; increase allocation and uptake of agri- forest-environment measures and Natura 2000 payments; increase area receiving above payments.

Economic impacts

The impacts of measure 2 can be expected to range from minor to positive economic impact on EU budget in its current state. It is in essence an allocation and efficiency measure to make Member States prioritise biodiversity when distributing their already set budget. Regional Development funding and measures - if implemented correctly - are expected to be beneficial in many ways for HNV farming, especially since sustaining the livelihood of farmers in distant areas is key to the problem (see box). EU mainly is able to make funding available and then encourage Member States, regions and local stakeholders to take the initiative. Funding via LIFE, EAFRD, FP7 and other regional development mechanisms are already in the 2007-2013 budget, hence the expected minor effects on the EU economy. Minor negative effects on other parts of rural development might be expected.

[110] Wehrheim, P. (2010) The EU's Rural Development Policy as an Instrument for Protecting Biodiversity – Complementarity with Life+. Presentation at LIFE Nature and Biodiversity Conference 31 May 2010, Brussels – Charlemagne. (http://ec.europa.eu/environment/life/news/newsarchive2010/documents/PW_DGAgri.pdf).

[111] Kettunen, M., Baldock, D., Adelle, C., Cooper, T., Farmer, M. Hart, K. (IEEP), Torkler, P. (WWF). (2009) Biodiversity and the EU budget: Making the case for conserving biodiversity in the context of the EU Budget Review. Report commissioned by the WWF to the Institute for European Enviornmental Policy (IEEP).

Box 3 Supporting evidence and references

Economic potential of the EAFRD

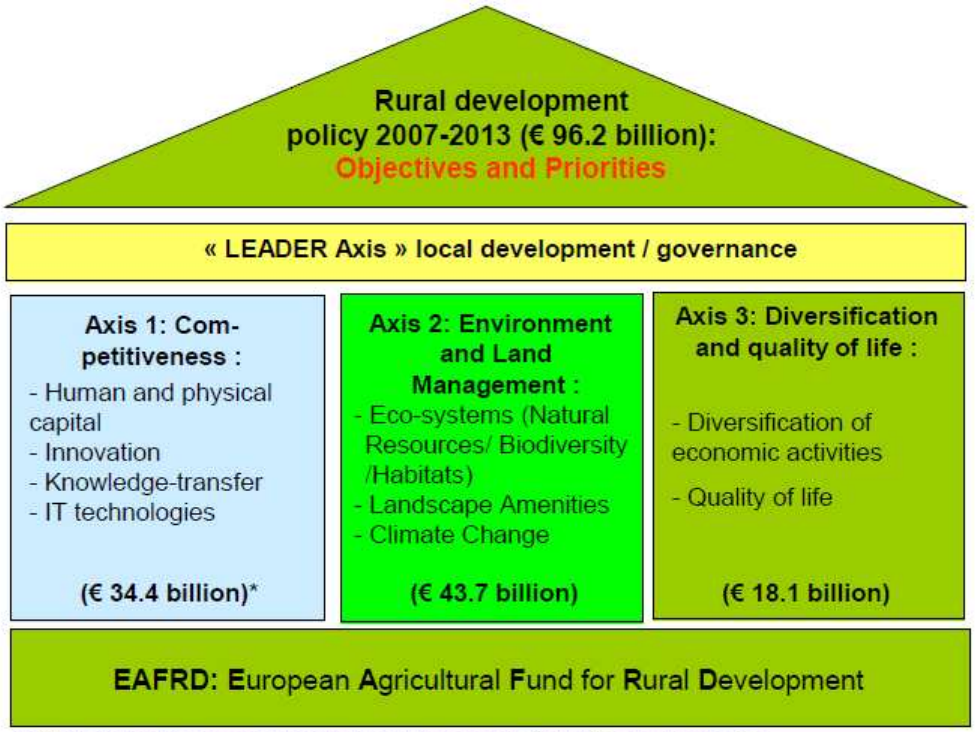
The first table below show how much larger the EAFRD is compared to other biodiversity related funding mechanisms available to MSs and other stakeholders.

Fund	Possible Community contribution for financing biodiversity (EUR)[9]	Proportion of the total EU budget	Comment
Environment: LIFE+	0.84 billion	0.1 per cent	40 per cent of the total LIFE+ funding earmarked for biodiversity
Agriculture & rural development: EAFRD	20.3 billion for agri-environment measures (AE) 0. 58 billion for Natura 2000 payments and Water Framework Directive (WFD) payments (agriculture and forest) 12.6 billion for natural handicap measures (LFA)	2.4 per cent 0.07 per cent 1.4 per cent	AE schemes are not only focused on biodiversity but often address other goals (see section 3.2 above). Therefore, the total amount of money either allocated specifically for biodiversity conservation, or that has indirect biodiversity benefits remains unclear LFA funding is **not earmarked** for promoting biodiversity conservation, i.e. final allocations for biodiversity not clear
Fisheries: EFF	No estimate available		
Regional development & cohesion: EFRD	2.7 billion for the promotion of biodiversity and nature protection 1.1 billion for promotion of natural assets 1.4 billion for protection and development of natural heritage	0.3 per cent 0.1 per cent 0.2 per cent	Funding for promotion of natural assets and protection and development of natural heritage **not earmarked** for promoting biodiversity conservation, i.e. final allocation not clear
Research & development: FP7	1.9 billion for environmental research Support to biodiversity projects to date: 29.6 million	0.2 per cent	Funding for environmental research **not all earmarked** for promoting biodiversity conservation, i.e. final allocation not clear

Source: Kettunen, M., Baldock, D., Adelle, C., Cooper, T., Farmer, M. Hart, K. (IEEP), Torkler, P. (WWF). 2009. Biodiversity and the EU budget: Making the case for conserving biodiversity in the context of the EU Budget Review. Report commissioned by the WWF to the Institute for European Enviornmental Policy (IEEP

Making use of the second pillar to support HNV farming

The second pillar's focus on rural development make substantial amounts of resources available, not only for AESs but also important measures to strengthen competitiveness and diversify the income base of rural areas.



* Figures in parantheses are indicative expenditures per axis 2007-13 as programmed by all 27 Member States including expenditures for technical assisstance and DP Romania and Bulgaria

Source: Wehrheim, P. (2010) The EU's Rural Development Policy as an Instrument for Protecting Biodiversity – Complementarity with Life+. Presentation at the LIFE Nature and Biodiversity Conference 31 May 2010, Brussels.

Considering the socio-economic causes of land abandonment for example, measures under both axis 1 and axis 2 can help to address the loss of HNV farmland. Additionally, the EAFRD is not the only potential source of funding. National co-financing and private expenditure also adds considerable amounts of funds.

Total indicative RD expenditures for EU-27 (2007-2013) with Health Check and Recovery Package

• EAFRD:	**€ 96.2 billion***	**41.4%**
• National co-financing:	€ 57.3 billion**	24.7%
• Private expenditures:	€ 66.2 billion**	28.5%
• National 'top-ups':	€ 12.4 billion**	5.3%
• **TOTAL:**	**€ 232.1 billion**	**100.0%**

* *This figure includes the additional amounts from Health Check and Recovery Package*
** *These figures are based on the revised programmes approved end of December 2009.*

Source: Wehrheim, P. (2010) The EU's Rural Development Policy as an Instrument for Protecting Biodiversity – Complementarity with Life+. Presentation at the LIFE Nature and Biodiversity Conference 31 May 2010, Brussels

However, these figures mainly show how large the potential funding is for Rural Development which could help against the loss of HNV farmland. In the end, these sources need to be better used by MSs to address biodiversity problems. Current uptake is still unsatisfactory, however, it shows that is more a matter of redistribution and targeting, then additional funding.

Social impacts

Expected social impacts, in the end, are largely similar to the ones mentioned under measure 1.

Environmental impacts

Please see measure 1 for explanation.

Feasibility

Uptake of pillar 2 funds and gearing CAP fund in MSs towards biodiversity had given uneven results. Some countries are more prone to use pillar 2 payouts for agri-environmental schemes and other not. Robust explanations for the situation are also scarce however the evaluation is considered to be challenging.

Box 4 Supporting evidence and references

Relevant sources

- Midmore, P., L. Langstaff, S. Lowman, and A. Vaughan (2008) Qualitative evaluation of European Rural Development Policy: Evidence from Comparative Case Studies. Paper presented at the 12th Congress of the European Association of Agricultural Economists – EAAE 2008;
- Glebe, T. and K. Salhofer (2006) National Differences in the uptake of EU Agri-environmental Schemes: An Explanation. Contributed paper prepared for presentation at the International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12-18, 2006;
- Barreiro-Hurléa, J., Espinosa-Godeda, M. and Dupraz, P. (2008) Does intensity of change matter? Factors affecting adoption in two agri-environmental schemes. Paper presented at the 107th EAAE Seminar "Modelling of Agricultural and Rural Development Policies". Sevilla, Spain, January 29th - February 1st, 2008.

Risks

Similar to measure one, redistribution of CAP always brings about the risk of civil unrest. Moreover, there are a number of undefined political risks if the Commission decides to increase pressure on MS to allocate funds in a certain direction.

5.1.3 *Measure 3 – Greening the CAP, finalise designation and ensure proper Natura 2000 management and increase monitoring (for the 2014-2020 budget period)*

To improve targeting of HNV farming in post-2013, there needs to be measures taken on an EU level and on MS level. The EU level is dealt with here in measure 3 and MS level is explained under measure 4. Much focus is on CAP, understandably considering the size and impact the 2013 reform could have for the viability of HNV farming. Nevertheless, other issues, such as monitoring, must be guided on an EU level to ensure adequate reporting on progress made. Measure 3 involves several EU level measures:

First, the already mentioned CAP reform could substantially alter funding patterns in favour of biodiversity. Whether to shift money from pillar one to pillar two – as argued in measure 1 – or how to use pillar 1 for HNV farming, is a matter of discussion. Current political climate appears to favour the two pillar system, however, the Single Payment System (SPS), especially when Member States

base support on historic levels, is having negative impacts on biodiversity, and should be addressed.[112]

Second, the designation of HNV farmland must be developed and guidelines for what is an HNV area and what is not, must be harmonised throughout the EU. However, when designating HNV land one must be cautious to not draw parallels to the Natura 2000 land designations. HNV farmland should not be designated land such as with Natura 2000 instead diffuse boundaries are to prefer and would benefit from remaining so. It is desirable that certain farming practices are promoted and not only payments based on land designation. This is why criteria should be based on farming and management practice instead of "blanket-payments" benefiting a whole area.[113]

Finally, the monitoring of HNV farming must improve, especially if targets are supposed to be measured. For 2007-2013, rural development programme interventions are evaluated with reference to the Common Monitoring and Evaluation Framework (CMEF). EU has developed a guidance document[114] on how to apply the indicator; this should in principle guide evaluators and Member States on how to assess RD interventions. In the CMEF, three indicators are related to HNV farming.

Table 7 CMEF indicators relevant for HNV farming

Indicator Number	Indicator Title	Measurement
Baseline Indicator 18	Biodiversity: High nature value farmland and forestry	UAA of HNV Farmland, hectares
Result Indicator 6	Area under successful land management contributing to biodiversity and HNV farming / forestry	Total area of HNV farming and forestry under successful land management, hectares
Impact Indicator 5	Maintenance of HNV farmland and forestry	Changes in HNV farmland and forestry defined in terms of quantitative and qualitative changes.

The EU must evaluate and develop the usage and of these indicators, in particular after seeing how they are being applied nationally in the upcoming mid-term assessment of CMEF. In case there is positive reactions from the evaluations and applications of indicators, this system should be maintained, in case it receives negative reactions it should be revised accordingly.

On an EU level, monitoring is more geared towards compiling and synthesising information than actual collection. Several systems are in place to address the scattered nature of EU-level biodiversity monitoring – such as BISE, EBONE and LifeWatch – however, there is currently no EU level initiative in place for HNV farmland monitoring.

Definition of Measure 3

Ensure that the CAP reform adequately recognises the role of biodiversity and ecosystem services: include measures in the CAP that provide benefits the biodiversity and ecosystem services especially to HNV and

[112] Beaufoy, et al 2009. Distribution and targeting of the CAP budget from a biodiversity perspective. Technical report. European Environment Agency, Copenhagen.

[113] Beaufoy and Marsden (2010) CAP reform 2013 last chance to stop the decline of Europe's High Nature Value farming? EFNCP, BirdLife International, Butterfly Conservation Europe and WWF joint paper. http://www.efncp.org/download/policy-cap-reform-2013.pdf.

[114] EC (2009) Guidance document: the application of the High Nature Value impact indicator. The European Evaluation Network for Rural Development.

Natura 2000 areas; finalise the designation of HNV farmland and HNV forest areas; develop together with MSs management criteria for HNV farmland and HNV forestry; encourage MSs to make use of these measures; develop monitoring and data collection system to measure the impact of land management on biodiversity and ecosystem services.

Economic impacts

The economic impacts of a change in CAP for the 2014-2020 budget period are at this stage too uncertain to assess. Increase in funding and better uptake on a national level will remain to be key, however, to what levels the funding need to go, is unclear.

Monitoring issues on an EU-level is more about coordinating and establish common guidelines and indicators for reporting. At this point, apart from the CMEF, indicators have been developed in the SEBI set (indicator 20) and IRENA.[115] This work needs to be further developed and include, in particular, socio-economic indicators such as generational shifts. The costs for this are, however, unclear.

Social impacts

The social impacts of a successful post-2013 CAP reform are expected to be similar to measure 1.

Environmental impacts

Please see measure 1 for explanation

Feasibility

The increased attention among the public and policy makers to environmental issues improves the political feasibility to gear the CAP towards biodiversity. Since the budget for agricultural subsidies have been a contentious issues in the eyes of many Europeans, “greening the CAP” could be a way to justify the spending on agriculture in eyes of the public and policy makers

Risks

See risks involved with measure 1.

5.1.4 *Measure 4: Increase funding opportunities for HNV farming on MS level, ensure proper usage and monitoring according to EU guidelines (Budget period 2014-2020)*

On a national level, the post-2013 period, should mean better availability of funds, better usage of funds and improved monitoring and reporting according to EU guidelines. It is similar to measure 2, however, in measure 4 the issue of monitoring is brought up.

Definition of Measure 4

Ensure that within the new financial programming more funds are directed to management practices benefiting biodiversity and ecosystems services: more money allocated to such measures than in the 2007-2013 period and more is actually being spent on them; more area receiving such payments than in the 2007-2013 period; apply monitoring and data collection system measuring the impact of land management on biodiversity and ecosystem services as developed by the EC.

[115] IEEP (2007) HNV Indicators for Evaluation, Final report for DG Agriculture. Contract notice 2006-G4-04.

Economic impacts

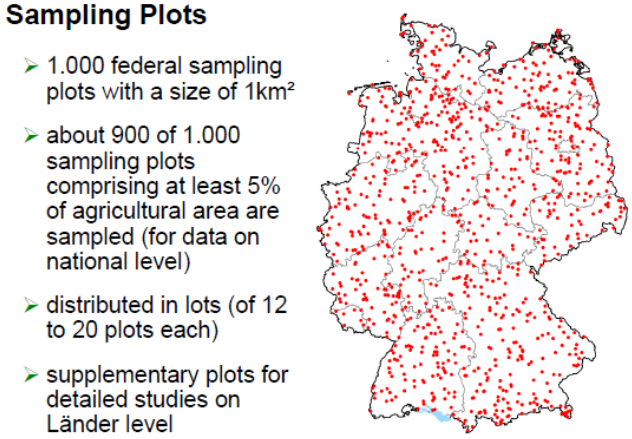
Member States are - like in measure 2 and 1 - in this measure encouraged to increase funding for HNV farming related objectives but most importantly, to utilise these funds in an effective manner. The impact of these efforts is at this stage very difficult to asses.

Regarding monitoring, however, there are more to be done. Currently, Member State level data collection and monitoring on HNV farming is under-developed. The only country with a system in place is Germany and is estimated to cost approximately €200,000 per year.[116] This system is expected to be suitable for up-scaling and naturally the size of the country and ratio of HNV farmland could bring this number up or low. Estimated share of HNV farmland in Germany is 15% which is relatively low considering the EU average is an estimated 32%. [117] One could therefore expect slightly larger funds needed for monitoring in many EU countries.

Box 5 Supporting evidence and references

German monitoring system

HNV farming monitoring is under-developed which makes policy impact difficult to measure. Germany has a simple site-based system costing about €200,000 per year.



Source: Benzler, A. (2010) Definition, Identification and Monitoring of HNV Farmland in Germany. Presentation at Vilm, Germany, June 14th to 18th 2010.[118]

Social impacts

Social impacts are expected to be similar to the ones under measure 2.

Environmental impacts

Environmental impacts are expected to be similar to the ones under measure 2.

Feasibility

Considering the uneven uptake of biodiversity related measures in Member States, the future of how an increased funding would be spent is uncertain. The 2013 CAP revision is certainly going to be pivotal for the 2014-2020 period but there needs to be robust wording on implementation measures on national level. Much of the potential lies in new Member States where large areas are used for grazing and low-intensity techniques are still in place. Farmers and governments in the EU-12 are therefore essential for the feasibility of preserving large HNV farmland. The issues are

116 Personal communication with Guy Beaufoy, EFNCP.

117 Beaufoy, et al 2009. Distribution and targeting of the CAP budget from a biodiversity perspective. Technical report. European Environment Agency, Copenhagen. p. 20.

118 Availaible via: http://www.bfn.de/0610_v_farmland2010.html.

certainly not easy to solve, considering that intensification of farms is more then low-intensity farms leading to economic growth in often remote rural areas with few other sources of income then agriculture.

Risks

Similar to measure 2.

5.2 Sub-target 2: Sustainable use of natural resources (fisheries)

The draft version of the impact assessment proposes the following definition for sub-target 2:

Definition

ST2 – Achieve Maximum Sustainable Yield (MSY) for 100% fish stocks by 2020 and eliminate destructive fishing practices

While fisheries is not the only example of overexploitation in Europe – soil and forests are other examples, it is the most serious and therefore has been chosen by the European Commission to be the focus of sub-target 2. As stated in the EC's Draft Impact Assessment, 88 % of Community stocks are being fished beyond Maximum Sustainable Yield and 30% of these stocks are outside safe biological limits. This makes fisheries the most representative example of overexploitation in Europe. Unsustainable fishing pressure is also a major cause of degradation of marine ecosystems and the other services they provide. Indeed, while the previous reform introduced a number of positive innovations - in particular the ecosystem-based approach, long-term approach to the management of stocks, action based on scientific advice and reductions in subsidies and assistance to fishing communities to adjust to a lower level of fishing activity – implementation and the TAC/quota setting process in Council has failed to deliver sustainable management. This has been recognised in the Green Paper on the CFP reform which provides a unique opportunity to stop the overexploitation in the CFP reform. Within the Commission at large, the urgent need to depart from the current reality of overfishing is fully recognised.

The EU committed itself at the World Summit on Sustainable Development in Johannesburg in 2002 to achieving maximum sustainable yield (MSY) for depleted stocks by 2015 and the Marine Strategy Framework Directive requires that Good Ecological Status is achieved in 2020. A recent Commission Decision[119] establishes that "good environmental status" under the Marine Strategy Framework Directive will include MSY. Therefore it was decided to propose to achieve MSY for all fish stocks by 2020 while also securing that destructive fishing practices are abandoned in order to protect other marine biodiversity which are not fish stocks but which are also at risk.

5.2.1 Measure 1: Management of fisheries based on Ecologically Sustainable Yield

The first proposed concrete measure for achieving sub-target 2 is the establishment of fisheries management based on ecologically sustainable yield.

Definition of Measure 1

Establish that the management of fisheries is based on MSY, and subsequently on **Ecologically Sustainable Yield** when fully defined, and not on the precautionary approach, in all areas where EU fleets

[119] Commission Decision of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters (2010/477/EU).

operate, that includes within all Regional Fisheries Management Organisations (RFMOs) regulatory areas and high seas, as well as Fisheries Partnership Agreements between the EU and third countries [to encourage the establishment of responsible and sustainable fisheries within the EEZ of third countries].

Essentially, this measure continues already ongoing efforts in EU fisheries policy to move towards implementing sustainability through maximum sustainable yield – an effort that had already been outlined in Communication COM(2006)360 and by now has become one of the key foci of the Common Fisheries Policy (CFP) reform process (e.g. as emphasised in the Green Paper: Reform of the Common Fisheries Policy).

It should be noted, however, that while the measure 1 definition is based on the target of Ecologically Sustainable Yields (ESY), the European Union has not fully defined this concept yet and most policy papers, goals and studies thus far have been based on the concept of Marginal Sustainable Yield (MSY) instead. It should be noted that there is a considerable difference between these two concepts, whereby ESY is an ecosystem-based approach rather than a species-based approach (MSY) and therefore any related objectives go beyond those based on MSY (see text box below for a more detailed definition of the two concepts).

Given the fact that ESY has not yet been fully defined in the European context, the assessment in this section primarily refers to MSY.

Economic impacts

Implementing fisheries management based on MSY – and subsequently ecologically sustainable yield – would imply an overall shift from current economic inefficiencies towards sustainable economic and social development based on the restored ecological viability of aquatic ecosystems. An MSY-based management approach essentially recognises that environmental sustainability is a prerequisite for achieving economic and social sustainability in the fisheries sector. The “evidence” that not following MSY leads to economic and social collapse is available in the New Foundland Cod fisheries collapse (see text box below for further details and references to this case study).

While the focus on MSY and economic sustainability in the fisheries sector do not represent conflicting objectives in the long term, this measure does encompass negative economic impacts in the short run. The change in management approach would require a further drastic down-sizing of the European fishing fleet since current capacity greatly exceeds marginal sustainable yield levels for most fish stocks.[120]

In the long run, however, the implementation of MSY-based management practices is expected to stabilise and maybe lead to an increase of economic prosperity levels of a smaller group of fishermen and significantly reduce the needs for government subsidies to the fishing industry because the quality and ethical soundness of sustainably managed fish – even with the associated increased prices – will be valued by consumers.[121]

The ‘no action’ scenario, on the other hand, does not look very positive for fishermen either. If maximum sustainable yield targets are not met, fishermen’s income will continue to be vulnerable to high fuel prices and the industry will still not be able to make a sustained living from their activity[122]

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120 Green Paper: Reform of the Common Fisheries Policy. COM(2009) 163 final.
121 Green Paper: Reform of the Common Fisheries Policy. COM(2009) 163 final.
122 Press Points for Council, Luxembourg, 29 June 2010: CFP reform options.

as catch quantities will become even more unpredictable and nothing would be done for consumers to value the high quality of well-managed species, etc.

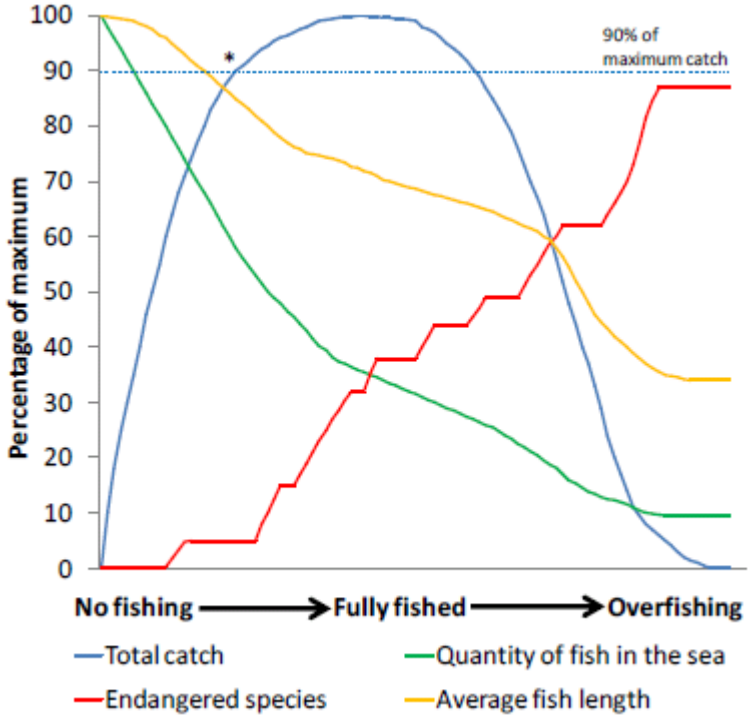
As regards the distribution of the economic costs incurred by this policy measure, most of the direct implementation burden would fall to the RFMOs, and of course the fishing industry itself. Most of the costs would likely be concentrated in one-off restructuring costs spread out over a few years. High-level policy decisions and linkages with the CFP reform should, however, be able to ensure that appropriate financial support is provided to RFMOs and the fishing sector to be able to incur these economic burdens in order to switch to a sustainable and economically efficient way of doing business in the future.

Box 6 Supporting evidence and references

Definition: "Ecologically Sustainable Yield" vs. "Maximum Sustainable Yield"

- In population ecology and economics, **maximum sustainable yield** (MSY) is, theoretically, the largest yield/catch that can be taken from a species' stock over an indefinite period. Under the assumption of logistic growth, the MSY will be exactly at half the carrying capacity of a species, as this is the stage at when population growth is highest.
- **Ecologically sustainable yield** (ESY), on the other hand, is a concept that has developed over the years to move away from the traditional approach to fisheries management relying on single-species models of population dynamics to an ecosystem-based approach that acknowledges the interactions among exploited species and other members of the same ecosystem (Zabel, 2003). ESY can therefore be defined as: *the yield an ecosystem can sustain without shifting to an undesirable state*. To determine the ESY of an ecosystem, it is therefore essential to simultaneously consider the impacts of all harvested species on the ecosystem. This means that essentially, for many ecosystems, harvesting at ESY levels would imply even stricter limits than those used to achieve maximum sustainable yields (MSY).
- Ecosystem-based management requires a long-term commitment to monitor all trophic levels of marine organisms and they physical forces that influence their communities. Good advances in such monitoring efforts have been made, for example, in the Baltic Sea and the Bering Sea, but are lacking in other regions. The Baltic Sea case study (as described in Harvey, 2003) shows, for example, that careful assessment of fish stocks in combination with limited levels of fishing effort allow sustainable fisheries. At the same time, however, the assessment also shows that prosecution of the Baltic Sea fishery – even at a very limited level – already fundamentally alters the community structure at all trophic levels. Therefore, even precautionary levels of harvest have the potential to diminish the ecological importance of target species by significantly weakening their linkages to other community members.

Figure: The tradeoffs between fishing, the state of fish stocks and other marine species



Source: Worm B et al., Science 325, 2009

Case study: socio-economic impacts of the New Foundland cod fisheries collapse

The long-term impacts of fishing on the socio-economic well-being of fishing communities can only be positive if the interaction between the community and the fish is at a level such that the ecological base of the fish resources remains intact over time. If this is not the case, the fishing community is likely to suffer large economic and social losses. This negative socio-economic impact of fishing beyond MSY/ESY levels has been demonstrated in the case of the collapse of the cod fishery off Newfoundland, Canada (e.g. Ommer, 1994).

Most relevant references:

- Green Paper: Reform of the Common Fisheries Policy. COM(2009) 163 final;
- Press Points for Council, Luxembourg, 29 June 2010: CFP reform options;
- Worm, B. et al., Science 325, 2009;
- Sumaila, U.R. et al. Addressing ecosystem effects of fishing using marine protected areas. *ICES Journal of Marine Science*, 57: 752-760. 2000;
- Zabel, R.W. et al. Ecologically Sustainable Yield. *American Scientist*, Volume 91, March/April 2003;
- Rosemary Ommer, "One Hundred Years of Fishery Crises in Newfoundland", *Acadiensis*, 23:2 (Spring 1994), pp. 5-20;
- Harvey, C.J. et al. An ecosystem model of food web and fisheries interactions in the Baltic Sea. *ICES Journal of Marine Science*, 60(5): 939-950. 2003.

Social impacts

Over the past 17 years the EU fishing fleet capacity has already declined at a fairly steady annual average rate, a little below 2%, in terms of both tonnage and engine power.[123] Social impacts of this decline have been cushioned by specific down-sizing subsidies and support to the sector that allowed for investments to provide alternative employment opportunities to affected fishermen. The potential need to increase the down-sizing percentage in the short term due to the switch to MSY-

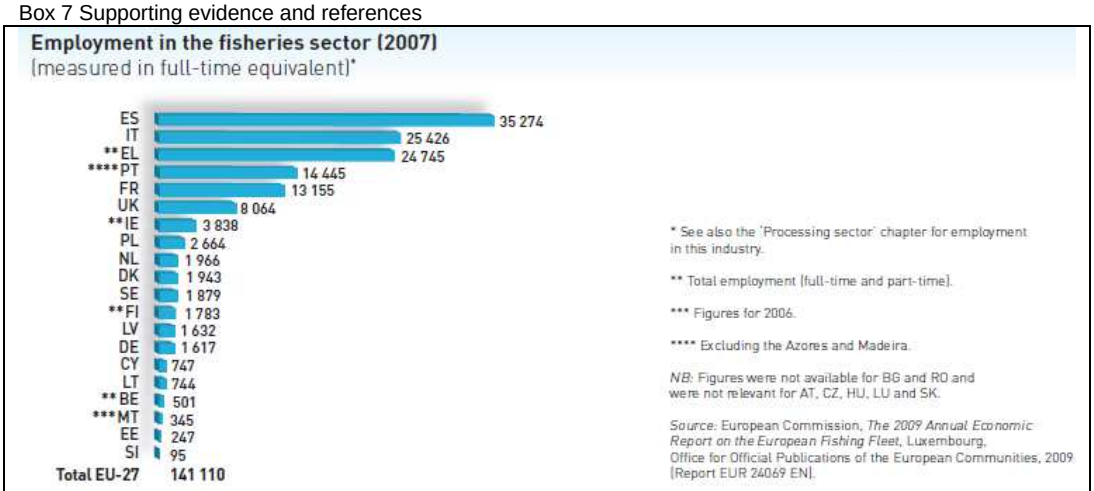
[123] "Facts and Figures on the Common Fisheries Policy", 2010 edition.

based management practices would generate social and income effects that are concentrated in a few Member States, i.e. those with the largest amount of full-term equivalent employment in the fisheries sector, namely Spain, Greece and Italy. Some of these negative effects could be counter-acted via sound re-employment policies and potential short term financial support to the industry to facilitate the transition to reduced fleet capacity.

At the same time, this short term economic cost has to be compared with social costs incurred due to current practices. Unlike other industries, fishing benefits from free access to the natural resource it exploits and currently does not have to contribute to the public management costs associated with its activities, such as safety measures or monitoring and control. Estimates from several Member States have shown that the cost of fishing to the public budgets actually exceeds the total value of the catches, and thus European citizens in practice pay twice for their fish: once in the store and once through their taxes.[124]

In sum, the main social costs in the short term of this policy measure would be born by the fishing sector, concentrated in a few Member States. The long term social benefits of the policy measure, on the other hand, would be felt across society as a whole (higher quality of consumed fish, ecosystem services of sustainable fish stocks, etc.) and across all EU Member States. Further analysis needs to be carried out as to the trade-offs between these likely short versus long term social benefits.

Box 7 Supporting evidence and references



Source: "Facts and Figures on the Common Fisheries Policy", 2010 edition.

Most relevant references:

- Green Paper: Reform of the Common Fisheries Policy. COM(2009) 163 final.
- "Facts and Figures on the Common Fisheries Policy", 2010 edition.
- Sumaila, U.R. et al. Addressing ecosystem effects of fishing using marine protected areas. *ICES Journal of Marine Science*, 57: 752-760. 2000.
- Rosemary Ommer, "One Hundred Years of Fishery Crises in Newfoundland", *Acadiensis*, 23:2 (Spring 1994), pp. 5-20.

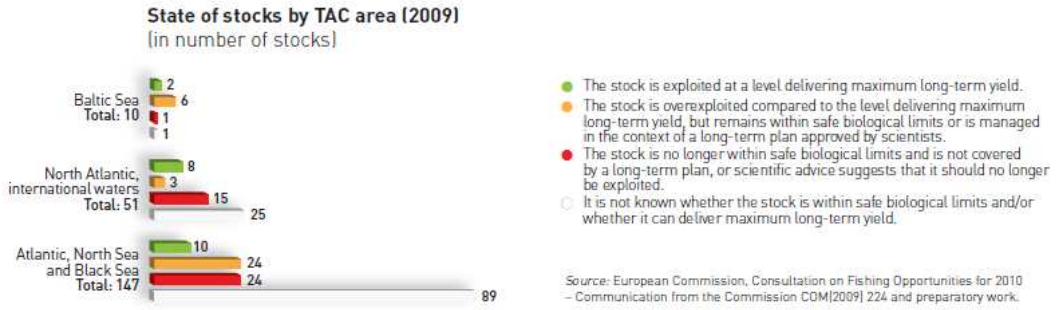
Environmental impacts

Commitments to ecosystem-based fisheries management already exist (Council Regulation (EC) No. 2371/2002. However, implementation has not progressed sufficiently and therefore the EC has reconfirmed its commitment (Commission COM 163 final / 2009). This commitment promises to

[124] Green Paper: Reform of the Common Fisheries Policy. COM(2009) 163 final.

ensure that the reformed CFP will fully support the achievement of "good environmental status" as required by the existing Marine Strategy Framework Directive (Directive 2008/56/EC). In theory – if implemented properly – such ecosystem-based management should yield the intended environmental benefits of protecting biodiversity and ecosystem goods and services and especially their functioning which in turn provides the resource base on which marine-related economic and social activities depend.

Box 8 Supporting evidence and references



Source: "Facts and Figures on the Common Fisheries Policy", 2010 edition.

Case study: Ecosystem-based management in practice

Large-scale fishery: Ecosystem-based fisheries management has resulted in highly successful fish stock rebuilding efforts in California, the northeast United States and northwest Australia. Efforts have involved experimentation with closed areas, gear and effort restrictions, and new approaches to catch allocation and enforcement.[125] South Australia has made long-term plans for each of its large-scale marine ecosystem zones. Activities such as fishing, aquaculture, or tourism are managed and balanced to try to minimise damage, according to the resilience or sensitivity of the ecosystem.[126]

Most relevant references:

- "Facts and Figures on the Common Fisheries Policy", 2010 edition.
- Day V et al., Marine Policy 32, 2008.
- Worm B et al., Science 325, 2009.
- Commission Decision of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters (2010/477/EU).
- Sumaila, U.R. et al. Addressing ecosystem effects of fishing using marine protected areas. *ICES Journal of Marine Science*, 57: 752-760. 2000.
- Zabel, R.W. et al. Ecologically Sustainable Yield. *American Scientist*, Volume 91, March/April 2003.

In terms of contributing to the 2020 biodiversity target as well as to the reduction of current pressures, this policy measure could certainly reduce – or ideally eliminate - overexploitation of fish stocks in EU waters and possibly in international waters. MSY-based fisheries management would very likely help the achievement of sub-target 2 of the 2020 biodiversity target and could also contribute to improved biodiversity protection on a global scale via improved and revised guidelines and tools for the Fisheries Partnership Agreements.

Feasibility

Political and technical feasibility for MSY-based fisheries management have increased since the introduction of the Marine Strategy Framework Directive as all EU maritime policies must comply

[125] Worm B et al., Science 325, 2009.
[126] Day V et al., Marine Policy 32, 2008.

with and support this approach, including the CFP. Nevertheless, it should be ensured that regionalisation of fisheries management continues to be carried out. While some high level decisions should continue to be taken on a high level at the European Council and Parliament – such as setting overall policy and harvest objectives and deciding the appropriate balance between social, economic and environmental sustainability – other decisions and the power for decision-making should be transferred to the regional level as 'good environmental status' varies by region and may require different types of management approaches. In this aspect, the RFMOs as well as Fisheries Partnership Agreements play an important role and their responsibility for MSY-based management should be matched with the appropriate corresponding decision-making power in order to increase the feasibility for sound implementation.

Another driving force to increase feasibility of successful implementation of sustainably managed fisheries is the fact that more and more consumers, processing and retail sectors share the concerns regarding the loss of biodiversity and the threat to fish stocks and marine biodiversity (via detrimental effects on by-catch species) begin to require that the fish they consume and sell originates from well-managed and sustainable fisheries.[127] Such demand-side driven pressures should help push along efforts and convince fishermen that sustainably managed fisheries will yield higher market value and a sound source of income in the future.

Risks

RFMOs are considered the best instruments for fisheries governance in particular for straddling and highly migratory fish stocks in the Exclusive Economic Zones (EEZ) and in the high seas. But their performance over the past years has been uneven and they have not always been effective in adopting stringent conservation and management measures / strategies or in ensuring compliance with these measures.[128] There is a need to improve their overall performance and review their means of control.

Similarly, while FPAs have helped provide EU vessels access and seek to strengthen partner countries' capacity to ensure sustainable fisheries in their own waters, the current architecture of these FPAs remains questionable as to whether or not this is the best set-up to achieve all the EU targets regarding sustainable fisheries management beyond EU waters.[129]

According to Alterra's marine scientists, another risk with assessing this measure in terms of its environmental, but also its economic and social impacts, is the fact that large natural variations exist in the marine ecosystem and as a consequence MSYs can also fluctuate significantly.

5.2.2 *Measure 2: Establish long term management plans for fishing activities*

The second proposed concrete measure for achieving sub-target 2 is the establishment of long term management plans for fishing activities.

Definition of Measure 2

The Commission, together with Member States, stakeholders and the EP will establish **long term management plans** for fishing activities. These will be based on best available scientific information, will need to include: targets (i.e. levels of fishing activities) and the limits (i.e. biomasses below which fishing activities would not be allowed).

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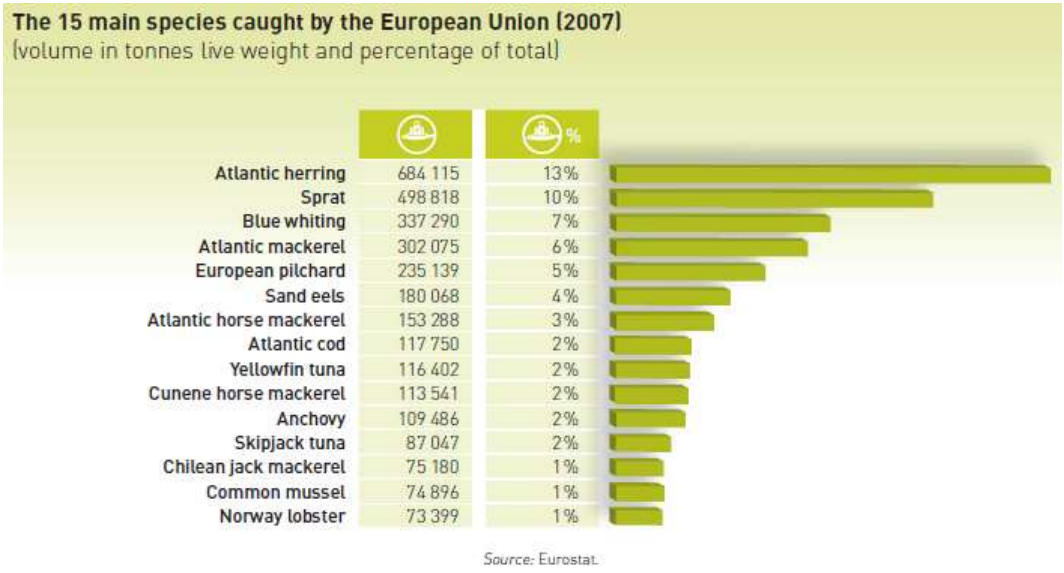
127 Green Paper: Reform of the Common Fisheries Policy. COM(2009) 163 final.
128 Green Paper: Reform of the Common Fisheries Policy. COM(2009) 163 final.
129 Green Paper: Reform of the Common Fisheries Policy. COM(2009) 163 final.

The reform of the Common Fisheries Policy set the basis in 2002 for implementing long term plans for sustainable fisheries management rather than a short-term approach based on openly negotiable annual decisions. The 2002 reform also established that multi-annual plans and recovery plans concerning fisheries resources of interest to the Community be implemented progressively over the coming years.

Management of resources based on long term plans is best geared to ensure that the exploitation of living aquatic resources provides sustainable economic, environmental and social conditions. As a guiding principle, the multi-annual plans stipulate that the variation in TACs from one year to the next cannot exceed 15% in either direction. This constraint is compatible with economic stability. Only if a given stock requires particularly urgent measures to save it from collapse, a reduction greater than 15% can be considered.[130]

Up to date, the Council has established long term management plans for cod in the North Sea, Kattgat, Skagerrak, eastern Channel, west of Scotland, the Celtic Sea and Irish Sea, for northern hake stocks, as well as for southern hake and Norway lobster off the Iberian Peninsula. Multi-annual plans also exist for sole in the Bay of Biscay, sole in the Western channel, sole and plaice in the North Sea, Baltic Sea cod and West of Scotland herring. In addition, the European Commission has made proposals for long term management plans for anchovy in the Bay of Biscay and for the western stock of Atlantic horse mackerel.[131]

This implies that for almost half of the 15 main species caught by the European Union, DG MARE or national authorities have already established long term management plans. Most of the species under long term management plans are or were threatened.



Source: “Facts and Figures on the Common Fisheries Policy”, 2010 edition.

In summary, this measure builds on Measure 1. It represents a further commitment of all actors involved to implement the MFD and the CFP and an intended EU-wide agreement on Measure 1. The economic, social and environmental (especially biodiversity and ecosystem services) impacts will therefore be generally in the same areas as those of Measure 1. In a sense, this measure is comparable to the Natura2000 measure to develop management plans for the Natura2000 sites.

130 “European Commission’s proposal on fishing opportunities: why and how?” MEMO/10/413, September 2010.
131 http://ec.europa.eu/fisheries/cfp/fishing_rules/multi_annual_plans/index_en.htm.

The change from unsustainable to sustainable fisheries should and could follow similar pathways as from large scale clear-cutting forestry to selective and sustainable harvesting. In the Netherlands, for example, the State Forestry Service has changed its objectives in the 1980-1990's from timber production to multiple use forestry with only very limited harvesting. A similar "change" in culture should and could be achieved in the European fisheries sector.

The impact analysis of potential economic, social and environmental consequences expected from measure 2 in the following sub-sections is based on European Commission Impact Assessments[132] that have been carried out prior to introducing the long term management plans for the species mentioned above.

Box 9 Brief introduction to species with long term management plans (or proposals to introduce them)

Anchovy

Anchovy is a short-lived fish, generally living less then three years. It is to be found migrating through coastal waters in large schools, primarily in the Mediterranean and off the Atlantic coast of Portugal, Spain and France. . The combination of a short life span and very variable recruitment, leads to violent fluctuations in stock size from year to year. Catches in EU waters have declined dramatically, falling from almost 85,000 tons in 1965 to less than 4,500 tons in 1982 and only 950 tons in 2005. Two fleets operating in the area are Spanish purse seiners and French purse seiners and pelagic trawlers. Since 2005, the main EU anchovy fishery in the Bay of Biscay has been closed due to the extremely poor condition of the stock. The fishing season runs from 1 July to 30 June the following year.

In July 2009, the Commission proposed a long-term plan[133] to manage the anchovy stock in the Bay of Biscay. Given the short-lived nature of the stock, the plan proposed is based on a simple rule for setting the TAC based on stock levels just before the season opens on 1 July. The scope of the proposal is of medium importance, covering up to €50 million in terms of catch value. Approximately 300 vessels and some 3000 at-sea jobs and about 16,000 tonnes of fish catch for human consumption were involved in fishing for anchovy in 2004 before the fishery was closed. These figures illustrate the effect of the proposal, which is intended to deliver stability and sustainability to the fishery.

Atlantic herring

The Atlantic herring is an oily fish found in the open sea throughout the North Atlantic. Herring are mainly caught by pelagic trawlers and purse seiners. The main stocks fished in EU waters are those in the Baltic, the North Sea and West of Scotland. The North Sea herring stock suffered a major collapse in the early 1970s, due to overfishing, which led to the fishery being completely closed from 1977 to 1980. A further decline in the 1990s led to recovery measures being implemented which have been largely successful. Today, the West of Scotland herring is covered by an EU long term management plan. Long term management plans have also been set up for the Atlanto-Scandian herring stock, which is managed jointly with Norway.

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132 The following impact assessments have been analysed:

- SEC(2009) 1077 final: Accompanying document to the Commission's proposal for a COUNCIL REGULATION establishing a long-term plan for the anchovy stock in the Bay of Biscay and the fisheries exploiting that stock IMPACT ASSESSMENT.
- SEC(2009) 524 final: Accompanying document to the Commission's proposal for a COUNCIL REGULATION establishing a long-term plan for the Western stock of Atlantic horse mackerel IMPACT ASSESSMENT.
- COUNCIL REGULATION (EC) No 1300/2008 of 18 December 2008 establishing a multi-annual plan for the stock of herring distributed to the west of Scotland and the fisheries exploiting that stock.
- FISH(2007) 033: Impact Assessment regarding the Commission's proposal for a COUNCIL REGULATION establishing a long-term plan for the stock of herring distributed to the West o Scotland and the fisheries exploiting that stock.
- Council Regulation (EC) 1100/2007, establishing measures for the recovery of the stock of European eel.

133 COM(2009) 399 Final.

The impact assessment that had been carried out prior to the introduction of the West of Scotland herring management plan showed that the scope of impacts would be relatively small; i.e. covering about € 8 million a year in terms of catch value and affecting approximately 90 vessels and 1400 at-sea jobs and around 25,000 tons of fish catch for human consumption. The overall socio-economic impact was deemed very small as the value of the catches from this stock comprises only a small part (less than 2%) of similar catching opportunities available to the same fishing fleet.

Cod

Cod is a cold water fish, which can be found on continental shelves and in coastal waters throughout the north Atlantic. Cod reach sexual maturity at between three and five years, and can live up to 25 years. Cod in the North East Atlantic is divided by scientists into 14 separate stocks which remain largely separate from one another. Important stocks in European waters include: North Sea (including the Skagerrak), Kattegat, Eastern Baltic, Western Baltic, Celtic Sea, Irish Sea, and Western Scotland. All cod stocks in EU waters have shown significant declines over the last decades due to a range of factors, including overfishing.

While cod can be taken by a wide range of means, including long lines and pots, the commercial catch comes almost entirely from mixed trawl fisheries, in which they are caught alongside other demersal species such as haddock and whiting.

North Sea cod was the first EU fish stock to be brought under long-term management.

Eel

European eel is a 'catadromous' fish – that is, it spawns and is born at sea, and then migrates into inland waters to eat and grow. European eel is now believed to spawn in the Sargasso Sea in the middle of the North Atlantic, the larvae then migrate to the coasts of Europe by drifting on the Gulf Stream. There they congregate in estuaries as glass eel, before metamorphosing into elvers and moving upstream. They spend most of their lifespan (6 to 20 years) in freshwater. When the time comes for them to spawn, they return downriver to swim back to the Sargasso Sea where their lives began. European eels can live for over 80. The main fisheries for eel take place while they are migrating, when they are trapped and netted in estuaries and inshore waters. While traditional fisheries for local consumption tended to focus on adult eels, the last 15 years have seen the emergence of a fishery for glass eels, which are exported to Asian markets where they are fattened in farms before being sold. As a result, the price of glass eel soared, to the point where in the mid-2000s it exceeded that of caviar. The last 20 years have seen a dramatic decline in the number of eels reaching European river systems, which have fallen to as little as 1% of their previous levels according to some estimates.

In 2007, the EU adopted measures to bring about the recovery of the eel stock. As a result, eel fisheries are now managed under long-term plans drawn up by the EU countries at river-basin level.

Horse mackerel

The scope of the long term management plan proposal for horse mackerel is of medium importance, covering about € 60 million per year in terms of catch value. Approximately 600 vessels, 6000 at-sea jobs and some 140,000 tonnes of fish catch for human consumption would be affected by the proposal, which is intended to deliver stability and sustainability. Even though horse mackerel is currently not considered a threatened species, the introduction of a long term management approach for this type of pelagic fish aims at more sustainable management and a prevention of a future collapse of the fish stock.

Economic impacts

While it is not possible to forecast economic impacts in absolute terms, one significant impact of introducing long term management plans for fisheries would be the much greater stability in

expectations concerning fishing opportunities. Predictability of fishing opportunities is a key demand of the sector. With a TAC-setting policy that applies a pre-defined method for each species, the TAC levels will become much more predictable and it will be easier for the fisheries to adjust to sustainable levels of catch. This should contribute to the stability of the fishing industries concerned and their markets, as well as greater price stability.

Furthermore, for most species concerned, the catches are taken by vessels engaging in a variety of fishing activities on various stocks and whose dependence on one particular stock is thus limited. Therefore, the direct impact of improved long term management of a particular stock will cover only a small part of the economic activity of these vessels. Overall economic impacts are thus even harder to pinpoint.

When trying to compare the potential positive and negative impacts associated with the introduction of long term management plans versus maintaining current annual management approaches, it becomes clear that while in the short term annual plans lend themselves to greater flexibility in decision-making, long term plans are focussed on the attainment of sustainability objectives. At the same time, however, annual management approaches would have to integrate much higher risk management, whereas multi-annual plans should result in a sustainable and stable fishery in the long term; thus long term management should lead to a reduction in estimated risks of fishery closure and therefore allow the industry to adapt its strategies to become profitable.

In terms of indirect impacts, annual management approaches are likely to trigger negative economic, social and environmental impacts due to the possible reduction of stocks' biomass to unsafe levels leading to reduced fishing opportunities in the long term. Longer term approaches, on the other hand, should spread stability in associated processing sectors, with economic and social gains.

When comparing short and long term economic effects of the measure, the following general picture emerges:

- *Short term*
  - The costs of development of the management plans will be in the order of magnitude of large research projects of the EC (maybe a few million Euros), setting up the structure and legal details for specific fisheries (species and region based), but once the "model" is approved and accepted , this can be reused across Europe. The cost of and implementation, and subsequently the actual management, can be minimised if all parties commit themselves to upholding the legal obligations. A minimal requirement of monitoring and independent accountancy reporting would add some costs, as well as employment for the sector. The total operation can be seen a step in professionalising the sector, and is expected to deliver positive economic results in the long run, as the image of the sector will strongly improve;
  - Annual management approaches (the status quo) in the short term would likely not involve significant changes in catches and profits;
  - For multi-annual management plans, initial gains are likely to be small due to the recovery phase needed by the fish stock; increases will then likely be gradual; the operation of a long term plan may also reactivate or stimulate investments in the sector.
- *Long term*
  - Under annual management approaches, possible negative economic impacts may be felt due to the increased risk of fishing above safe levels, which could lead to a closing of the fishery. This would result in the loss of profitability of the fishing industry;

- Under multi-annual plans achieving the targets means rebuilding the stock to Maximum Sustainable Yield levels at which the industry is the most profitable and the stock is in the healthiest state.

Box 10 Supporting evidence and key references

Highlights from the economic impact assessment of the Horse Mackarel management plan[134]

In overall terms, the options compared do not show significantly different impacts. The lower future performance compared to 2006 is due to 2006 being a high-performing year in the data series. Introducing a management plan shows a very modest profit increase for some fleet segments, compared to the baseline scenario.

Simulation of effects on the profit for selected fleet segments

		Baseline	No action	Long term management plan
	€ million	Profit 2006	Average (2007-09)	Average (2007-09)
NL >40m	Profit	6.42	7.61	7.77
IRE >40m	Profit	3.66	1.55	1.69
IRE 24-40m	Profit	4.1	9.17	9.23
GER >40m	Profit	57.76	53.59	53.72
UK >40m	Profit	44.34	31.98	31.98
ESP	Profit	1.5	1.10	1.10

Source: Adapted from SEC(2009) 524 final: Accompanying document to the Commission's proposal for a COUNCIL REGULATION establishing a long-term plan for the Western stock of Atlantic horse mackerel IMPACT ASSESSMENT.

Since the management plan would not introduce new procedures, no significant impact on administrative burden would take place. Moreover, adoption of a long-term plan with clear sustainability criteria may allow the fishery to qualify for certification under independent "eco-label" criteria. This could be helpful in product marketing terms, and in improving the perception of the sector as a responsible industry.

Social impacts

Expected social impacts of the measure are closely linked to the likely economic impacts related to the profitability and stability of the fisheries described above. In broad terms, when comparing the annual management approach with a long term management perspective, the following social impacts are likely:

- *Short term*
  - Annual management approaches would likely trigger no or only minor changes in employment and other social factors in the short term;
  - Multi-annual management plans may trigger a re-investment in gradual employment increase in case the fishery can be re-opened after stock recovery. Or – in case the long term management plan is introduced for an open fishery under severe threat –, the fishery may have to be closed in the short term thus leading to some negative social consequences.
- *Long term*
  - Possible stock collapse following TAC allocations based on *ad hoc* decisions resulting in cuts in employment in the sector;
  - Job creation and stable employment can be expected from profitable fishing activities if the stock is managed according to MSY.

[134] SEC(2009) 524 final: Accompanying document to the Commission's proposal for a COUNCIL REGULATION establishing a long-term plan for the Western stock of Atlantic horse mackerel IMPACT ASSESSMENT.

The social impacts of developing management plans should therefore in general be positive. The impacts of developing long term management plans, with the explicit intention to achieve the post 2010 targets and all ambitions in the MFD and CFP, can be positive in terms of additional employment in the actual development and implementation of the plans. Expertise from current, unemployed fishermen may even be used to develop the plans.

After a period of getting used to the new situation, many people currently involved in “catching” fish should be the first candidates to be involved in developing and implementing the management plans, and in fact in actual management of the fish production areas, the hatchery “grounds” and the fish catching operations themselves.

As all levels of government and the fisheries business are expected to be involved in the design of the details and implementation of the measures (both 1 and 2) , it is logical that all should be involved in supporting the transition of the sector, and be prepared to provide alternative jobs and future perspectives for those affected.

Furthermore, the adoption of a long-term plan with clear sustainability criteria may allow the respective fishery to qualify for certification under independent "eco-label" criteria. This, in turn, could be helpful in product marketing terms, and in improving the perception of the sector as a responsible industry.

Environmental impacts

Likely environmental impacts and trade-offs between annual versus long term management approaches can be defined relatively clearly. While continued management based on short term interests may cause the loss of the species in the long run because it cannot recover below a certain spawning biomass level; the positive impact on the conservation of species due to improved decision making based on long term management would be a clear environmental benefit.

In the longer term, even if the stock of concern did not collapse completely under annual management practices, the annual approaches carries an inherent risk that the stock biomass will fall below safe levels at some point in the future and thus trigger adverse effects on biodiversity. A longer term management perspective, on the other hand, would very likely benefit aquatic biodiversity.

As in terrestrial systems, the impacts on fish stocks, marine biodiversity in general and other ecosystem services is expected to be very positive in the long run. In the short run, the management plans may not yet have the desired results as some of the marine ecosystems have been heavily overfished, and food chains and webs need a long time to recover. There is very little experience and scientific knowledge about recovery and restoration of marine ecosystems and commercially harvested fish stocks (see Aronson et al.,2007).

The main environmental arguments in favour of multi-annual management are as follows:

- Long-term management of a stock would include provisions to ensure that:
  - conditions for sustainable long term yield for the stock are provided for;
  - acceptable year to year stability in the TAC is achieved;
  - a unified management regime across all areas where the stock is distributed is achieved;
  - there are not additional catches to those covered by the TAC, achieved by control programmes having to focus on long-term management plans.
- Target fisheries will proceed with minimum ecological impact (with the industry agreeing to partake in studies to demonstrate that there are no additional catches above the level of the TAC as well as in studies to quantify the levels of non-target by-catch).

Finally, it should be emphasised that it is extremely difficult to generate accurate long-term trend predictions for fisheries productivity. Changes in oceanic climate including global warming, and currently unexplained medium-term changes in recruitment can lead to significant trends in productivity. However, it is known that keeping fisheries impacts at levels no higher than those needed to take high yields improves the stability of the stock and improves the robustness of the fishery to adverse environmental effects. Therefore, implementing a multi-annual plan which will lead to moderate fishing mortalities will also lead to improved stability in stocks and in the industry.

Feasibility

Development of management plans for sustainable use of a renewable resource extraction sector is not new. In the case of forests and agriculture, experience has been gathered which could well be transferred. The arguments of feasibility for Measure 1 are valid for Measure 2 of course too. The major challenge is the change in "culture" of the sector, which has already started to change in many parts of the sector, both on the production and on the consumption side.

Given the fact that long term management plans have already been introduced for a variety of threatened and common species caught in EU waters, the overall feasibility of implementing this policy measure is quite high. Politically as well as technically, there should not be many hurdles for making long term management the standard approach to fisheries management across all fish stocks in the EU. Financially, there may be a small initial burden on the industry to contribute to the development of the management plans and later on to adhere to its stipulations. However, as the economic impact assessment has shown, in the longer run industry and society at large are also expected to benefit from the longer term management approach.

Risks

The policy measure under review does not have significant risks associated with its implementation. Given the fact that the new management approach has already been 'test-run' for several fish stocks, it is highly unlikely that there would be major difficulties in the establishment and implementation of long term management plans for all remaining fishing activities.

One of the greatest remaining risks to this policy measure is the lack of support from the responsible parties, both government and industry. A perfectly sane and promising policy may fall apart if the long term benefits are not recognised by the dominant parties over the short term gains of a few actors.

5.2.3 Measure 3: Create a scheme for Stewardship of the Sea

The third concrete measure for helping the achievement of sub-target 2 of the proposed biodiversity strategy centres on the creation of a scheme for the "Stewardship of the Sea". This scheme essentially focuses on defining efforts for redeployment of fishermen - who have become redundant due to more sustainable fisheries practices and management plans - to monitor and manage aquatic biodiversity.

Definition of Measure 3

Establish a scheme for **Stewardship of the Sea** that would allow catering for transitional measures for providing new opportunities to former fishermen for instance to monitor and manage the biodiversity in the sea particularly in Marine protected areas.

Measure 3 is essentially focused on safeguarding the process of transition from the unsustainable fisheries to ecologically sustainable fisheries. Some of the examples of opportunities for fishermen

to participate profitably in the transition have been mentioned above, explaining the required expertise and manpower in developing and implementing management plans. It is very similar to the social and economic plans required by Labour unions in many industries when major re-organisations take place. The costs for such transitions are generally shared by the various parties involved.

Economic impacts

Overall economic effects of this policy measure should be positive. Employment would shift from the fishing sector to the nature protection and monitoring sector rather than creating more unemployment. Furthermore, business opportunities are likely to result related to improved valuation of ecosystem services.

Nevertheless, the initial costs of a sector transition may be large.

Social impacts

Similar to the economic effects, overall social impacts should also be positive. This is primarily due to the fact that instead of being laid off, former fishermen would be offered retraining and new jobs in nature protection and monitoring.

Furthermore, society is set to benefit as a whole via improved protection of marine natural resources, in particular protected areas.

Environmental impacts

Even though this policy measure is primarily a social and economic measure affective fishermen, environmental effects of this policy measure would almost certainly be very positive. The measure should help to significantly improve the monitoring of marine resources and thus assist the generation of better knowledge. This in turn would likely lead to improved protection due to better possibilities to target measures as well as enhanced enforcement.

Feasibility

Feasibility for implementation of this policy measure remains questionable. While politically, willingness to support such measure may be relatively high and technical feasibility should be achievable as well, the financial feasibility of this policy measure may be more problematic. The retraining and redeployment of former fishermen as monitors and protectors of the marine environment needs to be backed up with sufficient funding. While LIFE monies could be used to fund parts of such a new scheme, some guarantee for funding/financing continuity would be needed in order for the Stewardship programme to really have a chance in taking off. Thus, strong support and commitment from both the EU level as well as Member State level would have to be sought for improving the feasibility of this policy measure.

Risks

The biggest risk to successful implementation of the policy measure is most likely the question of social acceptability and willingness to join the Stewardship of the Sea scheme on the side of the fishermen themselves. Such willingness and commitment would be essential for successful introduction of the scheme. However, it remains doubtful whether former fishermen would be eager to retrain and become monitors and protectors of the Sea, rather than trying to find a fishing job targeting different species, or potentially fishing in a different area. Therefore, risks are rather comparable to those of policy measure 2, in that the major risk is that some parties prefer short term gains for a few over long term gains of many.

5.2.4 *Measure 4: Include new fisheries activities in Directive on Environmental Impact Assessment*

The fourth policy measure to help the achievement of sub-target 2 aims at including new fisheries activities in the revision of the Directive on Environmental Impact Assessment.

Definition of Measure 4

Include new fisheries activities and aquaculture in the **Directive on Environmental Impact Assessment** in the upcoming revision.

The Common Fisheries Policy (CFP) has as one of its objectives the assessment of the environmental, social and economic dimension of the exploitation of living resources. The SEA Directive further requires that all plans and programmes for fisheries, among others, should be assessed for their environmental implications so as to achieve sustainable development of the resource. The inclusion of fisheries under the EIA Directive would further require that public and private fisheries projects that are liable to have a significant effect upon the environment are assessed to identify direct and indirect effects and their interaction – before consent is given, so that the decision about consent takes the result of the assessment into account.

This policy measure is in fact supporting policy measures 1, 2 and 3 as a control mechanism, to provide information about the extent to which any future fisheries will be within the ambition of ecologically sustainable yields.

Economic impacts

The main economic impacts can be summarized as follows:

In the short term, increased costs, delays and investment risks associated with permitting processes can be anticipated. Additionally, increased insolvency of inefficient fishing operators are likely to occur due to reduced harvesting capacity and pressure on fishing operations to improve efficiency of operations and reduce fish mortality.

Furthermore, the inclusion under the revised EIA Directive may also lead to a reduction of products on the market (which may be compensated for through increased imports), with longer term producer and consumer benefits.

In the long term, this policy measure should lead to increased fish resources as the foundation of a sustainable fishing industry in the EC; as well as increased opportunities for artisanal fishing activities due to their typically lower environmental impacts and thus likely better results under EIAs.

Social impacts

The social impacts of fishing policies, and therefore the potential impact of EIAs, are poorly researched and data is difficult to obtain. Possible social impacts include the following:

- In the short term increased frustration on the part of actors in the industry as a result of increased regulation;
- In the short term an increased likelihood of resistance to regulations reinforcing unsustainable fishing practices;
- An increased understanding of all stakeholders of the issues involved through participation in EIA processes. Participation in these processes are qualitatively different to more indirect management measures such as quotas;
- In the longer term more sustainable benefits to producers and consumers.

Environmental impacts

Inclusion of fisheries in the EIA Directive resonates with the shift in the Common Fisheries Policy (CFP) away from earlier fisheries management techniques, which consisted mostly of single-species annual plans, to an increasingly ecosystem-based approach with long-term planning and a repertoire of regulations usually referred to as technical conservation measures.

Potential benefits include the following:

- EIAs will improve the knowledge base of decisions in relation to the impacts of aspects of fisheries activities such as landing sizes, mesh parameters, type and amount of fishing gear used and closed areas and restricted times;
- EIAs will also improve insights into indirect ecosystemic effects, notably impacts on other species;
- EIAs will make possible more finely tuned management of specific impacts, thereby reducing unnecessary regulation of fisheries;
- EIAs will generate a beneficial impact on aspects such as fishing mortality and assist the recovery of fish stocks towards sustainable levels.

Feasibility

Political feasibility could be constrained due to economic effects on fisheries and fishing communities and differential impacts on Member States.

The technical feasibility of implementing EIAs could be constrained by the availability of reliable data, information and expertise about oceanic ecosystems, interspecies effects, etc.

Financial feasibility could be constrained by the economic marginality of some fishing operations.

Risks

Some opposition may be expected to additional regulations in the sector, but if properly embedded in the overall transition of the sector towards a “responsible” and “professional” resource management sector, risk may be minimal.

One potential risk (or opportunity for improvement) of this policy measure, highlighted by marine experts, is the question why such measure should only apply to new fisheries and not old ones as well. Experts believe it would certainly beneficial and more consistent to apply the policy to both existing and new fisheries.

5.2.5 *Measure 5: Reduce by-catch and preserve vulnerable marine ecosystems as much as possible*

The fifth concrete policy measure for supporting the achievement of sub-target 2 involves various types of efforts targeted towards reducing by-catch and better preserving vulnerable marine ecosystems.

Definition of Measure 5

To **reduce by-catch** and preserve Vulnerable Marine Ecosystems as much as possible, by

- Ensuring that gears are more selective, by
  - increasing the **research** on new techniques,
  - providing premiums and **incentives** to fishermen that use the most biodiversity-friendly gears
  - establishing certified **sustainable fisheries labelling [e.g. the Marine Stewardship Council http://www.msc.org/**
  - **banning** some techniques
- Proposing the adoption of thresholds and move-on rules by all RFMOs or, when such measures are not

fully implemented by RFMOs, to go further than RFMOs by adopting unilateral measures applicable to EU fishing vessels fishing within RFMO regulatory areas.

Such a move would ensure that a level playing field is established among EU vessels undertaking fishing activities in different areas. In addition, once the EU considers that certain measures should be adopted by an RFMO and consequently proposes these measures but which are rejected by the other parties, unilateral adoption of these measures would allow the EU to continue leading by example.

Also, these measures and techniques should be part of the management plans (Measure 2). They may require some special attention during the development phase of the plans.

It should be noted here that this proposed measure contains many sub-measures, which make an overall assessment of impacts more complex. In the sections below, overall impact trends are estimated and more specific impacts of some of the sub-measures are highlighted whenever possible.

Economic impacts

The overall aim of reducing by-catch and preserving vulnerable ecosystems would likely not generate major economic impacts aside from what will be part of the measures 1, 2, 3, 4 and 6.

The research and production of new techniques for greater selectivity is likely to generate some additional economic activity, including potentially the creation of some new jobs.

Simon Jennings and Andrew Revill[135], for example, have suggested a decision-support framework – or "toolbox" – that would allow managers to determine when it was cost-effective to seek a solution to a particular environmental problem – in this case improved selectiveness – through technological solutions to gear design, or its use in combination with other possible mitigation measures, such as effort reduction or area closures. This assessment tool actually showed that in many cases it was clear that reducing fishing effort or removing activity from the area of concern would be a more cost-effective solution than the delay and expense of technological solutions.

The provision of premiums and incentives to fishermen that use the most biodiversity-friendly gears could economically benefit in particular small-scale and artisanal farmers. However, at the same time some budget/fund for the provision of such incentives would have to be allocated on European level, thus leading to a slight increase in EU spending.

As regards intensified policy support for the establishment of sustainable fisheries labelling, such as under the Marine Stewardship Council (MSC)[136], a recent impact assessment[137] conducted for the first 10 years of operations of the MSC helps to highlight the economic, social and environmental benefits of such schemes.

The MSC's fishery certification programme and seafood ecolabel recognise and reward sustainable fishing. In the first 10 years of its operation, 42 fisheries around the world have been certified as sustainable. According to the assessment report, most fisheries say the MSC label has helped them retain existing markets and gain access to new ones, geographically or in terms of

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135 Jennings, S. and Revill, A.S. 2007. The role of gear technologists in supporting an ecosystem approach to fisheries. ICES Journal of Marine Science, 64: 1525-1534,

136 http://www.msc.org.

137 MSC. 2009. 10th anniversary report: Net Benefits. http://www.msc.org.

opportunities arising from new product category developments. More specifically, some fishers also reported price premiums. The main beneficiaries have been smaller-scale, artisanal fisheries – many of which have survived and prospered specifically because of the higher prices they could charge for certified catches.

Some concrete examples include the following:

- The Germany North Sea saithe fishery used to rely entirely on fresh fish sales. After certification, it now is also winning freezing contracts for fillets because German retailers (e.g. Aldi and Lidl) are requesting MSC-certified frozen products;
- In the UK, the NESFC sea bass fishery has reported premiums of up to 25%, compared to local values prior to certification, when selling to top London restaurants. Similarly, Hastings Dover sole, herring and mackerel fisheries typically received a 10% premium on products sold to the Netherlands and have been offered even up to 15% by the Casino supermarket in France.

Social impacts

In overall terms, no major social impacts aside from what will be part of measures 1, 2 3 and 4 are expected for this measure. The overall aim of reducing by-catch and protecting vulnerable marine areas should not impact employment or the overall social structure of the fisheries sector in any significant way.

When looking at sub-measures more specifically, the encouragement of new gear technology development could of course have some small positive impact on job creation.

Increased use of certification schemes would likely generate positive social effects. The MSC Net Benefits Report (2009) highlights that if fishery resources are managed sustainably, this should improve the security of the livelihoods of the fishing communities involved, in particular when small-scale and artisanal fisheries are concerned.

Environmental impacts

Policy measures proposed under this measure (e.g. new gears) should help to reinforce the positive environmental impacts expected from policy measures 1 and 2 by making them more effective in achieving ecologically sustainable yields.

More specifically, excellent examples of simple technology improvements that have served as effective mitigation technologies include bird-scaring devices deployed from longliners that effectively reduce incidental takes of scavenging seabird species[138], and the Nordmore excluder grid that greatly reduces by-catch of juvenile dish in temperate shrimp fisheries[139]. These two case studies provide excellent examples that could be further explored for their positive environmental impacts and their socio-economic implications.

As regards certification schemes, many fisheries have of course been fishing sustainably already before the creation of MSC, but still measurable improvements have occurred under MSC certification, as reported in the Net Benefits study. For example, as a consequence of certification, the Norway North Sea and north-east Arctic saithe fishery was required to record by-catch more systematically than under existing regulations. This may also lead to similar improvements in the way related fisheries are managed.

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[138] Lokkeborg, S. 1998. Seabird by-catch and bait loss in long-lining using different setting methods. ICES Journal of Marine Science, 55: 145-149.

[139] Vold-Soldal, A. and Engas, A. 1997. Survival of Young gadoids excluded from a shrimp trawl by a rigid deflecting grid. ICES Journal of Marine Science, 54: 117-124.

Feasibility

In overall terms, policy measure 5 should be technically, politically and financially feasible as it consists of relatively straight-forward, not too controversial and not too costly sub-measures. Nevertheless, there may be some problems in maintaining the adoption of thresholds and move-on-rules under the last sub-measure.

Financial feasibility for technology improvements is sometimes constrained by the current rigidity of funding frameworks that constrain the time-scale over which funds can be accessed or applied for.[140] This in turn delays rapid and responsive gear innovation. At the same time, some NGOs and other active stakeholders very much support the development of new technologies: for example, the World Wildlife Fund (WWF) launched very proactive a Smart Gear Competition[141] to generate incentives for technological innovation in more environmentally-friendly fishing gear (see box for more information).

Box 11 Supporting evidence on feasibility

Case study: WWF's Smart Gear Competition

WWF's International Smart Gear Competition, first held in 2005, brings together the fishing industry, research institutes, universities, and government, to inspire and reward practical, innovative fishing gear designs that reduce by-catch - the accidental catch and related deaths of sea turtles, birds, marine mammals, cetaceans and non-target fish species in fishing gear such as longlines and nets. WWF offers more than $50,000 in prize money to attract innovative ideas that may prove to be a valuable solution to some of the most pressing by-catch problems in fisheries around the globe.

Financial support for the competition is provided by a number of government departments including National Oceanic and Atmospheric Administration (NOAA), Canadian Department of Fisheries and Oceans (DFO), as well as support from a number of foundations and corporations.

An international panel made up of gear technologists, fisheries experts, representatives of the seafood industry, fishermen, scientists, researchers and conservationists judges the entries. The judges are guided by the following criteria:

- Does it reduce by-catch of non-target fish and other species, especially vulnerable and/or endangered species?
- Is the idea innovative and original?
- Is the idea practical and is the idea easy to use?
- Is the idea cost-effective?
- Will it allow fishermen to maintain or increase profitability?
- Could the idea actually be developed?

Risks

The risk in the overall implementation of this measure may be that the various sub-measures are very diverse and require different types of actions and implementation efforts. This may make measure 5 hard to control and enforce.

Looking at the risks with respect to the introduction of new gear technologies, in particular, there is the risk of non-acceptance of new gear by fishermen and other stakeholders. In order to reduce

[140] Kaiser, M. J. et al. 2007. Session 2 Summary: Ecosystem-sensitive approaches to fishing – reconciling fisheries with conservation through improvements in fishing technology. International Council for the Exploration of the Sea.

[141] http://www.smartgear.org

reluctance to change, Kaiser *et al*[142] highlighted the importance of effectively communicating critical design and operation features, as well as the benefits of using new gear, via avenues such as training workshops.

5.2.6 *Measure 6: Improve data collection and reporting obligations*

The sixth concrete policy measure for supporting the achievement of sub-target 2 involves the improvement of data collection and thus enhanced monitoring in more general terms.

Definition of Measure 6

Improve the data collection needs together with reporting obligations and reviewing periodically the relevant EC Regulation *****

This should of course not be a separate measure, but be part of the whole transition of the fisheries sector, which is at the heart of the set of policy measures 1, 2, 3 and 4.

Unfortunately, the limited detail provided on this policy measure only allows for a very general assessment of potential impacts.

In general, some steps in the right direction have been taken recently on EU and global levels that have the potential to significantly contribute to improved data collection efforts.

On 13 September 2010 the European Commission (DG Maritime Affairs and Fisheries) presented the Marine Knowledge 2020 initiative which aims to improve knowledge of Europe's seas and oceans. This initiative therefore contains useful elements to develop a targeted strategy on improving the knowledge base for the marine environment. The creation of marine knowledge begins with the collection of marine data, which are afterwards assembled, and then analysed to create information and knowledge. The Marine Knowledge 2020 initiative responds to the stakeholders' need for a more coordinated approach to marine data collection and assembly, and describes an action plan to develop or improve existing EU policy measures in order to achieve this aim. Three main objectives are proposed:

1. Reducing operational costs and delays for those who use marine data;
2. Increasing competition and innovation amongst users and re-users of marine data by providing wider access to quality-checked, rapidly-available coherent marine data;
3. Reducing uncertainty in knowledge of the oceans and the seas and so providing a sounder basis for managing future changes.

On a global level, the first Census of Marine Life (CoML)[143] hopes to act as a baseline of how human activity is affecting previously unexplored marine ecosystems. Its results were published on October 4, 2010. The international project involved more than 2,700 researchers from 80 nations, who spent a total of 9,000 days at sea during at least 540 expeditions. It has been described as the most comprehensive study of its kind.

The research programme, involving more that 670 institutions, set out in 2000 with the aim of answering three questions: what lived in the oceans? What does live in the oceans? What will live in the oceans? However, the collection of millions of specimens has led to researchers identifying

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142 Kaiser, M. J. et al. 2007. Session 2 Summary: Ecosystem-sensitive approaches to fishing – reconciling fisheries with conservation through improvements in fishing technology. International Council for the Exploration of the Sea.

143 http://www.coml.org/

more than 6,000 potentially new species, of which 1,200 have been formally described. The findings also prompted scientists to increase the estimate of known marine species from about 230,000 to almost 250,000.

The monitoring effort confirmed that in all oceans overfishing, pollution and rising water temperatures pose the most severe threats to biodiversity. In the Mediterranean Ocean, for example, only 3% of all species are fish. Scientists agree that the newly gathered data provides a basis for monitoring changes in the oceans in the future.

Other more specific initiatives already launched by DG MARE to explore the improvement of data collection include projects such as the "Joint data collection between the fishing sector and the scientific community in Western Waters" project[144] and the "Cooperation to develop Fisheries Information from the North Sea" project[145] - both of which piloted means for better interaction between various stakeholders to gather previously uncollected data and information.

Interviewed marine experts have highlighted that in particular ecological and use parameters, of all types of fisheries, would benefit from improved data collection and reporting obligations. Furthermore, recreational fisheries should also be incorporated as much as possible in these additional data gathering and reporting obligation efforts as they can potentially have large impacts as well.

Economic impacts

If improved data collection is 'enforced' via additional reporting obligations, this may put a small additional financial burden on Member States in terms of additional monitoring needs as well as the associated administrative burden.

If, however, existing schemes or voluntary incentives are used, costs should be marginal and can be borne by or passed on to the industry. The creation of additional monitoring and data gathering initiatives can actually also create new employment opportunities (for fishermen) who can become responsible fish stock managers carrying out scientific monitoring and reporting.

Social impacts

Overall social impacts are expected to be in line with the economic impacts. Some new employment opportunities will be created.

Environmental impacts

This policy measure should of course be part of the overarching mechanism (all specific policy measures) to steer the fisheries sector to an ecologically sustainable yield strategy and the overall required improvements to reach sub-target 2 of the post-2010 Biodiversity Strategy.

Feasibility

This measure is technically feasible. Previous experience with data collection and monitoring from scientific marine institutes and already ongoing efforts, such as under GMES' Marine Core Service, CFP reporting obligations, etc.

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144 Contract Ref. FISH/2007/03 Lot 1, Contract SI2.491885. Implemented by CEFAS, MI, BIM, Marine Scotland, IFREMER, AZTI, IPAMAR-INRB, ILVO.

145 Contract Ref FISH/2007/03 Lot 1, Contract SI2. 464218. Implemented by CEFAS, DIFRES, FRS, IFREMER, IMARES and others.

Political acceptability and financial support for increased data collection and monitoring, may on the other hand, not be as easy to secure given the current overall reluctance among Member States and other stakeholders to invest in additional monitoring.

Risks

Given the many different opportunities and avenues for exploring the improvement of data collection via voluntary incentives, reporting obligations, via different stakeholders, etc., the risk of not achieving any progress on this measure seems very low.

5.2.7 *Measure 7: Adapt CFP to better integrate fisheries management in marine Natura 2000 areas*

The seventh concrete policy measure for supporting the achievement of sub-target 2 involves the adaptation of the CFP in order to better integrate fisheries management in marine Natura 2000 sites.

Definition of Measure 7

Adapt the CFP to better integrate fisheries management in marine Natura 2000 areas, by providing the kind of measures necessary to fully comply with the requirements put on Member States through the Birds and Habitats Directives.

Currently there is a gap on the protection of marine N2000 EEZ sites, for which the MS have the obligation to protect but in practice must propose the adoption of fisheries measures by COM through Council Decision, i.e., while under the Habitats Directive MS have the full responsibility for the conservation of the sites, the CFP mechanism that must be followed does not ensure that outcome, as it can me refused, watered down or adapted by the other MS and COM.

In line with the ambition to transform the fisheries sector into an ecologically sustainable yield producing renewable resource management sector, the integration of protected area policies as part of the total future package is a logical step. In line with this, it makes sense that fisheries policies should incorporate ecosystem management in protected areas.

Economic impacts

Economic impacts of this measure are expected to be more or less in line with those of policy measures 1, 2, 3, and 4.

More specifically, the economic justification in broader terms for establishing marine protected areas typically takes two broad forms: on the one hand, economic benefits may follow in the form of creating employment through non-consumptive activities such as tourism and recreation; on the other hand, protected areas also help protect future fishing jobs by increasing the chances of managing stocks sustainably.

In a review of net benefit evaluation for marine reserves, for example, Hoagland *et al* (1995)[146] compared 62 economic studies published between 1980 and 1995. Based on these, they concluded that only two included both market and non-market values in the estimate of costs and benefits. But even market benefits alone may justify the creation or marine protected areas.[147]

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[146] Hoagland, P. et al. 1995. A methodological review of net benefit evaluation of marine reserves. World Bank, Environment Department Paper, Environmental Economics Series, No. 27. 69 pp.

[147] Dixon, J.A. and Sherman, P.B. 1990. Economics of protected areas: a new look at benefits and costs. Island Press, Washington. 234 pp.

Social impacts

Social impacts are expected to be in line with those of policy measures 1, 2, 3 and 4.

Environmental impacts

Environmental impacts are expected to be in line with those of policy measures 1, 2, 3 and 4. Specifically, the biodiversity improvement from enhanced protected area policies is expected to be large.

Previous studies have shown that the presence of even limited exploitation within protected areas diminishes the expected benefits generated by these areas.[148] [149] [150] Similarly, benefits decrease rapidly after exploitation resumes in previously unfished reserves.[151]

Feasibility

This policy measure should be relatively feasible if it is made part of the overall transition of the sector. Its implementation would, however, be much harder as an isolated policy measure.

Risks

Problems are expected if this is an isolated measure, instead of an integral part of the total transition and overall CFP reform process.

148 Jennings, S. et al. 1996. Seychelles' marine protected areas: comparative structure and status of reef fish communities. Biological Conservation, 75: 201-209.

149 Attwood, C.G. et al. 1997. Review of the state of marine protected areas in South Africa, South African Journal of Marine Species, 18: 341-367.

150 Wantiez, L.P., Thollot, P. and Kulbicki, M. 1997. Effects of marine reserves on coral reef fish communities from five islands in New Caledonia. Coral Reefs, 16: 215-224.

151 Alcala, A. C. and Russ, G. R. 1990. A direct test of the effects of protective management on abundance and yield of tropical marine resources. Journal du Conseil International pour l'Exploration de la Mer, 46: 40-47.

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ANNEX A: Additional analysis of the 2010 target

This Annex compiles text that had originally been drafted as part of the review of the 2010 target, policy baseline development and gap assessment.

The Commission has listed a number of shortcomings of the various Action Plans and policies of the EU[152]. Together these successes and shortcomings form the reference basis for the development of the policy baseline.

To be able to make reasonable projections of future successes and risks under the assumption of continued implementation of current policies and policies in the pipeline a closer analysis of the successes and shortcomings is presented, ranging from the difficulties involved in target formulation to the contributions of the scientific community. This section of the report thus presents some findings of the team that try to go beyond those mentioned in the sources and that are expected to help developing the estimates of future successes.

Shortcomings of the Biodiversity Action Plans

- a lack of prioritisation in addressing *key pressures* on biodiversity and related sectoral activities;
- *underlying causes* of biodiversity loss are not clearly addressed - if at all. The underlying causes of biodiversity loss have been systematically addressed in a study by ECORYS and Alterra[153] which has shown that market failures, inadequate property rights, negative externalities and poor governance prevent the proper allocation of public goods and resources between different competing users;
- as many of these plans were to a large extent *voluntary*, they lacked 'teeth' to guarantee results;
- *absence of a baseline and measurable targets* against which progress could be measured;
- *absence of evaluation of the potential of the actions* to achieve the final objectives.

Other policy shortcomings

Biodiversity policy in general must also come in for criticism as the assessment of that policy shows that there is/are:

- *insufficient integration* (mainstreaming)of biodiversity concerns in *other policy areas* and in the *financial* perspectives and financing cycles;
- *insufficient and inconsistent implementation* of EU nature legislation;
- *delayed benefits of other biodiversity relevant legislation* (e.g. Water Framework Directive; Marine Strategy Framework Directive);
- *insufficient funding* provided for biodiversity protection coupled with harmful subsidies;
- *insufficient resources* allocated to monitoring and evaluation tools;
- *policy gaps* in certain areas - e.g. invasive species, soil legislation; gaps in policy instruments (e.g. the absence of a general no-net loss biodiversity policy and the absence of EU legislation to protect soils);
- *insufficient use of economic incentives and economic instruments*;

[152] Sources: (1) ToR of this study; (2) COM(2010) 4; (3) Draft Post 2010 Biodiversity Strategy.

[153] Slingenberg et al., 2009.

- *insufficient focus on ecosystem services* (the Millennium Ecosystem Assessment was still too recent to strongly influence policies);
- *implementation problems with aspects of some existing practical measures*, such as the unfulfilled potential of some agri-environment schemes as a result of the use of generic management prescriptions;
- *insufficient advice and training* due to limited capacities in conservation agencies; and
- *information failures*, such as incomplete monitoring of many habitats and species of Community Interest (especially outside protected areas), inadequate monitoring of the impacts of developments and effectiveness of mitigation and compensation measures, and inadequate monitoring of the effectiveness of conservation management measures (e.g. agri-environment schemes).

Policy successes

On the other side of the coin, a number of successful measures are apparent[154]:

- *Targeted measures* under EU nature conservation legislation have proved capable of *reversing the decline* in some threatened species and habitats;
- So far, at EU level, related requirements of *cross-compliance* have been established under the common agricultural policy;
- EU regulations contribute to ensuring that the *environmental impacts of infrastructure development and spatial planning at EU level are minimized (or positive*) – Europe has well-established protocols for assessing the environmental impacts of projects and policies through mandatory processes such as EIA and SEA;
- Work is now gathering *pace to develop a baseline and related indicators* within the EU and at global level. A set of European indicators are being developed which, together with the data gathered for implementation of the Habitats Directive, which are likely to be the most advanced in the world;
- At global level, the EU is supporting *efforts to establish an Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)* to replicate the success of the Inter Governmental Panel on Climate Change (IPCC). The EU is further committed to securing a successful outcome in 2010 from ongoing negotiations under the UN CBD on access to genetic resources and the fair and equitable sharing of benefits derived from their use;
- EC is also *committed to making a success of negotiations on reducing emissions from deforestation and forest degradation* and including conservation as an essential first step towards a broader approach to valuating and rewarding ecosystem services.

An IEEP-Alterra study (2010) on the consequences of land use changes in Europe concludes the following, stating a number of similar strong and weak points:

- The EU has a *good framework for biodiversity conservation* with relatively comprehensive and effective legislation, wide-ranging environmental policies and potentially high levels of funding;
- Not achieving the 2010 target is at least in part due to *an inadequate implementation of the EU BAP*. The BAP aimed to provide a comprehensive list of actions that deliver the 2010 target; but there is little evidence of additional actions by Member States or that the BAP has been taken into account in the development and implementation of sectoral policies.

[154] COM(2010) 4.

The EU 2010 biodiversity target

According to the ToR of this study, the target was too general, not operational enough, no link with sub-objectives, no baseline and in addition, there was no assessment of the expected effects of policies and actions.

Another major reason for the limited progress on achieving the biodiversity target within the EU appears to be that the target does not have support outside the environmental sector. The relevance of biodiversity and well functioning ecosystems for the productivity in agriculture, fisheries and forestry is well documented in the scientific literature, but has not become a major convincing argument in the economic decisions in these sectors.

So, we observe (*a.o. from the interviews with European experts*) that "ownership" of the 2010 target rests heavily on the EU institutions. As a result most Member States do not feel obliged to pursue the EU BAP goals very vigorously. One reason may be that the efforts on Natura2000, which are part of the legal framework of the Union, were considered by Member States as sufficient towards the biodiversity target (e.g. Bouwma et al., 2006). Another factor appears to be that Member States and key stakeholders were not sufficiently involved (or did not feel involved) in the development of the target and BAP. As a result, although good progress has been made in some sectoral policies (most notably the CAP), inadequate mainstreaming of biodiversity conservation issues at the EU and Member states level has been identified as a key constraint on effective biodiversity conservation.

There are a number of problems with the formulation of the target in "headline" terminology. These problems were partly mentioned in workshops around Europe to analyse the conflicts in implementation of Natura 2000[155], and partly follow from analysing the implementation process in a number of European countries.[156]

First, as to the issue of "the target being too general", it is often mentioned that it would have been good to have had clear specifications of which aspects of the concept of "biodiversity" were to be protected against degradation. In fact with the Bird and Habitat Directives and Natura2000 policy, the EC had given a clear list of species and habitats to protect. However, related to these species and habitat targets, indications of environmental conditions, including cohesion of natural areas would have made the "target" broader and better embedded in the wider set of sectoral policies. The relationship between e.g. agricultural, fisheries, forestry and energy activities and biodiversity would most likely have been clearer if the link to environmental conditions (air, water, soil) would have been explicit.

Second, the Natura2000 policy is claimed to be mostly ecologically founded and misses the commitment of a number of relevant actors (stakeholders). In several countries this has led to serious blocking of the implementation processes.[157] As Natura2000 was a spatially very explicit policy, the stakeholders affected were clearly identified in the process, and e.g. in the Netherlands a serious number of court cases were developed from different stakeholder (organisations) which delayed the implementation considerably.[158]

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155 Bouwma et al., in prep.
156 Bouwma et al., 2006.
157 Bouwma et al., in prep.
158 Beunen, 2009.

Stakeholder involvement

As mentioned above, stakeholders in Europe generally complain of not having been involved. The stakeholders referred to are people, who are directly involved in conservation projects and who need to carry out the practical decisions and actions in terms of planning, design and actual implementation in terms of protection, management, restoration or creation of habitat and associated work with species (e.g. landowners and managers, contractors, conservation NGOs and volunteers, etc)[159]. They are directly affected by the plan or activity and can influence it but who are not directly involved in the work (e.g. adjacent landowners, local residents, hunters, bird watchers, recreational users, etc). It is a group of people whose permission, approval or (financial) support will be needed (e.g. regional and municipal authorities, local representatives of ministries, agencies and state institutes, etc). They may participate in implementation via community mobilisation efforts or by representing a particular segment of society (e.g. environmental organizations, elected officials, chamber of commerce representatives, neighbourhood advisory council members, religious leaders, etc). In some cases they may not be directly involved but who can influence opinions for or against the plan or activity (e.g. local celebrities, local media, elected officials, business or trade union leaders, environmental organizations, chamber of commerce representatives, teachers, neighbourhood group members, religious leaders, etc).

Dealing with the positions and issues of stakeholders was a major challenge facing the European Union (EC and Member states) when they embarked on the process of achieving the 2010 biodiversity target. At the time that the target was agreed upon, few if any of the stakeholders mentioned here had been consulted, not even in the implementation processes for the Bird and Habitat Directives. For most of the stakeholders, biodiversity conservation, or even sustainable use was not a first priority in daily life and decision making. Most of them had never before been explained why it was necessary, and how they could incorporate it in their lives[160].

Awareness, communication

In the chain of policy actions towards achieving a policy target, an import step is to create awareness of the relevant dimensions of the problem and of the actions that are considered necessary to be taken. The EC has taken many initiatives to increase the awareness of the biodiversity issue and its proposals to deal with them (see brochures and website DG ENV for many examples). Generally the awareness of the problematic situation as to biodiversity degradation is great. The examples in the BAP report[161] illustrate that at the level of the European Commission (the Member States are discussed elsewhere in this section) the awareness includes the wide ranging realization of actions which need to be taken, sometimes in terms of general policy or specific policy instruments (tools). Awareness can be increased and support for policy among government branches and stakeholders can be increased by communicating the rationale, strategy and consideration of interests of parties involved. So, even though direct improvement of the status of biodiversity cannot be linked to increasing of awareness, the continuation of the current measures into the future appears to be a good thing.

Policy initiatives

A crucial core task of policy makers is of course to make proposals which then go through the channels of government, where they may be amended, adopted, supported or ignored, countered and turned down. Some successful examples, to build on in the post-2010 period, are[162]:

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159 Adapted from: Rientjes, 2000.

160 See Bouwma et al., in prep.

161 EC, 2008.

162 See also proposals developed for Climate Change and Biodiversity and Invasive Alien Species, mentioned above.

- A Commission Communication on deforestation proposes that, within the framework of the UN Framework Convention on Climate Change negotiations on the future climate regime, the EU calls for halting global forest cover loss by 2030 at the latest and reducing gross tropical deforestation by at least 50% by 2020 from current levels. This objective would provide major climate change and biodiversity benefits by 2020;
- A key development in relation to forestry was the adoption of the EU forest action plan in June 2006, for which a work programme was adopted with the Member States in February 2008;
- A Communication on 'The role of the CFP in implementing an ecosystem approach to marine management' was adopted in April 2008;
- The EC actively participated in the UNCLOS process that led to the adoption in December 2006 of a Resolution by UNGA on Sustainable Fisheries for the protection of vulnerable deep-sea ecosystems in the high seas;
- The EU supported the adoption of some important decisions, including on ivory trade and the CITES Strategic Plan at the 14th Conference of the Parties of the Convention on Trade in Endangered Species.

Legal actions

An important step toward achieving biodiversity conservation and sustainable use is to create a legal framework by which all citizens, however they may be organized in stakeholders or political parties should live. Successful examples in the past decade include:

- Targeted measures under the EU nature conservation legislation have proved capable of reversing the decline in threatened species and habitats;
- An important development was the granting for the first time, in 2007, of interim measures by the EU Court of Justice to block potentially damaging activities in a Natura 2000 site in Poland;
- The Marine Strategy Framework Directive, adopted in June 2007, provides the basis for achieving good environmental status in the marine environment and improved conservation status for the EU's marine biodiversity. A series of fisheries regulatory measures are also being put in place to minimise the impact of fisheries on non-target species and habitats.

Aspects which require attention in the next decade are primarily:

- EC nature legislation does not apply to most of the Overseas Countries and Territories (OCTs) and Outermost Regions (ORs) of the EU Member States, which host some of the richest biodiversity hot-spots on the planet;
- The failure to adopt the proposed Soil Framework Directive still leaves a major legislative gap in relation to the preservation of soil structure and functions.

Funding

In western economies not much happens without money flows tied to the actors, actions and policies. An essential part of policymaking and government is allocation of tax money to make policies work. This is of course also the case in biodiversity policy. Some examples to learn from in the development of the policy baseline:

- Under Axis 2 of the Rural Development Programme an estimated EUR 20.3 billion of EAFRD has been allocated to agri-environment measures for 2007-2013, providing for substantial support for Natura 2000 and biodiversity;
- In addition, approximately EUR 577 million of EAFRD resources have been dedicated specifically to Natura 2000 agriculture and forest areas, representing new targeted measures under this policy;
- Average annual EU external assistance for biodiversity amounted to about EUR 740 million in 2003-2006, representing 48% of the aid related to global biodiversity;
- Opportunities to co-fund Natura 2000 costs exist in each appropriate EC funding regulation for 2007-2013;

- Guidelines and training under an EC contract have been provided to assist Member States in applying these funds;
- Under the operational programmes for 2007-2013 co-financed by the European Regional Development Fund (ERDF) and the Cohesion Fund, Member States have allocated EUR 2 719 million to the “Promotion of biodiversity and nature protection”;
- A further EUR 1 146 million has been allocated to the "protection of natural assets", which includes biodiversity projects. A total of EUR 1 376 million, earmarked for the "protection and development of natural heritage" in the framework of tourism, will also include some spending on biodiversity;
- A total of EUR 1 376 million, earmarked for the "protection and development of natural heritage" in the framework of tourism, will also include some spending on biodiversity.

In spite of the funds allocated, there is still concern expressed by the Commission[163] that funds have not been sufficient to support processes towards the timely achievement of the biodiversity target.

Examples include:

- These funds amount to less than 1/50th of Community and Member States’ total annual development aid budgets. There is no evidence that biodiversity-related funding has increased since the adoption of the Biodiversity Action Plan;
- Mainstreaming biodiversity in the development cooperation budgets of both donor and recipient countries faces great challenges;
- Early estimates show that only 20% of the total financing needs for managing protected areas in Europe are being met.

There is a risk factor involved in the funding of activities which have a clear causal role in the degradation of biodiversity. For example, as a significant share of the Structural Funds are now available to new Member States, this inevitably leads to greater pressures on biodiversity and requires careful planning to ensure that infrastructure needs are compatible with biodiversity protection.

The scientific community: serving multiple roles from individual expert to independent agency

The scientific community has much more knowledge about the ecology and the economics of nature conservation than has been actively used in the policy design, communication to stakeholders and implementation in the past 10 years. However, the messages from the scientific community were not always consistent, and often academic reasoning was used in arguing the validity of arguments pro and con policy measures, which did not help the process of decision making, nor the court cases in Natura 2000 disputes:

- In the marine environment, many ecosystems and habitats are poorly understood, species not described, and knowledge of marine genetic resources is in its infancy;
- One example which is very acute now is the crucial notion of social and economic benefits of nature conservation, which is the core of the concept of ecosystem services, was already available in many publications in renowned scientific journals. It took until the Millennium Ecosystem Assessment publication, in 2005, before the concept was introduced into formal European Biodiversity policy.[164] The TEEB study should put this knowledge in the global limelight and support the development of economic policy instruments which do avoid the “imperfections” of the traditional market based instruments;

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163 See a.o. COM(2010)4).

164 COM(2006), 216.

- Data gathering, analysis and validation in biodiversity have not always followed a comprehensive approach due to the complexity of biodiversity, which cannot be reduced to a single variable but requires development of a set of inter-related indicators;
- There has been continuing progress with the SEBI 2010 initiative. A set of 26 pan-European biodiversity indicators provides the basis for a first European indicator-based assessment of progress towards the 2010 biodiversity target, to be published by the EEA in the first half of 2009. The development of national indicators, aligned with the SEBI 2010 framework, is underway in the Member States. However, there has been no agreement at Community level on specific biodiversity indicators as part of the core Structural Funds indicators for 2007-2013;
- At least 14 Member States have a dedicated national or sub-national programme that supports biodiversity research. Funding for biodiversity monitoring lags however substantially behind national investments in other environmental issues and needs to be increased significantly to allow for comprehensive future assessments;
- Research undertaken under the Community's 6th Research Framework Programme (2002-2006) is already feeding into the development of EU biodiversity policy;
- Insufficient integration of scientific knowledge in policy design and implementation. Better information on the economics of biodiversity and on its linkages with poverty issues would help decision makers on both sides to direct more attention to the issue.

Member State Perspectives

Although a varying number and group of Member States have been taking actions towards achieving the 2010 target, the overall picture is not encouraging. Eight years after Gothenburg, implementation has not moved much beyond the partial carrying out of processes of legal embedment, delineation of Natura2000 areas, lawsuits to decide on obligations, starts of management plans and allocation of some funds. The examples have been extracted from the country reports for the BAP and from the BAP summary report (2008).

Awareness and communication

- EC Country Strategy Papers take due account of environmental concerns in addressing focal areas of cooperation;
- A Flash Eurobarometer opinion poll in December 2007 revealed that only a minority of EU citizens considered that they were well informed on the subject of biodiversity loss;
- Some Member States have already initiated campaigns to raise awareness about biodiversity;
- Twenty Member States have indicated that they have national initiatives aimed at promoting partnerships for biodiversity.

Proposals and adoption of proposals

- Since 2006, Member States have proposed an area larger than Portugal for protection under the Habitats Directive, extending the network for the first time to the new Member States;
- Likewise, under the Birds Directive, Member States have designated an area larger in size than Ireland. The combined Natura 2000 network now comprises more than 25 000 sites, covering around 17% of the total land area of the European Union;
- Work is ongoing in various Member States on the development of river basin management plans under the Water Framework Directive;
- Six Member States have plans to follow up on the MEA;
- Site management plans need to be further developed. The lack of such tools is a potentially serious limitation to ensuring adequate financing of the Natura 2000 network.

Funding

- Under the operational programmes for 2007-2013 co-financed by the European Regional Development Fund (ERDF) and the Cohesion Fund, Member States have allocated EUR 2 719 million to the “Promotion of b iodiversity and nature protection”;
- There are significant differences between Member States in their overall use of these funds;
- All but three Member States have allocated some funding for biodiversity, although as a proportion of the overall allocations this varies between countries. Two Member States intend to use more than 3% of their allocated funds for biodiversity-related categories;
- As a significant share of the Structural Funds are now available to new Member States, this inevitably leads to greater pressures on biodiversity and requires careful planning to ensure that infrastructure needs are compatible with biodiversity protection.

Implementation

- There are delays in establishment of the Natura 2000 network, which is not set to be complete on land until 2010 and at sea until 2012. In addition, reporting by Member States under the Birds and Habitats Directives has been uneven;
- Member States could more systematically take advantage of the possibilities offered under rural development funding for agri-environment measures, including Member States with widespread areas of biodiversity rich ‘high nature value’ farmland.

ANNEX B: Pilot detailed impact assessment on sub-target 1

This text was drafted during the course of the study to pilot the EC's proposed approach towards the impact assessment. The lessons learned from this pilot (i.e. that this type of impact assessment does not generate the right type of output) was used as a step towards deciding for the different approach used in the current version of the EC Draft Impact Assessment.

Introduction

Agricultural practices and policy play an important role in maintaining biodiversity levels in Europe and in 2003 it was estimated that "50 % of all species in Europe depend on agricultural habitats".[165] However, biodiversity in rural landscapes has declined (see e.g. IEEP & Alterra, 2010). Three major reasons should be mentioned: first, agricultural land competes with land that is or could be natural habitats with endemic flora and fauna. Secondly, agricultural techniques that rely on intensive farming and high turn-over of fertilisers cause pollution with often negative direct and indirect effects on biodiversity. Thirdly, abandonment, intensive farming and irrigation have all had negative effects for the so-called agro-biodiversity, the biodiversity associated with traditional agricultural practices, with surplus nitrogen from fertilisers for example contributing significantly to the deterioration of both terrestrial and aquatic systems.

Through legislation, the EU has achieved varying success in reducing pressure from agriculture on biodiversity. Direct effects are observed through control of nitrogen losses and indirect effects come from organic farming (21% increase from 2005-2008)[166]. However, over the last few decades abandonment has been relatively widespread in areas with extensive production and small farms, especially in mountainous regions and/or on poor soils. Elsewhere abandonment can be strongly localised and relatively small-scale. Intensification indicators suggest that over the 1990-2000 period the main areas of intensification were in Ireland, Spain and parts of North Western Europe, and during the later part of the decade in the former GDR, Hungary, and the Baltic States (following earlier extensification and widespread abandonment of agriculture). Losses of permanent grassland as a result of both intensification and abandonment are projected to be widespread across the EU, with particularly large declines predicted in Portugal, Greece, Spain and Estonia.[167]

Stopping continued loss of biodiversity in agricultural landscapes is a priority for a post-2010 biodiversity policy for Europe. Recent changes in the political landscape have created convergence towards the concept of High Nature Value (HNV) farming which generally means low intensity farming, enabling relatively high levels of biodiversity.

This impact assessment (IA) will present the concept of HNV farming, its potentials and challenges, current policy situation and propose future policy options. It will also evaluate expected socio-economic and environmental impacts following the proposed policy options in comparison to current policies.

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165 Kristensen, P., 2003. *EEA core set of indicators: revised version April 2003*. Technical report. European Environment Agency, Copenhagen.

166 EEA Biodiversity Baseline 2010

167 IEEP and Alterrra, 2010

Snapshot of High Nature Value farming in Europe

HNV farmlands refers to areas where farming systems are sustaining a high level of biodiversity. They are often characterised by extensive farming practices, associated with a relatively high species and habitat diversity or the presence of species of European conservation concern. HNV farmland currently represents approximately 1/3 of farmed land in Europe[168],[169] , located mainly in the Mediterranean region and Eastern European countries. Grassland (meaning the sum of semi-natural grasslands and pastures) is by far the largest type of HNV area, totalling 1/3 of the farming area.

Table 8 HNV farming areas per Member State (HA) [170]

Country	(1) HNV farmland area, JRC/EEA study	(2) Agricultural land (CLC agricultural classes + HNV areas)	(3) Utilised agricultural area UAA (EUROSTAT)	(4)=(2)/(3)[171] Agriculture land CLC compared to UAA	(5)=(1)/(2) Area share of HNV farmland
Belgium	347 960	1 786 942	1 385 580	129%	19%
Bulgaria	2 509 989	6 734 217	2 729 390	247%	37%
CzechRepublic	1 043 973	4 950 869	3 557 770	139%	21%
Denmark	172 267	3 446 150	2 707 690	127%	5%
Germany	3 162 699	21 607 362	17 127 350	126%	15%
Estonia	380 879	1 695 820	828 930	205%	22%
Ireland	1 162 594	5 777 390	4 443 970	130%	20%
Greece	5 349 572	9 122 263	3 583 180	255%	59%
Spain	18 986 960	34 038 906	26 085 390	130%	56%
France	7 797 145	35 311 870	27 856 320	127%	22%
Italy	6 127 030	18 359 587	13 062 260	141%	33%
Cyprus	342 045	637 043	151 500	420%	54%
Latvia	568 400	2 853 680	1 432 680	199%	20%
Lithuania	627 202	4 159 700	2 792 040	149%	15%
Luxembourg	12 871	142 632	127 510	112%	9%
Hungary	1 906 124	6 822 877	4 555 110	150%	28%
Netherlands	368 788	2 621 717	1 958 050	134%	14%
Austria	2 447 292	3 578 621	3 266 250	110%	68%
Poland	4 813 243	20 231 887	14 754 880	137%	24%
Portugal	2 900 462	5 035 890	3 736 140	135%	58%
Romania	4 860 372	14 433 920	13 906 700	104%	34%
Slovenja	591 314	754 255	485 880	155%	78%
Slovakia	547 582	2 485 476	2 159 900	115%	22%
Finland	1 330 797	2 967 068	2 215 970	134%	45%
Sweden	1 136 030	4 759 869	3 192 440	149%	24%

168 Paracchini M.L., J.-E.Petersen, Y.Hoogeveen, C.Bamps, I.Burfield, C.van Swaay (2008): *High Nature Value Farmland in Europe - An estimate of the distribution patterns on the basis of land cover and biodiversity data*, Report EUR 23480 EN. 87 p

169 Considering the constraints in mapping HNV areas, this number must be considered a conservative estimate.

170 Adapted from: Beaufoy, et al 2009. *Distribution and targeting of the CAP budget from a biodiversity perspective.* Technical report. European Environment Agency, Copenhagen. p. 20.

171 This column indicates the relation between agricultural land as estimated by CLC and Member States reported UAA.

United Kingdom	5 165 466	19 368 468	13 174 690	147%	27%
Total	**74 659 056**	**233 684 479**	**171 277 570**	**136%**	**32%**

The environmental benefits of preserving HNV farmland are well understood, but however, difficult to quantify. For example, nearly 1/3 of European HNV farmland falls within the Natura 2000 network, contributing to network objectives. In France, studies show how birds populations have declined in non-HNV areas but remained stable in HNV areas. Moreover, permanent pastures provide major carbons sinks even comparable to forests.

This value of HNV farming is also recognised in policy making. Conservation of biodiversity on agricultural land is an explicit objective of the Pan-European Biodiversity and Landscape Strategy (PEBLDS), the Bern Convention, the European Landscape Convention, and, at EU level, the Habitats and Birds Directives and Rural Development Policy (Community Strategic Guidelines for Rural Development, Programming Period 2007-2013). Conserving HNV farmland was key to achieving the 2010 biodiversity target. Pan-European data on distribution and conservation status of HNV farmland, however, were largely lacking. In their 2003 'Kyiv' declaration, the European Environment Ministers have therefore set the goal to fill this data gap and take adequate conservation measures (Parucci et al 2008).

The main policy vehicle for agricultural change in Europe is the Common Agriculture Policy (CAP). CAP support to HNV farming varies between Member States. Countries in regions with relatively little HNV farmland tend to support more intensive farming under Pillar 1[172]. The implementation of rural development measures under Pillar 2[173] also diverge widely across Member States. In general, budget allocations for HNV support are small. In a number of case studies EEA found that between 1.3 – 4 % of total CAP expenditure was spent on agri-environmental schemes that could benefit HNV farming[174] and in EU-15 cases, 85% of total CAP expenditure was spent under Pillar 1. Current Single Farm Payment Scheme (SPS) has largely fossilised the pre-existing funding pattern, generally favouring more intensive production systems[175] and distribution of CAP resources insufficiently supports HNV farming.

Table 9 Description of the two CAP pillars

Pillar 1	Pillar 2
The first pillar is a commodity-based regime. Originally it was a market intervention mechanism, providing price guarantees, production incentives and export subsidies for certain crops and livestock products. As such it was a catalyst of agricultural productivity. Through successive reforms, the first pillar subsidies have become more and more decoupled from production. Subsidies are now provided through either direct payments on the basis of historic production levels via Single Payment Schemes (SPS) or Single Area Payment Schemes (SAPSs), or, through market	The second pillar of the CAP allows Member States to implement measures for alleviating or improving the ecological impacts of agriculture. There is an array of measures that can be used to support low intensity farming and the main elements relevant to HNV farmland conservation are agri-environment schemes and less favoured area payments. **Second pillar payments are partially co-financed by Member States and regions.** *(based on: EEA, 2004 and 2009)*

172 See table 2.2.

173 Rural development expenditure, aimed at i.a. enhancing competitiveness, environmentally-friendly farming and forestry measures, training, rural tourism or local development.

174 EEA, 2009 *Distribution and targeting of the CAP budget from a biodiversity perspective*. European Environment Agency Technical Report No 12/2009.

175 Ibid. p. 7

interventions including tariffs, intervention purchasing, or output quotas. First pillar payments are subject to environmental conditions in so called 'cross-compliance'. **First pillar payments are taken 100% from EU budget.**	

Economic incentives are key to understand the intensification and/or abandonment of low intensity farming. Low intensity often means lower crop-yields for more labour input than high intensity. Hence the main pressure on contemporary HNV farming is the lack of socio-economic viability which leads to a parallel process of abandonment in more marginal areas and intensification where the productive potential can be exploited.[176] Hard data on the income situation of HNV farmers is scarce. However, studies indicate that low intensity farming yields less income then high intensity farming even with CAP support. In particular, if you monetise family work contribution at standard farm labour rates, HNV family farm workers earnings are relatively low[177]. Valuation of and subsequent payment for farmers' contributions to other ecosystem services than food production is an option to be developed. A system that intends to preserve rich biodiversity in HNV farmland must hence produce viable incentives where input of labour yields sufficient income. Payment for ecosystem services (PES) could become such an incentive. CAP is central in creating the incentive to maintain HNV farmland, even if other schemes can and should be geared towards the same goal.

Greening the CAP

The 2003 CAP reform aimed at creating economic incentives in tune with environmental needs. The reform included 'decoupling' subsidies from particular crops, which entailed that financial support became independent of volume of production. The, so-called, 'single farm payments' were made subject to 'cross-compliance' conditions which links production to environmental, food standard and animal welfare standards and the aim to liberate funds for improving environmental quality or animal welfare. This 'greening' of the CAP was expanded in 2008, after a 'Health check' of the CAP, and a remainder of crops were decoupled and put into so called Single Payment Schemes (SPSs). In article 68 of the Health Check, Member States decided to allow for more flexibility in using Pillar 1 funds for Pillar 2 purposes. It allows all Member States to retain up to 10 per cent of their national ceilings for direct payments to provide support to specific sectors, for an expanded range of purposes. There are now five purposes for which the funds can be used:

- protecting the environment, improving the quality and marketing of products (as currently permissible under Article 69) or for animal welfare support;
- payments for disadvantages faced by specific sectors (dairy, beef, sheep and goats, and rice) in economically vulnerable or environmentally sensitive areas as well as for economically vulnerable types of farming;
- top-ups to existing entitlements in areas where land abandonment is a threat;
- support for risk assurance in the form of contributions to crop insurance premia; and
- contributions to mutual funds for animal and plant diseases[178].

This move was made to boost investments in, e.g, biodiversity and climate change measures.

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176 Beaufoy, personal communication.

177 Ibid. p. 23

178 IEEP, 2008 *IEEP CAP Health Check Review: Article 68*, accessed: http://cap2020.ieep.eu/2008/12/2/ieep-cap-health-check-review-article-68-implications-for-the-future-of-the-cap.

Nevertheless, the greening of CAP is still in its infancy.

Targets for a post-2010 EU biodiversity strategy

The 2013 CAP reform provides a unique policy opportunity to strengthen the CAP/biodiversity agenda. The mission statement from the President to Commissioner Ciolos includes an explicit reference to the need to ensure greater CAP delivery on ecosystem services. Further greening the CAP is increasingly seen as part of the answer to the key question of the political acceptability of the CAP and of its share of the EU budget. Moreover, the rebalancing of the CAP budget in their favour sought by EU-12 Member States would imply some rebalancing of CAP priorities. Finally, the agricultural constituency's increasing concerns about the loss of non-urban areas (in most cases, agricultural areas) to urbanisation have created new convergences.

With this objective in mind, different possibilities for a sub-target formulation include:

- a sub-target focused on lowering the pressure of intensive agriculture and ensuring the sustained provision of a range of ecosystem services;
- a sub-target focused on a sufficient delivery of ecosystem services both in extensive and intensive agriculture areas;
- a sub-target focused on maintaining and restoring extensive agriculture.

For the latter, there is a certain convergence of views on the attractiveness of "High Nature Value" farming/forestry to underpin the sub-target. The concept of "High Nature Value"(HNV), although not fully harmonised and agreed yet, generally describes those types of farming activity and farmland that, because of their characteristics, can be expected to support high levels of biodiversity and their contribution to adaptation to climate change. These are not equally shared across Europe. The concept therefore makes it possible to reflect equity across Member States.

The following sub-target formulations are currently under review:

- % of land under a contract to deliver HNV related farming and forestry within and outside HNV areas;
- % of CAP direct support directed to HNV (area/farming to be determined) to contribute to good conservation status;
- Sub-target for intensive agriculture (e.g. % land under organic farming).

DG AGRI is currently working on a Communication on the Reform of the CAP which is due in November 2010. Although it is unlikely that this Communication would go into a very high level of detail on the changes to be introduced, biodiversity linked to a greening of the CAP and the payments for public goods are elements which are bound to feature prominently in that document. This would allow for an introduction of the instruments necessary for making the CAP more biodiversity-friendly in the subsequent revised regulations.

CAP reform is potentially the most potent, however, not exclusive measure to improve the HNV farmland situation. For example, nearly 1/3 of HNV farmland falls within Natura 2000 sites[179] and 15% of Natura 2000 sites are farmland. Hence, Natura 2000 and the support to HNV farming in and beyond the ecological network are entirely complementary approaches[180].

Ultimately, there are several interesting policy options available to support and reach tentative EU targets for HNV farmland. In order to frame the discussion, the next section of this IA intends to give

[179] EEA, 2004 *High nature value farmland: Characteristics, trends and policy challenges*. No: 1/2004.

[180] EEA, 2009.

a brief overview of four selected scenarios, which represents different pathways or scenarios to reach sub-target one.

Presenting the Policy Options and Assessing the Impacts

Four policy options have been selected for this impact assessment: Option 1, policy baseline, to which all the others are compared; Option 2, linking biodiversity action into legislation; Option 3, market based and voluntary measures; and, Option 4, developing a Biodiversity Framework Directive.

Option 1: Business-as-usual (BAU)

Business as usual describes the set of policy options relating to the current biodiversity policy baseline and its contribution to meeting the new biodiversity target. Thus, the business-as-usual option is based on the assumption that full implementation of current policies is achieved. Business-as-usual does not take into account the development of new policies for closing current gaps that have been identified.

This policy option will be used to compare all other options against.

Assessing the impact of Option 1

Preserving HNV farming in a business-as-usual (BAU) scenario would remain reliant on the continuing use of existing possibilities for funding under CAP's second pillar and it's axis 1 (measures on training, information and advisory services); under axis 2 (land management and non-productive investment measures); axis 3 (conservation and measures for the conservation and upgrading of the natural heritage allowing the support for the drawing-up of management plans related to Natura 2000 sites) (see table 1 of BAP MTR).

Cross-compliance and agri-environmental schemes would remain the strongest 'green' parts of the CAP and Member States would continue to implement and make use of these instruments as they wished. This implies a continued flow of a major share of Pillar 1 funds to intense farming and small resources from Pillar 2 being directed towards preserving HNV farms.

The current situation emanates from the changes made in the 2003 CAP reform and the 2008 Health Check which have not quite lived up to the expectations. Where decoupling has been applied extensive livestock grazing has declined in remote areas which exacerbate the risks of abandonment or intensified farming. Once farmers and their livestock have gone, it is apparently complicated to bring them back. Cross-compliance, meant to introduce green compliance for CAP delivery, is not geared towards spatial planning and has had no real benefits for HNV.

Social impacts

Current CAP amounts to roughly €53 billion a year. It equates a distribution of €290 per hectare of Utilised Agricultural Area (UAA) [181]. About 1/5 of the CAP expenditure is spend on under the 2nd pillar which includes agri-environmental schemes. It is not easy, however, to establish the actual income levels of HNV farms compared to non-HNV farms. Existing studies suggests that HNV farms have lower net incomes than non-HNV farms, partly because of lower shares of arable land. This could create significant social effects where intensification of farming is associated with higher income levels. Moreover, Article 68, introduced in the Health Check, was meant to boost funds going to HNV farmers. However, to this date it appears to have little effect.

[181] EEA 2009

Environmental impacts

To quantify the environmental impact of 2003's CAP reform on biodiversity poses large methodological hurdles. One study[182] expected the decoupling part to mainly concern land falling out of production, and extensification of land use (especially on grassland) and other forage area. Also, the inclusion of certain landscape elements into the eligible area, (depending on the implementation rules at Member State level) which might facilitate the creation of hedges and other landscape features, as the area related payments are not lost any more in case of land use changes.

Monitoring

Quantification of HNV farmland indicators is difficult in general considering differences in national applications of the concept, poor data, and non-existent monitoring schemes. Currently only Germany has a simple site-based (1000 sites) monitoring scheme in place. It cost about €200.000 per year and shows strong potential to upscale.

In conclusion, since the impact of CAP reforms has generally had negative impact on HNV farmland, it is assumed that the current policy is not generating positive environmental effects by shifting the economics. Even if current policy is implemented to the fullest, current progress is unlikely to contribute sufficiently to HNV farming targets for 2020.

[182] Osterburg et al 2007 *Analysis of policy measures for greenhouse gas abatement and compliance with the Convention on Biodiversity*. MEACAP WP6 D16a

Economic criteria	Key impact Indicators	Likely impact (rated from +++ to ---)	Explanation of expected impact
EU and MS budgetary impact	Financial costs to EU Budget; Financial costs to Member States and other public authorities, one-off versus recurring costs	+	Funds used for HNV farming are rather low, in particular compared to what the areas return in terms of ecosystem services.
Benefits (avoided costs)	Ecosystem services valuation; reduced emissions; improved adaptation to climate change; etc.	--	HNV farmlands contribute considerably to ecosystem services by for example, providing habitats to pollinators, and improve environmental quality by minimisinge the use of fertilisers. Additionally, grass fields for grazing are large carbon sinks, even comparable to forests, hence, in a BAU the loss of HNV farmland created negative costs in terms of ecosystem services (incl. carbon sinks). etc
Cost-effectiveness of biodiversity conservation	Level of cost-effectiveness of the approach	-	HNV farming support is from a biodiversity perspective a fairly cheap investment, since the farmland yields income, while preserving habitats. Abandonment and intensification is however, complicated to reverse.
Social criteria	**Key impact indicators**	**Likely impact (rated from +++ to ---)**	**Explanation of expected impact**
Impact on different stakeholder groups	Costs for different stakeholders	?	This indicator depends on which stakeholders to include. In case of further investments in preserving HNV farmland, non-HNV farmland might be disadvantaged. Etc.
Poverty alleviation (internal and external to the EU)	Allocation of property rights to indigenous custodians of high nature conservation areas; Reduced destruction of habitat for livelihoods	- -	Current HNV farmland policy is not geared towards either internal nor external poverty alleviation or land right issues.
Environmental criteria	**Key impact indicators**	**Likely impact (rated from +++ to ---)**	**Explanation of expected impact**
Biodiversity and the reduction of pressures	Contribution to 6 sub-targets + Pressures Overexploitation; Habitat Destruction / Fragmentation; Climate Change; Invasive species; Pollution	 - - - - ? - -	BAU leads to continued abandonment and intensification of low intensity farmland. It hence increases fragmentation, as formerly connected areas becomes patches with lower biodiversity. Carbon sinks could be lost. Fertilizers which are needed in intense farming strongly adds to pollution and contaminating water ways and ultimately oceans. Finally, the loss of habitats will impact negatively

	Global biodiversity	-	on global biodiversity.
Other criteria	**Key impact indicators**	**Likely impact (rated from +++ to - - -)**	**Explanation of expected impact**
Risks to policy implementation	Number of – and likelihood of - threats to successful policy implementation	+ +	Policy makers are increasingly positive to HNV farmland and 'greening' the CAP. The current pace might be more politically feasible than increasing spending on low-intensity and small crop yield farming
Feasibility	Political (incl. stakeholder views), financial and technical feasibility levels of the option; Timeline of implementation in relation to target achievement	+ +	See above answer
Flexibility	Degree of flexibility of the option to deal with local issues	+	Within the current framework, Member States are allowed to designate parts of CAP to other purposes (article 68) and sometimes supports agri-environmental schemes where considered appropriate.
Relationship to existing measures	Extent to which measure is done already / builds on existing policy; Degree of feasibility to adapt / adjust existing measures		
Enforcement	Level of enforceability of the measure; Types of enforcement mechanisms in place; Level of responsibility (who is responsible for implementation?)		
Monitoring and evaluation	Type/effectiveness of monitoring mechanism in place to check progress of the measure	+	CLC, Natura 2000 data, Important Bird Areas (IBA) and Prime Butterfly Areas (PBA) are readily available for monitoring. Updating datasets, measuring change and put monitoring programmes in place would need additional resources.

Option 2: Linking biodiversity action into existing legislation

This policy option implies that current policies already under the policy baseline would remain in function, but new / additional efforts necessary to achieve the 2020 target would be implemented either better linkages of biodiversity measures to existing legislation and/or via the development of specific new legislation for some of the sub-targets.

This policy option is based on the assumption that many of the existing legislations (on biodiversity and in other sectors) are already well-established and sometimes "simply" need a better link to ensure actions towards biodiversity are taken. To this end, each sub-target is analysed as to where this link would be most effective and how it could be established. For some specific issues under sub-targets gaps may be identified, i.e. no currently existing legislation is suitable for establishing a strong link to biodiversity measures, and thus new specific legislation is explored.

Assessing the impacts of Option 2

The 2013 CAP reform offers, a possibility to significantly improve the green credentials of the agricultural subsidy system. The current CAP is still biased towards larger production volumes and intensification[183], and green instruments are too weak and too small to have a considerable effect on HNV farmland preservation. Key to addressing the problem is to change socio-economic conditions for HNV farmers in order to counter land-abandonment or intensification. For CAP, this would mean stronger political signals in using pillar 1 funding for biodiversity improving measures and focus agri-environmental schemes. Political acceptance has changed fundamentally over the last few years, however, there are still diverging views among both countries and national ministries. For example, countries with the ambition to green Pillar 1, such as the Netherlands and the UK, might be more in favor of reforming the CAP in line with biodiversity targets. Also, greening the CAP might be a way to improve acceptance among the public to continue to heavily subsidise European farming.

Policy option 2 pertains to "improvements of current practice" and here three non-excluding policy options will be presented: 1) gearing pillar 1 towards biodiversity improvements in agriculture, 2) strengthening agri-environmental schemes, and 3) improved integration of HNV farmland in Natura 2000.

Gear pillar 1 funding towards HNV farmland

In the current CAP system, funds from pillar 1 are allocated largely based on productive areas which creates a bias against low-intensity farming. Considering the uneven CAP spending, favoring pillar 1 measures, the large funding potentials are geared away from contributing to biodiversity.

Beaufoy et al (2010) suggest two options of shifting pillar 1 expenditure towards HNV farming. (1) Introduce a flat rate system, where farmers receive a flat rate for their amount of land. It would increase subsidy levels for HNV farmers at no cost for the CAP. However, under the current Single Payment Scheme (SPS), several sectors would suffer significantly from a flat rate system, making it a rather radical option. (2) The second option would be to propose an arbitrary cap of highest possible payment per hectare across sectors. The funds made available through cutting subsidies could then be reinvested in HNV farming.

The two options create no additional costs by simply shifting CAP funds within pillar 1 and gearing it towards green instruments. However, there might exist strong vested interests working against such a solution, especially in EU-15 as: "*The widespread use of a historic basis for allocating*

[183] See Beaufoy, et al 2009. *Distribution and targeting of the CAP budget from a biodiversity perspective.* Technical report. European Environment Agency, Copenhagen. p. 20.

payments under the current Single Farm Payment Scheme (SPS) has largely fossilised the pre-existing funding pattern, generally favouring more intensive production systems" (Beaufoy et al. 2010, p.7).

Re-focus agri-environmental schemes to complement, rather than represent, CAP allocations to HNV farms

Paying farmers to create suitable habitats on private land to encourage wildlife and a diversity of species in the area: so-called agri-environment schemes (AES) is one well-established initiative to manage for biodiversity implemented in Member States. The range of measures taken to implement this approach obviously varies from Member State to Member State, but in essence still remains a prescribed policy intervention for achieving dedicated biodiversity improvement goals. Although it has been widely acknowledged that there is sufficient ecological insight and geographical information to identify the objectives, outcomes and targeting for potential Agri-environment prescriptions, results having not always been satisfactory (Klein et al. 2006; Stoate et al., 2009). Ecological insights have often been lacking for spatial scale effects and for temporal and ecosystem service effects (i.e. those services such as the provision of biodiversity).

One suggestion to improve this situation is to link wide-scale ecological evaluations to specific case studies on the causes of (in) effectiveness of agri-environmental schemes), which could, in some cases, reveal specific situations that deserved subsidies. (Wiertz & Sanders, 2006).In general, it is agreed that there are a few main areas where research is needed to improve the cost-effectiveness of such agri-environment schemes, namely the development of decision support tools for designing cost effective agri-environmental schemes, comparative research identifying best practice, and research to investigate how institutions and governance structures have to be designed to ensure that the available money is spent in the interest of conservation.

First, the effectiveness of AES in protecting biodiversity could be considerably augmented "if a smaller number of larger resource patches [were] provided, in contrast to current practice that promotes many small fragmented areas of environmental resource" (Whittingham 2007). Such disjointed patches of land do not provide sufficiently big habitats for many species, and consequently have only limited potential in conserving biodiversity (e.g.Wiertz & Sanders, 2006). Hence AES should prioritize sizable farmland and the integration of neighboring farms into joint HNV areas, which allows them to qualify. Another measure to improve the cost-effectiveness of agri-environment schemes could be the usage of larger moths as bio indicators of landscape-scale quality as well as providing more appropriate financial rewards to farmers for different landscape features, and lastly, through landscape-scale targeting of farmers to encourage participation in AES (Merckx et al. 2009)[184].

Moreover, small farms rarely receive subsidies, which can partly be attributed to unprofessional management of many micro-agricultural businesses, and partly to the method of fund allocation. While small farms often deploy relatively eco-friendly, low intensity farming techniques, they often do not fulfil the reporting requirements for subsidies or simply do not apply for them. Consequently, biodiversity could benefit greatly if small farmers were educated to engage in active seeking of subsidies.

Links between HNV farmland, Natura 2000 and natural handicap.

[184] Optimizing the biodiversity gain from agri-environment schemes, Agriculture, Ecosystems and Environment 130 (2009) 177–182.

(1) The “level”of protection against infringement by other land uses of that part of HNV farmland that is in Natura2000 areas is of course (much) higher than in the remaining HNV farmland.
(2) Also the Agro-Env. Financing schemes in many Member states are “volatile”, i.e. they are often short (1-year) contracts, and even in the Netherlands with 6-year contracts, there is no long term guarantee on developing stable ecosystems with stable biodiversity.

The most promising strategy would be to select “promising” areas for biodiversity and non-food ecosystem services, and provide comparatively higher levels of PES (Payment for Ecosystem Services) for e.g. Class 1 areas, with long term contracts and competing income levels for the farmers which are part time conservation managers (give them status, title and money).

Economic criteria	Key impact Indicators	Likely impact (rated from +++ to ---)	Explanation of expected impact
EU and MS budgetary impact	Financial costs to EU Budget; Financial costs to Member States and other public authorities, one-off versus recurring costs	+	Current CAP is geared towards intensive farming. Policy option 2 includes adjusting pillar 1 and shifting support to pillar 2 towards HNV farming and propose methods which does not incur additional costs on Member States.
Benefits (avoided costs)	Ecosystem services valuation; reduced emissions; improved adaptation to climate change; etc.	++	HNV farmlands contribute considerably to ecosystem services by for example, providing habitats to pollinators and minimise the use of fertilisers. Additionally, grass fields for grazing are large carbon sinks, even comparable to forests.
Cost-effectiveness of biodiversity conservation	Level of cost-effectiveness of the approach	++	There is great potential in CAP adjustments relating to the size of the funding.
Social criteria	**Key impact indicators**	**Likely impact (rated from +++ to ---)**	**Explanation of expected impact**
Impact on different stakeholder groups	Costs for different stakeholders	- -	Redistributing CAP funds means that non-HNV farming stakeholders might lose out on funding. This could pose large obstacle in implementation.
Poverty alleviation (internal and external to the EU)	Allocation of property rights to indigenous custodians of high nature conservation areas; Reduced destruction of habitat for livelihoods	+++	The purpose of the policy options is to make HNV farms economically viable and allow farmers and herders to sustain their current agricultural lifestyle.
Environmental criteria	**Key impact indicators**	**Likely impact (rated from +++ to ---)**	**Explanation of expected impact**
Biodiversity and the reduction of pressures	Contribution to 6 sub-targets + Pressures Overexploitation; Habitat Destruction / Fragmentation; Climate Change; Invasive species;	 ? +++ + ?	

	Pollution Global biodiversity	++ ?	
Other criteria	**Key impact indicators**	**Likely impact (rated from +++ to - - -)**	**Explanation of expected impact**
Risks to policy implementation	Number of – and likelihood of - threats to successful policy implementation	-	Slow and cumbersome agricultural policy process combined with heavily vested interest in, mainly, EU-15 would make a redistribution difficult. However, raising the effectiveness of AES should be in everyone's interest. MS in Eastern Europe with vast HNV farmland are more in favour of the concept and could put pressure on current system.
Feasibility	Political (incl. stakeholder views), financial and technical feasibility levels of the option; Timeline of implementation in relation to target achievement	- -	If left to improve AES then timeline and feasibility would improve.
Flexibility	Degree of flexibility of the option to deal with local issues		
Relationship to existing measures	Extent to which measure is done already / builds on existing policy; Degree of feasibility to adapt / adjust existing measures		
Enforcement	Level of enforceability of the measure; Types of enforcement mechanisms in place; Level of responsibility (who is responsible for implementation?)		
Monitoring and evaluation	Type/effectiveness of monitoring mechanism in place to check progress of the measure	+	CLC, Natura 2000 data, Important Bird Areas (IBA) and Prime Butterfly Areas (PBA) are readily available for monitoring. Updating datasets, measuring change and put monitoring programmes in place would need additional resources.

Option 3: Market based and voluntary mechanism

Choosing for market-based and/or voluntary implementation mechanisms would imply that current policies already under the policy baseline would remain in function, but new / additional efforts necessary to achieve the 2020 target would be implemented via market-mechanisms or voluntary approaches.

Market-based mechanisms would, in particular, focus on improving current market imperfections related to biodiversity and offer policy solutions that are cost-effective (TEEB). These market-based mechanisms could be combined with other non-legislative policy measures, namely with improved incentives for voluntary action. Measures under voluntary action could include, for example, biodiversity-relevant import certificates such as FSC, MSC; Green Development Mechanism; sectoral codes of conduct for invasive species; TEEB recommendations on business and biodiversity, etc.

Measures under this broader policy option should also explore investments in education as well as consumer awareness measures (e.g. endangered fish list in restaurants and supermarkets, etc.).

Assessing the impacts of Option 3

Community action

Key to success in preserving HNV farmland is to provide incentives to farmers to keep low-intensity practices and avoid land abandonment. Solutions often demand adaptation to local contexts and where such initiatives exist, they should be financially supported via, for example, LIFE. One such example is the BurrenLIFE project[185] (2005-2009) where researchers, farmers, conservation and agricultural authorities worked together to implement practical, local solutions to management problems and the rigorous monitoring of the agricultural, environmental and socio-economic impacts of these management changes. Another example is the LEADER+ project[186] (2000-2006) which aimed to "Encouraging the implementation of integrated, high-quality and original strategies for sustainable development, it has a strong focus on partnership and networks of exchange of experience.". [187] LEADER+ ran from 2000-2006 covering EU-15 and had a budget of €5 billion taken from EU's Regional Development Programmes.

Fostering interactive planning via programmes such as LEADER+ and BurrenLIFE are well received but in general too scattered to make a significant difference. In order to realise voluntary programmes there are two things needed: 1) long-term financial commitment from EU and Member States and 2) information and education to marginal farmers without capacity or know-how to apply for subsidies.

Another interesting option would be to incorporate HNV farmland in volunteer-based monitoring schemes.

Market based instruments

There are examples of economically viable HNV farms, especially among small scale enterprises. HNV farms are often small scale and run on a part-time basis which should be acknowledged and utilized, however, it is clear that farms can not sustain themselves without income support, in particular when intense farming is going through a constant process of rationalization.

185 http://www.efncp.org/hnv-showcases/ireland-the-burren/burrenlife-project/
186 http://ec.europa.eu/agriculture/rur/leaderplus/index_en.htm
187 http://ec.europa.eu/agriculture/rur/leaderplus/index_en.htm

- The only thing I see as a feasible option in the short run is via marketing non-food ecosystem services such as recreational use of HNV areas (access fees) with fringe activities by farmers as providing lodging, camping grounds, and food and drinks;
- In the long run, the system of regional-quality labels of landscapes, like wine and chees in some EU countries may divert regional tourist taxes to providers.

Economic criteria	Key impact Indicators	Likely impact (rated from +++ to ---)	Explanation of expected impact
EU and MS budgetary impact	Financial costs to EU Budget; Financial costs to Member States and other public authorities, one-off versus recurring costs		
Benefits (avoided costs)	Ecosystem services valuation; reduced emissions; improved adaptation to climate change; etc.		
Cost-effectiveness of biodiversity conservation	Level of cost-effectiveness of the approach		
Social criteria	**Key impact indicators**	**Likely impact (rated from +++ to ---)**	**Explanation of expected impact**
Impact on different stakeholder groups	Costs for different stakeholders		
Poverty alleviation (internal and external to the EU)	Allocation of property rights to indigenous custodians of high nature conservation areas; Reduced destruction of habitat for livelihoods		
Environmental criteria	**Key impact indicators**	**Likely impact (rated from +++ to ---)**	**Explanation of expected impact**
Biodiversity and the reduction of pressures	Contribution to 6 sub-targets + Pressures Overexploitation; Habitat Destruction / Fragmentation; Climate Change; Invasive species; Pollution Global biodiversity		

Other criteria	Key impact indicators	Likely impact (rated from +++ to - - -)	Explanation of expected impact
Risks to policy implementation	Number of – and likelihood of - threats to successful policy implementation		
Feasibility	Political (incl. stakeholder views), financial and technical feasibility levels of the option; Timeline of implementation in relation to target achievement		
Flexibility	Degree of flexibility of the option to deal with local issues		
Relationship to existing measures	Extent to which measure is done already / builds on existing policy; Degree of feasibility to adapt / adjust existing measures		
Enforcement	Level of enforceability of the measure; Types of enforcement mechanisms in place; Level of responsibility (who is responsible for implementation?)		
Monitoring and evaluation	Type/effectiveness of monitoring mechanism in place to check progress of the measure		

Option 4: Developing a biodiversity framework directive

This option would be the implementation mechanism likely requiring the most "extreme" changes compared to the BAU. It would pretty much mean that all current and new biodiversity related actions will be gathered under the umbrella of a new Framework Directive on Biodiversity. The advantages would, for example, include that DG ENV would have more control over the various stakeholders and would gain enforcement power. One of the biggest questions to investigate during the further development and assessment of this policy option would be how to include measures on all the sub-targets under one biodiversity umbrella if clearly other DGs and stakeholders are very closely affected by them?

Some first thoughts on developing a BFD:

- The Biodiversity Framework Directive (BFD) would impose requirements on Member States addressed to reach the biodiversity target and the associated sub-targets and prioritize the harmonization and equal implementation of EU biodiversity policy with requirements to implement the Directive subject to the European Court of Justice if not compliant. EU directives lay down certain end results that must be achieved in every Member State. National authorities have to adapt their laws to meet these goals, but are free to decide how to do so. Directives may concern one or more Member States, or all of them. Each directive specifies the date by which the national laws must be adapted - giving national authorities the room for manoeuvre within the deadlines necessary to take account of differing national situations. Directives are used to bring different national laws into line with each other, and are particularly common in matters affecting the operation of the single market (e.g. product safety standards);
- Timeframe of the policy process required to introduce a BFD needs to be assessed carefully with respect to the target achievement by 2020; i.e. feasibility;
- Careful analysis of the advantages and disadvantages of a BFD versus the integration into existing sectoral legislation (policy option 2) will be essential during the analysis;
- As long as Biodiversity is still perceived by many Europeans as an elitist hobby of preserving species which interferes with economic activities, it may not be a good idea to call the "integrating" Framework Directive a Biodiversity Framework Directive;
- The notion of ecosystem services being the economic benefits of rational (versus irrational / emotional) ecosystem / nature / biodiversity management may offer a better opportunity. It does not sound sexy however to call the Framework Directive the Economic Benefits of Nature FD!

Assessing the impacts of Option 4

NOT SO MUCH AN ENFORCEMENT ISSUE, MORE ABOUT SUPPORT AND INCENTIVES

HNV COUNTRIES NEED TO CLARIFY WHAT IS HNV IN THEIR CASE, WHAT ARE ITS CHARACTERISTICS AND NEEDS, WHAT IS VISION FOR FUTURE, HOW CAN IT BE ACHIEVED, HOW TO MONITOR…..

Economic criteria	Key impact Indicators	Likely impact (rated from +++ to ---)	Explanation of expected impact
EU and MS budgetary impact	Financial costs to EU Budget; Financial costs to Member States and other public authorities, one-off versus recurring costs		
Benefits (avoided costs)	Ecosystem services valuation; reduced emissions; improved adaptation to climate change; etc.		
Cost-effectiveness of biodiversity conservation	Level of cost-effectiveness of the approach		
Social criteria	**Key impact indicators**	**Likely impact (rated from +++ to ---)**	**Explanation of expected impact**
Impact on different stakeholder groups	Costs for different stakeholders		
Poverty alleviation (internal and external to the EU)	Allocation of property rights to indigenous custodians of high nature conservation areas; Reduced destruction of habitat for livelihoods		
Environmental criteria	**Key impact indicators**	**Likely impact (rated from +++ to ---)**	**Explanation of expected impact**
Biodiversity and the reduction of pressures	Contribution to 6 sub-targets + Pressures Overexploitation; Habitat Destruction / Fragmentation; Climate Change; Invasive species; Pollution Global biodiversity		

Other criteria	Key impact indicators	Likely impact (rated from +++ to - - -)	Explanation of expected impact
Risks to policy implementation	Number of – and likelihood of - threats to successful policy implementation		
Feasibility	Political (incl. stakeholder views), financial and technical feasibility levels of the option; Timeline of implementation in relation to target achievement		
Flexibility	Degree of flexibility of the option to deal with local issues		
Relationship to existing measures	Extent to which measure is done already / builds on existing policy; Degree of feasibility to adapt / adjust existing measures		
Enforcement	Level of enforceability of the measure; Types of enforcement mechanisms in place; Level of responsibility (who is responsible for implementation?)		
Monitoring and evaluation	Type/effectiveness of monitoring mechanism in place to check progress of the measure		

Conclusions of IA

In an optimal scenario, regulators manage to create a broad income support system for HNV farming, mainly through pillar 1 adjustments, and fine-tune them with AESs to support certain management practices. Such a system is rather built on incentives than regulations and prohibitions, to avoid intensification and abandonment. The most cost-effective system is based on a mix between option 2 and 3 where current policies are implemented and adjusted, and voluntary community schemes are supported, via for example LIFE programmes. It is key to allow for local and regional context to play an important part and hence create a flexible system based on incentives and needs, for example part-time farming. It is also imperative to create awareness and administrative and environmental training, to improve utilisation of existing and future mechanisms. Finally, the monitoring of HNV farmland and economy is insufficient and should be supported via for example, FP 7 and future Framework Programmes.

It is, however, acknowledged that there is a range of interests that need to be taken into account, beyond biodiversity. Increasing rationalization, market pressures, vested interests in high intensity, biofuels, food security etc. are reasons for which a less ambitious options might be favoured.

In the table below the results of this IA is summarised:

Economic criteria	Key impact Indicators	Policy Option 1	Policy Option 2	Policy Option 3	Policy Option 4
		Likely impact (rated from +++ to ---)	Likely impact (rated from +++ to ---)	Likely impact (rated from +++ to ---)	Likely impact (rated from +++ to ---)
EU and MS budgetary impact	Financial costs to EU Budget; Financial costs to Member States and other public authorities, one-off versus recurring costs	+++	+		
Benefits (avoided costs)	Ecosystem services valuation; reduced emissions; improved adaptation to climate change; etc.	--	++		
Cost-effectiveness of biodiversity conservation	Level of cost-effectiveness of the approach	-	++		
Social criteria	**Key impact indicators**	**Likely impact (rated from +++ to ---)**	**Likely impact (rated from +++ to ---)**	**Likely impact (rated from +++ to ---)**	**Likely impact (rated from +++ to ---)**
Impact on different stakeholder groups	Costs for different stakeholders	?	- -		
Poverty alleviation (internal and external to the EU)	Allocation of property rights to indigenous custodians of high nature conservation areas; Reduced destruction of habitat for livelihoods	- -	+++		
Environmental criteria	**Key impact indicators**	**Likely impact (rated from +++ to ---)**	**Likely impact (rated from +++ to ---)**	**Likely impact (rated from +++ to ---)**	**Likely impact (rated from +++ to ---)**
Biodiversity and the reduction of pressures	Contribution to 6 sub-targets + Pressures				
	Overexploitation;	-	?		
	Habitat Destruction / Fragmentation;	-	+++		
	Climate Change;	- -	+		
	Invasive species;	?	?		

	Pollution	- -	++		
	Global biodiversity	-	?		
Other criteria	**Key impact indicators**	**Likely impact (rated from +++ to - - -)**	**Likely impact (rated from +++ to - - -)**	**Likely impact (rated from +++ to - - -)**	**Likely impact (rated from +++ to - - -)**
Risks to policy implementation	Number of – and likelihood of - threats to successful policy implementation	+ +	-		
Feasibility	Political (incl. stakeholder views), financial and technical feasibility levels of the option; Timeline of implementation in relation to target achievement	+ +	- -		
Flexibility	Degree of flexibility of the option to deal with local issues	+			
Relationship to existing measures	Extent to which measure is done already / builds on existing policy; Degree of feasibility to adapt / adjust existing measures				
Enforcement	Level of enforceability of the measure; Types of enforcement mechanisms in place; Level of responsibility (who is responsible for implementation?)				
Monitoring and evaluation	Type/effectiveness of monitoring mechanism in place to check progress of the measure	+	+		

P.O. Box 4175
3006 AD Rotterdam
The Netherlands

Watermanweg 44
3067 GG Rotterdam
The Netherlands

T +31 (0)10 453 88 00
F +31 (0)10 453 07 68
E netherlands@ecorys.com

W www.ecorys.nl

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