



EU BIODIVERSITY POLICY POST-2010

Exploring the possibilities for safeguarding
broader ecosystems – A scoping paper



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ANNEX 1. Common Fisheries Policy (CFP) measures that contribute to the ecosystem-based approach to fisheries management and address the protection of broader marine ecosystems

1 INTRODUCTION

With the 2010 deadline for the EU's most pressing policy goal for biodiversity now imminent, different stakeholders in the Union are taking stock of its achievements and begun developing new objectives for the future. A review of progress over recent years reveals a number of accomplishments. For example, the Natura 2000 network, covering 17 per cent of the EU's terrestrial area¹, now forms the largest network of protected areas in the world; while the Birds and Habitats Directives (i.e. the EU nature Directives) have helped to protect a range of Europe's indigenous and most valued species and habitats (CEC 2008 and CEC 2009). Furthermore, sustainable agricultural practices have become more widespread, supporting the conservation of ecosystems in rural areas.

However, regardless of these successes it has been acknowledged that the EU's 2010 target to halt the loss of biodiversity will not be met². For example, according to the recent assessment by the Commission only around 17 per cent of EU's most vulnerable habitats and species are in favourable conservation status (CEC 2009). Furthermore, pressures on biodiversity in the wider environment, e.g. within the approximately 80 per cent of the EU land area not covered by the Natura 2000 network, continue to increase. Many commercial fish stocks in European waters still remain outside safe biological limits and, despite some positive developments, there are still significant problems in maintaining biodiversity in agricultural ecosystems, as shown by the continuing declines in farmland bird populations (EBCC/RSPB/BirdLife International/Statistics Netherlands, 2008, in EEA 2009).

Acknowledging the failure to meet the target and focusing on the challenges ahead, the EU has now started to look beyond the 2010 horizon and discussions on the post-2010 goals and policy regime are rapidly gearing up (e.g. the Council Conclusions December 2009³). While preventing any further loss of biodiversity remains high on the agenda there is also a growing interest amongst various stakeholders (e.g. the European Commission) in the possibility of focussing the post-2010 EU biodiversity policy agenda more on the protection and sustainable use of overall ecosystems and the services derived from them⁴.

¹ This includes over 21 600 Sites of Community Interest (SCIs) established under the Habitats Directive and over 5200 Special Protection Areas (SPAs) established under the Birds Directive. Note: some of the SCI and SPA sites can be overlapping.

(http://ec.europa.eu/environment/nature/natura2000/barometer/index_en.htm#newstat)

² E.g. "the Message from Athens" by the high-level conference to frame EU post-2010 biodiversity policy (27-28 April 2009) and the Conclusions of the "Nordic Biodiversity Beyond 2010" Symposium (26-27 October 2009)

³ Council conclusions on international biodiversity beyond 2010, 2988th Environment Council meeting Brussels, 22 December 2009

⁴ E.g. "the Message from Athens" and the Conclusions of the Nordic Biodiversity Beyond 2010 Symposium (above) and the Chair's Conclusions from the Swedish EU Presidency High-level Meeting "Visions for Biodiversity Beyond 2010 – People, Ecosystem Services and the Climate Crisis" (7-9 September 2009)

At the moment EU nature conservation policies primarily concentrate on the protection of scarce, declining or threatened habitats and species. Although this delivers a number of benefits in terms of wider ecosystem conservation (see section 3.1 below) it can be argued that more emphasis on measures at the broader ecosystem level will be required in the future, not least because the degradation of ecosystems is known to be one of the main reasons behind the loss of species and habitat.

There is also a growing recognition that long-term human wellbeing is dependent upon healthy ecosystems and the services that they provide or support (e.g. Millennium Ecosystem Assessment 2005, TEEB 2008 and 2009b). For example, according to a recent estimate around €405 billion in annual turnover and 4.4 million jobs in Europe are directly dependent on / linked with the maintenance of healthy environment⁵ (GHK at al. 2007). Globally, e.g. in most developing countries, the link between healthy ecosystems and human wellbeing can be even stronger. For example, worldwide, nearly 1.1 billion people (i.e. one sixth of the world's population) depend on the natural resources in protected areas for a significant percentage of their livelihoods (UN Millennium Project 2005). Furthermore, there is also growing evidence that the loss of biodiversity and ecosystems can result in, and has already led to, significant economic losses. According to current estimates, the failure to halt the loss of biodiversity and ecosystem services on land may cost \$500 billion by 2010 (TEEB 2008). At sea, unsustainable fishing reduces potential fisheries output by an estimated \$50 billion/year (World Bank & FAO 2008). It is hoped that the appreciation of negative socio-economic impacts associated with the loss of biodiversity and ecosystem degradation will help to increase the level of political support for the conservation of the environment and biodiversity relative to short-term economic goals. Increased knowledge of the benefits provided by biodiversity and ecosystems may also help strengthen the engagement of the broader public in supporting the post-2010 biodiversity policy agenda. Both of these aspects have been recognised as key reasons behind the failure to meet the current European biodiversity target (e.g. CEC 2008, Gantioler et al. 2009).

New post-2010 biodiversity goals, at both the EU and global level, are expected to be adopted during the first half of 2010. However, while the final scope and detailed objectives of the new policy regime still remain to be agreed, the Commission has already given a clear indication of its future inclinations. For example, the Commission-led Stakeholder Conference on Biodiversity in Athens (April 2009) concluded that the post-2010 biodiversity target should continue to emphasise the intrinsic value of biodiversity while also recognising the importance of healthy and resilient ecosystems and the services they provide. In addition, enforcing the links between biodiversity and climate change is seen as of crucial future importance. Similar trends are also emerging in the international arena as confirmed, for example, by the G8 Environment Ministers in Siracusa, Italy (April 2009)⁶ and the High-level Meeting on the future goals of the Convention on Biological Diversity (CBD) organised by the Swedish EU Presidency in Strömstad, Sweden (September 2009)⁴.

Interest in ecosystems as a focus of biodiversity policy has been growing in recent years, both globally and within the EU. For example, the 2005 Millennium Ecosystem

⁵ This includes organic agriculture, sustainable forestry, renewable energy, and water extraction and supply

⁶ G8 Environment Ministers' "Carta di Siracusa" on Biodiversity (22-24 April 2009)

Assessment formed a first global basis for assessing the status and trends of the world's ecosystem and their services⁷, the Economics of Ecosystems and Biodiversity (TEEB) initiative has been progressing since 2007 and the European ecosystem assessment (EURECA) is currently on its way⁸.

The objective of this short scoping paper is to outline and discuss what a broader, more ecosystem-based approach to EU biodiversity policy could look like, how it best could build on existing policies and initiatives and what the possible implications (e.g. risks and benefits) of adopting such a regime could be. In particular, the paper will aim to investigate how the current political rhetoric focusing on wider ecosystems and their services could, in more concrete terms, be addressed in the context of the future EU policy and decision-making processes beyond 2010. However, it does not attempt an exhaustive assessment of the existing EU policy framework in terms of its ability to address broader ecosystems. The main focus is within the EU but global aspects are also touched on.

KEY TERMS USED IN THE PAPER

There are a number of different terms used to address wider ecosystem focused assessments, management and policy frameworks. These include an 'ecosystem approach', 'ecosystem-based approach' and 'ecosystem-based management'. Sometimes these have been defined explicitly by the users, sometimes the users refer to definitions by others and sometimes they are used without definition. The same term may be defined in different ways by different institutions and different terms may be used for essentially the same concept.

In the context of this paper the term "**ecosystem-based approach**" is used to refer to an assessment and/or management process that, in general, aims increasingly be focused on addressing broader ecosystems, taking account of the complex interactions of organisms and their environment and interactions with human systems.

An "**ecosystem-based policy regime**" is used to refer to a policy framework (including goals and instruments), such as one addressing EU biodiversity protection, focused on broad ecosystem characteristics and using aspects of an ecosystem-based approach. This could include safeguarding a number of different ecosystem attributes, including their functioning, resilience and certain services they provide. In principle, biodiversity specific goals (e.g. for species and habitats) would constitute an important part of any such regime.

In addition, the term "**ecosystem service focused regime**" is used to describe a policy focus that would aim to secure the protection and maintenance of ecosystem services. The scope of this approach is narrower than those above, since the focus is primarily on safeguarding the benefits that biodiversity and ecosystems provide to human wellbeing. Note, however, that ecosystem services can form an integral (but not the only) part of the focus of a broader ecosystem-based policy regime, as understood above.

Please note: this paper refers to the "ecosystem approach" developed and defined in the context of the UN Convention of Biological Diversity (CBD)⁹. However, the principles elaborating the scope of the CBD ecosystem approach are wider than the scope of this discussion paper and embody a number of particular political objectives.

⁷ Millennium Ecosystem Assessment: <http://www.millenniumassessment.org/en/index.aspx>

⁸ EURECA: <http://eureca.ew.eea.europa.eu/>

⁹ <http://www.cbd.int/ecosystem/>

2 AN ECOSYSTEM-BASED POLICY REGIME – WHAT COULD IT MEAN IN PRACTICE?

2.1 The ecological foundations: from biodiversity to ecosystem functioning, resilience and services

One of the key motivations for extending the EU biodiversity policy regime beyond the core role of protecting species and habitats is the increasing concern over the continuing degradation of European ecosystems, including their capacity to continue providing ecosystem services and their ability to adapt to the pressures created by climate change. Indeed, ecosystems can play a major and cost-effective role in helping society to both mitigate and adapt to the consequences of climate change. For example, preventing deforestation can be an effective way to reduce current carbon emissions whereas coastal ecosystems can provide effective protection against flooding and storms induced by climate change (Millennium Ecosystem Assessment 2005, TEEB 2009b, inc. the references within).

In order to address these concerns there is a case for extending the EU policy focus beyond the safeguarding of species and habitats to considering and securing the broader “ecological foundations” of European ecosystems. In practise, this would mean paying increasing attention to the key factors that underpin the functioning of healthy ecosystems and the provisioning of their services.

The structure and functioning of ecosystems (e.g. the cycling of matter, energy and nutrients) are outcomes of the quantity, quality and diversity of species within the ecosystem and interactions between the living and non-living components of the system (see Box 2.1 below and sources quoted). The capacity of an ecosystem to provide **ecosystem services** depends on both the functional and structural attributes of the system. Some of the services, such as provisioning of genetic resources and wildlife tourism, are directly linked to the level of biological diversity (e.g. the diversity of habitats and species) within an ecosystem. In comparison, the overall provisioning of biodiversity based resources and regulating services is often more dependent on the overall abundance of species (e.g. available fish catch and the total forest biomass that stores or sequesters carbon) or the diversity and quality of physical structures within an ecosystem (e.g. the extent of vegetative cover that stores and purifies water).

The provisioning of different ecosystem services is often interlinked. For instance, the capacity to produce consumable of resources (e.g. crops, timber and livestock products) is dependent on the supply of fresh water, pollination and an ecosystem’s capacity to mitigate floods and soil erosion (e.g. TEEB 2009b, Kettunen et al. 2009a, Kettunen et al. 2009b). Furthermore, focusing only on enhancing the level of one ecosystem service can have negative effects, either on the maintenance of other services or on the conservation of species and habitats within the system. For example, enhancing carbon sequestration by reforestation with monocultures nearly always will be negative for biodiversity.

The capacity of ecosystems to cope with changes and disturbances (i.e. **ecosystem resilience**) depends on several factors. These include the abundance and diversity of species (e.g. their functional attributes and differences in their response to changes in the environment) that help to secure the maintenance of different ecosystem functions and services, such as predation, seed dispersal, pollination and nutrient cycling, in changing environmental conditions (Box 2.1). Furthermore, mitigating landscape fragmentation and restoring **ecosystem connectivity** (i.e. supporting the movement of species and the existence of viable populations within the wider ecosystem) is seen as a key contributor to maintaining ecosystems' functions, resilience and services in the long run. In general, resilient ecosystems are more capable of withstanding disturbances without reaching any tipping points that could have irreversible effects on their status (i.e. **ecological thresholds**).

Understanding these “ecological foundations” and inter-linkages is a starting point for the development of a broader ecosystem-based focus within EU biodiversity policy. It is important to recognise and try to reconcile possible differences between the conservation of biodiversity as a goal as opposed to the maintenance of ecosystem services (see also sections 2.2 and 3.2 below). Understanding the conceptual and scientific issues involved helps us to appreciate the complexity, and also high level of uncertainty, that an ecosystem-based policy regime would need to be able to address.

Box 2.1 The ecological foundation of ecosystems

Biodiversity: the variability among living organisms and the ecological complexes of which they are part. This includes diversity within species, between species and of ecosystems.

Ecosystem: a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit. The quantity (e.g. biomass and productivity), quality and diversity of species (richness, rarity, and uniqueness) each play an important role in determining the structure and functioning of a given ecosystem.

Ecosystem functions: the biophysical processes that take place within an ecosystem, such as the cycling of matter, energy and nutrients.

Ecosystem services: the benefits that people obtain from ecosystems and their functioning. These include: provisioning services (e.g. food, fibre, fuel, genetic resources, water); regulating services (benefits obtained from ecosystem functions that regulate the environment, e.g. climate, floods, disease, waste and water quality); cultural services (e.g. recreation, aesthetic enjoyment, tourism, spiritual and ethical values); and supporting services necessary for the production of all other ecosystem services (e.g. soil formation, photosynthesis, nutrient cycling).

Ecosystems' structural, functional & response diversity: Structural diversity is the diversity of physical structures within an ecosystem built up by species. This diversity forms important habitats for many other species and it also plays an important role in delivering different ecosystem services, e.g. regulating services. The functioning of an ecosystem is based on species / groups of species that perform certain functions. Functional diversity is the diversity of species that perform different ecological functions (e.g. predators, herbivores, decomposers, water flow modifiers and nutrient transporters), or perform a same function in different ways (e.g. insect and bird pollinators). Response diversity is the variability in response of species within one functional group to environmental change. That is, they all perform the same function, but they respond differently to changes in the environment.

Ecosystem connectivity: the availability of suitable habitat in the landscape to allow individuals or propagules of species to move through the landscape. This is a crucial factor for many functions, such as seed dispersal and pollination, and it is seen as one of the key attributes maintaining ecosystem resilience. Connectivity is impacted by habitat loss and/or degradation, but also fragmentation of landscapes into patches of remnant native ecosystems.

Ecosystem resilience: the capacity of ecosystem system to cope with disturbances without shifting into a qualitatively different state. It is considered that the high levels of diversity (i.e. biological, functional and response diversity) increase the resilience of an ecosystem.

Ecological thresholds: a point at which a relatively small change in external conditions causes a rapid change in an ecosystem. Crossing an ecological threshold might trigger changes in an ecosystem's status that are difficult or even impossible to reverse.

Sources: Convention on Biological Diversity (CBD) (www.cbd.int), Millennium Ecosystem Assessment 2005, Kettunen et al. 2007, Huitric et al. 2009 (e.g. the references within) and TEEB 2009b.

2.2 Safeguarding broader ecosystems vs. protecting ecosystem services

The debate on a possible future EU policy regime often underlines the need to both maintain healthy ecosystems and secure the provisioning of ecosystem services. It is important to understand that while these two ambitions can be mutually supportive they are not identical, i.e. emphasising one over another might result in different outcomes for biodiversity.

As outlined above, the idea of safeguarding broader ecosystems takes into consideration the conservation of the overall integrity of the system, including all its components (e.g. species, habitats and genetic diversity) and the different functions within the system. By protecting these ecosystem “building blocks” a broader ecosystem-based policy regime also helps to maintain ecosystems’ ability to provide services beneficial to human welfare.

By contrast, securing the supply of ecosystem services represents a narrower and more anthropocentric approach to conservation that is primarily focused on preserving the benefits provided by biodiversity and ecosystems. Therefore, even though focusing on the delivery of ecosystems services as the primary rationale for biodiversity conservation might also help to capture some of the broader biodiversity related concerns it may also result in overlooking several species and habitats with no recognisable value to human wellbeing.

2.3 The specific competence and the role of the EU

The EU's competence to act on environmental matters within the Union, including taking decisions related to the conservation of biodiversity and ecosystems, is based on the objectives outlined in the Treaty. According to the Treaty, one of the EU's goals is to work for the sustainable development of Europe based, in particular, on a

high level of protection and improvement of the quality of the environment (Article 3 of the Lisbon Treaty, entered into force 1 December 2009¹⁰). Sustainable development, including environmental protection and sustainable management of natural resources, is also seen as one of the key objectives of the Union in its relations with the wider world. Furthermore, since 1997 it has been a requirement under the Treaty that environmental protection requirements must be integrated into the implementation of all the Community's sectoral policies, in particular with a view to promoting sustainable development (Article 11 of the Lisbon Treaty¹¹).

The Treaty also states that EU environmental policies should be based on the **precautionary principle** and preventive actions should be the first line of defence against environmental degradation (Article 191 of the Lisbon Treaty¹²). In addition, according to the Treaty, parties responsible for polluting the natural environment are also responsible for paying for / rectifying the damage (i.e. the **polluter pays principle**).

Consequently, the EU appears to have a relatively solid basis to support the conservation of biodiversity also at a wider ecosystem level, both within Europe and in the global context (e.g. to protect ecosystem resilience and services to support sustainable development). In addition, given the ecological complexity and related uncertainty outlined in section 2.1 above, the precautionary principle is likely to play an important role as a basis for a policy regime aimed at safeguarding broader ecosystems in the EU.

Several other policy principles are also of relevance. According to the **subsidiarity principle** the EU should take action only in cases where the common policy goals cannot be sufficiently achieved by Member States alone. Consequently, any future EU biodiversity policy should provide clear added value in addressing the threats to European biodiversity and ecosystems compared to actions taken by individual Member States. It should also be demonstrated that adopting a more ecosystem-based policy regime would be the most appropriate means to achieve the soon to be agreed post-2010 biodiversity goals (i.e. the **best policy instrument principle**). Furthermore, the content and form of the future policy should be proportional to what is needed to achieve these forthcoming policy objectives (i.e. the **proportionality principle**).

The EU's ability to address broader ecosystems is also influenced by its formal competence in different sectoral policy areas. For example, the EU has no formal authority over land-use and spatial planning within the Union. Similarly, issues related to forestry are primarily governed by the Member States. These limitations affect the EU's capability to tackle some of the underlying causes of the loss of biodiversity and ecosystem degradation, e.g. fragmentation of landscapes and forest ecosystems.

In the light of subsidiarity and other general policy principles any new EU ecosystem-based biodiversity policy regime should be focused primarily on the principle issues of EU-wide importance and should complement the actions taken at national level.

¹⁰ i.e. ex Article 2 TEC

¹¹ i.e. ex Article 6 TEC

¹² i.e. ex Article 174 TEC

Therefore, a possible Community action to protect wider ecosystems and their services could, for example, encompass maintaining and restoring those ecosystem services that are considered to be of EU-level importance and that cannot effectively be addressed by Member States alone, e.g. the threats to these services need to be tackled at the EU or transnational level (Kettunen et al. 2009, see also EASAC 2009). Such services could include, for example, protecting and enhancing some ecosystems' ability to mitigate the impacts of climate change and to regulate the occurrence of extreme events and natural hazards (Kettunen et al. 2009). Funding could be directed to preserving ecosystems' natural capacity to maintain water quality, for example by managing and restoring important wetlands within the EU and supporting the implementation of the Water Framework Directive. Similarly, the Community could add value to the Member States' efforts by supporting the functioning and resilience of ecosystems on an EU scale, for example, by supporting ecological connectivity at transnational level (e.g. by improving the ecological connectivity of the Natura 2000 network).

Given the mixed and/or shared competences between the EU and its Member States in this area it is likely that a successful ecosystem-based EU biodiversity policy regime would need to be built around two parallel approaches. On the one hand it could show leadership in the areas of Community competence and on the other develop effective support mechanisms (including appropriate incentives) in areas where the main role of the EU is to support Member States actions (e.g. land-use planning and forestry).

3 IMPLICATIONS OF ADOPTING A BROADER ECOSYSTEM-BASED POLICY REGIME

3.1 The current EU biodiversity policy objectives

The thrust of current EU biodiversity policy set out in a Commission Communication adopted in 2006¹³, which builds on the principle Community legal instruments, including the Birds and Habitats Directives. True to the EU goals adopted in 2001¹⁴, this Communication, including the accompanying EU Biodiversity Action Plan, centres around halting the loss of biodiversity by (and beyond) 2010 and, for the first time, it proposes a relatively comprehensive framework for EU action on biodiversity, both at the Community level and in the global context. The Communication also reflects the EU's international commitments in the context of the Convention on Biological Diversity (CBD).

The 2006 Biodiversity Communication also introduces the concept of ecosystem services to a Community-wide audience, placing it firmly on the EU political agenda. However, even though ecosystem services feature prominently in the Communication, the associated EU Biodiversity Action Plan does not provide any specific framework for addressing these services nor does it include any explicit targets or measures aimed at addressing ecosystem services at the EU or global level. Moreover, the existing policy documents do not place any obvious emphasis on maintaining the overall health and integrity of ecosystems (e.g. their structure and functions).

The current Community biodiversity policy does, however, provide a comprehensive framework and clear objectives for the conservation of biodiversity within the EU. In particular, the Birds and Habitats Directives form a solid basis for protecting the species and habitats of Community interest, i.e. safeguarding natural habitats and wild species that are scarce, declining or threatened. The Directives also provide for the establishment of an EU-wide network of protected areas, i.e. the Natura 2000 network. A key objective of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of Community interest (Article 2.2, also see Box 4.1 below). The achievement of favourable conservation status provides broader ecosystem benefits beyond the targeted species and habitats (e.g. reducing generic threats from pollution, hydrological change, over-exploitation, habitat fragmentation). Consequently, the nature directives can also be seen more broadly as the corner stones for the maintenance of healthy ecosystems in the EU (See section 4.1 for more detailed discussion).

Furthermore, the 2006 Biodiversity Action Plan puts a strong emphasis on the protection of species and habitats within the wider environment, i.e. the broader countryside and marine areas. For example, increasing attention has been given to the conservation of high nature value (HNV) farmland and forest areas within the EU. These biodiversity rich areas depend on the continuation of traditional, extensive land use practises and they are currently at risk of intensification or land abandonment. A

¹³ COM/2006/216

¹⁴ Presidency Conclusions, Göteborg European Council 15 and 16 June 2001

significant proportion of HNV areas are outside Natura 2000 sites, therefore additional targeted measures are needed to maintain and/or restore their conservation status. Similarly, attempts are being made to protect or restore the 'good environmental status' of the marine environment and inland waters. If successfully achieved, these objectives could play an important role in maintaining the quality of broader ecosystem within the EU (e.g. their functioning, services and resilience). However, as indicated in the Chapter 1 Community policy still falls short in preventing the loss of biodiversity and degradation of ecosystems at the wider landscape scale (CEC 2008, Gantioler et al. 2009).

As regards climate change, the 2006 Biodiversity Communication and the Action Plan are primarily focused on supporting the adaption of biodiversity to the changing with relatively little emphasis on the role of biodiversity and ecosystems in mitigation (e.g. sequestration of carbon in plants and soils) and climate change adaptation across sectors (e.g. the potential for coastal ecosystems to provide protection from increasing storm events and rising sea-levels). Furthermore, even though the existing policy documents highlight the importance of increasing the resilience of biodiversity to climate change (e.g. by increasing the connectivity and resilience of protected area networks) they do not provide any explicit reference to safeguarding the resilience of broader ecosystems in the face of climate change, although maintaining the good conservation status of species and habitats helps to support such broader endeavours (see 4.1 below).

To conclude, current Community biodiversity policy provides a firm basis for the conservation of important elements of European biodiversity and in more recent statements paves the way towards a more ecosystem-based policy regime by emphasising the conservation of wider landscapes and by placing ecosystem services into the political dialogue. However, even though the existing Community instruments for species and habitat conservation can, when effectively implemented, also significantly support the protection of wider ecosystems they do not yet form a policy regime (e.g. a comprehensive contextual framework) designed to address broader issues related to ecosystem health, e.g. maintaining the functioning and resilience of ecosystems and their ability to provide services beneficial for human welfare. For example, the current policy framework and the way it is implemented is not sufficient to provide effective conservation of ecosystems at a landscape scale and is not fully geared to the new challenges arising from climate change.

3.2 From principles to practise: key elements for developing an ecosystem-based policy regime

With the post-2010 biodiversity goal for the EU still pending it is not yet possible to sketch a comprehensive and detailed picture of what a possible ecosystem-based approach to biodiversity conservation and related policy regime in the EU could look like. However, a number of key elements and steps essential for the development of an effective ecosystem-based regime can be identified.

Evidently any initiative to safeguard the functioning and resilience of ecosystems and their ability to support human wellbeing needs to be based on a thorough assessment

of the pressures affecting ecosystems and their impacts on the related services. Ideally the knowledge base for such an ecosystem-based policy regime would include information on the ecological quality of the many different European ecosystems (e.g. their functioning and resilience and biological / functional diversity) and the ability of ecosystems to uphold the provisioning of different services.

This would provide a preliminary basis for the identification of key objectives and policy measures to protect broader ecosystems (see also Chapter 6 below) and suggest indicators and targets against which their success can be evaluated. These objectives could, for example, range from achieving an overall good status within different ecosystems (e.g. see 4.2 and 5.1 below) to a more specific focus on maintaining or restoring the provisioning of key ecosystem services identified as being of EU-wide importance. The latter idea was also recently put forward by a group from experts of the European Academies Science Advisory Council (EASAC 2009, see also 6.1 below). It is not within the scope of this study to carry out such an assessment, but Table 3.1 identifies some of the key pressures affecting ecosystems in the EU, as well as their impacts on habitats and species and wider ecosystem services.

Table 3.1 draws on existing information on the status of biodiversity within the EU including the SEBI biodiversity indicators and Member States' reports (under Article 17 of the Habitats Directive) on the condition of habitats and species and threats to them. In future, it is foreseen that the European ecosystem assessment (EURECA) contracted by the EEA will significantly improve our understanding of the status of European ecosystems and the provision of ecosystem services. However, it is likely that some additions to complement the existing knowledge base will be required. For example, there is a need to consider whether the existing information and indicators are sufficient to estimate the status of and changes in the functioning and resilience of ecosystems or whether additional information would be required. The establishment of specific indicators for the capacity of ecosystems to maintain the provisioning of certain key services is also likely to appear on the future agenda as is the development of natural capital accounts (see 6.2 below and Chapter 3 in TEEB 2009b).

Furthermore, in order to ensure the maintenance of ecosystem services there is also a need to assess the overall flow of these services within and outside the EU, i.e. identify the "sources and end-users" of different services. This can help to develop appropriate policies and instruments aimed at securing the sustainable and equitable use of ecosystems and their services in the long-term (such as payments for ecosystem services) (see also Chapter 7 below and TEEB 2009b for further information).

Finally, this research and assessment exercise looking ahead to policy for beyond 2010 needs to be complemented by a detailed review of how well and to what extent the existing EU instruments already cover issues related to protecting the quality of broader ecosystems. A detailed analysis of what is already in place will help to identify the possible weaknesses or gaps in the current framework, including failures to implement current instruments fully or on time; and identify the need for and detailed scope of possible new policy instruments required to achieve future EU objectives. Some of these aspects are explored below (see Chapters 4 – 6).

Table 3.1. The principal generic threats to ecosystems in the EU and their impacts on habitats and species and the provision of ecosystem services

Main ecosystem / habitat types	Area trend	Impacts on key ecosystem properties			Impacts on habitats and species	Impacts on ecosystem services
		Structural	Composition	Processes		
Marine	=	Disturbance of seabed from bottom trawling and material/mineral extraction.	Reduction in abundance of key species of fish (especially top predators)/ shellfish and simplification of food web. Alien invasive species. Shifts in distribution due to climate change.	Widespread eutrophication, especially of coastal waters.	Significant declines in many target and non-target fish populations, and many seabird populations.	Ongoing declines in fish stocks. Increased carbon sequestration in marine algae due to nutrient enrichment.
Coastal (inter-tidal habitats, estuaries, lagoons, salt-marsh, dunes, etc)	↓	Losses due to coastal developments, sea defences and impoundments.	Some over-exploitation of fish & shellfish. Alien invasive species.	Eutrophication (from sewage and waste water, and diffuse pollution via rivers from agricultural run off etc).	Coastal habitats and associated species under severe threat in many parts of Europe.	Reduced sea defences. Increased carbon sequestration. Declining cultural values.
Wetlands	↑	New artificial wetlands, e.g. from mineral extraction workings. Hydrological impacts on some wetlands from abstraction, drainage or impoundments. Wetland loss in areas prone to drought and climate change.	Alien invasive species.	Eutrophication (see above).	Some species increasing, but many (e.g. amphibians) threatened by widespread losses of small wetlands and pollution.	High levels of carbon sequestration. Increasing cultural values
Rivers	=	Hydrological impacts from abstraction and impoundments. Structural changes for navigation and flood defences. Virtually all river systems are highly modified to some degree.	Reduced structural diversity has knock-on impacts	Eutrophication (see above).	Losses of many habitats and species dependent on with natural river ecosystems.	Reduced use of rivers for food and clean water. Low cultural value of highly modified river landscapes.

Mires (peatlands), upland heathlands and tundra	↓	Drainage, erosion (resulting from drainage, burning, over-grazing); peat extraction.	Changes in vegetation composition from inappropriate grazing, burning, drainage and climate change.	Eutrophication (from airborne deposition) and acidification (from airborne pollution) – but declining	Loss of sensitive habitats and species, exacerbated by climate change.	Some peatlands are carbon sources, rather than sinks. Reduced water retention and quality
Grasslands and shrublands (natural and semi-natural)	↓	Conversion to arable agriculture, forests and infrastructure / urban developments. Hydrological changes from drainage. Grassland / shrub land losses in areas prone to drought and climate change.	Changes in vegetation composition from changes in management practices (over-grazing, under-grazing, changes in stock type, reduced cutting for hay), use of fertilizers.	Eutrophication (from airborne deposition) and acidification (from airborne pollution) – but declining	Loss of sensitive habitats and species.	Increases in agricultural productivity (except where abandoned) Reduced water retention, quality, carbon sequestration and soil condition.
Improved grasslands and agricultural crops	↑	Soil damage and erosion from cultivations, compaction and exposure. Hydrological changes from drainage or irrigation.	Artificial vegetation communities, support low diversity of associated species; further reduced by use of fertilisers and pesticides.	Natural processes highly disrupted by cultivations and fertiliser use.	Ongoing widespread declines in most species in farmland habitats.	Increases in agricultural productivity Reduced water retention, quality, carbon sequestration and soil condition. Low cultural values.
Forests	↑	Increasing forest area due to plantations and natural regeneration following agricultural abandonment. Low structural diversity in plantations and some under managed forests. Increasing intensification of some forests and some ancient forests now being logged. Losses in areas prone to	Plantations typically of low diversity, and /or non-native species. Alien invasive species a major threat to some trees (from disease etc) and other species. Slow changes in species composition due to	Eutrophication (from airborne deposition) and acidification (from airborne pollution) – but declining. Low regeneration in some woodland due to high populations of deer	Ancient forests and associated species remain under threat, some other forest habitats of lower biodiversity importance and more generalist species	Increases in carbon sequestration, and in some cases water retention and quality from forest expansion. Increased cultural use of expanding

		drought, flooding, storms exacerbated by climate change.	climate change.	and other herbivores. Intensification, i.e. use of stumps and branches for biofuel leading to need for compensating by restoring nutrients, for example, in terms of wood ash.	increasing.	forest area, low cultural values of logged forest /plantations
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Sources: CEC (2008, 2009), EEA (2007, 2009).

3.3 Possible pros & cons of an ecosystem-based regime

The adoption of a more ecosystem-based policy regime could support existing conservation targets for species and habitats of Community interest and wider biodiversity goals. Balmford et al (2002) note that the potential benefits of habitat conservation have a greater chance of outweighing the economic gains to be had from habitat conversion when multiple services can be bundled together and provided by a single ecosystem. From the perspective of biodiversity, preventing the further degradation of ecosystems in order to protect their functioning, resilience and services can reduce pressures and threats to biodiversity and thereby significantly support current efforts to protect the diversity of habitats and species within the EU. As noted above, improving the overall biological quality of the wider countryside and marine environment can also help to secure the movement of species and therefore increase their resilience to climate change. Furthermore, greater investment in the restoration of ecosystems and their functioning could enhance not only the flow of ecosystem services but also benefit biodiversity conservation.

From a broader socio-economic point of view (i.e. as outlined in Chapter 1), safeguarding European ecosystems and natural capital (e.g. biodiversity) more effectively could significantly support Community-wide endeavours towards sustainable development, social wellbeing and economic prosperity, both within and outside the Union. It can also be foreseen that highlighting the variety of benefits provided by healthy ecosystems (as a part of a broader ecosystem-based policy regime) could help to increase political will for the conservation and sustainable use of biodiversity. In addition, improving communication on the role of nature as an EU-wide “life support system” could help to make the benefits of conservation more tangible to the broader public, thereby increasing support for biodiversity and improving the engagement of EU citizens in implementing the post-2010 biodiversity policy agenda.

The adoption of an ecosystem-based biodiversity policy regime can, however, also pose a number of difficulties and risks. For example, a policy regime focused primarily on maintaining or restoring the overall good status of ecosystems and/or ecosystem services could, in principle, lead to some species- and habitat-specific requirements and conservation objectives being overlooked, e.g. allowing some interchange (even loss) of species provided that the overall integrity of the ecosystem is maintained (See also 2.2 above).

In particular, there could be some potential conflicts if the provision of ecosystem services becomes a dominant aim, especially if a subset of ecosystem services becomes the specific attention of policy focus while other services are overlooked. For example, according to some recent evidence, there might be only limited congruence between areas of importance for biodiversity and those that are important for ecosystem services (Chan et al. 2006, Naidoo et al. 2006, Anderson et al. 2009), though the scale of assessment is an important factor to consider. Thus, a focus on ecosystem services could divert limited resources away from biodiversity conservation, or displace development pressures onto them (McCauley 2006,

Anderson et al. 2009). Moreover, there are often trade-offs in the delivery of ecosystems services; indeed many of the key threats to biodiversity arise from actions that increase provisioning services such as food, materials and energy to the detriment of other services. A narrow focus on other ‘new’ services (e.g. carbon) could also have detrimental impacts on biodiversity. As indicated in Table 3.2, increasing the provision of some ecosystem services could conflict with current habitat and species conservation objectives.

On the other hand, the capacity of ecosystems to cope with disturbances is highly dependent on the level of diversity within the system (i.e. biological, functional and response diversity, see Box 2.1 above). Therefore, even if there is no current evidence on the role of a species in terms of contributing to ecosystem functioning, the general approach of maintaining high levels of biological diversity within ecosystems is an “insurance” against negative changes in the environment. These considerations speak strongly in favour of maintaining the protection of biodiversity as the core of any policy regime aiming to successfully safeguard broader ecosystems (i.e. their functioning, resilience and services), particularly in the context of climate change.

Table 3.2. Examples of the likely positive and negative impacts of potential measures to support the provision of ecosystem services on existing EU species and habitat conservation objectives

Ecosystem (habitat type) / impact direction	Measures to increase ecosystem services			
	Supporting	Regulation	Provisioning	Cultural
Marine				
Positive	Maintenance of key processes (e.g. nutrient cycling)		Improved sustainability of current fishing & mineral extraction	Improved water quality and reduced litter
Negative		Intentional nutrient enrichment to increase carbon sequestration	Increased exploitation of currently non-commercial fish/shellfish	
Coastal (inter-tidal habitats, estuaries, salt-marsh, dunes, etc)				
Positive	Maintenance of key processes (e.g. nutrient export)	Maintenance / restoration of coastal habitats as sea-defences	Improved sustainability of current fishing	Protection of landscapes for aesthetic benefits
Negative			Increased exploitation of currently non-commercial fish/shellfish	Increased recreation, causing disturbance and pollution etc.
Wetlands				
Positive	Maintenance of key processes (e.g. nutrient cycling)	Maintenance of upland wetlands for water retention	Water quality improvements for fish etc	Protection of landscapes for aesthetic benefits
Negative		Intentional nutrient enrichment to increase carbon sequestration	Intensive management for fish etc	Increased recreation, causing disturbance and pollution etc.
Rivers				
Positive	Maintenance of water cycle and other key processes (e.g. hydrological conditions)	Restoration of natural river morphology for flood prevention	Water quality improvements for fish etc	Protection of landscapes for aesthetic benefits
Negative		Inappropriate use of floodplains for flood alleviation	Impoundment of rivers for fishing	Increased recreation, causing disturbance and pollution etc.
Mires (peatlands) and tundra				
Positive	Maintenance of key processes (e.g. nutrient cycling)	Increased carbon storage, water retention and quality from restored hydrology, reduced grazing and burning.		Protection of landscapes for aesthetic benefits
Negative		Large-scale abandonment of scarce semi-natural habitats	Overgrazing by livestock Exploitation of peat for fuel as 'semi-none-fossil'	Increased recreation, causing disturbance and fires etc.
Grasslands and shrublands (natural and semi-natural)				
Positive	Maintenance of key processes (e.g. soil formation and condition).	Maintenance of grasslands for carbon sequestration		

	Maintenance of shrublands for crop pollinators			
Negative		Large-scale abandonment of scarce semi-natural habitats	Overgrazing by livestock, or agricultural improvements / intensification to increase productivity	Increased recreation, causing disturbance and fires etc.
Improved grasslands and agricultural crops				
Positive		Maintenance of non-farmed habitats for pollinators / pest control	Maintenance of non-farmed habitats and management measures for sustainable game production.	Protection of non-farmed features in the landscapes for aesthetic benefits
Negative			Agricultural intensification to increase productivity. Intensive game management practices.	
Forests				
Positive	Maintenance of key processes (e.g. nutrient cycling, soil formation)	Habitats for pollinators / pest predators	Sustainable deer management. Improved management of neglected woodlands for woodfuel / biomass	
Negative		Afforestation with mono-cultures, even-age plantations alien species etc, for carbon	Logging of ancient forest for timber. Intensive management for timber/ woodfuel	Increased recreation, causing disturbance and fires etc.
Urban areas				
Positive		Trees/ grassland to improve local climate / reduce run-off.		Increase in green spaces / nature
Negative				

As regards practical aspects, while habitats and species are rather well-defined “targets” for policy measures, developing a meaningful and, above all, effective framework for protecting broader ecosystems could be a more challenging task, in particular when seeking to safeguard their functioning and services. For example, ecosystems’ ability to maintain soil quality depends mostly on local attributes (e.g. vegetation cover and soil fauna) while the circulation of water takes place at a wider catchment level. In other words, different ecosystem functions (and related services) take place at different scales and it can therefore be difficult to determine the overall physical borders of ecosystems, not to mention legislate the maintenance and conservation of their functions and services (See also 6.1 below). For example, it is more feasible to hold Member States accountable for the conservation of habitats and species rather than for less tangible ecosystem functions.

Finally, concerns have also been raised about the ability of an ecosystem based-policy regime to address and protect the intrinsic value of biodiversity, i.e. conserve species for their own sake, independent of their properties and their value to humans. In principle, adopting a broader ecosystem-based approach does not necessarily erode the moral basis for biodiversity conservation but the intrinsic value of nature and its components can form the basis of a wider ecosystem-based policy regime. In contrast, as outlined in section 2.2 above, a policy approach addressing ecosystem services would be primarily focused on preserving the benefits nature provides to our societies and economy. Therefore, it would not be focusing on conserving biodiversity in its own right.

To conclude, a broader ecosystem-based approach might help to improve the effectiveness of and increase the support to the EU biodiversity policy, e.g. create significant synergies with other policy areas such as climate change. However, given the risks outlined above it is clear that the possible implications of adopting such a regime need to be carefully considered. Appropriate planning of a regime’s scope and clear communication of its goals is needed to ensure that an ecosystem-based approach will not be narrowly interpreted as focusing on ecosystem services only. This could result in losing sight of the primary conservation goals and be counter-productive in the long-run, jeopardising the functioning of ecosystems and the supply of ecosystem services in the future. Furthermore, it is important for any future policy regime to address the whole variety of ecosystem services in a balanced manner, i.e. to avoid being focused only on the services that are high on the current political agenda and/or easiest to address and measure (see also 5.2.4). For example, given the current spotlight on climate change it is important to make sure that future EU biodiversity policy is not dominated by issues related to carbon sequestration only.

4 COULD THE EXISTING INSTRUMENTS FORM THE BASIS FOR A NEW REGIME?

4.1 Building on the EU nature Directives

The Birds and Habitats Directives are the central plank of the current EU biodiversity policy. Given that the functioning and resilience of an ecosystem ultimately hinges on the diversity of its different components, these directives can also be considered as the corner stone for protecting the ecological foundation of Europe's ecosystems.

A key objective of the Habitats Directive is to maintain or restore favourable conservation status of habitats and species of Community interest (Article 2.2), within Natura sites and where necessary elsewhere (see Box 4.1). The achievement of favourable conservation status will inevitably provide broader ecosystem benefits beyond the targeted species and habitats (by reducing generic threats from pollution, hydrological change, over-exploitation, habitat fragmentation etc.). Furthermore, in addition to providing a sanctuary for vulnerable habitats and species the Natura 2000 areas also help to maintain populations of “non-target” species, and in this way further support the different forms of diversity within ecosystems (Box 2.1). Well-managed Natura 2000 sites are also essential for the establishment of a network of protected areas in the EU (i.e. functioning as “core areas” within the network).

Box 4.1. The definitions of favourable conservation status in the Habitats Directive

Article 1(e) “conservation status of a natural habitat means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2.

The conservation status of a natural habitat will be taken as 'favourable' when:

- its natural range and areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable as defined in (i);

Article 1(i) conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2;

The conservation status will be taken as 'favourable' when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The EU nature Directives also provide for measures to increase the connectivity within the Natura 2000 network and in the broader environment, in this way helping to create an ecologically functioning network of protected areas. The Member States are required to take measures to maintain or restore the ecological coherence of the Natura 2000 network, e.g. to conserve landscape features which are of major importance for the movement and genetic exchange of wild fauna and flora (Kettunen et al. 2007)¹⁵. Member States should also promote the implementation of connectivity measures where these are more broadly required to maintain or restore the favourable conservation status of species or habitats, irrespective of their contribution to the coherence of the Natura 2000 network (CEC 2005, Kettunen et al. 2007).

Maintaining ecological connectivity between protected areas and within the wider environment can play an important role in preserving the functioning of ecosystems and securing the supply of several ecosystem services (e.g. seed dispersal and pollination, see below). In addition, preserving the ability of individuals and/or species to move across landscapes is seen as one of the key means of maintaining ecosystem resilience. For example, it helps to retain functional diversity within ecosystems (see Box 2.1) and preserve genetic variation that can allow species to adapt to changes in their environment. Therefore, if appropriately implemented, the connectivity related provisions of the EU nature Directives can contribute to the broader ambitions expected of post-2010 biodiversity policy.

Furthermore, even though not their primary purpose, Natura 2000 areas also maintain a variety of ecosystem services (e.g. Kettunen et al. 2009b, Cruz & Benedicto 2009, Kazakowa & Pop 2009, Pabian & Jaroszewicz 2009). For example, Natura 2000 sites often conserve habitat types that provide important services, such as water purification and retention (wetlands), carbon storage (peat bogs) and protection from erosion and avalanches (forests in mountain areas). Similarly, Natura 2000 sites with fire resistant vegetation may limit the spread and intensity of forest fires, both at local and regional levels. The Natura 2000 sites also support populations of many more species than those for which they are designated as a protected area; many of which may be of socio-economic value, e.g. pollinating insects, game animals and fish. For example, it has been increasingly acknowledged that, if appropriately designed and managed, marine protected areas can help the recovery of fish stocks (e.g. Halpern 2003, McClanahan & Mangi 2000, Icran et al. 2005). In addition, Natura 2000 areas are known to provide a number of ecosystem services related to recreation, education and tourism. In several cases Natura sites are also recognised as an important part of local cultural heritage and identity.

There are significant opportunities for addressing broader ecosystem concerns by improving the uptake and implementation of the existing provisions of the directives. For example, the connectivity related provisions of the Birds and Habitats Directives have been inadequately implemented by the Member States and up to now only a limited amount of attention has been given to implement these provisions in practise (Kettunen et al. 2007).

¹⁵ E.g. Articles 3 and 10 of the Habitats Directive and Article 3 of the Birds Directive

4.2 Using the existing instruments for environmental protection to safeguard broader ecosystems

In addition to the nature Directives, there are several other EU policy instruments that support (or have the potential to support) the protection of wider ecosystems. Most notably, some make an attempt to define and quantify the current quality of ecosystems, including setting targets for their desirable status. This section presents some of these key instruments and briefly outlines their possible role in and/or contribution to a possible more ecosystem-based biodiversity regime. Instruments related to the sustainable use and environmental protection of agricultural and marine ecosystems (e.g. the EU Marine Strategy Framework Directive (MSFD)) will be discussed in Chapter 5 below.

The **Water Framework Directive** (2000/60/EC) sets up the current basis for the protection of inland and coastal waters and groundwater resources in the EU. The Directive requires all inland and coastal water bodies to reach, as a minimum, 'good status' by 2015. This 'good status' takes into account aspects related to both ecological and chemical characteristics of the water body. The goals of the WFD are to be reached through the establishment of an integrated EU-wide river basin management structure within which environmental objectives for inland water bodies, including ecological targets, will be set. A key component of this structure is the development of river basin management plans (e.g. covering rivers, lakes, wetlands and coastal zones) that are to be finalised by the Member States by 2009. The Water Framework Directive also takes fully into account the provisions of the Habitats Directive. Therefore, the WFD will provide important support to the management and monitoring of the Natura 2000 network in the future.

The WFD 'ecological status' refers to maintaining and/or restoring the quality (e.g. structure and functioning) of aquatic ecosystems. Furthermore, the WFD definition of good ecological status also includes aspects related to maintaining or restoring morphological characteristics and the structure of inland water bodies, including preserving river continuity and enabling natural migration of species (Kettunen et al. 2007). Therefore, the Directive also provides for opportunities to maintain and enhance ecological coherence and the connectivity of inland water ecosystems, including river basins. As a result, when appropriately implemented the WFD can provide a good basis for safeguarding the structure and functioning of inland water ecosystems in the EU. In combination with the Birds and Habitats Directives (i.e. conservation of biodiversity within river basins) the WFD can significantly contribute to the maintenance of the overall integrity (e.g. resilience) of these ecosystems. In addition, even though not an explicit objective of the Directive, WFD can also directly or indirectly support the provisioning of a number of services within river basins (e.g. maintaining the overall quality of fresh water).

Furthermore, a key component of the WFD is the development of integrated river basin management plans (e.g. covering rivers, lakes, wetlands and coastal zones) that are to be finalised by the Member States by 2009. The establishment and implementation of these management plans also requires active participation of stakeholders. This river basin based governance of the WFD has also been considered to be a step towards more adaptive management of ecosystems, allowing for wider flow of relevant information into the decision-making process (e.g. from a broader

group of stakeholders) and better integration of relevant ecological scales (e.g. from individual water bodies to the dynamics of the wider river basin) into the decision-making process (see Chapter 8 below).

The EU Directives for **Environmental Impact Assessment (EIA)** (85/337/EEC, as amended by 97/11/EC) and **Strategic Environmental Assessment (SEA)** (2001/42/EC) are intended to help to avoid or pre-empt adverse environmental effects that might be associated with proposed programmes, developments or new activities. EIAs aim to identify, quantify and assess the potential impacts of individual projects (such as road, rail, port and large-scale industrial and residential construction or extraction projects) whereas SEA provides a mechanism for ensuring that environmental concerns are integrated with the development planning process.

Both EIA and SEA are important processes that aim to facilitate sustainable development including the biodiversity component (e.g. take explicit note of the EU nature Directives). They also have considerable potential for helping to maintain / restore the quality of broader ecosystems. For example, the directives can help to prevent development of the most sensitive areas within ecosystems, avoid fragmentation and other biodiversity impacts at the project level, provide connectivity and other biodiversity benefits through well designed project compensation measures, and improve understanding of connectivity impacts through research and post-project monitoring (Kettunen et al. 2007). If adverse environmental effects cannot be avoided, the EIA process generally triggers measures to reduce or control adverse effects on the environment or to provide compensation for unavoidable impacts (see also 6.2.5 below). The current EIA and SEA Directives do not refer to ecosystem services as such, however their provisions are “broad” enough to allow for these considerations to be included in the assessment process. Consequently, there are possibilities to use EIA and SEA for supporting the protection of ecosystem services in the future, e.g. by developing dedicated guidance to explicitly broaden the focus of the Directives (see also Chapter 6 below).

In addition to WFD, SEA and IEA, there are also a number of other policy instruments that help to maintain the quality of the wider environment and ecosystems in the EU. For example, the **Environmental Liability Directive (2004/35/EC)** establishes a framework for environmental liability based on the “polluter pays” principle, with a view to preventing and remedying environmental damage. The Directive seeks to prevent damage to Community water and land resources, and species and natural habitats covered in the nature Directives. Most notably, the Directive also seeks to protect (natural resource) services provided by species and natural habitats, water and land. The implementation of the Directive is still in its early stages (with delays in several Member States). However the provisions for the protection of services provide interesting opportunities to support the implementation of EU’s possible future objectives on ecosystem services.

Finally, if adopted, the **Soil Framework Directive (COM/2006/232)** could significantly contribute to the maintenance of soil quality in the EU, including its functions and the services healthy soils provide. For example, one of the main aims of the Directive is to prevent the degradation of soils and maintain the different environmental, economic, social and cultural functions / services they deliver. Furthermore, the upcoming **EU Strategy for Invasive Alien Species (IAS)** (e.g.

possible legislative provisions for its implementation) could help to protect broader ecosystems (e.g. their biodiversity and ecosystem services) from the negative impacts of IAS¹⁶.

To conclude, it appears that there are a number of existing / upcoming Community measures that can be used to deliver some components of a broader ecosystem based approach in the EU. However, the effectiveness of all the instruments above depends on their uptake and effective implementation. For example, one of the main constraints on SEAs and EIAs is that there is often limited information available on biodiversity, ecosystem functioning and services, and on the effects of proposed projects to carry out comprehensive ecological evaluations or to undertake reliable assessments of potential impacts (Kettunen et al. 2007). Quantifying good ecological status is a difficult task and, furthermore, it assumes that there is some stable domain of the ecosystem that can be achieved. This makes the WFD (and also the MSFD below) very “knowledge-intensive”, requiring region-specific programmes of measures, including assessments of pressures and impacts on the ecosystem, as well as economic and social analyses of resource use and of the cost of degradation of the marine environment (e.g. Huitric et al. 2009, see also 3.2 and 8). However, if these difficulties (e.g. defining the desirable status in dynamic ecosystems and ensuring more holistic and “ecosystem sensitive” implementation of existing provisions) can be overcome then these measures have the potential to lead the way towards integrating ecosystem functioning and resilience into the EU policy.

¹⁶ http://ec.europa.eu/environment/nature/invasivealien/index_en.htm

5 IMPROVING INTEGRATION OF BIODIVERSITY INTO SECTORAL POLICIES

Although nature conservation policy is important, the overall status of Europe's ecosystems is to a large extent determined by land- and resource uses that are governed by other sectoral policies. Several of these sectors, most notably agriculture and fisheries, are governed by dedicated Community-wide policies.

Consequently, the integration of concerns about ecosystem health into the relevant EU sectoral policies (e.g. into the Common Agriculture Policy (CAP), Common Fisheries Policy (CFP) and Cohesion Policy) can be seen as a crucial part of any policy regime aiming to preserve the integrity of broader ecosystems within the EU. Effective integration would help to minimise the damage of different sectoral activities on ecosystems and to maximise the positive contribution of these activities to conservation objectives. For example, there is a need to ensure that the measures supporting agriculture, fisheries and regional development do not have adverse impacts on biodiversity and ecosystems. Furthermore, integration could help to realise the potential of co-benefits to different sectors resulting from the maintenance and enhancement of healthy ecosystems. For example, an emphasis on preserving the natural functions of an ecosystem could help to prevent soil erosion and retain nutrient cycles in agricultural systems. Similarly, maintaining the ability of ecosystems to mitigate against natural hazards (e.g. flooding and draughts) can support the goals of the EU Cohesion Policy. Ultimately, the long-term success of these EU sectoral policies relies on the availability of natural capital, i.e. well-functioning ecosystems and access to biodiversity resources.

A number of initiatives and instruments exist to enhance the integration of biodiversity concerns into EU sectoral policies (See 3.1 and 5.1-5.2 below). However, in practise their success has been limited. For example, the failure to ensure effective integration has been identified as one of the main reasons for the EU's failure to meet its 2010 biodiversity goal (e.g. COM/2008/864, Gantioler et al. 2009). Therefore, integration and ensuring coherence between the different sectoral policies clearly remains as one of the key issues to be addressed in the context of the post-2010 biodiversity policy regime, in particular given the ambitions to better secure the health and integrity of broader ecosystems.

Several approaches are possible. For example, it can be profitable to promote investment in biodiversity and ecosystems a part of efforts to "green the economy" and exploit the potential that biodiversity restoration and conservation offers in terms of job creation. There are significant possibilities to encourage market mechanisms that take biodiversity concerns into account and/or reward sustainable management of ecosystems (e.g. payments for environmental services (PES), green procurement and labelling of sustainable agriculture, forestry and fisheries products). These and other similar mechanisms can help to make the EU sectoral policies more sustainable and sensitive to maintaining the health of European ecosystems.

This chapter outlines a number of key EU policy sectors that impact on European ecosystems and, subsequently, with a great potential to support the maintenance of

healthy ecosystems within the Union, e.g. the Common Agricultural Policy (CAP), the Common Fisheries Policy (CFP) and the EU Marine Policy, and the future EU framework for climate change adaptation. It summarises some of the potential to support the sustainable use of ecosystems in these fields and discusses the outlook of for the future. The Chapter does not aim to provide a comprehensive review of all EU sectoral policies with important impacts on the status of ecosystem within the EU. For example, a number of other EU sectoral policies, such as the Cohesion Policy and Community's policies on energy, are also in a need of better integration of biodiversity concerns into their objectives and implementation.

5.1 Agriculture, rural development and public goods

For some years efforts have been made to give greater prominence to environmental objectives in the Common Agricultural Policy (CAP) and there has been a shift of funding towards measures concerned with rural development and agri-environment. This has been beneficial but has been accompanied by a number of trends in agriculture which have put continuing pressure on biodiversity. These include further specialisation, intensification in some areas, the conversion of grassland to arable production and abandonment of some areas of land. Consequently there remain major concerns about the fate of biodiversity on farmland, as measured by population trends for many species as well as the conservation status of heaths, grassland, wetlands and semi-natural habitat complexes where agriculture has a key role in the management.

There are several policy measures within the CAP that have the capacity to assist the improved management of ecosystems. Of these the most important is the agri-environment measure which offers funding for a wide range of practices covering soil management, biodiversity and landscape maintenance and enhancement, improvements in water quality and the continuation of organic farming. Other measures within the CAP provide funding for land managers entering voluntary agreements in the realm of forestry, the management of Natura 2000 sites, training for improved farming practice, investment in capital projects to bring about environmental improvements etc. Whilst not addressed to ecosystem management in a holistic sense, they provide the machinery to incentivise farmers and foresters to undertake some of the essential tasks to bring about the health of ecosystems if national and regional governments design and implement the necessary measures in an appropriate way.

For a more holistic approach it is possible to envisage introducing a “landscape scale” or “ecosystem scale” element into the second Pillar of the CAP, which covers the rural development measures. This would encourage national authorities to intervene in a systematic way to pursue larger scale objectives rather than entering voluntary agreements with farmers on an individual basis only. This requires a new outlook to planning, positive steps to encourage participation by a range of farmers in a location, developing an appropriate set of management prescriptions and other adjustments. It would not be a radical departure from the ethos of rural development policy however.

To make this effective, it would need to be reinforced by strong encouragement from the Commission and an adequate budget within the second Pillar of the CAP. It is also

possible to envisage specific interventions in the second Pillar being backed up by targeted measures and sympathetic forms of agriculture replacing the currently untargeted direct payments within the CAP. A combination of incentives of this kind might be effective, not least because it would go beyond the purely compensatory approach of paying for additional costs and income foregone that underlies agri-environment payments at present.

Looking ahead, there is a vigorous debate about whether the future of the CAP lies in a new approach with a strong focus on the provision of public goods by farmers. In economic terms these are defined by the characteristics of non-excludability and non-rivalry. In operational terms it would imply a larger budget for targeted payments and rural development measures, along with an appropriate suite of incentives for farmers and other land managers. On this scenario the CAP would both generate greater environmental benefits and secure a flow of income into the rural areas of Europe supportive of wider objectives for the countryside and the rural economy, for example encouraging rural tourism and recreation as well as sustainable food production.

5.2 Continuing to reform the EU policies on marine and fisheries

Traditionally, the EU Common Fisheries Policy (CFP) has dealt with environmental matters in a reactive way, rather than integrating environmental concerns into all management considerations in a proactive matter¹⁷. The first fundamental element of environmental integration in fisheries has been the change in attitude to management through the adoption of an **ecosystem-based approach** to fisheries management: any management action performed should take into account its potentially important effects on the marine ecosystem. This means, for example, developing more sustainable fishing methods, reducing discards and incidental by-catch, and taking into consideration the impacts of fishing on the sea bed¹⁸. In the last five years, the Commission has taken action and adopted a number of measures (e.g. Regulations) which contribute to the ecosystem-based approach to fisheries management and address the protection of broader marine ecosystems. These measures include, for example, the closure of three areas in international waters to protect sensitive habitats and implementation of a ban on bottom trawling in parts of the Mediterranean (see Annex 1 for more details).

Naturally, attaining an ecosystem-based approach to marine management stretches beyond fisheries and is beyond the scope of the CFP alone. The Marine Strategy Framework Directive (MSFD)¹⁹ was adopted in June 2008. It has the overall aim to achieve ‘good environmental status’ (GES) in Europe’s marine waters by 2020²⁰. It does this by requiring Member States to determine GES for the marine waters over which they have jurisdiction in each Marine Region and then for Member States to

¹⁷ COM (2001) 143 final, Communication from the Commission to the Council and the European Parliament - *Elements of a Strategy for the Integration of Environmental Protection Requirements into the Common Fisheries Policy*, 16/03/2001, p. 5.

¹⁸ COM (2002) 186, Action Plan to Integrate Environmental Protection Requirements into the CFP, 28/5/2002; Council Regulation (EC) N° 2371/2002 of 20 December 2002 on the Conservation and Sustainable Exploitation of Fisheries Resources Under the Common Fisheries Policy, OJ N° L 358, 31/12/2002, p. 59-80.

¹⁹ 2008/56/EC

²⁰ Annex 1 of the MSFD lists 11 ‘qualitative descriptors’ for determining GES. A number of these relate to fishing activity but others are broader and focus on the ecosystem including species and habitats, marine food webs and seafloor integrity.

develop Marine Strategies with Programmes of Measures to tackle those pressures on the marine environment which prevent the achievement of good environmental status.

The MSFD brings the concept of an ecosystem-based approach into EU law. Even though the Directive does not provide an explicit definition for the approach it makes it operational by setting an administrative framework (i.e. Marine Strategies) and specific goals for its implementation, e.g. explicit reference to marine services) (See Box 5.1 below). In particular, according to the Directive the structure, functions and processes of the constituent marine ecosystems, together with the associated physiographic, geographic, geological and climatic factors, allow those ecosystems to function fully and to maintain their resilience to human-induced environmental change. Furthermore the Directive provides for the protection of marine species, habitats and their functioning and the prevention of human-induced decline of biodiversity.

The MSFD has a strong focus on maintaining biodiversity and sustaining clean, healthy and productive seas. It goes beyond the CFP with its focus on the sustainable use of goods and services, with a special emphasis on resilience, and impacts on the ecosystem, as well as economic and social analyses of resource use and of the cost of degradation of the marine environment. Additional key aspects are that the starting point is the ecosystem and that spatial protection measures (e.g. marine protected areas as part of a wider scheme of marine spatial planning) are underlined. The MSFD also provides a basis for Member States to take forward marine spatial planning, which would provide a tool for assisting in ecosystem-based management.

Box 5.1. Ecosystem-based approach to managing EU marine areas

Ecosystem-based approach: *'[...] an ecosystem-based approach to the management of human activities, ensuring that the collective pressure of such activities is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised, while enabling the sustainable use of marine goods and services by present and future generations'* (MSFD Article 1.3).

Good environmental status is *'the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations'* (MSFD Article 3.5).

Consequently, both the CFP and MSFD have made progress towards implementing an ecosystem-based approach to managing marine areas within the EU. However, significant efforts are still required to guarantee the successful implementation of this existing framework. For example, the implementation of the ecosystem-based approach under the CFP is still limited and further work is required, for example, to clarify the objectives of the approach and making them operational for specific

fisheries and ecosystems²¹. Furthermore, there is a need to ensure appropriate coordination between the two instruments.

The review of the current CFP is now underway. As an indication of the future priorities, the Green Paper launched in 2009 highlights the importance of managing fisheries in a more integrated way with the MSFD. In the short term, the Commission will be aiming to develop long term fisheries management plans based on the maximum sustainable yield (MSY)²² which will also integrate considerations of ecosystem impact of the specific fisheries. From 2011, there are also plans for a number of specific research proposals on filling the gaps on ecosystem interactions, impacts of fishing on food webs and what specific management actions need to be taken to meet both CFP and other environmental targets. In the meantime, Member States will be working towards defining and working towards the “good ecological status” under the MSFD. Whilst these two processes are developing i.e. the reform of the CFP and the implementation of the MSFD, it is unclear whether a broader ecosystem-based focus within the EU biodiversity policy (e.g. possible new provisions for safeguarding ecosystem services) would be able to add anything new to the current efforts to safeguard the marine ecosystems in the EU. To determine this, a more detailed analysis of the possible gaps in the current framework and added value of possible new policies / instruments would be required.

²¹ Commission Communication on the role of the CFP in implementing an ecosystem approach to marine management (COM/2008/187)

²² WWF has recommended to aim for Maximum Economic Yield, instead of MSY, as this will allow for a precautionary approach and in theory result in a fishery that has a higher catch per unit effort.

6 POSSIBLE NEW INSTRUMENTS FOR THE POST-2010 ERA

This chapter presents a number of considerations regarding possible new EU policies / instruments for the post-2010 era. The suggestions below should, however, be taken as preliminary considerations only. As outlined in section 3.2, a more detailed discussion on the development of new instruments to complement the current EU policy framework should be based on a comprehensive analysis of the threats to ecosystems and potential for existing policy instruments to deal with them and thereby secure the quality of ecosystems in the future. This analysis should also consider the possible implications (including socio-economic impacts), feasibility and risks related to the development of new instruments, e.g. the possibilities for compromising the implementation of the existing biodiversity goals and instruments.

6.1 Possibilities for new dedicated legislation to address broader ecosystems?

The development of a dedicated legal instrument, aiming at the long-term protection of ecosystems within the EU has been suggested as one possible way forward in the future (e.g. EASAC 2009). The development of such an instrument could have certain benefits but also would pose several questions and concerns that require careful consideration. In particular, there is a need to establish what the possible objectives of new legislation should / could be and how it could fit into the current framework for biodiversity conservation, e.g. “coexist” with the existing Community instruments (e.g. the legislative framework for protecting marine, fresh water and agricultural environments, see below). In addition, the EU-wide added value of such an undertaking would need to be clearly justified (See 2.3 above).

In principle, a more comprehensive legislative basis, e.g. a possible dedicated legislative EU instrument, could be based on existing Community measures (e.g. the nature Directives and other EU environmental policy instruments, set out in Chapter 5 above). This could, for example, mean the development of a kind of framework directive whose main aim would be to “amalgamate” all / a number of relevant existing Community level provisions, in this way creating a more coherent and harmonised framework for protecting the full range of ecosystems (e.g. their functions, resilience and services) within the EU. Such a framework directive would not seek to replace the existing instruments and provisions, e.g. it would preserve the legislative basis and high standard for protecting biodiversity within the EU. It could, however, create added value by particularly focusing on bringing together all Community level provisions aiming to ensure sustainable use of land and ecosystem resources, in this way simplifying and harmonising the current mixture of provisions adopted under different sectoral policies. Such an approach could also help to support the further integration of biodiversity and ecosystem related concerns into EU sectoral policies (See Chapter 5 above).

Dedicated EU legislation, e.g. a possible framework instrument, could also be developed with a view to redirect the implementation of the existing instruments more

towards addressing broader ecosystems. For example, it could be used to enforce the implementation of the connectivity related provisions of the Birds and Habitats Directives. It could also provide a basis to steer the implementation of the EIA and SEA Directives towards broader ecosystem-based considerations, e.g. to use the Directives' provisions more explicitly to prevent landscape fragmentation and in this way support the functioning and resilience of broader ecosystems. Furthermore, dedicated EU legislation to address broader ecosystems, such as a framework directive, could also introduce a number of new provisions to complement the existing objectives and standards, including addressing the key gaps in the existing framework (e.g. providing a legislative basis for some of the targeted measures outlined in 6.2 below).

However, the potential implications (e.g. risks) and feasibility of adopting a dedicated legislative instrument, to safeguard broader ecosystems would need to be carefully considered. For example, there is a need to make sure that a new legislative instrument would not diminish the current standards and the political will to conserve biodiversity in the EU (e.g. jeopardise the progress made with implementing the Birds and Habitats Directives). Similarly, any new legislative initiative on biodiversity should pay attention to the developments within the other relevant EU policy sectors, such as the reform of CFP and current discussion under the CAP (see Chapter 5 above). For example, it would be crucial to ensure that the developments within biodiversity policy support the current endeavours to make the agricultural and fisheries sectors more sustainable and biodiversity-friendly.

Clearly, there is also a need to carefully consider how possible new legislation would affect the already existing EU instruments that are, in effect, already based on the consideration of broader ecosystems, i.e. the Water and Marine Framework Directives. The possible new instrument could aim to complement the existing Directives by, for example, extending the broader ecosystem-based considerations to cover other "remaining" ecosystems and, where necessary, directing the implementation of the existing instruments towards addressing the functioning and resilience of freshwater and marine ecosystems, e.g. the provisioning of different ecosystem services, in a more explicit and holistic manner.

Finally, given the current political climate, with much attention focused on climate change and the increasing cries for reducing regulatory "red tape" it might simply be unrealistic to start the post-2010 era by trying to push for a more comprehensive legislative basis for protecting both biodiversity and broader ecosystems, regardless of the benefits this might bring. Consequently, if there is political interest for such endeavours it might be more feasible and also politically acceptable to adopt a more gradual approach towards the possible further development of EU legislation.

This could mean focusing firstly on the establishment of a solid and comprehensive policy framework for the post-2010 era, e.g. building up an appropriate knowledge base, carrying out a detailed assessment of the current policy framework in terms of its ability to protect broader ecosystems and possibly adopting a few dedicated thematic policies / instruments to address some of the key gaps in the framework (see below). It would be also interesting to explore other possible existing related legal experiences in other regions, e.g. jurisdictions outside the EU. These developments could then lead to the adoption of a dedicated legislative instrument for safeguarding

European ecosystems. Such a gradual approach could also help to take into consideration the lessons learned from the further implementation of the current EU Directives with a broader ecosystem focus, i.e. the Water and Marine Framework Directives.

6.2 Targeted policies & instruments to complement the existing framework

6.2.1 Biodiversity and climate change

As noted before in this paper, many ecosystems in Europe and their component habitats and species are threatened by the direct and indirect impacts of climate change (e.g. Berry 2008, Brooker and Young 2006, EEA 2005, Huntley et al. 2007, Olofsson et al. 2008, Parry 2000, Schroter et al. 2005, Thuiller et al. 2005). The impacts of climate change are already apparent and no matter what mitigation measures are undertaken in future, further climate change is inevitable as a result of green house gas (GHG) emissions to date. Measures to help biodiversity adapt to climate change are therefore undoubtedly necessary. A substantial number of reviews and recommendations have been produced on strategies and measures to facilitate biodiversity adaptation (see for example Council of Europe reviews by Huntley 2007 and Harley 2008).

In the near future measures need to focus on increasing the resilience of existing habitats and species populations, primarily by reducing existing threats, such as inappropriate habitat management, pollution, over-exploitation and fragmentation (Tucker and de Soye 2009). In the longer-term actions will be needed to further facilitate the redistribution of vulnerable habitats and species in response to changing climate conditions. Increasing the resilience of habitats and populations will also help in this respect (e.g. by increasing emigration and survival rates), but further measures to increase habitat connectivity and proactively restore or even transpose habitats and species may become necessary.

Most of these measures are already obligations under the EU Habitats and Birds Directives, and/or included in the existing EU Biodiversity Action Plan. In essence, therefore, rather than adopting any specific new instruments ensuring adaptation of biodiversity to the changing climate requires the redoubling of the Community's current conservation efforts to protect and manage habitats and species populations (Tucker and de Soye 2009). It is also apparent that an effective ecosystem-based conservation strategy would deliver many of the actions necessary to increase the resilience of habitats and species populations to climate change. For example restoring the hydrology of upland peatlands, to reduce carbon losses and improve water retention and quality, would also increase the resilience of peatland habitats to increased temperatures and reduced rainfall.

Ecosystem-based adaptation can often provide multiple co-benefits in terms of climate change mitigation and adaptation across a range of sectors (Berry et al. 2008, Paterson et al. 2008). Consequently, the mid-term assessment of the EU BAP calls for wider recognition of the critical role that healthy ecosystems play in mitigating

climate change and adapting to its impacts. The EU Ad Hoc Expert Working Group on Biodiversity and Climate Change has also produced a discussion document that highlights the potential for ecosystem-based adaptation (AHEWG 2009). As noted in Chapter 3, the current EU biodiversity policy goals (e.g. the 2006 Biodiversity Action Plan) does not explicitly address these co-benefits of biodiversity adaptation. Therefore, it could be foreseen that the post-2010 biodiversity policy regime, with its focus on wider ecosystems, could add value by providing a more comprehensive framework and possible new policy instruments for promoting the benefits of ecosystem-based adaptation at the EU level, e.g. enforcing synergies with other sectors such as climate change and risk prevention. This could also further support the conservation of ecosystems and biodiversity in the face of climate change.

Furthermore, there appears to be little evidence that significant biodiversity adaptation measures are being planned or implemented in most Member States. Although some have developed adaptation strategies, none seems to have developed a biodiversity adaptation action plan with defined actions, time tables and responsibilities. Therefore, the EU post-2010 policy framework could further support the Member States in completing national strategies for biodiversity adaptation. These could usefully be integrated with the climate change mitigation requirements and other sectoral adaptation needs to take advantage of the potential co-benefits of ecosystem-based adaptation approaches.

6.2.2 “No-net-loss” policy and a possible instrument to support biodiversity off-sets

Some of the most important causes of biodiversity loss are the impacts of development projects (e.g. for housing, industry, tourism, transport, energy and water management). There are a range of policy instruments (e.g. SEA and EIA) that aim to ensure that such developments are sustainable and have acceptable environmental impacts. Despite these instruments, many developments result in significant residual impacts on biodiversity even after appropriate avoidance, mitigation and remediation measures have been proposed and perhaps taken. It is therefore necessary to seek policies and supporting measures that require and deliver compensation for such residual impacts, without which it will be impossible to halt biodiversity loss. Compensation²³ measures are mandatory for residual impacts on designated habitats and species within Natura 2000 sites, but these measures have a narrow focus. Many other species and habitats of significant conservation importance occur widely outside protected areas and/or have weak legal protection.

Therefore it could be beneficial to consider complementing the existing EU biodiversity policy framework by developing a no-net-loss policy for biodiversity, which would apply to all developments (including small developments, because of their potential cumulative impacts) but also ideally all land use changes (including within agriculture) that result in biodiversity impacts. Without such a policy it is doubtful that it will be possible to halt biodiversity loss in the EU (e.g. for any subsequent post 2010 target). The scope of the policy might also be usefully extended

²³ Compensation must be in terms of biodiversity outcomes, rather than monetary compensation

to cover the loss of key and under-supplied ecosystems services, for example ensuring no net loss of carbon in ecosystems, i.e. covering green and blue carbon (TEEB 2009a).

But as some residual impacts from developments will be an unavoidable and widespread reality in the EU, it is evident that a no-net-loss policy would need to involve compensation through project-specific offsets, or perhaps through market-based habitat banking schemes. As noted in a recent study for DG Environment, habitat banking schemes have the potential to provide significant conservation benefits, e.g. through strategic location of large-scale habitat restoration measures (Eftic and IEEP 2009). But such measures could also bring risks, such as potentially reducing acceptable thresholds for residual impacts whilst providing compensation with uncertain long-term additionality. A no-net-loss policy and compensatory framework would therefore have to be introduced carefully with appropriate regulatory safeguards.

6.2.3 Possibilities for establishing a system for EU ecosystem accounts

It has been increasingly acknowledged that the “book keeping” with regard to our natural resources needs to go beyond the conventional system of national accounts (SNA)²⁴ and the very partial range of satellite environmental accounts (e.g. land, forest, fish, soil, emissions) and move towards a system of natural capital accounts such as the System of Economic Environmental Accounting (SEEA) accounts²⁵. This means moving towards integrating the real value of our natural capital (e.g. the range of biodiversity benefits and ecosystem services) into the national accounting frameworks. The idea of developing such natural capital accounts would be to better reflect the role of ecosystems and biodiversity in underpinning our socio-economic wellbeing, in this way ensuring more sustainable use of land and natural resources and maintaining the health of European ecosystems (e.g. supporting the conservation of biodiversity).

The most recent expression of this need has been in the TEEB initiative (TEEB 2009b), but this in turn echoes a wider recognition by the environmental accounting, economics and environmental communities of the need for improved measurement of welfare, as manifested by debates and initiatives like ‘Beyond GDP’²⁶, the OECD’s Global Project on Measuring the Progress of Societies²⁷ and the Stiglitz-Sen-Fitoussi Commission.

²⁴ United Nations (1968). *A System of National Accounts*, Studies in Methods, Series F, No. 2, Rev. 3, New York.

²⁵ United Nations et al. 2003- United Nations, European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, World Bank (2003). *Integrated Environmental and Economic Accounting (SEEA 2003)* <http://unstats.un.org/unsd/envAccounting/seea2003.pdf>

²⁶ In November 2007, the European Commission, European Parliament, Club of Rome, OECD and WWF hosted the high-level conference “Beyond GDP” with the objectives of clarifying which indices are most appropriate to measure progress, and how these can best be integrated into the decision-making process and taken up by public debate. A direct outcome of the conference was the publication in 2009 of the Communication “GDP and beyond: Measuring progress in a changing world” by the European Commission, which includes an EU roadmap. <http://www.beyond-gdp.eu/index.html>

²⁷ The project exists to foster the development of sets of key economic, social and environmental indicators to provide a comprehensive picture of how the well-being of a society is evolving. It also seeks to encourage the use of indicator sets to inform and promote evidence-based decision-making, within and across the public, private and citizen sectors. http://www.oecd.org/pages/0,3417,en_40033426_40033828_1_1_1_1_1,00.html

In order to develop such an initiative further at the EU level, there is first a need to establish physical natural capital accounts (i.e. accounts of the stocks of different ecosystems, ecosystem services and land uses) so that the changes to the natural capital stock, whether degradation or appreciation, can be identified (see also 3.2 above). There is also a need to support the system by the development of ecosystem quality and service indicators. Not all forms of natural capital can be expressed in monetary terms. Therefore, the accounting systems should also allow for the different ecosystem and ecosystem service values to be included into the system in physical (i.e. non-monetary) units. This would ensure a fuller reflection of the total quantity and, first and foremost, quality of natural assets. For example, this allows for the value of carbon storage and sequestration rates, water purification and provision and contributions to natural hazard risk management to be reflected in the accounts.

Clearly ideal natural capital accounts that would cover all ecosystems and their benefits (e.g. all ecosystem services) would take a long time to create. However, such an approach would be very valuable in strengthening the management of natural capital (e.g. the quality of ecosystems and ecosystem services) in a sustainable manner. There are a number of bases to build on and a new political momentum in the need for carbon-biomass accounts (not just for forests, but also for agricultural land, protected areas and wetlands) to support the climate change commitments and processes²⁸. However, care will need to be taken to make the best use of the increasing but narrow interest in the carbon related ecosystem services - there is a risk that the current enthusiasm will lead to a “carbon bias” in emerging natural resource accounts. The accounts should therefore aim to start at a high level of approximation to support a wide coverage of ecosystem values and allow for differential progress/status in information for different ecosystems, land uses and services.

There are commitments by the European Environment Agency (EEA), the European Commission and Eurostat to work towards such natural capital accounts²⁹ (see Chapter 3 of TEEBb). It is also hoped that individual Member States will help to develop and test natural capital accounts for their own countries. Leadership at the EU level, e.g. in the context of the post-2010 biodiversity strategy could help to support these endeavours towards a more sustainable use of wider ecosystems in Europe, while assuring the associated benefits to biodiversity

²⁸Notably, the proposed new instrument of Reducing Emissions from Deforestation and Forest Degradation (REDD-Plus) would offer incentives for forest conservation, sustainable forest management and enhancement of existing forest carbon

²⁹ Discussions at the open EEA management board seminar in Luxembourg November 2009.

7 GOING GLOBAL - THE EU'S ROLE IN SAFEGUARDING ECOSYSTEMS OUTSIDE ITS BORDERS

The EU plays an important role in supporting the conservation of biodiversity, ecosystems and their services at a global level. For example, a large share of resources used in the EU, such as timber, fish, agricultural products and energy resources, are imported from outside the Union, which affects the land and resource use patterns at global level. The trade between the Union and other countries is governed at the Community level, e.g. it is the exclusive competence of the EU to negotiate trade agreements between its Member States and non-EU countries. The EU is also a major player in terms of providing financial assistance to support global efforts for sustainable development, e.g. in the context of development cooperation. This means that the EU can also have significant impacts on the use of land, ecosystems and natural resources outside the Union through different actions and development projects it decides to endorse and/or finance.

The current EU biodiversity policy (e.g. the 2006 Biodiversity Action Plan) already emphasises the role of EU as a global actor. It highlights the EU's leadership in improving the global governance of biodiversity and, in particular, it urges the EU to improve the integration of biodiversity concerns into its trade policies and external assistance. However, even though the existing Community objectives also refer to the conservation of ecosystem services as a part of the EU's global endeavours the Biodiversity Action Plan provides no explicit actions or measures for safeguarding broader ecosystems, e.g. their services, in the context of EU external policies. Naturally, it can be seen that supporting the conservation of biodiversity in third countries also helps to maintain the functioning and resilience of global ecosystems more widely (see Chapter 2). Furthermore, a successful integration of biodiversity into the EU external policies could help to minimise the pressures on broader ecosystems outside the EU. However, there is still significant progress to be made in achieving these existing policy goals, e.g. ensuring that environmental assessments are systematically and thoroughly carried out to prevent negative impacts arising from EU trade and external assistance on biodiversity³⁰.

As for the impacts of EU consumption, the current biodiversity policy addresses the EU's role in preventing illegal logging and deforestation at the global level³¹. Consequently, it does not systematically cover the impacts of EU consumption on the world's ecosystems. This can be considered as a serious shortfall, particularly given the significant impacts of EU's resource use on the global natural capital stocks (e.g. the estimated size of EU's ecological footprint)³². For example, the EU's increasing demand for biofuels and the impacts of this on land use patterns in third countries is not addressed in the current policy framework.

³⁰ I.e. the Sustainability Impact Assessments (SIA) for trade agreements (<http://ec.europa.eu/trade/wider-agenda/development/sustainability-impact-assessments/>) (COM/2008/864)

³¹ Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan) and the Council Regulation (EC) No 2173/2005 of 20 December 2005 on the establishment of a FLEGT licensing scheme for imports of timber into the European Community.

³² http://www.footprintnetwork.org/en/index.php/GFN/page/basics_introduction/

Consequently, a future EU biodiversity policy should better address the impacts of the Community's policies (both internal and external) on biodiversity and broader ecosystems at the global level. A key challenge will be to ensure that the existing objectives for integration of biodiversity concerns are taken up and acted upon in a more effective manner. Furthermore, there is a need to address the impacts of EU consumption of food and non-food commodities on the status of biodiversity and broader ecosystems outside the Union. It is foreseen that this could lead to improving the effectiveness of biodiversity conservation at the global level.

The EU could also play an active role in supporting the development of global payments for biodiversity and/or ecosystem services (e.g. in the context of external assistance for developing countries)³³. For example, the possibilities for developing a mechanisms for Reducing Emissions from Deforestation and Forest Degradation (REDD) in developing countries are being actively discussed. It would be important for the EU to ensure that, if such a mechanism is going to be developed, it will bring true benefits to biodiversity, e.g. effectively support the conservation of natural forests (e.g. TEEBa 2009).

The EU could also further support global efforts to reform subsidies that lead to the unsustainable use of natural resources and negative impacts on biodiversity, e.g. support the production of biofuels on the expense of natural ecosystems. This could be achieved, for example, by further reducing imports of illegally logged timber to the EU and making greater use of sustainably produced goods such as eco-certified forest and fisheries products (e.g. through green public procurement).

Emphasising how biodiversity and well-functioning ecosystems underpin global welfare (e.g. support the goals for poverty alleviation) can help to further integrate biodiversity concerns into the EU, global and national policies, potentially reducing their negative impacts and supporting the protection of broader ecosystems and biodiversity at the global level (TEEB 2009b). For example, the maintenance of the natural "welfare support system" for the poor may help to gain broader political and stakeholder acceptance for conservation in the EU partner countries. This is also one of the key insights behind the Convention on Biological Diversity's (CBD) ecosystem approach³⁴. However, it is imperative that the protection of biodiversity in itself remains high on the EU global agenda (e.g. as one of the key thematic areas for development cooperation) as there is always the risk that the "pure" biodiversity concerns become sidelined due to the increasing pressures to use natural resources, especially in the developing countries.

³³ A number of countries are also contributing significant sums to forestry funds. See Chapter 5 of TEEB for Policy Makers. These are not, however, for specific ecosystem services, but do, de facto, pay for a "bundles of services".

³⁴ <http://www.cbd.int/ecosystem/>

8 TOWARDS MORE EFFECTIVE AND ECOSYSTEM-BASED EU GOVERNANCE

Even the most suitable and promising policies and instruments can fail to deliver their objectives if not put into practice in a timely and effective manner. Consequently, there is increasing recognition that the post-2010 biodiversity policy needs to be supported by appropriate governance, decision-making and management structures that help to ensure its successful implementation. The literature and knowledge base regarding the governance of biodiversity and natural resources has greatly increased during the past years. The purpose of this short Chapter is not to provide a detailed and exhaustive discussion on this vast and diverse topic but rather highlight the overall importance of EU governance in securing effective conservation of biodiversity and broader ecosystems and provide a few initial insights related to improving the EU governance framework in the future.

Slow implementation of the existing biodiversity policy instruments, e.g. the limited capacity of Member States' environmental agencies and other relevant organisations to support and monitor conservation actions, has been identified as one of the reasons for the EU's failure to achieve its 2010 biodiversity target (Gantioler et al. 2009). For example, the lack of stakeholders' capacity and resources combined with the EU bureaucracy and administrative burden have been identified as key factors limiting the use of available EU funds for biodiversity (Kettunen et al. 2009a).

Furthermore, given the sector-based management of natural resources and also the variable competence between the EU and its Member States (See 2.3 above) the conservation of broader ecosystems often continues to take place in a rather non-holistic and piecemeal fashion. As a result the use of land- and natural resources within a given ecosystem is governed by a combination of different Community-wide and Member State specific policies. Not surprisingly, administrative fragmentation and lack of coordination between different institutions, administrative bodies and stakeholders has been known to contribute to ineffective implementation of existing policies and instruments, both at the Community and Member State level (e.g. Eckerberg & Nilsson 2007). According to a recent assessment, substantial changes of biodiversity governance and management systems at a broader ecosystem level are rather rare, and have usually emerged as a result of serious depletion of the natural resource base, i.e. a response to a situation when critical and potentially irreversible changes have already taken place (Huitric et al. 2009). The gradual shift towards an ecosystem-based management of EU fish stocks in the context of CFP can be seen as one of such examples.

Consequently, moving towards an ecosystem-based EU biodiversity policy regime and successfully safeguarding / restoring the integrity of broader ecosystems seems also to require a careful re-evaluation of the EU governance and management systems, both at the Community level (e.g. EU internal and external policies) and between the Community and Member States. In general, a lack of acknowledgment of the dynamics of and interlinkages within ecosystems (e.g. their interactions with our social systems) has been recognised as a fundamental factor behind governance failures (Huitric et al. 2009). Without a due consideration of these factors and the

identified failures in the current governance, decision-making and management frameworks there is a real risk of falling short in delivering any set future biodiversity objectives.

To address the current problems, it is often suggested that a successful management of biodiversity and broader ecosystem requires more adaptive governance systems characterised by an ability to cope with uncertainty and adjust to change (Berkes et al. 2003, Ostrom 2007). A solid and constantly updated ecological knowledge base, e.g. the establishment of appropriate mechanisms to identify new and emerging issues (e.g. threats) relevant for managing biodiversity and ecosystems, is seen as one of the key features for such an adaptive system. The recent / ongoing initiatives such as the Millennium Ecosystem Assessment, EURECA and TEEB (see Chapter 1) have already paved the way for a creating a knowledge base to support more adaptive governance of biodiversity and ecosystems. Also, there is an ongoing discussion regarding the possibility of establishing a biodiversity and ecosystem service-related version of the International Panel on Climate Change (IPCC). This platform, currently called an International Platform for Biodiversity and Ecosystem Services (IPBES), might be an important further step towards a more adaptive and knowledge-based biodiversity governance, both at the EU and global level. (Please see Huitric et al. 2009 for more detailed discussion on adaptive biodiversity governance)

Furthermore, efforts should also be made to ensure good coordination and flow of information between different policy sectors and governance levels within the EU. In particular, there is a need to improve the ability of governance and decision-making mechanisms to address the different spatial (i.e. geographic) and time scales relevant to biodiversity conservation and the maintenance of ecosystem functioning and services. This can be done, for example, by creating mechanisms (e.g. formal and informal) that allow better dialogue between different levels of decision-making and increase the coordination of different sectors within the EU. Given the broad mixture of Community and Member State policies affecting the land use within broader ecosystems there could be scope to improve and/or develop new mechanisms to ensure more holistic land-use planning in the EU. The EU could, for example, take an initiative to create a Community level platform dedicated to supporting dialogue and sharing of lessons learned.

A number of recent EU policy instruments, such as the Water and Marine Framework Directives, already contain components that can guide the way towards a more adaptive and ecosystem-based governance structures. For example, some elements of the Water Framework Directive, e.g. the adoption of management plans at a river basin level and participatory approach, correspond to the characteristics of adaptive governance outlined above. For example, enhancing communication between different stakeholders allows the establishment of a joint vision on the local/regional development potential and objectives. This can provide important support for the integration of nature conservation related aspects, including preventing fragmentation and increasing connectivity between sites, into river basin and inland water management. In addition, the river basin management plans create a good framework for addressing cross-border issues (Kettunen et al. 2007). However, there are also several lessons to be learned, e.g. the Water Framework Directive is also considered to be too much expert-oriented and centralised which hinders its ability to adapt to changing ecological and societal conditions (Huitric et al. 2009). A more detailed

analysis of the lessons learned during the implementation of these directives is therefore needed to support the development of the future EU governance regime.

9 FINANCING THE POST-2010 BIODIVERSITY POLICY IN THE EU

In 2006 the European Parliament, the Council and the Commission agreed to undertake an extensive review of the EU budget. The review process is currently ongoing and it provides a timely opportunity for increasing the profile of biodiversity and broader ecosystems within the Community's financing framework, both in terms of securing an adequate level of future funding and highlighting the possible "win-wins" for conservation and socio-economic welfare. It is therefore of importance that the discussions on the EU post-2010 biodiversity policy regime will be closely linked up with the negotiations on the future EU budget. (Please see Kettunen et al. 2009 for further discussion on biodiversity and the EU budget)

The current EU financing framework (2007-2013) already seeks in principle to integrate biodiversity as one of the priorities for all the Community funds, thus providing opportunities for maintaining / restoring ecosystems and their services (Miller et al. 2007). For example, prevention of environmental risks is one of the priorities supported by the Structural Funds. If taken up appropriately (i.e. utilising synergies with biodiversity conservation) this offers possibilities for funding actions that aim to maintain or restore the natural capacity of ecosystems to mitigate flooding, wild fires and droughts. Similarly, EU funding for rural development can be used to support several services provided by agricultural or forestry ecosystems, including preserving the natural pollination of crops, maintaining water and soil quality, protecting landscape and cultural values, and supporting rural ecotourism and recreation.

It is also evident that the future success of EU biodiversity policy depends on the availability of financial resources to support its implementation. These are not sufficient within the EU budget for 2007 - 2013 (Kettunen et al. 2009a). For example, according to a recent assessment, the amount expected to be available for biodiversity amounts to only 0.47 per cent of the Community budget³⁵.

The EU's failure to reach its 2010 biodiversity goal is an important reason to believe that current levels of funding, coupled with existing policies and legislation, are insufficient to halt the ongoing decline of biodiversity. The EU financial contribution to conservation seems also insufficient when considering the significant current and future costs associated with the loss of biodiversity and ecosystem services, both within the Union and at global level (See 3.3. above, TEEB 2008). Furthermore, it can be foreseen that the higher agricultural commodity prices expected in future, coupled with increasing pressures for land use change will increase the opportunity costs to farmers of participating in voluntary agri-environment schemes and undertaking biodiversity sensitive management (Kettunen et al. 2009a). This means that payments to incentivise these actions, i.e. the 'costs' of conserving biodiversity and wider ecosystems within an agricultural context, will increase in the future. Finally, it is also likely that land prices (e.g. in coastal areas) will rise, putting up the cost of

³⁵ Including LIFE+ expenditure (0.84 EUR), EAFRD Natura 2000 payments (0.58 EUR), and the allocation for biodiversity under ERDF (2.7 EUR), see Kettunen et al. 2009a for more detailed information.

conservation and sustainable use in the face of competing land users and development.

Consequently, it is of great importance that a future biodiversity policy regime is reinforced by an adequate financial back up. Based on the EU's outspoken ambitions for the post-2010 era a number of preliminary observations on future funding priorities can already be made.

Firstly, it seems vital that biodiversity conservation, e.g. managing the Natura 2000 network, remains as one of the key activities supported by EU funding. As outlined in section 2.1 above, the variety of species and habitats create the "building blocks" for naturally functioning ecosystems and the services they deliver. In addition, biodiversity values are commonly considered to have a value of their own (i.e. intrinsic value) that merits being addressed at the Community level.

Secondly, the increased focus on safeguarding broader ecosystems and maintaining their functioning, resilience and services might require more novel approaches to EU (and also to Member State) funding. For example, given the increased interest and political focus on ecosystems and their role in maintaining human wellbeing, the idea of having a specific funding mechanism for supporting broader ecosystems and their services has been suggested (Kettunen et al. 2009a). This targeted Community funding could be provided for maintaining and restoring those ecosystem and services that are considered to be of EU-level importance and that cannot effectively be addressed by Member States alone. Such services could include, for example, protecting and enhancing some ecosystems' ability to mitigate the impacts of climate change, to maintain water quality and to regulate the occurrence of extreme events and natural hazards. Similarly, EU financial support could be used to safeguard ecosystems and landscapes that play a fundamental role in maintaining unique natural and cultural values within the EU.

As well as the EU and national government budgets, there is significant scope for additional funding via the use of new instruments on the principle of providing payments for ecosystem services (PES) and also simple direct investments in natural capital. Agri-environment measures within the EU could already be considered a form of PES. The REDD+ instrument being discussed in the context of the UNFCCC, has potential to be a major new tool at the global level if major issues, such as appropriate governance arrangements can be resolved. Direct investment in natural capital could take the form of local investment in restoration of forests or river basins to secure quality water provision for cities for example, or investment in restoration of wetlands to help with flood control.

Even though the uptake of the existing opportunities to fund ecosystem services from the Community funds has so far been limited there is a need to think carefully what the possible implications of complementing the existing funding mechanisms with a separate and specific funding for ecosystem and their services would be in terms of continuing the integration of biodiversity into different EU sectoral policies. These considerations are important as the different EU financing instruments cannot be used to fund identical priorities and actions. A dedicated fund for ecosystems and their services could partially overlap with existing / future funding priorities within other sectoral policies (e.g. future focus of the agricultural budget for the provision of

public goods) and could potentially undermine the attempts to re-enforce the role of biodiversity within these policy areas.

Finally, it has also been acknowledged that a number of activities funded from the EU budget continue to have both direct and indirect negative effects on biodiversity and ecosystems, e.g. several activities supported by the EU funds (e.g. to support the implementation of the EU Cohesion Policy) significantly contribute to the fragmentation and degradation of terrestrial and marine ecosystems, jeopardising their normal functioning. More attention has been given at the EU level to minimising potential conflicts between the conservation objectives and other priorities for Community funding. However, continued work on this area post-2010 is needed in order to improve the overall sustainability of the EU funding framework, for example in relation to investment in fishing vessel capacity.

10 CONCLUSIONS & RECOMMENDATIONS

The adoption of a more ecosystem-based EU policy regime for biodiversity could bring benefits but it needs to be carefully considered. Such a regime might help to increase public and political support for biodiversity protection and thereby improve the implementation of EU biodiversity policies (e.g. by highlighting significant synergies with other policy areas such as climate change adaptation). However, appropriate planning of such a regime's scope and clear communication of its goals would be needed to ensure that the momentum to support biodiversity conservation is not lost and that an ecosystem-based policy regime does not become narrowly focused on ecosystem services only. Importantly, increased focus on ecosystem services should not divert resources away from biodiversity conservation or displace development pressures onto them.

10.1 Ensuring the ecological foundations of an ecosystem-based policy regime

Biodiversity conservation is the foundation of broader ecosystems. The quantity, condition and diversity of species and habitats within ecosystems form the basis of their health (e.g. the structure, functioning and services they provide). Furthermore, ecosystem resilience (i.e. the capacity for ecosystems to cope with changes and disturbances) depends on the abundance and diversity of species and their functional attributes. Consequently, the conservation of biological diversity is crucial for the future of healthy ecosystems within the EU. The application of the precautionary principle (as foreseen in the EU Treaty) provides a solid basis for making biodiversity conservation one of the “first lines of defence” against the degradation of ecosystems and the services derived from them in a changing environment (e.g. in the context of climate change).

A word of caution: focusing only on ecosystem services can compromise biodiversity objectives and also jeopardise the functioning and resilience of ecosystems (e.g. the provisioning of ecosystem services). Safeguarding broader ecosystems requires conservation and sustainable use of all their components (e.g. species, habitats and genetic diversity) and the different functions within the system. In comparison, securing the supply of ecosystem services is primarily focused on preserving the anthropogenic benefits provided by biodiversity and ecosystems. Therefore, there is a need to ensure that any future EU policy regime does not become so focused on ecosystem services that it overlooks species and habitats with no recognisable value to human wellbeing. This would be undesirable and would also lead to the degradation of ecosystem quality (e.g. its functioning, resilience and services) in a long-run.

10.2 Building on the existing instruments and securing sectoral integration

The existing EU instruments for biodiversity conservation can provide a good starting point for addressing broader ecosystems. By safeguarding the variety of species and habitats (i.e. ecosystem “building blocks”) the EU Birds and Habitats Directives also provide a good starting point for supporting the quality of broader ecosystems, including their functions, resilience and many of their services. The Directives require a range of measures to maintain and restore favourable conservation status. The designation and appropriate management of Natura 2000 sites is the principal measure to maintain favourable conservation status, and is also “a back bone” for the maintenance of ecosystems in general and a variety ecosystem services. But measures are also required in the wider environment to maintain favourable conservation status, including those necessary to maintain connectivity amongst Natura 2000 sites and the overall coherence of the network.

Existing EU policies can help to lead the way towards a more ecosystem-based policy regime post-2010. The Water Framework Directive (WFD) and Marine Strategy Framework Directive (MSFD) (supported by the CFP) can contribute significantly to the maintenance of the “good status”, e.g. the overall integrity and resilience, of inland water and marine ecosystems. Furthermore, if adopted, the Soil Framework Directive could significantly contribute to the maintenance of overall soil quality and functionality in the EU, including its functions and the services that healthy soils provide. Less directly, technical measures such as EIA and SEA also have considerable potential for helping to maintain / restore the quality of broader ecosystems, provided that they are more explicitly targeted to address ecosystem-wide concerns (e.g. fragmentation and the maintenance of ecosystem functions and services). The Environmental Liability Directive might also play a supporting role although there are a number of difficulties (e.g. defining the desirable status in dynamic ecosystems and ensuring more holistic and “ecosystem sensitive” implementation of existing provisions) which would need to be overcome.

The integration of biodiversity concerns into relevant EU sectoral policies could play a key role in safeguarding broader ecosystems. The status of Europe’s ecosystems is to a large extent determined by different land- and resource use practises creating pressures on natural systems. Consequently, the integration of concerns relevant to ecosystems health into the relevant EU sectoral policies affecting ecosystems (most notably the agricultural and fisheries policies) can be seen as a crucial part of any post-2010 policy regime aiming to preserve the integrity of broader ecosystems within the EU. Effective integration is needed to minimise the damage to ecosystems caused by different sectoral activities and to maximise the positive contribution of these activities to conservation objectives.

10.3 Possibilities for new policy initiatives

Urgent actions are needed to improve the condition of ecosystems in order to increase the resilience of habitats and species to the impacts of climate change. In many cases such actions could be integrated with broader ecosystem based adaptation measures that may provide co-benefits in terms of climate change mitigation and/or adaptation needs for other sectors. A high priority should therefore be given to investigating the potential for ecosystem-based adaptation and developing policy instruments to support such measures.

Potential measures to improve and / or harmonise the EU legislative basis for safeguarding broader ecosystems would also require careful analysis. In particular, it is important to ensure that any such initiative will not diminish existing standards for biodiversity conservation nor compromise current endeavours for improving the environmental sustainability of EU sectoral policies. Furthermore, there are practical difficulties with defining, delineating and quantifying many ecosystem functions (and related services). It may therefore be too challenging to develop legislation that can directly target / protect broader ecosystems in a practical way that is verifiably effective.

The most successful Post-2010 biodiversity goals will probably be best achieved by gradual policy developments, with the priority being the effective implementation of existing instruments. A stepwise approach towards possible future developments to address broader ecosystems would appear to be particularly appropriate. This should firstly focus on the establishment of a strong and comprehensive policy framework for conserving biodiversity and healthy ecosystems (e.g. their services) in the post-2010 era, possibly adopting a few targeted policies / instruments to address obvious gaps in the existing framework. An additional priority should be to increase the knowledge base on the status of European biodiversity and associated ecosystem services. Later on a further step could be taken to carry out a thorough evaluation of current legislative and other policy instruments that could help to conserve broader ecosystems in the EU. This would help to identify further gaps and inform further assessments of the feasibility, merits and implications of potential options for more dedicated instruments for safeguarding European ecosystems. Such a gradual approach would also provide an opportunity to learn from the current implementation of the EU Nature Directives and other environmental policies including the Water and Marine Framework Directives as they are implemented more widely.

10.4 The global dimension

The post-2010 EU biodiversity policy needs to better address the impacts of the Community's policies on biodiversity and broader ecosystems at the global level and become more efficient. In particular, there is a need to address the impacts of EU consumption patterns on the status of biodiversity and the health of broader ecosystems both globally and within Europe. However, it is important that "pure" biodiversity" concerns also remain as one of the key objectives on the EU global

agenda as there is always the risk that these concerns become sidelined due to the increasing pressures from the EU and elsewhere to exploit natural resources, especially in the developing countries.

10.5 Governance and budget

A stronger EU biodiversity policy requires an appropriate governance framework and sufficient financial resources to support its implementation. A post-2010 biodiversity policy needs to be supported by appropriate governance, decision-making and management structures. An adaptive governance system characterised by an ability to cope with uncertainty and adjust to change would be appropriate. A careful re-evaluation of the current governance frameworks for biodiversity, both at the Community level and between the Community and Member States would be helpful if the focus on ecosystems is to become a core theme of EU policy. Even without a new focus on ecosystems additional resources are required to back up the EU's ambitions on biodiversity. The current review of the EU budget provides an important opportunity for increasing the profile of biodiversity and broader ecosystems within the Community's future financing framework.

The EU framework alone cannot guarantee the maintenance of healthy ecosystems and their services but actions are also needed at the Member State level. Primarily, EU actions to protect biodiversity and ecosystems should be focused on the key issues of EU-wide importance and complement the actions taken at national level. Indeed, the EU's ability to address broader ecosystems is influenced by its competence in different sectoral policy areas. Given these "framework conditions", it is likely that a successful ecosystem-based EU biodiversity policy regime would need to be built around two parallel approaches, i.e. showing leadership in the areas of (joint) Community competence (e.g. environment, climate change, agriculture and fisheries) and developing good support mechanisms (e.g. appropriate incentives) in areas where the EU mainly supports Member State actions (e.g. land-use planning and forestry).

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ANNEX 1. COMMON FISHERIES POLICY (CFP) MEASURES THAT CONTRIBUTE TO THE ECOSYSTEM-BASED APPROACH TO FISHERIES MANAGEMENT AND ADDRESS THE PROTECTION OF BROADER MARINE ECOSYSTEMS

In the last five years, the Commission has taken action and adopted a number of Regulations which contribute to the ecosystem-based approach to fisheries management. A list of these initiatives (including legislation adopted) is contained in a Communication published by the Commission in 2008.³⁶ The list highlights that the Commission has made some progress in adopting Regulations in support of the ecosystem-based approach to fisheries management. In 2006, the Commission proposed a policy to reduce the exploitation of marine fish populations to maximum sustainable yield (MSY) as laid down in the Communication on MSY.³⁷ In 2007, the Commission proposed a new discards policy³⁸ and in May/June 2008 has undertaken a consultation with stakeholders. In 2008, the Data Collection Regulation (DCR) was reviewed and will require the collection of data which will underpin the use of indicators supportive of the ecosystem-based approach to fisheries management.³⁹

An important event in addressing the broader marine ecosystems via CFP was the recent adoption of Regulation 734/2008 on the protection of vulnerable marine ecosystems.⁴⁰ Prior to this Regulation, the Community had only adopted measures to close bottom fishing in areas within Community waters⁴¹ and on the high seas within the framework of all existing regional fisheries management organisations (RFMOs) empowered to regulate bottom fisheries. This regulation seems to end the stalemate in the sensitive political debate as regards the scope of the Community's conservation competence. Member States' fishing vessels are authorised to operate only under a special fishing permit scheme. Compliance with the permit conditions is ensured by means of on-board observers and provisions regarding the operation of satellite-based Vessel Monitoring Systems (VMS) used to track vessel movement at sea. The issuance of such permits is subject to an impact assessment of the authorised fishing activities. The use of bottom gears is prohibited in areas that have not undergone an appropriate scientific assessment as to the risks of significant adverse impacts. Where in the course of fishing operations, a fishing vessel encounters a vulnerable marine ecosystem (VME) as defined by the UN General Assembly it must immediately cease fishing and may resume its operations only at an alternative site located at a minimum distance of five nm where no vulnerable marine ecosystems are found. The violation of specific conditions such as those relating to un-assessed areas, the operation of the VMS and the relocation of activities is included among the list of serious infringements contained in Regulation 1447/1999 establishing a list of types of

³⁶ COM (2008) 187, Communication from the Commission to the Council and the European Parliament - *The role of the CFP in implementing an ecosystem approach to marine management*, 11.4.2008.

³⁷ COM (2006) 360, Communication from the Commission to the Council and the European Parliament - *Implementing sustainability in EU fisheries through maximum sustainable yield*, 4.07.2006.

³⁸ COM (2007) 136, Communication from the Commission to the Council and the European Parliament. *A policy to reduce unwanted by-catches and eliminate discards in European fisheries*, 28.3.2007.

³⁹ Council Regulation (EC) No 199/2008 of 25 February 2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy, OJ L 60, 5.3.2008, p. 1–12.

⁴⁰ Council Regulation (EC) No 734/2008 of 15 July 2008 on the protection of vulnerable marine ecosystems in the high seas from the adverse impacts of bottom fishing gears, OJ L 201, 30.7.2008, p. 8–13.

⁴¹ Regulation (EC) No 602/2004 of 22 March 2004 amending Regulation (EC) No 850/98 as Regards the Protection of Deepwater Coral Reefs from the Effects of Trawling in an Area North west of Scotland, OJ L 097, 01/04/2004, p. 30.

behaviour which seriously infringes the rules of the CFP.⁴² All these initiatives, although not part of a comprehensive strategy to operationalise the ecosystem-based approach are specifically aimed at minimising the effects of fishing on marine ecosystems.

Beyond the fisheries related measures, under the CFP, there have been a number of broader measures aimed at mitigating the impact of fisheries on the marine environment. These include:

- The proposed discard policy which aims to reduce unwanted by-catch and habitat damage;
- The compulsory use of pingers on gill nets to help avoid incidental catches of marine mammals; area closures so as to increase the fish-based food availability for seabird predators (e.g the sandeel fishery closure);
- The implementation of a ban on bottom trawling in the Mediterranean in waters deeper than 1000 meters
- Closure of three areas in international waters to protect sensitive habitats (e.g. Posidonia and maerl beds) and
- Plans to protect sensitive species such as sharks and elasmobranchs (2008) and seabirds (2009).

⁴² Regulation (EC) N° 1447/1999 Establishing a List of Types of Behaviour which Seriously Infringe the Rules of the Common Fisheries Policy, OJ L 167, 2/07/1999, p. 5



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