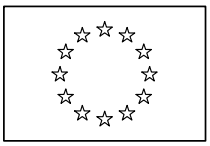

EUROPEAN COMMISSION

3.5.2011
SEC(2011) 540 final

COMMISSION STAFF WORKING PAPER

IMPACT ASSESSMENT

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Our life insurance, our natural capital: an EU biodiversity strategy to 2020

{COM(2011) 244 final}
{SEC(2011) 541 final}

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1. INTRODUCTION

Until now, EU Biodiversity Policy was driven by the target set by the EU Heads of State and Government in 2001 to halt biodiversity loss within the EU by 2010. The EU Biodiversity Action Plan[1] (BAP) was put in place in 2006 to accelerate progress towards this target. However, there is compelling evidence that the status and conditions of biodiversity and ecosystems in the EU, and the services they provide, continue to deteriorate[2] [3] [4], and that the EU has missed its target[5]. This is because different pressures (changes in land use, pollution, overexploitation, invasive species, climate change, etc) continue to have a high impact on biodiversity, in spite of significant action carried out within the framework of the BAP.

The EU is called upon to develop a new vision and headline target for the post-2010 period. On 15 March 2010, the Environment Council agreed a new vision and target reflecting the most ambitious option set out in a Commission Communication in January 2010[6]. The Spring European Council subsequently endorsed the vision and target on 26 March, noting that *"There is an urgent need to reverse continuing trends of biodiversity loss and ecosystem degradation."*

VISION

By 2050, European Union biodiversity and the ecosystem services it provides – its natural capital – are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided

HEADLINE TARGET

Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss

The 2020 target is more ambitious than the 2010 target in that it not only stresses the need to halt biodiversity loss but also highlights the value of ecosystem services, the need to restore them, and the EU's contribution to global biodiversity.

In addition, the global Strategic Plan for Biodiversity 2011-2020 adopted at the tenth meeting of the Conference of the Parties of the Convention on Global Biodiversity in 2010 (CBD COP-10) includes a 2050 vision, a 2020 mission, 5 strategic goals and 20 targets. Parties, including the European Union, must develop national and regional targets that contribute to reaching the global targets and report thereon to the CBD COP-11 in 2012. Parties also need to develop or update biodiversity strategies and action plans to ensure implementation.

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1 COM(2006) 216 final "Halting Biodiversity loss by 2010 – and beyond: sustaining ecosystems services for human well being"

2 COM (2008) 864 on a "Mid-term assessment of implementing the EC Biodiversity Action Plan"

3 http://biodiversity-chm.eea.europa.eu/information/indicator/F1090245995

4 http://www.eea.europa.eu/publications/eu-2010-biodiversity-baseline/

5 COM(2010)548 final http://ec.europa.eu/environment/nature/biodiversity/comm2006/bap_2010.htm

6 COM (2010) 4 final "Options for an EU vision and target for biodiversity beyond 2010"

To deliver on the 2020 headline target, the Council called on the Commission to develop a biodiversity strategy with targets and to identify the necessary, feasible and cost-effective measures for reaching them, as soon as possible after CBD COP10, taking into account its results[7].

By developing this strategy, the Commission therefore delivers on the very clear mandate provided by the Council and EU international obligations.

The Council also recognised the importance of identifying a clear **biodiversity baseline** of the state of biodiversity and ecosystems in Europe. The resulting baseline, finalised in October 2010, sets out the current state of biodiversity in the EU and indicators to measure and monitor progress and achievement from 2011 to 2020 (see Annex 1 for details)[8].

The focus of this Impact Assessment report is on identifying targets that, if met, would mean that Europe is making a significant contribution towards reaching the 2020 headline target. It also sets out potential measures to meet the targets. However, whilst demonstrating the feasibility of the 2020 headline target, the exact measures will be fleshed out in subsequent initiatives and their accompanying Impact Assessments.

Finally, the 2020 Biodiversity Strategy will contribute to at least three of the targets in the Europe 2020 Strategy[9], namely climate change, innovation and employment, in particular through the resource efficiency flagship. Moreover, the largely overlapping time-horizon with that of the coming EU budget period (2014-2020) and implementation of other policies such as the Climate Change 20/20/20 initiative offers ideal opportunities for better integrated implementation.

2. PROCEDURAL ISSUES AND CONSULTATION

EU institutions, Member States, civil society and the public at large have all been consulted on the long-term vision and 2020 headline target to underpin it, and continuing with the 2020 strategy itself. Annex 2 provides details about the actors and institutions consulted and a summary of their views. Annex 3 includes a list of underlying studies conducted by the Commission and lists several European research projects[10] helping to fill knowledge gaps.

All institutions of the European Union made their positions on the EU 2020 biodiversity policy known during the course of 2010 (see Annex 2 for details).

As part of the consultation process, the Commission ran a public Internet consultation, which received 2905 responses[11] of which 64% originated from citizens, 12% from NGOs and 6% from private business. The views of the different stakeholders are reported where relevant under each target.

Successive drafts of the Impact Assessment report (IAR) were circulated and discussed in meetings of the Commission's Biodiversity Inter-service Coordination Group and an Inter-service Impact Assessment Steering Group, from October 2010. The **Impact Assessment Board** (IAB) discussed a first draft of the report on 12 January 2011 and requested a re-submission of the draft IAR, based on which a final opinion was issued on 24 February 2011.

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7 Council Conclusions on Biodiversity post-2010, 15 March 2010.

8 http://www.eea.europa.eu/publications/eu-2010-biodiversity-baseline/

9 COM (2010) 2020.

10 Past and ongoing research projects in the field of biodiversity supported under the last three consecutive research framework programmes (FP5, FP6 and FP7) can be accessed via the website of the BIOTA cluster "Understanding Biodiversity": http://www.edinburgh.ceh.ac.uk/biota

11 Full report: http://www.acceptance.ec.europa.eu/environment/consultations/pdf/biodecline_results.pdf

The draft IAR was significantly restructured to address both sets of comments from the IAB. The following changes, in particular, were implemented:

– a re-organisation of the report, and the addition of explanatory graphs to better link the identified problems (and their drivers) with the proposed targets (objectives) and options/measures;

– a clearer presentation of the problems, with the addition of more details on the 2010 baseline, on the reasons for failing the 2010 target, a discussion on the effectiveness of existing policies, and the development of a qualitative 2020 baseline scenario;

– a better justification of the selection of the targets, with explicit links to the problems identified, and an analysis of alternatives. Further clarification was provided after the IAB final opinion on the relation between the respective targets on the Habitats and the Birds directives, and on the definition and value added of the agriculture and forest targets;

– a more systematic discussion of potential alternatives for measures available to achieve the targets, including funding options, also highlighting measures with the potential to achieve early and significant results. Following the IAB final opinion, these aspects were further strengthened. It was also clarified that the range of alternative options was restricted as the level of ambition had already been set at the level of the target, and was also determined by the Council's conclusions and the outcome of the CBD COP10 discussions;

– a more detailed presentation of stakeholder views on the potential measures;

– a clearer analysis of the impacts of the proposed options/measures, with a better distinction between impacts within the EU and global impacts, and a discussion of distributional aspects. Following the IAB final opinion, more details on distributional impacts across Member States and on subsidiarity were added;

– a clarification of overall costs and potential financial issues, with more details of financing solutions to reach each of the targets in the cross-cutting section on financing;

– the addition of a new section on the comparison of the proposed measures in terms of contributions to the main objectives, and in terms of the key costs and benefits;

– the addition in the 'next steps' section of a timetable summarising foreseen initiatives, including those stemming from the Biodiversity Strategy Communication, and expected new information. Further details on planned work and associated impact assessments were included after the IAB final opinion.

Annex 3 includes a list of **studies conducted for the Commission** to support this Impact Assessment and the Strategy and lists several **European research projects**[12] which have made an important contribution to filling the knowledge and understanding gaps.

[12] Past and ongoing research projects in the field of biodiversity supported under the last three consecutive research framework programmes (FP5, FP6 and FP7) can be accessed via the website of the BIOTA cluster "Understanding Biodiversity": http://www.edinburgh.ceh.ac.uk/biota

3. PROBLEM DEFINITION

The 2010 assessment of implementation of the EU Biodiversity Action Plan[13] (hereafter referred to as the 'BAP assessment') at both EU and Member State levels, together with the EU 2010 Biodiversity Baseline[14] (hereafter referred to as 'the Baseline') show that in spite of past EU commitments and wide-ranging action that resulted in significant progress in certain areas, the EU has missed its 2010 target of halting biodiversity loss.

3.1. Where does Europe stand in 2010?

3.1.1. Status and trends in biodiversity in the EU

Although it is not possible to assess biodiversity loss through a single indicator measuring the aggregated distance to the target, the 2010 EU biodiversity baseline[15] provides quantitative and qualitative information on the extent to which the 2010 target has been missed for specific elements of biodiversity. Up to 25% of animal species, including mammals, amphibians, reptiles, birds and butterflies face the risk of extinction. 65% of the habitats and 52% of the species covered by the Habitats Directive are still considered to be in an unfavourable conservation status. On average only 17% of habitats are in favourable conservation status, going down to 5% when looking specifically at grasslands and 7% for agro-ecosystems.

Other sources of evidence are that since 1990, the European Union's common farmland birds have declined by 20–25 % and, during the same period, common bird populations have decreased by around 10 %. However, there are signs that the decline has levelled off since the mid-1990s. In addition, since 1990, Europe's grassland butterflies have declined dramatically (nearly 70 %) and this reduction shows no sign yet of levelling off.

The latest Corine Land Cover inventory shows a continued expansion of artificial surfaces and abandoned land at the expense of extensive agricultural land, grasslands and wetlands across Europe. The loss of wetlands has slowed down to 3% in the last 16 years, but Europe had already lost half its wetlands before 1990.

Most of the ecosystem services in the EU are assessed to be degraded or mixed (degraded in some regions, enhanced in others) – i.e. no longer able to deliver the optimal quality and quantity of basic services such as crop pollination, clean air and water, and control of floods or erosion. However, there are some exceptions, such as timber production, and climate regulation in forests[16].

The EU 2010 biodiversity baseline also provides an assessment of the state of biodiversity per biogeographical region, showing some geographical disparity across Europe: in the Atlantic and Pannonian regions, more than 50% of habitats are assessed as 'unfavourable-bad', exceeding the percentage in the other biogeographical regions. Other examples of geographical disparity are that the percentage of loss of agricultural land to artificial surfaces bewteen 1990 and 2000 has been more significant in the Netherlands, Germany, Belgium, western Portugal, the eastern coast of Spain and Sardinia, than in the rest of Europe. Another

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13 Report from the Commission to the Council and the European Parliament. The 2010 Assessment of Implementing the EU Biodiversity Action Plan, COM(2010)548 final.

14 http://www.eea.europa.eu/publications/eu-2010-biodiversity-baseline/- published 2010.

15 European Environment Agency, 2010. EU 2010 Biodiversity baseline. EEA Technical report No 12/2010.

16 http://www.rubicode.net

example is the utilisation rate of forests[17], which in 2005 was relatively stable at around 60%, but higher than 80% in Belgium, Czech republic, and Sweden.

Overall, although there has been some improvements over the past years, it can be concluded that the target of halting biodiversity loss in the EU by 2010 has been missed by a significant extent, as demonstrated by the still high proportion of species at risk of extinction, and of habitats in poor conservation status. More details on the EU 2010 biodiversity baseline are given in annex I.

3.1.2. The international dimension

The global situation is even more alarming as pressures on biodiversity continue to intensify, as shown by the Third Global Biodiversity Outlook published in May 2010[18]. Between 12% and 55% of selected vertebrate, invertebrate and plant groups are threatened with extinction. The rate of tropical deforestation decreased by nearly 20% between 2000 and 2010 but is still very high, with 13 million ha lost every year. 20% of the world's tropical coral reefs are already lost and an additional 50% is at risk. Only 0.7% of oceans are protected.

The international community has also failed to achieve the global target agreed in 2002 of significantly reducing biodiversity loss worldwide by 2010.

3.2. Why is biodiversity loss a problem?

3.2.1. Consequences of biodiversity loss

Loss of biodiversity and ecosystems has social, environmental and economic consequences, which are summarised briefly below.

There are strong ethical and moral arguments in favour of protecting biodiversity in its own right, for its intrinsic value, independent of its instrumental value to humans. In addition, biodiversity loss has economic costs that are only now starting to be fully appreciated. Figure 1 illustrates the different categories. The TEEB study[19] proposes that flows of ecosystem services be seen as the 'dividend' that society receives from natural capital. The sustained provision of these flows in the future requires that stocks of natural capital, including biodiversity and ecosystems, are maintained.

Ecosystems provide a number of services that contribute directly and indirectly to human well-being. There are four main types of ecosystem services: provisioning services (e.g. food, water, fuel); regulating services (e.g. flood and disease control); supporting/habitat services (e.g. nutrient cycling); and cultural services (e.g. recreation). These services are of benefit locally, nationally or globally.

In general, the loss of ecosystems is equivalent to losing an important "natural" structural system whereas the loss of biodiversity is equivalent to losing a vital component of that structure. The former has direct human, social and economic costs whereas the latter is often more subtle – it makes ecosystems less stable and more vulnerable to collapse.

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17 ratio of annual felling to net annual increment in growing stock (SEBI indicator 17)

18 http://gbo3.cbd.int/

19 http://www.teebweb.org

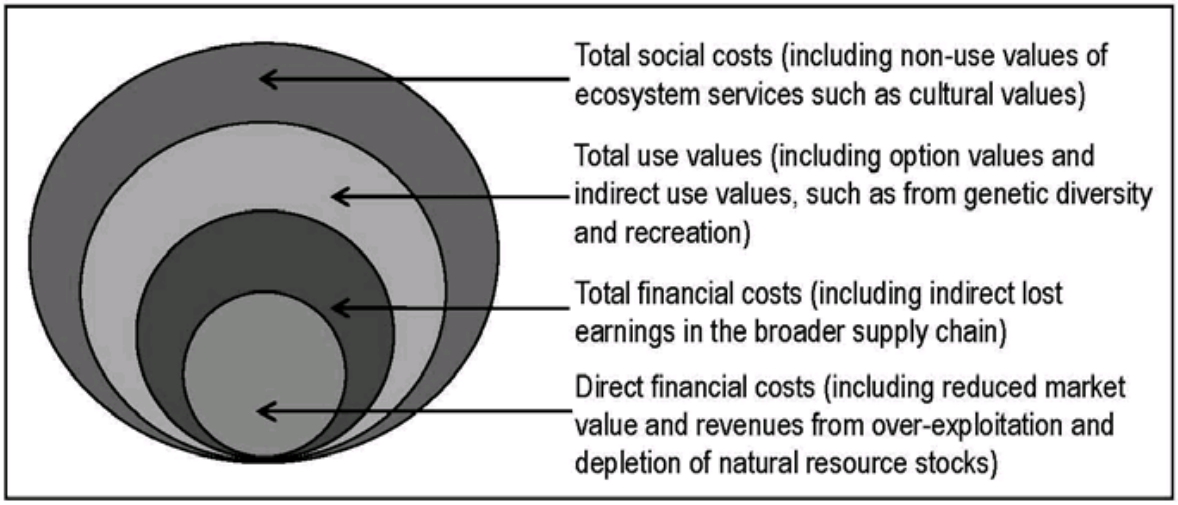

Figure 1. Costs of inaction with respect to biodiversity and ecosystem service loss

Source: OECD, Paying for Biodiversity: Enhancing the Cost-Effectiveness of Payments for Ecosystem Services (PES), 2010, Paris.

These economic impacts are, of course, associated with impacts on jobs. Some jobs are directly concerned with the conservation and management of biodiversity (e.g. in land management, protection of sites and species, provision of advice, and scientific research and monitoring activities). More numerous are jobs dependent on the provisioning, regulating and cultural services that biodiversity plays a role in delivering. Other social consequences include health, territorial cohesion, and social inclusion impacts.

3.2.2. Who is affected?

Biodiversity loss and the degradation of ecosystem services have an impact on society at large. Depending on the spatial scale of ecosystem services (see figure 2), it can affect people in the neighbourhood of ecosystems, as well as local authorities and businesses, or affect EU citizens as a whole, or may even global consequences. For example the loss of riparian wetlands could include the following impacts: reduced flood control services, with impacts on residents in the floodplain, local planning authorities, construction industry and insurances, lower water purification, with impacts on residents and the water supply sector; reduced recreational and amenity services with mostly local impacts; but also lower carbon storage, with global climate impacts.

Some business sectors are particularly affected, as they depend on biodiversity and ecosystem services, either directly or indirectly, including fisheries, forestry (wood products), agriculture (dependent on services such as pollination, biological control, soil formation, water availability and genetic diversity), water supply, pharmaceuticals and cosmetics, chemicals, agro-food, and growing parts of the tourism sector.

Lower income groups tend to be more dependent on ecosystem services, and vulnerable to their loss, but this holds more strongly at global than at EU level.

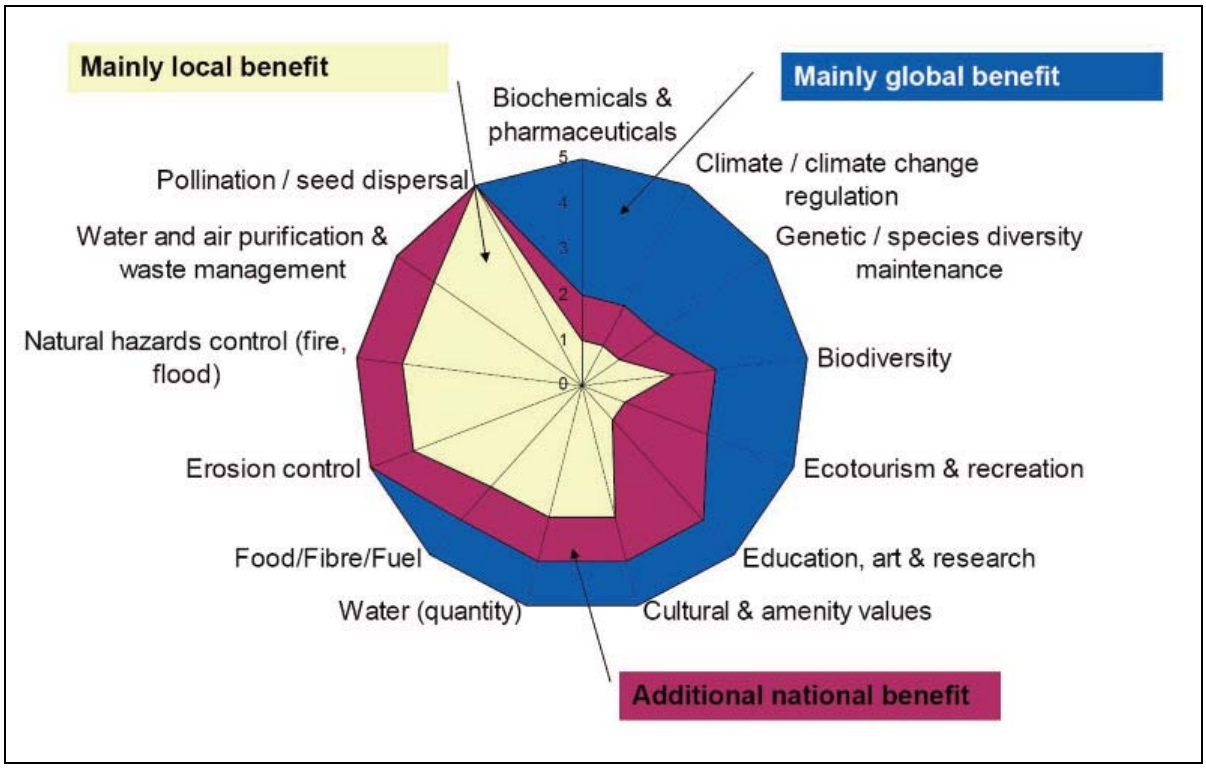

Figure 2: Spatial scales of ecosystem services

3.3. Causes of biodiversity loss in the EU

Biodiversity loss in the EU is the result of a combination of direct pressures and underlying socio-economic drivers. Most of the pressures on biodiversity stem from human-induced disturbance to ecosystems with underlying causes of economic and market failures. The 2010 EU biodiversity baseline documents the impact of these key pressures on biodiversity in the EU[20]. In particular, Europe's biodiversity remains under severe threat from:

- Habitat loss due to land use change and fragmentation, including through conversion of grassland into arable land, land abandonment, urban sprawl, and rapidly expanding transport infrastruture and energy networks; 70% of species are threatened by the loss of their habitats, in particular farmland birds have declined by 20 to 25% since 1990; The EU is one of the most fragmented regions in the world, with fragmentation of 30% of EU-27 land moderately high to very high due to urban sprawl and infrastructure development related to transport and energy. Fragmentation affects the connectivity and health of ecosystems and their ability to provide services.

- Pollution. 26% of species are threatened by pesticides and fertilisers such as nitrates and phosphates (IUCN).

- Overexploitation of forests[21], oceans, rivers and soils; 30% of species are threatened by overexploitation; 88% of stocks are fished beyond maximum sustainable yield.

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[20] European Environment Agency, 2010. EU 2010 Biodiversity baseline. EEA Technical report No 12/2010.

[21] Whilst wood harvesting in the EU is largely sustainable, dead wood (which is a key indicator for forest biodiversity and the conservation value of a forest) remains well below optimal levels from a biodiversity perspective in most European countries (EEA, 2009).

- Invasive alien species. 22% of species are threatened by invasive alien species. Some recent extinctions have been caused by the introduction of alien species e.g. Gasterosteus crenobiontus, extinct since the 1960s.

- Climate change. Shifts in habitats and species distribution due to climate change are being observed. Climate change interacts and often exacerbates other threats.

These pressures are either constant or increasing in intensity. In particular, invasive alien species remain a threat, and are predicted to carry on increasing exponentially[22]. Climate change impacts are only beginning to emerge, and degraded ecosystems have a reduced capacity to respond to future changes.

At global level, pressures are similar. For example, Invasive Alien Species (IAS) have been identified as a key factor in 54% of all known species extinctions documented in the IUCN Red List database and the only factor in 20% of extinctions. Global fisheries are overexploited: they are estimated to contribute USD 225 billion to USD 240 billion to the world economy annually but if fishing practices were more sustainable that amount would be up to USD 36 billion higher. The cumulative economic loss to the global economy over the last three decades is estimated to be in the order of USD 2 trillion. There is also enormous waste: by-catch (unused catch) amounts to 38 million tonnes/year or 40% of total catch.

These pressures are underpinned by indirect drivers that relate to demographic and cultural/lifestyle choices, institutional drivers, market failures, economic structure, size and growth, and trade.

Figure 3 below shows the drivers, pressures, states, impacts and current responses related to biodiversity loss broadly[23]. Clearly, the exact 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.

Direct pressures on biodiversity also influence ecosystem services. As an illustration, impacts of IAS on ecosystems can lead to reduced ecosystem services, whether provisioning (fish catch and aquaculture, crops, wood and livestock production, and water provision), or regulating (water retention, erosion and water quality control), with consequences on human well-being. IAS can also have an impact on the resistance of ecosystems to wild fires, and on the growth and structure of woodlands and forests (e.g. due to non-native diseases and pests such as Pinewood nematode).The proposed measures would reduce economic damages of IAS linked to decreased provisioning of food and water, impeded water regulation leading to local flooding (e.g. Japanese knotweed), and negative impacts on erosion control, water quality IAS also have the potential to modify all identified supporting processes (e.g. primary production, soil and sediment formation and nutrient cycling) via, for example, changing their physical environment (e.g. by dominating the habitat) and modifying ecosystem food webs and species dynamics.

Although this is not the case for IAS, some policies have already been put in place as a response to negative impacts on biodiversity. These have however not been sufficient as described in the following section.

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22 IEEP, 2010. Assessment to support continued development of the EU strategy to combat invasive alien species. Final report.

23 Study on understanding the causes of biodiversity loss and the policy assessment framework, 2009, Ecorys

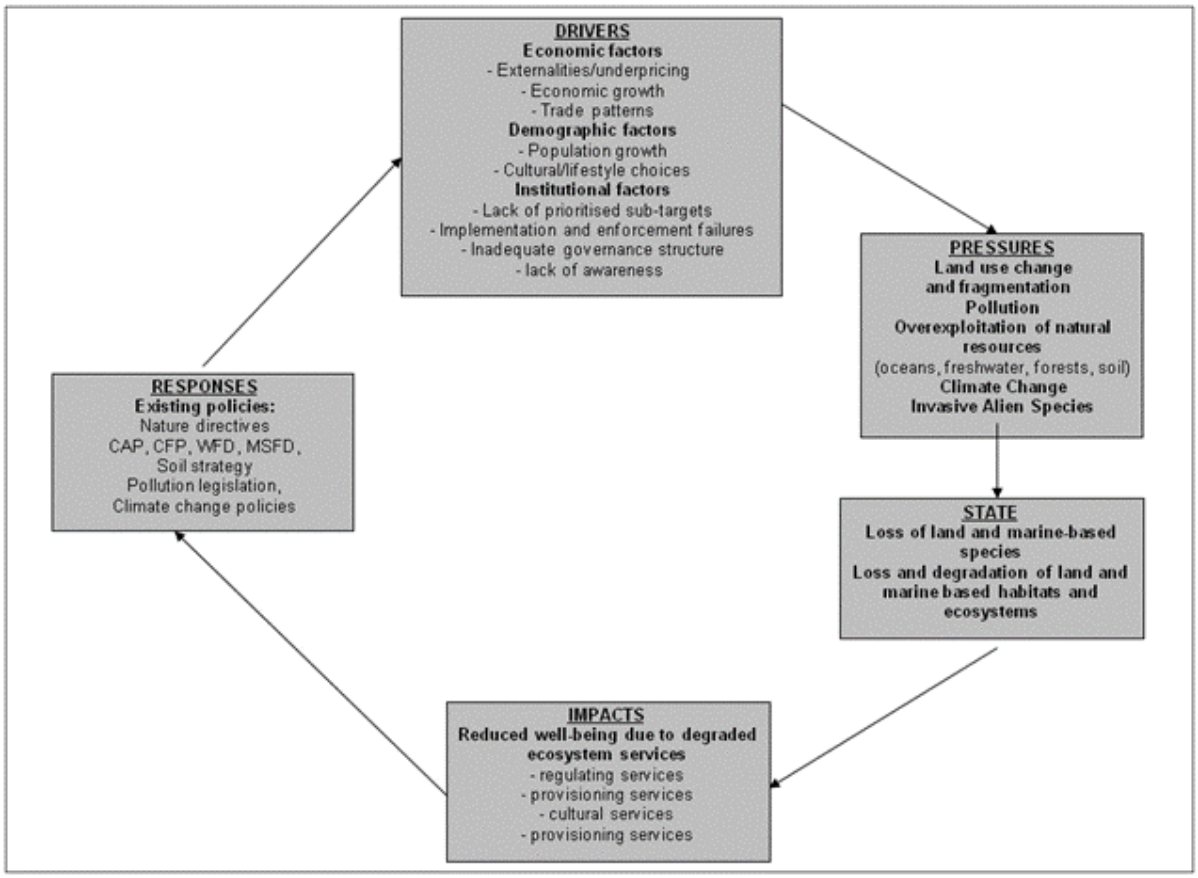

Figure 3: Causes of biodiversity loss in the EU

3.4. Why did we fail the 2010 target?

The reasons for failing to achieve the EU 2010 target are many and complex and are set out in numerous assessments[24] and summarised in a recent Commission Communication[25]. The most significant reasons are summarised under the headings below.

3.4.1. Insufficient integration across other sectoral policies

Article 11 of the Lisbon Treaty requires that environmental protection requirements, including biodiversity, are embedded and fully taken into consideration in all other sectoral policies. This is all the more important for those sectors that have significant impacts on biodiversity. This is particularly the case for agriculture and forestry, since 72% of land in the EU is used for farming (43%) and forestry (29%)[26], but also for fisheries, regional development, transport, climate change, energy, trade and development. While progress has been made in integrating biodiversity concerns in the above policy areas, the state of biodiversity in Europe leads to the conclusion that this integration has not been sufficient to deliver on the 2010 target.

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24 http://ec.europa.eu/environment/nature/biodiversity/comm2006/bap_2008.htm and http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/bap_2010/4%20EC_Knowledge_Base_Assessment_BAP_final.pdf

25 COM (2010) 4 final.

26 Eurostat, 2010. Land Use/Cover Area frame Survey (LUCAS).

In particular, habitats associated with sustainable agricultural practices show a worse conservation status than non-agricultural habitats, with only 7% showing favourable status compared to 17% on average for all types of habitats. The **Common Agricultural Policy** (CAP) has been reformed on several occasions in the past. The introduction of decoupled direct payments in particular aimed to remove the CAP-driven incentive to intensify, and the introduction of cross compliance aimed to ensure that farmers in receipt of CAP payments complied with a baseline of environmental rules. The creation of a Second pillar of the CAP (Rural Development) established the possibility for farmers to get financial support on specific measures aimed at improving the state of the environment, including the biodiversity status of farmland. In this respect, the mid-term review of the sixth Environment Action Programme[27] recognised that, in the agricultural sector, there have been fundamental reforms over the last 15 years that have moved towards seeing farmers as stewards of nature. As the recent communication on the CAP reform highlighted, however, there is still scope for agricultural policy to contribute to enhancing the sustainable management of natural resources, including biodiversity. A study looking at decoupling in the CAP reform concluded that impacts had been small to negative on biodiversity and nature conservation[28]. Although agri-environmental measures have been shown to have positive impacts on biodiversity overall[29], specific schemes are not always cost-effective and existing literature on the impacts of agri-environmental measures has reached mixed conclusions[30].

In spite of the 2002 reform of the **Common Fisheries Policy** (CFP), overfishing has not been addressed. 88% of EU stocks are still fished beyond maximum sustainable yield. The average size of fish has been steadily declining over the last 20 years. In general, gaps in indicators and data have made it difficult to quantify the efficiency of integration in different policy areas.

The situation is even less clear as regards the global impact of EU policies. A key challenge includes enhancing our understanding of the impact of EU consumption on biodiversity loss.

Additionally, the timeline of the EU biodiversity target and the fact that the development and implementation of the BAP were not synchronised with EU budgetary cycles hampered the harmonisation of priorities across sectors and led to lack of ownership and insufficient contribution to biodiversity policy implementation.

3.4.2. Incomplete implementation of existing legislation and policy gaps

Implementation gaps

EU Nature conservation policy is largely driven by the **Birds and the Habitats Directives**, which aim to ensure the favourable conservation status of selected species and habitats of Community importance listed in the Directive. Ensuring full implementation, especially the effective functioning of the Natura 2000 network of protected areas is critical to the success of biodiversity policy in the EU. The designation of Natura 2000 terrestrial sites is nearly

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27 COM(2007) 225 final, 30.4.2007

28 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

29 ENCA, 2010. Delivering biodiversity objectives through agri-environment measures of the CAP: evidence of success and scale of future needs. Position Statement 6-2010

30 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 .

completed, with 18% of EU territory covered, i.e. beyond the 2020 global target of having at least 17% of terrestrial and inland water conserved through protected areas. However, more efforts are needed for the marine sites[31], for which the global target is 10% of coastal and marine areas designated. It has been demonstrated that targeted conservation actions for Annex I bird species under the Birds Directive have made a significant difference in protecting many of Europe's most threatened birds from further decline[32]. The 2009 Habitats Directive health check has also confirmed that conservation action has resulted in some larger, emblematic species such as the wolf, Eurasian lynx, beaver and otter beginning to re-colonize parts of their traditional range.

However, although there has been substantial progress, the BAP 2010 report identified that implementation of the Habitats and Birds directives had been too slow to deliver the full biodiversity benefits expected. Major implementation gaps include the insufficient designation in marine areas as well as the lack of management plans in the NATURA 2000 sites. The fact that the network is still not complete can be partly explained by fact that there continues to be misinterpretation of the directives and fears of severe restrictions and socio-economic impacts. Nature protection has still to be fully integrated into national planning policies.

A number of other environmental policies will help stem biodiversity loss, but have not taken full effect yet. For example, the **Water Framework Directive** requires freshwater bodies to be of good ecological status, but the deadline for implementation is 2015. The **Marine Strategic Framework Directive** has also only recently been adopted.

Aquaculture[33] in the EU has to comply with the level of environmental protection requested by the comprehensive horizontal EU environmental legal framework. More specifically, intensive fish farming is listed in Annex II of the EIA Directive, and as such may be subject to an environment impact assessment, prior to the start of its operations, if the Member States decides so. In addition, Regulation (EC) No 708/2007 concerning the use of alien and locally absent species in aquaculture aims to create a framework governing aquacultural practices to protect the aquatic environment from the risks associated with the use of non-native species. In 2009, the Commission adopted a Communication on the sustainable development of European aquaculture[34] to promote the sustainable growth of Aquaculture in the EU through the use of environmentally-friendly production methods. Some of the actions included in the Aquaculture Strategy are aimed to achieve a better implementation of the EU legislation, in particular, to facilitate the implementation of the environmental legislation such as to develop guidance documents on aquaculture activities and Natura 2000 or to ensure a proper implementation of the Water Framework Directive. The results of a recent study indicate that the EU regulatory response to manage the environmental impacts of aquaculture[35] is adequate. Nevertheless, the implementation of these instruments will need to be closely monitored to evaluate any future policy or implementation needs.

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31 EEA-ETC/BD, 2010.

32 Paul F. Donald, Fiona J. Sanderson,1 Ian J. Burfield, Stijn M. Bierman, Richard D. Gregory, Zoltan Waliczky International Conservation Policy Delivers Benefits for Birds in Europe Science, 2007

33 aquaculture impacts on biodiversity through: the use wild fish populations to produce fishmeal and fish oil for aqua feed; spread of diseases and parasites among fish populations; interactions and competition between escaped farmed species and wild fish populations; nutrient enrichment; uncontrolled spreading of non-indigenous species; chemical pollution and habitat change or destruction

34 COM(2009)162.

35 Draft Final report of the study "Impacts and pressures by aquaculture activities: evaluation, relation with good environmental status and assessment of the EU responses"

Factors hampering implementation include lack of funding and inadequate governance structure. These points are further developed below.

Implementation across Member States

Existing policies have been implemented at different rates across Member States, as illustrated by Figure 4.

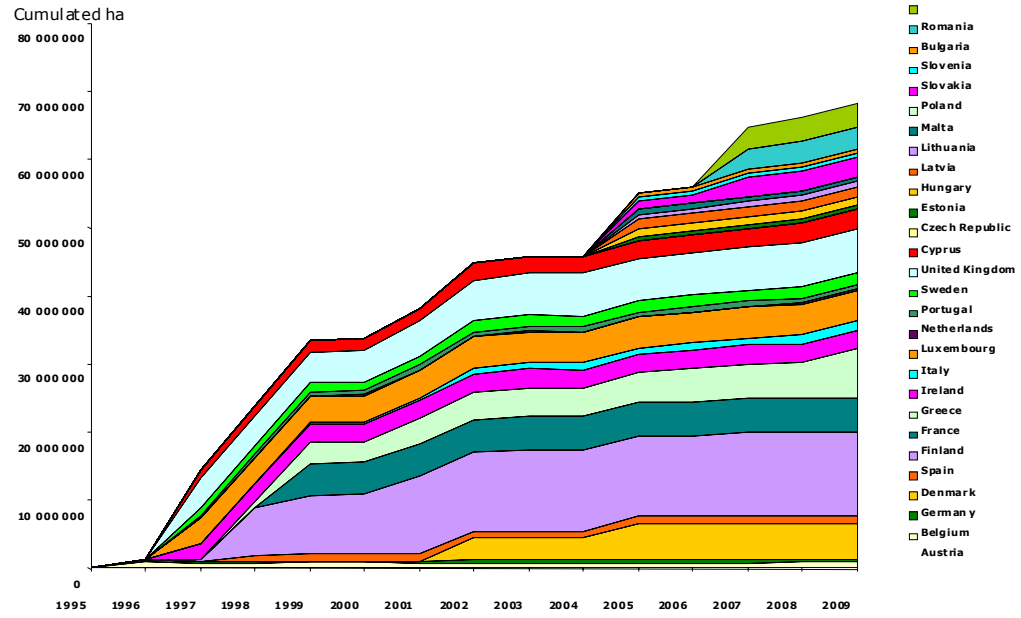

Figure 4: Cumulative surface area of sites designated by the Habitats Directive over time (SCIs)
Source: Natura 2000 EUNIS database

More generally, the 2010 BAP assessment summarises the current state of progress for objectives and measures set out in the 2006 BAP. The 27 country profiles[36] provide a detailed account of developments at national level, allowing some elements of comparison, although a full benchmarking across countries is not meaningful based on currently available data.

Legislative gaps

In addition, some of the pressures presented above have not been sufficiently addressed and contributed to the failure to meet the 2010 target. For example, although plant and animal regimes have proven effective to protect the EU against the entry, establishment and spread of many diseases and harmful organisms that are common elsewhere in the world, existing legislation is however not sufficient to tackle the full range of threats, in particular from pathways such as **IAS** introduced as pets, aquarium and terrarium species, ornamental plants, live bait and live food (see Annex 13 for a detailed review).

Furthermore, less than a dozen MS have legislation to protect **soil** ecosystems, which are therefore largely unprotected in the EU. This had significant consequences for below and above ground biodiversity and hindered the achievement of the 2010 headline target.

36 http://ec.europa.eu/environment/nature/biodiversity/comm2006/bap_2010.htm

3.4.3. Funding shortcomings

In the EU

Insufficient funding has been an important hurdle preventing effective implementation of existing policy instruments aimed at halting biodiversity loss[37].

Firstly, the available information on financing needs and opportunities for protected areas alone indicates that the current level of support is not satisfactory[38]. Management of Natura sites is estimated to require approximately 5.8 billion Euros a year, but currently only 1 billion a year is allocated[39] [40]. This situation is very much linked to the fact that Member States are far behind with drawing up management plans or identifying the specific needs for intervention. Funding would also be needed to conserve biodiversity in the wider environment, beyond Natura sites. Secondly, the exact amount spent on biodiversity remains difficult to assess, the collection expenditure data being in most cases inadequate to identify biodiversity-related funding both at Member States and Community level. The lack of an agreed methodology to determine how much Community funding has been used by the Member States for nature and biodiversity remains a problem to be addressed.

Thirdly, whereas funding opportunities for the protection and sustainable use of biodiversity do exist under different EU financing instruments (see Annex 4), their uptake has been limited under the current EU financing framework for 2007-2013. There are various reasons for this, including:

- lack of clear targeting of funds for biodiversity, which reduce their effectiveness for biodiversity goals;
- the fact that most EU funds are managed at the national level according to sectoral priorities, which do not always include biodiversity conservation as a primary concern;
- lack of coherence and coordination in securing total funding needs;
- weaker evidence base for most financial planning due to the slow development of Natura 2000 management plans or equivalent instruments, and therefore lack of concrete data on the impacts of funding;
- limited absorption capacity in some Member States due to human resource and other constraints in applying for EU funding is another factor (Kettunen *et al.*, 2009; WWF 2009). The share of the European Agricultural Fund for Rural Development (EAFRD) allocated to the protection of Natura 2000 sites was 0.62%, although Natura 2000 agriculture and forest sites are also financed under agri-environmental schemes;
- high administrative burden in some cases;

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37 Withana, S., Baldock, D., Farmer, A., Pallemaerts, M., Hjerp, P., Watkins, E., Armstrong, J., Medarova-Bergstrom, K., Gantioler, S. 2010. Strategic Orientations of EU Environmental Policy under the Sixth Environment Action Programme and Implications for the Future. Report for the IBGE-BIM, IEEP, London.

38 It is up to MS to decide how they allocate the available funds, taking account of the EU strategic objectives but also their own priorities.

39 COM(2004)0431 final on Financing Natura 2000: http://ec.europa.eu/environment/nature/natura2000/financing/index_en.htm

40 TEEB 2009.

- maximum funding rates, for example in the rural development regulations[41], that are insufficient to create the required incentives.

Finally, the current provisions relating to the EU budget do not allow for the continuity that is often needed to enable biodiversity related projects to succeed. This would require, for instance, a longer timeframe than is currently allowed under EU financing rules, and especially for projects funded through external funding mechanisms.

At global level

Over the period 2002 to 2008, the EU provided over USD 1 billion for global biodiversity annually. EU Member States contributed significantly to the recent replenishment of the Global Environment Facility, for which USD 1.2 billion is earmarked for biodiversity for the period July 2010 to June 2014. This represents a 28% increase compared to the last replenishment. However, biodiversity is also a relatively low priority for EU external aid, as it gets less than 1/50th of EU and Member States' total annual development aid budgets.

There is a global consensus that, even with a more efficient use of existing resources, the currently available financial resources for the achievement of global biodiversity commitments are still insufficient. The TEEB report for policy makers indicates that the world community is investing 60% to 75% of what would be needed to effectively manage the existing protected area network.

3.4.4. Inadequate framework and governance structure

The BAP has proven to be a useful tool to raise awareness of biodiversity issues and to foster action across sectors. However, it presents limitations that have contributed to the overall failure to reach the 2010 target. Its effectiveness was hindered by the lack of prioritisation[42] amongst its 160 actions and the absence of a clear governance structure, leading to uncertainties as to the distribution of responsibility for actions among different actors and levels of governance. The fact that the overall target was not translated into a limited number of targets meant that it was difficult to judge whether actions were sufficient.

Adequately monitoring progress towards the 2010 target of halting biodiversity loss was difficult because of it was not underpinned by a baseline.. Taken together, the governance and monitoring shortcomings of the BAP hampered its effective implementation and therefore its ability to tackle the challenge of biodiversity loss.

3.4.5. Limited awareness about biodiversity

A further factor contributing to the failure to address biodiversity loss in the EU is the low overall awareness about the importance of biodiversity and the implications of its loss for individuals, sectors and society at large. Annex 5 summarises the results of recent surveys of EU citizens' and business leaders' attitudes towards biodiversity. More information and awareness-raising is needed to reduce the indirect drivers of biodiversity loss and stimulate the lasting changes, for instance in lifestyle choices and business decisions, that required to reverse the current situation in Europe and the world.

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41 The rural development regulation however allows for derogating from these maximum rates provided that the Member State justifies it.

42 http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/bap_2010/4%20EC_Knowledge_Base_Assessment_BAP_final.pdf

3.5. Where will we be in 2020 compared to the new headline target?

3.5.1. Recent trends in the state and pressures of biodiversity

The 2010 EU biodiversity baseline is the first comprehensive assessment of the state of biodiversity in the EU and one of the most complete set of facts and figures of different biodiversity and ecosystem components in the world, whilst also directly policy relevant, and helping to summarise complex and often disparate sets of scientific data in a simple and clear manner. Given that biodiversity is by definition difficult to represent in aggregated terms, the focus is on specific components of biodiversity.

Looking backwards, there is often a lack of data on evolution over time, in particular for the data of habitats and species in favourable conservation status: the first assessment of conservation status was based on data reported by Member States in 2007, and the next reporting exercise is due in 2013. The few indicators for which there are some elements of time trends – e.g. red list species, Corine Land Cover, farmland birds – show that although the rate of deterioration had decreased, biodiversity loss is still ongoing.

Projections of biodiversity loss were developed based on the Mean Species Abundance (MSA) indicator, which calculates the mean species abundance of the original species compared to the natural or low-impacted state. Although it has significant limitations, including the inability to deal with changing species composition (e.g. extinction, invasion), MSA can provide indications on the key process of homogenisation, at different scales from national to global, and can also be seen as a measure of driver intensity. The projections for the EU based on a 2007 baseline show continuing decline beyond 2020 (figure 5).

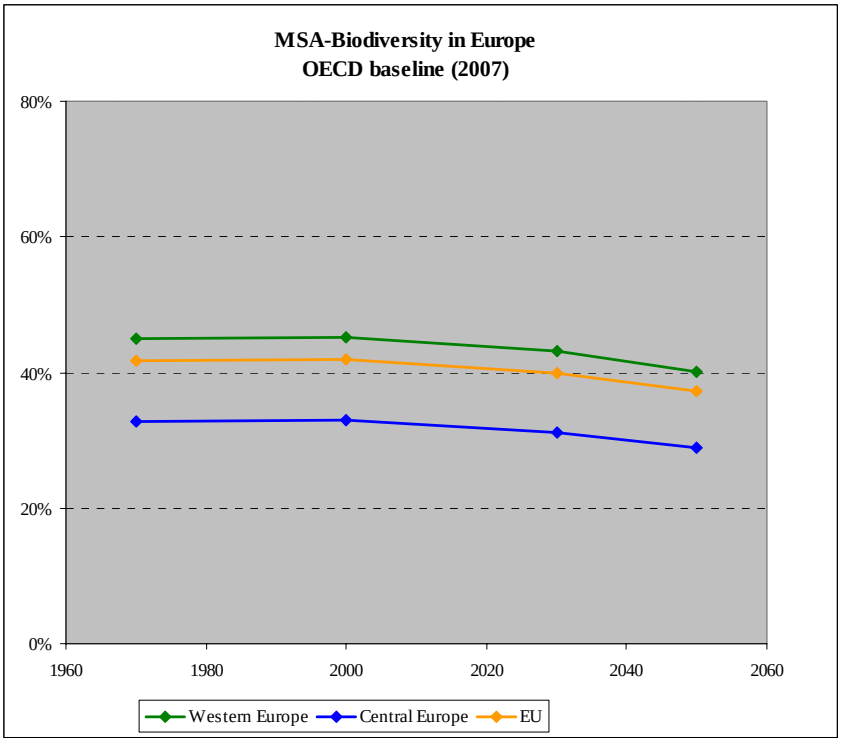

Figure 5: Projections biodiversity change in Europe based on the Mean Species Abundance indicator

Source: PBL

There is no suggestion that the drivers and pressures identified above will stop putting pressure on biodiversity and ecosystems in the absence of further action. The indications tend to be that they would continue (overexploitation, pollution, habitat loss) or even get worse

(climate change, IAS). This is in particular the case of IAS, given the ongoing increase in trade, which is an important pathway of introduction.

Globally, the evidence is the same: with current policies and current effort the loss of biodiversity and ecosystems will continue. A recent study estimated that 75 percent of the planet's coral reefs would be at risk of death or extreme damage within 20 years, and 95 percent of the world's reefs would be at risk by 2050, unless carbon emissions are cut drastically[43]. Projections based on MSA show that global biodiversity is expected to decrease by 10 percent points (pp) from about 70% in 2000, to about 60% in 2050 on average[44].

3.5.2. Consequences of existing policies and legislation

Annex 6 broadly summarises the major policies having direct significant impacts on biodiversity. The most relevant are reviewed here in more detail.

With most of the Natura 2000 network now in place, the next period of implementation of the Habitats and Birds Directives will be critical to making the network fully coherent and operational through effective management of the sites. This will require significant financial investments, related to land acquisition, habitat restoration, development of management plans, monitoring of the state of species and habitats, ensuring connectivity between sites, as well as ongoing management costs of sites. Given the current poor conservation status of many habitats, and implementation experience to date, unless some element of dynamism is provided, in particular through increased funding, implementation is likely to be again very slow in the next 10 years, and management measures are unlikely to be effective enough to reach the 2020 headline target. In a business as usual scenario, it is expected that the conservation status of species and habitats in EU would remain similar or worst than in the 2009 heath check, i.e. overall, only 17% of both habitats and species in favourable conservation status.

In addition, simply designating protected areas is not sufficient to halt biodiversity loss. Whilst the focus of protected areas tend to be on protecting emblematic habitats and species, wider biodiversity, and more common less charismatic habitats and species also need to be protected as they provide valuable services to society. Biodiversity concerns also need to be further integrated into other policies, and although the Common Agricultural Policy and Common Fisheries Policy provide some assistance through funding incentives, those should be enhanced to provide adequate levels of public goods.

Regarding the **Common Agricultural Policy,** given the present conservation status of agro-ecosystems, and according to the 2010 baseline report, agriculture is still a significant driver of habitat loss and degradation. In order to meet the biodiversity targets by 2020, the reformed CAP should seek to ensure that agriculture enhances its provision of public goods, notably farmland biodiversity.

Regarding **fisheries**, the situation is unlikely to improve by 2020 unless the CFP reform directly tackles the problem of overfishing. The recently adopted **Marine Strategy Framework Directive** should drive improvements in the status of marine ecosystems, since it requires that good environmental status (GES) - for which one of the descriptors relates to biodiversity - is achieved by 2020. Key deadlines include an initial assessment of the status of marine waters, and characteristics of GES and environmental targets for 2020 in 2012. The gap should be filled through measures to be taken in 2015.

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43 World Resources Institute, 2011. Reefs at Risk Revisited.

44 Netherlands Environmental Assessment Agency, 2010. Rethinking Global Biodiversity Strategies.

The **Water Framework Directive** also has a key role to play in biodiversity protection and ecosystem restoration. If adequately implemented, a significant amount of restoration of water related ecosystems is likely to take place, as the basic requirement is to reach good ecological status for freshwater bodies by 2015.

As regards **climate change**, achieving the '2 degrees' climate target is absolutely essential to avert global biodiversity loss. The EU has already developed and is implementing elaborate climate change policies and strategies to enable the EU to meet its targets for 2020 and beyond. Although it is too early to determine whether they will be sufficient, specific measures are in place to ensure that climate concerns are appropriately reflected in all Community policies, and reduce the EU's vulnerability to climate change impacts. Finally, the potential impact of the EU's **biofuels** policy on biodiversity will be addressed as part of the implementation of the renewable energy directive, in particular through the work on sustainability criteria. However, failure to agree on a future global climate agreement after the Kyoto Protocol's first commitment period's expiry would constitute an important gap and would risk jeopardising the achievement of the biodiversity goals.

As regards **pollution**, the EU has extensive legislation in place to tackle industrial, transport, domestic and agricultural pollution. Legislation covering chemicals and pesticides is particularly important in this context. While there has been a steady decline in the emissions of substances like nitrogen and phosphorous, which lead to eutrophication of ecosystems, enhanced implementation of all pollution related legislative instruments is needed.

The evolution of **soil** biodiversity will depend to a significant extent on the outcome of current discussions on the Commission proposal for a Soil Framework Directive, still under discussion. Without filling the legislative gap, reaching the 2020 biodiversity headline target and vision is unlikely.

Finally, there is currently no dedicated policy on **invasive alien species**, and current predictions are that the already rising trend of damage to habitats and species will carry on increasing exponentially[45]. Due to the expansion of trade and mobility and increasing environmental disturbances, threats from non-indigenous species are increasing at an accelerated pace. Europe’s maritime and land borders have already been breached by more than 11,000 alien species, around 10% of which are known to have an economic or environmental impact. According to expertise available, over 1000 species would require proactive management. Compared to other OECD countries (e.g. U.S., Canada, Australia, New Zealand), the EU is currently poorly equipped to tackle the challenge, and there is a serious risk that under a business as usual scenario, the EU would not reach the 2020 EU headline target, nor the global target for IAS.

3.5.3. Meeting the 2020 headline target

Business as usual scenario

Overall, given the current state of biodiversity and ecosystem services, the continuing pressures, the policy gaps and the slow implementation in key policies, although some improvements are expected, in realistic terms, a business as usual scenario is unlikely to see sufficient improvement to ensure that biodiversity loss is halted by 2020.

New elements of the 2020 headline target

[45] IEEP, 2010. Assessment to support continued development of the EU Strategy to combat invasive alien species. Final report to the European Commission.

In addition, the 2020 headline target includes new components: the conservation and restoration of ecosystem services and the contribution to global biodiversity. The BAP included elements of ecosystem conservation, but not specifically services. Whilst the Environmental Liability Directive refers indirectly to the notion of services, the explicit focus on ecosystem services is a new policy area. With ecosystem services, the focus is more on flows of benefits to society than on conservation of biodiversity per se. Although there is some evidence that high diversity of species might be correlated to ecosystem services, it is generally recognised that the relationship is not straightforward, and that a focus on increasing species diversity may not always lead to high levels of services. For example, research shows that ecosystems in non-biodiversity-rich areas also provide high levels of services[46]. Without a specific focus on these services, they are unlikely to be adequately maintained or restored. These new elements bring additional risks and uncertainties for policy achievement by 2020 Given the current poor state of ecosystem services in the EU, and the lack of explicit focus on ecosystem services of current policy, it is unlikely that there would be widespread restoration of ecosystem services under a business as usual scenario, although some amount of restoration is expected under the Habitats Directive, the WFD and the MSFD.

Unequal burden across Member States

Biodiversity is not evenly spread and trends differ from one Member State to another. There are also differences in implementation of existing legislation as shown by the state of progress by Member States in designating sufficient protected areas to provide for Habitats Directive annex I habitats and annex II species. Therefore the burden of tackling the challenge will be spread unequally.

3.6. Why should the EU get involved?

The legal basis for action

The legal underpinning for the development of biodiversity policy in the EU is found in Articles 191 and 192 (ex 174 and ex 175 TEC respectively) of the Treaty on the Functioning of the European Union, which requires a high level of protection and improvement of the quality of the environment in the European Union.

The protection of nature was among the first policy areas developed under EU environmental legislation, as far back as 1979, in recognition of the fact that the protection of species and habitats has transboundary considerations, as well as important implications for the achievement of other EU policy objectives and the sustainability of many economic sectors in the EU. EU action in the area of biodiversity and nature protection is also important in ensuring a level playing field in the EU and avoiding the distortion of competition in the internal market. As such, the principle of EU involvement in managing biodiversity is now well established.

Promoting solidarity

There is also a case for EU action to conserve biodiversity and promote its sustainable use based on the "solidarity principle", since biodiversity is unevenly distributed among Member States: there is a higher proportion of natural areas, and better preserved ecosystems in some countries than others. It can be argued that access to biodiversity and its benefits should be open to all Member States. This justifies the need for some effort sharing and co-ordinated effort at Community level for protecting biodiversity.

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[46] Naturally at your service - Why it pays to invest in nature (RSPB) 2009.

Subsidiarity

The principle of subsidiarity in this case means that actions may need to vary from Member State to Member State and within Member States from region to region. The challenge in those areas is in ensuring integration and coherent and co-ordinated programming. Actions proposed in this paper are those where the EU has most value-added and leverage. However, it is clear that without parallel action at Member State level, they will not be sufficient to deliver the target of halting biodiversity loss. In practice, success in delivering the 2020 headline target will depend on a mixture of EU and national, regional or local measures, in line with the principle of subsidiarity.

Delivering on global commitments

In the context of the 10th Conference of the Parties to the UN Convention on Biological Diversity (CBD COP10) in October 2010, the EU and its 27 Member States have agreed a Strategic Plan for Biodiversity 2011-2020 with a new 2020 global mission or headline target requiring them to *take effective and urgent action to halt the loss of biodiversity in order to ensure that, by 2020, ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being, and poverty eradication.* They have also committed to 20 global targets for biodiversity to be attained by 2020 at the latest.

Specifically, Target 17 of the Strategic Plan requires that "by 2015, each Party has developed, adopted as a policy instrument, and commenced implementing an effective, participatory and updated national biodiversity strategy and action plan".

4. OBJECTIVES OF THE EU BIODIVERSITY STRATEGY

This section describes the general and specific objectives underpinning the targets proposed as part of the strategy, as required by the Council. Based on the problem definition, identification of drivers, and implementation and policy gaps, a set of targets is proposed, as a response to the Council conclusions, and to the EU commitment to the Nagoya strategic action plan.

4.1. General objectives

The general objective is the EU 2020 biodiversity headline target, which has three components: to halt biodiversity loss and the degradation of ecosystem services by 2020, restore them as far as feasible, and step up the EU contribution to averting biodiversity loss. Achieving the 2020 headline target is also seen as an intermediary step towards attaining the objective set out in the 2050 vision, and a means of meeting the EU commitment to the global 2020 biodiversity targets.

Halting biodiversity loss and ecosystem services degradation involves stopping or preventing the long-term or permanent qualitative or quantitative reduction in components of biodiversity (genes, species and habitats/ecosystems) and their potential to provide goods and services. Biodiversity loss needs to be understood against general characteristics such as variety, quantity and quality or distribution, rather than at the level of each individual organism.

The restoration of ecosystems and their services is understood as actively assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed, although natural regeneration may suffice in cases of low degradation. The objective should be the return of an ecosystem to its original community structure, natural complement of species, and natural functions to ensure the continued provision of services in the long term, although in cases of extreme degradation, the focus on specific services may be justified.

Stepping up the EU contribution to averting global biodiversity loss is essential to ensuring that the EU delivers on its global biodiversity commitments, in particular the 2020 biodiversity targets and mission under the CBD.

4.2. Specific objectives

The strategy should contribute to meeting the general objectives outlined above. This requires addressing the drivers and pressures of biodiversity loss, and the implementation and policy gaps identified in the problem analysis, whilst also taking into account the Nagoya strategic action plan targets. In doing so, it needs to be recognised that some of the drivers and pressures are expected to be addressed through other policies, and so this strategy focuses on the key areas which require additional action.

In addition, targets should be selected on the basis of two further factors: their **overall potential to deliver early and significant results** and to seize **opportunities provided by ongoing or upcoming reform processes** in relevant policy areas.

Both state-based and effort-based targets are needed so that effects can be perceived within a politically relevant time frame (e.g. 5, 10 years) while generating positive results in the longer term. Targets should be focused on key drivers that, unless tackled, risk leading to irreversible loss of biodiversity or very high restoration costs.

For some areas, the policy framework was assessed to be adequate or in early stages of implementation, and therefore no dedicated target was set:

- For the time being, no specific measures are proposed to tackle the root causes of **climate change** as these are being developed as part of Climate policy. However, adaptation to climate change is an essential element of the Biodiversity Strategy, and some selected targets are expected to contribute significantly to related EU climate objectives.

- Regarding **pollution**, there is still a case for further action in certain areas, such as phosphates and certain atmospheric pollutants to further limit emissions of acidifying and eutrophying pollutants and ozone precursors. As these are under consideration by the Commission, no new measures are proposed for inclusion in the strategy.

- For similar reasons, no specific measures are proposed on **soil**, pending a conclusion of current discussions on the Commission proposal for a Soil Framework Directive. However, some measures such as those related to restoration and green infrastructure will have a positive impact on soil ecosystems.

- No target was proposed for **aquaculture** as the EU regulatory response was assessed to be adequate, although implementation will need to be closely monitored.

The Water Framework Directive (WFD) is expected to deliver good environmental status of water ecosystems by 2015. An ongoing fitness check of water-related policy will lead to a Blueprint initiative in 2012. The situation will need to be reviewed after 2012.

The policy gap analysis in section 3.5, however, showed that given the slow implementation of the **Habitats and Birds directives**, additional measures are needed to reach their full potential. Also, more integration of biodiversity concerns are needed in sectoral policies such as the **CAP and the CFP**, which are currently undergoing a reform.

In conclusion specific objectives need to focus on the three areas where opportunities for improving implementation or integration are greatest, namely the Nature Directives,

agricultural policy and fisheries policy. In addition, two other objectives should focus on areas where there is at present no specific policy framework, including ecosystem services outside Natura 2000, and invasive alien species. Finally, the international dimension of the 2020 objectives, and the recent commitments in Nagoya warrant an additional specific objective focusing on the EU contribution to global biodiversity.

The selected specific objectives directly relate to the problems and causes of biodiversity loss identified. Each objective is linked to specific problems and drivers, with different degrees of intensity, as illustrated in Figure 6.

Figure 6 illustrates that the first two specific objectives focus directly on the **problems** (loss of species, habitats and ecosystem services), while the ones on agriculture and forestry, fisheries and IAS focus more on the **causes of biodiversity loss**. It also illustrates that although not the specific focus of individual targets, pollution and climate change are addressed by some of the selected targets. This is also illustrated in the context of the DPSIR framework in figure 7.

Taken together, the specific objectives address the three dimensions of the EU 2020 biodiversity headline target. The first two focus on **protecting and restoring biodiversity and associated ecosystem services** both within and outside the Natura 2000 network. Whilst protecting species and habitats of European Community Importance remains a priority, ecosystems outside protected areas provide essential, valuable services that need to be protected and restored. Addressing the **key pressures on biodiversity** with the following three objectives is a necessary condition to conservation and restoration. The sixth objective reflects the third dimension of the headline target: **the global contribution**.

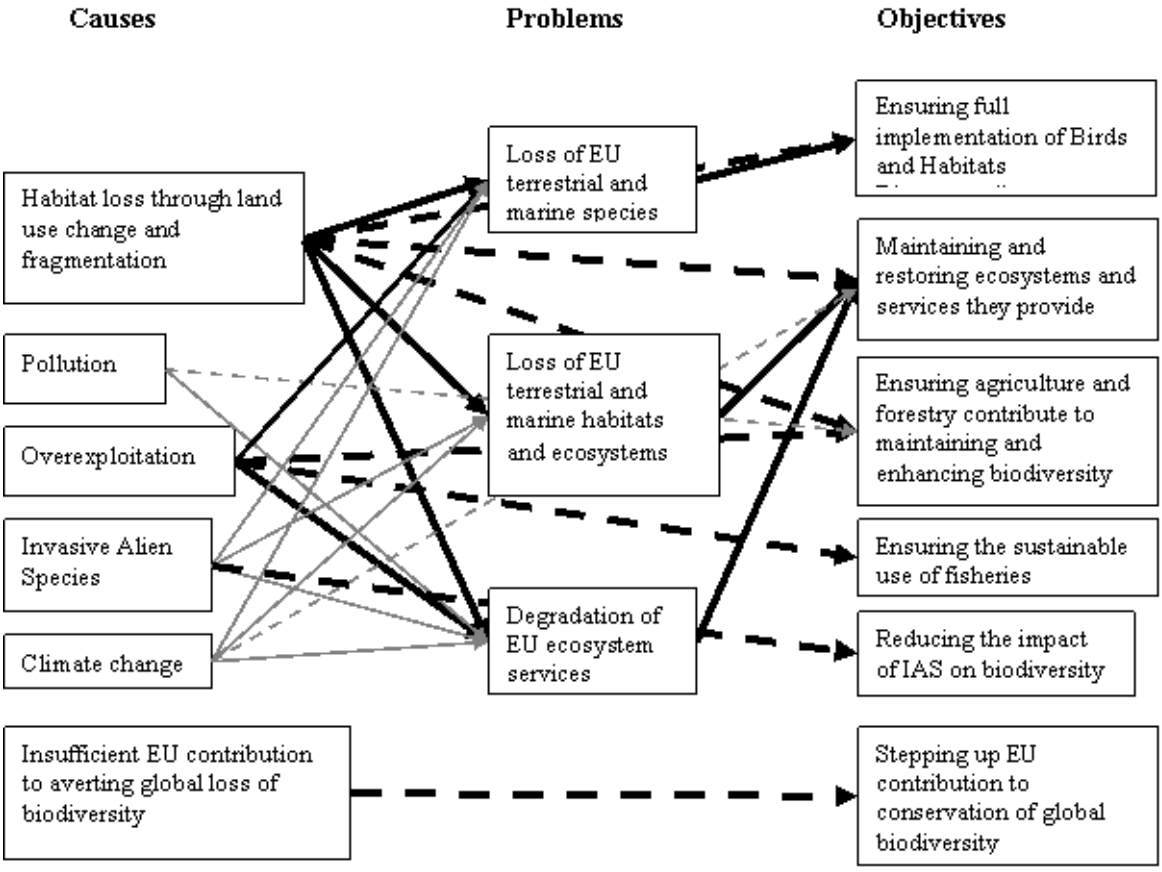
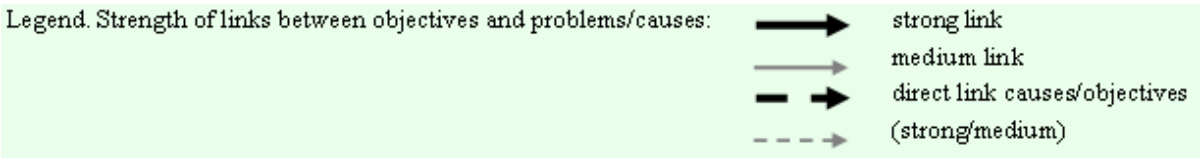


Figure 6: relation of specific objectives to problems and causes of biodiversity loss



Indirect drivers are best addressed across targets in relation to specific pressures, rather than in isolation. For example, the use of **incentive-based mechanisms** should contribute to correcting market failures associated with the degradation and loss of biodiversity and ecosystems and will be included within each target. Similarly, other drivers such as cultural/lifestyle-related, trade-related drivers of biodiversity loss, and lack of awareness will be addressed in the biodiversity strategy through the other targets. **Institutional drivers** will be addressed through the governance aspects of the strategy (see figure 7).

In addition, many indirect socio-economic drivers of biodiversity loss are also drivers for **other environmental issues**. The EU's flagship initiative on a resource efficient Europe, in preparation as part of the EU 2020 Strategy for smart, sustainable and inclusive growth, will contribute to reducing some key indirect drivers, such as demand for natural resources and ecosystem services. The initiative aims at putting in place a roadmap including actions to foster sustainable supply of resources (those being commodities, raw materials, minerals, but also natural resources and their services), boosting overall resource efficiency.

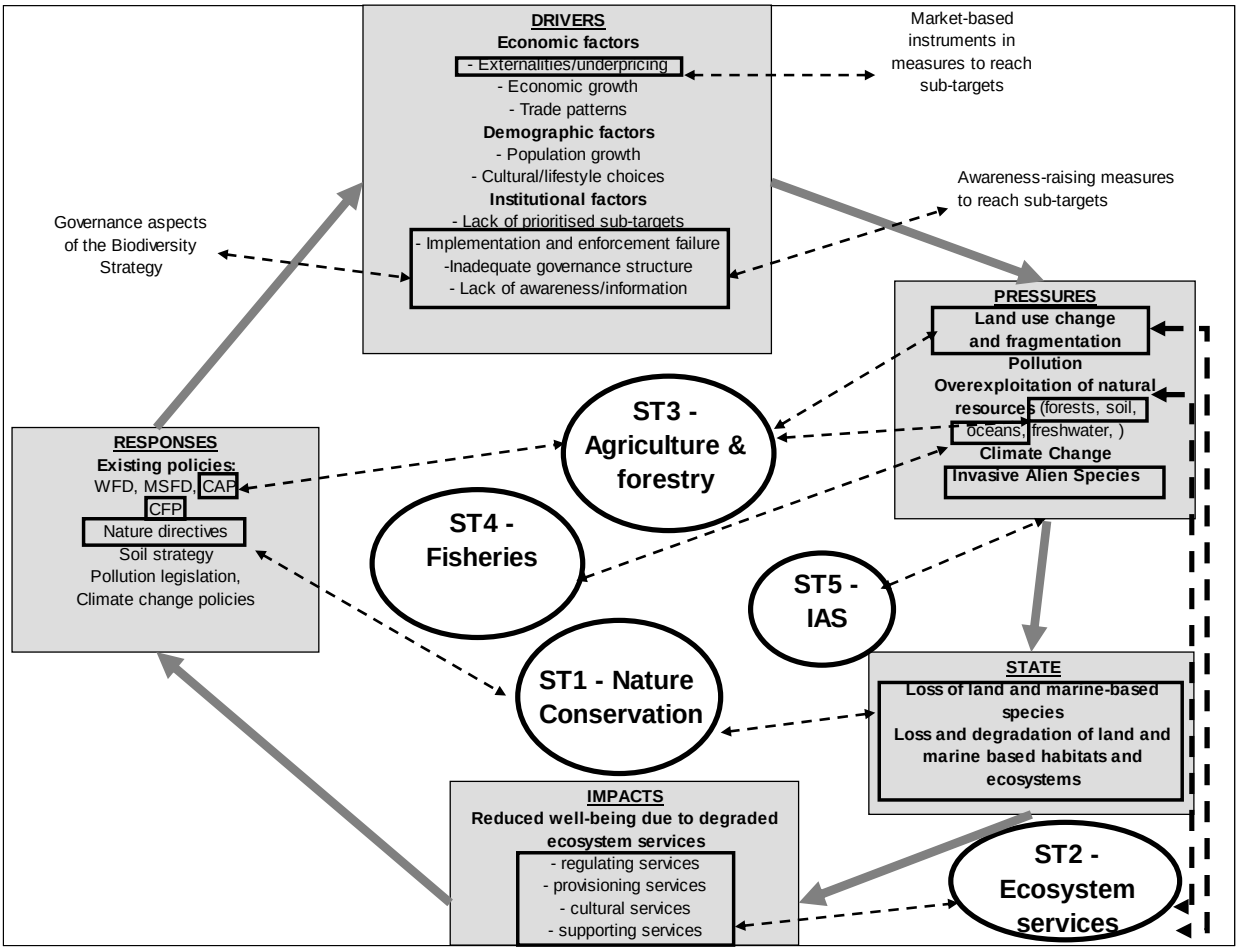


Figure 7: Links between the problem elements and the targets and measures based on the DPSIR framework

5. OPTIONS FOR THE TARGETS

This section describes what alternatives were considered for the operational targets and justifies the final selection. The nature of the target (indicative or binding), once implemented, is also described, as well as possible future adjustments needed as the knowledge base evolves. The selected targets and links to general and specific objectives are outlined in Table 1.

5.1. T1 - Fully implement the Birds and Habitats Directives

Link with EU objectives and global targets

Full implementation of the Nature directives is key to halting biodiversity loss. This specific objective is linked with two global 2020 biodiversity targets:

- By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced (Global Target 5);

- By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained (Global Target 12).

Discarded options

Some options originally considered for this target included: a reduction in the percentage of unknown assessments for the conservation state of habitats and species; a percentage of Natura 2000 sites with a Management Plan; or a blending of improved conservation status for habitats and species protected under the Nature legislation and additional species and habitats covered under national legislation. These were not retained on the basis of further assessment and input received from stakeholders and Member States, namely: while valuable to address current information gaps, an increase in the knowledge of the state of species would be too limiting as a target and may not necessarily translate into an improved state; the Nature legislation does not require that all Natura 2000 sites have a formal management plan and while being a key tool, the fact of having such a plan would not guarantee an improvement in the conservation status of protected habitats and species; finally, blending obligations arising from the Nature legislation and additional species and habitats covered under national legislation would render monitoring overly complex; additional national obligations would be better addressed through national biodiversity strategies. A target pertaining to the improvement of the state of conservation was preferred, as having a more direct link with the relevant global targets.

Alternative options considered

The Birds Directive covers all bird species and related habitats, and requires that all birds species reach good status. The latest 2004 assessment for 25 EU member States concluded that 52% of species are secure. The Habitats Directive covers other species and habitat types, and requires that each habitat type and each species in the different biogeographical regions reaches favourable conservation status. The assessment methodology is described in Annex 8. The 2009 health check concluded that 17% of habitats and species are in favourable conservation status. Whilst sites protected under both directives are included in the Natura 2000 network, the definition of the status of species and habitats is different under each Directive, and therefore the target must contain objectives that are differentiated according to the different requirements.

Three options were therefore considered for this target:

- Option 1: achieve favourable conservation status for all species and habitats under the Habitats directive and good status for all bird species under the Birds directive.

- Option 2: achieve a realistic proportion of species and habitats in good conservation status under the habitats directive, and in good status under the birds directive

- Option 3: achieve favourable conservation status or significant improvement in conservation status, and achieve good status or significant improvement in the status of bird populations.

Whilst it can be argued that all Member States have the obligation to achieve the goals of option 1, as soon as possible, the Directives do not contain specific deadlines. Moreover, since species and habitat types covered by the Habitat Directive were selected because they are already rare or threatened, achieving favourable conservation status is not easily attainable. It implies not only ensuring that populations of species and area of habitat are favourable but also that their overall range is favourable. Therefore, option 1 was assessed to be only attainable in the **medium to long term** for many species and habitats.

Option 3 was preferred to option 2, as a realistic recovery target for 2020 based on favourable conservation status alone would be rather low, and it would hide all the improvements that can and should be made in the other categories of the assessments, for example from unfavourable-inadequate to favourable, as progress is made towards favourable conservation status. Taking into account these improvements is important as they represent the **restoration efforts that are needed** to achieve the overall 2020 biodiversity headline target. Option 3 would therefore represent a more sensitive indicator of progress made to not only halt the loss but also restore biodiversity in the EU.

Level of ambition

An analysis was carried out to assess the level of improvements in conservation status that could be expected if the adequate conservation measures were undertaken to improve certain parameters (habitat area for species, population and future prospects for species and future prospects and structure & functions for the habitat types), which underpin the assessment of conservation status. This analysis concluded that a realistic target could focus on a 25% increase in favourable or improving conservation status for species and 33% for habitat types (see annex 8 for details of the analysis). This would also be in line with Global Target 12.

A separate assessment was carried out for birds as the Birds Directive has a different focus. The approach is based on an assessment of risk of extinction of different species. If the necessary conservation measures are put in place, it is considered feasible to achieve a significant measurable improvement from the current level of 52% of bird species populations having secure/good status to a maximum level of 80% of bird species either being secure or showing improving population status by 2020. The figures were translated in terms of percentage of improvement and rounded in the final formulation of the target.

Nature of the target

This target is indicative, and may be reviewed in 2014, when the outcome of the next 'Article 17' report will provide an update on trends in conservation status of habitats and species.

5.2. T2 - Maintain and restore ecosystems and their services

Link with EU objectives and global targets

Halting the degradation of ecosystems and their services requires that there is no further net loss overall compared to the 2010 biodiversity baseline. The council conclusions request in addition that ecosystem services are restored as far as feasible. As a Party to the CBD, the EU has also committed to two related global 2020 targets requiring that:

- ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and wellbeing, are restored and safeguarded (Global Target 14)

- ecosystem resilience and the contribution of biodiversity to carbon stocks have been enhanced, through conservation and restoration, including restoration of at least 15% of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification (Global Target 15).

Alternative options considered

Ensuring that restoration of ecosystems leads to enhanced ecosystem services requires that attention is paid to integrating ecosystems in the wider landscape, as location and connectivity will influence the level of ecosystem services. Spatial planning is therefore an important dimension, which can be delivered through the establishment of green infrastructure. This would pursue the aim of strengthening and restoring the good functioning of ecosystems and associated services, increase resilience and reduce vulnerability to climate change and natural disasters as well as increase spatial and functional connectivity between existing natural areas, while taking care to ensure that these solutions are well adapted to local and regional conditions.

Three options were considered:

- Option 1 – establishment of green infrastructure.

- Option 2 – restoration of degraded ecosystems.

- Option 3 – establishment of green infrastructure and restoration of degraded ecosystems.

With option 1, the focus would be on spatial integration of ecosystem services. This has the appropriate qualitative focus but risks not being concrete enough in terms of desired output for restoration, especially as the concept of green infrastructure is still being developed. Option 2 would focus on ecosystems only, as a proxy for ecosystem services. This has the merit of being more easily quantified than ecosystem services. However there is a risk that the focus on restoration will be mainly on restoration area, without due consideration to the type and level of services restored. Elements such as connectivity and integration in the landscape may not be taken into consideration, and opportunities for benefits from multiple services may be lost. Option 3 is the preferred option as it combines the two elements above and has the merit of combining a concrete focus on outcome with the appropriate qualitative elements on ecosystem services linked to green infrastructure.

Level of ambition

An additional consideration is the quantified level of the EU target compared to the global target. Restoration of at least 15% of degraded ecosystems is the minimum level of ambition as any less would put the EU in non compliance with the CBD obligations. However, a higher figure (for example 30%) merits being considered for a number of reasons. Firstly, the EU has adopted a more ambitious headline target than the one agreed globally, and the EU's 2050

vision requires that ecosystem services are appropriately restored. Secondly, the EU is the most fragmented continent in the world and a significant amount of restoration is expected to take place under existing legislation. Thirdly a higher percentage of restoration is likely to be cost-beneficial, in particular given the climate change mitigation and adaptation benefits of many ecosystems. However, there is currently not sufficient evidence of how much restoration would take place under existing EU policy, whether additional efforts would be needed to reach 30%, and what their costs and benefits would be, to take a fully informed decision. Therefore, the chosen level is initially the minimum compliance with respect to international commitments.

While there was some a discussion with Member States on different options before the CBD-COP 10 in Nagoya, the adoption of relevant targets in the Strategic Plan of the CBD which were sufficiently clear and quantified allow the Commission to focus on these elements.

Nature of the target

This target is indicative, and the level of ambition should be reviewed in 2014, when it should be clearer how much restoration is likely to take place under the WFD and the MSFD, and progress has been made on the costs and benefits of further action.

5.3. T3 - Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity

Link with EU objectives and global targets

Addressing key drivers of biodiversity loss is essential to reach EU objectives. One of the 2020 global biodiversity targets requires that areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity (Global Target 7). As explained in section 4.2, no EU target is dedicated to aquaculture.

Agriculture

Discarded options

Initial options considered for the agriculture target included: a percentage of CAP funds earmarked for biodiversity, a percentage of agricultural area under organic farming or a percentage of high nature value farmland that should be maintained. These were not retained on the basis of further assessment and input received from stakeholders and Member States, namely: earmarking of CAP funds would not have been possible without pre-empting the discussions on the CAP reform; while the environmental benefits of organic farming are recognised[47], it was felt on the one hand that leaving conventional farming unaddressed would be problematic given its dominant share in agricultural area and, on the other hand that other types of farming also provide benefits for biodiversity. As regards the High Nature Value farmland, the problem of the lack of a common definition of NHV farmland or HNV farming at EU level was raised. A target based on the area of agriculture land that is under measures that have to deliver an improvement in the state of biodiversity was thus preferred.

Alternative options considered and level of ambition

The recent communication on 'The CAP towards 2020'[48] highlights that 'the active management of natural resources by farming is an important tool to combat biodiversity loss

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47 See for example 'Organic farming shows limited benefit to wildlife'. *Science Daily*. 6 May 2010, showing a 12% increase in biodiversity in organic farms, but lower yields; and http://www.newscientist.com/article/dn6496-organic-farming-boosts-biodiversity-.html

48 COM(2010)672 final.

and contributes to mitigating and adapting to climate change'. Targeted financial rewards for agri-environmental ecosystem services are needed to provide better incentives to farmers to engage in activities that contribute to conserving and restoring biodiversity on their lands.

This requires an increase in the proportion of utilised agricultural area (UAA) under which biodiversity supportive practices and the delivery of public goods from agriculture are rewarded.

The proportion of UAA likely to be covered depends on the type of agro-ecosystems targeted. High Nature Value (HNV) areas[49] are particularly important as evidence shows that HNV areas are critical to conserving biodiversity. For example, it has been shown that the diversity of farmland birds was statistically higher in HNV areas than outside HNV areas[50]. Maintaining these areas requires income support as these farming systems are under threat due to low farm incomes. Agro-ecosystems outside HNV areas also provide valuable ecosystem services, such as carbon sequestration, soil erosion control, and water regulation. This includes other types of extensive agriculture, including non HNV Natura 2000 agricultural land, and grasslands, but also more intensive agricultural areas.

The target should therefore focus on the extent of agricultural areas covered by biodiversity-related measures, as well as the effectiveness of the measures in enhancing biodiversity. Three options were considered, depending on whether biodiversity-measures would target:

- Option 1 – extensive agricultural areas including HNV areas, Natura 2000 and grasslands (40 to 50% of UAA)

- Option 2 – a proportion of agricultural area across grasslands, arable land and permanent crops including both extensive and intensive agriculture (at least 60% of UAA)

- Option 3 – all agricultural land (100% of UAA)

Annex 7 provides the analysis of the extent of agricultural area likely to be covered under each of the options . Option 1 would reflect the high importance of extensive agricultural areas including HNV, Natura 2000 and grassland areas in maintaining biodiversity, but would leave out important benefits that more intensive agro-ecosystems could also provide. On the contrary, option 2 would recognise that intensive arable land also provides restoration opportunities through the use of measures that allow the land to rest and recover; such as set aside, or other landscape and management measures. A realistic proportion of agricultural area covered under option 2 could be about 60% of UAA (see annex 7), or more, depending on the extent to which the options considered in the recent communication on 'The CAP towards 2020', are taken forward in the CAP reform. It would ensure the contribution of the different types of farmland areas that can provide ecosystem services and biodiversity

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[49] High Nature Value farmland comprises the areas in the rural landscapes where farming supports high biodiversity in terms of species and habitats, of which three main categories can be distinguished: farmland with a high proportion of semi-natural vegetation; farmland with a mosaic of low intensity agriculture and natural and structural elements, such as field margins, hedgerows, stone walls, patches of woodland or scrub, and small rivers; farmland supporting rare species or a high proportion of European or World populations. Pedroli B, Van Doorn A, De Blust G, Paracchini ML, Wascher D & Bunce F (Eds. 2007). Europe's living landscapes. Essays on exploring our identity in the countryside. LANDSCAPE EUROPE / KNNV, Chapter 2.).

[50] Analysis of spatial and temporal variations of High Nature Value farmland and links with changes in bird populations: a study on France (Philippe Pointereau, Aggeliki Doxa, Frédéric Coulon, Frédéric Jiguet, Maria Luisa Paracchini), JRC Scientific & Technical Reports, EUR 24299 EN - 2010

benefits, covering a significant proportion of agricultural land overall, whilst leaving some flexibility as to the proportion covered by each sub-category.

Under option 3, all agricultural land would be covered by biodiversity-related measures and deliver substantial benefits from agro-ecosystems and the services they provide. However, a substantial financial effort would be needed under the first and second pillar of the CAP, going well beyond a redistribution of resources within the CAP. For the second pillar, this would require a higher expenditure by Member States due to co-financing requirements, which may seriously hamper the achievement of this target.

The target was formulated against the background of option 2. It is based on the rationale that biodiversity-related measures are needed on all types of agricultural land, covering grasslands, arable land and permanent crops and that the area under such measures is to be maximised to ensure a measurable improvement in the status of species and habitats. This approach offers the best guarantee to deliver on biodiversity objectives without requiring a disproportionate financial effort as would have been the case under Option 3. Option 2 has been translated into the following target: "Maximising areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP so as to ensure the conservation of biodiversity and to bring about a measurable improvement in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU 2010 Baseline, thus contributing to enhance sustainable management" . To ensure that this target contributes to achieving Target 1 and Target 2, the improvement in the status of species and habitats should match the level of ambition of Target 1 for species and habitats of European interest, and the level of ambition of Target 2 for other species and habitats. Similarly, the improvement in the provision of ecosystem services should be evaluated in light of the level of ambition of Target 2. Until a baseline is defined for ecosystems services, the ecosystem (or habitat) should be taken as a proxy.

Nature of the target

This target is indicative, but would need to be translated in concrete terms in the design of the CAP reform, to deliver on the 2020 biodiversity target. The situation should be reviewed in 2014, once the CAP reform package has been adopted, and also in light of the take up of the proposed measures by farmers, and any updated data on areas covered by the different types of ecosystems.

Forests

Discarded options

Initial options considered for the forests target included: a percentage of undisturbed forests that needed to be maintained as such; a percentage of forests under certification; a reduction in the percentage of fragmentation within forests. These were not retained on the basis of further assessment and input received from stakeholders and Member States, namely: too few Member States have undisturbed forests; forest certification's potential was recognised, in particular for third countries (albeit with some caveats[51]), but it was pointed out that some of the existing Forest Management Plans in the EU include more stringent environmental

[51] According to recent research the Forest Stewardship Council (FSC) certification scheme has not reduced deforestation, as originally intended (Marx, A., Cuypers, D. (2010) Forest certification as a global environmental governance tool: what is the macro-effectiveness of the Forest Stewardship Council? *Regulation & Governance.* 4:408-434.)

requirements than those retained in certification schemes; while forest fragmentation was recognised as a key threat it was raised that it is often beyond the remit of influence of forest holders. A target related to the percentage of forests that have a management plan or equivalent instrument that contributes to the improvement of the state of biodiversity was preferred.

Alternative options considered and level of ambition

Maintaining and enhancing biodiversity is identified as a substantial element of the EU Forest Strategy and the 2006 Forest Action Plan, in the context of Sustainable Forest Management (SFM) and the multifunctional role of forests[52]. The Forest Strategy indicates that appropriate measures should be integrated in the forest programmes or equivalent instruments of the Member States.

In addition, the Ministerial Conference on the Protection of Forest in Europe (MCPFE, now Forest Europe process) in its Resolution H2 agreed that forest management should be based on periodically updated plans or programmes at local, regional or national levels as well as for ownership units, when appropriate. According to the data provided by Member States in the context of Forest Europe, 23 Member States have more than 60% of the forest area under a management plan or equivalent instrument. Management plans or equivalent documents in line with sustainable forest management (SFM), with a better integration of biodiversity considerations than at present, are important elements to maintain and foster a sound approach towards the implementation of multiple, long-term sustainability goals. They would contribute to the long term EU biodiversity objectives are reached.

The target should focus on increasing the number of forests covered by a management plan that includes biodiversity aspects, and on ensuring that a sufficient enhancement of biodiversity and ecosystem services is achieved.

Two options were considered, requesting that by 2020:

- Option 1 - All publicly owned forests EU have a management plan or equivalent instrument in line with SFM

- Option 2 - All publicly owned forests and all forests receiving EU funds under the Rural Development Policy have a management plan or equivalent instrument in line with SFM

The proportion between areas of publicly and privately owned forests in the EU is approximately 40 % and 60 % respectively. Many of the publicly owned forests already have management plans or equivalent instruments, but not all include biodiversity related aspects. Option 1 implies that public authorities reflect in their own management plans the biodiversity-related commitments they have agreed to in the context of Forest Europe. Therefore it would not be a new requirement but rather the **crystallization of an existing agreement**. However it would not have any bearing on privately owned forests.

Option 2 would, in addition, take advantage of the opportunities embedded in rural development policy and the LIFE + program to provide leverage for a wider application of Management Plans and equivalent instruments in privately owned forests. It would therefore provide added value to Member States action and ensure that adequate **incentive**s are provided by **rewarding forest management practices** that deliver benefits from biodiversity and ecosystem services. The wider use of management plans would also provide **additional**

[52] COM(2006)302.

benefits as it could serve as a basis for the identified needs[53] of better integrating forestry into rural development, and improving the evaluation of forestry measures with respect to the broader aims of rural development policy, thereby allowing a better evaluation of the effectiveness of the use of public funds.

An alternative option requiring that all forests in the EU have a management plan would fully reflect the recommendation of Resolution H2 of MCPFE which applies to all forests irrespective of their ownership, and maximise benefits from forest biodiversity and ecosystems services. However, apart from the influence of rural development funding, the EU has limited leverage over private forest decision-making, which is within the remit of Member States. Therefore this option for a target was not retained, to take into account **subsidiarity** considerations.

Option 2 is therefore the preferred option. An additional issue is the **administrative level of management plans**, as resolution H2 allows some flexibility. Whilst management plans at national or regional level would lower the administrative burden, they would be unlikely to adequately deliver on the biodiversity targets. The adoption of management plans should be at the holding level to be effective, given that forest management decisions are taken by forest holders, depending on local conditions (climate, solid, species etc.), whilst relying on national forest management regulations and on principles agreed within the framework of Forest Europe. Many Member States have adopted guidelines for the management of forests for biodiversity conservation, which would facilitate the task of forest holders.

To reduce the **administrative burden** for very small holdings, the target for private holdings could be restricted to holdings above a certain size. The decision on the size under which funding under the EU Rural Development Policy would not be conditional upon the development of a Forest Management Plan could be decided by the Member States or regions taking into account **subsidiarity** considerations.

The management plans would need to contribute to a measurable improvement of the status of species and habitats dependent on or affected by forestry, as well as in the provision of ecosystem services, compared to the current state. The improvement in the status of species and habitats, is to be measured against the state of biodiversity as described in the EU 2010 Baseline, and should match the level of ambition of Target 1 for species and habitats of European importance, and the level of ambition of Target 2 for other species and habitats. Similarly, the improvement in the provision of ecosystem services should be measured against the EU 2010 Baseline and evaluated in light of the level of ambition of Target 2. Until a baseline is defined for ecosystem services, the ecosystem (or habitat) should be taken as a proxy.

Although an intermediary target was considered, given that the CAP reform would only enter into force shortly before 2015, any mid-term target would only evaluate the output of past policies.

Nature of the target

This target is indicative. It could however be translated in more concrete terms if retained in the design of the CAP reform, and the formulation of the Rural Development Policy post-2013. The situation should be reviewed in 2014, once the CAP reform package has been adopted, and also in light of the take up of management plans, and their effectiveness in conserving and enhancing forest biodiversity and ecosystem services.

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[53] Reporting on the implementation of the EU Forestry Strategy – COM (2005)84 final.

5.4. T4 - Ensure the sustainable use of fisheries resources

Link with EU objectives and global targets

Overfishing is an important driver of biodiversity loss. The fisheries target adopted in Nagoya as part of the CBD Strategic Plan is aimed at ensuring that "By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits" (Global Target 6).

Alternative options considered

In Johannesburg, in 2002, the European Union committed to maintain or restore stocks to levels that can produce MSY, achieving these goals for depleted stocks on an urgent basis, and where possible not later than 2015[54].

The Marine Strategy Framework Directive (MSFD)[55] establishes European Marine Regions on the basis of geographical and environmental criteria, with the objective of achieving or maintaining Good Environmental Status for all marine waters, including its marine biodiversity by 2020 based on criteria including fish stock health. The recently adopted Commission progress report on the Integrated Maritime Policy[56] consolidates the Marine Strategy Framework Directive as its environmental pillar.

Based on the above, this target needs be centred on two main dimensions: restoring stocks to MSY and ensuring that adverse impacts of fisheries on marine ecosystems are minimised. This was clearly supported by stakeholders and Member States given the commitments made in Johannesburg and Nagoya.

Two main options were considered on MSY, in line with the main environmental options considered in the ongoing reform of the Common Fisheries Policy:

- Option 1 – achieving environmental sustainability, with MSY in mixed fisheries based on the most commercially valuable species.

- Option 2 – achieving environmental sustainability, with MSY in mixed fisheries focusing on the most vulnerable species.

The focus of MSY in mixed fisheries is important because the level of effort cannot be adapted to different species. If the level of effort is aimed at achieving MSY for the most valuable species, it may be higher than what would be needed to achieve MSY for other joint species, that could then be overexploited. On the other hand, if the level of effort is aimed at achieving MSY for the most vulnerable species, it may be lower than what would be needed to achieve MSY for other joint species, that would then be underexploited, with economic consequences. Therefore, a compromise is needed on the choice of the criteria to set the MSY levels: the most vulnerable or the most valuable. Option 2 is preferred to option 1, as more in line with the EU 2020 biodiversity headline target, and the Nagoya commitments.

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54 World Summit on Sustainable Development, Johannesburg, 2002.

55 Directive 2008/56/EC.

56 COM (2009) 540 final.

Level of ambition

The level of ambition here is linked to timing. Two options were considered, also in line with the CFP reform options currently considered:

- Achieve MSY for all stocks within a flexible time horizon, not later than 2020
- Achieve MSY for all stocks by 2015

Given the Johannesburg commitments, the preferred option is to achieve MSY for all stocks by 2015. Decisions will however need to be taken for each individual stock, based on specific circumstances. This might involve the use of proxy measures and precautionary approaches for stocks for which there is not sufficient data availability. Finally the target should also reflect the requirements of the MSFD. Beyond quantitative objectives in terms of mortality or biomass, objectives should be set on the status within stocks, having regard notably to population age and size distribution, in line with Commission Decision 2010/477/EU on criteria and methodological standards on good environmental status. The latter also requires a long-term commitment to monitor all trophic levels of marine organisms and the physical forces that influence their communities. In the longer term, therefore, suitable metrics for fisheries management approaches addressing a range of ecosystem interactions would need to be developed.

Nature of the target

Although indicative at this stage, this target would need to be translated in the legal framework of the CFP reform to ensure that the objectives are reached. The situation would need to be reviewed in 2014, once the package of the CFP reform has been adopted.

5.5. T5 - Combat invasive alien species

Link with EU objectives and global targets

This specific objective also focuses on one of the key drivers of biodiversity loss and is directly related to the global 2020 biodiversity target: 'By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment' (Global Target 17).

Alternative options considered

The global target reflects that efforts have to be two-fold to reduce the impact of invasive alien species on native biodiversity: it involves on the one hand tackling the spread of already introduced invasive alien species, and on the other hand, preventing the introduction of new invasive species (by focusing on pathways). Two options were considered with respect to tackling the spread of already introduced IAS.

- Option 1 – Applying the 2020 global target for IAS as it stands, implying a prioritisation of species to be tackled.
- Option 2 – Adjusting the 2020 global target for IAS to broaden the scope of species to be tackled (by deleting ‘prioritised’).

In option 1, species posing the most significant biodiversity, economic and social/health threats would be prioritised (e.g. establishment of a “black- list” of species prohibited from import and sale in Europe) in view of future measures. This option would have the advantage

of limiting action to key, most damaging species at EU level, while foreseeing the identification and tackling of nationally or locally damaging species at Member State level. The response to the IAS challenge would therefore be proportionate, reconciling the need for action while ensuring that implementation costs are kept to the minimum.

In option 2, the objective would be to leave the question of prioritisation of species more open, in view of possibly more inclusive lists of tackled species. Indeed, Europe does not have a particularly good record in managing IAS, with only 34 species successfully eradicated from one or more regions. This may plead for broader coverage, at least in a first phase of implementation, also for awareness raising reasons. The fact that a significant proportion of alien species in Europe are native elsewhere on the continent may also justify a more open framework, possibly going beyond most damaging species at EU level. While this may present advantages, Option 2 would present one important shortcoming: the number of species covered would be both higher than in Option 1, which would increase implementation costs, and the method to be used to include species on any registers/lists would be more difficult to establish, which would create uncertainty. Option 1 was therefore preferred, which is also more in line with the global target.

Nature of the target

This target is indicative, although it should be underlined that the EU has committed to it as a CBD party. It will need to be reviewed after the Strategy on invasive alien species has been adopted, which is foreseen in 2012, and may be translated into a regulatory framework, if this is the option retained at that time.

5.6. T6 – Help avert global biodiversity loss

Link with EU objectives and global targets

The EU derives benefits from a healthy global biodiversity and also bears a certain degree of responsibility for global biodiversity loss. All Parties to the CBD, including the EU, have their share of responsibility for delivering on the objectives of the Convention, and need to take the necessary measures to ensure the achievement of the vision, mission and targets of the recently adopted Strategic Plan 2011-2020.

The selected target therefore mirrors the third dimension of the EU headline target.

Discarded options

Other options originally considered for the target on global biodiversity included: a percentage of earmarking of development aid for biodiversity, a percentage of reduction of EU's ecological footprint, a percentage of Marine Protected Areas established in areas beyond national jurisdiction. These were not retained on the basis of further assessment and input received from stakeholders and Member States, namely: earmarking of external aid would not have been possible without pre-empting the ongoing discussions on resource mobilisation; the ecological footprint and the marine protected areas while important aspects were considered too limited to capture the entire contribution that the EU can have to the protection of global biodiversity. A more general formulation reflecting the wording of the EU biodiversity headline target was preferred.

Nature of the target

The target is again indicative, although representing an international EU commitment, and will need to be reviewed in 2014 or earlier, in particular following COP-11 negotiations on financing targets and the adoption of a legislative proposal on ABS.

General objectives	Specific objectives	Operational targets
Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020	Fully implement the Birds and Habitats Directives	T1 - To halt the deterioration in the status of all species and habitats covered by EU nature legislation and achieve a significant and measurable improvement in their status so that, by 2020, compared to current assessments: (i) 100% more habitat assessments and 50% more species assessments under the Habitats Directive show an improved conservation status; and (ii) 50% more species assessments under the Birds Directive show a secure or improved status.
	Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity*	T3a - By 2020, maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP so as to ensure the conservation of biodiversity and to bring about a measurable improvement (*) in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU 2010 Baseline, thus contributing to enhance sustainable management. T3b - By 2020, Forest Management Plans or equivalent instruments, in line with Sustainable Forest Management (SFM[57]), are in place for all forests that are publicly owned and for forest holdings above a certain size (**) (to be defined by the Member States or regions and communicated in their Rural Development Programmes) that receive funding under the EU Rural Development Programme, so as to bring a measurable improvement (*) in the conservation status of species and habitats that depend on or are affected by forestry and in the provision of related ecosystem services as compared to the EU 2010 Baseline. (*) For both targets, improvement is to be measured against the quantified enhancement targets for the conservation status of species and habitats of EU interest in Target 1 and the restoration of degraded ecosystems under Target 2. (**) For smaller forest holdings, Member States may provide additional incentives to encourage the adoption of Management Plans or equivalent instruments that are in line with SFM.
	Ensure the sustainable use of fisheries resources	T4 - Achieve Maximum Sustainable Yield (MSY) by 2015. Achieve a population age and size distribution indicative of a healthy stock, through fisheries management with no significant adverse impacts on other stocks, species and ecosystems, in support of achieving Good Environmental Status by 2020 as required under the Marine Strategy Framework Directive
	Combat invasive alien species	T5 - By 2020, invasive alien species and their pathways are identified and prioritised, priority species are controlled or eradicated, and pathways are managed to prevent the introduction and establishment of new IAS.
Restoring ecosystem services in so far as feasible	Maintain and restore ecosystems and their services	T2 - By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restorating at least 15% of degraded ecosystems.
Stepping up the EU contribution to averting global biodiversity loss	Help avert global biodiversity loss	T6 - By 2020, the EU has stepped up its contribution to averting global biodiversity loss.

Table 1: General and specific objectives and operational targets

5.7. Additional considerations in the choice of targets

The relationship between the different targets was also an important consideration. There is no clear-cut division between the six targets and many are mutually supportive or inter-dependent. For instance, the effectiveness of actions undertaken in the context of pressure-

[57] As defined in SEC(2006) 748

based targets, such as those focusing on agriculture and forestry, fisheries and invasive alien species, will contribute to the delivery of impact based targets on restoration or nature conservation. Similarly, measures undertaken under the global target focus on indirect drivers of biodiversity loss and as such should bring positive benefits also within the EU, thereby contributing towards the achievement of all targets.

An additional consideration was the potential of the targets to contribute towards the achievement of other EU priority objectives. For example, activities carried out under the fisheries target, and targets 1, 2 and 5 would contribute to achieving the objective of good environmental status of marine waters in the EU by 2020 as required under the Marine Strategy Framework Directive. Investing in green infrastructure to restore ecosystem services will contribute to adapting to and mitigating climate change. Finally, more sustainable agriculture, forestry and fisheries will also contribute to several environmental objectives and to three objectives of the EU 2020 Strategy (innovation, climate change and poverty targets) and its resource efficient flagship initiative.

Finally, the targets were selected so that EU meeting its 2020 headline target will contribute to the achievement of global objectives. Annex 9 shows how the global targets will be reflected in the EU strategy, and Annex 10 reflects an analysis of whether or not new measures are needed at EU level to achieve the global targets.

5.8. The nature of the targets

As described in more detail under the respective sections, all targets are and most will remain indicative, unless they are taken up in parallel or forthcoming legislative initiatives.

All targets are proposed at EU level. Although consequences will vary at Member State level, given the different situations regarding the state of biodiversity and the level of implementation of existing legislation, it is not intended that the EU target will be translated into explicit and differentiated national targets. For some new targets, such as restoration, part of the proposed measures is a process for implementation at national level.

Some new information is expected in the next few years, as highlighted in section 8.2 on reporting and review. In addition, targets may need to be re-adjusted after adoption of the ongoing main policy reforms and other relevant initiatives planned in the near future. A general review is therefore proposed in 2014, when the proposed targets will need to be reviewed, and possibly adjusted if justified by new information. Therefore no intermediate targets have been proposed at this stage, except for the fisheries target, where there is a clear international commitment for a milestone by 2015.

6. SCOPING OF MEASURES TO ACHIEVE THE TARGETS

The Council Conclusions requested that the biodiversity strategy include the necessary, feasible and cost-effective measures and actions for reaching the selected targets. These should be integrated into relevant internal and external EU sectoral policies; build on existing EU policies and legislation and commitments made at international level; and aim to incorporate the value of biodiversity and ecosystem services.

The following section presents a discussion of possible measures that could be considered to reach the selected targets.

Measures seek to address the factors which hindered the achievement of the 2010 biodiversity target, in particular insufficient integration into sectoral and national policies, implementation and legislative gaps, lack of adequate funding, lack of awareness, and inadequate governance

structure (including lack of baseline and knowledge). The emphasis on the different categories varies across targets, depending on their relevance.

Possible alternatives for measures are discussed in the text focusing on the broad categories of action described above. The range of alternatives is however often constrained by the selected target for which an orientation and level of ambition have already been chosen, and also in some cases by the EU commitment to achieve the CBD Strategic Plan targets. Given the parallel or forthcoming relevant impact assessments, it would not be proportionate to carry out a detailed analysis of alternatives for each individual measure. The analysis focuses instead on the broad categories of action. These could be implemented separately, or more often as a combination, to achieve the targets. Stakeholder views are also included, and a possible prioritisation of measures discussed.

This scoping exercise therefore leads to the design of broad areas of action to reach specific targets but often also contributing to other targets, which would be further elaborated in forthcoming impact assessments. It is important to underline however that the identified measures would not be sufficient on their own to reach each relevant target. Full implementation of existing EU legislation, as well as action at national, regional and local level, in areas of national competence would also be required.

6.1. Measures for Nature Conservation

Whilst the establishment of the Natura 2000 network is at an advanced stage, implementation has been slow, in particular regarding the selection of marine areas and the development of site management plans.

The Nature Directives have however shown their effectiveness for conservation, thus measures under this target should focus on speeding up the completion of the Natura 2000 Network, and on making the network fully operational through the effective management and restoration of the sites – moving from 'non-deterioration' to effective management and restoration, in order to maintain and improve the conservation status of species and habitats covered by the Nature directives. Measures focusing on the management of Natura 2000 sites would have an impact on the implementation of both the Habitats and the Birds directive since all sites covered by these directives are part of the network.

Better implementation and enforcement

The Habitats Directive promotes the development of management plans or equivalent instruments for the sites, as a strategic tool to help achieve conservation objectives and coordinate management and restoration actions. However, to improve the overall coherence of implementation measures at biogeographical level, an extended biogeographical process is needed that would also facilitate priority-setting and strengthen trans-boundary co-operation and information sharing across the network.

In addition, better law enforcement will be essential to achieve the target, given that there are well-documented cases of inadequate implementation and enforcement[58]. Some Member States have also experienced delays in transposing the Birds and Habitats Directives into national law, in designating Natura 2000 sites, and in establishing conservation measures for

[58] http://eu-information-service.rs-consulting.com/Policy%20Department%20C%20-%20Citizens'%20Rights%20and%20Constitutional%20Affairs/5.%20Petitions/National%20Implementation%20of%20the%20'Habitats'%20Directive.pdf

designated sites. This requires specific action, including better training, inspection capacity, guidance and where needed legal action.

Better knowledge base

To address the problem of the lack of a clear baseline, sufficient knowledge is needed to measure progress in a consistent and comparable way, while at the same time minimising the administrative burden on Member States. New complementary tools are needed, including a reporting system for birds, and a dedicated ICT tool within BISE to ensure wider availability and more efficient use of data.

Communication and awareness raising

The active support and involvement of all relevant stakeholders will be essential to achieving this target. Targeted initiatives to raise public awareness, support and participation and communication on the multiple ecosystem benefits arising from effective management of Natura 2000 would also contribute to the global biodiversity target that by 2020, at the latest, people are aware of the steps they can take to conserve and use it sustainably.

Financing options

Options for the financial support of the effective management of Natura 2000, and to address the issue of the current low uptake will be considered by the Commission, and, without pre-empting the outcome of the negotiations on the next Multi-annual Financial Framework, may include:

- enhancing integration in key sectoral funds to ensure a sufficient level of prioritized delivery in line with Natura 2000 needs
- strengthening and adapting the LIFE instrument, combined with enhanced integration
- developing a dedicated financing instrument for Natura 2000

The likelihood of future success would be greatly enhanced if the funding of Natura 2000 was put on a more strategic planning basis, covering the period of the next funding cycle. Article 8 of the Habitats Directive already foresees the need to develop "*a prioritized action framework*". This would be made possible on the basis of Member States establishing national or regional Natura 2000 prioritised action frameworks for the next financing period.

Complementing the EU co-financing framework with innovative instruments (e.g. innovative financial approaches, market based instruments) will also be considered.

Stakeholder views

Measures for the improvement of knowledge conservation status were considered as important by the Business sector. Adequate funding and management were considered one of the most important to take for Nature Conservation by the Agricultural sector and NGOs.

Prioritising measures

A package of measures that would include a combination of increased and better use of existing instruments (e.g. connectivity and integration measures, management plans, measures for better enforcement), with new approaches designed to address the obstacles which slowed down implementation in the period up to 2010: an improved governance structure through a bio-geographical region process and a new streamlined approach to monitoring and reporting, as well as dedicated initiatives to improve funding and communication is deemed necessary to

reach the target. Although some of these initiatives such as a new bio-geographical process and a new impulse to funding approaches have a potential to deliver early and significant results compared to others, measures that would deliver in the longer term, such as improved communication, and new monitoring and reporting systems are instrumental in reaching the target and should not be ignored.

TARGET 1: FULLY IMPLEMEMENT THE BIRDS AND HABITATS DIRECTIVES

To halt the deterioration in the status of all species and habitats covered by EU nature legislation and achieve a significant and measurable improvement in their status so that, by 2020, compared to current assessments: (i) 100% more habitat assessments and 50% more species assessments under the Habitats Directive show an improved conservation status; and (ii) 50% more species assessments under the Birds Directive show a secure or improved status.

Action 1: Complete the establishment of the Natura 2000 network and ensure good management

1a) Member States and the Commission will ensure that the phase to establish Natura 2000, including in the marine environment, is complete by 2012.

1b) Member States and the Commission will further integrate species and habitats protection and management requirements into key land and water use policies, both within and beyond Natura 2000 areas.

1c) Member States will ensure that management plans or equivalent instruments which set out conservation and restoration measures are developed and implemented in a timely manner for all Natura 2000 sites.

1d) The Commission, together with Member States, will establish by 2012 a process to promote the sharing of experience, good practice and cross-border collaboration on the management of Natura 2000, within the biogeographical frameworks set out by the Directive.

Action 2: Ensure adequate financing of Natura 2000 sites

2) The Commission and Member States to provide the necessary funds and incentives for Natura 2000, including through EU funding instruments, under the next multiannual financial framework. The Commission will set out its views in 2011 on how Natura 2000 will be financed under the next multi-annual financial framework.

Action 3. Increase stakeholder awareness and involvementand improve enforcement

3a) The Commission, together with Member States, will develop and launch a major communication campaign on Natura 2000 by 2013.

3b) The Commission and Member states will improve cooperation with key sectors and continue to develop guidance documents to improve their understanding of the requirements of the EU nature legislation and its value in promoting economic development.

3c) The Commission and Member States will facilitate law enforcement of the nature directives by providing specific training programmes on Natura 2000 for judges and public prosecutors, and by developing better compliance promotion capacities.

Action 4: Improve and streamline monitoring and reporting

4a) The Commission, together with Member States, will develop by 2012 a new EU bird reporting system, further develop the reporting system under Article 17 of the Habitats Directive and improve the flow, accessibility and relevance of Natura 2000 data.

4b) The Commission will establish a dedicated ICT tool as part of the Biodiversity Information System for Europe to improve the availability and better use of data by 2012.

6.2. Measures for Maintaining and restoring ecosystems and their services

Whereas the Council conclusions require the restoration of ecosystem services, the Nagoya target focuses on restoration of ecosystems. A key issue is whether policies for restoring ecosystem services should be different from those focusing on biodiversity and ecosystems. The link between biodiversity and ecosystem services is not well understood. An analysis of a number of restoration projects showed that restoration resulted in the increased provision of biodiversity and ecosystem services by 44% and 25% respectively, and that there is a positive relation between the two, suggesting that restoration focused mainly on improving services should also have as a primary aim to restore biodiversity.[59] However, other evidence shows that maximising species diversity does not always lead to high levels of ecosystem services[60].

Better knowledge base

Better knowledge of ecosystems services and how they are linked to biodiversity is therefore needed, and also of their values and their distribution in the EU, with a view to integrate them into systems of accounting and reporting to increase their visibility. Implications for the location and scale of restoration need to be explored.

Restoration and Green Infrastructure

To ensure that restoration provides significant benefits in a cost-effective way, a prioritisation framework should also be developed that defines the scale of the restoration target and the criteria on which prioritisation should be based, which could include: relevance for biodiversity; extent of degradation of ecosystems; the provision of key ecosystem services and cost-benefit ratios of restoration.

Key to enhancing ecosystem services is improving ecosystem resilience and habitat connectivity, through the development of planning tools such as integrated spatial planning that includes the establishment of green infrastructure, which requires action at Member State level. There is a wealth of initiatives at local, regional or national levels in Member States (see Annex 12) but so far they have been carried out in an isolated way. A green infrastructure initiative would help to foster synergies between planned efforts as well as promote further investments, thereby providing **added value** to Member States action. The main options include:

- **Integration** of green infrastructure in other EU policies that influence land use and its spatial patterns;

- Promotion of the concept of green infrastructure and integrated spatial planning through **communication activities**, including training, citizen participation and capacity building for relevant authorities;

- Encouraging implementation of green infrastructure through a range of possible funding sources, including: EU funds (for example structural funds for investments into local GI projects); innovative financial instruments to encourage investments from the private sector; public private partnerships.

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59 Nellemann, C., E. Corcoran (eds) 2010. Dead Planet, Living Planet. Biodiversity and ecosystem restoration for sustainable development. A rapid response assessment. UNEP, GRID-Arendal.

60 R. Naidoo, A. Balmford, R. Costanza, B. Fisher, R. E. Green, B. Lehner, T. R. Malcolm, and T. H. Ricketts, 2008 Global mapping of ecosystem services and conservation priorities. *PNAS* 105(28), pp 9495–9500.

No net loss of biodiversity and ecosystem services

Beyond the toolbox needed to establish green infrastructure, there may also be a need for a wider no-net-loss approach to ensure no further loss or degradation of ecosystems and their services overall. Whereas compensation for displaced habitats is a legal requirement of the Habitats directive, and also of the Environment Liability Directive (ELD)[61] in the case of damage to Natura 2000 and biodiversity, there is no requirement for systematic compensation outside Natura 2000, which leads to net losses. There is a need for, on the one hand, a clear hierarchical framework whereby degradation is avoided as far as possible, and on the other hand, where degradation cannot be avoided, a requirement for compensation. Options, which are not necessarily mutually exclusive, include:

- A clear decision-making framework, to ensure degradation is avoided wherever possible before compensation is envisaged. Avoiding damages to biodiversity and ecosystems is already included in the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) directives, and these elements could be further strengthened. There should be **better guidance** on how to apply this in practice in light of biodiversity objectives, similar to current practice for climate change. To avoid damages to biodiversity, the Commission will develop a methodology for the assessment of the impact of EU investments by 2014.

- An overall non-binding framework at EU level providing **guidance and exchanges of best practices** for Member States who have adopted voluntary or mandatory biodiversity offset policies. This could involve for example guidance on the scale at which no net loss should be measured, on the equivalency methodology and the time scale for compensation, and using a prioritisation framework to ensure overall no net loss at EU level.

- An EU level **legal framework** for no net loss of ecosystems, which could make some of the above elements mandatory.

These options will be reviewed and further analysed in the context of a Commission initiative on the no net loss of ecosystems outside Natura 2000, and the services they provide, by 2015.

Stakeholder views

In the consultation for the strategy, stakeholders had the following opinion on measures: the agricultural sector advocated for maintaining and increasing the resilience of ecosystems and their services, increasing biodiversity in urban areas, as well as mitigating adverse effects from transport and energy infrastructure. The business sector viewed ensuring connectivity between protected areas, systematic compensation of biodiversity loss, promoting integrated spatial planning, using market-based financing mechanisms and biodiversity provisions in impact assessment tools, as the most important measures to take. Finally, the major NGOs found ensuring connectivity, restoring ecosystems and their resiliency and integrated spatial planning as the most important steps to take.

Prioritising measures

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[61] ELD requires that, in the event of an incident (or an imminent threat of an incident), any environmental damage caused to water, land and nature should be remediated so that the affected environment returns to its baseline. See discussions on methodology for evaluating compensation needs at http://www.envliability.eu/

All these options are clearly new policy measures since there are currently no policies specifically focusing on ecosystem services, and no strategic framework for no-net-loss and restoration. Several of these options would bring significant results in a reasonable time frame, in particular green infrastructure, and a no-net-loss initiative. However, the knowledge base needs to be further developed before concrete proposals can be put forward. Options will therefore be further refined and analysed in the foreseen initiatives on green infrastructure and no net loss.

TARGET 2: MAINTAIN AND RESTORE ECOSYSTEMS AND THEIR SERVICES

By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restorating at least 15% of degraded ecosystems.

Action 5: Improve knowledge of ecosystems and their services in the EU

5) Member States, with the assistance of the Commission, will map and assess the state of ecosystems and their services in their national territory by 2014, assess the economic value of such services, and promote the integration of these values into accounting and reporting systems at EU and national level by 2020

Action 6: Set priorities to restore and promote the use of green infrastructure

6a) By 2014, Member States, with the assistance of the Commission, will develop a strategic framework to set priorities for ecosystem restoration at sub-national, national and EU level.

6b) The Commission will develop a Green Infrastructure Strategy by 2012 to promote the deployment of green infrastructure in the EU in urban and rural areas, including through incentives to encourage up-front investments in green infrastructure projects and the maintenance of ecosystem services, for example through better targeted use of EU funding streams and Public Private Partnerships.

Action 7: Ensure no net loss of biodiversity and ecosystem services

7a) In collaboration with the Member States, the Commission will develop a methodology for assessing the impact of EU funded projects, plans and programmes on biodiversity by 2014.

7b) The Commission will carry out further work with a view to proposing by 2015 an initiative to ensure there is no net loss of ecosystems and their services (e.g. through compensation or offsetting schemes).

6.3. Measures for Sustainable Agriculture and Forestry

Agriculture

Land to be covered under the Agriculture target include agro-ecosystems within HNV and Natura 2000 areas, and more generally permanent grasslands within or outside these areas, as well as intensive arable land which could provide biodiversity benefits through green cover, crop rotation or ecological set-aside. This could be achieved through direct payments rewarding generic environmental provisions, or under the second pillar, through agri-environmental payments rewarding more targeted actions that are beneficial to biodiversity.

Improving the first pillar

The current orientation of the Commission for the CAP reform is the enhanced provision of environmental public goods as one of the objectives of the first pillar, with part of the **direct payments** that could take the form of simple, generalized, non-contractual and annual actions to reward agricultural practices with a positive impact for biodiversity (e.g. permanent pasture, green cover, crop rotation, ecological set-aside). In addition, the possibility of including the requirements of current NATURA 2000 areas and enhancing certain elements of

GAEC standards should be analysed[62]. Discussions on which elements should be mandatory or optional, and on their additionality is ongoing. Including under **cross-compliance actions required under the Water Framework Directive** once it has been implemented and the operational obligations for farmers have been identified, would also ensure that benefits are delivered for water ecosystems. These elements for cross-compliance should ensure a minimum level of provision of public goods in the form of ecosystem services.

Covering some of the above elements, for example Natura 2000 and HNV areas, under the second pillar could be considered as an alternative. However, to maximise biodiversity benefits, agri-environmental schemes should be used as a **complement to baseline actions** under the first pillar with broad environmental requirements for all areas, to target more precise requirements from specific ecosystems, habitats or species. There is growing evidence and recognition that a combination of direct payments and well targeted agri-environmental schemes is an effective strategy for delivering biodiversity benefits[63] [64].

Improving the second pillar

In terms of payments under the second pillar, although there is ample evidence that past schemes have had a positive impact on biodiversity, there is also recognition that the effectiveness of the schemes could be increased[65]. Options for an improved Rural Development scheme include [66]:

- a **more outcome oriented approach**, to better focus the policy on EU priorities and increase the effectiveness of agri-environment measures in delivering environmental public goods, with **possible quantified biodiversity targets**.

- mechanisms to facilitate the **collaboration of farmers**, to contribute inter alia to the establishment of green infrastructure, with the aim of ensuring connectivity between landscape features and habitats and increasing the scale of connectivity and restoration, also with a view to enhancing ecosystem services and resilience against climate change.

The ongoing assessment of the CAP reform considers three main options, from an adjustment scenario, which would assume a continuation of the current process with further gradual changes to the current policy framework, to a refocus scenario moving to support only from rural development measures, focused solely around environmental and climate change objectives, through an integration scenario integrating environmental, economic and social objectives under both pillars of the CAP. The combination of the above proposed measures would correspond to the latter middle scenario.

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62 COM(2010) 672 final

63 FAO (2010). Relevance of OECD agri-environmental measures for remuneration of positive externalities/payments for ecosystem services.stakeholder consultation, Rome, 27-28 September 2010. https:// www.fao.org/docrep/013/al921e/al921e00.pdf

64 ENCA IG, 2011 Response to the Commission's consultation for Impact Assessment on the reform of the CAP towards 2020.

65 See FAO (2010). Relevance of OECD agri-environmental measures for remuneration of positive externalities/payments for ecosystem services.stakeholder consultation, Rome, and ENCA, 2010. Delivering biodiversity objectives through agri-environment measures of the CAP: evidence of success and scale of future needs. Position Statement 6-2010.

66 Cooper, T., Hart, K. and Baldock, D. (2009) The Provision of Public Goods Through Agriculture in the European Union, Report Prepared for DG Agriculture and Rural Development, Contract No 30-CE-0233091/00-28, Institute for European Environmental Policy: London.

Measures for genetic diversity

Finally, the CBD strategic plan target 15, which requires that 'by 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity' must be implemented through specific measures. These could for example include developing a specific Commission strategy for the conservation of genetic diversity which could inter alia build on the revision of the propagating material regimes and new actions in the context of the Evaluation of Regulation 870/2004 on the conservation, characterisation, collection and utilisation of genetic resources in agriculture.

Measures outside the CAP

In addition to funding from the CAP, funding to farmers from the private sector could also be envisaged. Private companies could for example set up contracts directly with land owners to deliver ecosystem services which benefit them, such as the case of Vittel, who is providing incentives to farmers in the Vittel catchment to voluntarily change their management practices to reduce water pollution. Although these initiatives should be encouraged, they are unlikely to form the bulk of funding sources for delivering public benefits from agriculture.

Stakeholder views

In the consultation, farmers found that funding for agri-environmental measures and including voluntary monitoring measures within the CAP were amongst the most important steps to take. The business sector found that the most important measures were reducing intensive farming, increasing the area of organic farming and including more explicit biodiversity objectives and voluntary monitoring measures within the CAP. Finally, the NGOs highlighted preserving and expanding high nature value areas, increasing funding for agri-environment measures, integrating the target within the reformed CAP and including obligatory monitoring and reporting requirements as important measures.

Prioritising measures

Although cross-compliance and agri-environmental measures to increase environmental public goods are not new elements within the CAP, the greening of direct payments, and the more effective targeting of rural development measures could deliver early and very significant results for biodiversity and ecosystem services.

Forests

Given the focus of the target, measures should aim explicitly at increasing the extent of both publicly and privately owned forests covered by a Management Plan or equivalent instrument that applies Sustainable Forest Management (SFM) and includes biodiversity aspects, to ensure a measurable improvement in the status of species and habitats dependent on and affected by forestry and in the provision of ecosystem services.

Financing options

Incentives to achieve that objective and prepare the management plans could be provided for privately owned forests through rural development measures and the LIFE+ programme. However, publicly owned forests are not eligible for payments under the CAP, although they can receive support for non-productive investments. Other incentives should therefore be sought through innovative financing mechanisms for both private and public forests, to attract

funding from the private sector in support of ecosystem services, which are non-marketed goods, provided by forests.

Contents of management plans

To ensure that management plans adequately protect and enhance biodiversity and ecosystem services, in line with SFM and pursuant to Resolution H2 – General Guidelines of the Conservation of the Biodiversity of European Forests, Member States should require a specific set of measures to be included in the management plans, drawing from a prescribed list of individual measures, which may be adapted to fit local conditions.

Stakeholder views

The Confederation of European Forest Owners (CEPF) indicated that active management of forest ecosystems was necessary to secure their sustainability in the long run, and that existing instruments should be evaluated and better coordinated in support of the new biodiversity targets, before considering new ones. They suggested that the availability and accessibility of financial mechanisms should be seen as a prerequisite for a successful implementation, and that rewarding measures for promoting partnerships and the involvement by people with a direct connection to nature would also be beneficial. In the context of the consultation on Green Paper on forests, forest industry said that SFM should be formally recognized, and that more financial support for the forest sector and payment for ecosystem services (PES) and full application and formalisation of existing MCPFE commitments and reporting system based on criteria and indicators could be useful.

Prioritising measures

The use of management plans is not new. However, the active support of Member States and the Commission, as well as the use of the EU Rural development instruments as an incentive to promote the adoption and use of management plans, combined with the requirement that specific biodiversity-related measures are included, where appropriate, in these plans, would provide a new impetus to ensure an adequate level of protection and enhancement of forest biodiversity and ecosystem services.

TARGET 3: INCREASE THE CONTRIBUTION OF AGRICULTURE AND FORESTRY TO MAINTAINING AND ENHANCING BIODIVERSITY

3A) Agriculture: By 2020, maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP so as to ensure the conservation of biodiversity and to bring about a measurable improvement(*) in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU 2010 Baseline, thus contributing to enhance sustainable management..

3B) Forests: By 2020, Forest Management Plans or equivalent instruments, in line with Sustainable Forest Management (SFM)[67], are in place for all forests that are publicly owned and for forest holdings above a certain size(**) (to be defined by the Member States or regions and communicated in their Rural Development Programmes) that receive funding under the EU Rural Development Policy, so as to bring about a measurable improvement(*) in the conservation status of species and habitats that depend on or are affected by forestry and in the provision of related ecosystem services as compared to the EU 2010 Baseline.

(*) For both targets, improvement is to be measured against the quantified enhancement targets for the conservation status of species and habitats of EU interest in Target 1 and the restoration of degraded ecosystems under target 2.

(**) For smaller forest holdings, Member States may provide additional incentives to encourage the adoption of Management Plans or equivalent instruments that are in line with SFM.

[67] As defined in SEC(2006) 748.

Action 8: Enhance direct payments for environmental public goods under the EU Common Agricultural Policy

8a) The Commission will propose that CAP direct payments will reward the delivery of environmental public goods that go beyond cross-compliance (e.g. permanent pasture, green cover, crop rotation, ecological set-aside, Natura 2000).

8b) The Commission will propose to improve and simplify the GAEC (Good Agricultural and Environmental Conditions) cross-compliance standards and consider including the Water Framework Directive within the scope of cross-compliance once the Directive has been implemented and the operational obligations for farmers have been identified in order to improve the state of aquatic ecosystems in rural areas.

Action 9: Better target Rural Development to biodiversity conservation

9a) The Commission and Member States will integrate quantified biodiversity targets into Rural Development strategies and programmes, tailoring action to regional and local needs.

9b) The Commission and Member States will establish mechanisms to facilitate collaboration among farmers and foresters to achieve continuity of landscape features, protection of genetic resources and other cooperation mechanisms to protect biodiversity.

Action 10: Conserve Europe's agricultural genetic diversity

10) The Commission and Member States will encourage the uptake of agri-environmental measures to support genetic diversity in agriculture and explore the scope for developing a strategy for the conservation of genetic diversity.

Action 11: Encourage forest holders to protect and enhance forest biodiversity

11a) Member States and the Commission will encourage the adoption of Management Plans,[68] including through use of rural development measures[69] and the LIFE+ programme.

11b) Member States and the Commission will foster innovative mechanisms (e.g. Payments for Ecosystem Services) to finance the maintenance and restoration of ecosystem services provided by multifunctional forests.

Action 12: Integrate Biodiversity measures in management plans

12) Member States will ensure that forest management plans or equivalent instruments include as many of the following measures as possible:

- maintain aoptimal levels of deadwood, taking into account regional variations such as fire risk or potential insect outbreaks;
- preserve wilderness areas;
- ecosystem-based measures to increase the resilience of forests against fires as part of forest fire prevention schemes, in line with activities carried out in the European Forest Fire Information System (EFFIS);
- specific measures developed for Natura 2000 forest sites
- ensuring that afforestation is carried out in accordance with the Pan-European Operational Level Guidelines for SFM[70], in particular as regards the diversity of species, and climate change adaptation needs.

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68 SFM requires wider use of management plans or equivalent instruments. 23 Member States already have more than 60% of their forested areas under such plans.

69 These measures are currently set out in articles 42-49 of Council Regulation 1698(2005).

70 http://www.foresteurope.org/

6.4. Measures for Sustainable Use of Fisheries Resources

Implementing MSY

The current approach adopted by the Commission in 2006[71] to implement the concept of MSY is in principle appropriate: for stocks that are not yet covered by multi-annual plans, fishing mortality should be reduced in equal steps until the 2014 fishing year to the level that would achieve MSY (F_{MSY}), and stocks should be exploited at F_{MSY} in 2015 and thereafter[72]. A significant number of stocks are now under multi-annual plans. However, MSY is currently only applied to a limited number of them. More long-term management plans are therefore needed which include time-limited objectives on MSY, based on the most vulnerable stocks for mixed fisheries, to avoid the risk of their over-exploitation. The rigorous application of MSY will be a major contributor to achieving stocks that maintain their productive capacity and that are healthy both in terms of size/abundance, distribution and population condition.

Multi-annual management plans do not include methods and rules for adjusting annual Total Allowable Catches (TACs) and fishing effort restrictions. Options for adapting fishing effort to reach MSY are explored in the impact assessment of the CFP reform.

Eliminating adverse impacts

In addition, to reach the target, impacts from unwanted discards and by-catches and from fishing gear on marine ecosystems need to be addressed. Although a reduction of the fishing pressure to MSY levels contributes largely to reduction of negative impacts, specific measures may be required in some cases to gradually eliminate discards and to avoid the by-catch of unwanted species. The CFP reform impact assessment considers options from a move to **catch quotas** (implying inter alia technical measures), to a **discard ban**. To adequately address the biodiversity impacts of by-catch, specific measures such as threshold levels and move-on rules would be needed, particularly for deep-sea fisheries.

The upcoming reform of the CFP also needs to cater for measures and mechanisms to contribute, within the remit of Common Fisheries Policy, to the objectives of the Habitats and Birds Directives and the Marine Strategy Framework Directive. This could be through a **regulatory approach**, for example fishing bans in marine protected areas, or through the **provision of financial incentives** in the frame of the future financial instruments for fisheries and maritime policy.

Better knowledge

For non-assessed stocks, data collection efforts should be increased significantly, and some proxy assessment and management methods could be required, in particular the use of the precautionary approach, as recognized in the impact assessment of the CFP reform.

Finally, eliminating the impact of fisheries on marine ecosystems would require the development in the longer term of an adequate ecosystem approach. Scientists are therefore increasingly promoting the development of other concepts, such as for instance Ecological

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71 COM(2006)360 final.

72 Fishing mortality (F) is higher than the level at which fishing produces MSY, MSY being the maximum long term average yield that can be produced by a stock on a continuing basis. A stock is overfished when stock biomass (B) has fallen to a level below that which can produce MSY. So there are two aspects that managers must monitor to determine the status of a fishery: the level of F in relation to F at MSY (FMSY), and the level of B in relation to B at MSY (BMSY).

Maximum Sustainable Yield (EMSY)[73], whereby the concept of adapting fishing efforts to ensure the sustainability of fish populations is extended to the sustainability and resilience of ecosystems. Such approaches would need to be developed as soon as possible so that their use could be envisaged to protect harvested stocks, non-harvested species and ecosystems more effectively.

Stakeholder views

In response to the consultation on the CFP reform, the fisheries sector shared the objective to gradually reach exploitation rates matching with MSY by 2015. On management tools to limit fishing mortality rates most of the contributions consider catch and effort limits as relevant, depending mainly on the types of fisheries they would be applied to. They were also in favour of the implementation of multi-annual plans supporting a fisheries approach, some suggesting ecosystemic multi-annual plans. Harvest Control Rules in these multi-annual plans should reflect strictly results made available through the scientific advisory process for major stocks, group of stocks or fisheries. There was wide support for regional implementation of the IMP including fisheries at sea-basin level with a regional forum where all aspects are being discussed. A large majority favoured a CFP aligned with the MSFD and other environmental legislation, as well as the ecosystem approach. Most contribution raised the problem of data availability and quality and it was suggested to step up the investments in research and data collection, the creation of incentives for fishermen to provide good data, and some propose a new EU structure to ensure better coordination of resources. Many called for multidisciplinary research and advice in an ecosystem context, integrating it with the MSFD. Many contributions expressed a need for continuation of public funding for the fishery sector.

As part of the biodiversity strategy consultation, the business sector saw changing the monitoring and control system, minimizing negative impacts of fishing and including more explicit biodiversity objectives and voluntary monitoring measures in the CFP as the most important measures.

The major NGOs wished to ensure consistency with the Marine Strategy Framework, have ambitious goals to reach the MSY by 2015, promote long-term management plans, expand marine protected areas and include more explicit biodiversity objectives in the CFP as well as obligatory monitoring measures.

Prioritising measures

The commitment of the Commission to MSY is not new. The new element of the proposed measures are that they are time-bound, and focusing explicit on the treatment of mixed fisheries. The additional measures proposed to reduce discards and by-catch such as closed areas and gear or effort restrictions are new, and have the potential to deliver early and significant results, as demonstrated through their implementation in California, the northeast United States, and northwest Australia[74]. Financial incentives to implement environmental obligations under the Habitats Directive and MSFD would also be likely to yield early and positive results.

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[73] 'EMSY is the yield an ecosystem can sustain without shifting to an undesired state' in: Zabel, R.W.., C.J. Harvey, S.L. Katz, T.P. Good and P.S. Levin, 2003. Ecological maximum sustainable yield, *American Scientist* (21) pp150-157.

[74] Worm, B. et al, 2009. Rebuilding Global Fisheries, *Science* 325(5940): 578-585.

TARGET 4: ENSURE THE SUSTAINABLE USE OF FISHERIES RESOURCES

Achieve Maximum Sustainable Yield (MSY) by 2015. Achieve a population age and size distribution indicative of a healthy stock through fisheries management with no significant adverse impacts on other stocks, species and ecosystems, in support of achieving Good Environmental Status by 2020 as required under the Marine Strategy Framework Directive.

Action 13: Improve the management of fished stocks

13a) The Commission and Member States will maintain and restore fish stocks to levels that can produce MSY in all areas in which EU fish fleets operate, including areas regulated by Regional Fisheries Management Organisations, and the waters of third countries with which the EU has concluded Fisheries Partnership Agreements.

13b) The Commission and Member States will develop under the CFP long-term management plans with harvest control rules based on the MSY approach. These plans should be designed to respond to specific time-related targets, and be based on scientific advice and sustainability principles.

13c) The Commission and Member States will significantly step up their work to collect data to support implementation of MSY. Once this objective is attained, scientific advice will be sought to incorporate ecological considerations in the definition of MSY by 2020.

Action 14: Eliminate adverse impacts on fish stocks, species, habitats and ecosystems

14a) The EU will design measures to gradually eliminate discards, to avoid the by-catch of unwanted species and to preserve vulnerable marine ecosystems in accordance with EU legislation and international obligations.

14b) The Commission and Member States will support the implementation of the Marine Strategy Framework Directive including through financial incentives through the future financial instruments for fisheries and maritime Policy for marine protected areas (including Natura 2000 areas and those established by international or regional agreements). This could include restoring marine ecosystems, adapting fishing activities and promoting the involvement of the sector in alternative activities, such as eco-tourism, monitoring and managing marine biodiversity, and combating marine litter.

6.5. Measures for Invasive Alien Species (IAS)

Prevention measures

Regarding prevention of IAS damage, there are two main options which could potentially be complementary:

- **Integration** of biodiversity concerns animal and plant health regimes, by introducing new provisions and extending the scope of the legislation in the foreseen 2012 review, through the following potential elements:
  - Including diseases affecting native animals into animal health regime
  - Including invasive plants with economic impact only in plant health regime
  - Including invasive plants of wider environmental impact in plant health regime
- A dedicated **legal instrument** on IAS, which could include the following elements:
  - A black list approach, preventing import and trade of priority IAS
  - Preventing the intentional release of IAS into the natural environment
  - Preventing the unintentional release of IAS into the natural environment, by controlling priority pathways (e.g. ballast water)

Control measures

Additional options include an early warning and rapid response (if prevention fails), for example through a **surveillance and mandatory notification and rapid response system** at the EU-level, as well as measures for **containment, management and restoration** (if prevention and early warning and rapid response fail), which might involve mandatory control actions for selected species. This could only be established through a new dedicated legislative instrument for IAS, as proposed by the European Commission in its Communication of December 2008[75], and supported by the Committee of Regions and the Economic and Social Committee in June 2009, and subsequently by the Council.

Stakeholder views

The agricultural sector viewed preventing the introduction and establishing an early warning and rapid response system as the most important measures to take, as did the business sector. NGOs supported the measures suggested.

Prioritising measures

Given the currently high negative impacts of IAS and the predicted exponential increase, this is one of the areas where very significant results are expected. Measures on prevention and early warning and rapid response in particular would be very cost-effective as they would avoid the higher cost of dealing with full scale damage of introduced IAS.

TARGET 5: COMBAT INVASIVE ALIEN SPECIES
By 2020, Invasive Alien Species (IAS) and their pathways are identified and prioritised, priority species are controlled or eradicated, and pathways are managed to prevent the introduction and establishment of new IAS.
Action 15: Strengthen the EU Plant and Animal Health Regimes
15) The Commission will integrate additional biodiversity concerns into the Plant and Animal Health regimes by 2012.
Action 16: Establish a dedicated instrument on Invasive Alien Species
16) The Commission will fill policy gaps in combating IAS by developing a dedicated legislative instrument by 2012.

6.6. Measures for the EU Contribution to Averting Global Biodiversity Loss

The EU can make a significant contribution to averting biodiversity loss by focusing its efforts and development aid in a more targeted way to address some of the key underlying drivers of global biodiversity loss: unsustainable consumption and production patterns, the lack of financial, human and technical resources, and the unregulated access to genetic resources and inequitable sharing of the benefits derived from the use of genetic resources.

The rapid industrialisation and urbanisation of Europe led to the degradation and loss of much of the continent's biodiversity. As a result, Europe is now heavily reliant on certain ecosystem goods and services from other countries and continents. The European Environment Agency fourth Environment State and Outlook report[76] (SOER 2010), shows that global demands are accelerating. These mounting demands on natural capital for resources to feed, clothe, house and transport people are exerting increased pressure to ecosystems, economies and social cohesion in Europe and elsewhere. SOER 2010 concludes that in order to shift to a resource-

[75] http://ec.europa.eu/environment/nature/invasivealien/docs/1_EN_ACT_part1_v6.pdf

[76] The European Environment state and outlook 2010 report, EEA, 30 November 2010 (see http://www.eea.europa.eu/pressroom/newsreleases/butterflies-or-business-europe-can)

efficient green economy, all environmental resources, including biodiversity, should be fully considered in production, consumption and global trade decisions, and regulators, businesses and citizens need to work together and find innovative ways to use resources more efficiently.

Reducing indirect drivers of biodiversity loss

The development of a flagship initiative on a resource efficient Europe as part of the EU 2020 Strategy for smart, sustainable and inclusive growth, and within it the 2012 review of the EU Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan, represent useful opportunities for addressing biodiversity impacts of unsustainable consumption and production patterns. Measures undertaken under this target would aim specifically at reducing negative impacts of EU consumption and production patterns on biodiversity beyond EU borders, but also by extension within the EU itself, contributing to broader sustainable consumption and production and resource efficiency objectives. The Council has specifically advocated reducing the EU ecological footprint on global biodiversity through work undertaken on resource efficiency as part of the EU 2020 Strategy[77].

Although more information and data on the impacts of trade flows on global biodiversity is needed, some commodities have been shown to have significant negative impacts. Studies point out that a number of commodities (like soybeans, fish and crustaceans, bovine meat, cotton and palm oil[78]) may have significant negative impacts on global diversity. Similar exercises are being carried out at Member State level[79]. A better understanding of links between trade and illegal logging and recognition of the magnitude of the problem led the EU to adopt the Forest Law Enforcement Governance and Trade Action Plan (FLEGT), under which Voluntary Partnership Agreements (VPA) are being concluded with timber producing countries. This approach of measures aiming to **reduce biodiversity impacts of EU consumption patterns** might be considered for other sectors and commodities. However, the potential environmental, economic and social impacts in source countries of any corresponding new policy instruments under consideration would need to be assessed. The close involvement of private sector actors (producers, traders, retailers) in the eventual development of such measures will also be essential given their pivotal role in greening the respective supply chains. A number of approaches could be considered including:

- measures focusing on demand (changing consumption patterns through for example, eco-labelling, and green procurement);
- measures focusing on supply (including for example sustainability criteria, or banning placing on the market of illegally logged timber).

Impacts of EU consumption in source countries can also be influenced through trade policies. T**rade impacts on biodiversity** should be systematically reviewed in trade agreements, on the basis of tried and tested methodologies, both ex ante and ex post. In that respect, the recent Trade 2020 Communication states that impact assessments and evaluations should be more

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77 Council (Environment) conclusions of March 2010 (preambular para i), 15 October 2010 (para 19).

78 http://ec.europa.eu/environment/natres/studies.htm

79 As part of the UK Global Influence initiative, the UK government and the Joint Nature Conservation Committee (JNCC) have engaged in a process to identify the commodities that have a higher impact on ecosystems and biodiversity as well as quantify UK international trade and investment flows; identify key partner countries, potential ecosystem impacts arising from the flow in goods and investments, and policy options for government and UK business to encourage sustainable use of global ecosystems.

embedded in trade policy making, including through carrying out impact assessments on all new trade initiatives with a potentially significant economic, social or environmental impact on the EU and its trading partners, and through the more systematic use of ex post evaluations of trade agreements.

Increasing the efficient use of resources also requires setting adequate accounting tools and **market signals** so that biodiversity values are taken into account when making economic decisions. Possible approaches include:

- **positive incentives** for the maintenance and enhancement of biodiversity and ecosystem services through market-based instruments, such as biodiversity off-sets or payments for ecosystem services;

- **removing incentives** for those EU activities having **a negative impact** on biodiversity. The G-20 Heads of State recently committed to phasing out and rationalising inefficient fossil fuel subsidies over the medium term while providing targeted support for the poorest, while in the EU, harmful subsidies are likely to come under increased scrutiny in the context of budgetary constraints. The TEEB study concluded that the G20 initiative needed to be extended to other subsidies with direct and important harmful effects on ecosystems and biodiversity. Priority areas for reform include the removal of capacity- or effort-enhancing subsidies for fisheries and the continued reform of agricultural subsidies inducing unsustainable production. Additional and prioritised reform efforts are needed in other sectors too, including fossil fuels, transport subsidies; and water subsidies that result in unsustainable water consumption.

Increasing funding and assistance for global biodiversity

Some of the most important biomes are found in a single country or region, yet the benefits are shared globally. The EU therefore has an interest in ensuring that biodiversity beyond its borders is conserved and sustainably used, and has already committed under the CBD to assist partner countries in conserving their biodiversity. Specifically, at CBD COP10, the EU committed to a process aimed at **adopting targets for biodiversity resource mobilisation** at COP11 in 2012. The global funding baseline is to be determined according to a set of agreed indicators to estimate the aggregated annual financial flows of biodiversity-related funding from a broad range of sources, public and private. Parties are required to submit information related to these indicators by 30 June 2011.

The agreed process also puts onus on developing countries, requiring that they carry out valuation of biodiversity, identify and report funding needs, gaps and priorities and develop **country-specific resource mobilisation strategies** for biodiversity. The EU should support developing countries in this process to ensure effectiveness of funding, as well as through coordinating the implementation of biodiversity projects with key donors, according with CBD guidelines.

'Biodiversity proofing' EU development cooperation

The Commission will also seek to use more systematically **strategic environmental assessments**, including in relation to budget and sectoral aid, to improve the effectiveness of

its own development cooperation support for biodiversity, in line with the 2005 European Consensus and CBD guidelines[80].

Better access to and sharing of benefits from genetic resources

Finally, the EU ratification of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization[81] will likely require the development of new EU policies or laws. The most efficient and effective way of implementing the Nagoya Protocol in the EU will be identified over the course of 2011 by means of an impact assessment and a public consultation. Aspects that will need to be considered include: tools/ frameworks for cooperation with countries providing genetic resources; how to enhance transparency and information about access and benefit-sharing in research and development; how to enable companies to properly address access and benefit-sharing prior to the marketing of products based on genetic resources and associated traditional knowledge. The results of this exercise will be set out in a Commission Communication and **potential regulatory proposals**, to be adopted by the College in 2012 in view of adopting legislation by 2015, as required by the global target.

Stakeholder views

The agricultural sector saw ensuring that biodiversity considerations are reflected in EU's dialogue with third countries and promoting synergies between climate change and biodiversity agendas as important measures. The business sector viewed reducing negative impacts in trade, production and consumption, ensuring that biodiversity considerations are reflected in EU's dialogue with third countries and possible international payments for ecosystem services and enhance synergies between climate change and biodiversity objectives as important measures to take. Finally, the NGOs supported the measures suggested.

Prioritising measures

Transposing the ABS protocol is an EU commitment and is expected to deliver significant results within a relatively short period of time. Setting in place a process to deliver on the EU commitment to agree a funding target before 2012 is also a priority.

TARGET 6: HELP AVERT GLOBAL BIODIVERSITY LOSS	
By 2020, the EU has stepped up its contribution to averting global biodiversity loss.	
Action 17: Reduce indirect drivers of biodiversity loss	
17a)	Under the EU Flagship on resource efficiency, the EU will take measures (which may include demand and/or supply side measures) to reduce the biodiversity impacts of EU consumption patterns, particularly for resources that have significant negative effects on biodiversity.
17b)	The Commission will enhance the contribution of trade policy to conserving biodiversity and address potential negative impacts by systematically including it as part of trade negotiations and dialogues with third countries, by identifying and evaluating potential impacts on biodiversity resulting from the liberalisation of trade and investment through ex-ante Trade Sustainability Impact Assessments and ex-post evaluations, and seek to include in all new trade agreements a chapter on sustainable

[80] The Commission Staff Working Paper "Sector Approach in the Environment and Natural Resources" could provide useful background in this respect. It guides donors and partner countries in the development and implementation of a sector approach in the Environment, contributing to harmonising the EU approach while promoting the sustainable and responsible management of the sector in developing countries.

[81] On 11 February 2011, the Commission submitted a proposal to the Council for a Council decision on the signing, on behalf of the European Union, of the Nagoya Protocol.

development providing for substantial environmental provisions of importance in the trade context including on biodiversity goals.

17c) The Commission will work with Member States and key stakeholders to provide the right market signals for biodiversity conservation, including work to reform, phase out and eliminate harmful subsidies at both EU and Member State level, and to provide positive incentives for biodiversity conservation and sustainable use.

Action 18: Mobilise additional resources for global biodiversity conservation

18a) The Commission and Member States will contribute their fair share to international efforts to significantly increase resources for global biodiversity as part of the international process aimed at estimating biodiversity funding needs and adopting resource mobilisation targets for biodiversity at CBD COP11 in 2012[82].

18b) The Commission will improve the effectiveness of EU funding for global biodiversity inter alia by supporting natural capital assessments in recipient countries and the development and/or updating of National Biodiversity Strategies and Action Plans, and by improving coordination within the EU and with key non-EU donors in implementing biodiversity assistance/project.

Action 19: 'Biodiversity proof' EU development cooperation

19) The Commission will continue to systematically screen its development cooperation action to minimise any negative impacts on biodiversity, and undertake Strategic Environmental Assessments and/or Environmental Impact Assessments for actions likely to have significant effects on biodiversity

Action 20: Regulate access to genetic resources and the fair and equitable sharing of benefits arising from their use

20) The Commission will propose legislation to implement the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization in the European Union so that the EU can ratify the Protocol as soon as possible and by 2015 at the latest, as required by the global target.

7. ANALYSIS OF THE IMPACT OF RETAINED MEASURES

This section explores the likely impacts of the proposed packages of measures associated with each target against environmental, economic and social criteria, differentiating by type of measure when appropriate.

Environmental criteria are disaggregated in the three main objectives of the 2020 headline target: halting biodiversity loss, ecosystem restoration and the EU contribution to averting global biodiversity. Economic impacts are disaggregated into direct economic impacts at the EU, national or local level, and on specific businesses/economic actors, with a highlight on issues of administrative burden where relevant. Social impacts focus mainly on employment and health, cultural aspects, as well as social inclusion. Additional sections are included on distributional effects and the international dimension when relevant.

Given the strategic level of the options, the impacts are mostly assessed in a qualitative way, with orders of magnitude of quantitative impacts where possible, bearing in mind that measures linked to ongoing or forthcoming Commission initiatives will be the subject of a more detailed and quantitative analysis in the accompanying impact assessments, as highlighted in the analysis for each target. Where there are no aggregated figures of costs and benefits, examples of specific cases, usually at project level, where costs and benefits have

[82] As set out in COP10 Decision X/3.

been estimated are also given for illustrative purposes (see in particular Annex 11)[83]. The level of analysis is also related on the amount of knowledge and data available, which depends on the state of progress of related policy initiatives.

7.1. Impacts of Nature Conservation related measures

Environmental impacts

The measures proposed would increase the benefits of Natura 2000 sites (see Annex 11) by improving the effectiveness of management both at site level, and in terms of overall coherence of the network. Preparation and delivery of management plans or equivalent instruments will ensure adequate management and restoration of sites to maintain or improve the status of species and habitats protected under the Nature directives. A new mechanism to promote the sharing of expertise and best practice on the management of Natura 2000 at the biogeographical level will help ensure that the necessary conservation measures are established. Combined with strategic action on financing needs, and awareness raising and training, this brings additional biodiversity benefits. Streamlined monitoring and reporting, including a new EU bird reporting system, is needed to improve information on the status and trends of species and habitats of European Importance, which is essential for measuring progress, and the overall achievement of the target. Effects on restoration will also significantly contribute to T2.

Economic impacts

Whilst the full costs of implementing the Nature directives will need to be matched with funding if the target is to be met, the costs directly linked to the 2020 biodiversity strategy are those related to promoting new approaches for stepping up the implementation, and are likely to be a small proportion of the overall costs of managing the Natura 2000 network, currently estimated at €5.8 billion per year for the achievement of favourable conservation status, which is equivalent to €62/ha/year. It is estimated for example that the EU level coordination of a biogeographical process aimed at promoting the effective management of the Natura 2000 network will cost €350,000 for each of the next 3 years. Actions to improve enforcement such as better training, inspection capacity, and guidance will also entail specific costs.

Management measures that lead to enhanced biodiversity and ecosystem services could create limited economic benefits for some activities linked to e.g. eco-tourism, local natural and traditional products.

Some of the measures such as a Communication campaign and the new bird reporting system will also carry additional financial costs. An EU level campaign to strengthen recognition of the multiple ecosystem benefits that derive from the effective management of the Natura 2000 network is estimated to cost €350.000 for each of 4 years. EU level co-ordination for the development of the new bird reporting system by Member States and leading bird conservation organisations is estimated to cost €400,000.

Whilst these investments are necessary to step up the slow implementation of the Nature directives and reach the target, they will be compensated to some extent by the positive effects of the cost-effective streamlined monitoring and reporting system.

Social impacts

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[83] Unless otherwise specified, illustrative examples are taken from the TEEB reports (www.teebweb.org) ' and Eftec, 2010. Report for the European Commission DG Environment son the of costs and benefits for biodiversity conservation.

Several studies have shown the positive effects of protected areas in generating growth and employment in rural areas. For example, in Spain, it was shown that in the National park of Sierra Nevada[84], the index of ageing was lower for the municipality in the protected areas (60.09) compared to other mountain areas non protected (66.31). In addition, the yearly average increase for the period 1991-2001 in gross income was higher (6.73) in protected areas than in non protected mountain areas (5.07), and the regional average (4.50). Some of the proposed measures would contribute to and increase these benefits, in particular those related to completing the designation of marine areas, and the adequate management and restoration of sites.

It should however be noted that biodiversity protection is often accompanied by restricted access to resources and can lead to a decrease in economic output as measured by market values and negative local impacts on jobs and land value, at least in the short term. Finding alternative sources of local income to compensate for use restrictions is challenging but essential for the long-term success of any protected area scheme. These may include conservation easements, payments for ecosystem services and promotion of tourism and other sustainable activities (e.g. production of certified local products).

Distributional effects

Member States which have designated a larger share of their territory as Natura 2000 areas (e.g. Slovenia) and which are biodiversity-rich (e.g. Spain) will face more impacts, for example on the design and implementation of management plans, but will benefit more from measures foreseen under the target or under related targets (e.g. T2 and T3).

International impacts

Measures to protect and enhance of Natura 2000 sites will also have a global impact since some habitats/ecosystems provide global services (e.g. forests, grasslands, and wetlands provide carbon storage benefits). Completion and management of the network will therefore also contribute to the global target through reduced climate change impacts on global biodiversity.

7.2. Impacts of Ecosystem Restoration and Green Infrastructure

Environmental impacts

Measures related to green infrastructure and no net loss would provide benefits to society in terms of maintained and enhanced ecosystems and related services, which are currently undermined by ecosystem degradation. The latter include life-supporting cycles such as water and carbon cycles, or the provision of clean air. Some of these services would have positive feedback effects for biodiversity conservation; for example water filtering and flood control services, which would reduce pressure from pollution and lead to better adaptation to climate.

More specifically, green infrastructure will increase resilience and reduce vulnerability to climate change, within and outside the Natura 2000 network, in the context of higher flood and forest fire risks, water scarcity, and droughts. It will generate investments in natural capital, contributing directly to the target of at least 15% of restoration.

The main environmental impact of no net loss policy would be that there is no further loss of ecosystems and ecosystem services overall and that the overall headline target of halting biodiversity loss is met. As an example, the current situation in France is that out of 60,000 ha

[84] Sunyer, C. (Ed.). 2009. Eco-emprendedores: Retos para la puesta en valor de los espacios protegidos. TERRA centro para la política ambiental. Madrid.

lost to urban sprawling and infrastructure every year (equivalent to one French department every 10 years), only 3,000 ha are compensated for.

Economic impacts

The costs and benefits of establishing green infrastructure and restoration projects to reach the target - beyond those likely to take place in a business as usual scenario (through Natura 2000, WFD and MSFD) - have not yet been estimated at EU level. Evidence at local or national level in EU Member States suggests that benefits for society of restoration and GI projects exceed costs in many instances (see Annex 11). A French assessment produced calculated reference values for ecosystems, ranging from €600 per ha/per year for pastureland to €2000 per ha/per year for some types of forest (€950/year for temperate forestry)[85]. Global reviews of restoration projects[86] showed costs ranging between several hundreds to thousands of dollars per hectare (grasslands, rangelands and forests) to several tens of thousands (inland waters) to millions of dollars per hectare (coral reefs) (see Figure 8), and cost-benefit ratios in the range of 3 to 75[87]. Whilst not all projects are likely to be cost-effective, there are likely to be many opportunities for restoration with high cost-benefit ratios given the state of degradation of ecosystems in the EU. For certain ecosystem services, like recreation, or water purification, benefits will depend on location and access. This will need to be taken into account in the proposed prioritisation framework for the restoration of ecosystems and their services in the EU.

Green infrastructure and no net loss initiatives will also provide new investment opportunities to businesses. As an illustration, sustainability-related global business opportunities in natural resources (including energy, forestry, food and agriculture, water and metals)" are estimated to be in the range of US$ 2-6 trillion by 2050 (at constant 2008 prices). About half of this is "additional investments in the energy sector related to reducing carbon emissions". Markets for biodiversity and ecosystem services are growing. Payments for Ecosystem Services for water-related ecosystem services and watershed management account for only US$5 billion in 2008, but are expected to total more than 30 billion by 2050.[88]

Both green infrastructure and no net loss initiatives, and the 'biodiversity-positive' investments they entail have an important innovation potential, including for example man-made elements (such as green roofs, porous pavement, rain absorbing gardens, eco-ducts for wildlife crossings), innovative planning approaches, the design and application of urban elements enhancing biodiversity, all combinations of technologies enhancing ecosystem services, or finally the development of new organization methods, products, services and system innovations to better protect ecosystems.

Green infrastructure would also reduce fragmentation and the social costs of traffic accidents caused by wildlife, including material damage, human injuries and human fatalities. This has been estimated to reach €42 million per year in Switzerland. In Spain, the annual economic cost of material damage resulting from accidents with wild boar and roe deer was estimated to

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85 Chevassus-au-Louis - 2009. An economic approach to biodiversity and eocsystem services; Contribution to public decision-making. Centre d'analyses stratégiques report.

86 Chapter 9 in *The Economics of Ecosystems and Biodiversity in National and International Policy Making*. An output of TEEB, edited by Patrick ten Brink. Earthscan, London.

87 Nellemann, C.E. Corocran (eds) 2010. Dead Planet, Living Planet – Biodiversity and ecosystem restoration for sustainable development. A rapid response Assessment. UNEP, GRID-Arendal.

88 PricewaterhouseCoopers in TEEB for business report, 2010.

€862,179[89]. In France, where management plans have allowed a certain recovery of wild board population and the fragmentation of forests has significantly increased, the number of road collision involving wild boards and other game animals have increased and the total costs derived from these collisions is estimated at €150 million, of which 96 million only for wild boards, according to the *Office National Interministériel de la Sécurité Routière*.

Some of the economic benefits from green infrastructure also stem from the fact that in many instances, for example for climate change adaptation or mitigation of extreme events, solutions based on maintaining or enhancing ecosystem-based services are more cost-effective than hard engineering solutions. Well-targeted investments in green infrastructure - such as restoring natural flood plains in order to increase flood protection rather than having to build expensive dykes - make sound economic sense[90]. Green infrastructure can also make a cost-effective contribution to reducing energy demands.

The experience of not net loss policies in some countries provides useful estimates. The US National Mitigation Banking Association estimates that USD 3,8 billion/year are spent on compensation, including 65% on restoration, 15% on protection, and 20% on the creation of wetlands[91]. The market for US wetland credits is currently estimated at USD 1.1 to 1.8 billion annually[92]. Several Australian states have introduced similar schemes. The Bushbroker scheme in Victoria has so far facilitated more than AUD 4 million in trade. Overall, global revenues from regulated biodiversity offset transactions are already worth $ 3.4 billion per year and could grow to $ 10 billion by 2020[93].

Assessing and mapping ecosystems and their services, as well as developing a prioritisation approach will generate some costs, but are a necessary step to achieve the above benefits. As an example, the costs for the ongoing UK National Ecosystem Assessment are currently at around £1.2M for the whole project, which covers new analytical work on a framework but relies on existing data.

Social impacts

Green infrastructure and a prioritised restoration framework would provide multiple social benefits. For example, restoring ecosystems such as watershed forests, barrier beaches, or riparian and coastal wetlands reduces exposure of human communities to natural disasters, such as landslides, flooding, storms and wave surges.

Green infrastructure in urban areas, such as developing and maintaining green spaces, yard and park trees, street trees, green roof tops, vertical gardens in cities have positive impacts on health and quality of life. These include mitigating urban heat islands by cooling the air and shading buildings and surfaces, aesthetical and psychological benefits[94], improvement of

89 http://www.iene.info/cost-341/SotA-COST341ER0318.pdf.;http://www.iene.info/cost-341/COST%20341-handbook.pdf

90 TEEB issues update on climate change

91 Le Monde, 14 May 2009, "Une nouvelle arme pour lutter contre la destruction de la nature".

92 Madsen, B., Carroll, N. and Moore Brands, K. 2010, State of Biodiversity Markets report: Offset and Compensation Programs Worldwide. http://www.ecosystemmarketplace.com/documents/acrobat/sbdmr.pdf

93 Ecosystem Marketplace, 2008.

94 Fuller RA, Irvine KN, Devine-Wright P, Warren PH, Gaston KJ. 2007. Psychological benefits of greenspace increase with biodiversity. Biology Letters. 3: 390–394.

water quality, filtering air pollutants and improvement of air quality results from the capture of pollutants such as PM10[95], O_3, SO_2 and NOx.

As access to green spaces is unequally distributed across socio-economic groups, with poorer social groups having, in general, lower access, and given that green space could have positive influence on health conditions such as obesity, mental health, circulatory disease and asthma, more equal access to green space could also help reducing health inequalities between socio-economic groups[96].

It has also been argued that green spaces can also have positive impacts in terms of increasing social activity, improving community cohesion, developing local attachment and lowering crime levels, particularly in deprived communities[97].

Finally, restoration and green infrastructure would provide new job opportunities. It is estimated that 20,000 jobs in France are contributing to knowledge, management, protection and restoration of biodiversity, projected to rise to 40,000 by 2020 as a result of newly established biodiversity priorities. Large companies are now recruiting "biodiversity specialists", for example experts on "*Trame Verte et Bleue*" employed by *Autoroutes du Sud de la France*[98]. It is foreseen that in France, 10,000 jobs will be created in the near future in the sector of ecosystem maintenance and restoration (*génie écologique*)[99]. These new jobs opportunities could have an important role in the reinsertion of low qualification workforce[100]. Although specific restoration projects involve one-off employment opportunities, they usually also require action on maintenance and conservation with more permanent impacts on jobs.

Restoration and green infrastructure also provide new recreational opportunities, and can lead to local development and regeneration in rural areas. For example in Belgium, a project to recreate grasslands for flood control also led after a number of years to development of agro- and eco-tourism (see Annex 11). In the UK, the creation of the National Forest increased the number of local jobs by 4.1% and local regeneration using green infrastructure attracted £96 million of investment[101]. The Glasgow Green Renewal project stimulated the development of 500-750 new residential properties, enhanced average house prices and the total value of property transactions by net £3 million–£4.5 million, increased yield in council tax by 47% and increased the value of the land from £100,000 to £300,000 per ha[102].

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95 Human health benefits for the local population of new planting in a 10km per 10km area of East London, was assessed in terms of reduced premature mortality and respiratory hospital admissions through reduced PM10 air levels (Tiwary, A., et al., Environmental Pollution, 2009). PM10 capture was estimated to be 0.009 t ha-1 yr-1, averting 2 deaths and 2 hospital admissions per year. There would be additional impacts from other pollutants, and respiratory symptoms that do not require hospital admissions. A recent study looked at asthma prevalence in 4-5-year old children in New York and found that the presence of street trees was associated with a 29% reduction in asthma (Lovasi, G.S. et al, Journal of Epidemiology and Community Health, 2008). These results do not include indirect health impacts through recreation, sport, and increased well-being.

96 Sustainable Development Commission (2010). Sustainable development: the key to tackling health inequalities. Sustainable Development Commission, London.

97 Forest Research (2010). Benefits of green infrastructure. Report by Forest Research. Forest Research, Farnham.

98 Le gouvernement français veut faire de la biodiversité un gisement d'emploi – Le Monde, 6 July 2010.

99 Ecotech Study 2012 (Boston Consulting Group for the French Env Ministry).

100 Humanité et biodiversité - Manifeste pour une nouvelle alliance, Ligue Roc, Descartes & Cie, 2009.

101 CESR (2004). Much more than trees 2: measuring the social and economic impact of The National Forest. Staffordshire University Centre for Economic and Social Regeneration (CESR).

102 GEN Consulting (2006). Glasgow Green renewal benefits analysis. A report to Glasgow City Council. November 2006.

Distributional effects

The main stakeholders affected would be private businesses concerned by new investment opportunities, or by requirements for compensation for displaced habitats (including the transport and energy sector), as well as planning authorities.

Member States that already have started putting in place some elements of green infrastructure (e.g. Netherlands, France, Czech Republic and Slovakia), or have some form of no-net-loss policy (e.g. France, Germany), will require relatively fewer efforts to implement the measures needed to reach the target, compared to Member States who haven't.

International impacts

As for measures to reach T1, measures targeting restoration and compensation for displaced habitats would provide global benefits given the global services provided by some ecosystems, and would also contribute to the global target through reduced climate change impacts on global biodiversity.

Foreseen additional analysis

Additional analysis will be carried out in the context of the foreseen initiatives on green infrastructure by 2012, the strategic restoration prioritisation framework by 2014, and the no net loss initiative by 2015. The impact assessment report accompanying the 'blueprint to safeguard EU waters' initiative scheduled for 2012 will provide additional relevant analysis.

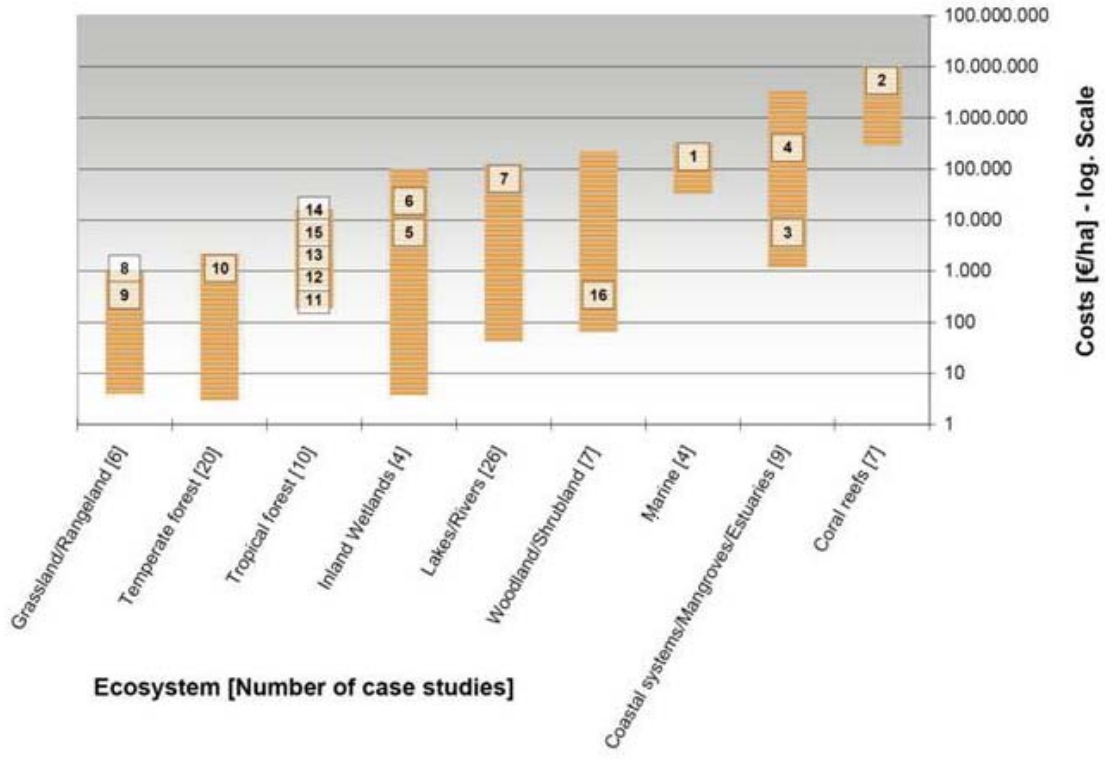

Figure 8: Summary of cost ranges of restoration efforts

7.3. Impacts of Agricultural and Forestry related measures

Environmental impacts

Greening the first pillar of the CAP to ensure that direct payments reward benefits from biodiversity-supporting farming systems in a larger surface of agricultural land in the EU (possibly including permanent grassland, land under ecological set aside and Natura 2000 areas) would have direct benefits in terms of increased area of extensive agro-ecosystems, improved status of corresponding species and habitats, and the services they provide.

Changes in the second pillar aimed at increasing environmental performance and ensuring that environmental measures are more closely tailored to the specific needs of areas such as Natura 2000 and HNV areas would have direct impacts in terms of maintenance and restoration of agro-ecosystems, and the many services they provide in rural areas and for society at large. Facilitating the collaboration of farmers to achieve connectivity of landscape features for biodiversity and climate change adaptation will greatly boost the establishment of Green infrastructure and will contribute to deliver on the EU objectives for restoration. In addition, these measures would have a positive impact on a number of drivers for biodiversity loss and reduce the overexploitation of resources such as soil, water, on pollution through less energy-intensive agriculture and reduced use of fertilisers and pesticides. This could considerably reduce the pressure on High Nature Value farmland, which for instance in France decreased by almost 70% from 1970 to 2000.

Full implementation of the Water Framework Directive would also lead to benefits in terms of protecting and restoring water-related ecosystems and the services they provide, and would also contribute to progress towards Good Ecological Status. Once the Directive has been implemented and the operational obligations for farmers have been identified, inclusion under cross compliance would add to ensuring compliance.

The increased use/preservation of traditional crops, in addition to positive impacts on genetic diversity, would have a positive impact on climate adaptation through maintaining a more diverse genetic stock, and may also increase resistance to invasive alien species.

For forestry, the measures proposed would ensure that a larger proportion of forests is under management plans or equivalent instruments that include biodiversity objectives. The improvement in management practices induced by plans would maintain and increase the many services provided by forests in the EU, including carbon storage, erosion prevention, pollution control and water purification.

Economic impacts

At EU level, costs relating to greening the first pillar and introducing changes in the second pillar are not likely to increase the overall budget but rather involve a redistribution of CAP funds towards encouraging more biodiversity-supporting farming systems. The proposed measures would also allow for a higher diversification of the agricultural sector, adding value to rural products and services associated with specific natural or landscape elements.

Rebalancing direct payments would increase efficiency in the use of EU funds. A more outcome oriented approach and mechanisms to foster collaboration between farmers in Pillar 2 would also increase efficiency. Both sources of funding would contribute in part to the overall costs of maintaining Natura 2000 in agricultural and forested lands, and if appropriately targeted HNV areas. The overall cost of Natura 2000 management has been estimated at around € 5.8 billion per year, whilst managing sustainably the European

countryside for multiple environmental objectives could cost up to 16 billion per year[103] (with some overlap with the previous figure), including costs at both EU and Member States level.

For forestry, management plans would increase the competitiveness of the sector, through: a more sustainable raw material supply, particularly in light of emerging threats and challenges; a better inventory of current conditions of forest resources; and better planned and coordinated measures for achieving multifunctional objectives. They could also encourage a diversification of the sector, through including new activities in the management planning. For example, in Spain, mushroom harvesting has been estimated to represent between 6 to 10% of the value of timber, without taking into account its recreational value generated by this activity (Martínez Peña, 2003; Aldea, 2009). The Estimate of the recreational value of forests in Germany is 2.4 billion USD for occasional visitors (Elsasser, 1999)[104].

Developing management plans or adapting them to include biodiversity objectives would increase administrative costs. The average cost of developing a management plan for a duration of 10 years is in the order of 10 to 60€/ha depending on the size of the area, which compares favourably to payments for sustainable use of forestry land, under EAFRD (Axis 2, Art 36), which range from 150 to 700 €/ha for afforestation, and from 40 to 200 €/ha for forest environment annual payment and Natura 2000. The restriction of the target to forest holders above a certain size would also avoid a comparatively higher administrative costs for small forest holders.

Social impacts

CAP support to maintaining and enhance biodiversity in rural areas would contribute to rural development in less favoured areas, notably in HNV and Natura 2000 areas. The enhancement of recreational ecosystem services would lead to job creation through the increase of rural activities such as eco-tourism, including in forests, as called for in the European Forest Sector Outlook Study report[105].

Engaging and incentivizing farmers and forest holders for the delivery of the biodiversity objectives will allow them to pull forces with non governmental organisations and will highlight the public contribution of semi-subsistence farmers, small family farmers and organic farmers, which are often a crucial basis for the social fabric of many regions. This will make extensive and low input rural areas more dynamic and more attractive to young farmers thus decelerating depopulation in rural areas and land abandonment.

Distributional effects

The proposed measures would bring about a more equitable distribution of direct aids amongst farmers. A recent report on farm viability showed that pillar one payments in the current CAP are disfavouring small-scale, low-intensive farming, whilst favouring high intensity farms[106]. Whilst direct 'green' payments under pillar 1 are likely to favour large holdings, if they take the form of flat rates per ha, measures under pillar 2 tend to favour small

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103 Based on IEEP, 2010, Costing the environmental needs related to Rural Land Management, Draft Final Report for DG Environment. This is however likely to be an overestimate - there may be some double counting across different objective and efficiencies that can be achieved with a programming approach.

104 Manuel pour la création de marchés de la biodiversité- OECD report 2005- http://www.oecd-ilibrary.org/docserver/download/fulltext/9704142e.pdf?expires=1290348679&id=0000&accname=ocid194935&checksum=6A586087A7AFE7DD8CDE55F66FFD6996

105 http://www.unece.org/timber/efsos/

106 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

farmers as they tend to reward specific features found in smaller scale farming. An additional payment under pillar 1 specifically targeting small farmers could also be envisaged.

Measures under this target are also likely to have a comparatively higher positive impact in Member States with a high proportion of UAA under extensive agro-ecosystems and HNV areas, including new Member States.

International impacts

Agro-ecosystems such as grasslands and peatland, and forest ecosystems provide global climate change mitigation benefits. In addition, measures for the preservation of agricultural genetic diversity would also have international spillovers as they would contribute to a more diverse gene pool, with benefits for climate change adaptation. A more sustainable production of agricultural and forest products would also benefit exports to EU trading partners.

Foreseen additional analysis

A more detail assessment of the environmental, economic and social impacts of different options to change the Common Agriculture Policy, including most of the measures proposed under this target, will be developed in the context of the Impact Assessment that will accompany the upcoming Commission proposals for regulatory instruments to reform the CAP.

7.4. Impacts of Fisheries-related measures

Environmental impacts

The combination of measures proposed, if implemented properly, should reduce fishing pressure on stocks and lead in the long run to increased and more sustainable levels of fish populations. The positive impact on rebuilding depleted stocks of measures such as closed areas and gear or effort restrictions have been demonstrated in California, the northeast United States, and northwest Australia[107]. In addition, technical measures to progressively eliminate discards and to avoid by-catch, and targeted support for better implementation of Natura 2000 and MSFD obligations should yield additional benefits for marine biodiversity and ecosystem goods and services, thereby also contributing to the first two targets.

Economic impacts

Ensuring sustainable use of the fish resources is a clear prerequisite for the viability of the fisheries sector, as shown by the costs of overfishing in the Baltic and North Sea fisheries (see Annex 11). In addition to ensuring that stocks would not collapse, improving sustainability would allow the development of larger fish stocks, leading to more fishing possibilities at lower cost and with a higher unit value. There would however be negative economic impacts in the short run, linked to lower initial catches, and reduction of the size of the fleet. In the long run, however, the implementation of MSY-based management practices is expected to improve revenues for fishermen and significantly reduce the needs for government subsidies to the fishing industry.

The measures proposed would also increase efficiency of public funding. On top of the direct aid from the European Fisheries Fund and similar national schemes, the industry benefits from a number of indirect subsidies, the most important of which is the overall exemption from fuel taxes. Unlike other industries, fishing also benefits from free access to the natural resources it exploits and does not have to contribute to the public management costs

[107] Worm, B. et al, 2009. Rebuilding Global Fisheries, *Science* 325(5940): 578-585.

associated with its activities, e.g. control and safety at sea. Estimates from several Member States have shown that the cost of fishing to the public budgets (including public management costs such as safety measures or monitoring) actually exceeds the total catch value.[108]

As regards the distribution of the economic costs incurred by this policy measure, most of the direct implementation burden would fall to the Regional Fisheries Management Organisations (RFMOs), and the fishing industry itself. Most of the costs would likely be concentrated in one-off restructuring costs spread out over a few years.

Fisheries measures aiming at eliminating adverse impacts of fishing on other species, habitats and ecosystems may in most, if not all, cases imply higher management costs that include acquisition of additional information, planning and consultative decision-making processes involving a broader range of stakeholders/interest groups, and additional monitoring, control and surveillance. According to the FAO, higher management costs due to ecosystem-based approaches would often be out-weighed by the long-term benefits[109] for society. These measures could also have a positive impact on recreational activities. As part of a study on economic losses linked to overfishing, it was concluded that countries are also missing economic opportunities by not promoting alternative uses of the sector, such as whale watching and other marine recreational activities[110].

Social impacts

The need to increase the down-sizing percentage in the short term due to the switch to MSY-based management practices would have a negative short term social impact, which would need to be integrated in an existing trend, for which local communities are starting to adapt, to some extent. Further support via sound re-employment policies and potential short term financial support to the industry may be needed in the short term. This impact should also be contrasted with the very high negative effect on employment of a collapse in fish stocks (see for example the Newfoundland example in Annex 11).

Distributional impacts

The main social costs in the short term of this policy measure would be borne by the fishing sector, concentrated in the Member States with the largest amount of full-term equivalent employment in the fisheries sector, namely Spain, Greece and Italy. The long term social benefits of the policy measure, on the other hand, would be felt across society as a whole (sustainable fish stocks, enhanced marine ecosystems) and across all EU Member States.

International dimension

Through reducing fishing effort and adverse impacts on marine ecosystems, measures will also contribute to more sustainable global fisheries and enhanced global marine biodiversity. More sustainable fisheries products would also benefit exports to EU trading partners.

Foreseen additional analysis

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

109 Fisheries Management - 2. The Ecosystem Approach to Fisheries FAO Technical Guidelines For Responsible Fisheries Suppl. 2, FAO, Rome 2003.

110 Cisneros-Montemayor, A.M. and U.R. Sumaila. 2010. A global estimate of benefits from ecosystem-based marine recreation: Potential impacts and implications for management. Journal of Bioeconomics. DOI: 10.1007/s10818-010-9092-7.

A more detailed assessment of the environmental, economic and social impacts of these measures is developed in the Impact Assessment reports of the Commission proposals for the reform of the Common Fisheries Policy.

7.5. Impacts of Invasive Alien Species related measures

Environmental impacts

The measures proposed would lead to better control of IAS already introduced, limit associated damage, and avoid new damage by controlling pathways for new IAS.

In addition, as IAS work as additional pressures on ecosystems, the proposed measures would have strong synergy effects with measures under other targets, for example also contributing to reducing pressures on overexploited natural resources, and Natura 2000 sites, as well as increasing the probability of success of restoration measures. Control for introduction of new species would also contribute to reducing potential costs associated with climate changes, as new species could become more invasive due to changing climate conditions (e.g. Pacific oyster).

Economic impacts

The total documented monetary impacts of IAS in Europe have been estimated to amount to more than € 12 billion a year over the last 20 years, of which € 9.6 billion can be attributed to IAS damage (e.g. to agriculture, fisheries and aquaculture, forestry and health sectors[111]). This is generally considered as an underestimate as a far greater number of IAS cause negative socio-economic effects than are not documented in monetary terms. On the other hand, the design of measures would need to take into account some positive impacts of IAS, e.g. American mink providing fur, the pacific oyster for oyster farming, and the potential role of some IAS for biofuel production.

Although the final full cost-benefit analysis of the measures proposed will only be available in conjunction with the detailed impact assessment that will accompany the proposal for a dedicated legislative instrument, early estimates provide a good indication of the magnitude of the damage caused and of the costs of inaction. A significant part of the €9.6 billion/year damage costs would be avoided, and these benefits would significantly outweigh the costs of the measures needed (€ 40 million–190 million / year). This is without taking into account additional benefits which have not been monetarised, including to biodiversity, human health and preservation of natural heritage. Several studies have shown that the costs of controlling invasive alien species are usually lower than the expected damage costs (see Annex 11)[112].

Social impacts

The proposed measures would deliver significant social benefits in terms of reduced health impacts. Almost 30 of the total of 125 studied IAS can negatively affect human health either by functioning as disease vectors or causing allergies. The negative impacts are also confirmed by data on the costs of human epidemic diseases.

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111 IAS can also damage infrastructure due to burrowing (e.g. musk rat) or via their root systems (many plants), or by blocking drainages or disrupting e.g. water purification plants (e.g. zebra mussel).

112 For example, McConnachie et al. (2003) review 10 benefit-cost studies of successful biological control programs, where the benefit-cost ratios of terrestrial weeds range from 1.9:1 to 24:1. Van Wilgen et al. (2004) estimate the costs and benefits of biocontrol of six invasive weed species in South Africa, with benefit-cost ratios ranging from 8:1 for red Sesbania to 709:1 for jointed cactus.

There are also negative employment consequences to damage from IAS. For example the collapse of the Black Sea fishing industry due to the introduction of the comb jellyfish led to 150,000 jobs being lost. In Canada, outbreaks of the mountain pine beetle on forests were foreseen to lead to the closure of 16 major sawmills unless addressed. Furthermore, the economic impacts of IAS on local livelihoods are likely to cause broader socio-economic impacts in affected communities.

In addition, there are a number of IAS with demonstrated negative effects on cultural services, caused by the reduction of recreational use and/or tourism, because of decreased aesthetic value, nuisance to humans and/or recreational activities, and impacts on human health. In a number of cases, IAS are also reported to negatively affect broader cultural values, such as those related to landscapes with high cultural significance, or populations of charismatic and/or locally important species. For example, Cypress forests in the Mediterranean are known to suffer from invasions of ink disease and cypress cancer.

Distributional impacts

The current distribution of costs and benefits of IAS action is extremely uneven. Most costs associated with IAS control and lost production, ecosystem services and amenities are met by stakeholders on the ground, with a major part of the burden falling on local authorities. The beneficiaries of activities providing pathways for IAS introduction/spread usually have few or no economic incentives to minimise such risks.

In addition, IAS species may have a social value as pets, game species and ornamental plants and animals. The growing trade in such species is indeed a key driver of the introduction of IAS in the EU, and will need to be addressed in the forthcoming IAS strategy.

International dimension

The proposed measures will comply with the WTO-SPS-agreement[113] and their impact on trade will be analogous to the impact of the animal and plant health regimes. The extent of the impact will also depend on the level of ambition chosen. Whilst new measures may place restrictions on some traded commodities, in general the new measures would increase the entry requirements, thus requiring further border inspections. It is however important to consider that several EU key trading partners already have ambitious IAS policies in place, and cooperation with these countries may actually improve trade relations and contribute to smoother trade flows.

Foreseen additional analysis

More detailed analysis of the impacts will be set out in the impact assessment accompanying the proposal for the Commission strategy on Invasive Alien Species foreseen in 2012.

7.6. Impacts of measures related to stepping up the EU contribution to averting global biodiversity loss

Environmental impacts

Some measures related to EU consumption and production, although targeted at reducing impacts in source countries, would also have a positive impact in the EU through reduced demand for products that are also produced in the EU.

Increased resource mobilisation, along with measures for more sustainable production and consumption patterns in the EU would improve biodiversity in developing countries.

[113] http://www.wto.org/english/tratop_e/sps_e/spsagr_e.htm

Environmental benefits from protecting global biodiversity have been widely documented, for example through the Millennium Ecosystem Assessment, and would also deliver significant benefits in tackling other environmental challenges.

Regarding climate change, 45% of Green Carbon (carbon bound through photosynthesis in ecosystems) is stored in terrestrial ecosystems and a further 55% is bound in marine ecosystems.[114] Carbon uptake of tropical forest ecosystems alone is estimated equivalent to approximately 15% of the total global anthropogenic carbon emissions[115].

Biodiversity conservation can also play a crucial role in tackling the global water crisis and ensuring that the provision of high quality freshwater continues to be provided in developing countries. For instance continued destruction of the Mau forest ecosystem[116], considered to be the single most important water catchment in Rift Valley and western Kenya, has been identified as a driver that will contribute to aggravating the water crisis in the country.

Parties to the Nagoya Protocol on ABS will encourage users and providers of genetic resources to direct benefits arising from the utilisation of genetic resources towards the conservation and sustainable use of biological diversity. The use of genetic resources from non-EU countries by EU researchers and companies is expected to result in significant environmental benefits outside of the EU.

Economic impacts

The associated costs for the EU of the CBD agreement to substantially increase financial resources for biodiversity from all sources by 2020 will be clearer when the financing targets are agreed at COP-11 in 2012. The current ODA spending on biodiversity issues was USD 3,395 million in 2008[117]. The necessary international financial flows advanced by developing countries during COP-10 negotiations for reaching the CBD targets by 2020 ranged from USD 30 billion to 200 billion. These estimates were presented by developing country Parties to the Convention but it remained unclear whether these were annual targets or targets for the 10 year period, and these proposals have not been substantiated. The existing estimates of global financing needs of USD 4-45 billion per annum for expanding global protected area network and 290 billion USD per annum for a fully comprehensive global conservation programme outside protected areas[118], are not fully reliable and need to be updated. A proportion of the funding would have to be contributed as public funding from the EU but other sources of funding, including innovative financing mechanism, private sector funding and increased domestic funding in developing countries will also need to be explored.

These potential costs need to be weighed against the economic benefits that the preservation and enhancement of biodiversity and ecosystem services will provide in developing countries, which are often higher than the costs as demonstrated by many studies (see Annex 11). For example, initial measures to rehabilitate the Mau forest ecosystem above have been estimated to be in the range of USD 81 million over three years while the value of the goods and services provided by the Mau forests exceed these costs by far. Conversely, ongoing forest

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114 UNEP – Blue Carbon – The role of healthy ecosystems in binding carbon.

115 UNEP – The Natural Fix – The role of ecosystems in climate change mitigation.

116 Rehabilitation of the Mau Forest Ecosystem - Executive Summary - http://www.unep.org/roa/kcp/Mau/Docs/MAU_Executive_Summary.pdf

117 Global Monitoring Report 2010 – Innovative Financing for Biodiversity.

118 Global Canopy Programme, 2010. The little biodiversity finance book. A guide to proactive investment in natural capital

conversion in Sulawesi, Indonesia is expected to reduce pollination services and thus coffee yields by up to 18% and net revenues per ha by up to 14% over the next two decades[119].

The EU will also benefit from maintained and enhanced global biodiversity as some of its services, such as climate mitigation, are global in nature. The preservation or enhancement of global terrestrial and marine ecosystems and of their potential to contribute to mitigating anthropogenic carbon emissions can be a cost-efficient way to contribute to achieving the objectives of the UNFCCC. For instance global investments in protected areas in 2003 were estimated to be in the range of 6 billion US$ while the value of the carbon stored by the current system of terrestrial protected areas alone is estimated to lie somewhere between USD 1,142 and 7,992 billion[120]. EU companies will also benefit from protected or increased genetic diversity for new cosmetics and medication. Between 25-50% of the pharmaceutical industry benefits, estimated at USD 640 billion a year, are derived from biodiversity and genetic resources. So is a significant proportion of the natural cosmetics market value, estimated at USD 7 billion in 2008. At the same time, the collection and sale of medicinal plants provide opportunities for revenue generation for rural communities. The global market for medicinal plants is estimated to generate billions of USD in revenues.

The Nagoya Protocol on ABS obliges Parties to provide legal certainty, clarity and transparency of their domestic access and benefit-sharing frameworks. Ratification and implementation of the Nagoya Protocol by the EU and its Member States will result in significantly improved access of European researchers and companies to genes and biochemical compounds contained in genetic material that are of significant value for research and development in a range of industries (pharmaceuticals, biotechnology, botanical medicines, crop protection, plant and animal breeding, healthcare and cosmetics). It will however also impose a cost, since part of the benefits will be directed to developing countries.

Social impacts

Biodiversity protection in developing countries is closely linked to poverty alleviation. Many social groups directly and indirectly depend on well functioning ecosystems, in some cases, more so that in Europe due to their direct contact and link with the natural resources. The natural environment also plays a vital role in shaping the cultural identity of nations and peoples. For India the TEEB study estimated that 352 million rural poor depend directly on ecosystem services. An estimated 500 million people live close to coral waters and directly depend on coral reefs for their food and livelihoods[121]. Ensuring the provision of these services would have a measurable impact on the global objective of poverty eradication[122].

Higher vulnerability to natural disasters as a result of ecosystem destruction can have devastating effects for societies in developing countries. With regard to the 2010 flood event in Pakistan IUCN Pakistan has suggested that better flood-plain management could have helped to reduce the impacts of the flood including the number of casualties[123]. The literature

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119 Priess, J. Mimler, M. Klein, A.M., Scharze, S., Tscharntke, T. And Steffan-Dewenter, I. 2007. Linking deforestation scenarios to pollination services and economic returns in coffee agroforetry systems. Ecological Applications 17(2); 407-471.

120 UNEP WCMC - Carbon Storage in Protected Areas – Technical Report.

121 TEEB Climate Issues Update (September 2009).

122 http://www.teebweb.org/LinkClick.aspx?fileticket=bYhDohL_TuM%3d&tabid=924&mid=1813

123 http://iucn.org/about/union/secretariat/offices/asia/asia_where_work/pakistan/?5854/Floods-in-Pakistan--Interview-Partners-Available and http://news.dawn.com/wps/wcm/connect/dawn-content-library/dawn/news/sci-tech/04-asia-floods-ecosystem-damage-qs-05

provides many examples of how natural ecosystems as for example coastal mangroves, coral reefs, floodplains and forest help communities to mitigate the impacts of disasters[124].

Biodiversity loss also has important health impacts. Biodiversity loss has likely facilitated the emergence and spread of infectious diseases. In tropical forests, deforestation increases the risk of some infectious diseases, for example, by tending to favour those mosquito species that are better vectors for malaria, and those snail species that are better hosts for schistosomiasis[125]. Biodiversity loss also wipes out important nutritional resources, compromising efforts to enhance community health[126].

In addition, the majority of the world's population still depends on the use of medicinal plants for primary health care. The WHO estimates that in some Asian and African countries, 80% of the population depend on traditional medicine for primary health care[127].

The Nagoya Protocol on ABS also addresses access to and benefit-sharing for traditional knowledge associated with genetic resources of indigenous and local communities. Benefits from its implementation are therefore expected to contribute positively to the livelihoods of often marginalised indigenous and local communities in non-EU countries.

Distributional impacts

The highest donors (DE, FR, IT) are likely to increase their contributions proportionally, although some Member States that are not traditionally donors could consider starting making contributions.

Foreseen additional analysis

Impacts related to Access and Benefit Sharing will be set out in more detail in the legislative proposal foreseen by 2015. The work to estimate funding needs for EU's contribution to CBD targets in the run up to COP-11 will also provide further information on the financial impact of this target.

7.7. Comparison of options

Expected contributions to the main policy objectives

Table 2 summarises qualitatively the expected contributions to the main policy objectives of the main proposed measure headings under each target.

As measures are not designed as policy alternatives, but rather as main areas for action, since the main options in terms of orientations and levels of ambition have already been considered at the level of the target, table 2 serves to illustrate the complementarity between measures, where relevant, and synergies across targets. Within each heading, chapter 6 has scoped what the main alternatives are, and for most areas, forthcoming or parallel ongoing impact assessments will determine what individual measure for each area of action is more cost-effective.

In T1, the main measure headings proposed are interlinked, e.g. adequate funding sources are necessary to complete and manage the Natura 2000 network. In T2, better knowledge is necessary to implement GI and no net loss. Whilst GI would have positive impacts on restoration of ecosystem services, it may not be very effective in ensuring that there is a gain

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124 http://assets.panda.org/downloads/natural_security_final.pdf

125 http://www.sciencedaily.com/releases/2009/12/091203132157.htm.

126 http://www.cohabnet.org/news/Nagoya-summit-must-recognise-the-health-value-of-biodiversity.htm

127 http://www.who.int/mediacentre/factsheets/fs134/en/

overall when taking into account ongoing degradation of ecosystems through pressures which are not addressed by other targets. Thus, a no net loss policy framework could be introduced subsequently, once better knowledge is available and the experience of GI is evaluated.

In T3, for agriculture, the first two actions are clearly complementary, whereas the third action could be taken independently. For forests, the two options are linked and would need to be taken together.

The column on synergies also illustrates that the first two targets are linked and complementary by directly contributing to the first two objective, whereas the two sectoral targets (T3 and T4) as well as T5 directly contribute to T1 and T2. T6 is potentially linked to most EU targets through the sustainable consumption and production measures which may also have a positive impact in the EU.

	Halting biodiversity loss and ecosystem services degradation	**Restoration of ecosystem services**	**EU contribution to averting global biodiversity loss**	**Synergies with other targets**
T1 –Fully implement the birds and habitats directives	**++**	**+**	**+**	**T2, T3 &T4**
Completion & Management of N2k	++	+		T2&T4
Funding	++	+		T2, T3 &T4
Communication	+	+		
Monitoring and reporting	+	+		
T2 - Maintain and restore ecosystems and their services	**++**	**++**	**+**	**T1, T3 &T4**
Better knowledge	+	+		
Restoration & Green Infrastructure (GI)	+	++	+	T1, T3 &T4
No net loss	++	+	+	T1
T3 – Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity	**++**	**+**	**+**	**T1& T2**
AGRI - Greening direct payments	++	+		T1& T2
AGRI - Better targeted RD	+	++		T1& T2
AGRI - Genetic diversity	+		+	
FOREST – Measures targeting forest holders	++	+		T1& T2
FOREST – Biodiversity measures	++	+		T1& T2
T4 - Ensure the sustainable use of fisheries resources	**++**	**++**	**+**	**T1& T2**
Fish stocks management	++	+	+	
Impacts on other species & habitats	++	++		T1& T2
T5 – Combat Invasive Alien Species	**++**	**+**		**T1, T2, T3, T4 & T6**
Integration into existing regimes	+	+		T1, T2, T3, T4, T6
Dedicated instrument on IAS	++	+		T1, T2, T3, T4, T6
T6 – Help Avert global biodiversity loss	**+**		**++**	**T1, T2, T3 & T4**
Addressing indirect drivers	+		+	T1, T2, T3 & T4
Resource mobilisation			++	
Biodiversity proofing			++	

Genetic resources			++	

Table 2: contribution of packages of measures per target to main policy objectives

Key costs and benefits of reaching the targets

Table 3 provides a summary of the key costs and benefits of reaching the targets, in a quantitative way every time this is possible, and qualitatively otherwise.

		Environmental	**Economic**	**Social**
T1	+	Increased biodiversity and ecosystem services from Natura 2000 sites, better resilience to stressors such as climate change. Synergies with WFD and MSFD.	Increased social benefits from ecosystem services. Limited private business opportunities in Natura 2000 sites, e.g. linked to eco-tourism, local natural and traditional products	Increased employment in rural areas in the medium term
	-		Fraction of total management costs of €5.8 billion per year	Possible short term job losses due to restricted access to resources
T2	+	Maintained and enhanced ecosystems and services, such as clean air and water, carbon storage and natural disaster control. Increased ecosystem resilience and reduced vulnerability to climate change. Synergies with WFD and MSFD.	Increased benefits from ecosystem services. No aggregated estimates of benefits, but project-based evidence of benefit-cost ratios in the range of 3 to 75. New investment opportunities for businesses and innovation potential. Climate mitigation benefits.	Multiple social benefits, both in urban and rural areas, such as positive impacts on health and quality of life, aesthetical and psychological benefits, reduced exposure to natural disasters, new job opportunities in restoration and conservation
	-		Costs in the order of several billions per year, but GI costs could substitute for more costly grey infrastructure investment.	
T3	+	Maintaining and enhancing agro-ecosystems and forest ecosystems and their services, including carbon storage, erosion prevention, pollution control and water purification. Synergies with WFD.	New possibilities created for agricultural sector diversification; improving farmers income in natura 2000 and HNV areas; increased competitiveness and diversification of the forestry sector.	Contribution to rural development in less favoured areas; new jobs
	-		Costs related to funding from pillar 1 and pillar 2 measures, which would partly contribute to costs of managing Natura 2000 and HNV areas. Likely not to be net costs but a change of spending priorities in the CAP. Forest management plans administrative costs compensated by funding from rural development	
T4	+	Increased and more sustainable levels of fish populations, maintained and enhanced marine ecosystems & services. Synergies with MSFD.	Positive long-run impact on fisheries income. Conservation of UK marine habitats had a positive benefit cost ratio between 6.7 and 38.9. Increased efficiency of public spending	Prevent negative effect on employment in case of a collapse in fish stocks.
	-		Negative short term impacts on fisheries income. Higher management costs to avoid adverse impacts on ecosystems	Short term social cost of scaling down of fleet in the fishing sector

T5	+	Reduced pressure on species and habitats from IAS. Strong synergy effects with other targets to achieve e.g. ecosystem restoration.	Reduced economic damage. Rough estimates show benefits in terms of avoided damage costs of €1-9 billion / year	Reduced adverse impacts on human health, avoided negative employment consequences, enhanced cultural services and recreational activities.
	-		€40 million–190 million / year.	
T6	+	Improved global biodiversity especially in developing countries, Increased ecosystem services such as carbon storage, water provision, purification and retention. Some improvements also in the EU.	Economic benefits from biodiversity & ecosystem services, e.g. climate mitigation, increased crop yields through pollination in developing countries. Genetic diversity benefits EU & developing countries (cosmetics & medication). ABS protocol provides legal certainty of access to resources for EU companies.	Poverty alleviation, e.g. in India approximately 352 million rural poor depend directly on ecosystem services. Decreased risk of social impacts of natural disasters. Health benefits. Improved livelihood of indigenous communities through sharing of traditional knowledge benefits
	-		EU contribution to financing global biodiversity to increase by 2020; cost of ABS protocol to EU industry	

Table 3: Key costs and benefits of reaching targets

Who will bear the costs?

Although full quantification of the cumulative impacts of the proposed measures is not possible at this stage, it is possible to provide an indication of who will primarily bear the costs. This varies across targets.

For T1, although the intention is to increase private investments in Natura 2000, the expectation is that the bulk of the costs would be covered by public sources both at EU and national level. For T2, the initial steps in terms of setting up processes and knowledge gathering will also bear primarily on the public authorities. In terms of implementation measures for green infrastructure, but also measures relating to no net loss, the infrastructure sector, mainly energy and transport, and businesses more generally, will bear a part of the costs. Sectors who will gain are mainly those depending on biodiversity and ecosystem services for their activities (e.g. eco-tourism, water companies) or entrepreneurs seeking to invest in natural capital. Their investment might be encouraged through public private partnerships, or the use of other innovative financial instruments.

Regarding T3, again most of the funding is likely to come from public funds, although for forestry specific measures proposed should encourage funding from the private sector. The situation is similar for fisheries (T4). For T5, costs will be mainly borne by the sectors affected by the expanded measures to control intentional and unintentional introductions and movement of IAS into and within the EU (e.g. horticulture, forestry, pets and aquarium trade sector, marine transport). Regarding T6, funding is likely to be from public authorities for a significant share, although private funding will also need to be stepped up through innovative financing instruments. The ABS protocol will also have significant costs on the private sector, mainly on pharmaceutical/cosmetic companies, but will also provide legal certainty and predictability of their access to resources.

Overall, from this initial qualitative analysis, a large part of the costs are likely to be borne by public authorities, with the largest share from the private sector for IAS, ecosystem restoration and GI, and the global target (ABS). For other targets, although mainly publicly funded, the objective would be to attract private funding through innovative financial instruments.

Prioritisation of action

In terms of new initiatives, T2 on ecosystem restoration and green infrastructure and T5 on invasive species are the most innovative, as they kick start policy action in areas which are currently not part of the biodiversity policy framework at EU level. Both targets have good potential for delivering significant and early results. However, improved implementation and integration in sectors is also key to reaching the overall objectives.

In practice, a combination of the proposed measures will be needed to deliver in 2020. However, within each target, some actions can be prioritised, as discussed in chapter 6, and in some cases would need to be taken as a sequence. For example, the achievement of several targets, including ecosystem restoration and fisheries rely on better knowledge, and early data gathering would be a priority. Actions that prevent higher costs in the future should also be a priority, such as prevention and early warning for IAS, or a no net loss policy framework, since restoration is usually more costly than conservation. Finally, timing is also dictated by parallel sectoral policy developments, such as the CAP and CFP reform.

8. CROSS-CUTTING ISSUES ON FUNDING AND GOVERNANCE

8.1. Funding

EU and national public sources currently account for the majority of funding in support of biodiversity objectives, largely because biodiversity is considered a public good. The share of private biodiversity funding is comparatively low, but will need to be significantly stepped up if the EU and global targets are to be met.

8.1.1. Existing funding instruments

The following section outlines the main existing funding streams and those likely to become available to support actions and measures carried out under the strategy.

EU funding

The current approach to financing environmental objectives, including nature and biodiversity, from EU funds is based for the most part on integration. In theory, this means that environmental objectives should be adequately addressed in all EU policies and necessary funding dedicated for this purpose through related financial instruments. The 2007–2013 Mutiannual Financial Framework offers opportunities for co-financing of biodiversity and Natura 2000, among others under the LIFE+ instrument, the European Agricultural Fund for Rural Development (EAFRD), the European Agricultural Guarantee Fund (EAGF), the European Fisheries Fund (EFF), the Structural Funds (European Regional Development Fund (ERDF) and European Social Fund (ESF)) and the Cohesion Fund, and the 7th Framework Programme for Research (Annex 4 includes a short analysis of current biodiversity expenditure under these instruments).

National funding

It is not possible to assess the level of direct financial contributions to national biodiversity conservation activities from the information received from the Member States in the scope of the 2010 BAP assessment. However, as already indicated, EU funding made available to Member States which could be used for biodiversity purposes is not fully availed of.

As for national funding for biodiversity, 24 Member States have national programmes in place that identify long-term goals and the allocation of funding (both EU and national co-funding). Overall figures appear to be relatively low. For example, in France, expenses for

biodiversity and landscape conservation account for only 4.2% of the total environmental protection budget. The Biodiversity Action Plan 2010 assessment report provides information on the range of situations across Member States[128].

Global funding

Estimates of the current level of global funding for biodiversity and ecosystem services are wide-ranging. For instance, the TEEB report for Policy Makers estimates that biodiversity financing from different international sources and funds amounts to around USD 4–USD 5 billion a year. Another source estimates the range to be between USD 36-38 billion annually if one takes into account all funding sources, including traditional non-market mechanisms, innovative forms of finance, user fees, etc[129]. Official Development Assistance (ODA) from high-income countries provides up to USD 3.5 billion/year, mostly in the form of country-to-country bilateral aid, with the rest as multilateral aid managed by the Global Environment Facility (GEF), other UN agencies, the International Development Agency and multilateral development banks. The percentage spent on biodiversity conservation has remained consistently low over the past 15 years (2.4% to 2.8% of total bilateral ODA). Funding from non-profit organizations (mainly channelled through international conservation NGOs, private and business foundations) for international biodiversity protection contributes more than USD 1 billion/year, but relevant information and data are fragmentary. Market-based sources of income have grown quickly in the last 20 years and have the potential to contribute between USD 1–2 billion annually (Gutman and Davidson, 2007). These include international tourism, especially ecotourism, and markets for environmentally friendly products such as organic, certified and fair trade products.

8.1.2. Financing options in the EU 2020 Biodiversity strategy

As insufficient funding was a key factor in the failure to meet the 2010 EU target, it will be important to ensure adequate and effective funding for the implementation of the 2020 biodiversity strategy.

The review of the costs of the measures proposed in the Strategy indicates that funding needs will differ according to the targets and measures proposed. In some cases, more funds will be required to implement measures needed to achieve a given target, in particular for example for the restoration of ecosystems and the global target. In others, the focus will be more on redistributing existing resources and/or ensuring they are taken up to their full extent (agriculture and forestry, fisheries targets). The combination of funding sources is also likely to vary depending on the target. Various funding streams at different levels will come into play.

EU funding

At the EU level in particular, and without pre-empting the outcome of the negotiations on the next Multi-annual Financial Framework, opportunities offered in the framework of ongoing or upcoming policy reforms (e.g. CAP, CFP, Cohesion Policy), new policy initiatives (e.g. the Resource Efficiency flagship initiative) and the coming Multiannual Financial Framework should be seized in support of the strategy. Research funding under the eighth framework programme will contribute to closing identified knowledge gaps and supporting policy.

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128 http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/bap_2010/4%20EC_Knowledge_Base_Assessment_BAP_final.pdf

129 Global Canopy Programme, The Little Biodiversity Finance Book, 2010.

Finally, it will be important to maximise synergies between finance for biodiversity and climate change related activities, since these can often be mutually supportive.

The Commission may envisage a Common Strategic Framework (CSF) to set out the priorities of five important EU funds (EAFRD, ERDF, ESF, Cohesion Fund, and the EFF), and their contributions to achieving the objectives of Europe 2020, with a view to better complementarity at EU level. Given that in the current context efforts to ensure complementarity are essentially made at national and regional level, an adequate integration of biodiversity and nature conservation objectives in this framework could help funds work together at sub-regional level and to support integrated projects. Member States concerned would need to develop good strategies to make the best use of the funds available in line with the EU biodiversity and EU2020 priorities. Life+ could also be used as a catalyser to fund integrated projects that would attract funding from other sources. This would contribute to addressing some of the factors behind low uptake of current financing availabilities.

EU funding is an option considered in all targets. Two specific funding-related initiatives, stand out in particular. The first concerns the need for adequate financing for the Natura 2000 network, which is essential for its full implementation. This may entail that Member States develop multi-annual planning for Natura 2000, consistent with the prioritized action frameworks required under the Habitats Directive. The second responds to the COP10 commitment to substantially increase financial resources from all sources for the effective implementation of the Nagoya outcomes. These commitments will need to be met through dedicated additional funding for biodiversity and well designed synergies with other relevant funding sources, such as climate change (e.g. REDD+, Green Climate Fund). Other EU funding instruments would be used to reach other targets: e.g. Structural funds and CAP funds for the Restoration and Green Infrastructure Target, CAP funds and Life + for the Agriculture and Forestry targets, the new Fisheries fund for the Fisheries target.

Contribution of the European Outermost Regions (ORs) and Overseas Countries and Territories (OCTs) to the achievement of the targets

ORs and OCTs are home to exceptional biodiversity and more endemic species than on the whole of continental Europe. Guyane alone hosts the largest protected area and only tropical forest in the EU. These territories can greatly contribute to the achievement of the biodiversity headline target and vision. However, due to local conditions and specificities, the biodiversity of ORs and OCTs is more much vulnerable to certain pressures such as invasive species and climate change. This will need to be recognised and addressed as part of the Strategy, including through adequate future funding.

National funding

Sufficient funding will also be needed at national level. The reform of harmful subsidies, as highlighted in the 2020 Strategy, would offer opportunities to redirect funds towards positive incentives, which could include more sustainable and biodiversity friendly activities. This would be in line with the global target of the CBD Strategic Plan requiring that incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts.

Private funding

Although there has been limited use of market-based instruments or other innovative financial instruments in the field of biodiversity thus far, this appears to be a promising future source of biodiversity funding (see annex 14). It is also clear that the biodiversity challenge cannot be

addressed without such innovative tools, since public funding alone will not be sufficient, especially in light of budgetary constraints as a result of the current economic situation.

Transnational and international Payments for Ecosystem Services (PES) for global public goods (e.g. carbon sequestration through the proposed REDD scheme under UNFCCC) are amongst the most prominent recent proposals for environmental financing schemes: others include environmental taxes and public-private partnerships that link businesses, NGOs, public bodies and communities. To date, PES in the EU have mainly involved public funding – for example agri-environmental and forest-environment measures within the CAP. PES are also options to be considered for the Fisheries Target, and for the Restoration and Green Infrastructure Target. The private sector could be better engaged in PES, potentially through public-private partnerships.

Lessons learnt from existing habitat banking schemes in the United States and other countries, as well as pilot experiences in certain EU Member States (such as the UK, Germany and France), and other options to attract private partners into biodiversity conservation will need to be considered. A Commission study has shown that market incentives can stimulate private investment in biodiversity conservation and the potential and feasibility of habitat banking schemes at EU level is worth exploring in the context of discussions on restoration and 'no net loss' approaches[130]. Biodiversity offsets, and possibly habitat banking, could be considered in the Restoration and Green Infrastructure Target in the context of a possible initiative on no net loss of ecosystems and their services.

Examples of innovative financial instruments include green investment as part of the Corporate Social Responsibility strategy of companies and banks, or investments by insurance companies in the restoration of natural flood plains to prevent damage from natural disasters. Public contributions, in particular EU funding, can play a supporting role in the design of Public Private Partnerships to attract more investment from businesses in nature and the services it provides. Instruments to attract such investment can take the form of guarantee schemes, risk-sharing instruments, equity funds or a combination of grants for technical assistance with other financial instruments. The opportunity to use these to implement specific targets are under discussion with the European Investment Bank.

However, this will depend on businesses being aware of the importance of biodiversity for them and for the sustainability of their activities. The EU Business and Biodiversity Platform[131], which aims at providing support to businesses that actively engage in the conservation and sustainable use of biodiversity and prove that there are huge market opportunities for the businesses that take the lead on that challenge, is an ideal platform for exploring further the potential win-win opportunities of private sector investment in biodiversity conservation and sustainable use. PricewaterhouseCoopers estimated that sustainability-related global business opportunities in natural resources are significant (USD 2-6 trillion by 2050)[132].

Annexes 14 summarises the main financing mechanisms that can be envisaged for biodiversity, including both traditional and innovative financing instruments. Some of these mechanisms could be used in the EU to fund the costs of the measures in each sub-target, as a complement to the main EU funding sources, as discussed in chapter 6.

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130 EFTEC/IEEP – The use of market-based instruments for biodiversity protection- the case of habitat banking (2009).

131 http://www.business-biodiversity.eu

132 PricewaterhouseCoopers in TEEB for business report, 2010.

Global funding

An estimation of funding needs, a baseline for aggregated financial flows of biodiversity-related funding from a broad range of sources, public and private will be identified in the course of 2011/2012 and subsequently presented to the 11th meeting of the Conference of the Parties to the Convention on Biological Diversity. It is already clear, however, that more funding will be needed, and that public funding will not be sufficient to cover the costs of reaching the 2020 biodiversity global target. Although the reliability of the global financing needs are currently uncertain, with some estimates of up to USD 300-400 billion per annum, it is clear that private funding and the use of innovative financing instruments will need to be stepped up to meet these costs, at global, but also at EU and national level. The private sector's financial involvement in maintaining and enhancing biodiversity can also make sound economic sense[133].

8.2. Governance

As previously pointed out, the policy framework put in place to reach the 2010 target lacked a clear governance structure. This resulted in an unclear distribution of tasks, which in turn made it difficult to hold different actors to account for their responsibilities.

The **consultation** process followed in preparing the Strategy to date has involved a wide range of government, institutional, private and non-governmental actors. While the inputs received have been important in shaping the Strategy, achieving its objectives will require their continued involvement in the implementation phase. Indeed, in the public consultation on the 2020 EU biodiversity strategy, the involvement of all stakeholders and the full engagement of all actors concerned were highlighted as key conditions to halting biodiversity loss. It is therefore proposed that a clear governance scheme is established for the Strategy.

In terms of **institutional input**, the scheme established for the EU 2020 Strategy for smart, sustainable and inclusive growth can be looked to as a source of inspiration. In practice, this would mean that, following the adoption of the Commission Communication on the Strategy, the Parliament would be invited to adopt a Resolution, the Council to adopt Conclusions, and the European Economic and Social Committee and Committee of the Regions to adopt Opinions pertaining to the Strategy, its overall approach and the targets set out in it. EU institutions and Member States would then need to deliver on the relevant EU-wide targets and identify the level of ambition each needs to contribute to the wider EU effort, considering that the burden of tackling the challenge is spread unequally.

Each Member State would also need to incorporate these targets – complemented with corresponding national targets as necessary - into its own **National Biodiversity Strategy and Action Plan** as required under the CBD, taking into account both the EU targets and the global targets set out in the Strategic Plan 2011-2020, the majority of which are reflected in varying degrees in the proposed EU targets (see Annex 9).

Action will be needed at all administrative levels. Environment departments within National authorities are already engaged in the development and implementation of Biodiversity National Plans, but there is a need to actively involve other governmental departments.

The role of **local and regional authorities** will also be crucial in implementing the Strategy[134]. They have an especially important role in monitoring and assessing biodiversity

133 TEEB for businesses, July 2010.

134 The Committee of the Regions organised a specific consultation for local and regional authorities entitled "Assessment of Territorial Impacts of the EU Post 2010 Biodiversity Strategy", which ran from

and ecosystems, integrating biodiversity concerns into spatial planning, designating protected areas and ecological corridors, ensuring connectivity, putting in place incentives (positive and negative) for the private sector to be better engaged in biodiversity conservation, and enhancing public awareness and engagement in efforts to conserve the natural environment. In this respect, regional and local authorities should be equipped with adequate human, financial and technical means, commensurate to their responsibility and to the task of helping to stem biodiversity loss.

Progress towards reaching the EU 2020 biodiversity targets could be assessed as part of a dialogue between Member States and the Commission, in the form of a **common biodiversity implementation strategy** involving key actors, sectors and institutions as necessary, inspired by the successful approach of the WFD. This would also enable the consistency of national targets with the EU targets to be assessed. These are common goals to be pursued through a mix of national and EU level action The Commission will support and complement these national efforts by enforcing environmental legislation, filling the policy gaps by proposing new initiatives, providing guidelines, funding, and fostering the exchange of best practice.

It is also clear that **private sector engagement**, including businesses and banks, will be vital to achieving the targets. For that purpose the Commission will continue to work intensively on the Business and Biodiversity Platform. Similarly, the participation of civil society should be promoted and facilitated at all levels of implementation.

9. MONITORING, REVIEW, COMMUNICATION AND WAY FORWARD

9.1. Monitoring

The lack of a clear baseline against which progress could be monitored and measured in the EU contributed to the failure to meet the 2010 biodiversity target. Significant progress has since been made to improve data and knowledge about biodiversity. A common framework for evaluating progress towards the 2020 headline target is now in place through the Baseline developed by the European Environment Agency and its European Topic Centre on Biological Diversity. The Streamlining European 2010 Biodiversity Indicators (SEBI 2010)[135] and the Europe Corine Land Cover update are integral parts of the Baseline. All this information is publicly made available through the Biodiversity Information System for Europe (BISE), the single entry point for biodiversity information in Europe[136].

The work to develop the EU 2010 Biodiversity Baseline has shown that, although knowledge has significantly improved, there are still gaps that are relevant to biodiversity policy making, implementation and evaluation which need to be filled in the years to come[137]. Data gathering, analysis and validation have not followed a comprehensive approach. This might be due to the complexity of biodiversity, which cannot be reduced to a single variable but requires development of a set of inter-related indicators. For instance, establishing the state of soil biodiversity and assessing the risks of soil biodiversity loss requires the development of

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9 September to 25 October 2010. The responses received indicate that many local and regional authorities in the EU consider they will play a central role in the delivery of biodiversity targets.

135 Streamlining European 2010 Biodiversity Indicators process (SEBI 2010) is a partnership led by the European Environment Agency involving country representatives and experts from across the EU under which a set of 26 biodiversity indicators was agreed.

136 http://biodiversity.europa.eu

137 It does not, at this stage, differentiate the scale of gaps: some areas, topics and issues may require much more effort than others. Nor does it prioritise how the gaps should be addressed, for example via research activities, indicator and reporting frameworks, monitoring initiatives and so on (cf. EEA Technical Report n°12/2010 'EU 2010 Biodiversity Baseline', 2010).

reliable indicators so that long-term monitoring programmes can be set up[138]. In addition, reporting by Member States under the Birds and Habitats Directives has been uneven, as have biodiversity monitoring and research efforts, which remain underfunded. More integrated research is needed, especially on the links between biodiversity, ecosystem functioning, ecosystem services and natural capital. Discussions on the next Research Framework Programme provide an opportunity to address these gaps.

Increased capacity for indicator development and data collection and management, as well as better integrated and harmonised biodiversity-relevant indicators in Community policy and Member States, regions and the European level, especially Eurostat should be sought. Several initiatives are already under way to help collect, harmonise and provide access to data needed for integrated policy-relevant assessments. These include the Shared Environmental Information System (SEIS), the Inspire Directive, the Global Monitoring for Environment and Security (GMES) as an integral part of the recently adopted Digital Agenda for Europe[139]. The LUCAS surveys implemented by Eurostat will be a useful source of information for land cover, land use and agro-environmental issues. Specific ad hoc modules on biodiversity issues are foreseen to be added to future LUCAS surveys after 2012.

The Commission, together with other partners, will continue to address knowledge gaps, in particular on the links between biodiversity, ecosystems and their services, should be developed and supported with appropriate resources.

At the global level, the EU is supporting efforts to establish an Intergovernmental science policy Platform on Biodiversity and Ecosystem Services (IPBES), which would have a role similar to the Intergovernmental Panel on Climate Change (IPCC).

The adoption of an EU 2020 Biodiversity Strategy with a limited number of targets will require the consecutive development of a logical framework to monitor trends and assess progress on the measures and targets in a coherent way, based on clear baseline and a streamlined set of agreed indicators. Annex 15 summarises the available indicators that could be used to monitor the specific targets. Additional indicators may be needed to assess progress towards outcome-oriented targets and process of implementation of the EU Strategy (e.g. enabling monitoring and data collection of other relevant policies to follow-up on efforts and impacts of their measures). Indicators to be considered include SEBI indicators, Eurostat's Sustainable Development Indicators and Agro-Environmental Indicators, and other initiatives.

The development of more coherent and consistent assessment, monitoring and information schemes would bring significant benefits and efficiency gains by eliminating duplication of costs and efforts by different levels of government (EU, Member State, regional and global level). Such schemes would also generate cost efficiencies for biodiversity-related industries, which are all interested in a common, reliable information system to plan more efficiently their future investments and identify appropriate development sites, and benefit scientific research. Finally, it would reduce the costs of regulation, planning and decision-making and allow for informed policy-making, and therefore better targeted and less costly measures. At EU level, improving synergies between data collected under the CAP, CFP or regional policy and under dedicated biodiversity-related legislation, and devising joint monitoring systems would stimulate further mutual supportiveness between these policies.

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138 See the Executive Summary of the Soil Biodiversity Report, pp. 10-11.

139 See http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52010DC0245(01):EN:NOT) and more specifically 'eEnvironment' under the priority area on 'eGovernment' (2.7.4).

In the short term, the establishment of common principles and approaches for the development of more integrated monitoring schemes would impose costs on government. In order to minimize the administrative burden, the Commission, in consultation with the Member States, will develop, in time to provide information for the mid-term review of the Strategy, a set of indicators building on SEBI 2010 that also takes into account and is streamlined to the extent possible with the framework to be adopted under the CBD at the next Conference of the Parties.

9.2. Reporting and review

To ensure that the EU remains on track towards reaching its 2020 headline target, the Strategy will need to be reviewed so that eventual gaps and shortcomings in implementation can be spotted and addressed in good time. A **mid-term review of the Strategy** will be completed in early 2014 at the latest, following the forthcoming CAP and CFP policy reforms and agreement on the next Multiannual Financial Framework. This review should be informed by: the Biodiversity Baseline, which will be periodically updated, taking into account the next streamlined conservation status assessment under the Habitats and Birds Directives; reporting and evaluations carried out under the Water Framework Directive and the Marine Strategy Framework Directive, and other relevant processes at EU and Member State level. A final assessment of the Strategy should be carried out in 2020.

In order to minimize the administrative burden, the Commission, in consultation with the Member States, will develop, in time for the mid-term review, **a reporting system** that also takes into account and is **streamlined and aligned** with the review and reporting obligations under the CBD wherever possible. The 10th Conference of the Parties to the CBD in October 2010 set a deadline of 31 March 2014 for the next national reports under the Convention[140].

9.3. Communication and awareness raising

Insufficient awareness and political will was highlighted as one of the factors that contributed to the failure to reach the EU 2010 biodiversity target. In recent years, communication and raise awareness raising efforts were stepped up, especially during the 2010 International Year of Biodiversity. The Commission launched a major biodiversity awareness raising campaign for this purpose in early 2010. However, it is clear that this is an ongoing challenge underpinning the achievement of all other targets, and cannot be achieved through a single activity or measure, but rather needs to be pursued as a cross-cutting issue at all levels of government and in all relevant sectors to be effective. For instance, among the measures proposed under T5 involves a communication campaign on Natura 2000 to be carried out by the Commission. Similar actions will need to be envisaged and regularly carried out to increase **public understanding** of the role that individuals, businesses, public authorities and other actors can play in conserving biodiversity and restoring ecosystems, and the benefits they derive from it.

9.4. Next steps

The 2020 Biodiversity Strategy Communication defines the **biodiversity priorities** for the next ten years, sets the agenda for achieving the 2020 headline target and outlines actions to be taken in order to ensure full implementation of the Birds and Habitats Directives, maintain

[140] Parties should submit their fifth national reports to the CBD Secretariat by 31 March 2014. The reports are expected to focus inter alia on the implementation of the Strategic Plan 2011-2020 and progress toward the 2020 targets, using indicators where possible and feasible, and provide an update on status and trends of and threats to biodiversity, using national biodiversity indicators.

and enhance ecosystems and the services they provide, ensure the further contribution of agriculture and forestry to maintaining and enhancing biodiversity, ensure the sustainable use of fisheries resources, reduce the impact of invasive alien species on EU biodiversity and step up the EU contribution to global biodiversity.

On the basis of these priorities and the actions presented, the Commission will come forward with concrete **proposals and initiatives** to deliver on the different components of the Strategy, some of which are already announced in the Strategy (see table 4). Ongoing policy reform processes, including those of the CAP, CFP and Cohesion Policy, provide timely opportunities to enhance synergies and maximise coherence with the biodiversity strategy targets and measures. Efforts were made to **align the options for targets and measures** discussed in this report with the options discussed in the **parallel sectoral impact assessments** to ensure consistency. The evidence necessary to further underpin and operationalise proposed orientations and measures will be provided in this context, including through further stakeholder consultations.

Expected date	Planned initiative(s)	Planned IA	Milestones & New knowledge expected
2011	- Commission's proposal on CAP reform - Commission's proposal on the new Multiannual Financial Framework (MFF) - Commission's proposal on CFP reform	IA IA	- Fitness check of water-related policies - UNFCCC COP-17
2012	- Blueprint to safeguard EU waters - Commission initiative on green infrastructure (green paper) - Communication campaign on Natura 2000 - Commission proposal on Access and Benefit Sharing - Revision of the Plant and Animal Health regimes - Commission proposal on Invasive Alien Species - New MFF agreed; Financial regulation in place	IA IA IA IA	- CBD COP-11 negotiations on financial targets - Completion of the Natura 2000 network - Initial assessment of the status or marine waters, and characteristics of Good Environmental Status - UNFCCC COP-18 […]
2014	- Strategic restoration prioritisation framework - Review of the 2020 Biodiversity targets		- Ecosystem services mapped and assessed - Updated assessment of conservation status under the Nature Directives - Update of the EU biodiversity baseline - CBD COP-12
2015	- Commission initiative on no net loss of ecosystems and ecosystem services	IA (proportionate to type of initiative)	- MSY achieved for all fish stocks - Good Ecological Status required under the WFD

Table 4: Planned initiatives linked with the biodiversity strategy, associated planned IA, and new knowledge expected

The **2014 review of the Strategy** will coincide with new information on the state of biodiversity in different types of ecosystems, progress of implementation of relevant legislation, and the start of the practical implementation of the reformed CAP and CFP. It will be an opportunity to **review the targets and adapt them** if warranted by this new information. The Commission may consider further and complementary steps reflecting relevant developments and emerging priorities at national, EU and global level. In particular, the finalisation of the new Multiannual Financial Framework and decisions about the modalities of the future Community instruments to be completed by 2012, developments

arising from the CBD on global biodiversity financing by 2012 and relevant decisions under the UN Framework Convention on Combating Climate Change (e.g. REDD and LULUCF) will need to be factored into the implementation of the Strategy.

Due to the long lead-in times for biodiversity policy changes to be reflected in improvements on the ground, taking action today is essential to ensure that the structural changes needed for the ecological recapitalisation which the Strategy is seeking to achieve will be completed in due time to respond to the 2020 challenge.

Glossary

Biodiversity: The variability among living organisms from all sources including terrestrial (above and below ground), marine and other aquatic ecosystems and the ecological complexes of which they are part. This concept covers the diversity of genes, species and ecosystems.

Biodiversity loss: The long-term or permanent qualitative or quantitative reduction in components of biodiversity and their potential to provide goods and services, to be measured at global, regional and national levels.

Biogeographical region/level: Geographical regions in which animals and plant having similar or shared characteristics are typically found together. Europe features 13 biogeographical regions: 9 land (Alpine, Atlantic, Black Sea, Boreal, Continental, Macaronesian, Mediterranean, Pannonian, Steppic), and 4 marine regions (Atlantic, Baltic, Macaronesian, Mediterranean).

Connectivity: the extent to which ecosystems and natural areas are linked together in fragmented landscapes.

Conservation status: The status of habitats and species in terms of such parameters as distribution, structure and functions, population size, age structure, mortality and reproduction rates. The Habitats and Birds Directives define four categories of conservation status: 1) favourable; 2) unfavourable-inadequate; 3) unfavourable-bad; 4) unknown.

Corine Land Cover inventories: regular reports on the state of the European environmental landscape based on interpretation of satellite images.

Drivers of biodiversity loss: Factors (natural or human-induced) that lead to changes in the status of biodiversity. Drivers can be direct (e.g. land-use change, overexploitation, pollution) or indirect (e.g. lifestyle choices, population growth).

Ecological Maximum Sustainable Yield (EMSY) is the yield an ecosystem can sustain without shifting to an undesired state.

Ecosystem: A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

Ecosystem services: The direct and indirect contributions of ecosystems to human well-being. They can be categorised in four main types: provisioning services (e.g. food, water, fuel); regulating services (e.g. flood and disease control); supporting/habitat services (e.g. nutrient cycling); and cultural services (e.g. recreation).

Ecosystem restoration: The return of an ecosystem to its original community structure, natural complement of species, and natural functions.

Fragmentation: the division of an ecosystem or habitat into distinct parts. Fragmentation can result from infrastructure development, such as roads and railways, or natural occurrences like forest fires.

Green infrastructure: A spatial intervention that has one or several environmental aims, among which to ensure the maintenance and restoration of ecosystem functioning, enhance ecosystem services, facilitate habitat connectivity and promote species resilience. Green

infrastructure can mobilise an array of practices and innovative solutions that use natural systems to enhance overall environmental quality and the provision of ecosystem services.

High Nature Value (HNV) areas: farmland/forested areas characterised by high biodiversity. HNV farming and forestry are generally low-input systems, usually based on extensive rather than intensive agricultural practices.

IUCN Red List: A list established and maintained by the International Union for the Conservation of Nature (IUCN) that classifies evaluated species for which there is enough data into 7 categories: extinct, extinct in the wild, critically endangered, endangered, vulnerable, near threatened, least concern. It is widely used as an indicator of biodiversity trends.

Maximum Sustainable Yield (MSY): the maximum long-term average yield that can be produced by a fish stock on a continuing basis.

Pressures: Habitat loss, overexploitation of natural resources, the introduction and spread of invasive species, pollution and climate change are the five key pressures on biodiversity

Resilience: The ability of an ecosystem to buffer and adapt to changes as well as recover after being disturbed.

Restoration: Actively assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed, although natural regeneration may suffice in cases of low degradation. The objective should be the return of an ecosystem to its original community structure, natural complement of species, and natural functions to ensure the continued provision of services in the long term.

EUROPEAN COMMISSION

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SEC(2011) 540 final

COMMISSION STAFF WORKING PAPER

Annexes to the IMPACT ASSESSMENT

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Our life insurance, our natural capital: an EU biodiversity strategy to 2020

{COM(2011) 244 final}
{SEC(2011) 541 final}

ANNEXES

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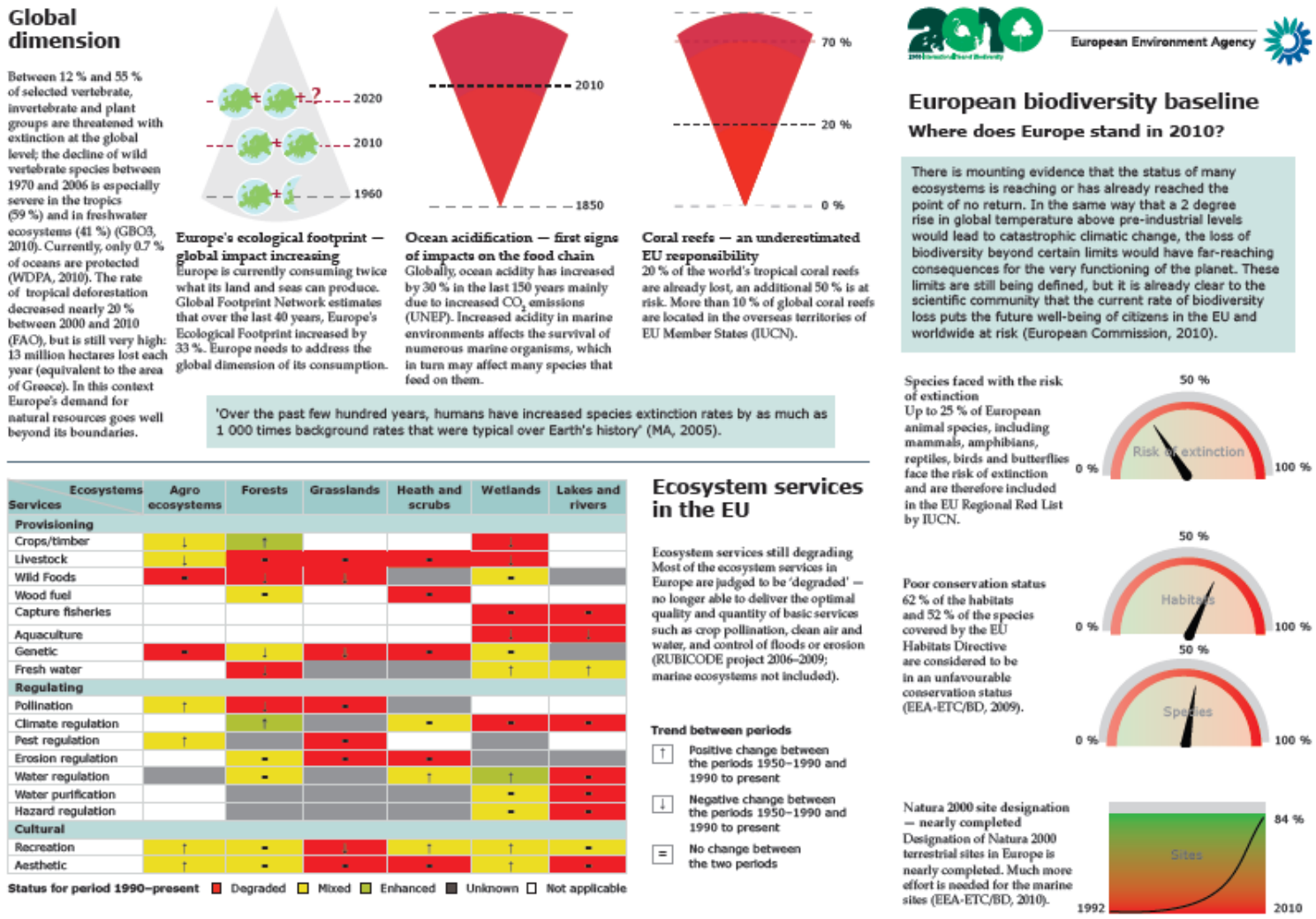
ANNEX 1 – EU 2010 BIODIVERSITY BASELINE



Services \ Ecosystems	Agro ecosystems	Forests	Grasslands	Heath and scrubs	Wetlands	Lakes and rivers
Provisioning						
Crops/timber	↓	↑			↓	
Livestock	↓	-	-	-	↓	
Wild Foods	-	↓	↓		-	
Wood fuel		-		-		
Capture fisheries					-	-
Aquaculture					↓	↓
Genetic	-	↓	↓	-	-	
Fresh water		↓			↑	↑
Regulating						
Pollination	↑	↓	-			
Climate regulation		↑		-	-	-
Pest regulation	↑		-			
Erosion regulation		-	-	-		
Water regulation		-		↑	↑	-
Water purification					-	-
Hazard regulation					-	-
Cultural						
Recreation	↑	-	↓	↑	↑	-
Aesthetic	↑	-	-	-	↑	-

Threats

The main causes of biodiversity loss are changes in natural habitats. These are mostly due to: intensive agricultural production systems and land abandonment; construction and transport (fragmentation); overexploitation of forests, oceans, rivers, lakes and soils; invasion of alien species; pollution; and — increasingly — climate change. For any policy to be effective in maintaining and restoring biodiversity in Europe, it must address these threats.

Habitat loss — a major concern
70 % of species are threatened by the loss of their habitat (IUCN). Farmland birds declined by 20–25 % between 1990 and 2007 (Eurostat, 2010).

Overexploitation — more sustainability needed
30 % of species are threatened by overexploitation (IUCN). For instance: 88 % of stocks are being fished beyond Maximum Sustainable Yields (ICES, 2008) and 46 % outside safe biological limits, which means that stocks may not be replenished (EEA, 2010).

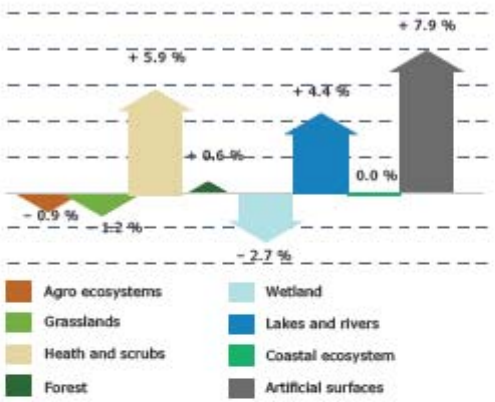
Pollution — improvements in some areas
Despite improvements in some areas, 26 % of species are threatened by pesticides, and fertilisers like nitrates and phosphates (IUCN).

Invasive alien species — an increasing phenomenon
22 % of species are threatened by invasive alien species (IUCN).

Climate change
Shifts in habitats and species distribution are being observed, so is desertification. Climate change interacts and often exacerbates other threats.

Ecosystems

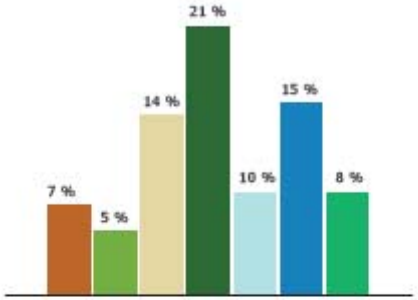
Changes in ecosystems between 1990 and 2006



Natural areas still being lost
The latest Corine Land Cover inventory (EEA, 2010) shows a continued expansion of artificial surfaces (e.g. urban sprawl, infrastructure) and abandoned land at the expense of agricultural land, grasslands and wetlands across Europe. Natural grasslands are still being turned into arable land and built-up areas. The loss of wetlands has slowed down (near 3 % lost in the last 16 years) but Europe had already lost more than half of its wetlands before 1990. Extensive agricultural land is being converted into forms of more intensive agriculture and for parts into forest.

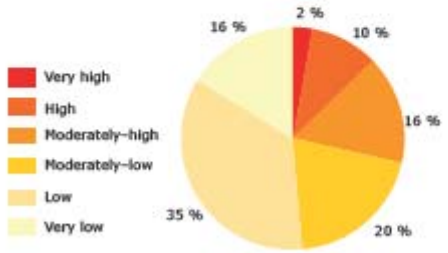
Exploiting natural resources at current rates is steadily reducing biodiversity and degrading ecosystems. Simply designating protected areas is not enough to halt this decline. Biodiversity must be further integrated into other relevant policies (agriculture, fisheries, energy, transport, structural policies and development). To monitor progress and measure trends beyond 2010, the European Environment Agency and the European Commission have developed a 'baseline' — a snapshot of the current state of biodiversity to establish the evidence base necessary for stepping up EU action to address the global biodiversity crisis now. For further information please see www.biodiversity.europa.eu.

Favourable conservation status of habitats



Habitats in ecosystems — poor conservation status overall
The progress report for Article 17 of the EU Habitats Directive for the period 2001–2006 shows that the conservation status of species and habitats characteristic of the main ecosystems is poor. Depending on the ecosystem, the proportion of habitats in favourable conservation status is between 5 and 21 %.

Fragmentation in EU-27 (% of total area)



Fragmentation threatens EU green infrastructure
The fragmentation of nearly 30 % of EU-27 land is moderately-high to very high due to urban sprawl and infrastructure development. Fragmentation affects ecosystem connectivity and their health and ability to provide services (EEA, ETC/LUSI, 2010).

ANNEX 2 – CONSULTATION AND EXPERTISE UP TO THE ADOPTION OF THE POST-2010 EU BIODIVERSITY TARGET

Towards an EU vision and a new target for biodiversity

Since the completion of the mid-term assessment of the BAP[1], all the European institutions and many Member States, organisations and stakeholders have pronounced themselves on the 2010 biodiversity targets and the need to look beyond 2010.

High Level Conclusions

In April 2009, **G8 Environment Ministers** adopted the "Carta di Siracusa" on Biodiversity, which proposes a "common path toward the post-2010 framework on biodiversity". This was subsequently endorsed by **G8 Leaders** at their Summit in l'Aquila, Italy in July 2009, who underlined *"the necessity to establish a vision and an ambitious and achievable common framework for biodiversity beyond 2010, making use of the synergies between climate change and biodiversity policies."*

European institutions

The **Council** has expressed its views on the way forward on biodiversity after 2010 in different sets of Conclusions. In its **March 2009** Conclusions the **Environment Council** *"UNDERLINES the need to establish, by mid-2010 at the latest, a vision and targets beyond 2010 for the conservation and sustainable use of biodiversity within the EU, building on and contributing to deliberations at global level on a vision for biodiversity beyond 2010"*. The **June 2009 Council** reiterated this request. Additionally, in its Conclusions[2] on 'A mid-term assessment of implementing the EU Biodiversity Action Plan and Towards an EU Strategy on Invasive Alien Species' the **Environment Council** expressed its deep concern that the EU is unlikely to meet its 2010 target of halting biodiversity decline. It further stressed that biodiversity loss is extremely worrying on account of both its important intrinsic value and because it results in a decline in ecosystem functions that are essential in providing vital services which underpin long-term sustainable development, and on which a healthy environment, food security and human livelihoods, particularly for the world's poorest, depend. The Council also called for greater synergies between measures for climate change mitigation and adaptation and for combating land degradation and desertification and the conservation and sustainable use of biodiversity and ecosystems, in order to fully exploit and maximise co-benefits. The **European Council** stressed in its **Conclusion of December 2009**[3] the urgent need for action and significant additional efforts to, among others, reverse the current loss of biodiversity and natural resources in order to reach the goal of sustainable development.

The **European Parliament Intergroup on Climate Change and Biodiversity** hosted in 2009 a high-level international conference *'The 2010 Biodiversity Challenge: Will the EU reach it? What future after 2010?'* on the EU Biodiversity Action Plan (BAP). The conference discussed the BAP mid-term review, and focused on defining future targets and the post-2010 vision. The participants acknowledged that some progress had been made in certain areas, but

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1 COM (2008) 864 final.
2 (ST/11412/09) of 25 June 2009.
3 EUCO 6/09; 10/11 December 2009.

that more still has to be done to halt biodiversity loss. The need for better integration of biodiversity into other policy sectors, the lack of adequate funding and the economic dimension of biodiversity and ecosystem services was stressed.

The opinion of the **European Economic and Social Committee**[4] on the BAP Mid-term assessment gave specific recommendations on a post-2010 EU biodiversity policy, pointing out that mainstreaming of biodiversity considerations has not yet been achieved, and that the economic value of biodiversity has not yet been taken into account when defining policies.

The **Committee of the Regions**[5] adopted a specific opinion on a new impetus for halting biodiversity loss, in which it notes the failure of policies to stem the erosion of biodiversity in Europe by 2010. It suggests that a proactive strategy is required, reflected in a systemic approach and supported over the long-term, well beyond 2010. The Opinion stresses that this strategy must fully involve local and regional authorities.

The **Commission** has engaged in a broad and long consultation within its services, using the **Biodiversity Inter-service Coordination Group** to exchange views and collect information on the progress to target, on the options for a new post-2010 biodiversity target for the adoption of the Communication on options for a post 2010 target and vision, and on the way towards a new EU biodiversity strategy. Regular meetings were hold and the BISCG has been convened 5 times in the space of one year.

- *Stakeholder and Member State consultations*

The German CBD Presidency organised a high-level stakeholder event entitled '**High-level working group on the future of global targets for biodiversity**' (9-10 March 2009, Bonn).

The Commission organised the **Biodiversity Protection – Beyond 2010 Conference** (April 2009, Athens), which resulted in the adoption of "The Message from Athens", an eight-point plan for future action to confront the ongoing global biodiversity crisis. As regards the post-2010 vision and target, this inter alia called upon the EU institutions and Member States to develop a clear target on biodiversity[6].

- The Commission has used the opportunity offered by meetings of the **EC Coordination Group for Biodiversity and Nature (CGBN)** and **EU Nature Directors** to consult EU Member States, environmental NGOs and biodiversity user groups (agriculture, forests, business, fisheries sectors, etc.) on their views on a post-2010 biodiversity vision and target.

European institutions

Already in March 2009, the Environment Council underlined the need to establish, by mid-2010 at the latest, a vision and targets beyond 2010 for the conservation and sustainable use of biodiversity within the EU, building on and contributing to deliberations at global level on a vision for biodiversity beyond 2010.[7]

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4 Opinion (Nat/436) adopted on 15 July 2009.
5 Opinion CoR 22/2009 adopted on 18 June 2009.
6 http://ec.europa.eu/environment/nature/biodiversity/conference/
7 7065/09 conclusions adopted by the Council (Environment); 3 March 2009.

One year later, on 15 March 2010, the **Environment Council**[8] agreed on:

- a long-term vision that by 2050 European Union biodiversity and the ecosystem services it provides – its natural capital – are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided;

- a headline target of halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss, for the above vision to be achieved.

It also outlined the EU's stance concerning biodiversity protection at global level. In addition, the conclusions call for reinforced mainstreaming of biodiversity objectives in cross-cutting EU policies and in the Strategy for Growth and Jobs (EU 2020 Strategy[9]) that was in preparation at the time, in order to maximise coherence and mutual supportiveness at the highest political level. Finally, it called upon the Commission in co-operation with Member States to develop an EU post-2010 Biodiversity Strategy proposing targets and also identifying the necessary, feasible and cost-effective measures and actions for reaching them, and to adopt the Strategy as soon as possible after the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity in October 2010, Nagoya (CBD COP 10).

The **Spring European Council** in its Conclusions of 25/26 March 2010[10] stressed the urgent need to reverse continuing trends of biodiversity loss and ecosystem degradation and the EU Heads of State and Government **committed themselves to the long term biodiversity 2050 vision and the 2020 target** set out in the Council's conclusions of 15 March 2010.

The **European Parliament** in its 21 September[11] Resolution expressed its concerns that the EU 2010 biodiversity target to significantly reduce the rate of biodiversity loss has not been met and stressed the urgency and importance of halting the loss of biodiversity. It called for ensuring a further mainstreaming of biodiversity into other EU policy areas, making the European Union's sectoral and budgetary policies more consistent; improving the integration of biodiversity criteria in decision-making processes at local and regional level in matters concerning land use and territorial policy, increasing the budget for research dedicated to biodiversity, ensuring synergies between actions taken for climate change and biodiversity, adopting measures to develop resource efficiency and sustainable consumption and production and improving the implementation of EU legislation. The EP adopted a further resolution on 7 October[12] stressing that the decisions to be taken needed to build on the recommendations of the study on 'The Economics of Ecosystems and Biodiversity'[13]; and underlining that more regard should be given to investigating and approving market instruments, to help ensure adequate financial resources for biodiversity.

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8 7536/10 conclusions adopted by the Council (Environment); 15 March 2010.

9 COM (2010) 2020 on "EUROPE 2020 – A strategy for smart, sustainable and inclusive growth".

10 The EUCO 7/10 conclusions of the European Council (25/26 March).

11 PE441.267v02-00 - European Parliament Resolution on the implementation of EU legislation aiming at the conservation of biodiversity.

12 P7_TA(2010)0353 European Parliament resolution on the EU strategic objectives for the 10th Meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD), to be held in Nagoya (Japan) from 18 to 29 October 2010.

13 www.teebweb.org

The **Committee of the Regions** in its June 2010 Opinion[14] expressed its concern about the serious consequences of increasing loss of biodiversity; welcomed the EU 2050 biodiversity vision and the new target for 2020 adopted by the Council and supported the call of the Council upon the European Commission to submit an EU 2020 Biodiversity Strategy, taking account of the results of the CBD COP 10. It highlighted that the EU 2020 Biodiversity Strategy should focus on a limited set of five to six targets including agriculture, fisheries and marine environments, land use and habitat destruction and fragmentation. Additionally, it stressed that there was a need for a significant increase of the financial means within post 2013 EU budgets to meet the targets and to improve the integrated model to fund biodiversity and Natura 2000; and highlighted the role of local and regional authorities in promoting a EU 2020 Biodiversity Strategy.

The **European Economic and Social Committee** in its September 2010 Opinion[15] expressed its concerns about the impacts of further loss of biodiversity, called to bring biodiversity higher on political agenda and stressed the need for enhanced integration, without which no biodiversity targets can be achieved. More specifically, EESC explicitly urged to introduce changes to the agricultural and fisheries policies, to secure and develop further the Natura 2000 network, called for the establishment and development of "green infrastructure" through a TEN biodiversity network and for stronger integration of biodiversity into all other EU policy areas as well as education campaigns at EU level.

- *Stakeholder and Member States consultations*

There have been intensive discussions with various internal and external experts and stakeholders. The 2020 EU Biodiversity Strategy has been developed in a close co-operation with Commission services concerned and also other groups outside EU institutions. Specifically, the Commission organised several stakeholder meetings (3 June 2010, 3 September 2010) and ran a public Internet consultation between 23 August and 22 October, which received 2905 responses. Over 80% of respondents felt that EU biodiversity policy measures did not have the necessary buy-in from other sectors. Close to 80% of respondents also said that the objectives of economic development were prioritized over biodiversity concerns, that the economic value of biodiversity for other sectors is underestimated and that the political will to tackle the issue has been insufficient.

Member States and other major constituencies were consulted at the meetings of the Nature Directors and the Co-ordination Group for Biodiversity and Nature. Additional ad hoc meetings with Member States' experts were also held.

Almost 80% of the respondents answered that the future actions to halt biodiversity loss should include measures and actions that go beyond nature conservation and most felt that in order to reach the EU's 2020 biodiversity target, existing EU environmental legislation is not sufficient and that additional measures focusing on other sectors are required. On the sub-target on agriculture and forestry – over 80% of respondents felt that the reformed Common Agricultural Policy should include more explicit biodiversity conservation objectives. On the target on fisheries, close to 80% of respondents felt that in order to contribute to a better conservation of biodiversity, the reformed Common Fisheries Policy (CFP) should include

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[14] ENVE-V-003 Opinion of the Committee of the Regions on "EU and International Biodiversity Policy beyond 2010".

[15] NAT/411 – CESE 1178/2010 Opinion on Biodiversity beyond 2010.

more explicit biodiversity conservation values. On the target on nature conservation over 80% felt that it should focus on an improved conservation status of species and habitats of community interests. On the target on Green infrastructure, almost 90% felt that the measures should focus on mitigating the adverse effects of transport and energy infrastructure, and almost 80% said that focus should also be on ecosystem restoration contributing to climate change mitigation and adaptation and natural disaster risk reduction. On the target on EU contribution to global biodiversity, most respondents also agreed with the proposed measures, especially (>80%) on ensuring that biodiversity concerns are systematically reflected in the EU's dialogue with third countries and on reducing the negative impacts of EU's production and consumption patterns on global biodiversity. http://ec.europa.eu/environment/consultations/pdf/biodecline_results.pdf provides a full report of the internet consultation.

ANNEX 3 – STUDIES CARRIED OUT BY THE COMMISSION, RESEARCH PROJECTS

The Commission has gathered a significant amount of information to support the development of a vision and target post 2010. Hereafter are listed the **most relevant studies and scientific findings** which have provided a crucial input to substantially strengthen the necessary knowledge base:

- Reports on the progress made in the implementation of the Biodiversity Action Plan[16]
- The UNEP's Millennium Ecosystem Assessment[17],
- The Economics of Ecosystems & Biodiversity (TEEB)[18],
- Assessing biodiversity in Europe – the 2010 report[19],
- The EU 2010 Biodiversity Baseline[20],
- The 3rd edition of the Global Biodiversity Outlook[21], the flagship publication of the Convention on Biological Diversity, which summarizes the latest data on status and trends of biodiversity and draws conclusions for the future strategy of the Convention.

Studies

- Commission Assessment of the Conservation Status of Habitat Types and Species[22]
- Studies on the "Value of Biodiversity, the assessment of the Cost of Policy Inaction (COPI), and on the drivers of biodiversity loss"[23]
- Study on the "Costs Benefits Assessment of measurement/monitoring systems of progress towards an EU post 2010 biodiversity target"
- Study on "Policy Options for a Future EU Biodiversity Strategy"
- Study "Soil biodiversity: functions, threats and tools for policy makers"[24]
- Literature study on the impacts of biodiversity changes on human health[25]

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16 Available at http://ec.europa.eu/environment/nature/biodiversity/comm2006/index_en.htm

17 Mace, G. et al. Biodiversity in Ecosystems and Human Wellbeing: Current State and Trends (eds Hassan, H., Scholes, R. & Ash, N.) Ch. 4, 79–115 (Island Press, 2005).

18 http://www.teebweb.org/

19 EEA Report No. 5/2010 http://www.eea.europa.eu/publications/assessing-biodiversity-in-europe-84

20 http://www.eea.europa.eu/publications/eu-2010-biodiversity-baseline/

21 http://gbo3.cbd.int/

22 COM(2009)358 final on the "Conservation Status of Habitat Types and Species as required under Article 17 of the Habitats Directive".

23 Available at http://ec.europa.eu/environment/enveco/biodiversity/index.htm

24 Available at http://ec.europa.eu/environment/soil/biodiversity.htm.

- Study on "The Social Dimension of Biodiversity Policy" [26]
- Study on "The use of market-based instruments for biodiversity protection – the case of habitat banking"[27]
- Technical support to EU Strategy on invasive alien species (IAS)[28]
- Assessment of reasons for 2010 target failure[29]
- Assessment of the EU Biodiversity Action Plan as a tool for implementing biodiversity policy[30]
- Impact Assessment accompanying the Commission Communication on invasive species[31]
- The assessments for the compilation of the latest European Red Data Lists [32]

Research Projects

- DAISIE[33] – Delivering Alien Invasive Species Inventories for Europe
- MACIS[34] – Minimisation of and Adaptation to Climate Change Impacts on Biodiversity
- ALARM[35] – Assessing Large scale Risks for biodiversity with Tested methods
- ALTER-Net[36] – A Long-Term Biodiversity, Ecosystem and Awareness Research Network
- MARBEF[37] – Marine Biodiversity and Ecosystem Functioning EU Network of Excellence
- RUBICODE[38] - Rationalising Biodiversity Conservation in Dynamic Ecosystems
- PRESS[39] - PEER Research on EcoSystem Services

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25 Zaghi, D., Calaciura, B., Spinelli, O., Basili, M., and R. Romi (2010). Comunità Ambiente Srl, report for the European Commission (Directorate General Environment), Contract 07-0307/2009/533527/ETU/B3. July 2010 (forthcoming).

26 Nunes, P.A.L.D., Ding, H., Ghermandi, A., Rayment, M., Varma, A., Pieterse, M. Lago, M., Görlach, B., Kapthengst, T. and P. ten Brink (2010). Final Report to the contract No. ENV.G.1/FRA/2006/0073 – 2nd, Contract: 070307/2009/550766/ETU/F1, pages vii-179, Italy, Venice 2010 (forthcoming).

27 Available at http://ec.europa.eu/environment/enveco/pdf/eftec_habitat_technical_report.pdf

28 http://ec.europa.eu/environment/nature/invasivealien/index_en.htm

29 Assessment report to Service contract 07.0307/2008/513998/SER/B2

30 Assessment report to Service contract nr 09/543261/B2 http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/bap_2010/4%20EC_Knowledge_Base_Assessment_BAP_final.pdf

31 COM(2008)789 final EU strategy on invasive species.

32 http://ec.europa.eu/environment/nature/conservation/species/redlist/index_en.htm

33 http://www.europe-aliens.org/

34 http://www.macis-project.net/

35 http://www.alarmproject.net/alarm/

36 http://www.alter-net.info

37 http://www.marbef.org

38 www.rubicode.net

39 http://www.peer.eu/projects/press/

ANNEX 4 – MAIN EU FUNDING INSTRUMENTS THAT CONTRIBUTE TO FINANCING EU BIODIVERSITY

The single instrument of the European Union directly targeted at supporting environment related projects across Europe is LIFE+, a part of which is used to support the development of nature, biodiversity and especially Natura 2000 (LIFE+ Nature and LIFE+ Biodiversity). Among others, LIFE+ supports biodiversity monitoring, the development of demonstration and best practice projects for management and restoration of Natura 2000 sites and facilitate projects outside Natura 2000, aimed at contributing to the progress towards achieving the EU biodiversity target. Despite the importance of LIFE+ as regards the only EU funding dedicated to biodiversity and nature, the LIFE programme amounts to less than 0.1 % of the EU budget in any recent year.

The Common Agricultural Policy (CAP), through the **European Agricultural Fund for Rural Development** (EAFRD)[40] provides approximately EUR 53.5 billion per year in funding for the agricultural and forestry sector, with a breakdown of EUR 42.7 billion (80%) for direct aids and market interventions (Pillar 1) and EUR 10.9 billion (20%) for rural development (Pillar 2). Support for biodiversity protection, management and restoration measures in agricultural and forest habitats is principally funded under Pillar 2. The most important measures for biodiversity are primarily those available under Axis 2 of the EAFRD, which are aimed at improving the environment and the countryside. These include Natura 2000 payments, Agri-environment payments and Forest-environment payments, Planned allocations under Axis 2 for the period 2007-2013 amount to 44% (approximately EUR 42.7 billion) of total EAFRD funding. Of these three measures, agri-environment payments account for the majority of EAFRD expenditure with approximately 23% of Rural Development Programme expenditure (roughly EUR 22.2 billion of the EAFRD across all Member States). But there is considerable variation in the proportion spent amongst the Members States. Budget allocations for the other two Axis 2 measures that may provide substantial biodiversity benefits are small in all Member States and absent in many. In particular, allocations for dedicated Natura 2000 measures (agriculture and forest) are very low, 0.62% of total EAFRD expenditure, or approximately EUR 590 million. However, quite a few Member States have chosen to finance Natura 2000 management essentially or solely via agri-environment.

In addition to the measures described above, the less favoured area (LFA) measure may provide some biodiversity benefits where it supports traditional low intensity farming systems that maintain certain semi-natural habitats and other high nature value farmland, as well as High Nature Value (HNV) farming. Two other measures under Axis 2 may also provide important biodiversity benefits: the non-productive investment measures for agriculture and for forests. These measures are sometimes used to provide one-off capital grants, e.g. for habitat restoration works. In addition, under axis 1, support for training, advisory services and environmental investments, and under axis 3, support for the conservation and upgrading of the rural heritage have a role to play in the preservation of biodiversity. Other pro-biodiversity instruments that may favour farmland biodiversity are cross-compliance, the decoupling of single farm payments and modulation.

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[40] Council Regulation 1698/2005 of 20 September 2005 on support for rural development by the European Agricultural Fund for Rural Development, OJ L 277, 21.10.2005.

The **European Agricultural Guarantee Fund** (EAGF) finances direct payments necessary to maintain farmers on land, therefore contributing to preventing land abandonment. In addition, it gives the possibility of financing agri-environmental measures under article 68 of horizontal regulation and agri-environmental measures under the Common market organisation for fruit and vegetables.

The **European Fisheries Fund**[41] (EFF) is designed to secure a sustainable European fishing and aquaculture industry. Assistance under the EFF shall aim to: support the Common Fisheries Policy (CFP) so as to ensure exploitation of living aquatic resources and support aquaculture in order to provide sustainability in economic, environmental and social terms; promote a sustainable balance between resources and the fishing capacity of the Community fishing fleet; promote a sustainable development of inland fishing; and foster the protection and enhancement of the environment and natural resources where related to the fisheries sector. Under the EFF, each Member State was required to adopt a national strategic plan and submit it with the Operational Programme document. The Operational Programme (OP) is the single document drawn up by the Member State and approved by the Commission containing a set of 'Priority Axes' to be achieved with the aid of the EFF. Axis 1 is for measures for the adaptation of the Community fishing fleet to ensure it is in balance with available resources; Axis 2 is for measures relating to aquaculture, inland fishing, processing and marketing of fishery and aquaculture products and requires the inclusion of aqua-environmental measures; Axis 3 is for measures of common interest (e.g. collective actions, protection and development of aquatic fauna and flora; fishing ports; development of new markets etc.); and Axis 4 is for actions that support the sustainable development of fisheries areas. Due to the structure of data collection on funding under EFF, it is not possible to give exact figures on EFF funds allocated to biodiversity and Natura 2000 purposes. The only available information concerns the total allocation of the EFF plus the national public contribution for each Priority Axis, and the total annual commitment of the EFF in the operational programme.

In relation to EU Cohesion Policy, the Community Strategic Guidelines and the relevant fund regulations include clear references to the importance of nature protection in developing infrastructure and in relation to economic diversification. The 2007-2013 programming period of the Cohesion Policy addresses directly the preservation of biodiversity under the **European Regional Development Fund** (ERDF), **European Social Fund** (ESF) and **Cohesion Fund** (CF). A few categories of the European Regional Development Fund (ERDF) and Cohesion Fund (CF) spending are related to the protection of biodiversity and management of natural resources[42]. The most relevant category is No. 51 the "Promotion of biodiversity and nature protection" (for which EUR 2 689 million has been allocated). Also highly relevant are the category No. 55 ("promotion of natural assets", for which EUR 1 137 million is allocated) and the category No. 56 ("protection and development of natural heritage", with a total of € 1 406 million) both of which might have some indirect, positive impact on our natural heritage.

It is the Member States' responsibility to select and implement the programmes and projects co-funded by the Cohesion Policy, along the strategy and priorities set in the National Strategic Reference Framework (NSRF) and the their National Development Plans and the relevant Operational Programmes (OPs). All but two Member States have allocated some funding for nature and biodiversity protection, although as a proportion of the overall allocations this varies considerably between countries. As it is shown in the 2010 BAP

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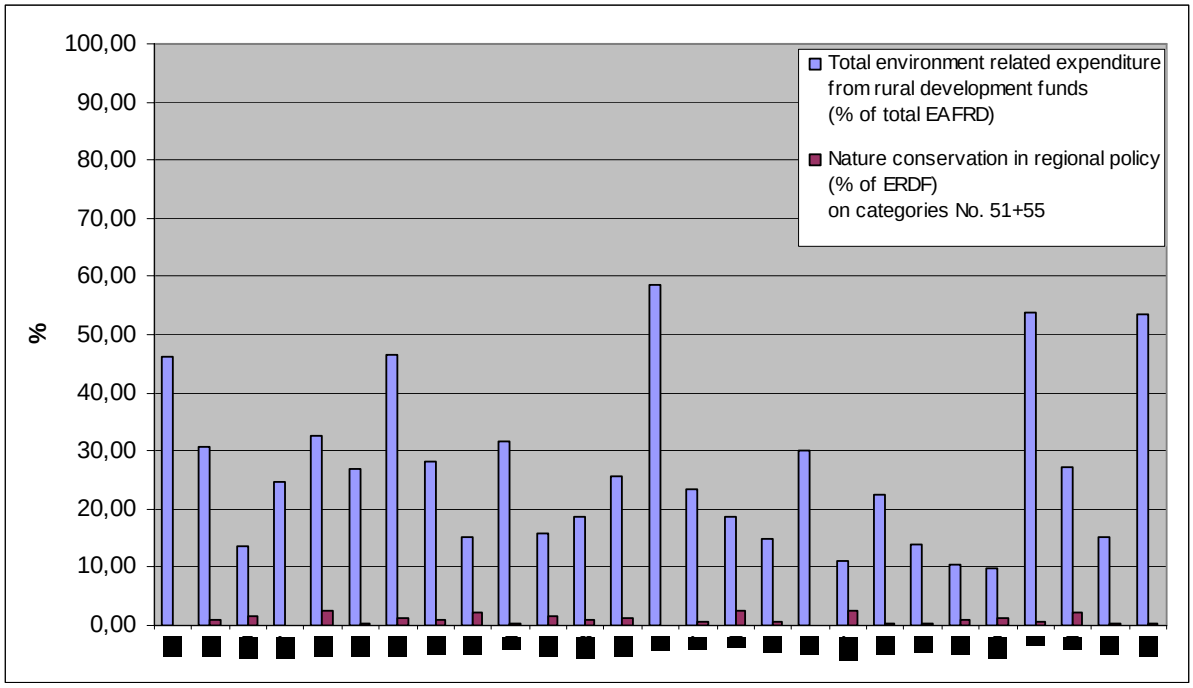
41 Council Regulation (EC) No 1198/2006.

42 See OJ L45 15/02/2007 and Commission Regulation EC n° 1828/2006 of 8 December 2006.

assessment, seven Member States intend to use more than 2% of their allocated funds for biodiversity related categories. Nonetheless, other categories can have indirect benefits on biodiversity such as "Management and distribution of water" (No. 45), "Water treatment" (No. 46), "Air quality" (No. 47), "Integrated prevention and pollution control" (No. 48), "Rehabilitation of industrial sites and contaminated land" (No. 50) or "Promotion of clean urban transport" (No. 52). For instance waste water treatment projects may contribute to preserve biodiversity in rivers and seas while natural risk prevention developments may also protect biodiversity through projects such as restoration of natural floodplains.

The **European Social Fund** (ESF) promotes employment and better prepared workforce and companies to face new challenges such as biodiversity protection. It is difficult to track accurately spending for nature protection under the ESF, however impacts can be positive just like in Spain where spending has been made to improve and adapt labour force and companies to new environmental challenges and to promote nature conservation into the private sector management. Additional support to the regional development funds are provided by European Territorial Cooperation schemes contributing to bi- or multilateral projects.



The comparison of allocation on direct and indirect measures for Natura 2000 and biodiversity from rural and regional development funds (state of October 2008; source: 2008 BAP assessment).

EU Research Framework Programmes (FP) also provide financial support for biodiversity-related research across. Thus far under the Environment Theme of the 7th Framework Programme (2007-2013), EUR 109.5 million have been allocated to projects aimed at the conservation and sustainable management of natural and man-made resources and biodiversity (sub-activity 6.2.1), out of a total budget of EUR 780.5 million. Also under the Environment theme, further financial resources have been allocated to biodiversity topics under sub-activity 6.2.2 (Management of marine environments) and 6.4.2 (Forecasting methods and assessment tools for sustainable development taking into account different scales of observation).

The **Environment and Natural Resources Thematic Programme (ENRTP)** is targeted at helping developing countries and partner organisations to address environmental and natural resource management issues. Concerning EU financing for global biodiversity, the total amount allocated to biodiversity specific projects for the period 2007-2010 under the ENRTP was almost EUR 70 million, while approximately EUR 110 million was committed for biodiversity related activities – equivalent to about EUR 44 million when using an adjustment factor to avoid overestimation, as biodiversity conservation is only a secondary objective[43]. This would represent a total amount of EUR 114 million for the period.

[43] The OECD DAC developed the so called "Rio markers" to help determining whether aid activities contribute to the objectives of the three Conventions – including the UN Convention on Biological Diversity (CBD). Activities receive a principal score (score "2") where the CBD is the principal objectives, and a significant score (score "1") where CBD is an important, but not principal objective. To avoid overestimation of the financial support for meeting the obligations of the CBD, EuropeAid proposes to apply a fixed adjustment factor to account for activities that are only partially relevant to the objectives of the CBD – that is, to consider 40% of the allocated budget if biodiversity conservation is only a secondary objective.

Target Funding instrument	Agriculture and Forestry		Fisheries		Invasive Alien Species		Nature Conservation		Restoration		Global biodiversity	
EU funding	**Main instruments**	**Budget**	**Main instruments**	**Budget**	**Main instruments**	**Budget**	**Main instruments**	**Budget**	**Main instruments**	**Budget**	**Main instruments**	**Budget**
	Common Agricultural Policy – European Agricultural Fund for Rural Development 2007-2013		Common Fisheries Policy – European Fisheries Fund	Due to the structure of data collection on funding under EFF, it is not possible to give exact figures on EFF funds allocated to biodiversity and Natura 2000 purposes	LIFE+	Less than 0.1% of total EU budget per year; out of which ca. EUR 119.5 million p.a. for LIFE+ Nature and LIFE+ Biodiversity	EAFRD Pillar 2 Axis 2: Natura 2000 payments payments + agri- and forest-environment payments	0.62% of total EAFRD for 2007-2013 + 44% of total EAFRD = EUR 42.7 billion	LIFE+	Less than 0.1% of total EU budget per year; out of which ca. EUR 119.5 million p.a. for LIFE+ Nature and LIFE+ Biodiversity	Environment and Natural Resources Thematic Programme 2007-2010	
	Pillar 2 Axis 1: measures on training, information and advisory services	n.a.	European Social Fund	n.a.			LIFE+	Less than 0.1% of total EU budget per year; out of which ca. EUR 119.5 million p.a. for LIFE+ Nature and LIFE+ Biodiversity	Pillar 2 Axis 2: land management and non-productive investment measures (especially Natura 2000 payments, agri- and forest-environment payments)	44% of total EAFRD = EUR 42.7 billion	Biodiversity	EUR 70 million

Target Funding instrument	Agriculture and Forestry		Fisheries		Invasive Alien Species		Nature Conservation		Restoration		Global biodiversity	
	Pillar 2 Axis 2: land management and non-productive investment measures (especially Natura 2000 payments, agri- and forest-environment payments)	44% of total EAFRD = EUR 42.7 billion					EFF protection and development of aquatic fauna and flora	n.a.			Projects with likely benefits to biodiversity	EUR 44 million[44]
	Pillar 2 Axis 3: measures for the conservation and upgrading of natural heritage	n.a.					European Regional Development Fund and Cohesion Fund 2007-2013				Geographic instruments (EDF, DCI, ENPI) 2007-2009	
							Promotion of biodiversity and nature protection	EUR 2689 million			Programmes with a focus on biodiversity	EUR 133 million
							Promotion of natural assets	EUR 1137 million			Programmes with likely benefits to biodiversity	EUR 100 million[45]
							Protection	EUR 1406				

44 Equivalent to the EUR 110 million spent on projects that might deliver biodiversity benefits, using the so called "Rio markers" developed by OECD DAC.

45 Equivalent to the EUR 255 million spent on projects that might deliver biodiversity benefits, using the so called "Rio markers" developed by OECD DAC.

Target Funding instrument	Agriculture and Forestry		Fisheries		Invasive Alien Species		Nature Conservation		Restoration		Global biodiversity	
							and development of natural heritage	million				

n.a. – data/information not available or the categorisation system of the funding instrument does not allow breakdown of allocations
Inclusion of the same funding stream in different cells does not refer to additional funding but indicates the relevance of funding for the target in question.

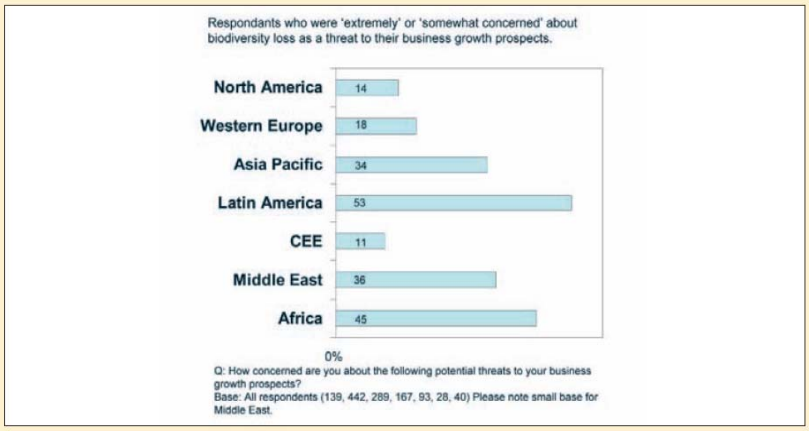
ANNEX 5 –AWARENESS ABOUT BIODIVERSITY

Public awareness about biodiversity loss is on the increase. This has led to changes in consumer preferences and purchasing decisions. Businesses, too, have begun to recognise the threats posed by biodiversity loss to their activities. Nonetheless, from available statistics it is clear that awareness remains insufficient and the urgency of the problem is largely unnoticed by the wider public.

A recent Eurobarometer survey shows that most Europeans still do not feel well informed about biodiversity. The new "Attitudes towards biodiversity" survey reveals that only 38% of Europeans know the meaning of the term, although another 28% have heard of it but do not know its meaning. A majority feel that biodiversity loss is a serious issue, although they do not think they will be personally affected by the decline, with only 17% of respondents agreeing that they are already touched by it. When asked about the most important threats to biodiversity, 27% prioritised pollution, with another 26% blaming man-made disasters. The main reason cited by citizens for their lack of actions to stop biodiversity loss was low awareness of what can be done.

Another survey of CEOs and their attitudes to biodiversity loss revealed that of the 1100 CEOs surveyed, only 27% expressed concern about the impacts of biodiversity loss on their business growth prospects[46]. Those expressing concern were more numerous in industries characterized by large direct impacts on biodiversity and in developing regions (Figure 1).

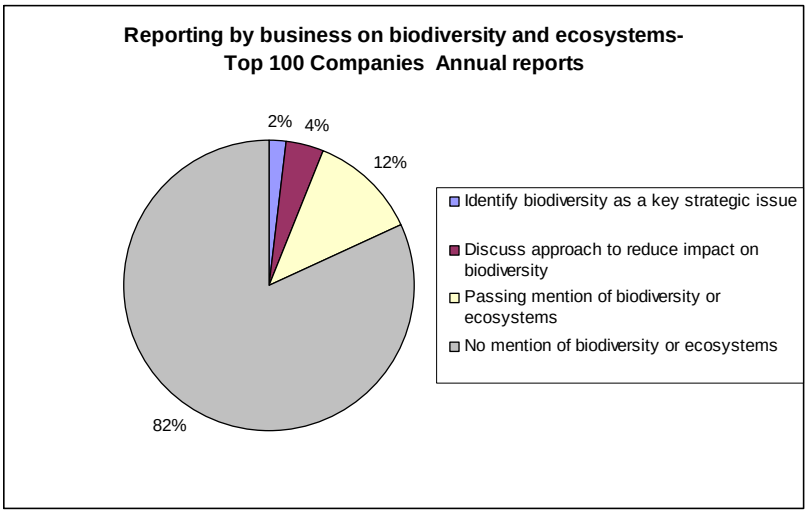
Figure 1: Views of global CEOs on the threat to business growth from biodiversity loss

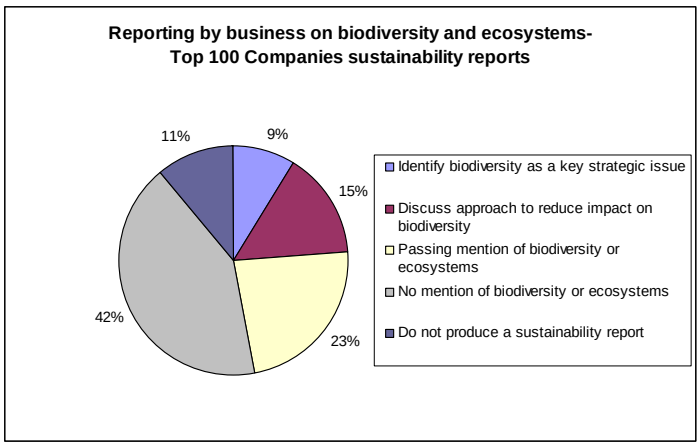


Source: PricewaterhouseCoopers 13th Annual Global CEO Survey 2010

The same survey assessed the annual reports and sustainability report of the top 100 companies in the world by revenue. Figures 2 and 3 show that very few companies actively consider biodiversity as a strategic issue or discuss ways of reducing the impacts of their activities on biodiversity. Not surprisingly, companies in sectors sometimes characterized by high impacts or dependency on biodiversity and ecosystem services (i.e. oil and gas, utilities, chemicals, big pharmaceutical companies and food retailers) are more likely to identify biodiversity as a key strategic issue (19% versus 9% overall) and are also more likely to report actions to reduce impacts on biodiversity (36% versus 24% overall).

46 PwC survey 2009.


Reporting by business on biodiversity and ecosystems-
Top 100 Companies Annual reports
2%
4%
12%
82%
Identify biodiversity as a key strategic issue
Discuss approach to reduce impact on biodiversity
Passing mention of biodiversity or ecosystems
No mention of biodiversity or ecosystems


Reporting by business on biodiversity and ecosystems-
Top 100 Companies sustainability reports
11%
9%
15%
42%
23%
Identify biodiversity as a key strategic issue
Discuss approach to reduce impact on biodiversity
Passing mention of biodiversity or ecosystems
No mention of biodiversity or ecosystems
Do not produce a sustainability report

ANNEX 6 – POLICY BASELINE

General overview of the likely impacts of different policies on reaching the 2020 EU biodiversity target [47]

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ES)	3. Restoration of biodiversity & ecosystem services	4. Counteracting increased loss of biodiversity at global level	Over-exploitation	Fragmentation	Climate change	Invasive species	Pollution
	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
Biodiversity policies Birds (1979) & Habitats (1992) Directives Biodiversity Action Plan (2006)	+++	++	+++	+++	+++	+++	+++	+++	++	+++	+
	+: Core of EU biodiversity policy is the Natura 2000 network of protected areas, species and habitats, based on strong legal basis in Habitats and Birds Directives	**+:** Connectivity is promoted within the nature directives (Article 10 of the Habitats Directive)	**+:** Natura 2000 marine species and sites	**+:** By protecting species and habitats and managing sites, nature directives highly contribute to maintenance of ES	**+:** Aims to achieve favourable conservation status; nature conservational objectives through proper management.	**+:** Protection of EU bio-diversity contributes global biodiversity through the protection of migratory species and ES and provides an example for other countries as it is the biggest network of protected areas	+: directly addressed in the BAP, Favourable Conservation Status	+: directly addressed in the BAP, Favourable Conservation Status, connectivity under Habitats Directive	+: directly addressed in the BAP	+: directly addressed in the BAP, LIFE projects	+: measures to protect biodiversity contributing to reduction of pollution

[47] The policy baseline was produced based on the study "Policy Options for a Future EU Biodiversity Strategy" and further developed based on the 2010 BAP report and inputs received throughout the discussions with members of the Biodiversity Inter-service Coordination Group. The table is structured in alphabetical order, biodiversity policy upfront.

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ES)	3. Restoration of biodiversity & ecosystem services	4. Counteracting increased loss of biodiversity at global level	Over-exploitation	Fragmentation	Climate change	Invasive species	Pollution
	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
						in the world; Initiative to develop 'Natura 2000-like' networks (BEST) in Outermost Regions and Overseas Territories					
		+: LIFE+ Biodiversity finances projects			+: LIFE+ Nature funding targeted directly at protection and restoration of Natura 2000 species, habitats and sites, which also contributes to ES restoration			+: Projects that prevent or mitigate			+: Projects that prevent or mitigate

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ES)	3. Restoration of biodiversity & ecosystem services	4. Counteracting increased loss of biodiversity at global level	Over-exploitation	Fragmentation	Climate change	Invasive species	Pollution
	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
LIFE+		delivering biodiversity benefits in the wider landscape (outside Natura 2000 areas) and contributing to biodiversity objectives					+: Projects that prevent or mitigate over-exploitation can be funded by LIFE+	fragmentation can be funded by LIFE+	+: Projects that prevent or mitigate climate change can be funded by LIFE+	+: Projects that prevent the introduction or establishment of IAS can be funded by LIFE+	pollution can be funded by LIFE+
Agriculture and Forestry policies CAP EU Forestry Strategy (1998); EU-Forestry Action Plan (FAP) for 2007-2011 Forest Focus Regulation Framework Directive on the Sustainable use of	+++/---	++/---	++	+++/--	++/---	--	--	+/--	--	--	+/--
	+: Some agricultural and forestry measures in the CAP can contribute significantly to biodiversity (e.g. Natura 2000 payments, HNV farming, Less Favourable Areas, organic farming) Various commitments in	+: Agri- and forest-environment schemes; Cross-compliance; organic farming -: Intensification with high input agriculture; marginalisation; land abandonment, monocultures. Use of invasive species, homogenous age	+: Cross-compliance can bring a reduction of nutrients in river effluent to sea -: Intensification can lead to increased use of nutrients	+: Appropriate management contributes to creation and maintenance of ES, public goods (e.g. food supply, soil functioning, timber, flood prevention, pollination). Forest Focus co-financing forest fires prevention activities and studies on forest	+: Some agri-environment measures and forest environment measures highly contribute to restoration and delivery of ES -: competition for land, trade offs,	+: Some positive measures can be replicated in other parts of the world. Natural and semi-natural forests are the most biodiversity rich ecosystems in Europe.	-: intensive agricultural management	+: hedgerows, pastures, set-aside areas etc. elements creating connectivity, conversion of arable land into grassland and forest. -: conversion of natural, semi-natural land into	-: intensive livestock, energy grass, non-permanent soil cover	+: rural development can be used to combat IAS and protect genetic resources and species/varieties under threat of extinction	+:support for organic farming, integrated production, nutrient management -: use of chemicals as well as fuel for cultivation purposes

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ES)	3. Restoration of biodiversity & ecosystem services	4. Counteracting increased loss of biodiversity at global level	Over-exploitation	Fragmentation	Climate change	Invasive species	Pollution
	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
Pesticides	the Forest Europe to protect biodiversity in forests **-:** Land abandonment and unsustainable agricultural practices can be very harmful to. Insufficient integration of biodiversity aspects in the management of forests	structure of forests		biodiversity **-:** Both intensification and land abandonment may decrease provision of ES, for example through damaging ES or leading to imbalanced provisioning of multiple ES		**-:** competition for land, intensification, increasing demand for food supply and production		arable land,			
Air policies	+	+	+	+	+	+	0	0	++	0	+++
Air Quality FWD, CAFÉ, NECD, VES, IPPC, LCP, Waste Incineration Directive, Thematic Strategy on Air Pollution	**+:** local reduction of N-deposition in protected areas	**+:** general reduction of deposition on land	**+:** general reduction of deposition on sea	**+:** general improvement of air quality good for all services	**+:** general improvement of air quality good for restoration initiatives	**+:** general improvement of air quality good for global biodiversity	Not using natural resources	No spatial dimension	+: reduction of emissions,	No major disturbance or activity that may lead to new introduction	+: all tools aimed at reducing pollution from different sources
Consumption /	+	+	+	+	0	+	+	0	+	0	++

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
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	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
Production policies IPP, EMAS, Ecolabel, ETAP, GPP, ERP, SICP/SIP action plan Environmental Liability Directive	**+:** indirect effect might come from demand for labelled products	**+:** indirect effect may be expected through demand for / supply of eco-products	**+:** indirect effect on marine biodiversity may be expected through demand for / supply of sustainable fisheries	**+:** indirect effect via eco-market on increase of multiple services in forestry, agri- & aqua-culture		**+:** eco-labels, certification of products and materials (e.g. forest, timber, fish and food) reduces ecological footprint	+: sustainability criteria	No necessary spatial dimension	+: sustainable production methods; reducing negative impacts of consumption, lower input demand	No inclusion of IAS criteria	+: long-term sustainability
Climate Change policies	++	++	++	+++	++	++	+	++	+++	+	+++
EU 20/20/20 climate change target White paper on adaptation to climate change (COM (2009) 0147) Reducing Emissions from Deforestation and Forest Degradation	**+:** general slow down of climate change	**+:** general slow down of climate change	**+:** general slow down of climate change	**+:** general slow down of climate change Improve the resilience of ecosystems through adaptation measures	**+:** general slow down of climate change and restoration of ecosystem services through adaptation and mitigation measures	**+:** general slow down of climate change; REDD funding to stop deforestation in biodiversity hotspots	+: REDD	+: building on ecosystem-based solutions, creating Green Infrastructure	Main objective of the package	+: Mitigation measures which will lead to lower migration of IAS	+: increased use of alternative energy sources, ETS

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ES)	3. Restoration of biodiversity & ecosystem services	4. Counteracting increased loss of biodiversity at global level	Over-exploitation	Fragmentation	Climate change	Invasive species	Pollution
	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
(REDD) Climate Change Programme (ICCP), European Emission Trading Scheme (ETS); UN Framework Convention on Climate Change (UNFCCC)											
Energy policies	+/-	+/-	+	-	-	+/-	0/-	-	+++	--	+++
EU Biomass Action Plan (up to 2010) Directive on the promotion of the use of energy from renewable sources	+: wind and solar energies contribute to GHGs emission reductions that lower pressure of climate change Sustainability criteria for biofuels that include restrictions on areas where raw material for biofuel production can be grown in	+: more use of renewable resources lowers pressures from grey energy -: increase demand on land to produce biomass and biofuels likely to lead to intensification of agriculture	+: Off-shore wing energy contributes to reducing GHGs emissions. In general, wind energy does not represent a serious threat to wildlife, but poorly designed wind farms can pose a potential threat to vulnerable species and	-: large areas devoted to energy-crops monocultures have low level of other services	-: potential competition with biofuel plantations	+: reduction of GHGs emissions and lower the pressure of climate change, -: direct and indirect land use changes due to increased EU biomass demand, with potential negative	- : possible overexploitation of soil and water by energy plantations	-: potential competition for land, conversion of semi-natural land into energy crop production/tree plantation	+: increased share of renewables, lower demand due to increased energy efficiency -:unsustainable practices of biomass production can in some cases lead to deforestation or soil carbon depletion	-: use of non native species as energy crops/trees	+: Increased use of renewable energy decrease pollutants

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ES)	3. Restoration of biodiversity & ecosystem services	4. Counteracting increased loss of biodiversity at global level	Over-exploitation	Fragmentation	Climate change	Invasive species	Pollution
	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
	order for those biofuels to be counted towards the 2020 targets and to benefit from financial support - potential conversion of natural/semi-natural land to biofuel plantations, biofuel plantation monocultures having less biodiversity		habitats.			consequences for biodversity in third countries					
External relations	+	+/-	+/-	+/--	-	--	-	0	+	--	-
Thematic Programme for Environment and Natural Resources **(ENRTP),** European Neighbourhood and Partnership Instrument (ENPI), Development	+: CBD, other biodiversity-targeted programmes and funding -: -: international trade can drive habitat loss in third countries	+: biodiversity-targeted programmes and funding -: -: international trade can drive overexploitation of resources in third countries	+: biodiversity-targeted programmes and funding -: -: international trade can drive overexploitation of resources	+: biodiversity-targeted programmes and funding -: -: international trade can drive overexploitation of ecosystems in third countries	+: biodiversity-targeted programmes and funding -: -: international trade can drive overexploitation of ecosystems in third countries	+: OCTs and ORs**,** Voluntary Partnership Agreements (VPA) under FLEGT	+: CITES, certification criteria -: international trade can drive overexploitation of resources in third		+: FLEGT, biodiversity targeted programmes	-: increased introduction of IAS through increased trade	-: increased pollution through increased trade and transport

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ES)	3. Restoration of biodiversity & ecosystem services	4. Counteracting increased loss of biodiversity at global level	Over-exploitation	Fragmentation	Climate change	Invasive species	Pollution
	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
Cooperation and Economic Cooperation Instrument (DCECI), **European Development Fund (EDF)** Millennium Development Goals (MDG) Global Environment Facility (GEF) CITES EU Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan Trade and other bi- or multilateral agreements			in third countries				countries				
Fisheries and	+/--	-	+++/---	+++/---	++/---	++	+/--	-	0	---	++

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ES)	3. Restoration of biodiversity & ecosystem services	4. Counteracting increased loss of biodiversity at global level	Over-exploitation	Fragmentation	Climate change	Invasive species	Pollution
	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
Marine policies CFP, Marine Strategy FWD (2008) , Integrated Coastal Zone Management, Illegal fishing (IUU)	**+:** extensive fish farming methods in protected areas, management and restoration plans for targeted species **-:** overfishing, intensive fishing destructive fishing practices, and unsustainable fish farming methods, overnutrification	-: intensive fish farming, use of invasive species, overnutrification	+: Total Allowable Catch (TAC) & Quota Regulation, Maximum Sustainable Yield of fish stocks, Community Action Plan for Sharks, combating Illegal, Unreported and Unregulated fishing -: Overfishing, harmful methods, by-catch	+: TAC & Quota -: Other uses of marine ecosystem (recreation) degraded	+: ecosystems based approach of Marine Strategy Framework Directive -: Intensive overfishing and destructive fishing practices destroying marine ecosystems	+: covering all EU seas and fleet -: EU / MS subsidies & lack of control on EU fleet enables fishing in grounds of developing countries	+: MSY, Good Environmental Status -: overfishing, by-catch, discard	-: degradation of sea bed, destructive practices	No direct mitigation and/or adaptation actions	-: Introduction and dispersal of IAS	+: MSY leading to reduction of fleet and fishing activities
Plant and Animal Health policies Plant health directive, animal health legislation (various directives and regulations)	+++	+++	0	++	0	0	0	0	0	+++	-
	+: Both regimes are under review and the possibility of expanding their	+: Both regimes are under review and the possibility of expanding their	Marine environment outside the scope	See first 2 columns: reducing the impact of invasive alien	Scope on prevention and eradication	Scope on EU	Scope on health and safety	Scope on health and safety	Scope on health and safety	+: the review of the Plant Health Regime to consider the inclusion of all	

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
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	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
	scope to include pest and diseases of wild species is under consideration; for the plant health regime, the possibility of including all invasive alien plants causing damage to the wider environment is being considered -: Control measures may cause direct damage to protected areas (e.g. tree felling against pinewood nematode) -: Control measures may cause indirect damage to protected areas (e.g. spreading pesticides)	scope to include pest and diseases of wild species is under consideration +: If plant health regime considers the inclusion of all invasive alien plants causing damage to the wider environment, this means that also aquatic plants would be included -: Control measures may cause direct and/or indirect damage to other lands or fresh water (e.g. spreading pesticides)		species will also be beneficial for the ecosystem services, control measures may also affect ecosystem services						invasive alien plants causing damage to the wider environment	

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ES)	3. Restoration of biodiversity & ecosystem services	4. Counteracting increased loss of biodiversity at global level	Over-exploitation	Fragmentation	Climate change	Invasive species	Pollution
	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
Regional development EU Regional Policy (ERDF, ESF, CF)	++/--	+/--	+/-	+/--	++/--	+	0	---	+/-	+/---	++/--
	+: investments directly benefiting biodiversity, compliance with regulations, -: fragmentation, competition for land, natural area clearing for infrastructure	+: contributions to environmental quality, investments in waste water treatment -: grey infrastructure & urban development, habitat destruction	-: development of ports and seashore investments putting at risk nature and biodiversity +: programmes and projects on integrated coastal management, coastal protection	+: environmental quality improvement, in particular for water bodies -: land for urban sprawl/ grey infrastructure	+: environ-mental quality improvement facilitates ESS, investment in Green Infrastructure, investments in rehabilitation of contaminated land, floodplains… -: land for urban / infrastructure	+: territorial cohesion, making EU businesses competitive thus reducing import rates		+: ecosystem based approaches -: grey infrastructure, strong spatial dimension, without built-in biodiversity criteria	+: energy efficiency, isolation, renewable energy investments -: no criterion to ensure no negative impact on climate change	+: projects/measures to reduce IAS in some programmes -:	+: investments in technologies reducing pollution (BAT) -: development of infrastructure and facilities increasing pollution
EIA/SEA	++	+	0	+	0	++	++	+++	0	0	+++
	+: aim to avoid destruction; mitigation and compensation measures	+: all major plans and projects covered		+: aim to avoid destruction; mitigation and compensation measures		+: assessments applied in Outermost Regions and Overseas Territories	+: aim to avoid destruction; mitigation and compensation measures	+: aim to avoid destruction; mitigation and compensation measures	Climate change not sufficiently addressed by EIA/SEA	IAS not addressed by EIA/SEA	+: complex assessment of all environmental impacts
Transport/	+/---	---	0/-	---	--	---	0	---	--	--	-

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ES)	3. Restoration of biodiversity & ecosystem services	4. Counteracting increased loss of biodiversity at global level	Over-exploitation	Fragmentation	Climate change	Invasive species	Pollution
	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
Infrastructure and Energy Trans European Networks TEN-T, TEN-E,	+: application of best practices minimising or eliminating negative impacts -: fragmentation, habitat loss, destruction of populations of protected species and habitats both during construction and functioning	**+:** new technology with lower pollution and noise levels, sustainable transport initiative **-:** expected increase in total transport volume, development of new transport infrastructures destroying habitats, no impact assessment on nature conservation criteria	-: conversion and urbanisation due to new infrastructures	**+:** new technology with lower pollution and noise levels -: expected increase in total transport volume, contribution to main pressures on biodiversity (pollution, climate change etc.)	+: compensation measures -: degradation, conversion, destruction	-: fragmentation and habitat loss adding up to the already fragmented EU	No direct policy measures on natural resources	-: conversion, habitat loss, fragmentation,	-: degraded ecosystems having lower mitigation and adaptation capabilities, increased traffic, higher fuel demand	-: IAS spreading along linear infrastructures; increased transport raising risk of IAS introduction	-: increased pollution
Water policies	+++	+++	+	+++	++	+	+	+	++	++	+++
Water Framework Directive, Flood risk management , Groundwater, Urban Wastewater Treatment Directive, Nitrates Directive,	**+:** improving ecological status of water and soil	**+:** improving ecological status of water and soil	**+:** in the long run improved ecological status in marine systems	**+:** regulating and cultural services improving (recreational, sport fishing)	**+:** enhances restoration projects, ecosystem based approaches e.g. for flood risk management	**+:** Improvement of the quality of river basins shared with third countries, .	+: good ecological status of water bodies	+: river basin management	+: flood risk prevention through Green Infrastructure	+: good ecological status	+: quality of both inland and ground water

Key EU policy area relevant for biodiversity	A. Contribution to achieving the 2020 EU biodiversity target						B. Contribution to reducing main pressures on biodiversity				
	1. Halting biodiversity loss			2. Halting degradation of ecosystem services (ES)	3. Restoration of biodiversity & ecosystem services	4. Counteracting increased loss of biodiversity at global level	Over-exploitation	Fragmentation	Climate change	Invasive species	Pollution
	a. Protected area/ species	b. Other land / fresh water	c. Marine environment								
Environmental Quality Standards Directive											

+++, ++, + = relevant; most, many and some positive results expected (policy present and effective);

-, --, --- = relevant; generally negative results expected (policy not present, or in-effective);

+/- = relevant; positive and negative results may vary across Europe; across policy tools; across species or habitats; or services;

0 = not relevant or not of significant importance

ANNEX 7 –ANALYSIS OF AGRICULTURAL AREA POTENTIALLY COVERED BY BIODIVERSITY-RELATED MEASURES

1. Rationale:

The aim is to estimate the area covered by the components of agricultural land that are likely to deliver the highest benefits if targeted by adequate measures. Grasslands and Natura 2000 have been highlighted as likely targets for payments in the communication on the future CAP reform. High Nature Value (HNV) is not explicitly highlighted, but would be covered by agri-environmental measures, as it is already done at present to some extent.

In addition, a proportion of more intensive arable land can also deliver biodiversity benefits through the use of complementary measures such as set-aside and crop-rotation, which were also highlighted as possible elements of the greening component of the first pillar in the new CAP.

Currently 22% of the Utilised Agricultural Area (UAA) is covered by some type of agri-environment contract. It can be assumed that about 15% of the UAA can be associated with biodiversity targets.

2. Data sources:

Eurostat produces official statistics on the use of utilised agricultural areas. The latest data (2007) for EU-27 are: 60% of UAA under arable land, 33% under grassland, and 6% under permanent crops.

Corine Land Cover (CLC) data are also a useful source of information, but do not correlate exactly with official statistics. Areas that are too small to be visible through remote sensing are not measured. In addition, some categories of agricultural land are classified in "heterogeneous" classes, making it difficult to estimate its components separately (arable, permanent crops and grasslands).

For example according to CLC data, grasslands represent only 22.5% of UAA. Comparing to official statistics, this means that about 10% of UAA as grassland are not directly measured, either because they are hidden in heterogeneous CLC agricultural categories[48] (i.e. complex cultivation patterns) or because they are embedded in other non-agricultural classes (i.e. forests). In addition, in some countries, natural vegetation such as moors and heathland, transitional woodland-shrub, sclerophyllous vegetation are included in UAA official statistics. This is for example the case of Scotland. The CLC estimates of grasslands based on 'UAA like' categories are therefore clearly an underestimate.

[48] Gallego, J. and Bamps, C., 2008. Using CORINE land cover and the point survey LUCAS for area estimation, *International Journal of Applied Earth Observation and Geoinformation* 10:467–475.

3. Analysis based on HNV, N2000 and grassland areas

	% of EU UAA
HNV	26
Grasslands	33
Natura 2000	10
- Nat 2000/HNV overlap	7.1
- Grasslands/HNV overlap	16.5
+ grasslands/HNV/Natura2000 overlap	3.1
	48.5

Explanation of categories:

- *HNV area in total EU UAA*

Estimation from the Commission's Joint Research Centre (JRC) based on CLC categories that can be related to UAA ('UAA-like' categories), covering EU-24.

- *Grasslands in total EU UAA*

Official Eurostat statistics (2007, EU-27)

- *Natura 2000 area in total EU UAA*

JRC estimation based on 'UAA-like' CLC categories, for EU-24.

- *Overlap between HNV and Natura 2000 areas:*

According to JRC estimations based on CLC data, 71% of Natura 2000 agricultural area (based on CLC categories that can be linked to UAA) is HNV. Applied to 10% of UAA covered by Natura 2000, this represents 7.1% of total UAA

- *Overlap between HNV and Grassland areas:*

According to JRC estimations, half of grasslands is HNV. Applied to 33% of grasslands, this represents 16.5% of total UAA.

- *Overlap between HNV, grasslands and Natura 2000*

This area has been substracted twice in the above two categories, and needs to be added in compensation. According to JRC estimations, based on 'UAA-like' CLC categories, this represents 3.1% of total UAA.

2. Analysis based on disaggregation of arable land, permanent crops and grassland in total HNV, Natura 2000 and grassland.

According to JRC estimation of 'UAA-like' CLC categories, the disaggregation of HNV, Natura 2000 and grassland areas is as follows (without overlaps between categories):

	% total UAA
Arable	4.1
Permanent crops	0.83
Grassland	22.5+7
Heterogeneous agricultural areas	11.92
Total	46.35

Included in these categories are:

- *Arable land*

This is the proportion of CLC categories that can be directly related to arable land in UAA (Non-irrigated arable land, Permanently irrigated land, Rice fields)

- *Permanent crops*

This is the proportion of CLC categories that can be directly related to permanent crops in UAA (Vineyards, Fruit trees and berry plantations, Olive groves)

- *Grassland*

This is the proportion of CLC categories that can be directly related to grassland in UAA (Pastures and Natural grasslands). However, when comparing to official statistics, it is clear that this is an underestimate of grasslands, and that 10.5% is contained in heterogeneous areas. Assuming that the Heterogeneous agricultural areas in HNV and Natura 2000 already counted below include 1/3 of grasslands, 7% of grassland outside HNV and Natura 2000 still need to be added.

- *Heterogeneous agricultural areas*

This includes the following categories, which are either in HNV and Natura 2000: annual crops associated with permanent crops + complex cultivation pattern + land principally occupied by agriculture with significant areas of natural vegetation + agroforestry areas. These categories represent different proportions of a mix of arable land, permanent crops and grassland, which is not possible to allocate precisely.

Conclusion

Based on these two different methods, it can be concluded that a plausible proportion of area covered by HNV, Natura 2000 and Grasslands would be between 45 and 50% of UAA. Including a higher proportion than this under biodiversity-related measures in the new CAP reform would involve targeting more intensive arable and permanent crop land, for example through set-aside and crop rotation measures. Covering an additional 10 to 15% of UAA

under more intensive agricultural land would imply a realistic proportion of about 60% of UAA under biodiversity-related measures.

ANNEX 8 – JUSTIFICATION OF FEASIBILITY OF THE NATURE CONSERVATION TARGET

"To halt the deterioration in the status of all species and habitats covered by EU nature legislation and achieve a significant and measurable improvement in their status so that, by 2020, compared to current assessments: (i) 100% more habitat assessments and 50% more species assessments under the Habitats Directive show an improved conservation status; and (ii) 50% more species assessments under the Birds Directive show a secure or improved status "

1. Habitat types and species under the Habitats Directive

Background

The Habitats Directive target uses the first conservation status assessment under Article 17 of the Directive for habitat types and species of Community importance. This EU level assessment was published in 2009 based on national reports provided by the Member States. The assessment will be repeated every 6 years, with a next round of national reports foreseen in 2013.

The European Environment Agency, with the support of the European Topic Centre for Biodiversity, helped develop this sub target using data from the 2009 assessment. The feasibility assessment relates to the conservation status (defined as favourable, unfavourable – inadequate, unfavourable-bad, unknown) for each habitat type and each species in each biogeographical region and looks at four parameters for both habitat types and species that underpin the Article 17 conservation status assessments[49]. A species or habitat type is considered to have a favourable conservation status only if either all four parameters are positive or three are positive and one "unknown".

Feasibility

The assessment is based on the assumption that if adequate conservation management measures are carried out certain parameters (habitat area for species, population and future prospects for species and future prospects and structure & functions for the habitat types) will improve. Range is not considered likely to change significantly over the relatively short period of time up to 2020.

Improvements in only one or two parameters are considered most likely during the period up to 2020. Signs of potential improvement within single parameters are also included in the assessments to make the target more sensitive to trends and improvements that do not necessarily trigger a change in overall status. Based on these assumptions and using the EU-assessment database the calculations of what could be considered as realistic improvements were made. This analysis used 2240 assessments for species and 701 assessments for habitats at the biogeographical level.

[49] For species the parameters are population, habitats for the species, range and future prospects. For habitat types the parameters are area covered by the habitat type, specific structures & functions as well as typical species, range, and future prospects.

For species, using ‘population’, ‘habitat for the species’ and ‘future prospects’ as parameters most likely to change between assessments, it was estimated that the maximum attainable improvement is

– 7 % from unfavourable-inadequate (U1) to favourable (FV) and

– 4 % from unfavourable-bad (U2) to unfavourable-inadequate (U1).

For habitats, using the parameters ‘habitat area’, 'structure & functions' and 'future prospects', the estimated maximum improvement is

– 13 % from unfavourable-inadequate (U1) to favourable (FV) and

– 11 % from unfavourable-bad (U2) to unfavourable-inadequate (U1).

The other level of the assessment looks at the potential for improvement within selected parameters. To assess potential improvement within U1 and U2 assessments trend data under the parameter ‘population’ for species and ‘area of habitat’ for habitats were used. It was ensured that assessments were not double-counted with the ‘traffic light’ assessment above. As a result of this analysis, about 2% more species assessments show potential for improvement (within a conservation status category). The equivalent figure for habitats is less than 1 %.

Conclusion

When the above mentioned figures are aggregated (FV, + potential improvement from amber (U1) to green (FV) + potential improvement from red (U2) to amber (U1) + improvement within selected parameters) the maximum potential figure that might be used in a target is 30% for species and 42% for habitats. This includes attaining favourable conservation status, improvements in a category of conservation status, and clear signs of improvement that might be detected by 2020. As these represent an absolute maximum, slightly reduced figures are used to make sure reaching the target will be realistic. The proposed targets are 25% in favourable or improving conservation status for species and 33% for habitat types.

Presentation of the target

The target is presented as a percentage of improvement, i.e. from 17% to 25 % for species and from 17% to 33% for habitat types. With some rounding this translates into a 50% improvement for species and a 100% (i.e. doubling of) improvement for habitat types.

2. Bird species under the Birds Directive

Background

All bird species are protected under the Birds Directive. Previous assessments of their conservation status, prepared by BirdLife International, have been based on an analysis of extinction risk of each species and a determination of species of European conservation concern (SPECs). The latest 2004 assessment for the EU 25 Member States concluded that 52% of species are secure, although the situation appears to vary between different categories of species, with migratory and farmland bird species of particular concern. Four categories of bird species covered by the Birds Directive can be considered in the context of setting targets

for the period up to 2020. It has already been demonstrated that targeted conservation actions for Annex I bird species under the Directive have resulted in improvements in conservation status for different species. In August 2007 the journal Science published an analysis showing that the Birds Directive has made a significant difference in protecting many of Europe's most threatened birds from further decline[50]. The groundbreaking paper shows that the Birds Directive has clearly helped those species considered to be most at risk, partly through the designation of Special Protection Areas (SPAs).

1. Globally threatened species

60% of these 40 species are already stable or increasing in the EU, which represents important progress, given that most of them were declining and in very poor condition in the 1980s and 1990s. This is largely down to conservation action inspired by EU Species Action Plans and often funded by EU projects, particularly the LIFE financial instrument. This has halted the decline of many species (e.g. Lesser Kestrel, Great Bustard) and led to dramatic increases in others (e.g. White-headed Duck, Imperial Eagle). This recovery can be continued for the other 40% of species that are currently still declining or have unknown trends.

2. Annex I species

Likewise, 76% of these species are already stable or increasing in the EU. Due to the size of the species pool, and the fact that some of these species cannot be conserved solely through Special Protection Areas as they also need other 'special conservation measures', e.g. at landscape scale, they will require a suite of conservation measures over the coming decade to achieve significant improvements in conservation status.

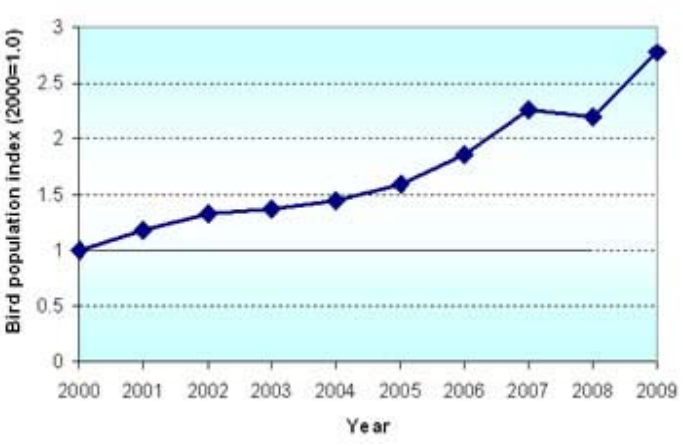
3. Migrant species

Improvements in conservation status are clearly feasible for many species but there are particular challenges for declining long-distance migrants. Tackling the problems facing these species will require international collaboration with countries outside the EU, within the framework of the African Eurasian Waterbird Agreement and other mechanisms.

4. Farmland species

Thanks to a large amount of research there is now a good scientific understanding of why most farmland bird species are declining. Conservation measures have been developed, trialled and rolled out solutions developed that can be deployed through agri-environment schemes to reverse their declines (and benefit other biodiversity).

[50] Paul F. Donald, Fiona J. Sanderson,1 Ian J. Burfield,2 Stijn M. Bierman, Richard D. Gregory, Zoltan Waliczky International Conservation Policy Delivers Benefits for Birds in Europe Science, 2007.



The above graph shows what can be achieved by implementing targeted conservation measures: a near-trebling of the farmland bird population at the Royal Society for the Protection of Birds (RSPB) Hope Farm in less than a decade[51]. This is not a special case, but a regular arable farm that the RSPB bought to demonstrate that it is perfectly possible for modern farming methods and wildlife to co-exist, producing food cost-effectively and benefiting biodiversity. The farm is not organic and applies fertiliser, pesticide, etc. in the same way as other modern farms. It just makes full use of agri-environmental scheme measures.

Feasibility

Therefore, on the basis of current knowledge, if the necessary conservation measures are put in place it is considered feasible to achieve a significant measurable improvement from the current level of 52% of bird species populations having secure/good status to a maximum level of 80% of bird species either being secure or showing improving population status by 2020. This formulation implies that all those species currently in good status should be maintained there, whilst about 50% of those not in a good status should show signs of improvement (positive trends) by 2020 – some of these may even recover sufficiently to be restored to a good status by that time. Obviously, the possibility remains that some other EU bird species continue to decline or remain in a less good status. This is probably inevitable, especially for long distant migrants that only spend part of their annual cycle in the EU, owing to the scale of the challenges facing them.

Presentation of the target

The target is presented as a percentage of improvement, i.e. from 52% to 80% for bird species. With some rounding this translates into a 50% improvement of population status of bird species

[51] Case study by RSPB http://www.rspb.org.uk/ourwork/farming/hopefarm/index.aspx

ANNEX 9 – PROPOSED TARGETS IN RELATION TO POLICY PRIORITIES AS HIGHLIGHTED AT COMMISSION, COUNCIL AND GLOBAL LEVEL

	Link to COM (2010)4	Link to Council Conclusions	Link to global targets in the revised Strategic Plan for Biodiversity 2011-2020
T1- Nature Conservation related target	"*In Europe, conservation assessments of species and habitats show that, despite some successes, the overall situation has continued to deteriorate."* *"Early estimates show that only 20% of the total financing needs for managing protected areas in Europe are being met*."	CC March 2010 " *Reaffirming that protected areas and ecological networks are a cornerstone of efforts to preserve biodiversity, stresses the need to fully implement the Birds and Habitats Directives, to speed up the completion of the Natura 2000 Network, both on land and at sea, and to put in place adequate finance, taking into account also that biodiversity is unevenly spread throughout the EU, and effective management and restoration measures*;"	This would be linked to **T1, T5**, **T11** (in particular), **T12**
T2- Restoration and Green Infrastructure related target	"*Appropriate forms of land and maritime management are needed to maintain and enhance ecosystems that provide ecosystem services to society at large*" *"while EU regulations contribute to ensuring that the environmental impacts of infrastructure development and spatial planning at EU level are minimised, further benefits could be reaped from better coordination, in accordance with the subsidiarity principle, with the development of and investment in 'green infrastructure' in the 83% of EU territory falling outside the Natura 2000 network.."*	CC Dec 2009 "*Highlights the mitigation and adaptation potential of resilient wetlands, oceans, forests, peatlands and grasslands and other ecosystems*" CC March 2010 "*Emphasizes the contribution of Green Infrastructure" to climate adaptation and mitigation objectives, to prevent habitat fragmentation, to increase connectivity and to maintain species evolution processes*" " *Calls on the Commission to further develop this process*"	This would be linked to **T2, T5, T6, T7, T11, T10, T14, T5** (in particular)
T3- Agriculture and forestry related target	"*Strengthening rural development policy with a view to developing ecosystem services by preserving and enhancing farming and forestry with a high nature value in the context of the CAP*"	CC December 2009 "*Acknowledges that agrobiodiversity is an important element with significant potential for improving food security and climate*	This would be linked to the achievement of targets **T3**, **T4**, **T7** (in particular), **T8**, **T13**,

	Link to COM (2010)4	Link to Council Conclusions	Link to global targets in the revised Strategic Plan for Biodiversity 2011-2020
		change mitigation and adaptation"	**T14**, **T15**
T4- Fisheries related target	*"Addressing the problems identified in the Green Paper on reform of the common fisheries policy is a priority in order to deliver an ecologically sustainable policy in 2012 based on scientific advice and effectively tackling overcapacity, and to better contribute to biodiversity targets."*	CC December 2009 "*Acknowledges the need for a growing world population to sustainably use marine resources and stresses the urgent need to reverse the loss of freshwater, marine and coastal biodiversity*"	This would be linked to **T3**, **T4**, **T6** (in particular), **T10**
T5- Invasive Alien Species related target	COM(2008) 789 final "Halting *the loss of biodiversity in the EU will not be possible without tackling IS in a comprehensive manner. The ecological, economic and social consequences of IS in the EU are significant and require a coordinated response. […]* *The Commission will examine the possibility of setting up an Early Warning and Information System based on a regularly updated inventory combined with effective response mechanisms which it considers would be an important step forward*".	CC June 2009 *" Recalls the urgent need for an EU strategy on invasive alien species "* *" Calls for an effective Strategy which should fill the existing gaps at EU level and establish a comprehensive EU IAS framework in a proportionate and cost-effective manner including by providing for new, dedicated legislative elements and, where necessary, amending or incorporating existing provisions"*	This would be linked to target **T9**
T6- Global contribution related target	"*Further integration is a priority in external policy and in other policies closely interlinked with biodiversity. In addition to stepping up efforts to reduce the negative impact of these policies on biodiversity in the EU and globally, more awareness is needed about the implications of biodiversity loss for the long-term sustainability of activities resulting from these policies, as well as the economic benefits they can harness from healthy ecosystems*."	CC Dec 2009 "*Stresses the need to take measures to reduce the EU's ecological footprint*" CC March 2010 "*Promote all necessary measures to protect biodiversity in third countries*"	This would be linked to **T2, T3, T4, T16, T18**, **T20**

ANNEX 10 – GLOBAL 2020 TARGETS AND MEASURES REQUIRED TO ACHIEVE THEM[52]

2020 Global target (agreed at CBD COP10)	Current action(s) within the EU	EU contribution towards achieving the 2020 global target
Target 1: By 2020, at the latest, **people are aware of the values of biodiversity** and the steps they can take to conserve and use it sustainably.	Efforts to step up communication and raise awareness about biodiversity were stepped up in recent years, especially during the 2010 International Year of Biodiversity. The Commission launched a major biodiversity awareness raising campaign for this purpose in early 2010.	This is an ongoing challenge underpinning the achievement of all other targets, and cannot be achieved through a single activity or measure but rather needs to be pursued as a cross-cutting issue at all levels of government and in all relevant sectors to be effective. Therefore, it is to be integrated as a cross-cutting issue in the EU biodiversity strategy. Additionally, for example among the measures proposed under target 1 involves a communication campaign on Natura 2000 to be carried out by the Commission. Further actions will be required at all levels of government and in all relevant sectors.
Target 2: By 2020, at the latest, **biodiversity values have been integrated** into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	Based on the Treaty, environment policy objectives are to be achieved through policy integration. Thus, several EU policies take partial account of biodiversity concerns and provide opportunities to invest in actions promoting biodiversity (see Policy Baseline). The current work of the Commission to develop the Green Infrastructure concept and subsequently put it in place is especially focusing on development and spatial planning based on a strategic, ecosystem-based approach. The integration of biodiversity values into national and regional development policies and national accounting	The selection of the 6 targets of the EU biodiversity strategy is partly designed to enable better integration within the EU. Target 2 will contribute to incorporating biodiversity values into accounting and reporting systems. Target 6 of the EU biodiversity strategy is expected to contribute partially towards achieving this target by assisting developing country partners with biodiversity integration into development planning and undertaking work on valuation. However, additional measures beyond the scope of the EU strategy will be required to achieve this

[52] For more on EU action, please see Annex on Policy Baseline.

2020 Global target (agreed at CBD COP10)	Current action(s) within the EU	EU contribution towards achieving the 2020 global target
	systems is a key recommendation from the TEEB study. In addition to taking action to implement this target within the EU, the EU can also contribute to the achievement of this target at global level by providing assistance to third countries in carrying out work on valuation of biodiversity and ecosystem services and enhancing the integration of biodiversity in national development and poverty reduction strategies.	target at EU level.
Target 3: By 2020, at the latest, **incentives, including subsidies harmful to biodiversity are eliminated, phased out or reformed** in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.	In its Europe 2020 Strategy, the EU recognised the negative effects on the environment of different existing subsidies and called upon the Member States to phase out environmentally harmful subsidies, limiting exceptions to people with social needs. This exercise will need to be followed and strengthened with the development and implementation of the flagship initiative on Resource Efficiency. The ongoing reforms of the main EU policies (e.g. CAP, CFP and Regional Development) provide an excellent opportunity for further integration to achieve that no EU funds counteract biodiversity objectives. Ensuring that biodiversity concerns are adequately reflected in these initiatives will be key to achieving this CBD target.	Targets 3 and 4 of the EU biodiversity strategy are expected to promote positive incentives for biodiversity conservation and sustainable use. Biodiversity concerns (impacts, benefits) should also be integrated into the EU's subsidy reform agenda.
Target 4: By 2020, at the latest, **Governments, business and stakeholders** at all levels have taken steps to achieve or have implemented **plans for sustainable production and consumption** and have kept the impacts of **use of natural resources** well **within safe ecological limits**.	The EU has put considerable effort towards promoting sustainable consumption and production patterns over the past decades. Numerous initiatives have been taken both at EU and national levels, such as the Sustainable Production and Consumption and Sustainable Industrial Policy Action Plan (SCP/SIP), EMAS or Eco-labelling. The Europe 2020 Strategy aims at achieving, among others, sustainable growth and identifies resource efficiency as one of its	Several targets in the EU biodiversity strategy will require planning aimed at improving resource use and minimising negative impacts on biodiversity, most specifically T3, T4 and T6, and as such are expected to contribute towards the achievement of this target. Biodiversity concerns (impacts, benefits) should also be integrated into the EU's Resource Efficiency Flagship

2020 Global target (agreed at CBD COP10)	Current action(s) within the EU	EU contribution towards achieving the 2020 global target
	flagship initiatives.	initiative.
Target 5: By 2020, the **rate of loss of all natural habitats, including forests, is at least halved** and where feasible **brought close to zero**, and **degradation and fragmentation is significantly reduced**.	The EU takes numerous actions on this field both inside and outside the EU. Most notably, the creation and management of the Natura 2000 network in EU territories and marine areas and through dedicated development projects in third countries, or the promotion of Natura 2000-like protected networks in Overseas Territories.	All targets in the EU biodiversity strategy are expected to contribute towards achieving this target
Target 6: By 2020, **all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches**, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	The EU committed in 2002 to maintain or restore fish stocks to levels that can produce Maximum Sustainable Yield (MSY) not later than 2020. The Marine Strategy Framework Directive sets the objective to achieve good environmental status by 2020. The Common Fisheries Policy should be designed to assist these processes.	Target 4 is expected to contribute directly towards achieving this target, and target 1 and target 5 would contribute indirectly.
Target 7: By 2020, areas under **agriculture, aquaculture and forestry are managed sustainably,** ensuring conservation of biodiversity.	The Common Agriculture Policy and the Common Fisheries Policy are providing the major frame for actions to achieve sustainable agriculture, forestry and aquaculture. Additionally, there are targeted tools promoted by the EU, like certification (e.g. FSC, MSC), that contribute to global target.	Targets 3 and 4 are expected to contribute towards achieving this target. Additional measures focusing on aquaculture may be required given the lack of a coherent and consistent aquaculture policy for the EU.
Target 8: By 2020, **pollution**, including from excess nutrients, **has been brought to levels that are not detrimental** to ecosystem function and biodiversity.	The EU already has an extensive pollution-related *aquis* covering a wide range of pollutants (nitrates, pesticides, air, chemicals, industrial emissions, waste, etc.)	NO
Target 9: By 2020, **invasive alien species and pathways are identified and prioritized**, priority species are **controlled or eradicated**, and measures are in place to	The EU is currently poorly equipped to tackle the challenge of invasive alien species as it currently lacks an EU framework. However, some existing tools if better	Target 5 is expected to contribute directly towards achieving this target.

2020 Global target (agreed at CBD COP10)	Current action(s) within the EU	EU contribution towards achieving the 2020 global target
manage pathways to prevent their introduction and establishment.	fitted (e.g. Plant and Animal Health Regime) may contribute. Unless action is taken there is a serious risk that the EU will not reach the 2020 global target.	
Target 10: By 2015, the **multiple anthropogenic pressures on coral reefs**, and other vulnerable ecosystems **impacted** by climate change or ocean acidification are **minimized**, so as to maintain their integrity and functioning.	The EU has been leading the efforts to combat climate change and ocean acidification, and has decided to increase its contribution to protect vulnerable marine ecosystems by establishing a "Voluntary scheme for Biodiversity and Ecosystem Services in Territories of European Overseas" (BEST) to promote conservation and sustainable use of biodiversity and ecosystem services in European overseas entities inspired by the experience with EU nature conservation. EU climate commitments are expected to highly contribute to mitigate climate change.	NO
Target 11: By 2020, **at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas**, especially areas of particular importance for biodiversity and ecosystem services, **are conserved through** effectively and equitably managed, ecologically representative and well connected systems of **protected areas** and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.	At present, the Natura 2000 protected areas network covers almost 18% of EU territory and designation of marine sites is in well underway. In this sense, the EU has already partially achieved this target. However, it is clear that further efforts will be needed to reach the 10% coastal and marine target, as well as the qualitative dimension of the global target.	Target 1 in particular, as well as targets 3 and 4 of the EU biodiversity strategy are expected to contribute towards achieving this target.
Target 12: By 2020, the **extinction of known threatened species has been prevented** and their **conservation status**, particularly of those most in decline, has been **improved and sustained**.	The objective of the EU nature conservation policy is explicitly the achieving of favourable conservation status of species and habitats covered by the pieces of legislation. Additionally, there are other EU policies, the implementation of which improves the status of species,	All targets in the EU biodiversity strategy are expected to contribute towards achieving this target. However, additional action at national and local level will also be needed.

2020 Global target (agreed at CBD COP10)	Current action(s) within the EU	EU contribution towards achieving the 2020 global target
	such as the Water Framework Directive (obligation to achieve good ecological status) or the Marine Strategy Framework Directive (obligation to achieve good environmental status). The EC support improving knowledge on species through promoting monitoring, research as well as the assessment f species' threatenedness (Red Lists).	
Target 13: By 2020, the **genetic diversity** of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is **maintained, and strategies have been developed and implemented** for minimizing genetic erosion and safeguarding their genetic diversity.	Action to conserve genetic diversity in the EU is carried out at EU and Member State level, including through the 2nd Community programme on the conservation, characterisation, collection and utilisation of genetic resources in agriculture 2006-2011 which aims inter alia at reinforcing the Community's efforts to conserve and document plant, animal and microbial genetic resources and eliminating duplication of effort. Additionally, EU funds (especially the EAFRD, but also the EU research framework programme) provide opportunities to protect genetic diversity especially that of local breeds or varieties.	In addition to existing measures, a specific action will be included under target 3 to support genetic diversity in agriculture.
Target 14: By 2020, **ecosystems that provide essential services**, including services related to water, and contribute to health, livelihoods and well-being, are **restored and safeguarded**, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	Though there is no EU policy dedicated to the protection and enhancement of ecosystem services, there are several policies having an influence on delivering on this target, and work has been started to enable policy making to build on ecosystem services (e.g. TEEB, Green Infrastructure, mapping of ecosystem services).	Target 2 is directly aimed at improving ecosystem services, whereas targets 1, 3, 4 and five are expected to contribute. Additional actions will be needed to be taken at national, regional and local level.
Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including **restoration of at least 15 per cent of degraded ecosystems**, thereby contributing to climate change mitigation and adaptation and to combating desertification.	Achieving the status based objectives of EU policies (e.g. favourable conservation status under the Habitats Directive, good ecological status under the Water Framework Directive or good environmental status under the Marine Strategy Framework Directive) requires	Targets 2 and 1 in particular, as well as targets 3 and 4 of the EU biodiversity strategy will contribute towards achieving this target. However, there is a need to enhance the use of ecosystem-based approaches to climate change mitigation

2020 Global target (agreed at CBD COP10)	Current action(s) within the EU	EU contribution towards achieving the 2020 global target
	restoration. The very strong involvement of the EU in Reducing Emissions from Deforestation and forest Degradation (REDD) in developing countries yield a significant improvement of the contribution of natural carbon storage in ecosystems in developing countries thus combating global biodiversity loss.	and adaptation to maximise biodiversity benefits.
Target 16: By 2015, the Nagoya Protocol on **Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization** is **in force and operational**, consistent with national legislation.	There is no EU legislation in place.	The EU will need to transpose into European legislation the obligations and provisions of the Nagoya Protocol. New EU legislation is likely to be developed in 2012 with a view to implementing this target.
Target 17: By 2015, each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated **national biodiversity strategy and action plan**.	The 2006 EU Biodiversity Action Plan is no longer adequate for ensuring delivery on the 2020 biodiversity targets.	The 2020 biodiversity strategy will itself fulfil this target for the EU. Member States, as individual Parties to the CBD, will also be required to develop or review and update/revise their National Biodiversity Strategies and Action Plans.
Target 18: By 2020, the **traditional knowledge, innovations and practices of indigenous and local communities** relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are **respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation** of the Convention with the full and effective **participation of indigenous and local communities, at all relevant levels**.	Traditional knowledge falls under the exclusive competence of the Member States.	NO
Target 19: By 2020, **knowledge, the science base and technologies** relating to biodiversity, its values, functioning, status and trends, and the consequences of its	The EU is supporting biodiversity-related research through its research framework programmes and is strongly supporting the establishment of the Inter-governmental	To be integrated as a cross-cutting issue in the EU biodiversity strategy.

2020 Global target (agreed at CBD COP10)	Current action(s) within the EU	EU contribution towards achieving the 2020 global target
loss, are **improved, widely shared and transferred, and applied**.	Panel on Biodiversity and Ecosystem Services (IPBES). Once in place, this Platform will help build strong consensus on scientific evidence that would secure knowledge based sound policy making. This is addressed in the monitoring section.	
Target 20: By 2020, at the latest, the **mobilization of financial resources** for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the **consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels**. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.	There are funding streams within the EU established to contribute to biodiversity, both within the EU in an integrated approach and globally through dedicated aid or support (see especially Annex on main EU funding instruments).	Target 6 is expected to contribute towards achieving this target. Efforts will need to be stepped up in the lead to COP-11 to establish EU funding targets by 2012, as agreed in COP-10 in Nagoya.

ANNEX 11 – SUPPORTING EVIDENCE FOR SOME PROPOSED MEASURES

1. Supporting evidence for the nature protection measures

– Natura 2000 in Scotland (Environment Group, 2004): The estimates were developed based on information from seven representative case study areas, extrapolated over the total number of Natura 2000 sites in the area. The cost estimates includes direct costs (management and policy) and opportunity costs. The benefits arising from both use values (e.g. recreational use) and non-use values were measured using contingent valuation questionnaire surveys (willingness to pay). Finally, a cost benefit analysis was carried out to estimate the net benefits of Natura 2000 in Scotland. The benefit-cost ratios are strongly positive (about 7:1 for protection overall, and 12:1 for the incremental value of the Natura 2000 designation), and there are additional values not assessed (social, cultural, educational, research, environmental services and health values: all likely to be positive, though possibly partly included in the non-use responses). The broad result that non-use values from local and international populations could justify Natura 2000 costs and opportunity costs seems robust.

– Natura 2000 in the Netherlands (Kuik et al, 2006): A 2006 assessment by the Dutch Institute for Environmental Studies of the benefits associated with Natura 2000 in the Netherlands has provided the estimated value of different benefits associated with Natura 2000 sites, calculated as an average of € / ha / year benefits from different key Natura 2000 ecosystems. Based on these average values, benefits provided by Natura 2000 in the Netherlands were estimated to be around € 4000 / ha / year. Recreation and tourism as well as wider ecosystem functions were important components of this value. Non-use benefits were also important. The provisioning service of raw materials was of lesser importance in the Netherlands. The authors extrapolated the gross welfare benefits of all Natura 2000 areas in the Netherlands (1.1 million ha), deriving an estimate of around € 4.5 billion / year.

– Large Blue butterfly conservation in Germany (Watzold et al 2008). This study considers optimal conservation levels of Large Blue butterflies (protected by the EU Habitats Directive) via payments to conserve specific times and sequences of mowing regimes on which the species depends. Costs include opportunity costs and compensation payments needed; Benefits are based on an ecological model to determine the ecological effects of alternative mowing regimes, coupled with contingent valuation. The results show that conservation is cost-effective up to maximum level assessed

2. Supporting evidence for restoration and green infrastructure measures

– Lower Danube Green Corridor (WWF, 2000). The 2236 km2 corridor (Bulgaria, Romania, Moldova and Ukraine) has made significant improvements to water quality; increased biodiversity; lowered risks from flooding; and improved local livelihoods. The flood in 2005 caused an estimated €396 million worth of damage. The cost of the restoration has been estimated at €183 billion. The estimated value of the ecosystem services provided is €500ha/yr and additional future earnings are estimated at €85.6 million per year.

– River Elbe floodplain restoration (Meyerhoff and Dehnhardt, 2007). The context of this study is restoration along River Elbe (Germany) through dike shifting, reducing agriculture

impact and constructing fish ladders. This combines a partial a cost benefit analysis based on CV study, avoidance costs, engineering costs and land opportunity costs, and a statistical model of nitrogen retention as a result of reduced water runoff velocities in two areas, then scaled up to whole restoration area. Recreation and flood protection benefits, carbon benefits and/or methane disbenefits were not valued and could be significant, which would strengthen conclusions. 8 scenarios were considered, with BCRs ranging from 2.5 to 4.1. Separate sensitivity scenarios still produced a positive NPV, providing robust support for the conclusion that NPVs are positive.

– Skjern river restoration in Denmark (Dubgaard, 2004). This study focused on the restoration of the Skjern river from a channelled river to a meandering course, with the creation of outflows from the river to the Fjord with the intention of forming a delta of app. 220 ha in time, the creation of a lake of approximately 160 ha, permitting periodical floods on land within the project area. This would involve the transfer of 1,550 ha of arable land to extensive grazing. An ex-post CBA which uses value transfer, market prices and replacement costs to value costs and benefits, showed that up to at least 5% social discounting, the project appears to have a positive net present value. The net present value was of DDK 228 million at 3% discount rate, and 67 million at 5%.

– Blackwater Estuary, UK (Luisetti et al., 2008). This study focused on an estuary of 5,500 hectares with open water, mudflats and saltmarshes, and the costs and benefits of maintaining flood defences with sea-level rise and coastal squeeze of intertidal wetlands. Benefits were estimated through a production function for fish (bass) and sediment burial estimates from simultaneous fisheries and biogeochemistry studies, carbon calculations taking into account methane and nitrous oxide emissions, market prices for coastal defence work (costs avoided) and fish production function; three carbon price estimates, and finally stated preference for "composite environmental benefit". Results show that with constant discount rate, the highest NPV is the Deep Green scenario (£106m over 25 years, £192m over 100 years) but with declining discount rates the Extended Deep Green scenario looks better over longer horizons. Overall, the study shows that managed realignment can be cost-beneficial if account is taken of non-marketed benefits, in particular for conservation and recreation.

– National Forest, UK (eftec, 2010). Large regeneration area including some former landfill sites, quarries, other post-industrial brownfield sites, in the context of a long-term project to create woodlands and priority open habitats on 33% of The National Forest land area. The study estimated £178m of costs based on actual and predicted expenditures for achieving the objectives, compared to £1,623m of benefits, largely from recreation, with lesser contributions from carbon, biodiversity and aesthetic values in particular. Results indicate a Net Present Value of £1.44bn, and a Cost Benefit ratio of 9.1:1.

– Agro-ecosystem of Sint-Truiden, Belgium (Turkelboom, 2010). A series of actions were undertaken primarily to protect the village from soil erosion and mud floods, including almost 20 hectares of grassed waterways, 150 hectares of grassed buffer strips, 40 earthen dams (retention ponds) and 150 ha of conservation tillage in the catchment. The total cost of the control measures is low (€126/ha/20 years). This figure is low if one compares to the saving of the damage and clean-up costs caused by muddy floods in the study area (€54 /ha/year) and all the secondary benefits, which included improvement of downstream water quality; reduction in downstream dredging costs; reduced psychological stress to inhabitants who were frequently threatened by muddy floods; increase in biodiversity

(birds and mammals); and enhanced landscape quality due to the new green and blue corridors through the landscape. Local entrepreneurs responded to bikers and hikers exploring the area by transforming traditional farms into bed-&-breakfast facilities, and by promoting agro- and eco-tourism.

3. Supporting evidence for agri-forestry related measures

– A study on restoring land to increase forage for bumblebees in intensively farmed landscapes in UK (Pywell et al. 2006) shows clear benefits from pollination services for semi-natural ecosystems and a wide range of agricultural and horticultural crops, and many garden plants.

– An assessment of costs and benefits of wild goose conservation in Scotland (Macmillan et al., 2004) demonstrates that wild goose numbers have risen rapidly over the past 30 years which cause some damage in crops. Farmers receive compensation for putting in place conservation schemes (feeding and buffer areas for geese on farmland). The study estimated the willingness to pay of the general public for goose conservation measures and the costs of goose damage to agriculture. The resulting cost-benefit ratio was of 700:1 for measures allowing a 10% increase in endangered species, and 113:1 for measures allowing a 10% increase in all species. The study concluded that goose conservation measures were good value for money for taxpayers.

– The assessment "Agriculture-forest conversion in Wales" (Bateman et al, 2005) looks at costs and benefits of establishing multi-purpose woodland on agriculture land. Net benefits in the latter areas reach as high as £200/ha/year in 1990 prices. Overall the analysis shows that there are substantial areas of Wales which would yield significant net social benefits from conversion out of agriculture and into multi-purpose woodland.

4. Supporting evidence for fisheries related measures

– Several studies showed that overfishing has significant economic impacts. Cod fishing in the Baltic in 2002 represented a cost of US$ 128.6 million compared with what could have been harvested with sustainable yields. Similarly, the North Sea cod fishery lost US$ 195.3 (WWF-Germany, 2002). Economic and social consequences of failing to apply Maximum Sustainable Yield (MSY) was also dramatically demonstrated in the case of Newfoundland, Canada after the collapse of North Atlantic cod stocks in the early 1990s. The sector provided between 80 and 100% of income in some communities, and 20% of the population was employed in the fishery. The collapse resulted in over 40,000 people losing their jobs, including 10,000 fishermen.

– 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.

– Marine conservation zones in the UK (Defra 2009): The study looks at costs to government for implementing and maintaining the marine conservation network as well as the costs to business from restrictions on activity and benefits from the conservation zones (including food and raw materials; nutrient cycling; climate regulation; sea defence; cognitive values (research spending) and expenditure (education) with specific marine focus. The conclusion is that active conservation of the UK marine habitat has a positive net present

value. Establishment of a network of marine conservation zones (MCZs) throughout UK waters has a Benefit Cost Ratio of between 6.7 and 38.9. Sensitivity testing shows that even given the uncertainty in the estimates it is rather unlikely that the BCR could be below 1.

– Restricting damaging fishing practices (Homarus Ltd, 2007). The study considers a proposed conservation zone of 60 square nautical miles centred on Lyme Regis, UK. Within this area, scallop dredging would be stopped, but more sustainable forms of fishing would be allowed (e.g. dive catching of scallops, crustacean potting and fixed netting of skates and rays), as would recreational use. The results suggest that benefits from other uses are at least double benefits from scallop dredging. This provides good evidence that protection would be beneficial, given that the environmental benefits of protection are unknown but certainly positive.

5. Supporting evidence for measures related to Invasive Alien Species

– McConnachie et al. (2003) review 10 benefit-cost studies of successful biological control programs, including four insect pests, four terrestrial weeds, and two aquatic weeds. For terrestrials, the benefit-cost ratios range from 1.9:1 to 24:1.

– Van Wilgen et al. (2004) estimate the costs and benefits of biocontrol of six invasive weed species in South Africa, where biocontrol has been practiced since 1910. They estimate benefit-cost ratios ranging from 8:1 for red Sesbania to 709:1 for jointed cactus.

6. Supporting evidence for measures related to achieving the global target

– Conservation in Sumatran oil palm plantations - Bateman et al (2009), Bateman et al (2008). This study looked at costs of possible conservation measures within palm oil plantations in Sumatra, which would contribute to sustaining tiger populations and other species in surrounding land. This is compared to potential price premium for 'conservation-grade' palm oil. The analysis shows a 'win-win' situation in that the optimal areas for biodiversity are also the areas with least opportunity cost. The smallest conservation area scheme requires only the lowest (15%) price premium to generate a small yet positive net benefit for the plantation; larger schemes are not viable at the lower price premium level. The results suggest that a reorganization of conservation efforts incorporating the strategies underpinning recent conservation-grade and Fairtrade production movements would provide an economic incentive for a majority of plantations to see conservation as an economically beneficial undertaking.

– Coral mining in Indonesia and Sri Lanka - Ohman and Cesar, 2000. This study examines the socio-economic effects of coral mining for lime production in Lombok, Indonesia and Sri Lanka. Extraction of corals has a detrimental effect on the reef ecosystem and recovery is slow. Tourism is an important industry in Lombok and is growing rapidly. Other activities include fishing and mangrove forestry. The study compares cost-benefit analyses of two sites of coral mining. The analyses produces different values which reflects the biological differences in fisheries in the two areas as well as the production differences in lime from coral. Both studies suggest net economic losses from coral mining once the ecosystem service impacts are taken into account.

– Mangrove conservation, Southern Thailand - Sathirathai and Barbier, 2001 – This study reviews the case of conservation of mangroves in Southern Thailand versus conversion to

shrimp farms, when water and flood protection services are taken into account. The study compares costs and benefits of three different land-use options for mangroves in Southern Thailand, and concludes that the value of conserving mangroves in Surat Thani Province is higher than that of converting mangroves to shrimp farms.

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ANNEX 12 – EXAMPLES OF GOOD PRACTICE ON RESTORATION AND GREEN INFRASTRUCTURE IN THE EU

1. STRENGTHENING ECOSYSTEM SERVICES

France: Réseau pollinisateurs - pollination

Given that 35% of the food resources of France depend on pollinators, France is creating 250 km of pollinator corridors along side of highways. The aim is to extend this exercise to 12.000 km of highways in the next years.

Austria: Vienna - Rax-Schneeberg-Schneealpen massif – drinking water purification

The per capita consumption of water in Vienna is 150 litres per day. About 95% of annual water supplies come from springs in the Rax, Schneeberg, Schneealpe mountains and from the Hochschwab mountain massif. The Vienna City Constitution put Vienna's water and the forests surrounding the springs under protection orders provide for pure drinking water at any time. Vienna established water protection areas and preservation areas were proclaimed around the supply sources. In 1965, for instance, the whole Rax-Schneeberg-Schneealpen massif was declared a water protection area. The Forestry Office of the City of Vienna administers a total area of approximately 32,000 hectares of forest, mountain pastures and meadows in the Rax and Schneeberg area as well as in the Hochschwab massif, enabling it to coordinate the use of all country area, tourism, hunting and fishing activities with the requirements of spring protection.

Ireland: Anne Valley – local solutions for waste water purification

In Anne Valley, Ireland, an integrated constructed wetland (ICW) was created instead of installing a traditional treatment plant. Not only the wetland is more efficient in clearing mostly livestock wastewater than a comparable traditional sewage plant, it also offers multiple benefits for the ecosystem services the wetland provides: water purification, fresh water, climate regulation and carbon sequestration, flood control, recreational aspects, soil formation and nutrient cycling - and it provides a suitable habitat for wetland flora and fauna. Farmers are quoted that they are only keeping their farming business due to the installation of this wetland, and the aesthetical value of the area has considerably increased. Capital costs for 1750 population equivalents were 770,000 EUR + 165,000 EUR for scientific monitoring of the project over three years. This sum includes costs for tourism facilities of 220.000 EUR, and maintenance costs are lower than for a traditional plant. This favourably compares to estimated costs of 1.530.000 EUR for an equivalent traditional plant. Financing stems from LIFE and INTERREG III A programmes + local funding sources.

Denmark: Copenhagen - Green roofs for climate regulation and provision of habitats

The City of Copenhagen has set out four requirements for green roofs. Buildings with green roofs should be able to meet at least two of the following effects:

Absorb 50-80% of the precipitation that falls on the roof, provide a cooling and insulating effect of the building and reduce reflection, help make the city greener, reducing the urban heat island effect, counteracting the increased temperatures in the city. They will also

contribute to a visual and aesthetic architectural variation that has a positive effect on the quality of life and double the roof life of the roofing membrane by protecting it against UV rays.

Similar policies take place in Germany (Osnabrück), Switzerland (Basel - where 10% of buildings have a green roof), Copenhagen, where there are mandatory green roof objectives.

2. GREEN INFRASTRUCTURE FOR CLIMATE CHANGE MITIGATION/ADAPTATION

Belgium: Dijle River – prevent flooding by grassland protection

LIFE funding enabled Natuurpunt, a Flemish NGO, to acquire land along the banks of the Dijle, in Leuven, and to remove obstacles to flooding, such as poplars and maize crops. Before the implementation of the project actions, flooding would regularly affect areas of Leuven, including the famous University campus. However, since the completion of the project, the city has not experienced flooding for several years. The dual conservation and flood management benefits of the project means that it has been a win-win situation. It has also proven to be a cheaper alternative to constructing a large dam near the city, even taking account of the cost of buying the land.

Hungary: Tisza- HU- flood management

From September 2005 onwards, the Hungarian Tisza River Floodplain is conserved and restored through Integrated Floodplain Management. The project is managed by the UNDP/Global Environment Facility and will mainstream biodiversity conservation within floodplain management across the Tisza River Floodplain. The project will significantly improve management of 1,600 km2 through activities within pilot areas, while moderately influencing an estimated area of 9,400 km2 (about 20% of the Great Hungarian Plain) applying supportive policy environment and institutional capacity building at the local level. In addition, Hungary is planning to use farmland to hold up to a billion cubic meters of water to prevent flooding elsewhere. The Hungarian government will create a dozen reservoirs on farmland near the Tisza that will be allowed to flood during emergencies. Two is operational since end of 2006 and up to 12 by 2020.

Netherlands: Rhine Delta Project - flood and coastal management

Due to anticipated climatic changes the Rhine delta river branches have to accommodate ever-higher extreme discharges. Until recently it was standard policy to raise the crest levels of the dikes to maintain the required level of flood protection. This centuries' old policy was abandoned in 2000 in favour of 'Room for the River'. In the new policy, river cross sections are widened by situating the dikes further away from the river, or by lowering the river forelands. This will result in lower flood levels. By the year 2015 the river should be able to safely discharge 16,000 m3/s.

Improvement of overall environmental conditions: In giving 'Room for the River' care should be taken not to affect valuable features of landscape, nature and cultural history. More space can also be found by enlarging the river channel within the dikes. In the process, one should aim at a balance between present and foreseeable future spatial requirements, keeping an open eye for every opportunity to enhance safety as well as the master landscaping and the improvement of overall environmental conditions.

France- Trame Verte et Bleue

Within its Grenelle de l'Environnement process, France has passed a new law to create a green and blue infrastructure across the country – known as la Trame Verte et Bleue (TVB) by 2012 which will become an indispensable element of all future spatial planning policies. The legislation is being tested through a series of pilot projects in 45 regional national parks across France. The green infrastructure network will be founded on scientific data and include protected areas and other areas in order to ensure the connectivity and global functionality of biodiversity across the country. The blue infrastructure network will have an equivalent structure for fresh water bodies and their associated ecosystems.

Czech Republic and Slovakia- "ecocenters"

These countries have developed so called "Territorial system of ecological stability, which consists of so called "ecocenters" and interactive elements (eco-corridors) at three levels (local, regional, supra-regional).

The Netherlands - Building up a National Ecological Network

The Dutch government decided in 1990, following a multi-year research programme, to develop a National Ecological Network that could provide the long-term basis for ecological sustainability throughout the country. Given the scale of the initiative, establishing the network is a long-term enterprise with full implementation scheduled for 2018.

The National Ecological Network as originally adopted in 1990 was an “oversized” indicative map of core areas, nature development areas and corridors. It is the task of the 12 provinces to delineate the precise boundaries of the network. This is being done using 132 habitat and landscape types for which minimum aggregate total areas have been fixed at national level. The final network is intended to cover about 730,000 hectares, or 17.5 per cent of the Dutch countryside.

ANNEX 13 – SYNTHESIS OF EXISTING TOOLS UNDER KEY EU INSTRUMENTS ADDRESSING INVASIVE ALIEN SPECIES

ACTIVITY	ANIMAL HEALTH INSTRUMENTS	PLANT HEALTH DIRECTIVE	WILDLIFE TRADE REGULATION	AQUACULTURE REGULATION	HABITATS AND BIRDS DIRECTIVES	WATER FRAMEWORK DIRECTIVE	MARINE STRATEGY FRAMEWORK DIRECTIVE	COMMENTS
Scope/coverage								
Taxonomic coverage	Animal pathogens & diseases Wild bird imports (avian flu)	Animals, plants, pathogens to the extent these are 'harmful organisms' (pests of plants or plant products)	'Species'	Aquatic organisms/GMOs	'Species'	Not limited.	'Species'	AQR not applicable to pet-shops, garden centres or aquaria.
Impact coverage	Health of farmed & wild animals	(Current) direct impacts on plants	Ecological (wild native species)	Biodiversity & ecosystem functions	Natural habitats, wild native species	Ecological (inland, transitional, coastal waters)	Ecological impact (marine waters)	
Risk assessment & decision-making procedures								
Decision level	COM	MS initiate proposals: adopted at COM level	COM	MS COM oversight if transboundary	MS	MS	MS	
Listing mechanism	Black (open)	Black (open)	Black (open)	White (closed): exemptions for long-used species	Variable, mainly black	N/A	N/A	
Adaptable to biogeographic/areas?	✓ (zonation)	✓('protected zones')	No	✓(explicit)	Depends on interpretation of 'territory'	✓(river basins)	✓ (marine regions)	WFD/MSFD both based on ecosystem approach.
Formal risk assessment?	✓ EFSA	✓ EFSA	No	✓(non-routine movements)	✓ (impacts to Natura 2000 sites)	N/A	N/A	
Prevention								

ACTIVITY	ANIMAL HEALTH INSTRUMENTS	PLANT HEALTH DIRECTIVE	WILDLIFE TRADE REGULATION	AQUACULTURE REGULATION	HABITATS AND BIRDS DIRECTIVES	WATER FRAMEWORK DIRECTIVE	MARINE STRATEGY FRAMEWORK DIRECTIVE	COMMENTS
Import	✓	✓	✓	(✓)	N/A	N/A	N/A	AQR references EU fish health legislation applicable to imports
Intra-EU movement/ holding	✓	✓ BUT not possible for HO once established or common in part of EU, unless protected zone	✓(not used)	✓('closed' facilities)	N/A	If needed	If needed	Unclear for MS (Single Mkt, holding in captivity)
Introduction to wild	N/A	N/A (movement focus)	N/A	✓('open' facilities)	✓	If needed	If needed	Renewable Energy Directive: biofuel plantation to avoid ecol. impacts
Unintentional introductions: commodities/transport	✓	✓	N/A	✓('non-target organisms')	N/A	If needed	✓(ballast water)	
Unintentional: corridors and natural spread	N/A	Under consideration	N/A	(Implicit)	N/A	If needed	If needed	
Early warning & rapid response								NOBANIS
Surveillance & monitoring	✓(being strengthened)	✓ (under review)	N/A	✓ (2 years min.)	Yes, monitoring is required for Annex.species	Big MS variations	✓ (specific descriptor)	WFD and MSFD: EU guidance in progress
Reporting & information exchange	✓	✓(under review)	N/A	✓	Yes, Article 17-reports (6 yrs-intervals)	N/A	N/A	
Contingency planning	✓(being strengthened)	✓ (under review)	N/A	✓ (MS)	N/A	N/A	N/A	
Fast track decisions for emergency action	✓	✓	N/A	✓ (MS)	N/A	If needed	If needed	

ACTIVITY	ANIMAL HEALTH INSTRUMENTS	PLANT HEALTH DIRECTIVE	WILDLIFE TRADE REGULATION	AQUACULTURE REGULATION	HABITATS AND BIRDS DIRECTIVES	WATER FRAMEWORK DIRECTIVE	MARINE STRATEGY FRAMEWORK DIRECTIVE	COMMENTS
EU co-financing?	✓	✓ (under review)	N/A	No	✓(but mechanism not fast)			
Control and management								
Long-term management	No	No	N/A	✓	✓ (N2000/ protected species)	✓ (good ecol.status)	✓ (good env status)	
Ecological restoration	No	No	N/A	✓ (remediation)	✓ (N2000/ protected species)	✓ (good ecol.status)	✓ (good env status)	
Cross-cutting instruments & infrastructure support								
Funding (variable scope)	✓ (Solidarity)	✓ (Solidarity)	✓ (Occasional, contract services)	N/A	LIFE+ (management, awareness raising, etc.) Contract services			Opportunities under EAFRD, INTERREG, RTD framework programmes, contract services, etc.
Responsibility & cost recovery	Under development	Under development		✓	Env.Liability			
Capacity building	✓	✓	✓					
Research	✓	✓	✓ (Occasional)	(✓)	RTD (limited)	✓	✓	

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ANNEX 14 – MARKET BASED INSTRUMENTS AND POTENTIAL FINANCING MECHANISMS FOR BIODIVERSITY CONSERVATION

Market-based instruments (MBI) aim at internalising the external costs of consumption and production activities on the environment, including biodiversity. If well designed, they can contribute to reaching the objective of halting biodiversity loss at a lower cost than command and control instruments. Potential economic instruments for the management of biodiversity and ecosystem services include:

- taxes, fees and charges;
- subsidies;
- tradable permits;
- certification schemes and (eco-)labelling;
- liability and
- off-setting, compensation schemes.

Economic instruments have been used in the EU to protect biodiversity, whether at local, national or EU level. A Commission study[1] analysed over 200 examples of the application of market based instruments for the preservation of biodiversity in EU Member States. The majority of countries use MBI for biodiversity conservation. In the majority of cases, MBIs are applied in the field of habitat and ecosystem conservation. However, practices vary across the EU. For example, subsidies are most commonly used in Northern and Western Europe, whereas in Central and Eastern Europe, taxes and charges appear to be more common though this varies (e.g. taxes are widely used in Poland but subsidies are more common in the Czech Republic).

Tradable permits for the moment are mainly restricted to fishing and hunting permits. There are however a number of pilot projects (mainly in the UK, the Netherlands, France and Germany) to explore in what circumstances tradable permits for habitat areas (so called "Habitat banking") could be implemented.

At EU level, instruments such as Payments for Ecosystem Services[531] have also been used extensively in farming and forestry, where agri-environment and forest-environment measures reward agricultural and forest practices that favour biodiversity and certain ecosystem services.

Lessons learnt through implementation in the EU so far are that well-designed and credibly implemented MBIs seem to be able to deliver biodiversity objectives cost-efficiently. Many examples of MBIs show that they work best not as a substitute to regulatory approaches, but complementary to them. It will often be desirable to use some combination of MBIs and

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53 A Payment for Ecosystem services is defined as "a voluntary transaction whereby a well-defined ecosystem service, or a land-use likely to secure that service, is being bought by at least one buyer from at least one provider, if, and only if, the provider secures the provision of the service".

regulatory approaches to achieve the desired aims. In general, MBIs like taxes, fees and charges can be seen as approaches that are useful to limit damage to existing biodiversity while MBIs offering subsidies/support (e.g. agri-environmental measures) and eco-labelling or other certification schemes can foster the provision of 'new' biodiversity or the enhancement of its quality. MBIs can also act as a way of conserving the quality of biodiversity whilst generating income, enhancing the acceptance of stakeholders; the generated income can then be used to fund biodiversity management needs.

The use of MBIs is more suitable in some areas of application, than others. There may be some limitations in terms of public acceptance. For example, although individual tradable quotas have been successfully used to manage fisheries in New Zealand, Canada, the United States and Iceland, its implementation may encounter more difficulties in the EU. Or the structure of the externality itself may make the use of MBI more complex, for example in the case of invasive alien species. Greening agriculture is an area where MBIs have been used with success and where there is scope for building on existing experience, as well as new instruments to provide stronger and more consistent incentives. The use of habitat banking has also been used with some success for example in the United States and Australia. Pilot initiatives in EU Member States will also provide some lessons on whether this could be used more extensively in the EU.

Many MBIs can also generate funding for biodiversity objectives. Other innovative financial instruments (such as green investing, and other instruments described in the table below) have so far been used to a limited extent in the EU, but are undergoing a dynamic development and should also be considered as part of the packages of measures.

Table: Traditional and innovative financing instruments for biodiversity conservation

		Geographic area			Applicability to Biodiversity target						Weaknesses/needs for improved performance	
Source of funds	**Available Instruments**	**L/R**	**Nat**	**EU/ Int**	AGRI/FORE ST	FISH	IAS	NATURE	RESTOR	GLOBAL		
Private	**Protected areas entrance and use fees**	X				X		X			core component of PA funding	better calculation of prices introduce ecological sustainability when extractive/harvesting uses
Private	**Tourism-related incomes**	X	X	X	X	X		X	X		can recover resource costs can capture WTP from the visitors diversification of tourism markets rural/local development can be used to manage demand	investments to improve facilities expertise to provide and market these services calculation of prices and charges
Private	**Markets for sustainable rural/local products**	X	X		X			X	X		can promote and communicate the value of the resource can assist in branding of a protected area work in combination with local/rural development moneys are distributed to local communities certification is a top-up	investment needed for certification developing markets/marketing
Private	**Innovative goodwill fundraising instruments (Internet based, etc)**	X	X	X	X	X		X	X		very innovative source of funds that seek to reach global 'small' contributors additionality is key	need for making it policy specific and targeting mainstream the instruments in policy need for new creative ideas and marketing
Private	**Green lotteries**	X	X	X	X	X		X	X		new tool to mobilise funds appeal to consumers and wider public works better when associated with biodiversity of high value	need for publicity and marketing
PrivatePublic	**Non-profit organisation (NGOs, foundations, trusts and charities) funding**	X	X	X	X	X	X	X	X	X	important source of funds overall, provided at habitat level or species level, can help in mobilising actors to donate	need to sustain and increase donor and public interest in biodiversity increase interaction with donors/public develop new approaches and marketing
Private/ Public	**(International) Markets for all type of ecosystem services (PES) and green markets**		X	X	X	X	X	X	X	X	use has increased recently opportunity to generate revenues for services and not only extractive use can provide compensation to landowners	need for developing design guidelines, supportive policy and legislative frameworks improved methodologies for establishing the biophysical links, set prices, monitor delivery of services

		Geographic area			Applicability to Biodiversity target						Weaknesses/needs for improved performance	
Private/ Public	**Bio-prospecting**		X	X						X	immediate link with biodiversity and protected areas can develop significant potential and mobilise additional funds	R&D and administrative costs need for highly specialised knowledge need to work together with access and benefit sharing (ABS)
Private	**Public Private Partnerships (PPP) & business-public-NGO partnerships**	X	X	X	X			X	X	X	can evolve in the context of business CSR measure included in the menu of many international financing efforts (Climate Change, poverty, etc) experiences exist flexibility and adaptability can be applied	tendency to 'move on' local/regional implementation can be more stable
Private	**Business voluntary standards**		X	X				X			can be developed for protected area and sustainable practices although not really bringing actual money they can contribute to sustainable management of protected area and local development	not all business can follow, as standards are costly even for those who introduce/are leaders
Private	**Businesses' goodwill investments (like Corporate Social Responsibility - CSR)**	X	X	X				X	X	X	potential for increasing corporate support/sponsoring	Need to sustain and increase interest in biodiversity, increase interaction with private sector, develop new approaches and marketing
Private	**Venture capital and portfolio (green) investments**		X	X	X			X	X		Potential for mobilising corporate funds in a sustainable way; sponsoring protected areas and species; can support environmental business from SMEs near the protected area	High administrative costs; may generate low returns and loose support from capital/investors; Providing for corporate tax relief associated with these mechanisms may further support their uptake
Public/Private	**Biodiversity cap-and-trade schemes and market-based instruments (MBI) (e.g. off-sets, habitat banking)**			X				X	X	X	Instrument that can help in but mostly around protected area; can mobilise significant funds; can create markets for biodiversity and their services	Costs for administration; implementation at global level and registration/monitoring; further work on equivalency methods and their application may be needed
Public/Private	**Carbon emission permits (use part of the auctions)**		X	X				X		X	Can provide complementary funds for protected areas; some synergies can strengthen between climate change adaptation and ecosystem financing needs	Competition for the distribution of the resources coming from actions/permits between different environmental purposes
Public	**Government budgetary allocations**	X	X	X	X	X	X	X	X	X	Core component of protected area funding, but are not enough on their own	Some evidence of protected area funding decline; resources often driven to / compete with other priorities, strengthening policy integration and mainstreaming protected area is needed
Public	**Earmarking public revenues**		X	X	X	X	X	X	X	X	Can potentially provide sufficient resources that will go to protected area and biodiversity conservation	Quite difficult to achieve: if resources earmarked for environmental purposes there is competition between different

		Geographic area			Applicability to Biodiversity target						Weaknesses/needs for improved performance	
												environmental goals/policies
Public	**Environment-related taxes (national or international)**		X	X	X	X	X	X	X	X	Taxing (or increase taxation) to international trade; some products are related to nature (timber, etc); others (aviation, shipping) are of environmental nature but already can be accepted.	Competition about the distribution of revenues between different environmental causes
Public	**Environmental tax reform**		X	X	X	X		X	X	X	Reforming taxation of international currency transactions can bring important resources for environmental purposes (climate and biodiversity)	Political will is needed for environmental tax reform; internationally this require more efforts
Public	**Reforming subsidies (rural development, fisheries, etc)**		X	X	X	X		X	X	X	Can help provide subsidies for land owners and users of protected area that will allow sustainable use of the resource, or even will allow to implement protected area management	Better calculation of prices/subsidies, design of subsidies to be more green, but quite difficult to achieve consensus and harmonised approach at global level
Public	**Benefit-sharing and revenue-sharing**	x	X					X		X	Integral component of protected area funding; potential to offset local opportunity costs; increase availability of local funds; tapping into development sources; improving benefit sharing	Need for design and communication with local/national authorities; monitoring of its implementation to demonstrate benefits
Public	**Reforms in the international monetary system**			X						X	Reforming taxation of international currency transactions can bring important resources for environmental purposes (climate and biodiversity)	Political will is needed for agreeing the introduction of such taxes internationally
Public	**Bilateral and/or multilateral aid (and GEF)**			X						X	Core component of protected area funding; source of direct budgetary support to protected area	Some evidence of funding decline; Major reorientation to poverty reduction and sustainable development may drive resources to other priorities; strengthening integration and mainstreaming of protected area is needed
Public	**Debt-for-nature swaps**		X	X						X	can provide large and secure amounts for protected areas or specific sites; funding biodiversity through SD and poverty reduction	instrument in decline, due to difficulties in persuading donors/government to release large amounts of funds difficulties in persuading agencies to invest large amounts for the future
Public	**Development banks and agencies**		X	X						X	Big number of agencies, lots of funds, but no increase there	biodiversity priorities mixed with other environmental objectives/MDG bureaucracy; increased spending on start-up but not so much on reoccurring costs
Public	**Long-term ODA commitments through a Green Development Mechanism (GDM)**	X	X	X						X	help transfers from developed/developing countries to less developed countries, GDM can Implement MDG and assist local needs too	need for developing guidelines, legislative frameworks at global level, need for improved methodologies for establishing the biophysical links, set

		Geographic area			Applicability to Biodiversity target					Weaknesses/needs for improved performance	
											prices, monitor delivery of services, evaluate the efficiency of transfers

Abbreviations: Private (Pri), Public (Pub), Local (L), Regional (R), National; (Nat), International (Int), Small and medium sized businesses (SME).

Adapted from TEEB (2011), The Economics of Ecosystems and Biodiversity in National and International Policy Making. Edited by Patrick ten Brink. Earthscan, London..

Source: Compilation of information within Emerton et al. (2005); UNEP/CBD/WP-PA/1/3 (2005); Bräuer et al.(2006)

ANNEX 15 – MAPPING BETWEEN EU POST-2010 TARGETS AND SEBI INDICATORS

EU post-2010 strategy		(Potentially) relevant SEBI indicators
Vision 2050	By 2050 EU biodiversity and the ecosystem services it provides – its natural capital – are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human well-being and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided.	
Headline target 2020	Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss.	*IUCN Barometer of Life for EU (tbd?)*
Targets	***Baseline***	***Potential Indicators***
Target 1	**Nature Conservation**	SEBI 1. Abundance & distribution of selected species (birds, butterflies) SEBI 2. Red List Index for European species (mammals – marine & terrestrial, birds, amphibians, reptiles, dragonflies, butterflies) SEBI 3. Conservation status of species of Community interest (in EU, per biogeographical region, per MS) SEBI 5. Conservation status of habitats of Community interest (in EU, per biogeographical region, per MS) SEBI 7. Nationally designated protected areas SEBI 8. Sites designated under the EU Habitats and Birds Directives (Natura 2000 sites) SEBI 11. Impact of climatic change on bird populations
Target 2	**Restoration and Green Infrastructure**	SEBI 4rev. Land cover changes SEBI 13. Fragmentation of natural and semi-natural areas SEBI 14. Fragmentation of river systems *(when available)* SEBI 16. Freshwater quality

EU post-2010 strategy		(Potentially) relevant SEBI indicators
Target 3	**Agriculture and agro-ecosystems**	SEBI 1. Abundance and distribution of selected species (farmland birds, grassland butterflies) SEBI 3rev. Conservation status of species of Community interest in agro-ecosystems SEBI 4 rev: Land cover changes in agriculture SEBI 5rev: Conservation status of habitats of Community interest in agro-ecosystems SEBI 6. Livestock genetic diversity SEBI 9: Critical load exceedance for nitrogen SEBI 19. Agriculture: nitrogen balance per ha of agricultural land in OECD countries SEBI 20. Agriculture: area under management practices potentially supporting biodiversity (distribution of High Nature Value Farmland & share of total UAA occupied by organic farming)
	Forest	SEBI 1. Abundance and distribution of selected species (woodland birds) SEBI 3rev. Conservation status of species of Community interest in forest ecosystems SEBI 4 rev: Land cover changes in forest SEBI 5rev: Conservation status of habitats of Community interest in forest ecosystems SEBI 17. Forest: growing stock, increment and fellings SEBI 18. Forest: deadwood
Target 4	**Fish and fisheries**	SEBI 12. Marine Trophic Index of European seas *SEBI 15. Nutrients in transitional, coastal and marine waters* SEBI 21. Fisheries: European commercial fish stocks (proportion of stocks within and outside safe biological limits) - *To be replaced by Mean Sustainable Yield according to Marine Framework Directive* SEBI 22. Aquaculture: effluent water quality from finfish farms

EU post-2010 strategy		(Potentially) relevant SEBI indicators
Target 5	**Invasive Alien Species**	SEBI 10. Invasive alien species in Europe
Target 6	**Contribution to global biodiversity**	SEBI 23. Ecological Footprint of European countries SEBI 24. Patent applications based on genetic resources SEBI 25. Financing biodiversity management SEBI 26. Public awareness