



Costs and Socio-Economic Benefits associated with the Natura 2000 Network





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ABBREVIATIONS

CAP	EU Common Agricultural Policy
CORINE	Coordination of Information on the Environment
DEFRA	Department for Environment, Food and Rural Affairs (UK)
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
EEA	European Environment Agency
ESS	Ecosystem Services
ETS	Emission Trading Scheme
EU	European Union
FCS	Favourable Conservation Status
FTE	Full-time Equivalent
GDP	Gross Domestic Product
GIS	Geographical Information System
GNP	Gross National Product
LIFE	European Environment Fund
MA	Millennium Ecosystem Assessment
MS	Member State
NPV	Net present value
PES	Payments for Environmental Services
PPP	Purchasing Power Parity
SAC	Special Area of Conservation
SCI	Site of Community Importance
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest (UK)
TEV	Total Economic Value
TSV	Total System Value
WTA	Willingness to Accept
WTP	Willingness to Pay

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EXECUTIVE SUMMARY

Key Messages

Financial resources required to implement Natura 2000

- Building on the results of the Member States questionnaire, the annual costs of implementing the Natura 2000 network were estimated as €5.8 billion per year for the EU-27.
- This value should be seen as an underestimate as most countries focused on historic and/or budgeted expenditures (e.g. Belgium), and fewer provided information on the future needs. For instance, the cost of achieving favourable conservation status was only captured to a limited extent. In addition, the cost of implementing marine Natura 2000 sites was under represented.
- The overall costs are not expected to decline in the future, though a gradual shift from one-off investments to regular management costs is supposed to occur. In most Member States the network is seen as delivering long term objectives which will require ongoing expenditures.

The benefits of investing in the network

- The existing examples of the benefits of Natura 2000 underline the wide range of ecosystem services that are provided by the network – e.g. tourism and recreation, water quality, flood control, and wider cultural services.
- A number of examples have demonstrated that the benefits can be larger than the associated costs. In Ireland, the total rate of return on government support to the Burren park was estimated (conservative) to be around 353 – 383%, (without or with tourism), and 235% if all operating costs of the farming programme and all direct payments are considered.
- Natura 2000 sites can be particularly important for local and regional economic development, as they help attract financing and offer an important source of direct and indirect employment.
- Even though our knowledge on the value of biodiversity, ecosystems and their service is steadily increasing, there is still an apparent lack of quantitative/ monetary and well-documented information on the socio-economic benefits associated with Natura 2000.
- Concerted efforts are required to improve the understanding of the benefits – a common approach to demonstrate the value at not just local, but also regional, national and EU level is needed.

Awareness of the benefits of Natura 2000

- Awareness of the benefits of Natura 2000 is helpful in attracting financing, in supporting vital engagement of local stakeholders, generating appreciation for the values of the network, and influencing policy decisions and instrument choice. Delivering local successes can be crucial for gathering wider support.

Implications for Financing Natura 2000

- Financial support from the EU budget forms an important source of financing for the Natura 2000 network. Indicative information on the current level of support shows that the estimated 5.8 billion EUR/ year costs for managing Natura 2000 in the EU is around four times higher than the likely annual contribution of the present EU budget.
- Innovative financing tools offer potential for new and more effective funding sources for Natura 2000. However, it was emphasized that they should not substitute dedicated public funding.

The pillars of Europe's legislation on nature conservation and biodiversity are Council Directive 2009/147/EC on the conservation of wild birds (Birds Directive) adopted in 1979 and Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) adopted in 1992. Together, both Directives form the most ambitious and large scale initiative undertaken to conserve Europe's biodiversity, with the implementation of a network of protected areas - Natura 2000 - lying at their heart.

The establishment of Natura 2000 is at an advanced stage – the nearly completed terrestrial network consists of roughly 26,000 sites and covers almost 18 per cent of the EU territory, including terrestrial SCIs with an area of 59 million ha and terrestrial SPAs with an area of 49 million ha¹. For the terrestrial sites, the focus will now increasingly shift to effective protection, management and restoration. Key priorities will hereby be the formal designation of the sites by Member States, the setting of conservation objectives for all sites to maximise their contribution to the achievement of favourable conservation status and putting in place of effective management measures. Though significant additional marine areas have been added to the network in recent years, the key focus will also be on finalising the list of marine Natura 2000 sites and subsequently the shift to effective protection and management. The next period will be critical for making Natura 2000 fully operational.

In this regard, updating and **increasing the knowledge base on the financial requirements of Natura 2000** is needed to estimate if the financial resources foreseen for the network's future management and restoration at national level are adequate. Emphasising the socio-economic benefits of Natura 2000 will also be necessary in order to **facilitate the preparation of funding applications, and to encourage regional and local acceptance of the network**.

This study on the costs and benefits of Natura² was designed to support the European Commission in obtaining an accurate estimate of the costs of managing the network, increasing awareness of its socio-economic benefits, and developing a methodology for the systematic updating and refinement of the costs and benefits linked to the network. It builds on cost questionnaires sent to the Member States and an extensive consultation process involving national-level representatives and key partners in implementing the network on the costs and benefits of Natura 2000.

Financial resources required to implement Natura 2000

Historical context

Understanding the costs of Natura 2000 is essential to ensure that sufficient resources are allocated to the network. The EU has a strong interest in this, not only to ensure that Natura 2000 is effective in meeting its objectives, but also because Article 8 of the Habitats Directive introduced a requirement for the EU to co-finance the delivery of the network.

In response to these issues, an expert working group was established in 2002 to assess the costs of delivering the Natura 2000 network ('Markland' report³). Questionnaires

¹ Natura 2000 barometer, May 2010
http://ec.europa.eu/environment/nature/natura2000/barometer/index_en.htm

² Formal title: 'The Economic and Social Benefits associated with the Natura 2000 network' EC contract: ENV.B.2/SER/2008/0038

³ Final Report on Financing Natura 2000. Working Group on Article 8 of the Habitats Directive, chaired by John Markland. November 2002, Brussels

were sent to Member States in 2002 and 2003, which fed into the 2004 Communication on Financing Natura 2000. The analysis of the 2002 questionnaires resulted in a total cost of €4.0-€4.4 billion per year for EU-15 and 10 Acceding Countries, while the 2003 data led to a revised estimate of €6.1 billion per year for EU-25⁴. A new round of improved questionnaires was sent in 2008, in order to collect up to date cost data. 25 of the 27 Member States filled in the new cost questionnaire or provided cost information; which represented a real step forward in extending the area coverage of the cost estimates and in providing real data for the new Member States. This study contributed to and built on the results of this latest enquiry, and also benefited from direct engagement with 26 Member States and key stakeholders.

The results of the cost questionnaire

The 2008 cost questionnaire asked for information on one-off and recurrent costs related to the Natura 2000 network. The data submitted by the Member States included both incurred costs and future costs which were expected for the finalisation of the network and the achievement of favourable conservation status at the sites.

EU-25 Response: 25 Member States completed the questionnaire or provided cost information by 30 June 2010. Based on the data in the questionnaire returns, the costs of managing the Natura 2000 network for both the terrestrial and marine sites are estimated at **€5.1 billion per annum over the 2008-2014 period for the 25 countries.**

The estimates indicate that:

- 98% of these costs relate to existing sites, and only 2% to new sites
- On average, 33% of the costs are one-off investments (e.g. investment in infrastructure and land purchase) and 67% are recurrent annual costs (e.g. habitat management and planning).

As regards annual and recurrent costs and the different components, key insights include:

- Overall recurrent costs were, at €3.4 billion/ annum, higher than the annualised one-off costs, which were €1.67 billion /annum for the 25 respondent countries
- The (recurrent) habitat and management costs (e.g. conservation management measures, monitoring) were the highest of cost elements – at €2.7 billion/ annum
- Infrastructure costs (e.g. equipment acquisition, signage, trails, observation platforms) amount to €0.81 billion/ annum, almost twice that of land purchase (to €0.42 billion/annum)
- Recurrent management planning costs (e.g. running costs of management bodies, public communication) were €0.7 billion/annum for the 25 respondent countries.

Extrapolation to EU-27: The Member States completing the survey account for approximately 88% of the total area of the Natura 2000 network. Different methods were explored to extrapolate from these results in order to fill the gaps for the non-responding Member States (Finland and Romania). The resulting value for the **EU-27 amounts to €5.8 billion per year.**

⁴ Communication from the Commission to the Council and the European Parliament. Financing Natura 2000. Brussels, 15.07.2004 COM(2004)431 final

Estimated average costs: Averaged over the terrestrial land area of the network, the total costs amount to €63 per hectare per year. **There are very wide variations in average costs, which range from €14 per hectare in Poland to more than €800 per hectare in Cyprus, Luxembourg and Malta.** These higher cost estimates result in part from the scale of fixed infrastructure envisaged relative to the area of the network in these small countries. The higher cost estimates are also in part due to the fact that smaller sites in proximity to urban areas face higher per hectare costs given existing pressures, but may also reflect differences in the interpretation of the exercise. Some estimates were based on actual planned expenditures, while others estimated the expenditures that would ideally be made if the resources were available. This resulted in high cost strategies being proposed in some Member States (involving, for example, high levels of land purchase) compared to more conservative programmes in others.

The estimated average cost of €63/ha/yr is **low compared to previous estimates.** For example, Stones et al (1999)⁵ in a report for BirdLife International based cost estimates on a central figure of €80 per hectare per year and the Commission's previous estimates, extrapolated from the Markland report, suggested an annual cost of around €107/ha/yr. The figures are also much lower than recent estimates by BirdLife International⁶, which suggest an average cost of €128 per hectare, based on estimates for 6 Member States provided by BirdLife partners. A key reason for the relatively low estimates made by the Member States is that many of these appear to be based on the existing resources available for the network rather than estimates of the cost of completing, restoring and managing the network if resource constraints were not an issue.

Time profile of costs: In general little detailed information is available about the profile of future costs. However, the interviews at Member State level provided some insights about how costs might be expected to develop in future. **In most Member States some increase in costs is expected in future, and in no case was it suggested that costs will decline.** Even though many current investments are of a one-off nature, these are expected to be followed by further one-off investments (e.g. further infrastructure), periodic expenditures (e.g. revised management plans, repeat surveys, and further research) and increases in management activity with recurrent costs. In most Member States the network is seen as delivering long term objectives which will require ongoing expenditures. In general greater increases in costs are expected in the new Member States, in which the network is still very much under development, than in the EU15, where a significant proportion of one-off investments have already been made and where the focus is shifting towards recurrent costs. On an annualised basis, one-off costs were 43% of total annual costs for responding new Member States (11 of EU-12) of the EU; for the responding EU-15 (14 of 15) this was 30%.

Interpreting the results

Differences in costs estimates between Member States may vary widely by types of sites, being highest in areas which require highest levels of intervention and management (e.g. in agricultural areas in North-Western Europe) and face greater pressure from development and disturbance (e.g. islands in Southern Europe). The costs of

⁵ Stones T, Harley D, Rose L, Lasen-Diaz C, Rayment M and Trash M (1999). The Cost of Managing the Natura 2000 Network. Report for RSPB and BirdLife International. RSPB, Sandy, UK.

⁶ BirdLife International 2009. Financing Natura 2000: Assessment of funding needs and availability of funding from EU funds. Final Composite Report
http://www.birdlife.org/eu/pdfs/N2000_Final_composite_report_09.pdf

completing and managing a network of protected areas are dependent on a number of factors:

- **The size of the sites** (costs per hectare are lower for bigger sites than for small ones)
- **Accessibility / proximity of the sites to urban areas** (the increased pressure on the site tends to increase costs)
- **Income** (costs of protected areas management tends to be higher in higher income countries, reflecting wage and land costs)⁷
- **Maturity of the network** and the past expenditure will also affect the costs, as past expenditure can reduce needs for future expenditure.

Different conservation strategies might also affect the level of costs. Several Member States (e.g., Bulgaria, Czech Republic, France, Italy, Malta, Slovakia and UK) indicated that land purchase is only contemplated in rare circumstances, and that forming management agreements with private landowners is the norm. However, in others (e.g., Cyprus, Lithuania, Luxembourg, Romania, and Sweden) purchase of land was seen to play a more important strategic role, often being seen as the best means of achieving the required objectives of the network.

A great cause of variations in cost estimates also relates to the **interpretation of the questionnaire by Member States**, and particularly the degree to which responses were constrained by the realities of existing resource limitations. The guidance stated that the purpose of the questionnaire was *to obtain an estimate of the financial resources required to complete and effectively manage Natura 2000 at land and sea*. However, in practice, respondents interpreted this somewhat differently, with some providing data that built mainly on current and/or effectively planned expenditures (e.g. Belgium) and others providing estimates of what would ideally be spent if the resources were available (e.g. Cyprus, France, Germany, Hungary, Luxembourg, Malta, Sweden). Only Spain provided two estimates – one which reflected planned expenditures with the available resources and another estimate of what would ‘desirably’ be spent if the resources were available. Several MS had to make specific assumptions to separate the costs of Natura 2000 from those of national protected areas, and to avoid double counting for overlapping SCIs and SPAs and cross-border sites. Difficulties were encountered also to break down data into land use types.

Key methodological issues affecting the cost estimates by MS included:

- The approach taken to distinguish between the costs of N2K and national designations.
- Variations in costs and the difficulties of extrapolation from sample sites.
- The annualisation of capital costs (especially the time period over which expenditures were spread).
- Variations in land purchase costs, particularly affected by differences in assumed land purchase strategies as well as land prices.
- Variations in recurrent land management costs, partly related to differences in the actions needed to achieve favourable conservation status.

⁷ Vreugdenhil 2003 and Balmford et al 2003 in Bruner A., Hanks J., Hannah L. 2004.: How Much Will Effective Protected Area Systems Cost? Conservation International.

http://www.conservationfinance.com/Documents/CF_related_papers/PA_Costs2.pdf

Balmford, A., Gaston, K.J., Blyth, S., James, A., & Kapos, V. 2003. Global variation in terrestrial conservation costs, conservation benefits, and unmet conservation needs. *Proceedings of the National Academy of Sciences*. 100:3, 1046–1050. Available from <http://www.ibcperu.org/doc/isis/1046.pdf>

- Differences in approaches to estimating future costs, reflecting different plans for completion of the network.

Most Member States indicated that their estimates are approximates and that there are significant assumptions and uncertainties affecting them. However, in most cases the respondents indicate that they provide reasonable estimates of the costs of delivering the network, based on the evidence available.

In summary, diverse national circumstances (sites type, land use, location, ecological status, pressures, labour and wage costs, management strategies), the level of current data, and different cost assessment approaches and methodologies explain differences in the cost estimates across Member States and reveal issues for future attention.

Issues for the future

The cost exercise has been a valuable process, providing useful data and representing a clear step forward compared to previous cost exercises. In particular, progress has been made in extending the area coverage of the cost estimates, in providing real data for the new Member States (where previous estimates were based on assumptions and extrapolations), and in updating estimates to reflect latest understanding on the measures required to implement the network and the associated unit cost of these. In addition, more detailed data has been provided on the range of component costs – one-off management (e.g. finalisation of sites), investment (e.g. land purchase and compensation), recurrent management planning, and habitat management and monitoring. It has, however, been a difficult exercise, as noted by the range of ‘challenges’ encountered and the different approaches followed by MS.

A **more regular cost exercise** could be valuable at country or regional level to help make greater use of funding opportunities and ensure that greater commitment and resources are devoted to such reporting. As it was sometimes difficult for Member States to obtain data from different authorities, a mandatory cost assessment as part of the Natura 2000 reporting cycle or as part of an assessment of the progress of Member States in relation to sub-targets under the future EU 2020 Biodiversity target could facilitate the process. This could come along with the development of a database, which would allow collecting the information in a standardised format and so stimulate further exchange of information.

Additional guidance would also be needed to help harmonise the approach and to ensure a certain level of transparency and comparability. This could be achieved by, for example, helping clarify the meaning of Favourable Conservation Status and how to capture related costs, the annuity period for land purchase costs and ways forward on how to effectively collect cost data at the site level.

Importantly, the process could be complemented by two new activities:

- A **bottom up site questionnaire** on costs of Natura sites, and arguably also including questions on funding and on benefits to help obtain information of use in different domains.
- A **case study approach** to look at the time line of costs. This could also be done in conjunction with an assessment of how the costs are met by funding, on the benefits arising from Natura 2000 and on how the understanding of such benefits has helped raise additional funds.

The benefits of investing in Natura 2000

The study explored with Member States what they saw as the key benefits of Natura 2000 – combining a qualitative overview, case examples as well as discussion around major studies carried out in and by the countries to value the socio-economic benefits associated with the network. It also looked at the methodological approaches to the calculation of benefits in the different case studies and wider literature on economic valuation. The aim was to develop a common methodology in assessing Natura 2000 benefits and to pave the way for capturing its overall value at the European level.

Synthesis of existing information on benefits

In addition to their crucial role in maintaining Europe's biodiversity, Natura 2000 sites can also provide a range of benefits to societies and economies. These benefits are often referred to resulting from **ecosystem services** and they include a number of tangible resources (e.g. water, sustainably produced crops and timber – “provisioning services”) and beneficial processes provided and/or maintained by well-functioning ecosystems (MA 2005) – e.g. regulating functions such as water, waste and air purification, carbon storage/climate control, natural hazards management. Benefits also include a range of “cultural services” such as recreation, tourism and cultural identity, and “supporting services” such as soil formation. In addition, healthy ecosystems sustained within and outside Natura 2000 boundaries offer benefits of “resilience” (e.g. to climate change). The box below presents a range of examples of benefits valuation work across the EU.

Benefits provided by Natura 2000 in the **Netherlands** were estimated to be around 4000 EUR / ha / year, calculated as an average of EUR / ha / year benefits from different key Natura 2000 ecosystems. Recreation and tourism as well as wider ecosystem functions were important components of this value. Non-use benefits were also important. The provisioning service of raw materials was of lesser importance in the Netherlands. The authors extrapolated the gross welfare benefits of all Natura 2000 areas in the Netherlands (1.1 million ha), deriving an estimate of around **4.5 billion EUR / year**.

The protection of all 300 Natura 2000 sites throughout **Scotland** was estimated to have an overall benefit cost ratio of around 7 over a 25-year period. This means that overall national welfare benefits are seven times greater than the national costs and represent good value for money. However, about 99 per cent of these benefits (**£210 million per year**) relate to non-use values. Around 51 per cent accrues as non-use value to the Scottish general public and 48 per cent accrues as non-use value to visitors to Scotland. Around £1.5 million (1 per cent) of the benefits relate to use values (e.g. walking and angling etc). Consequently, most of the benefits seem to arise from non-use values.

As part of a wider economic and institutional assessment of Natura 2000 in **France**, several studies were carried out to determine the benefits arising from Natura 2000 across a range of sites. The objective of the assessment was to estimate the net benefits related to the management of Natura 2000. Within the framework of this project, in 2008 a study was carried out to determine costs and benefits of the Natura 2000 site ‘Plaine de la Crau’. The calculated overall benefits amounted to €182/ha/year, and net benefits to €142ha/year, i.e. the **benefits were estimated to be around seven times higher than the costs associated with the Natura 2000 site**.

According to a study in **Ireland**, the aggregate benefits provided by the Burren park's limestone pavements and the orchid rich grasslands were estimated to amount to €842/ ha/ year (prediction based approach) or €4,420 / ha / year (traditional CE approach). Based on these values, the total benefit from the karst limestone pavements and the orchid rich grasslands is estimated to be **€15.89 (67.93) million** and **€9.38 (€64.6) million** per year respectively. In addition, the total revenue (e.g. multiplied effects) from domestic tourists was estimated to be about €71.47 / hectare / year. All in all, the total **rate of return** on government support to the park was estimated (conservative) to be around **353 – 383%**, (without or with tourism), and **235%** if all operating costs of the farming programme and all direct payments are considered.

Many of the typical habitats of the **Lower Danube** are protected under the Ramsar Convention for the

protection of wetlands of international importance as well as under the EU Birds and Habitat Directives. The Lower Danube Green Corridor (LDGC) agreement to restore a total area of 2,236 km² is fully implemented and the restoration of floodplains and former side channels along the entire Danube is included, potential flood control benefits would amount to **nearly 2,100 million m³ in flood retention capacity** and would lower Danube extreme flood peaks by 40 cm. In addition, based on highly differing economic values for several ecosystem services, an average value was calculated to be around **€500 per ha/year** for provision of ecosystem services for fisheries, forestry, animal fodder, nutrient retention and recreation through floodplain restoration.

The growing state of knowledge on benefits: Even though our knowledge on the value of biodiversity, ecosystems and their service is steadily increasing, there is still an apparent **lack of quantitative / monetary and well-documented information on the socio-economic benefits associated with protected areas, including Natura 2000, in Europe**. According to the review carried out in the context of this study, existing information on the socio-economic significance of Natura 2000 is mainly related to benefits arising from direct and indirect employment supported by Natura 2000 sites. In addition, data is available on the socio-economic impacts of cultural ecosystem services, in particular tourism and recreation. However, there is a clear shortage of well-documented examples demonstrating and, in particular, quantifying the value of other ecosystem services relevant in the context of the network, such as sustainable production of certified products from Natura 2000 sites, role of Natura 2000 areas in purifying water and maintaining healthy populations of species (such as pollinators and natural enemies of pests). Many case studies also relate to terrestrial sites as far less information is available on marine protected areas. The benefits of these are increasingly recognised across the globe, notably for the potential to help restore fish stocks (see Chapter 8 of TEEB 2009 and 2011 forthcoming⁸), though work in this area has been sparser in Europe. All this has led to an under-appreciation of the value of Natura 2000 in the public, policy and political spheres.

There is, however, a relatively **swift shift in appreciation of the benefits of nature over the last few years** at least at a qualitative level. The qualitative assessment undertaken in the framework of this study indicates that benefits arising from Natura 2000 related ecosystem services were perceived as most significant at a local and national level, and global benefits, while less important relatively, were still seen as significant. Regulating and cultural services were identified as the most relevant ecosystem services provided by Natura 2000 sites, including the regulation of climate (e.g. mitigation of climate change), purification of water and maintenance of water flows, safeguarding natural pollinators, preservation of landscape and amenity values, and support of tourism and recreation. In addition, the role of Natura 2000 in preserving genetic and species diversity was recognised to be of high importance (e.g. maintaining healthy populations of species beneficial to human wellbeing). On the other hand, the relevance of Natura 2000 sites in providing different goods, such as sustainably produced food, fibres, natural medicine and pharmaceutical products, was considered rather low. In addition, Natura 2000 areas were not believed playing a very significant role in regulating outbreaks of diseases (e.g. human health).

Developing a common methodology for Natura 2000

Interviews in the framework of the study have shown that administrations in most Member States have not yet developed overall methodologies with regard to the

⁸ TEEB – The Economics of Ecosystems and Biodiversity for National and International Policy Makers (2009) www.teebweb.org

valuation of the socio-economic benefits associated with the Natura 2000 network. The UK, Spain, Latvia, the Netherlands and France provide some approaches, while only few countries are in the planning process of developing a common approach at the national level. Insights and lessons learned from existing examples as well as from recommendations provided by Member State representatives and key stakeholders have been used in further developing a typology of benefits and a standard valuation framework to support the assessment of the overall monetary value of the Natura 2000 network.

The definition of a common typology of benefits linked to Natura 2000 is a prerequisite for developing a standardised framework for assessing the value of the network and thus the first necessary step to allow aggregating and presenting benefits at the national and/or European level. In this regard, the report builds on **the MA classification**, and at the same time takes into account the objectives of the Habitats and Birds Directive. In addition, **wider socio-economic benefits** (e.g., employment, financing benefits) are also noted given the importance attributed to the value of Natura 2000 for rural and regional development.

Furthermore, aspects such as coherence, benefits beyond national borders, increased resilience and the conservation of natural heritage have been identified as important **“additional” benefits provided by the network**. Further understanding is needed on how the monetary value of these benefits can be systematically recognised, demonstrated and captured. The identification of a sample of study sites would allow comparing different forms of conservation initiatives and their impact on the delivery of socio-economic benefits as well as the ‘added value’ of Natura 2000.

In this report the **Total Economic Value (TEV)** framework forms the basis of a standard valuation framework applied for Natura 2000. This should be tailored to the objectives of the network. The suggested framework breaks down the TEV into two major components, **socio-economic benefits** and **conservation benefits**. With regard to socio-economic benefits, the framework takes a different perspective than its usual definition, as it focuses on the **benefit flow related to management activities** (or their absence) rather than on the ‘use’ of ecosystem services. Referring to conservation benefits, on the other hand, emphasises the importance that people give to the existence value of certain habitats and species protected by Natura 2000 today and for future generations. They represent an interface between the **anthropogenic perspective** of benefits for human well-being and the **intrinsic value** of habitats and species. This allows to capture some intrinsic values within the TEV approach (e.g. peoples’ willingness to pay for conservation benefits), but other intrinsic values will remain outside the TEV (e.g. conservation values independent of human benefits).

It is useful to **distinguish between values** representing ‘real money’ (i.e. market values or avoided costs e.g. of flood damage), those with a ‘potential to be real’ (indicative and becoming real if markets are set up – e.g. via payments for ecosystem services for water quality) and broader ‘welfare benefits’ that may not be captured in market values (e.g. public goods that are not priced, such as air quality, noise pollution regulation, amenity values).

Besides being important when communicating the network’s benefits to different stakeholder groups, the approach also highlights where major efforts are still needed in implementing adequate instruments that transform ‘potential to be real’ benefits

into ‘real money’. In addition, the report suggests analysing the **economic impact** of Natura 2000 (e.g., direct and indirect employment). Although not additive to the TEV, it helps to provide a better approximation of the **Total System Value (TSV)** and highlights the importance of Natura 2000 for its wider socio-economic benefits.

Many additional aspects of the methodology depend on whether a study attempting to capture the overall national or European value of the network includes primary valuation work or not. Considering the apparent lack of monetary valuation studies on Natura 2000 as well the heterogeneity of the existing ones it is recommended to undertake such work. In this case, the authors suggest applying a **habitat type approach**, which would require identifying benefits specific to a certain habitat, and would be well suited to inform the development of different policy instruments affecting certain habitats/land use types. In addition, by looking into a **representative sample of sites** a more thorough analysis of changes over time and of the incremental value of the network due to changes in aspects such as conservation strategies and conservation status would be possible. This would facilitate the use of **adjusted unit** or **meta-analytic benefit transfers** and reduce so the probability of generalisation errors.

Responding to the value of nature – a case of greater investment

The designation of an area is not an essential prerequisite for the overall existence of ecosystem services, but affects their quantity, quality and composure. **Activities on a site are not only decisive regarding the flow of benefits provided, but also influence the level and the nature of costs as well as to whom they are occurring.** Without any form of designation or conservation, the flow of benefits risks being unbalanced (e.g., in favour of provisioning services), with some services becoming eroded (e.g. regulating services, cultural services) or even completely lost in extreme cases where the site is under strong environmental pressures or facing potential conversion (e.g., built-up land).

Benefits that are lost due to the deterioration of a site over time can be manifested as societal costs, private costs or opportunity costs (costs of income forgone to public and private entities) on the other side of the equation. For example, due to the loss of natural flood protection, society might have to invest in costly man-made alternatives as well as bear the costs linked to the increased risk of damages.

A **fair and transparent comparison** between welfare benefits and costs associated with the Natura 2000 network needs to balance different components on each site of the equation, so as to compare the like with the like. A comparison of costs estimates and monetary benefits of the network needs therefore to be undertaken under similar assumptions and conditions. This refers to aspects such as the **time period** considered for the evaluation, **the exploration of marginal** costs and benefits and the costs of reaching **favourable conservation status** compared to the benefits of achieving it.

The few existing examples which look into the costs of the network as well as into the benefits demonstrate that the **benefits of conservation are often greater than the investment needed**, in places several times larger, even if not all ecosystem services are counted. The sites often are a motor for the local economy and pole of attraction to the outside community. However, the existing studies also show how results are strongly influenced by the various factors taken into account in the comparison (e.g., policy scenario, beneficiaries, typology of costs and benefits) and that a thorough un-

derstanding of these is needed to guarantee an additional level of accurateness. Particularly, the imbalance in understanding the monetary benefits of the network compared to its costs needs to be overcome by additional primary valuation studies which look into the net benefits Natura 2000 provides.

While further steps are taken to estimate the role of nature in supporting our welfare, there remains a major challenge in assessing, communicating and taking into account the value of biodiversity and its services. The value of the flow of services coming from protected areas also needs to be seen in the context of the intrinsic value of Natura 2000 sites, and also in the context of their roles in offering insurance and resilience to climatic and other pressures. It will be important to develop the understanding of which ecosystems at which sites, with whose help, offer what services to which communities (local, regional, national and global), over what timescale, and how protected sites can be engines of growth, sources of cost effective solutions, or of community identity. The numbers will be invaluable in clarifying issues of who may get rewarded how much for helping maintain or offer the services (e.g., payment for ecosystem services to reward farmers or foresters).

There is a case for increasing the level of investment and making greater use of the funding opportunities that are available via the EU funds and also national funds and innovative funding sources. In some areas, the motivation may be to encourage tourism and recreation, for others site flood protection, protection against soil erosion, in yet others air pollution control, and in all there is a potential for carbon storage/sequestration benefits to be an (economic) argument for funding the management of sites so that they can reach their ecological potential.

Awareness of the benefits of Natura 2000

There are a range of reasons for why a greater awareness of the net benefits of Natura 2000 is needed:

- Increasing awareness of the socio-economic benefits can influence the willingness to pay of different stakeholders and so ultimately have an impact on the **perception of the overall economic value** associated with the network.
- Ensuring that the **right investment decisions are made**, as in some cases working with nature can be less expensive than man-made solutions (e.g. carbon storage, flood control, pollination and water purification and provision).
- Ensuring that public goods are taken properly into account in public policy by looking at the **wide set of ecosystem values to a wider set of stakeholders**.
- Having better information to make the case for funding – e.g. to **help realise the potential** for use of Cohesion Policy funds.
- Having information to support the design and use of different instruments – notably PES schemes, but also to communicate the value of Natura 2000 designation itself.

The consultation process tried to establish what factors influence the public's perception of the benefits of the network and what measures have been used successfully to communicate with stakeholders.

Current levels of awareness

Members States agreed on the importance of the public, landowners and policy-makers being made aware of the benefits associated with the Natura 2000 network in order to secure adequate funding for the network's completion and management. **Current awareness** of the benefits of the network outside officials directly involved

in the network is deemed to be **very low** and in general, the network is often seen as a **burden** to economic development and creating opportunity costs. However, in a number of cases where the public has greater access to natural areas, there tends to be an intuitive understanding of the benefits provided by nature, even if people do not necessarily associate these with Natura 2000.

The perception of the value of the network has been greatly affected by the manner in which the authorities approach the issues of designation and management. Often, the designation of a site under Natura 2000 has been presented in a negative light rather than as an opportunity (e.g. for increased payments or tourism) and in some cases over-restrictive interpretation of the Directive has reinforced the perception of the network as a constraint on development. There have been examples, however, where MS have reversed negative perceptions through adequate compensation and sensitive engagement of landowners and also demonstrated the possibilities of commercial activities on a protected area (e.g. Kosterhavet Marine Protected Area near Stromstad in Sweden).

Current activities

Member States have employed a range of measures to improve awareness ranging from high-level campaigns about nature to targeted leaflets for landowners. Examples that have worked include the engagement of mayors and local leaders, training courses that assist farmers in meeting the obligations for Natura payments, and the re-introduction of charismatic species which have boosted tourism and the national consciousness. NGOs have in general trialled more hands-on approaches to awareness raising, such as developing projects to demonstrate the potential of Natura designation to bring in extra income. They have also developed programmes to integrate nature conservation directly into the education system and high profile campaigns alongside celebrities to stop the hunting of protected species.

Key factors to successful communication

A number of key factors to develop positive impressions on the network emerged, including:

- **Early engagement and civil involvement:** it was clearly demonstrated that early engagement with landowners and the building of mutual trust greatly improves perceptions of Natura 2000.
- **Prompt and appropriate payment:** attitudes towards designation have changed once landowners have learnt how to secure payment, providing measures are not over onerous.
- **Consistent and appropriate implementation:** it is important that Natura 2000 measures are not over zealous and do not contradict existing legislation.
- **Delivering local successes:** demonstrations of how Natura can provide benefits to the community help to alter perceptions.
- **Education and skills:** incorporation of nature conservation into the education system can provide more long-lasting changes to perceptions of protected areas.
- **Choosing the appropriate scale for communication:** the size of country can impact the success of a programme, as smaller scale projects can be tailored for the local situation.
- **Engagement of other government departments:** the benefits associated with Natura need to be better understood by the Agriculture and Finance Departments to ensure their continued implementation.

As regards awareness of the value of Natura 2000, major steps forward are made where clear and robust assessments have been carried out that are either high profile benefits studies (e.g., Scotland assessment) or have high practical functions (e.g. where linked to flood control and investment decisions, such as in Lower Danube assessment). Similarly, investment in developing a robust mapping of natural capital, including ecosystem services from key natural assets (as has been done in Wales and Flanders for example), also helps to increase awareness, for both academic and institutional (e.g. local, regional or national governments) and creates an improved evidence base for policy making.

Implications for Financing Natura 2000

The discussion with Member States in the consultation process, complemented by the conference ‘Financing Natura 2000’ on 15-16 July 2010 as part of the deliverables of this project (see conference proceedings for details) underlined the following points:

- **Financial support from the EU budget forms an important source of financing for the Natura 2000 network.** However, the available indicative information on the current level of support to biodiversity conservation is not satisfactory when compared to the foreseen future financing needs for Natura 2000. The estimated 5.7 billion EUR/ year costs for managing Natura 2000 in the EU is around **four times higher** than the likely annual contribution of the present EU budget, calculated on an indicative basis, to biodiversity⁹
- It was acknowledged that the available opportunities for EU funding to Natura 2000 might not always be fully utilised due to a **lack of stakeholders’ capacity and resources to apply for and manage such funding.**
- In some new Member States, the relative **immaturity of the network** and the lack of management plans for many sites is a barrier to attracting funding. The lack of management plans means that funding needs are often insufficiently defined.
- **In practice, financing the management of Natura 2000 often lose out for other competitive priorities under different EU funding instruments (e.g. goals for broader rural and regional socio-economic development).** For example, the use of the Structural Funds can be problematic because of the difficulty in demonstrating economic benefits of Natura 2000 investments
- **Innovative financing tools** offer possibilities for complementary, and sometimes even more effective, funding for Natura 2000. While no single new financing tool is likely to bridge the financing gap, a range of ideas were explored that offered promise (e.g. payment of ecosystem services, fiscal credits). It was emphasized that these ideas should not substitute the need of dedicated public funding for the implementation of the Natura 2000 network, but rather complement these existing sources.

The demonstration of the socio-economic benefits of Natura 2000 should prove to be a valuable tool to help make the case for financing the network in order to meet the costs of completing the Natura 2000 network and its conservation objectives.

⁹ Kettunen et al. 2009b

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1 INTRODUCTION

The Birds and Habitats Directives and the Natura 2000 network

The pillars of the European Union's legislation on nature conservation and biodiversity are Council Directive 2009/147/EC¹⁰ on the conservation of wild birds (Birds Directive) adopted in 1979 and Council Directive 92/43/EEC¹¹ on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) adopted in 1992. Together, both Directives form the most ambitious and large scale initiative undertaken to conserve Europe's biodiversity, with the implementation of a network of protected areas - Natura 2000 - lying at their heart.

Although the above mentioned Directives were adopted at different times and have a partly different scope – with the Birds Directive protecting all wild birds whilst Habitats Directive covering species and habitats of Community interest listed in its Annexes – they share some similar approaches to achieving the set targets. In summary, two main approaches are used to deliver the overall conservation objectives of these Directives (as defined in Article 2 of each Directive):

- The establishment, protection and management of a coherent network of areas designed to protect the habitats and species targeted by the Directives – known as the Natura 2000 network (cf Articles 3-6 of the Habitats Directive and Articles 3 and 4 of the Birds Directive)
- The establishment of a system of strict protection for animal and plant species covered by the Directives (cf Articles 12-16 of the Habitats Directive and Articles 5-9 of the Birds Directive).

In addition, both Directives prescribe measures to be taken outside protected areas to ensure ecological coherence (Article 10 of Habitats Directive and Article 3 of Birds Directive). They also have similar accompanying measures in terms of surveillance, monitoring, research and reporting obligations.

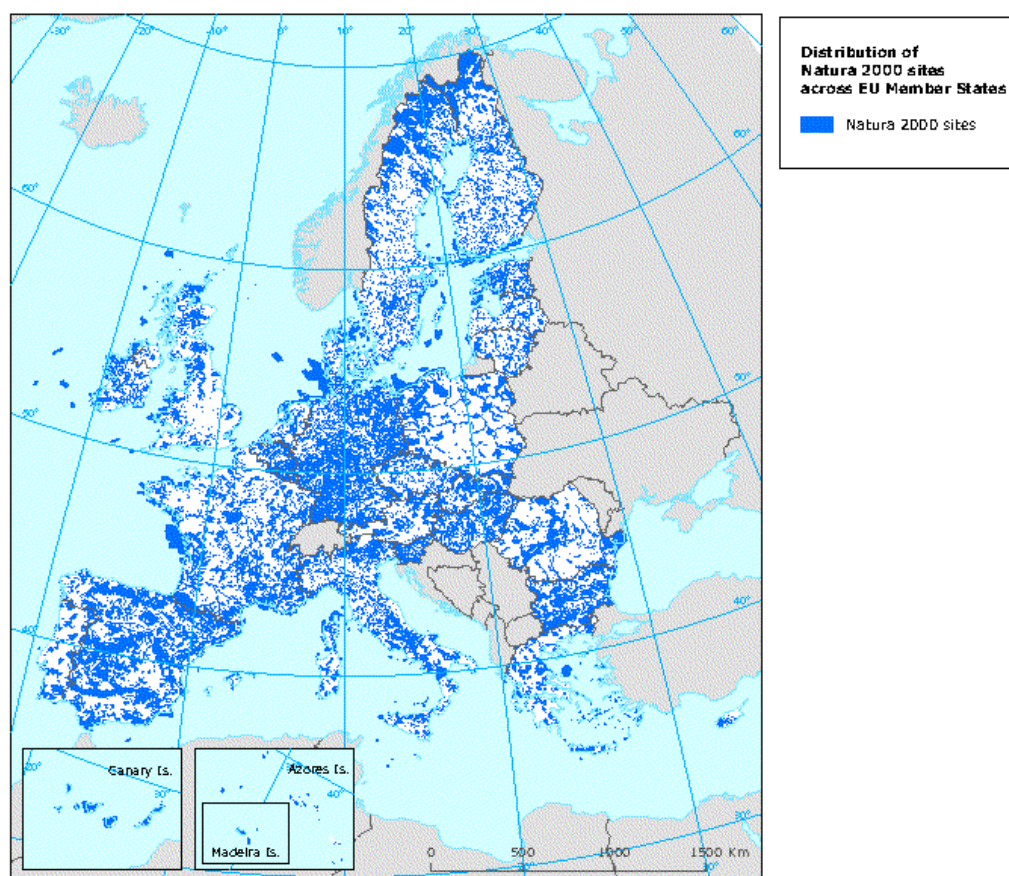
The process of proposing and designating Natura 2000 sites under the Directives has, however, been a long and difficult one. Issues such as lack of data, political reluctance and inadequate communication between stakeholders at national level have hindered the implementation of the network. Despite this delay the establishment of Natura 2000 is at an advanced stage (see Figure 1) – the nearly completed terrestrial network consists of roughly 26,000 sites and covers almost 18 per cent of the EU land territory. For the terrestrial sites, the focus will now increasingly shift to effective protection, management and restoration. Related key priorities will be the formal designation by Member States, the setting of conservation objectives for all sites to maximise their contribution to the achievement of favourable conservation status and the putting in place of effective management measures. Though significant additional marine areas have been added to the network in recent years, the key focus in this regard will be on finalising the list of marine Natura 2000 sites and subsequently the shift to ef-

¹⁰ 2009/147/EC (OJ L20, 26.1.2010) Directive on the conservation of wild birds

¹¹ 92/43/EEC (OJ L 206, 22.7.1992) Directive on the conservation of natural habitats and of wild fauna and flora

fective protection and management. The coming period will be critical for making Natura 2000 fully operational.

Figure 1: Distribution of Natura 2000 sites across the EU-27



Source: EEA-ETC/BD, June 2010.

Under Article 17 of the Habitats Directive, Member States are obliged to report every six years on their progress in implementing the Directive and the status of habitats and species of Community interest. The systematic assessment covering the reporting period from 2001 to 2006¹² concluded that only 17 per cent of the 701 Annex I habitats were found to be in ‘favourable’ condition, though this is quite variable across the regions. Overall across the EU, only 17 per cent of the species assessments carried out were considered ‘favourable’.

Considering the status, scale, scope and diversity of Natura 2000 sites within the network and the large number of land uses, stakeholders and economic activities that are either directly or indirectly affected by Natura 2000, the correct and effective implementation of management measures poses a real challenge for all concerned. It is crucial to guarantee adequate funding for establishing and carrying out these management activities in practice. In this context, it is important to communicate that the network does not only incur costs, but that it also provides a number of benefits, including socio-economic ones, to a number of stakeholders.

¹² COM(2009) 358 final. Composite Report on the Conservation Status of Habitat Types and Species as required under Article 17 of the Habitats Directive. Brussels

Financing Natura 2000

The Natura 2000 management costs should in principle be covered by national budgets, based on the principle of subsidiarity. However, the Habitats Directive Article 8 also provides for the possibility of Community co-financing of management activities where needed. In general, the Commission has suggested that about 50 per cent of the costs of establishing and maintaining the Natura network could come from Community co-funding.

The Community co-funding available for Natura 2000 during the period 2007-2013 is accommodated within existing EU financial instruments (so called ‘integrated financing’). This means that a number of Community funding instruments, such as the European Agricultural Fund for Rural Development (EAFRD), European Fisheries Fund (EFF), the Structural Funds¹³ and the 7th Framework Programme for Research and Development (FP7), now integrate possibilities for financing the management of Natura 2000. In addition, the Financial Instrument for the Environment (LIFE+) still represents the main instrument for financing Natura 2000 related activities. In line with this, during the development of the legislation underpinning the EU’s financial perspectives for 2007-2013, the financial regulations for the above-mentioned funds all included the option of using a part of these funds for biodiversity conservation. In each instrument there is also the explicit option of financing relevant measures for the conservation and management of Natura 2000 sites.

The aim of the 2007-2013 co-funding model is to ensure that the management of Natura 2000 sites forms a part of the wider land management policies of the EU. It is also envisaged that this type of funding structure will allow Member States to set national priorities which reflect the national/regional specificities related to the management of the network. Finally, integrating the management of Natura 2000 into the existing funds aims to avoid duplication and overlap of different Community funding instruments.

In principle, as result of the integrated financing a number of current Community funding instruments can now be used to finance the management of Natura 2000 network. However, apart from the LIFE+ fund, there is no ring-fencing for nature conservation and biodiversity in the other EU funds. Therefore, the programming of the funds gives Member States a lot of freedom to develop policies and measures that suit their national and regional specificities, for example to decide the amount of money directed to Natura 2000. Consequently, the actual level and types of funding in support of Natura 2000 in individual countries depend on decisions taken at a national level.

Costs and benefits associated with the network

Clearly, securing adequate funding for Natura 2000 management is key to the successful maintenance of the network and the favourable status of its habitats and species. Obtaining a reliable estimate of the management costs is prerequisite to this endeavour. This cost estimate can then be used as a reference point when assessing the spending on nature conservation under the current EU funds, i.e. when estimating the success of the 2007-2013 ‘EU integrated funding model’. In addition, a reliable cost figure can provide a stronger case for Natura 2000 in the future budget negotiations,

¹³ European Regional Development Fund (ERDF), European Social Fund (ESF) and European Cohesion Fund

both at EU and national level, and help to secure adequate allocation of funds to nature conservation.

Consequently, the information on costs collected in the context of this study plays an important role in securing the financing of Natura 2000 in the future. For example, updating and increasing the knowledge base on the financial requirements of Natura 2000 is needed to estimate if the financial resources expected to be available for the network's future management are likely to be adequate.

Natura 2000 forms the foundation for biodiversity conservation in the EU. In addition to conserving Europe's natural heritage, the EU-wide ecological network of protected areas also plays an important role in supporting the conservation of biodiversity and related ecosystem services, including provisioning, regulating, supporting and cultural services (MA 2005), on a wider countryside and marine environment scale.

The socio-economic benefits of Natura 2000 have not, however, gained widespread acknowledgement and acceptance. On the contrary, biodiversity protection and Natura 2000 are still often perceived as mainly imposing costs or restrictions on communities and economies. Emphasising the socio-economic benefits of Natura 2000 will be necessary in order to encourage regional and local acceptance of the network, and to facilitate the preparation of funding applications. Additionally, demonstrating and providing information on the range and scale of socio-economic benefits provided by Natura 2000 (in the context of ecosystem services) helps tie biodiversity conservation efforts more closely into the general Community goals on sustainable development and growth (renewed EU Sustainable Development and Lisbon strategies). It can also be said that an appropriately managed Natura 2000 network to a large extent 'repays' the costs related to its maintenance.

Scope of the report and study process

The Commission has supported several initiatives to address the different issues highlighted above, including for example the development of Commission guidance documents on Article 8 of the Habitats Directive or a guidance handbook on financing Natura 2000. In 2007/2008, a European Commission contract¹⁴ supported the refinement of the cost estimates included in the 2004 Communication on Financing the Natura 2000 network¹⁵ by sending questionnaires to the Member States (see Chapter 2). In addition it saw the development of a standard approach to help identify and evaluate the full range of socio-economic benefits provided by individual Natura 2000 sites.

In 2009, the Commission launched another contract which should build on the results of the previous EC project, to achieve:

1. A further refinement of the estimations of the costs of managing the network as compared to the benefits of the network or individual sites
2. An increased awareness of the net benefits associated with Natura 2000 network

¹⁴ Natura 2000 Preparatory Actions – Lot 1: Financing Natura 2000: Cost estimate and benefits of Natura 2000. N 070307/2007/484403/MAR/B.2

¹⁵ COM(2004)431 final. Communication from the Commission to the Council and the European Parliament. Financing Natura 2000. Brussels

3. The development of a methodology for the systematic updating and refinement of the costs and benefits associated with the Natura 2000 network.

This report constitutes one of the deliverables of the 21-month contract. It synthesises and assesses the information on costs and benefits of Natura 2000 as collected by the cost questionnaire, and in information stemmed from interviews with national-level representatives and key partners in implementing the network on the costs and benefits of Natura 2000, using a structured and common interview protocol.

Chapter 2 presents refined estimates of the costs of implementing and managing the Natura 2000 network, based on responses to a questionnaire survey of Member States. In addition, it includes an analysis of methodologies for cost assessment, recommendations for future monitoring and estimation of costs.

Chapter 3 provides an overview of the existing information and level of awareness on the benefits of Natura 2000 in the EU and paves the way for a common methodology for assessing the benefits associated with Natura 2000 at the European level.

Chapter 4 discusses the relationship between costs and benefits associated with Natura 2000. It offers insights from a range of examples on cost-benefit comparisons in different Member States and a potential way forward in getting a picture of the net benefits of the network.

Chapter 5 presents initiatives and approaches taken to promote awareness of the net benefits of the network and a number of key factors to successful communication.

Chapter 6 summarises conclusions and recommendations addressed in the previous chapters.

2 COSTS ASSOCIATED WITH NATURA 2000

The effectiveness of the Natura 2000 network depends to a large degree on the allocation of sufficient resources for its implementation and ongoing protection and management. Understanding the costs involved is therefore important in ensuring that sufficient resources are allocated. The EU has a strong interest in this, not only to ensure that the network is effective in meeting its objectives, but also because Article 8 of the Habitats Directive introduced a requirement for the EU to co-finance the delivery of the network.

In response to these issues, an expert working group was established in 2002 to assess the costs of delivering the Natura 2000 network. The working group, chaired by John Markland of Scottish Natural Heritage, employed a questionnaire survey to collate cost information from Member States.

The responses to this questionnaire led to a cost estimate of €3.4 billion per year for the EU-15. This figure was extrapolated to calculate costs for the 10 Acceding Countries and resulted in total costs for the EU-10 of between € 0.63 billion and €1.06 billion per year, bringing the total cost estimate to €4.0-€4.4 billion per year for the enlarged EU. However, the assumptions used raised concerns about the reliability and comparability of the first estimates, and this led to a new questionnaire being sent to both Member States and Accession Countries in June 2003, requesting more detail and justification of the projected figures. Analysis of this information led to a revised estimate of €6.1 billion per year for the EU-25.

A 2004 Communication on the Financing of Natura 2000 stated that the €6.1 billion cost estimate was the most reliable estimation at the time, but that it could and should be further refined, with Member States asked to review their submissions on the basis of commonly agreed cost estimation methods. It was suggested that the anticipated progress in preparation of management plans in the coming years should provide a sound basis for improving these cost estimates.¹⁶

Section 2.1 presents revised estimates of the costs of implementing the Natura 2000 network, based on responses to a questionnaire survey of Member States. It begins by introducing the survey methodology and the scope of the questionnaire (Sections 2.1.1 and 2.1.2), and then presents and discusses the cost estimates provided by Member States (Sections 2.1.3 to 2.1.5). These are used to provide an updated cost estimate for the EU-27 (Section 2.1.6). This revised estimate is compared with other estimates of the costs of the network (Section 2.1.7). Section 2.1.9 considers the likely future costs of the network, based on questionnaire returns and interviews held in the Member States, while Section 2.1.10 examines funding issues and considers the extent to which the estimated costs are met by current expenditures and funding streams.

Section 2.2 provides an analysis of methodologies for cost assessment, examining the different methodological issues that need to be considered in future analysis of the costs of the network, and providing recommendations for future monitoring and esti-

¹⁶ COM(2004)431 Final. Communication from the Commission to the Council and the European Parliament on Financing Natura 2000. Brussels

mation of costs. Overall conclusions and recommendations on the costs of the Natura 2000 network, and on methodologies for cost assessment, are presented in Chapter 6.

2.1 Updating/refining cost estimates: the cost questionnaire

In 2008 the authorities in each Member State were asked by the European Commission to complete a spreadsheet questionnaire detailing the costs of implementing and managing the Natura 2000 network.

The questionnaire asked for information on:

- Size of the network, in terms of the number and surface area of sites
- One-off costs of implementing the network, including management, land purchase and infrastructure costs
- Recurrent costs of managing the network, including management planning and habitat management and monitoring
- Breakdown of costs between different land use types
- Costs of managing new as well as existing sites
- Staff numbers and wage costs involved in managing the network, including current levels and those anticipated in future.

Member States were given the option of submitting information in either a more detailed or a summary format. They were also asked to provide explanatory information regarding the basis of the estimates made, either in the spreadsheet or in additional paper annexes. In addition, the Member States had the opportunity to discuss the results in the framework of the interviews carried out as part of this project.

The questionnaire was accompanied by a written guidance document which provided advice about its completion. Both documents are attached in Annex II of this report. As important for the understanding of the final cost estimates, details on the cost typology are further elaborated below.

2.1.1 The cost typology used

The questionnaire required Member States to provide information on a range of different costs associated with Natura 2000. The typology of these costs was defined in the questionnaire and in the guidance document.

First, the typology distinguished between ‘recurrent’ and ‘one-off’ costs:

- **‘One-off’ costs** are land purchase and capital investment type costs which are estimated to be incurred between October 2008 and the completion of the network.
- **‘Recurrent’ costs** are those that are generally associated with the on-going management activities to maintain or improve sites.

The costs types were further differentiated according to key activities required to achieve the Natura 2000 conservation objectives.

One-off costs were broken down into:

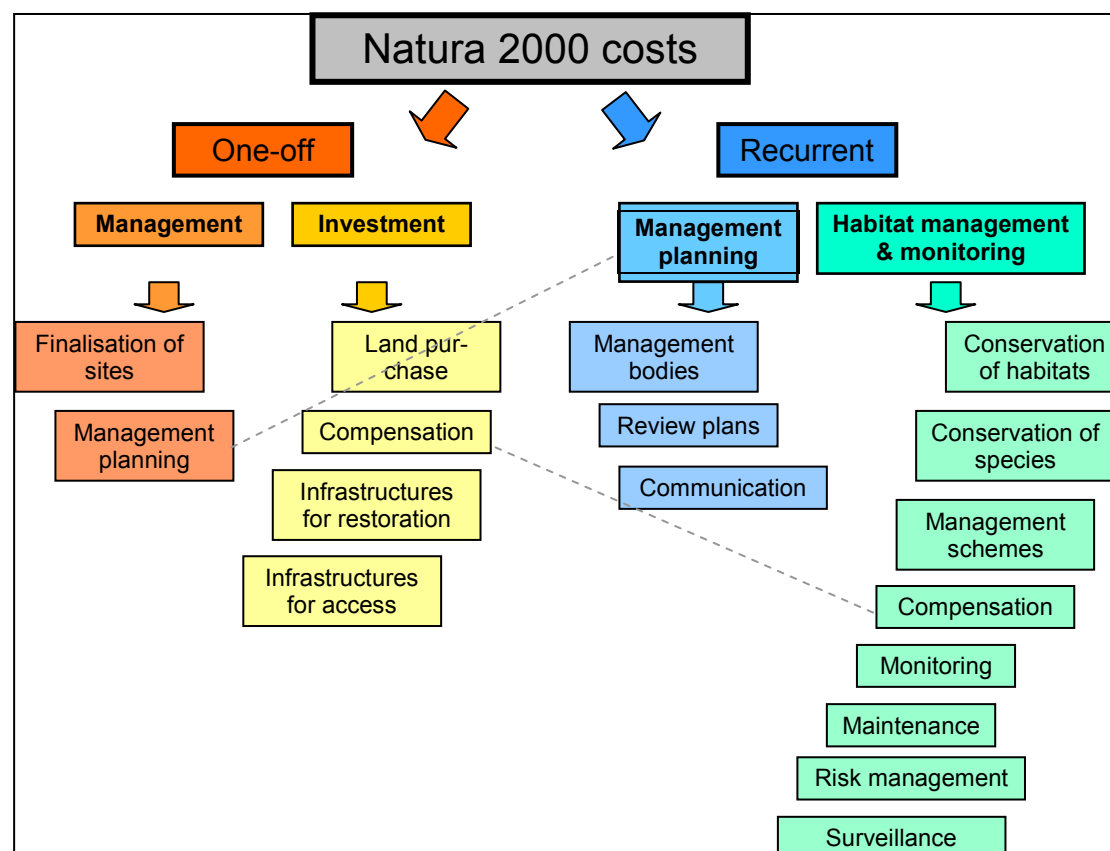
- **One-off management costs** - these included:
 - (1) Costs for the finalisation of sites, such as costs for scientific studies, administration, consultation etc.
 - (2) Costs for management planning, i.e. one-off costs for preparing management plans, establishing management bodies, consultations etc.
- **Investment costs** – these included:
 - (3) Cost of land purchase
 - (4) One-off payments of compensation for development rights
 - (5) Infrastructure costs for the improvement/restoration of habitat and species
 - (6) Other infrastructure costs contributing to conservation, e.g. for public access, interpretation works, observatories and kiosks, etc.

Recurrent costs were differentiated into:

- **Costs for management planning** – unlike the costs for management plans included under the ‘cost for the finalisation of sites’ category (1), these refer to the recurrent (annual) activities for management planning, including:
 - (7) Running costs of management bodies
 - (8) Costs for review of management plans
 - (9) Costs for public communication.
- **Habitat management and monitoring costs** – these included cost on:
 - (10) Conservation management measures– maintenance and improvement of habitats’ favourable conservation status
 - (11) Conservation management measures– maintenance and improvement of species’ favourable conservation status
 - (12) Implementation of management schemes and agreements with owners and managers of land or water for following certain prescriptions
 - (13) Provision of services; compensation for rights foregone and loss of income; developing acceptability ‘liaison’ with neighbours
 - (14) Monitoring
 - (15) Maintenance of infrastructure for public access, interpretation work, observatories and kiosks etc.
 - (16) Risk management (fire prevention and control, flooding etc.)
 - (17) Surveillance of the sites.

Figure 2 below provides a schematic overview of the cost categories used and the way they were grouped. It can be noticed that two categories are covered both under ‘one-off costs’ and ‘recurrent costs’ – namely ‘management planning’ and ‘compensation’. Their inclusion under one or the other heading depends on the frequency of the payment.

Figure 2: Cost structure for data gathering



2.1.2 Methodology used by the team

The questionnaire was initially sent by the Commission in November 2008 and followed by subsequent follow-up requests over the period to early 2010. Furthermore, the country visits completed by the contractors during 2009 and 2010 provided an opportunity to remind Member States of the questionnaire and encourage its completion as well as offering the opportunity to discuss already submitted ones.

As a result, after a slow initial response, 25 Member States had sent cost information by 1 July 2010. The two non-respondents at this date were Finland and Romania. Overall, the response is a significant step forward relative to past cost estimates.

The analysis of the data submitted revealed a number of issues, such as:

- Variability in the degree of detail submitted – e.g. Denmark, Germany and the Netherlands provide only a few data items while others provide much more detailed cost breakdowns
- Incomplete coverage of some Member States – e.g. Italy, where the return is understood to have covered only 14 of 21 regions
- Variability in description of the methodology employed – some Member States give details of the working, assumptions and unit costs employed, while others provide cost estimates with no description of methodology

- Variability in assumptions and estimation methods – e.g. assumptions about number of years over which one-off expenditures take place.

The data received were combined in a spreadsheet model which allowed the results to be aggregated for the responding Member States. The explanatory material provided by Member States, as well as the country visits by the contractors, provided some insights into the different methods and data sources used in producing the estimates. These made it clear that different Member States had interpreted some of the questions in different ways, which clearly influenced the data provided (see Section 2.1.4 below). For example, cost estimates by some Member States were aspirational while those of others reflected resources actually spent and committed; some Member States included a large element of land purchase; and there were differences in the approach in accounting for the gross costs of the network or its net / incremental costs relative to other policies. There were also differences in how remuneration of staff was counted, with some integrating it into annual costs and others keeping it separate (and hence to be added to obtain a full picture).

The effect of differences in assumptions and assessment methods is exemplified by Spain, the Member State which provided the highest cost estimates. Spain was the only country to submit two estimates of costs – “real” costs (i.e. those actually being incurred) and “desirable” costs (those expenditures which it would be desirable to make). The cost estimates are sensitive to which of these estimates are used, with the “desirable” costs some 61% higher than the “actual” costs. The cost estimates presented below incorporate the “desirable” costs as this is the estimate of the true cost of implementing the network to achieve its full benefits. However, this example demonstrates how costs may vary depending on the approach that different Member States take towards the estimation of costs.

There was some discussion as to whether it was appropriate to make adjustments to the stated costs to allow for these variations and to present cost estimates on a comparable basis. However, while it would be possible to standardise the treatment of some variables (e.g. the approach to land purchase and the timescale over which the costs should be annualised to get an annual value), it was concluded that the wide range of implicit and explicit potential variations in approach made it impossible to devise a satisfactory means of standardising the cost data across the board. The results provided by the Member States were therefore largely taken at face value and aggregated accordingly. Thus, they provide an aggregation of Member States own estimates of the costs of implementing the network, rather than estimates based on a standardised cost model.

The figures are therefore consistent in the sense that they all represent estimates by the Member States of the costs of implementing and managing the network in the coming years. It should be noted that variations in cost methodologies and assumptions used by Member States are likely to explain some variations in the cost estimates. Therefore comparisons between the costs estimated by different Member States need to be made with care. Variations in unit costs between Member States may reflect differences in estimation methods, assumptions and general aspirations as much as the real cost of managing the network.

Although the cost estimates are in large part those provided by the Member States, some adjustments were made to the data provided to standardise them as far as possible. These were as follows:

- **Treatment of Capital Costs** – Different Member States used different methods to convert one-off costs of implementing the network to annual estimates. One-off costs were variously divided by a factor of 4, 5, 6, 10 or 19 by Member States to annualise them, or simply left as a lump sum. In order to make these estimates consistent the contractors have assumed that costs are spread over a 6 year period (2008 to 2014), which reflects a median of the methods used by the Member States.
- **Gap Filling at National Level** – Italy provided data for 14 out of 21 regions. These data were up-scaled on an area basis to provide a national estimate.
- **Gap Filling at EU Level** – Data were received for 25 of the 27 Member States of the EU, accounting for approximately 85% of the network by area. Estimates for the EU as a whole were made by up-scaling the total for the 25 Member States. Three possible aggregation factors were identified and applied:
 1. A simple per hectare average was used and applied to the estimated Natura 2000 area
 2. The per hectare costs were estimated for the EU-15 and “new” EU-12 and applied to fill the missing data
 3. Regional averages for North-Western (NW), Northern (N), Southern (S), and Central (CE) Europe were used to estimate the EU total.
- **Conversion of all figures to Euro**, using the exchange rates of 1 January 2010 as in Annex I.

As well as data provided by the Member States, cost estimates have also been provided by BirdLife International, offering a useful basis for comparison. These estimates are more aspirational and focus on the resources deemed necessary to manage the network, and are less constrained by current plans and budgets. Comparisons have also been made with the previous estimates of the costs of the network, developed from those in the Markland report, which allows a better understanding of how the estimates have developed over the last few years.

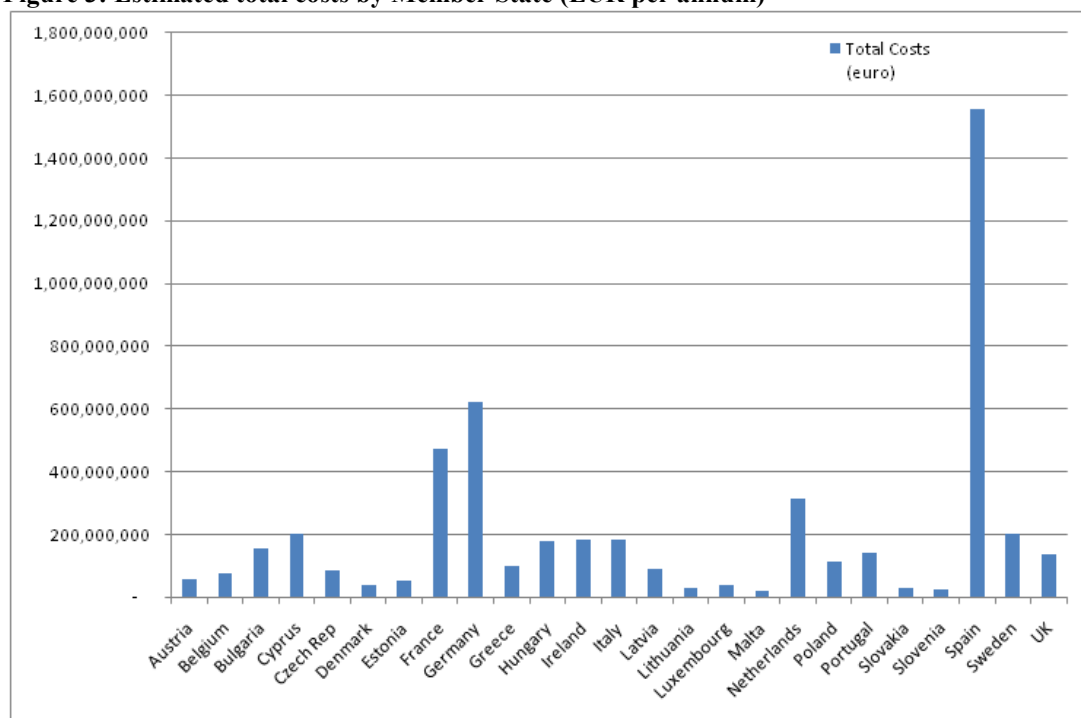
2.1.3 Overview of Member States cost estimates

Processing the data according to the methodology described above gives an overall cost estimate for the Natura 2000 network in the 25 responding Member States of **€5.1 billion per year** (Table 1). The returns together cover approximately 88% of the total Natura 2000 network.

Table 1: Natura 2000 cost estimates, by Member State

	One off costs (annualised, €M)				Recurrent costs (annual, €M)			Grand Total (annual, €M)
	Management	Land purchase	Infrastructure	Sub-total	Management planning	Habitat management and monitoring	Subtotal	
Austria	2.9	3.5	8.3	14.6	3.0	38.4	41.4	56.0
Belgium	15.2	18.9	16.0	50.2	5.2	20.2	25.4	75.6
Bulgaria	34.0	22.8	0.5	57.3	67.2	30.3	97.5	154.8
Cyprus	0.6	125.0	10.4	135.9	18.3	46.3	64.7	200.6
Czech Rep	21.6	-	3.6	25.3	4.8	53.9	58.7	84.0
Denmark	-	-	-	22.6	-	-	17.9	40.4
Estonia	1.9	8.6	18.2	28.8	0.8	25.0	25.8	54.6
France	15.3	0.3	4.5	20.0	40.5	413.3	453.8	473.8
Germany	-	-	-	160.0	117.0	343.0	460.0	620.0
Greece	12.1	5.4	13.4	30.9	6.7	59.6	66.3	97.1
Hungary	3.8	20.0	27.2	51.0	17.7	111.2	128.9	179.9
Ireland	6.5	19.7	11.7	37.9	0.6	146.7	147.3	185.2
Italy	3.1	18.1	10.6	31.8	24.3	125.4	149.7	181.5
Latvia	0.8	26.2	48.1	75.1	2.1	11.2	13.3	88.4
Lithuania	2.2	-	1.9	4.1	2.8	21.0	23.9	28.0
Luxembourg	0.3	3.3	19.8	23.4	7.5	7.4	14.9	38.3
Malta	3.1	-	5.7	8.8	0.9	10.8	11.7	20.5
Netherlands	5.4	-	200.0	205.4	-	110.0	110.0	315.4
Poland	4.9	-	-	4.9	9.9	100.4	110.2	115.2
Portugal	4.4	3.4	20.0	27.8	12.4	100.3	112.8	140.6
Slovakia	3.7	8.8	1.8	14.3	0.9	15.7	16.6	30.9
Slovenia	2.8	1.6	11.1	15.5	2.3	7.3	9.6	25.1
Spain	97.0	49.2	372.4	518.7	332.8	705.5	1,038.3	1,556.9
Sweden	7.2	81.1	7.0	95.3	6.4	98.2	104.6	199.9
UK	7.2	0.7	4.6	12.5	18.4	107.4	125.8	138.3
Total (25)	256.0	416.6	816.8	1,672.1	702.8	2,708.5	3,429.1	5,101.2

Figure 3: Estimated total costs by Member State (EUR per annum)



The largest annual cost estimate is for Spain (€1,557m), followed by Germany (€620m), France (€474m), Netherlands (€315m), Sweden (€200m), Cyprus (€200m), Ireland (€185m), Italy (€182m) and Hungary (€180m). The Spanish figure is for “desirable” costs – current “real” costs are estimated at €968m.

Table 2: Breakdown of identified costs between EU-15 (14 of 15) and new Member States (11 of 12) (€ million)

	One-off (€M)	Recurrent (€M)	Total (€M)	Per cent
EU-15	1,251.1	2,868.2	4,119.2	81%
New MS	421.0	560.9	982.0	19%
Total	1,672.1	3,429.1	5,101.2	100%

Table 3: Breakdown of costs between existing and new sites (€ million) for the EU-25 respondents

	One-off (€M)	Recurrent (€M)	Total (€M)	Per cent
Existing Sites	1,595.2	3,384.4	4,979.6	98%
New Sites	76.9	44.7	121.6	2%
Total	1,672.1	3,429.1	5,101.2	100%

Two thirds of these annual costs are recurrent costs (mostly habitat management and monitoring), and the remainder are one-off costs (land purchase, infrastructure and management).

The recurrent costs form a much higher share of the overall cost estimates in the EU-15 (70%) than in the New Member States (57%). This reflects the more established state of the network in the EU-15, where much of the effort is now focusing on ongoing site management, than in the new Member States, where investing in the establishment of the network and the supporting infrastructure is still a major priority.

Table 2 indicates that 81% of the identified costs are among the EU-15 and 19% among the more recent entrants of the EU. It is important to note that coverage of both of these groups is incomplete.

Table 3 indicates that 98% of the identified costs relate to existing sites, with only minor costs estimated for new sites. The cost estimates for new sites relate mostly to the more recent EU entrants, though some costs are included for France, Greece, Ireland, Italy and Portugal. Part of this is due to the fact that the list of sites are complete for many countries (certainly terrestrial sites), but also that where sites have not yet been designated they are simply not covered.

As could be expected, one-off costs form a greater share of total costs for new sites than for existing sites. Again, the above values need to be treated with some caution as many Member States did not submit information on new sites.

Annualising one-off lump sum cost estimates over a 10-year rather than a 6-year cycle reduces the overall cost estimate slightly to €4.77 billion – for the EU-25.

2.1.4 Discussion of cost estimates

The cost exercise has been a valuable process, providing useful data and **representing a clear step forward compared to previous cost exercises**. In particular, progress has been made in extending the area coverage of the cost estimates, in providing real data for the new Member States (where previous estimates were based on assumptions and extrapolations), and in updating estimates to reflect latest understanding on the measures required to implement the network and the associated unit cost of these. In addition, more detailed data has been provided on the range of component costs – one-off management (e.g. finalisation of sites), investment (e.g. land purchase and compensation), recurrent management planning, and habitat management and monitoring. It has, however, been a difficult exercise, as noted by the range of ‘challenges’ encountered and the different approaches followed by Member States.

The cost estimates are based on a variety of estimation methods. Some Member States base their estimates on dedicated studies and detailed source data; some provide more outlined estimates; while others provide cost estimates with only little information about how these were calculated.

Most Member States indicate that their estimates are approximate and that there are significant assumptions and uncertainties affecting them. However, in most cases the respondents indicate that they provide reasonable estimates of the costs of delivering the network, based on the evidence available. In some cases, however, warnings are

given of the uncertainties surrounding the cost estimates. For example, in Greece they are described as “rough estimates”, and in Slovakia several questionnaire entries are described as “speculative judgements”. In Malta, estimates for new sites are said to be “highly provisional and subject to change”.

The responses collected in the context of this project indicate that a number of issues affect the accuracy and completeness of the cost estimates. These issues include:

- **Cost estimates from different bodies.** Often the costs are shared between a variety of different government departments and agencies, some of which have been unable to provide data. In Lithuania, it was noted that data were obtained from a variety of organisations but were not necessarily comprehensive. In Greece, the cost estimates focus only on those management bodies that have applied for state funding.
- **Missing actions.** Though most cost estimates are reasonably complete, some have missing costs – for example some actions and costs cannot be defined until management plans are in place (e.g. land purchase and infrastructure in Poland).
- **Incomplete network coverage.** In Greece management bodies are estimated to be in place for only 22% of the network; as a result costs are estimated for a minority of sites only. The costs of marine sites are incomplete in many Member States, as a result of uncertainties regarding the actions required.
- **Missing regions.** Some Member States were unable to provide estimates for certain regions (e.g. Portugal could not provide data for the Azores; data are missing from 7 of 21 Italian regions).
- **Regional estimates.** Some estimates are assembled from assessments provided by individual states and regions (e.g. Belgium, Germany, Italy, and UK). These regional estimates may employ a variety of assessment methods, details of which are often not provided in the national returns. In Italy it was noted that different regional authorities had interpreted the questionnaire in different ways, while regional coverage is incomplete, and extrapolation to fill gaps has been necessary.
- **Variations in costs between sites** and the challenge of identifying representative unit costs from which to make overall estimates.

Nevertheless, most Member States have been able to provide what they regard as reasonably complete estimates of the cost of implementing the network. The greatest issue with regard to the reliability of the cost estimates relates to the wide variation in methodological approaches between Member States, often a result of differences in the way in which the questionnaire has been interpreted. Issues include:

- **Future vs. historic costs.** Most Member States have made estimates of the costs of implementing the network over a defined future period. Typically these are estimated by identifying appropriate average unit costs and multiplying these by the scale of activity required. However, for some, cost estimates are based largely on historic expenditures (e.g. Czech Republic). Other Mem-

ber States include budgeted expenditures (e.g. Belgium) or a combination of historic expenditures, budgeted allocations and projections based on anticipated needs (e.g. Greece, Latvia).

- **“Actual” vs. “desirable” costs.** The degree to which cost estimates are constrained by available budgetary resources varies widely. Some Member States base estimates on the resources available or expected to be available in the Member States (e.g. Belgium) while others estimate the costs that would be incurred if the network was managed optimally, irrespective of current resources (e.g. Cyprus, France, Germany, Hungary, Luxembourg, Malta, Spain, Sweden). Some of these estimates appear to be more optimistic than others (e.g. Cyprus which has made large estimates of land purchase costs). Spain is the only Member State to make estimates of both “real” and “desirable” costs.
- **Gross vs. net costs.** Most Member States estimate the overall cost of implementing and managing the sites in the network. However, the UK has estimated the additional cost of the network relative to existing national designations; this clearly reduces the cost estimates produced.

Differences in costs estimates between Member States may also vary widely by types of sites, being highest in areas which require highest levels of intervention and management (e.g. in agricultural areas in North-Western Europe) and face greater pressure from development and disturbance (e.g. islands in Southern Europe). The costs of completing and managing a network of protected areas is dependent on a number of factors (see also Box 1) – **the size of the sites** (costs per hectare are lower for bigger sites than for small ones), **the accessibility / proximity of the sites to urban areas** (the increased pressure on the site tends to increase costs) and **income** (costs of protected areas management tends to be higher in higher income countries, reflecting wage and land costs). Finally, the **maturity of the network** and the past expenditure will also affect the overall costs, as past expenditure can reduce the need for future expenditure.

Box 1: Factors explaining management costs of protected areas

Balmford et al. (2003) collected expert estimates of management costs (excluding one-off costs such as land purchase costs, opportunity costs etc.) for over 150 individual sites worldwide, and used this information to derive a model of how costs of protected areas (PA) vary across the world. This model was able to explain over 80 per cent of the variation in costs based on

- PA size (costs per hectare go down with increasing size)
- Population density (costs per hectare go up with increasing density)
- Gross national product (costs per hectare go up with increasing output)
- Purchasing power parity (PPP).

Unsurprisingly, the costs of field conservation vary widely, though strikingly the scale of costs ranges over seven orders of magnitude, from less than \$0.1 per km² per year in the Russian Arctic to over \$1,000,000 per km² per year for some Western European programmes, in which restoration is needed to recover conservation value at protected sites. Changes of conservation cost are affected by:

- The extent of nearby development, which in turn relates to pressures on the site (conservation costs vs. wilderness value: $r_s = -0.55$, $n=139$ sites, $P<0.001$)
- Local human population density ($r_s = 0.36$, $n=139$, $P<0.001$) and the increase of economic activity, as measured by mean per capita GNP ($r_s = 0.75$, $n=139$, $P<0.001$); or the ratio of GNP to country area ($r_s = 0.80$, $n=139$, $P<0.001$)
- Dollar costs decrease with increases in the local buying power of a U.S. dollar (measured as PPP: $r_s = -0.80$, $n=139$, $P<0.001$)
- Costs per unit area also decrease with the areal extent of projects ($r_s = -0.69$, $n=139$, $P<0.001$).

[r_s = correlation coefficient, n =number of samples, P =confidence level]

In summary, effective field-based conservation efforts are cheaper when conducted in less developed regions with low cost structures, and where they cover large areas.

Vreugdenhil (2003) also developed a model of core PA operations that estimates the cost of 50 basic management components according to national prices, PA size, and level of threat.

Different **conservation strategies** might also affect the level of costs. Whether the purchase of land or forming management agreements with private landowners is seen as the best means of achieving the required objectives of the network significantly influences the level of costs.

These variations in approaches, conservation strategies as well as different cost ‘drivers’ are likely to affect the comparability of cost estimates between Member States and are further discussed below.

2.1.5 Comparison of different cost estimates across Member States

Table 4 presents the average annual cost per hectare of the Natura 2000 network. The averages are calculated simply by dividing the estimated costs for all sites (existing and new sites) by the total terrestrial area of the network in each Member State. Marine sites are excluded as they often occupy large areas while incurring very low costs, and would otherwise distort the per hectare figures.

The average cost of implementing the network is estimated at **€63.4 per hectare per year, across the 25 responding Member States**. This comprises recurrent costs of €42.6/ha/yr and one-off costs of €20.8/ha/yr.

The figures indicate that there are very wide variations in mean costs per hectare between Member States, with Cyprus, Luxembourg and Malta estimating very high

costs (at over €800/ha/yr). The high per hectare costs for these small Member States suggests that there may be a significant element of fixed costs, irrespective of the size of the network. Average per hectare costs are also relatively high in Netherlands (€281/ha/yr), Belgium (€195/ha/yr), Ireland (€139/ha/yr), Spain (€110/ha/yr – “desirable” costs), Latvia (€109/ha/yr) and Germany (€107/ha/yr). They are lowest in Poland, Slovakia, Italy and Greece.

Inclusion of marine areas would reduce per hectare cost estimates and significantly depresses mean per hectare costs for Member States with a large area of marine sites, especially Belgium (and to some extent Germany). For example, Belgium estimated one-off costs of €40,000 and annual recurrent costs of €195,000 for 3 marine SACs and one marine SPA covering a combined total of 4.75 million hectares. In the UK, costs of marine sites were put at £500,000 per year for an area of 245,000 hectares, little over £2 per hectare per year – these were entirely made up of “surveillance” costs.

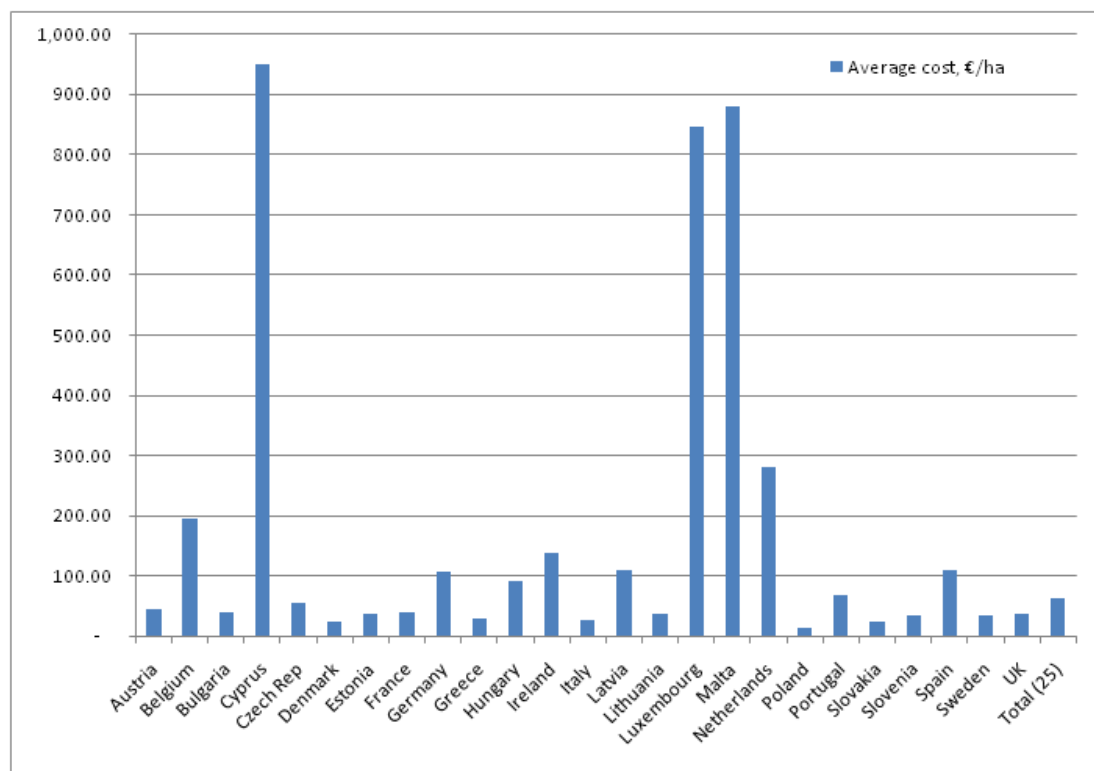
The figures reveal very wide variations in different types of costs, including both one-off and recurrent costs. For example:

- One-off management costs are relatively high in Malta, Belgium and the Czech Republic
- Land purchase costs are extraordinarily high in Cyprus, which considers that it is necessary for the state to purchase very large areas of privately owned land at a high average cost per hectare, in order to protect it from development. Belgium, Latvia and Luxembourg also estimate relatively high land purchase costs
- Infrastructure costs (which include infrastructure for restoration of habitats and species as well as public access and interpretation) are very high in Luxembourg and Malta (and fairly high in Latvia and Cyprus). Very few details are given in support of these cost estimates
- Recurrent costs of management planning are estimated to be very high in Cyprus and Luxembourg
- Habitat management costs are estimated to be high in Cyprus, Luxembourg, Malta and to a lesser extent Ireland.

Table 4: Average per hectare costs by Member State

	Area of net-work (ha)	One off costs, €/ha (annualised)				Recurrent costs, €/ha			Grand Total €/ha
		Management	Land purchase	Infrastructure	Sub-total	Management planning	Habitat management and monitoring	Subtotal	
Austria	1,232,904	2.32	2.80	6.73	11.85	2.44	31.16	33.61	45.46
Belgium	387,131	39.29	48.93	41.39	129.61	13.48	52.14	65.62	195.23
Bulgaria	3,861,300	8.80	5.91	0.13	14.84	17.40	7.84	25.24	40.08
Cyprus	210,959	2.65	592.53	49.15	644.34	86.91	219.67	306.58	950.92
Czech Rep	1,503,411	14.40	-	2.42	16.81	3.22	35.83	39.05	55.86
Denmark	1,667,600	-	-	-	13.54	-	-	10.71	24.25
Estonia	1,489,000	1.30	5.80	12.23	19.33	0.56	16.78	17.34	36.66
France	12,300,000	1.24	0.02	0.37	1.63	3.29	33.60	36.89	38.52
Germany	5,775,366	-	-	-	27.70	20.26	59.39	79.65	107.35
Greece	3,407,551	3.56	1.59	3.92	9.06	1.97	17.48	19.45	28.51
Hungary	1,968,218	1.92	10.16	13.81	25.89	9.00	56.49	65.50	91.39
Ireland	1,335,535	4.86	14.73	8.79	28.37	0.44	109.86	110.31	138.68
Italy	6,721,590	0.46	2.69	1.58	4.73	3.62	18.66	22.28	27.01
Latvia	811,309	0.99	32.32	59.29	92.59	2.63	13.78	16.41	109.01
Lithuania	781,479	2.85	-	2.40	5.25	3.63	26.94	30.57	35.82
Luxembourg	45,260	7.03	73.65	436.53	517.21	166.56	163.02	329.58	846.80
Malta	23,257	134.41	-	242.97	377.38	38.16	465.61	503.77	881.14
Netherlands	1,121,900	4.80	-	178.27	183.07	-	98.05	98.05	281.12
Poland	7,954,710	0.62	-	-	0.62	1.24	12.62	13.86	14.48
Portugal	2,026,954	2.19	1.67	9.86	13.72	6.14	49.50	55.64	69.37
Slovakia	1,343,000	2.73	6.58	1.37	10.67	0.67	11.69	12.36	23.03
Slovenia	720,270	3.85	2.22	15.46	21.53	3.26	10.07	3.65	16.70
Spain	14,200,000	6.83	3.47	26.23	36.53	23.43	49.68	73.12	109.64
Sweden	5,816,650	1.23	13.95	1.20	16.38	1.10	16.88	17.98	34.36
UK	3,793,095	1.91	0.17	1.22	3.30	4.84	28.32	33.17	36.47
Total (25)	80,498,448	3.18	5.18	10.15	20.77	8.73	33.65	42.51	63.21

Figure 4: Average cost per hectare (EUR)



These variations in costs are likely to reflect a variety of factors, such as differences in:

- **Unit costs** – with higher costs in those countries where labour and land is more expensive, greater levels of intervention and management are required (given external pressures as well as site status and needs), the size of the protected areas is smaller, and the opportunity cost of conservation higher (especially in the NW of the EU and densely populated areas).
- **Interpretation of the questionnaire and methodology employed** – Section 2.1.4 makes clear that some Member States have interpreted the questions differently than others and employed different definitions and estimation methods
- **Stage of implementation of the network** – some of the more recent entrants to the EU identify relatively high one-off costs relating to the implementation of the network
- **Strategies adopted** – with some Member States such as Cyprus proposing relatively expensive strategies involving a significant amount of land purchase
- **Tactical motivations** – it is possible that Member States which have submitted high cost estimates have done so in order to make a case for additional EU funding for the network
- **Gross and net costs** – it is known that the UK (at least) has not estimated the gross cost of implementing the network but the net cost, in addition to existing national designations. Therefore the estimated costs are not the full costs of managing Natura 2000 sites, as they are for some other Member States.

- **Actual and desirable costs** – Spain is the only country to have made an explicit distinction between actual and desirable expenditures, estimating the “real” costs of managing the network and the “desirable” costs. It is likely, however, that there is variation between Member States in the degree to which cost estimates reflect the actual resources committed or those which might be committed if available.
- **Fixed costs** – the high per hectare unit costs for small countries like Malta, Cyprus and Luxembourg suggests that there may be a significant element of fixed costs, irrespective of the area of the network.
- **Missing costs** – there are missing costs for some Member States, e.g. some such as Poland have not included costs of land purchase, indicating that these cannot be estimated at this stage.

Table 5 and Table 6 compare average per hectare costs for groups of Member States. The figures indicate that average costs per hectare are higher for respondents from the EU-15 than for the later entrants to the EU (Table 5), and are highest in Southern and North West Europe (Table 6).

Table 5: Average costs for EU-15 and new Member States (€/ha/yr)

	One-off (€/ha)	Recurrent (€/ha)	Total (€/ha)
EU-15	20.91	47.94	68.85
New MS	20.37	27.14	47.51
Total (25)	20.77	42.60	63.37

Figure 5: Comparison of average costs in EU-15 and NMS12 (€/ha/yr)

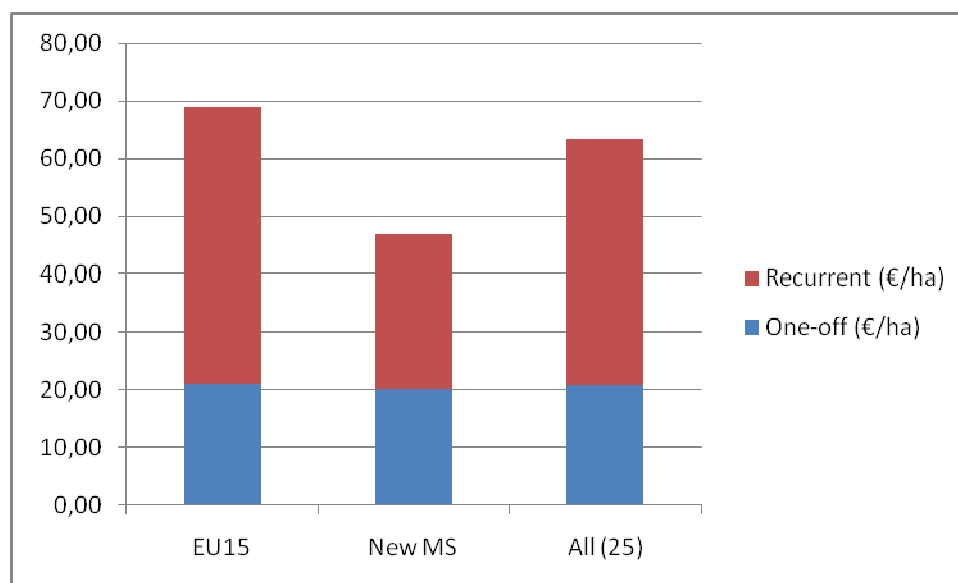


Table 6: Average costs by geographic region (€/ha/yr)

	One-off (€/ha)	Recurrent (€/ha)	Total (€/ha)
NW Europe (AT,BE,DE,DK,FI,EI,LU,SE,NL,UK)	19.76	50.49	70.25

CE Europe (BG,CZ,EE,HU,LV,LT,PL,SK,SL)	13.52	23.71	37.24
S Europe (CY,IT,ES,MT, PT,EL)	28.35	54.28	82.64
N Europe (SE)	16.38	17.98	34.36
Total	20.77	42.60	63.37

A key determinant of variations in per hectare costs is likely to be differences in labour costs between Member States. Data collected from the questionnaires regarding levels of employment and wage costs in running the network suggest that there are substantial variations in the staff costs (Table 7).

Table 7: Staffing levels and salaries for Natura 2000 network

Member State	Number of FTE staff	Salaries (mEUR)	Implied salary per job (EUR)
Austria	93.5	5.61	60,000
Be (Flanders)	125	5.00	40,000
Be (Wallonia)	60	3.36	56,000
Bulgaria	22	0.08	3,846
Cyprus	112	2.02	18,000
Czech	130	2.21	17,020
France	785	37.80	48,153
Greece	455	15.99	35,138
Hungary	823	13.72	16,667
Ireland	192	11.25	58,594
Italy	195	4.26	21,846
Lithuania	565	13.20	23,363
Malta	158	2.77	17,532
Poland	750	9.88	13,173
Portugal	1564	34.86	22,288
Slovenia	82	2.32	28,232
UK	626.5	22.77	36,345
Total	6738	187.09	27,767

The figures in Table 7 imply an average salary per FTE job ranging from as low as €3,846 in Bulgaria to €60,000 in Austria, with an average of €28,000 across the Member States for which data was available. The highest average salaries are in the North West European countries, a region which also has high per hectare unit costs. However, the figures confirm that wage costs are not the only determinant of variations in unit costs – Cyprus and Malta have produced high cost estimates for the network but have relatively low labour costs. This relates to the high population densities, small site areas, pressures on the sites given accessibility and in Cyprus' case a reliance on land purchase for cost estimate. Table 8 allows comparing average costs to a range of different 'drivers' as discussed in Section 2.1.4.

Costs may also vary widely by types of sites, being highest in areas which require highest levels of intervention and management (e.g. in agricultural areas in NW

Europe) and face greater pressure from development and disturbance (e.g. islands in southern Europe).

In Sweden, where unit costs are relatively low, an interviewee told the project team that many natural and semi natural areas do not need substantial management, while costs are mainly associated to monitoring activities. Costs were therefore considered to be lower than in other parts of Europe, where nature is more affected by anthropogenic activities, natural habitats are small, and more management is required.

In Greece the team was told that only 22% of the Natura 2000 network is covered by a management body which incurs costs. Many of these management bodies are not particularly active: they do not develop action plans, they do not hire staff and do not claim funding from the government. Recorded costs are therefore low as a result of low levels of management activity. Marine or coastal sites (mainly on the islands) are generally more costly than land- or water-based sites. Marine and coasts require different monitoring and protection techniques which are more costly (e.g. chartering private boats for transport as there are no public transport links, underwater monitoring etc.). Furthermore, there are greater pressures on island sites from tourist development and thus there is a higher opportunity cost in conservation and sustainable development (compared to development for mass tourism).

The data indicate that there are significant variations in per hectare costs within as well as between Member States. For example, in Germany estimated costs among federal states varied between 65€/ha and 190€/ha. These values may reflect different estimation methods but were still considered reliable.

In the UK, the RSPB told the team that the size of sites is a major determinant of average unit costs.

The purchase of land is an area where costs vary very widely between Member States, largely as a result of differences in policy. Several Member States (e.g., Bulgaria, Czech Republic, France, Italy, Malta, Slovakia, UK) indicated that land purchase is only contemplated in rare circumstances, and that forming management agreements with private landowners is the norm. However, in others (e.g., Cyprus, Lithuania, Luxembourg, Romania, Sweden) purchase of land was seen to play a more important strategic role, often being seen as the best means of achieving the required objectives of the network. The most extreme example was Cyprus where the cost estimates are based on the purchase of a large area of land (25,000 hectares) at a high unit cost of €30,000 per hectare, giving an overall cost estimate of €750million.

Table 8: Average per hectare costs per Member State compared to likely cost 'drivers' such as size, range of sizes, population density and income

Countries	Grand Total €/ha	Areas of SCIs/ SACs (ha)	Area of SPAs (ha)	Range of Natura 2000 Site Sizes (in ha)							Population density (people/km ²)	GDP/capita (€/person)
				No. of SAC sites	No. of SPAs sites	0 -1,000	1001- 5,000	5001- 10,000	10,001- 50,000	50,001- 300,000		
Austria	45.46	897,800	986,900	168	96	126	41	14	28	9	99.5	28,800
Belgium	195.23	307,100	296,700	280	234						350.4	27,200
Bulgaria	40.08	3,283,800	2,267,800	228	114	86	89	34	65	21	69.0	10,400
Cyprus ¹	950.92	66,100	7,670	36	7	34	5	1	0	1	83.5	23,200
Czech Rep.	55.86	785,400	968,400	1,082	39	1018	55	20	24	6	113.8	19,000
Denmark	24.25	317,400	253,800	261	113						126.7	27,700
Estonia	36.66	756,900	609,000	531	66	387	81	17	36	5	30.9	14,600
France	38.52	4,670,900	4,325,600	1,366	381	754	499	200	230	28	100.9	25,300
Germany	107.35	3,457,400	4,372,900	4,622	738	4002	819	147	122	21	229.9	27,400
Greece	28.51	2,145,400	1,564,100	239	163	69	110	61	110	9	85.6	22,300
Hungary	91.39	1,397,300	1,351,200	467	55	275	128	44	57	8	108.1	14,900
Ireland	138.68	754,400	201,700	424	131	383	92	27	37	2	63.7	30,900
Italy	27.01	4,305,500	4,105,300	2,268	597	1548	698	157	141	20	201.2	24,000
Latvia	109.01	729,400	647,900	324	95	244	65	14	10	4	36.5	11,400
Lithuania	35.82	865,100	586,000	279	81	248	68	13	33	4	53.9	12,500
Luxembourg	846.80	39,900	1,450	48	13	42	15	2	0	0	182.8	63,000
Malta ²	881.14	4,200	1,600	28	13	32	1	0	0	0	1281.2	18,300
Netherlands	281.12	348,500	523,000	146	77	93	83	18	9	9	485.3	30,700
Poland	14.48	3,440,300	4,873,800	823	141	187	95	56	112	40	122.0	14,300
Portugal	69.37	1,601,300	981,600	96	59	48	30	12	31	17	115.2	18,500
Slovakia	23.03	573,900	1,223,600	382	38	326	44	20	25	12	110.1	16,900
Slovenia	16.70	636,000	465,300	259	27	212	38	10	21	5	100.2	20,300
Spain	109.64	12,350,800	10,399,800	1,448	599	746	410	201	329	79	87.2	24,500
Sweden	34.36	5,695,600	2,585,600	3,983	531						22.3	28,400
UK	36.47	1,665,700	1,521,300	623	257	534	198	52	63	18	250.8	27,400
Total (25)	63.21											

Note: For the number of sites per range, all data come from EUNIS database except for AT, CZ, IT, LT and SI (own data). Database is not necessarily up to date, and might be subject to underestimations. 1) SPA area corresponds to the area of Cyprus where the Community acquis applies at present. 2) Several marine SPA sites, but no information on marine areas provided in the database.

Source: Population Density- Eurostat 2007, except for AT, CY, LU, MT, PL and ES which are from Eurostat 2006. GDP- Eurostat 2009, except for BG which is from Eurostat 2008; Number and Area of Sites – Natura 2000 barometer 2009; Range of Sizes – Member States and EUNIS database, last accessed February 2010

2.1.6 Estimated costs for EU-27

The estimated costs of implementing the Natura 2000 network have been estimated by scaling up the cost estimates on an area basis, to fill the gaps resulting from the unavailability of cost estimates from two Member States (Finland and Romania). These two Member States account for approximately 12% of the Natura 2000 network by area, with a combined area of 10.6 million hectares.

The estimated total annual costs for the 25 Member States for which data are available are 5,101 million EUR.

Three potential gap filling estimates have been identified:

1. Simple area based extrapolation. This assumes that the missing costs are equivalent to the per hectare average for the 25 Member States for which data are available (i.e. 63.4 EUR/ha)
2. Extrapolation based on EU-15 and EU-12 averages. This extrapolates the costs based on the identified average for the 15 established and 12 more recent members of the EU (69 and 48 EUR per hectare per year respectively)
3. Regional based extrapolation. This uses the regional averages set out in Table 6 and categorises Finland in Northern Europe and Romania in Central/Eastern Europe.

The results of extrapolating the cost estimates in this way are given in Table 9. The additional costs of the network in the two Member States for which data are missing are estimated at between 378 (Method 3) and 671 million EUR per year (Method 1), giving an estimated annual total for the EU-27 of between 5,479 and **5,772 million per year**.

Table 9: Estimated costs for EU-27, based on three extrapolation methods

	Additional cost for 4 "missing" MS	EU-27 cost
Method 1	671	5,772
Method 2	621	5,722
Method 3	378	5,479
Average	557	5,658

Extrapolation based on the simple per hectare average gives the highest cost estimates, and the regional based extrapolation the lowest. This is because a large proportion of the missing area is in Finland and Romania, two Member States for which the average cost per hectare might be expected to be relatively low, based respectively on the estimates for Sweden and for the newer entrants from Central and Eastern Europe.

Using the average estimates from the three extrapolation methods suggests a total annual cost of managing the network in the EU-27 of €5,658 million per annum.

2.1.7 Comparison of costs across land use types

In their cost questionnaires, six Member States provided complete breakdowns of costs of the Natura 2000 network by land use, as well as data on the area of each land use in the network:

Austria

- Cyprus
- Hungary
- Poland
- Portugal
- Slovakia

A further four Member States provided breakdowns of recurrent costs or habitat management and monitoring costs by land use type:

- Czech Republic
- Malta
- Slovenia
- UK

As these represent a minority of participants it is not possible to provide comprehensive estimates of the costs attributed to different land use types. However, the available evidence enables to provide breakdowns for these 10 Member States (the combined area accounts for is 18.4 million hectares, or 20% of the overall Natura 2000 network) and to compare the average unit costs for different land use types. By estimating the per cent breakdown of costs by land use, it is also possible to provide overall estimates of the costs by land use across the EU27.

Table 10 presents estimated total costs by land use for the above mentioned 10 Member States. It should be noted that these estimates combine data on total (one-off plus recurrent) costs for six Member States and recurrent cost data only for a further four Member States. The proportion of costs accounted for by each land use is given in Table 11. This indicates that 35% of the combined cost estimates relate to agricultural land uses, 33% to forests, 11% to other terrestrial land uses, 7% to inland waters, 6% to wetlands, 6% to coasts and 1% to marine areas.

The largest average costs per hectare relate to inland waters (€107/ha), followed by agricultural land (€66/ha). The mean unit cost per hectare per year is €48, below the estimated average found in the study as a whole (€63), indicating that the unit costs for the countries that provided land use data is below the EU average. This is despite the inclusion of high cost countries such as Cyprus and Malta.

Table 10: Total costs by land use (€)

	Agricultural	Forests	Other Terrestrial	Inland Waters	Wetlands	Coastal	Marine	Total
Austria	23,801,869	14,230,892	5,669,229	7,784,344	4,560,898	-	-	56,047,232
Cyprus	59,846,333	93,445,273	-	15,277,333	3,421,300	28,544,000	70,500	200,604,740
Czech Republic	19,058,382	2,848,734	2,853,719	18,881,524	667,180	-	-	44,309,539
Hungary	53,577,109	68,105,443	38,422,937	12,923,345	6,846,286	-	-	179,875,120
Malta	1,904,815	1,249,823	1,591,905	1,021,013	1,641,785	1,249,956	-	8,659,296
Poland	39,116,765	59,476,477	2,314,953	4,867,336	1,424,586	3,205,319	8,310,087	118,715,522
Portugal	50,188,470	30,216,696	41,607,116	1,126,710	3,316,872	11,065,861	3,000,000	140,521,725
Slovakia	2,450,000	14,000,000	2,250,000	1,900,000	1,800,000	1,400,000	-	23,800,000
Slovenia	4,137,700	544,500	182,950	568,100	1,158,300	-	-	6,591,550
UK	56,654,566	9,800,433	4,713,261	1,581,417	24,314,642	8,611,357	555,556	106,231,231
Total (10)	310,736,009	293,918,271	99,606,069	65,931,123	49,151,849	54,076,493	11,936,142	885,355,956

*Note the table combines data on total (one-off and recurrent) costs for 6 MS and recurrent costs only for 4 MS (those in *italics*), in order to include as much data as possible breaking costs down by land use.

Table 11: Per cent breakdown of known costs by land use

	Agricultural	Forests	Other Terrestrial	Inland Waters	wetlands	Coastal	Marine	Total
Austria	42%	25%	10%	14%	8%	0%	0%	100%
Cyprus	30%	47%	0%	8%	2%	14%	0%	100%
Czech Republic	43%	6%	6%	43%	2%	0%	0%	100%
Hungary	30%	38%	21%	7%	4%	0%	0%	100%
Malta	22%	14%	18%	12%	19%	14%	0%	100%
Poland	33%	50%	2%	4%	1%	3%	7%	100%
Portugal	36%	22%	30%	1%	2%	8%	2%	100%
Slovakia	10%	59%	9%	8%	8%	6%	0%	100%
Slovenia	63%	8%	3%	9%	18%	0%	0%	100%
UK	53%	9%	4%	1%	23%	8%	1%	100%
Total (10)	35%	33%	11%	7%	6%	6%	1%	100%

Table 12 provides an indicative estimate of the costs by land use type for the EU as a whole. This has been made by apportioning the overall cost estimate of €5,769 million for the EU27 according to the % breakdown by land use in Table 5. Thus the largest cost estimate relates to agricultural land (€2.0bn) followed by forests (€1.9bn). The figures indicate that very few marine costs are included in the assessment.

Table 12: Estimated Breakdown of EU27 costs by land use type

	Assumed %	Estimated Cost (€m)
Agricultural	35%	2025
Forests	33%	1915
Other Terrestrial	11%	649
Inland Waters	7%	430
wetlands	6%	320
Coastal	6%	352
Marine	1%	78
Total	100%	5,769

2.1.8 Comparison with other cost estimates

The estimated average cost of €63/ha/yr is low compared to previous estimates. For example, Stones et al. (1999) in a report for BirdLife International based cost estimates on a central figure of €80 per hectare per year and the Commission's previous estimates, extrapolated from the Markland report, suggested an annual cost of around €107/ha/yr¹⁷.

The figures are also much lower than recent estimates by BirdLife International (Table 13). These suggest an average cost of €128 per hectare, based on estimates for 6 Member States provided by BirdLife partners.

Table 13: Cost Estimates by BirdLife International (2009)

Country	Total annual costs (EUR)	Size of Natura 2000 network (ha)	Average costs per ha per annum (EUR)
Austria	206,905,000	1,228,000	168.48
Bulgaria	143,482,803	3,759,000	38.17
Finland	126,970,710	5,557,291	22.84
Netherlands	208,571,428	1,100,000	189.61
Slovakia	61,647,855	1,377,425	44.75
Spain	2,749,392,658	14,286,090	192.45
Total	3,496,970,454	27,307,806	128.06

Five of these Member States – Austria, Bulgaria, Netherlands Slovakia and Spain – have provided cost estimates to the Commission as part of the current study. The annual per hectare costs estimated by BirdLife are 371%, 95%, 67%, 194% and 176% of the official estimates respectively.

¹⁷ Based on €6.1 billion per year for an area of 57 million hectares

Other studies also suggest that the official cost numbers are probably lower estimates. For example, the cost of delivering Habitat Action Plans under the UK Biodiversity Action Plan is estimated at £321 million over a terrestrial area of approximately 5.5 million hectares, an average of £58 per hectare per year (€64/ha/yr). This is much higher than the €36/ha/yr suggested by the UK questionnaire return. The latter is low probably due to the fact that it does not estimate the total cost of site management but the estimated additional costs on top of national designations.

Table 14 provides a comparison of cost estimates for individual Member States with those estimated in the previous costing exercise¹⁸. The figures show a marked variation in the relationship between current and previous cost estimates. The current figures for Austria, Greece and Italy are substantially lower than previous ones – in the case of Italy the previous estimate was unusually large. For most Member States the current estimates are higher than the previous figures, although the revised cost estimate for the EU as a whole, at €5.8 billion, is below the previous estimate of €6.1 billion.

Table 14: Comparison of Current with Previous Cost Estimates for Member States

Member State	Previous Estimate (€ m, 2004)	New Estimate (€ m, 2009)	New/Previous (%)
Austria	181	56	31%
Belgium	44	76	172%
France	372	474	127%
Germany	620	620	100%
Greece	238	97	41%
Ireland	72	185	256%
Italy	2,879	181	6%
Portugal	223	140	63%
<i>Spain*</i>	1,300	1,557	120%
Sweden	178	200	112%
<i>UK*</i>	50	138	275%
Cyprus	16	200	1266%
Estonia	12	54	469%
Hungary	143	180	125%
Latvia	15	88	600%
Lithuania	30	28	93%
Poland	14	115	800%
Slovakia	3	31	917%
Slovenia	25	12	208%

A key reason for the relatively low estimates made by the Member States is that many of these appear to be based on the existing resources available for the network rather than estimates of the cost of managing the network if resource constraints were not an issue.

¹⁸ Taken from 2004 Commission Working Document, Annexes to the Communication on Financing Natura 2000. Based on a questionnaire survey of Member States. The questionnaire was first sent out in 2002 and subsequently revised in 2003. Most estimates, except those marked with an asterisk, are based on the revised questionnaire return.

2.1.9 Trends and expected future costs

In general little detailed information is available about the profile of future costs. However, the interviews at Member State level provided some insights about how costs might be expected to develop in future.

In most Member States some increase in costs is expected, and in no case was it suggested that costs will decline. Even though many current investments are of a one-off nature, these are expected to be followed by further one-off investments (e.g. further infrastructure), periodic expenditures (e.g. revised management plans, repeat surveys, and further research) and increases in management activity with recurrent costs. In most Member States the network is seen as delivering long term objectives which will require ongoing expenditures.

Key reasons for expected cost increases include:

- **An expected increase in the area of the network.** This is likely to be marginal in most Member States (e.g. Finland, Germany, Ireland, Slovenia) but significant in some (e.g. Lithuania).
- **An increase in management activity.** Particularly in the newer Member States, relatively little is known about the condition of many sites and the management actions required to achieve favourable conservation status. With improved evidence and the development of management plans, it is likely that management efforts and expenditures will need to increase, although for many Member States there remain great uncertainties. This is the case for the Czech Republic, Estonia, Poland, Portugal and Romania
- **The long term challenge of achieving favourable conservation status.** In some Member States (e.g. Czech Republic, Estonia, Finland, Luxembourg, Portugal, Sweden) it was stressed that achieving favourable conservation status is a long-term challenge, which may require significantly increased inputs, although the required management actions may be uncertain. Significant costs will persist over time.
- **Increased costs for marine sites.** Particularly in the EU-15, much of the work necessary to establish the network has been completed for terrestrial sites, but significant efforts are still required for marine areas (e.g. Italy, Ireland, UK)
- **Planned increases in staffing for the network** (e.g. France, Italy, Luxembourg, Poland) though these are dependent on the availability of resources
- **Higher administrative costs** – in Germany, the team was told that existing designations meant that the costs of managing the network were not expected to increase significantly. However, it was stressed that there would be additional administrative costs associated with EU designations. In Poland, Natura 2000 is expected to result in increased planning costs in future.

- **Changing pressures on sites** – climate change (e.g. UK) and undergrazing/abandonment (e.g. Ireland, Germany) were stressed as pressures that could require the need for new and expensive management regimes. In the case of climate change, it was suggested that the network may need to constantly change and develop, leading to further costs over time.
- **Cost inflation** – Slovenia reported that costs have changed greatly in the last few years and can be expected to do so significantly over the coming seven years. For example, prices of agricultural land in many parts of Slovenia were rising at about 20% a year from 2000 to 2008, and are now stagnating or falling. The costs of services has also been increasing by about 10% annually, inflating various costs of Natura 2000 (e.g. scientific studies, administration, consultation, preparing management plans, establishing management bodies, monitoring, etc). A number of one-off costs include building and other civil engineering costs, which were estimated to have increased by between 10% and 20% annually from 2000-2008, but have fallen substantially since 2008. These changes indicate that costs can vary significantly year on year, especially among economies in transition, and are also sensitive to general economic conditions.

In general greater increases in costs are expected in the new Member States, in which the network is still very much under development, than in the EU-15, where a significant proportion of one-off investments have been made and where the focus is shifting towards recurrent costs.

2.1.10 Funding and cost coverage

Financial support from the EU budget forms an important source of financing for the Natura 2000 network. Over the ongoing 2007-2013 budgetary period, the implementation of Natura 2000 is supported by altogether seven different Community funding instruments, including the European Agricultural Fund for Rural Development (EAFRD), European Fisheries Fund (EFF), Structural funds, EU Fund for Environment (LIFE+) and the 7th Framework Programme for Research and Development (FP7).

A number of studies and assessments, e.g. the mid-term assessment of the implementation of the EU Biodiversity Action Plan, have addressed and/or tried to estimate Member State expenditure on biodiversity and Natura 2000 under the current EU funding framework (Farmer et al. 2008, COM/2008/864¹⁹, Torkler et al. 2008, EEA 2009, Kettunen et al. 2009b) (Table 15). The studies have all noted that there are significant differences in the uptake of different available funds across the Member States. Furthermore, all of the existing assessments have highlighted that there are difficulties in relation to determining the exact allocation of current and recent expenditure under the different funds for biodiversity and Natura 2000. This is because the exact levels of spending on biodiversity under the different EU financial instruments are not always transparent or easy to identify, e.g. the budgetary lines of different

¹⁹ COM/2008/864 Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. A Mid-Term Assessment of Implementing the EC Biodiversity Action Plan, and SEC/2008/3044 Commission Staff Working Document accompanying the Communication.

funds do not often make a clear distinction between support to overall environmental goals and specific funding to biodiversity and Natura 2000.

However, the available indicative information on the current level of support to biodiversity conservation is not satisfactory when compared to the foreseen future financing needs for Natura 2000. The estimated 5.8 billion EUR / year costs for managing Natura 2000 in the EU is around **four times higher** than the likely annual contribution of the present EU budget, calculated on an indicative basis, to biodiversity²⁰ (Table 15).

Table 15: EU financing sources foreseen for biodiversity in 2007-2013.

Fund	Possible Community contribution for financing biodiversity (EUR) ²¹	Proportion of the total EU budget	Comment
Environment: LIFE+	0.84 billion	0.1 per cent	40 per cent of the total LIFE+ funding earmarked for biodiversity
Agriculture & rural development: EAFRD	20.3 billion for agri-environment measures (AE)	2.4 per cent	AE schemes are not only focused on biodiversity but often address other goals (see Section 3.2 above). Therefore, the total amount of money either allocated specifically for biodiversity conservation, or that has indirect biodiversity benefits remains unclear LFA funding is not earmarked for promoting biodiversity conservation, i.e. final allocations for biodiversity not clear
	0.58 billion for Natura 2000 payments and Water Framework Directive (WFD) payments (agriculture and forest)	0.07 per cent	
	12.6 billion for natural handicap measures (LFA)	1.4 per cent	
Fisheries: EFF	No estimate available		
Regional development & cohesion: ERDF	2.7 billion for the promotion of biodiversity and nature protection	0.3 per cent	Funding for promotion of natural assets and protection and development of natural heritage not earmarked for promoting biodiversity conservation, i.e. final allocation not clear
	1.1 billion for promotion of natural assets	0.1 per cent	
	1.4 billion for protection and development of natural heritage	0.2 per cent	
Research & development: FP7	1.9 billion for environmental research Support to biodiversity	0.2 per cent	Funding for environmental research not all earmarked for promoting biodiversity conservation, i.e. final allocation not clear

²⁰ Estimated as the annual sum of the EU 2007-2013 allocations for biodiversity: earmarked funding for biodiversity under LIFE+; EAFRD Natura 2000 payments; the earmarked funding for biodiversity and nature under ERDF; and assuming 1/3 of EAFRD agri-environment expenditure to be allocated for biodiversity.

²¹ As according to COM/2008/864 and SEC/2008/3044, based on analysing the preliminary budgetary allocations by Member States, includes the Community contribution only (i.e. not MS co-financing)

	projects to date: 29.6 million		
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Source: Kettunen et al. 2009b

The missions to different Member States and the conference carried out in the context of this study provided additional details about funding for the Natura 2000 network at national level.

Most Member States are funding expenditures from a variety of sources, including national, EU, regional and local funds, and to a lesser extent entry fees and private donations. The relevance of different funding sources varies across the EU:

- **National budgets are important in most Member States**
- **The Common Agriculture Policy (CAP), through the European Agriculture Fund for Rural Development (EAFRD)** provides an important funding source in most member States (e.g. Estonia, Germany, Malta, Portugal, Sweden and the UK), but Rural Development Programmes are considered less well adapted to the needs of the network in Italy and are still in their infancy in Bulgaria and Romania
- **The Structural Funds are particularly important in the new Member States** (e.g. Malta, Romania, Slovenia) and have been important in Germany and Italy and to a certain extent Belgium (INTERREG), though a shift in funding allocations and emphasis in the EU mean that opportunities in more developed regions are declining
- **LIFE+** has been used in most Member States and is seen to have played an important role in many (e.g. Belgium, Ireland, Italy and Romania)
- **There has been limited success in using the European Fisheries Fund (EFF) for Natura 2000** (e.g. Estonia, Italy, Poland, Spain) but it has been successfully used in some areas (e.g. aquaculture in Lithuania)
- **Bilateral funding projects** have been important in some countries, including NGO activity in Bulgaria, and European Economic Area and Norwegian financing mechanisms in Estonia and Lithuania
- **Funding by local communities** is significant in Sweden but levels and approaches vary between communities.

In some Member States, the relative immaturity of the network and the lack of management plans for many sites is a barrier to attracting funding (e.g. Cyprus, Malta, Portugal, and Spain). The lack of management plans means that funding needs are often insufficiently defined.

The national missions raised a wide range of issues with regard to EU funding for the network. These can broadly be grouped as relating to:

- The level of funding available
- The applicability of EU funding to the needs of the network
- Barriers in accessing funding.

The following issues were highlighted with regard to the level of EU funding:

- Very limited EU funding is available in some Member States (e.g. only LIFE+ is significant in Luxembourg)
- Limited levels of funding can mean that funding needs to be prioritised, not all sites can be funded, and land-owners may be undercompensated (e.g. Lithuania, Romania)
- LIFE+ is a good funding source but limited in scale (e.g. Austria, Belgium, Greece, Portugal)
- Availability of resources from Structural Fund programmes is much more limited in the current programming period than previously (e.g. Germany, Italy)
- Incentives to conserve sites from agri-environment and other schemes are often insufficient to prevent changes in land use and development
- The degree to which EU funding is used for Natura 2000 may vary by region as well as Member States, especially in the case of the Structural Funds.

Issues relating to the applicability of funding to the needs of the network include:

- Funding sources may not be suited to the type of expenditures required. Each fund has its own logic and eligibility criteria which may present barriers to access. e.g. Structural Funds are more suited to capital rather than recurrent costs and to hard infrastructure rather than “soft” investments such as management plans and monitoring; LIFE focuses on one-off projects rather than recurrent costs; more flexibility to suit site-specific requirements is needed (e.g. Czech Republic, Estonia, Germany, Hungary, Ireland)
- There are gaps in the ability to finance particular habitats (e.g. habitats other than agriculture and forestry in Estonia; forestry in Slovenia)
- A lack of a co-ordinated approach to funding is evident in some Member States (e.g. Slovak Republic, Sweden)
- Particular rules have inhibited funding in some cases. For example, changes in EU definitions of grazing areas (i.e. a decrease in the number of trees allowed in the area) led to the exclusion of some grassland areas from agri-environment funding in Sweden, and even to the felling of trees in some extreme cases.
- A lack of certainty of funding, and of dedicated Natura 2000 funding from the EU budget, was noted as an issue in Sweden.

Barriers to accessing EU funding include:

- A lack of capacity to access EU funds (e.g. Bulgaria, Cyprus, Hungary, Malta, Romania, Slovenia)
- Administrative burdens reduce the attractiveness of EU funding (e.g. Cyprus, Germany, Malta, Romania, UK)

- Funding can be hard to access because of the variety of potential sources and the difficulty of determining the relevance of each. More guidance might help (e.g. Malta, UK)
- Use of the Structural Funds can be problematic because of the difficulty in demonstrating economic benefits of Natura 2000 investments (e.g. Portugal, UK).
- Co-financing for Structural Funds and especially LIFE + can be a barrier to uptake (e.g. Czech Republic, Estonia, Latvia)
- Political influence on national funding makes it difficult for some organisations to access it (e.g. Slovak Republic).

2.2 Methodology to update information on costs

This section looks in more detail at some of the issues/difficulties faced by Member States in completing the cost questionnaire and offers insights on how these can be addressed in the future. Some of these insights relate to solutions found by Member States in responding to the questionnaire, and others stem directly from the study team.

The assessment of the costs of Natura 2000 has often not been an easy task for Member States. For some, especially the new Member States, it was a completely new exercise. The older Member States had already some experience from the earlier cost questionnaires, but nevertheless for many of them data gathering and aggregation remained a challenge. The usefulness of the questionnaire was stressed by many countries, who believed the exercise allowed them to learn more about cost assessments, improve their awareness on Natura 2000 and increase their skills at calculating costs.

However, almost all Member States encountered some difficulties in addressing one or more aspects of the cost assessment. Insights on the approach taken and the key problems which emerged from a range of interviews with Member State representatives and stakeholders are summarised below.

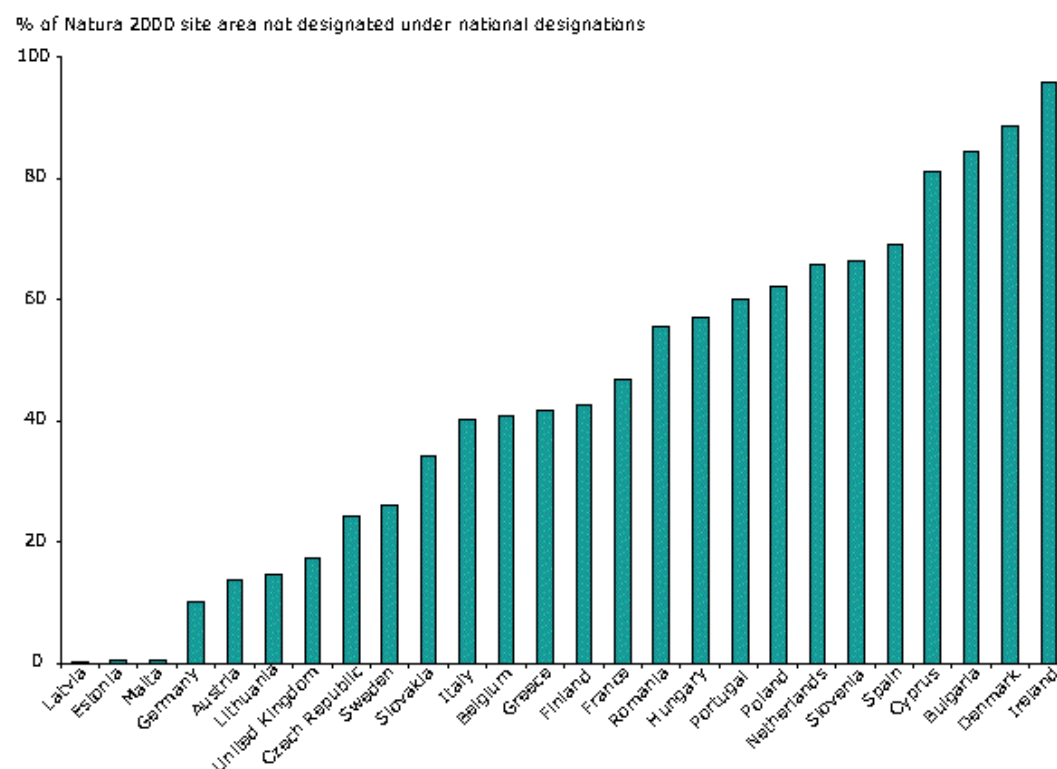
When comments were explicitly made by one or several Member State respondents, the Member States in question have been noted in parentheses in the text. However this does not imply that only these Member States have experienced that particular problem/practice, but only that the issue was explicitly mentioned during a particular mission.

2.2.1 The difficulty to pin down costs specific to Natura 2000

Several Member States observed that it was difficult to make a distinction between costs strictly related to Natura 2000 sites and costs referred to protected areas more broadly (e.g., as was pointed out by Sweden, Estonia, Germany, France, Hungary, Italy, Lithuania, Luxembourg). Some of the data sources and studies used for the assessment often referred to protected areas in general, and costs specific to Natura sites were often difficult to extract. Also national accounts may not make the distinction between Natura 2000 and other protected areas explicit. To put this in context, the

area coverage of Natura 2000 sites is about 107.4 million hectares²² whereas the total protected area across different forms of designation in 39 EEA countries covers around 100 million ha²³. Figure 6 provides an overview of the percentage of Natura 2000 site area not protected under national instruments in the EU Member States.

Figure 6: Percentage of Natura 2000 site area not protected under national instruments per EU Member State



Source: European Topic Centre on Biological Diversity (ETC/BD), 2009, <http://www.eea.europa.eu/data-and-maps/figures/percentage-of-natura-2000-site-area-not-protected-under-national-instruments-per-eu-member-state>

Also within Natura 2000 areas, overlaps and double counting of costs are possible, in particular due to the potential overlap between Sites of Community Importance (SCIs)/Special Areas of Conservation (SACs) under the Habitats Directive and Special Protection Areas (SPAs) under the Birds Directive. In most countries this has not been a problem, as calculations were made by area/habitats rather than by site type and were also top-down rather than bottom up exercises. The use of Geographical Information System (GIS) data further helped to identify any potential overlaps which might affect cost estimates (e.g., Czech Republic).

Costs related to cross-border sites (i.e., areas across countries or regions) were also considered difficult to assess, as it was not always clear what share of costs should be attributed to the area within national or regional borders (e.g. Austria, Scotland and England).

²² EEA Natura 2000 data - the European Network of Protected Sites <http://www.eea.europa.eu/data-and-maps/data/natura-2000-natura-2000-public-microsoft-access-database-10-tables/microsoft-access-format-zip> (last accessed July 2010)

²³ EEA - Nationally Designated Areas – this covers 24 EU MS and do not include Luxembourg, the Netherlands and Hungary. <http://www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-4> (last accessed July 2010)

The perceived added costs of Natura 2000

Many countries have not yet assessed the change in costs to manage the network compared to the costs of site management incurred prior to Natura 2000 designation, either because they felt it was too early in the implementation phase, or simply because there was no evidence available. Estonia for instance noted it was not possible to measure the difference in costs now and prior to designation, due to significant changes in the nature conservation system administration.

Some countries (e.g., Germany, Sweden) observed that the costs of managing Natura 2000 have not necessarily been higher compared to the costs of site management incurred prior to the establishment of the network. In some cases Natura 2000 has simply required a change of name (e.g., from nationally protected areas to Natura 2000 sites), but not a real change in management and protection level. Occasionally, however, the change may have led to higher administrative costs. Sweden noted that the establishment of the network has required additional costs in particular for monitoring and reporting activities.

Finland pointed out that issues of comparability may arise if countries report only on the incremental costs related to Natura 2000, rather than including the total costs of managing the site. This does not seem to have been the case in the completed country questionnaires – which largely refer to total costs. The exception is the UK which has estimated the net costs of the network relative to existing national designations. It may be worthwhile clarifying this point in future questionnaires, to avoid possible confusion in future cost assessments.

The issue of differentiating costs between Natura 2000 sites and general protected areas cannot easily be tackled with a particular methodological approach that adopts a top-down perspective. However, a **bottom-up analysis** would allow getting greater specificity on the costs of Natura 2000 and indeed offer a range of additional insights (e.g., from costs of current management to costs needed to meet conservation objectives) and complement information gathered in a top-down exercise (e.g., administrative staff working on Natura 2000).

Box 2: Complementing top-down cost assessment with a bottom-up process

The cost collection exercise carried out by Member States was generally a top-down exercise, where costs of various budget lines (actual and or planned) or organisations relating to Natura 2000 were added together. This runs the risk that the resulting cost estimates are anchored to the existing/planned expenditure and may not fully take into account the cost of completing the network and meeting conservation objectives.

A bottom-up analysis could be a complementary approach for Member States, which would allow significant additional insights and retain ownership of the results. Such an analysis could involve:

- A short questionnaire to a larger but representative sample of sites, covering different characteristics such as conservation status, bio-geographical regions, different sectors (e.g., agriculture, forestry, marine), different sizes, different proximities to infrastructure and urban centres and different conservation schemes (e.g., nationally protected areas). This would generate statistically significant samples. An online questionnaire could help to avoid administrative costs.
- By covering different characteristics such as site size and proximity to urban development, the relationship between costs and different explanatory variables ('drivers') could be more comprehensively analysed (see Section 2.1.4). By linking the costs of a site to the conservation status, separate cost functions could be created for different levels of ecological quality.

- When extrapolating the identified unit costs to a full list of sites the identified relationships above could be used to factorise values depending on which characteristics the different sites meet.
- The questionnaire could be shorter than the existing cost questionnaire to the Member States, but ideally would be comparable to allow the top-down and bottom-up exercises to be compared and contrasted.
- It could also be useful to explore with some site managers whether they would be willing and interested to have more in-depth discussions on costs, which could result in a detailed analysis on how costs evolve over time and to meet conservation objectives, and on what factors drive costs. The issue of costs and their links to benefits, or indeed to financing, could also be usefully explored with interested site managers. This could offer some depth of insight on cases studies to complement the wider survey.
- The key challenge will be having a statistically significant sample to form a basis for scaling up / extrapolation to a national total.

Note: The bottom-up exercise can be done centrally at EU level (e.g., by contractors), or by the countries themselves if they wish to retain ‘ownership’ of the exercise. The former would allow applying a standardised approach; the latter would help build the capacity/understanding at national level.

The bottom-up approach as presented in Box 2 could help in identifying and quantifying the different costs of sites before and after the implementation of the Natura 2000 network, also taking into account additional characteristics such as the achievement of favourable conservation status. Site level data could for instance complement total/aggregate figures collected by the Member States.

A complement to a short questionnaire would be to thoroughly investigate a range of case studies that represent a time line of expenditure and to track the costs and identify links to other conservation initiatives and other biodiversity and ecosystem service indicators. This could help give a practical **benchmark for incremental/marginal costs**.

Even in the absence of a bottom-up costing exercise, an increased experience with Natura 2000 assessment will most likely help Member States gather a better understanding of the share of costs that should be attributed to Natura 2000 within their borders, and the way to calculate it. For the issue of cross-border costs, a top-down approach of looking at government and other budgets / expenditure will avoid the problem. To address this in a bottom-up approach will require some careful wording in the site-specific cost questionnaires that would be needed.

A more regular and potentially mandatory costs analysis may incentivise Member States to align their national accounts and studies to the Natura 2000 approach.

2.2.2 The assessment of specific cost typologies

A primary difficulty encountered by Member States in the completion of the questionnaire was the correct identification of **one-off** and **recurrent costs**. For instance, as some cost categories refer to the same area of action (e.g., habitat management); it has not always been easy for the respondents to break down the costs according to one-off and recurrent activities (e.g., Sweden). Certain measures, such as conservation management, may include both one-off and recurrent costs which may be impossible to disentangle (e.g., Czech Republic).

Furthermore, specific issues emerged when assessing specific cost categories within one-off and recurrent costs. These are discussed in more detail below.

One-off costs

Probably the most difficult issue related to one-off costs was to turn them into **annual values**. Some Member States spread the costs over a 10-year period (e.g., Lithuania) while others noted that some activities took place on a much shorter time horizon, down to one year or less (e.g. Italy). Other countries were not able to estimate the time horizon to reach favourable conservation status (e.g. Bulgaria). In some cases the time period used was not always clear (e.g. some regions in Italy), or if figures were provided on annual or total basis. This may have hampered the comparability of data.

As part of the one-off cost estimates, the approach used for **land purchase** costs have been very diverse. Most countries referred to actual figures of land purchased or planned to be purchased, while others (e.g., Ireland) estimated an ideal percentage of land purchase that would be required to adequately manage the network. In some cases the cost was roughly estimated on the basis of current land value in the location where land could potentially be purchased (e.g., Cyprus). In general, many countries (e.g., Germany, Luxembourg, Poland) noted that providing an overall picture of land purchase costs can be difficult as the prices tend to vary according to value and level of management of land and between regions, and also depend on local factors such as soil fertility, stock of trees etc., and the level of competition between different uses.

In other countries (e.g., Bulgaria) finding information on **infrastructure costs** was difficult, as these costs were typically incurred at local level and were very fragmented. Also, it was noted that some infrastructure investments often had several aims besides implementing Natura 2000, hence assessing the share directly related to the network was difficult.

Further guidance on how to annualise costs should be provided, e.g., a simple formula could be included in the questionnaire to make sure the total costs are divided by the number of years over which one-off measures were spread. The number of years could be decided by Member States when they are aware of the actual length of the measures, and should be clearly stated in the questionnaire. However, if the aim of the exercise is to compare costs incurred with the benefits associated with the network, it will be important to agree on a standard period to be taken into account for the analysis. A **period of 6 years** (instead of 10) could be suggested as default value for general one-off costs, as this would correspond to the likely time frame of one-off investments needed for establishing the network and represents a roughly average of timeframes chosen across Member States.

On the other hand, to allow a fair comparison between two different conservation strategies – e.g., land purchase and management contracts, an alternative could be to use the lifetime of a site as reference. In practice this would mean adopting a much **longer time period** and also require a choice of discount rate to help annualise one-off costs (e.g., time period of 20 or 30 years and 4% real discount rate). The 6-year approach would give better insights on needed investment over a time period. The lifetime approach would help ensure that different conservation strategies are compared more evenly. Which approach is better suited depends on the objectives of the cost exercise. It would also be possible to use two different approaches and have a range of costs.

Recurrent costs

Some countries found it difficult to identify the management activities necessary for all sites. New Member States especially did not yet know the conservation objectives of many sites and/or hadn't yet identified the necessary management activities (e.g., Estonia, Hungary).

In some cases it was difficult to determine **highly typical management activities** due to strong variation in the measures applied depending on the conservation objectives of the sites (e.g., Czech Republic). Some countries chose to average them (e.g., Lithuania).

Other countries (e.g., Malta, Lithuania) observed that prices/costs may **change over time**. Lithuania raised the issue of how to consider management activities price changes when estimating recurring costs - as the price of some activities such as mowing meadows or cutting shrubs are likely to change every year.

As for specific cost categories, in some cases it was unclear whether 'running costs of management bodies' included staff cost. In some cases double counting may have occurred.

The share of conservation measures for **species** attributable to Natura 2000 was sometimes difficult to identify, as species are typically spread across different areas and habitats, not only in Natura 2000 sites (e.g., Sweden).

As for **opportunity costs**, the questionnaire mainly asked for information on compensation payments paid to land owners for lost economic opportunities, and to a large extent fails to capture other opportunity costs that remain uncompensated. Some noted that very low compensation payments often do not reflect the real cost of foregone activities. In other countries, in contrast, the payments were said to overcompensate farmers (e.g., Luxembourg), hence such payments can only be seen as a proxy for the real opportunity costs. However, 'land purchase' costs could also be used as a proxy for opportunity costs. Such payments are often determined by taking into account the income forgone by land owners for selling their land, as this would imply stopping any economic activity they could carry out in their property.

Though the cost questionnaire in its analysis on opportunity costs was mainly limited to compensation payments, Member States provided some useful insights on the issue during the interview process. Opportunity costs were considered relatively high in countries like Bulgaria, where agriculture is still relatively extensive but increasingly facing the dilemma of either becoming more intensive and competitive, or remaining extensive in order to preserve biodiversity. Coastal meadows and scenic areas can also have higher opportunity costs as a result of industrial and housing development potential, and could represent a significant pressure on Natura 2000 sites (e.g., Estonia, Greece)

Spain, which submitted an independent study on the costs of the Natura 2000 network, is the only country that provided a specific assessment of opportunity costs more widely. A top down approach was applied, following two approaches: a questionnaire sent to stakeholders, and a technical method based on Geographical Infor-

mation System (GIS). These two approaches led to different results, with the opportunity costs values being higher in the questionnaire approach. It was however noted that these calculations were only ‘theoretical approximations’.

Where costs of recurrent activities vary widely from one year to another, average **values over time** should be used.

Staff costs should be integrated into the questionnaire, e.g., under ‘running cost of management bodies’ or as a separate category, in order to avoid the risk of double counting.

The issue of **opportunity costs** should be explored in more detail. It is important to clarify what type of compensation payments (one-off and recurrent) can be considered as opportunity costs. In many cases land purchase costs can also be considered a (capitalised) measure of opportunity costs. It would be worthwhile asking Member States to clarify what the calculations for compensation and land purchase are based upon, and/or to clarify if they represent a good approximation, an overestimation or an underestimation of opportunity costs.

2.2.3 Categorisation - land use versus habitat types

The questionnaire required respondents to provide information, where possible, broken down by land use type, namely:

- Agricultural
- Forests
- Other Terrestrial
- Inland Waters
- Wetlands
- Coastal
- Marine

This approach was considered more closely related to funding availability and income opportunities (e.g. payments to agricultural Natura 2000 sites under the Common Agriculture Policy), to facilitate the integration of costs for species conservation and also to enable easier comparison between costs and benefits. In addition, the objective was also to facilitate “cost transfer” and “gap filling”, as it was expected that not all countries would reply to the questionnaire. Having specific ranges and average values of costs for agricultural sites, and forestry sites was thought to help nuance the cost transfer to other countries, by weighting according to agriculture or forestry shares in the different countries.

Several countries, however, noted that it was not always easy to understand how to allocate costs according to land use types (e.g., Lithuania, Ireland, Germany, Czech Republic and others), and stressed that this categorisation did not reflect habitat types as listed in the Habitat Directive, with which they were more familiar.

For instance, Ireland noted that for coastal areas it was particularly difficult to distinguish between those that were supposed to be considered agricultural land or strictly coastal – as a significant portion of these areas are grazed.

Most countries are used to the Habitat Directive habitat categorisation and are less familiar with the land use approach. A link between the two should be made – guidance is needed on **which habitats and species should be covered under each land use**.

2.2.4 Assumptions and challenges to assess future costs

The cost questionnaire aimed to obtain an estimate of the financial resources that will be required to complete and effectively manage Natura 2000 on land and at sea, this means the expected costs of protecting, managing and monitoring the network. Estimates were meant to relate to what was still required rather than what was currently spent.

Only a few countries provided information on future costs (see Section 2.1.9) and even fewer clarified the approach taken to assess future costs. Ireland for instance noted that future costs, such as those related to farm plans, were averaged over the period 2007-2011 to give an overview of expected annual costs. Spain is the only country that identified both “real” and “desirable” costs (current and future) to achieve favourable conservation status (FCS).

Most countries instead highlighted the difficulties they encountered in assessing future costs.

First of all, the meaning of future costs has been interpreted differently. By some it was considered as the cost of completing the network, and by others as the cost of reaching FCS (e.g., Ireland). There have therefore been some differences as to how future costs have been assessed by different countries. In Greece for instance it was noted that in some cases costs were low because management actions have not been taken or planned, but this does not imply that such actions are not needed to ensure efficient management. In this case the costs needed to improve the network were not taken into account.

Many Member States (e.g., Austria, Lithuania, Sweden) stressed the difficulty to define ‘favourable conservation status’ and ensure there was a common understanding across the EU. Some countries (e.g., Bulgaria, Czech Republic) have not yet clarified what favourable conservation status implies for many of their Natura 2000 sites and which related management measures need to be implemented to reach the target. Particularly in some new Member States some sites are not yet proposed or fully designated (e.g., Slovak Republic), therefore no evaluation in this sense was considered possible. Germany adopted a traffic-light scheme to present the conservation status of habitats in each bio-geographical region, on the basis of the EU guidance document on reporting and monitoring. Some countries generally thought it rather difficult to determine when FCS would be reached (e.g., Finland).

Differences in interpreting the conservation status are likely to affect the comparability of the cost exercises.

More generally, several countries noted the difficulty of combining a realistic assessment of what will be possible with what would be really needed. It was noted that issues related to potential future requirements of the network and the establishment of

possible new sites can be a sensitive issue, both politically and for the broader public (e.g., Finland).

In practice Member States applied rather different approaches, and in some cases it is not always clear if the information provided is based on current and future data, and how future data have been estimated. Some countries clarified that an assessment of the needs has not been undertaken so far (e.g., Latvia). Some provided no indication as they considered it ‘impossible’ to foresee future costs (e.g., Poland).

In some cases past figures have been used to estimate future costs. Hungary requested clarification of how far back in time one should go, more specifically how far back costs from national protected areas should be included. Other Member States used a ‘mark-up’ on top of the current spending, such as Sweden, which increased the funds allocated under the current budget by 25%.

As for general expectations regarding the main future costs, Member States expressed different views, according to the status of their sites and their planned measures. Ireland for instance expected that the biggest expenditure for completing the network will be represented by scientific research required for designation of marine sites, reflecting the more difficult and expensive task of carrying out research at sea. In Poland it was expected that most of the future costs would consist of costs for management plans, as none have been created yet. Estonia believes that completing inventories and ongoing monitoring will play a significant role. Italy expects major costs to come from the implementation of marine sites and the maintenance of the conservation status of sites. In general, several Member States admitted to having little experience and information on the costs of marine sites and that the future costs of marine protected areas remain uncertain.

It will be crucial to more clearly specify from the outset the aim of the questionnaire and the approach to be taken to estimate future cost. This will be particularly important to improve comparability across Member States.

Ideally, Member States should be requested to distinguish between **current/real cost** and **expected/ideal costs** to complete the network. The approach to estimate desirable cost should be clearly spelled out, addressing questions such as: Is it calculated as a mark-up on top of existing costs – if so of what percentage? Is it calculated as a number of actions on top of the existing ones – if so which? Or is it based on an estimated cost per site or per hectare, taking account of the extra costs needed to achieve the desired objectives?

Several Member States required further guidance from the European Commission on the definition of FCS.

In addition, as noted above, the use of a **bottom-up questionnaire** and range of case studies looking at costs evolution over time as the site moves up to **favourable conservation status** would be valuable. This will help clarify whether the cost mark-up used by some countries is reasonable or whether it is a first estimate that needs revision. In addition, it will help explore to what extent cost mark-ups are country-specific and what drives them. The mark-up can be very different across countries, given different site characteristics and conservation objectives, maturity of the protected area policy, historic developments, pressures on the sites, and the nature of the

land use on the sites. It would be interesting to see the variation across sites of such a “mark-up”, and to understand the factors behind it (see also Box 2 on bottom up questionnaire).

2.2.5 Insights on costs grossing up and scaling up

Unlike small Member States (e.g., Luxembourg), where detailed data could be obtained at site level, in larger countries cost estimates were usually based on a bottom-up approach where the cost assessment required a grossing up exercise. This usually implies using representative data from sample sites to apply at a larger scale. In other cases this has resulted in the collation of data provided by different regions. The robustness of the overall data gathered depends to a large extent on the reliability of information provided at the smaller scale, particularly regarding the consistency of methodological approaches taken across regions or federal states (e.g., German, Italy).

Some countries/regions chose to focus on representative sites and related costs were calculated in detail (e.g., Scotland and England selected 10 SPAs and 10 SCIs/SACs of different habitats). These were then scaled up according to the proportion of the total network they covered. The total costs were split between land types according to their proportion of the total areas. These figures were also checked and supplemented with known figures, for example with data on agri-environment schemes. Where it was known that certain management measures were not required for particular habitat types (e.g., no fire control is required for inland water) these costs were split between the remaining land use types. Where there was overlap between SCIs/SACs and SPAs and between sites across regional borders, the figures were broken down as best as possible by site managers and experts to determine costs associated to each.

In Bulgaria conservation measures for forest in SPAs have also been calculated on the basis of a ‘standard’ value for nature parks conservation activities developed in the context of a Global Environmental Facility/World Bank project. As this standard value was estimated in 2002, an increase of 20 per cent was applied to reflect inflation.

Others, like the Czech Republic, did not base their cost estimates on case examples, but used GIS data to determine the extent of areas and types of habitats, linking these to cost estimates provided by regional authorities. Extrapolation was only done when estimating costs for future sites. In this case two approaches were followed: if the sites had been clearly identified and GIS data were available, the area of the site was used for calculations; for other sites, only the number of sites was considered.

Germany based its calculation on average expenses for main activities by habitat type across federal states to calculate a rough average estimate. Some countries, like Malta, based their estimates on data from areas where costs were known, and transferred these data to other sites.

In Ireland estimates were made per habitat type and per hectare, and then multiplied by the number of hectares for each habitat. Errors may have been induced by the fact that the land use type approach in the questionnaire did not correspond to the Habitats Directive habitat types. Furthermore, disentangling the overlap between sites was also considered a potential substantial source of error.

Sweden used data that were already aggregated for an internal report estimating the Natura 2000 costs related to financial resources available. In order to assess the costs required to reach FCS, Sweden assumed that current costs should increase by 25%.

The UK warned that the size of a site is hugely significant in predicting the overall cost of a site (see also Section 2.1.4). Therefore scaling up costs from a site of a particular habitat to all similar habitats may be highly speculative if the sites differ greatly in size.

As noted above, the scaling up issue can be addressed if a wider survey is carried out to establish a cost function for Natura 2000 sites, taking different characteristics into account (e.g., size of the sites).

It should be noted that one can expect **cost functions** to differ for terrestrial and marine protected areas (e.g., marine costs less influenced by area and more by actions), and probably also for different land uses and for different regions (though the explanatory variables may turn out to capture much of regional variation). Cost functions can then be applied to a wider number of sites to allow grossing up that avoids the approximations inherent to the use of average per hectare values.

While the provision of more standardised EU wide data and the development of a standard cost function would undoubtedly be informative, the merits of this also need to be weighted against those of regional and national approaches to cost estimation, which take account of specific conditions and needs.

Importantly the approach of a bottom up questionnaire can be done at a Community or Member State level, or even at regional level. As mentioned before the former approach would be more “standardised” and “transparent” but could also run against the engagement of Member States and fail to consider country characteristics.

2.2.6 Key drivers of costs and implications for future updates

Besides differences in how the cost questionnaire was interpreted, Section 2.1.4 also highlighted other characteristics that may influence the overall cost estimates such as size or conservation strategies. In the following section aspects are described which Member States highlighted as having an important effect on the overall estimates.

Agriculture intensification and development work was considered a significant driver of costs (especially restoration costs) in new Member States (e.g., Bulgaria). As biodiversity in some of these countries is still relatively rich, and agriculture still extensive, compensation payments will be needed to maintain the current status by covering the rising opportunity costs. This can avoid an increase in future restoration costs, which are likely to be incurred in case of agriculture intensification.

Ireland noted that a future challenge for costing sites is the uncertainty around what the situation of the sites will be, as many farmers are leaving the countryside and under-grazing is becoming an issue. This may imply that additional costs for grazing may be incurred by site managers in the future.

The effect of changes in prices (e.g., of crops, fuel, machinery etc.) has typically not been taken into account in the analysis. Nevertheless, possible increases or decreases

of prices can also influence future cost estimates. Countries like Lithuania noted that large differences in prices and in purchasing capacity in recent years give reason for uncertainties in estimating future costs.

The Slovak Republic noted that, should estimates based on future prices be required for some reason, it would be important to know which inflation rates should be taken into account.

The size of a given protected area was also considered an important driver of costs. Very large sites, like in Bulgaria, can make estimates difficult as the sites can spread across different municipalities with different conservation goals, management techniques and so on. Very small sites, like in Malta, may need to be aggregated in macro areas for management/funding purposes, hence some costs may cover more than one site.

Size also affects estimates of the number of staff working or expected to be needed on each site. In Cyprus for instance it was estimated that 2 to 3 people will be needed per site. In Malta, where sites are very small, one person can be in charge of more than one site. The number of staff would clearly also depend on the level of active management that should be pursued on each site. This would affect the assumptions made by each country regarding the number of staff needed.

Size is also important with regard to consistency and harmonisation of data within a country. In small countries it is clearly easier to adopt a centralised/harmonised approach for cost assessment (e.g., Luxembourg). In larger countries data typically need to be extrapolated from sample estimates. Data are often collected and aggregated at regional level, using different approaches, which means that harmonisation can be an issue at national level.

The UK also pointed out that costs of sites are often more closely related to the relative size of a site than its habitat type, due to economies of scale. Therefore caution is advisable when attempting to make general statement about per hectare costs.

Depending on how regular the cost assessments will be in the future, **inflation** may or may not need to be taken into account. To keep things simple, it would be easier not to include inflation at all, and base the analysis on current prices. Issues related to market distortions, such as high management costs due to lack of competitiveness (e.g., Slovakia), may also need to be kept in mind.

For every cost assessment round, Member States could clarify what were the main **drivers of costs** – and this could include issues like changes in prices, in land use, in policy and so on. This will help explain possible high variability of costs from one cost assessment to the previous one. The issue of cost drivers could also be included in the proposed bottom-up site questionnaire noted in Box 2.

As for implications regarding the **size of sites**, per hectare costs should be seen as an interesting piece of information, but in perspective: While larger sites are generally more costly, the per hectare costs decreases as the area increases. This should be taken into account when using benefits and cost transfer. If possible, values should be transferred across sites sharing similar characteristics, including size.

As noted above, a cost function could be developed and values factorised, building on

the correlation of costs with different variables. See Section 2.2.5 for the limitations of the approach.

2.2.7 Data collection and gaps

Data availability is a problem in many countries, due to lack of capacity and resources to collect information, lack of centralised data systems, lack of transparency or a combination of these.

Time and resources can constrain data collection, especially in the new Member States (e.g., this was pointed out by Estonia, Hungary, Latvia, and Romania). It was noted that there is a need for building technical capacity, improving monitoring and mapping and the quality of inventories in order to make the cost assessment more accurate (e.g., Bulgaria). In the absence of reliable national data on land use, some countries relied on existing databases – like the CORINE database.

In some countries (e.g., Bulgaria, Malta, Germany) some data, although existent, are not publicly available. More guidance by the European Commission was considered useful to improve data availability.

In addition, when Natura 2000 areas are managed in a decentralised manner, collecting information centrally and ensuring that such information is comparable can be difficult. In several countries (e.g., Austria, Germany, Italy, Greece, Spain, UK and others) sites are managed at regional/federal level and data are collected at local scale. Some of these countries noted that the types of data, the measures and methodologies used were very different and the costs estimates across different regions were very heterogeneous. In some countries the process used by local authorities to collect data was unclear (e.g., Greece).

In Estonia, for example, data on costs are often split between the government, local bodies and contractors, making it difficult to recover the cost figures. It was also noted that data were usually gathered for other purposes; hence they were not always suitable for the aim of this study.

In Greece, data were aggregated for the first time in the framework of this exercise, and no central database exists. Furthermore, the information collected did not cover all costs, but only those claimed from the government. Contributions of time (e.g., volunteers) and money from other sources (e.g., private) were not included.

Further guidance should be provided to ensure consistency of data across different regions within Member States. A **working group** on Natura 2000 at national level could help providing guidance on how to calculate costs and support regions/federal states in the cost assessment.

Making the **cost assessment mandatory** could stimulate Member States to provide sufficient resources for the analysis and data collection and set up **centralised databases** where information on the different types of costs is collected. This could be carried out every 5 years and linked to the Natura 2000 reporting period.

2.2.8 Lessons learned from other cost methodologies

Several studies have attempted to assess Natura 2000 costs either at the local, regional

or national level. They use various methods to measure the costs and impacts related to the network, including expert judgement, value transfers from other areas and studies, segment analysis, and original survey work. This section looks at a small selection of recent studies using slightly different analytical approaches. Although this is not meant to be an exhaustive analysis of all the valuable studies conducted on Natura 2000, this section portrays a useful sample of approaches which have been compared to the present study.

In a recent study by **Birdlife (2009)** the costs of maintaining or restoring the Natura 2000 network were estimated in 7 EU countries²⁴. Costs were grouped according to the categories laid out in the EC's Financing Natura 2000 Guidance Handbook 2007 (WWF and IEEP 2007), which in turn is based on the classification suggested by the Markland Report (2002) and followed by the EU Communication on Financing Natura 2000²⁵. These categories are broadly similar to the ones used in this study, which builds on the same background.

The Birdlife study therefore adopted 4 cost categories:

- Finalisation of sites
- Management planning
- Ongoing habitat management and monitoring
- Investment costs

These are detailed into 25 sub-categories, shown in the table below. It should be noted that the same sub-categories have been used in this study, but some have been grouped to allow simplification.

Table 16: Cost classification in Birdlife (2009)

	No	Types of Activities
Establishment of Natura 2000 sites	1	Administration of site selection process
	2	Scientific studies/inventories for the identification of sites – surveys, inventories, mapping, condition assessment
	3	Preparation of initial information and publicity material
	4	Pilot projects
Management planning	5	Preparation of management plans, strategies and schemes
	6	Establishment of management bodies
	7	Consultation – public meetings, liaison with landowners
	8	Review of management plans, strategies and schemes
	9	Running costs of management bodies (maintenance of buildings and equipment)
	10	Maintenance of facilities for public access to and use of the sites, interpretation works, observatories and kiosks etc.
	11	Staff (conservation/project officers, wardens/rangers, workers)
Ongoing habitat management and monitoring	12	Conservation management measures – maintenance and improvement of habitats favourable conservation status

²⁴ Austria, Bulgaria, the Netherlands, Finland, Slovakia, Spain and the UK

²⁵ COM(2004)431 final. Communication from the Commission to the Council and the European Parliament. Financing Natura 2000. Brussels

	13	Conservation management measures – maintenance and improvement of species' favourable conservation status
	14	Conservation management measures in relation to invasive alien species (IAS)
	15	Implementation of management schemes and agreements with owners and managers of land or water for following certain prescriptions
	16	Provision of services; compensation for rights foregone and loss of income; developing acceptability 'liaison' with neighbours
	17	Monitoring and surveying
	18	Risk management (fire prevention and control, flooding etc)
	19	Surveillance of the sites
	20	Provision of information and publicity material
	21	Training and education
	22	Facilities to encourage visitor use and appreciation of Natura 2000 sites
	23	Land purchase, including compensation for development rights
Investment costs	24	Infrastructure needed for the restoration of habitat or species
	25	Infrastructure for public access, interpretation works, observatories and kiosks, etc

Source: Birdlife (2009) - building on WWF and IEEP (2007) 'Financing Natura 2000 Guidance Handbook'

In order to assess overall annual costs, the Birdlife study estimated average per hectare values (unit cost) and multiplied these by the area of habitats or sites. One-off costs were smoothed out over a limited number of years.

The BirdLife approach was fairly similar to the one used in this report in terms of cost classification. The use of average costs was used more extensively, and clearly ensured a more homogeneous approach across all the study areas. This was possible as the study was conducted centrally for all the countries, using a common framework.

However, different from the cost questionnaire, the BirdLife study had a clear objective to identify financial requirements to restore the Natura 2000 network to favourable conservation status. Thus, the focus was on the needed/desirable costs rather than the actual costs occurring. In the present study no standard methodology was applied and partners adopted different approaches for determining financial needs to achieve FCS. The Austrian case study represents a particularly interesting approach. A common set of conservation measures for all species and habitats was determined. Modelling was then undertaken for 216 species and habitats to predict their occurrence for grids of roughly 232 ha. For each conservation measure one or several 'habitat types for management' were defined (e.g., deadwood to preserve old forest stands) and the related total area calculated. Each species and habitat was then attributed a percentage area of the relevant 'habitat type for management' needed for the implementation of conservation measures. For each grid the area coverage of conservation measures was calculated by multiplying the expected occurrence with the percentage of 'habitat type for management' needed. The results were multiplied with typical costs linked to the conservation measures, allowing the calculation of respective funding needs.

A study by **CJC Consulting (2004)** assessed the costs of the UK national network of Sites of Special Scientific Interest (SSSI). The main cost categories used in this study were:

- *Costs of provision* (designation and maintenance). These included costs associated with managing the SSSI series incurred by English Nature; costs to the Department for Environment, Food and Rural Affairs (Defra) and the Forestry

Commission for grant aid that assists in safeguarding SSSIs; costs to individual owners, including transaction and management costs; and the opportunity cost of restricting use of the site by designation.

- *Restoration costs* attributable to improving the condition of SSSIs. These included additional costs to English Nature and Defra for new management agreements and action designed to deliver restoration; and costs to other public bodies and occupiers undertaking restoration.
- *Enhancement costs*. This means the cost of enhancing the outputs from some SSSIs and facilitating accessibility.

The study chose to assess the costs using an institutional framework, which means assessing the cost incurred by each agent (e.g., Defra, Natural England etc), and separating out the costs of provision, restoration and enhancement when possible. It should be noted that such an institutional approach can be applied in single countries/regions, but likely not at EU level, given the large variety of institutions involved in all the Member States.

A study by **Jacobs (2004)** on the cost and benefits of Natura 2000 in Scotland adopted a slightly different approach, focusing on three main types of economic cost:

- *Direct costs*: covering site management costs and administrative/policy costs; the classification of direct costs was based on the Habitats Directive Article 8 Natura 2000 costing questionnaire conducted across the EU; when possible these have been split into one-off and recurrent costs. An overview is provided in the table below.
- *Opportunity costs*: these have been defined as the maximum alternative return foregone associated with having to adapt or being unable to undertake other economic activities in or near the protected area; they have been assessed at site level through a consultation process, and extrapolated to the national level.
- *Indirect costs*: for example costs related to the impacts of large visitor numbers or result from increasing species populations and their impact on crops; these were considered relatively small and difficult to quantify, therefore were not valued in the study.

Table 17 Costs incurred for designating and managing Natura 2000 sites

Category	Type of Cost
Designation Process	Administration of selection process
	Survey – inventory; mapping; condition assessment
	Consultation / Preparation of information and publicity material
	Land purchase
Management planning and administration (occasional and annual)	Preparation and review of management plans, strategies and schemes
	Establishment and running costs of management bodies
	Provision of staff (wardens, project officers etc), buildings and equipment
	Consultation – public meeting; liaison with landowners
	Rent and administration
‘Ongoing’ management actions and incentives (where not accounted for above)	Conservation management measures (e.g. maintenance of habitat/species status)
	Fire prevention and control
	Research, monitoring and survey
	Visitor management
	Provision of information, interpretation and publicity material
	Training and education
‘Occasional’ capital investments	Restoration or improvement of habitat or status of species
	Compensation for rights foregone (e.g. mineral or fishing rights), loss of land value.
	Habitat surveys
	Infrastructure for public access

Source: Jacobs et al. (2004) - Adapted from Article 8 Natura 2000 site costing questionnaire

The approach adopted aimed to undertake a cost benefit analysis (CBA) and economic impact assessment at national level and on selected Natura 2000 case study areas (7), and comparing current and future costs against current and future benefits. The timeline used was 25 years and 50 years from 2003. To convert future costs (and benefits) into equivalent present day values, a discount rate of 3.5% was applied for the first 30 years and 3% from years 31 to 50.

Data collection was carried out using contingent valuation method (CVM) surveys to obtain Willingness To Pay (WTP) values related to stakeholder preferences and values for conservation of habitats and species in Scotland. This was followed up by a telephone survey to check the validity of the general public responses. Questionnaires were also sent to a large number of stakeholder groups at each site and at a national level to gain information on, inter alia, their management, opportunity and indirect costs.

Compared to the cost questionnaire, Jacobs’ approach has a stronger benefits valuation perspective (through the WTP surveys). Such approach makes the comparison between costs and benefits easier, and allows the identification of the stakeholder groups to which these relate. The categories used for the estimation of direct costs are not dissimilar to those used in the present report. The category ‘opportunity costs’ instead has been analysed in more detail through consultations, and represent an interesting addition.

Another study undertaken by the **Spanish Ministry of the Environment** (Ministerio 2008) used similar cost categories, namely:

- direct costs;
- potential income foregone and opportunity costs; and
- indirect costs.

Opportunity costs were estimated on the basis of documented sources (inventories, official statistics etc.) and through surveys to land owners and local authorities. Indirect costs were not included, but it was suggested that they should be calculated by applying multipliers to the direct costs.

An overview of how the current classification relates to the broader direct/indirect and opportunity cost approach is exemplified in the table below.

Table 18: Comparing the costs categories used in this study with a direct/indirect/opportunity costs approach

Direct costs	Categories covered in this study: One-off management costs: (1) Costs for the finalisation of sites (2) Management planning Investment costs: (5) Infrastructure costs for the restoration of habitat and species; (6) Other infrastructure costs Costs for Management planning (7) Running costs of management bodies; (8) Review of management plans; and (9) Public communication. Habitat management and monitoring costs – these included: (10) Conservation management measures; (11) Conservation management measures; (12) Implementation of management schemes and agreements with owners and managers of land or water for following certain prescriptions; (14) Monitoring; (15) Maintenance of infrastructures for public access, interpretation works, observatories and kiosks etc; (16) Risk management; (17) Surveillance of the sites.
Opportunity costs	Can include the following categories used in this study (depending on the definitions used): (3) Cost of land purchase; (4) One-off payments of compensation for development rights; (13) Provision of services; compensation for rights foregone and loss of income; developing acceptability ‘liaison’ with neighbours; Other opportunity costs not covered in this study (e.g. costs not related to compensation payments) – can be obtained through surveys, value transfer etc
Indirect costs	Not covered in this study. Can include costs related to the impacts of large visitor numbers, impacts on crops as a result of increasing species populations, etc. May be obtained by applying multipliers to direct costs.

The small sample of studies presented above reveals that the cost categories used in this study are in line with past Commission studies on Natura 2000. These categories, however, appear to be limited mainly to direct costs.

With the exception of Spain, opportunity costs have been less explored – and only incorporated when compensated, for example by including cost sub-categories related to compensation for income foregone. No analysis has been undertaken to determine

to what extent opportunity costs are covered within management agreements or land purchase.

Indirect costs have not been taken into account in the cost questionnaire used for this study, and are in general difficult to assess, but some may be estimated with the use of multipliers or through bottom-up data gathering.

The current assessment strongly focuses on the **financial costs** – largely public sector – involved in implementing the network and the financial resource implications. These appear to comprise a large proportion of the overall economic costs. However, a full economic cost-benefit analysis might require other costs to be analysed such as uncompensated opportunity costs or indirect costs, for example, by using multipliers or survey approaches.

2.2.9 Summary of lessons learned and recommendations by Member States on improving cost data collection

The following section summarises lessons learned and recommendations repeatedly raised by Member States for future updates on cost estimates linked to Natura 2000.

Consultations and collaborations among agencies and stakeholders – Some Member States collected cost information by consulting different stakeholders and circulating a standardised questionnaire at a regional level. Meetings amongst experts responsible for filling in the cost questionnaires could prove very helpful to discuss major challenges related to providing cost estimates (e.g., definition of favourable conservation status, cross-border overlaps), across Member States as well as nationally.

Experience sharing and coordination - Sharing experience and methods with other Member States was considered helpful to clarify how to assess certain costs (e.g. one-off compensation payments) and address certain challenges (e.g., identifying marginal costs). In addition, greater central coordination at Member States and EU level was considered useful, and the further development of a common EU methodology would be welcomed.

Data collection and databases - The need to develop a cost database was often emphasised. The development of a database could be linked to the Natura 2000 reporting requirements and associated platforms. This would also allow more regular data collection, and represents an opportunity to include costs in a standardised form across the EU. In order to improve costs estimates it was recommended to stimulate a web exchange of information.

Site level data - Interest was expressed in getting recommendations on how to develop a cost questionnaire that would allow collecting information on the site-level. A questionnaire for site level cost assessment would be valuable for all countries. Ideally this would be done by Member States themselves to maintain ownership of the results.

Mandatory cost assessments - It was noted that it was difficult for Member States to obtain data from different authorities as the questionnaire was not a mandatory exer-

cise. It was suggested that cost estimates should be made part of mandatory reporting activities under Natura 2000 and should be linked to respective reporting periods, conducted at least once every 5 years. Reporting could also be part of the assessment on whether future sub-targets under the new EU Biodiversity Strategy are to be achieved (e.g., on whether sufficient funding for the Natura 2000 network is ensured).

Questionnaire guidance - Further guidance on the questionnaire would be welcomed and instructions could also be translated into different languages. In some cases a distinction between old and new Member States could be helpful as they are at different stages in the implementation of the network, and are hence facing different costs. On the positive side, the cost exercise was perceived as useful and a lot has been learned on how reporting can be conducted.

Land use types versus habitat types - Further guidance on land use classification was thought necessary. In the current questionnaire there is considerable risk of overlap and wide scope for interpretation. Member States are used to applying the habitat classification connected to the Habitats Directive and encountered difficulties in realigning this to reflect land use types (e.g., alluvial forests and wetlands, agricultural activities on coast lines).

Favourable Conservation Status - Clear guidance on how best to define FCS in light of an assessment of costs incurred to reach the target was considered particularly important. This may also prevent Member States from overestimating their costs.

Cost categories - The type of costs to be included should be further clarified. Suggested important categories were: costs for personnel, studies, conservation actions, information, costs of footpaths, signs and tourist information. The costs related to Article 6(3) of the Habitats Directive for appropriate assessment and permitting can be significant and should be included in the cost assessment.

Political will - Among the obstacles for estimating Natura 2000 related costs, the lack of political will and low placing of Natura 2000 in the political agenda, financial resource scarcity and the lack of real implementation of Natura 2000 were considered important factors.

Subsidy removal - Environmentally Harmful Subsidies should be removed as they distort information on costs and benefits; this would allow better comparability between costs and benefits.

Clear guidelines, a broad agreement on a common approach and standardised data and experience sharing across Member States would be important if further **harmonisation** in the cost assessment approach were to be achieved. A stronger input from the EU Commission could also be useful to strengthen the collaboration among different ministries and bodies dealing with financing Natura 2000 in the Member States.

In order to achieve greater harmonisation in the cost assessments it was also noted that an agreement on a common understanding of the concept of FCS would be needed. In addition, the need to centrally collect information on the costs of the network was emphasised. This could be linked to Natura 2000 reporting requirements and databases could build on related platforms when gathering information at Community level.

Although a **generalised cost model** for the EU may be hard to achieve or potentially less statistically significant (depending on the eventual results), consistent national approaches (including national cost models such as econometric analysis of relationships of costs to a range of site characteristics), which perhaps are informed by generalised cost data/models as tools, as well as clear common guidelines, would be beneficial.

3 SOCIO-ECONOMIC BENEFITS ASSOCIATED WITH NATURA 2000

In addition to their crucial role in maintaining Europe's biodiversity, Natura 2000 sites can also provide a range of benefits to society and the economy. These benefits are often referred to as **ecosystem services** and include a number of tangible resources (e.g. water, sustainably produced crops and timber) and beneficial processes provided and/or maintained by well-functioning ecosystems (MA, 2005).

The variety of ecosystem services provided by the Natura 2000 network (both directly and indirectly) is extensive. 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 (forested mountain areas). The sites also support populations of many other species besides those for which they were designated as a protected area, many of which may be of socio-economic value, e.g. pollinating insects, game animals and fish. 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 furthermore recognised as an important part of local cultural heritage and identity.

In addition to the direct benefits associated with different ecosystem services, the broader socio-economic significance of Natura 2000 sites can also be demonstrated by assessing the benefits arising from the overall 'existence' of the site (i.e. looking at benefits that cannot be easily attributed to one specific ecosystem service as such) (Kettunen et al., 2009a). These benefits include, for example, direct and indirect employment and expenditure supported by Natura 2000.

In general, however, the socio-economic benefits of Natura 2000 remain rather poorly understood and appreciated, and the network is still often perceived as mainly imposing costs or restrictions on communities and economies across the EU Member States. Consequently, it is generally considered that better understanding and increased communication of the Natura 2000 related socio-economic benefits will help to create wider support for the network, including ensuring appropriate resources for its management and seeing in perspective the costs outlined in Chapter 2.

The toolkit for assessing socio-economic benefits of individual Natura 2000 sites by Kettunen et al. (2009a) was the first step towards a more regular assessment of Natura 2000 related benefits in the EU. By providing methodological guidance to site practitioners it aimed at helping to increase the availability of primary studies on Natura 2000 benefits valuation. In addition, it is anticipated that documenting and assessing the benefits of the **whole network** would further help to highlight the benefits of Natura 2000 at the wider EU level. For this purpose there is a need to assess the existing knowledge base on the Natura 2000 benefits across the EU and based on this assess the possibilities for developing an assessment of the Natura 2000 benefits at the European level.

In light of the above, the purpose of this Chapter is two-fold:

- Provide an overview of the existing information and level of awareness on the benefits of Natura 2000 in the EU
- Pave the way for a common methodology for assessing the benefits associated with Natura 2000 at the European level, e.g. provide suggestions for possible components of such a methodology.

3.1 Synthesising existing information on Natura 2000 benefits

3.1.1 Overall assessment

Even though our knowledge on the value of biodiversity, ecosystems and their services is steadily increasing, there is still an apparent lack of **quantitative / monetary and well-documented** information on the socio-economic benefits associated with protected areas in Europe, including Natura 2000 (Table 19 below). This applies to both examples demonstrating the value of (one or more) ecosystem services at the level of individual sites and to broader assessments aiming to estimate the overall benefits linked with Natura 2000 at regional or national level.

According to the review carried out in the context of this study, existing information on the socio-economic significance of Natura 2000 is mainly related to benefits arising from direct and indirect employment supported by Natura 2000 sites. In addition, data is available on the socio-economic impacts of cultural ecosystem services, in particular tourism and recreation. However, there is a clear shortage of well-documented examples demonstrating and, in particular, quantifying the value of other ecosystem services relevant in the context of Natura 2000, such as sustainable production of certified products from Natura 2000 sites and the role of Natura 2000 areas in purifying water and maintaining healthy populations of species (such a pollinators and natural enemies of pests).

In addition, the available information (e.g. information on employment and tourism linked with Natura 2000) is based on a rather sporadic collection of local case studies and examples, making it difficult to form a coherent picture of the benefits associated with Natura 2000 on a broader scale. Only a handful of studies exist that try to assess the gross / net benefits of Natura 2000 at regional or national level (see 3.1.2 below). However, these studies also often focus on a limited number of socio-economic impacts (e.g. excluding several ecosystem services), therefore falling short in addressing the true welfare benefits arising by Natura 2000 sites. Furthermore, no studies could be found that would have aimed to assess the value-added of Natura 2000, i.e. to compare benefits achieved by designating Natura 2000 areas with benefits associated with other types of protected areas and/or other possible means for ecosystem protection (e.g. establishing different regimes for sustainable use).

Nevertheless, based on the existing information, e.g. information gathered during the stakeholder interviews carried out in the context of this study, it is clear that well-managed Natura 2000 sites can provide a range of benefits both at local, regional and national level (see Annex III). In addition, there seems to be an increasing interest in

assessing benefits arising from Natura 2000 areas (e.g. their ecosystem services) across different Member States (Table 19).

Table 19: Current availability of information on benefits of Natura 2000 in 27 EU Member States.

Member State	Availability of existing information on Natura 2000 benefits	Interest increasing?	Possible future interests
Austria	Low	Yes	Tourism and provisioning services, and their importance for regional economy
Belgium	Low (moderate for Flanders), but some available	Yes	Flood control, tourism and recreation benefits, air regulation benefits
Bulgaria	Low, but some available	Yes	Some interest in forest carbon and forests' role in water regulation
Cyprus	Low	Yes	Tourism and job creation
Czech Republic	Low	Yes	Regulating services (e.g. flood protection, water regulation, erosion control) and cultural services (e.g. landscape values, ecotourism, education and research)
Denmark	No data		
Estonia	Low, but some available	Yes	Provisioning services (e.g. sustainable meat and reed for biofuel from Natura 2000 sites)
Finland	Low, but some available	Yes	
France	Moderate	Yes	Provisioning services and their branding (i.e. certification of products from Natura 200 sites)
Germany	Moderate	Yes	
Greece	Low	No specific indication	
Hungary	Low	Yes	Ecotourism, water purification (wetlands) and cultural services
Ireland	Low, but some available	Yes	
Italy	Low	Yes	
Latvia	Low	Yes	
Lithuania	Low	Yes	Forest and wetland ecosystem services (e.g. erosion control, climate change regulation, tourism)
Luxembourg	Low	No specific indication	
Malta	Low	Yes	Provisioning services and their branding (i.e. certification of products from Natura 200 sites), ecotourism
Netherlands	Low, but some available	No specific indication	
Poland	Low	No specific indication	
Portugal	Low	No specific indication	
Romania	Low, but some available	Yes	Water purification, ecotourism and production of high quality food from Natura 2000 areas
Slovakia	Low, but some available	Yes	
Slovenia	Low	No specific indication	
Spain	Moderate	Yes	
Sweden	Low, but some available	Yes	Ecosystem services benefiting fish and forest industries (e.g. pest control)
UK	Moderate	Yes	

Note: The assessment is based on the information gathered / interviews carried out in the context of this study. Therefore, it should be considered as indicative only.

3.1.2 Summary of the existing quantitative and monetary assessments

Benefits of Natura 2000 at national and / or regional level.

To date, assessing the overall benefits of Natura 2000 sites at regional or national level has been rather limited. However, a number of studies are available that provide insights of the broader benefits of Natura 2000.

In 2006, the Dutch Institute for Environmental Studies (IVM) carried out an assessment of the **gross benefits** associated with Natura 2000 in the Netherlands (see Box 3 below). The main aim of this assessment was to provide a broad estimate of the benefits provided by Natura 2000 areas at the national level. The assessment identified a range of ecosystem services linked with Natura 2000 and, with the help of benefit transfer from existing studies, estimated the average gross benefits provided by Natura 2000 sites in the Netherlands to be approximately 4000 EUR / ha / year. At national level, i.e. when extrapolated over the total coverage of Natura 2000 areas in the Netherlands, this results to around 4.5 million EUR total welfare benefits per year.

Box 3: Example 1 - Estimated gross benefits of Natura 2000 sites in the Netherlands

In 2006, the Dutch Institute for Environmental Studies (IVM) carried out an assessment of the benefits associated with Natura 2000 in the Netherlands. The main aim of the study was to provide a broad estimate of the gross benefits of Natura 2000 areas at the national level.

Method: The study was based on benefit transfer and extrapolation of a generic EUR / ha / year average value across the Natura 2000 network. Firstly, average EUR / ha / year values for different benefits provided by Natura 2000 areas were determined, based on existing information from literature. To follow this, a broad estimate of the total EUR / ha / year value of Natura 2000 sites was developed and then extrapolated across the whole area covered by Natura 2000 in the Netherlands.

Note: The estimates of the overall benefits of the Natura 2000 were based on benefits transfer and extrapolation. Therefore, these values should be treated as indicative only.

Results: Benefits provided by Natura 2000 in the Netherlands were estimated to be around 4000 EUR / ha / year, calculated as an average of EUR / ha / year benefits from different key Natura 2000 ecosystems. Recreation and tourism as well as wider ecosystem functions were important components of this value. Non-use benefits were also important. The provisioning service of raw materials was of lesser importance in the Netherlands. The authors extrapolated the gross welfare benefits of all Natura 2000 areas in the Netherlands (1.1 million ha), deriving an estimate of around 4.5 billion EUR / year.

Source: Kuik, O., Brander, L. & Schaafsma, M. 2006. Globale Batenraming van Natura 2000 gebieden. 20 pp

As regards the **added value** of Natura 2000, an assessment was carried out in 2005 to estimate the benefits linked with the implementation of Natura 2000 in Galicia (Spain) (Blanco et al., 2005). The study was based on willingness to pay (WTP) methodology, estimating the added value of Natura 2000 in Galicia by determining inhabitants WTP to increase the level of biodiversity protection to cover the full range of Natura 2000 sites in the region. As an outcome, the study discovered that the Galicians were willing to pay 113 EUR / family / year to increase the coverage of protected areas in the region from 36,000 ha to 280,000 ha, resulting in an estimated 15 per cent increase in the level of protection.

Finally, three studies were found that had aimed to assess the **net benefits** of Natura 2000 sites (see Box 4 to Box 6 below). All of these studies incorporated information on direct and indirect costs of implementing Natura 2000 sites (e.g. opportunity costs) whereas the benefits were estimated either based on the revenue and employment linked with Natura 2000 (Spain) or surveys determining people's willingness to pay

(Scotland and France). All of these studies concluded that the benefits of Natura 2000 were likely to be greater than the associated costs. In Scotland, the overall welfare benefits of Natura 2000 sites were estimated to be seven times greater than the associated costs (Jacobs, 2004). In Spain, the implementation of the Natura 2000 network was considered to have positive impacts on GDP, with an estimated increase between 0.1 - 0.26 per cent at national level (Fernández et al., 2008). Finally, in France, the estimated net benefits associated with key Natura 2000 management activities were calculated to be EUR 142 / ha / year, i.e. around seven times higher than the costs associated with the management of Natura 2000 sites (Hernandez & Sainteny, 2008).

As evident from the above, existing studies have adopted a range of different approaches to estimate the overall benefits and/or socio-economic impacts of Natura 2000. Given these differences in focus and methodology, the information available does not allow any clear comparisons to be made between different EU regions and Member States. Similarly, it is not possible to “sum up” these estimates with a view of developing an aggregate estimate of the benefits associated with Natura 2000 in multiple EU Member State (see Section 3.2 for a more detailed discussion on the methodological insights and lessons learned).

Box 4: Example 2 - Assessment of the net economic benefits of Natura 2000 sites in Scotland

In 2004, a study commissioned by the Scottish Executive Environment and Rural Affairs Department (SEERAD) was carried out to assess the net benefits associated with the designation of Natura 2000 sites in Scotland.

Method: The estimates were developed based on information from seven representative case study areas, extrapolated over the total number of Natura 2000 sites in the study area. The cost estimates include direct costs (management and policy) and opportunity costs. The benefits arising from both use values (e.g. recreational use) and non-use values were measured using contingent valuation questionnaire surveys (stated preference methods). Finally, a cost benefit analysis was carried out to estimate the net benefits of Natura 2000 in Scotland.

Note: The benefits from regulating services (e.g. water purification, regulation of human health) and cultural ecosystem services other than recreation (e.g. education, research) were not specifically valued in the study, though part of these values are integrated into the use and non-use value estimates. Furthermore, the estimates of the overall costs and benefits of Natura 2000 were based on extrapolation. Therefore, the authors of the study recommend these values to be treated as indicative only.

Results: The protection of all 300 Natura 2000 sites throughout Scotland was estimated to have an overall benefit cost ratio of around 7 over a 25-year period. This means that overall national welfare benefits are seven times greater than the national costs and represent good value for money. However, about 99 per cent of these benefits (£210 million per year) relate to non-use values. Around 51 per cent accrues as non-use value to the Scottish general public and 48 per cent accrues as non-use value to visitors to Scotland. Around £1.5 million (1 per cent) of the benefits relate to use values (e.g. walking and angling etc). Consequently, most of the benefits seem to arise from non-use values.

Source: Jacobs (2004) Environment Group Research Report: An Economic Assessment of the Costs and Benefits of Natura 2000 Sites in Scotland, 2004 Final Report, The Scottish Government. 75 pp
URL: <http://www.scotland.gov.uk/Resource/Doc/47251/0014580.pdf>.

Box 5: Example 3 - Global economic costs of the Natura 2000 Network in Spain

In 2008, an evaluation was carried out to assess the costs of Natura 2000 in Spain in order to determine the overall economic effects of the network (i.e. impacts on GDP) at national and regional level.

Method: The cost estimate referred to direct costs (e.g. management costs), opportunity costs and indirect effects (i.e. the economic impact caused by Natura 2000 in a territory measured as variations in GDP, productivity or employment rates).

Note: The overall aim of the study was not to determine the benefits provided by the network. The assessment was therefore not based on a cost-benefit analysis, and did not take into account welfare benefits arising from a number of relevant ecosystem services, such as regulating and cultural services. Nevertheless, the analysis revealed that the economic impact caused by Natura 2000 is positive rather than negative. Thus, the results are presented below.

Results: The implementation of Natura 2000 network was considered to have positive impacts on GDP in Spain, with an estimated increase in GDP between 0.1 - 0.26 per cent at national level. In general, it was estimated that the network would generate an additional 12,792 jobs to the country. At the regional level, Andalucía, Aragón and the Canarias islands were supposed to benefit the most from Natura 2000 with a 0.26 - 0.44 per cent increase in their GDP and between 1346 - 5957 additional jobs created.

Source: Fernández, M., Moreno, V., Picazo, I., Torres, A. & Martínez, B. 2008. *Valoración de los costes indirectos de gestión de la Red Natura 2000 en España*. Dirección General de Medio Natural y Política Forestal, Ministerio de Medio Ambiente y Medio Rural y Marino. Madrid. Unpublished

Box 6: Example 4 - Estimated net benefits of managing Natura 2000 in France

As part of a wider economic and institutional assessment of Natura 2000 in France, several studies were carried out to determine the benefits arising from Natura 2000 across a range of sites. The objective of the assessment was to estimate the net benefits related to the management of Natura 2000. Within the framework of this project, in 2008 a study was carried out to determine costs and benefits of the Natura 2000 site 'Plaine de la Crau', which is exemplarily presented below.

Method: The study was based on estimating the net value of benefits linked to certain key management activities at Natura 2000 sites. The cost estimates included direct, indirect and opportunity costs of the selected activities and/or related programmes. Some of the benefits and their monetary values were determined via stated preference methods. In addition, a cost-benefit analysis was conducted to determine the net benefits of the management activities.

Results: The calculated overall benefits amounted to €182/ha/year, and net benefits to €142ha/year, i.e. the benefits were estimated to be around seven times higher than the costs associated with the Natura 2000 site.

Source: Maresca B., Poquet G., Ranvier M. (Credoc) Evolution Economique et Institutionnelle du Programme Natura 2000 en France. Collection de Rapports N°251

Hernandez S. and Sainteny G. 2008. Evaluation économique et institutionnelle du programme Natura 2000: étude de cas sur la plaine de la Crau. Lettre de la direction des études économiques et de l'évaluation environnementale. Hors Série N°08 – Juillet 2008.

Benefits arising from a bundle of ecosystem services supported by individual Natura 2000 sites.

Information on the bundle / full range of ecosystem services provided and/or maintained by individual Natura 2000 sites is also limited. However, some studies exist that have attempted to value a broader range of ecosystem services at the site level. For example, in 2006 a Dutch assessment was carried out to determine the value of two Natura 2000 sites important in terms of water-based recreational activities, navigation and maintaining inland fisheries (Bade & van der Schroeffer, 2006). According to the study, the economic revenues generated by the productive functions of the sites (e.g. indirect impacts to regional economy) were around €91 million / year. In Ireland, the total benefits associated with the Burren national park has been estimated to be over €15 million (van Rensburgh et al., 2009) (see Box 8).

A range of the case studies currently available assessing multiple socio-economic benefits provided by Natura 2000 sites have been developed by applying the Kettunen

et al. (2009a) toolkit for assessing socio-economic benefits of Natura 2000. In this context, Cruz and Benedicto (2009) assessed the socio-economic benefits linked with the Pico da Vara / Ribeira do Guilherme Natura 2000 sites in Azores (Portugal) (see Box 7 below). According to the assessment, the amount of water originating from and used by the communities around the Natura 2000 area is close to 1.5 million m³ / year. At the same time, the willingness to pay (WTP) for maintaining the landscape and amenity values of the area is estimated to be €3 million / year. In the Białowieża Forest Natura 2000 site in Poland the market value of tourism and provisioning services (e.g. honey, game, mushrooms and wild berries) is estimated to be around €700,000 / year whereas WTP reflecting the existence value and value of cultural services (e.g. amenity and recreation) in the area is around 4 billion € / year (Pabian and Jaroszewicz 2009).

Estimating the total value of a bundle / full range of ecosystem services is often hindered by the lack and disparity of quantitative and monetary information available. As illustrated above and in Box 7 below, a range of different methods have been used to assess the value of individual services (e.g. quantification of volume, documented market prices, estimation of avoided costs or stated preference methods). Therefore, it is often not possible to simply “sum up” the values of individual services in order to develop an aggregate estimate for the total value of the site. In addition, the available estimates often overlap, i.e. they capture the value of the same service in a different manner. For example, market price estimates are commonly available to assess the recreational benefits associated with a site, but recreation is also often integrated into the stated preferences studies used to determine the overall value of cultural services at the site. Summing up such overlapping values to create an aggregated estimate leads to double counting of a given site’s total economic value.

Box 7: Example 5 - A range of ecosystem services provided by the Natura 2000 area “Pico da Vara / Ribeira do Guilherme” (Azores, Portugal)

In 2009, a team of researchers from the Royal Society for the Protection of Birds (RSPB) carried out a study to assess the socio-economic benefits provided by the Natura 2000 area “Pico da Vara / Ribeira do Guilherme” in the Azores, Portugal. The study aimed at identifying the full range of ecosystem services provided by a Natura 2000 site and, where possible, quantifying and/or monetising the value of these services. In addition, broader socio-economic values linked with the overall “existence” of the sites (e.g. employment) were taken into consideration.

Method: The study was based on the approach adopted in “The Toolkit for assessing socio-economic benefits of Natura 2000” developed by Kettunen et al. (2009a). It provides guidance on an overall rapid assessment of possible benefits as well as on valuation methods for a more thorough analysis of Natura 2000 benefits at a site level. The identification of ecosystem services and related benefits was based on the classification by the Millennium Ecosystem Assessment (2005). Due to the risks of double counting and variety of different estimates, it has not been possible to “sum up” the values of individual ecosystem services to form an estimate for the overall value of the site.

Results:

- Water provisioning: amount of water originating from the Natura 2000 area used by the surrounding communities is 1,408,273 m³/year, worth €600,000/ year. This estimate based on existing price of drinking water, excluding water used by agriculture, i.e. likely to be an underestimate of the total value.
- Flood and landslide protection: Estimate of the magnitude of avoided costs - 29 deaths and around €20,000,000 in damages in the areas in 1997 due to landslides and floods.
- Carbon storage: carbon stored in the Natura 2000 areas estimated at around 465,000 tC, plus 223,667,84 tC/year sequestered in the peat area

- Ecotourism: value of ecotourism in the Nordeste council area: €60,000 (travel cost method) / €16,500 (tourism expenditure)
- Education: 10 school groups / year, around 10 university visitors / year, a total of 10 scientific papers since 1968
- Landscape and amenity value: In the Povoação community, WTP €500 - 800 / person, total WTP estimate €3,000,000 for the Povoação region
- Job creation: LIFE Priolo Project created around 21.6 direct full time jobs / year. Expenditure of the park and its staff and volunteers: €350 000 / year, supporting 4 indirect fulltime jobs / year

Source: Cruz, A de la, Benedicto, J., 2009. Assessing Socio-economic Benefits of Natura 2000 – a Case Study on the ecosystem service provided by SPA Pico da Vara / Ribeira do Guilherme. Output of the project Financing Natura 2000: Cost estimate and benefits of Natura 2000. 43pp.

Box 8: Example 6 - Estimated benefits arising from the Burren national park in Ireland

In 2009, the cultural value and benefits particularly arising from tourism were estimated at the Burren national park, Ireland. The national park is located on the largest area of limestone in Britain and Ireland and it is unique for its rich natural and cultural heritage. The study investigates whether the farming practices recommended by BurrenLIFE project (BLP) are economically viable in providing a desirable public good.

Method: Different survey methodologies (e.g. willingness to pay surveys and predictive surveying) were used to estimate the cultural value of the national park. In addition, the revenues created by domestic tourism in the park area were analysed.

Results: According to the study, the aggregate benefits provided by the park's limestone pavements and the orchid rich grasslands were estimated to amount to €842/ ha / year (prediction based approach) or €4,420 / ha / year (traditional CE approach). Based on these values, the total benefit from the karst limestone pavements and the orchid rich grasslands is estimated to be €15.89 (67.93) million and €9.38 (€64.6) million per year respectively. In addition, the total revenue (e.g. multiplied effects) from domestic tourists was estimated to be about €71.47 / hectare / year. All in all, the total rate of return on government support to the park was estimated (conservative) to be around 353 – 383%, (without or with tourism), and 235% if all operating costs of the farming programme and all direct payments are considered.

Source: Rensburg T. V., Kelley H., Yadav L. (2009) *Farming for Conservation of the Upland Landscape and Biodiversity in the Burren*, Working Paper No. 153. NUIG. Report prepared for the BurrenLIFE Project.

Benefits arising from tourism and recreation at Natura 2000 sites

Tourism and recreation are by far the most frequently documented ecosystem services / socio-economic benefits related to Natura 2000 to date. At **site level**, it has been estimated that the national park Wattenmeer in Germany is responsible of around 23 per cent of total tourists in the region, with associated gross economic income of over €100 million in 2003 (Neidlein and Walser, 2005). Similarly, the yearly profits associated with tourism in the Bayerischer Wald, Berchtesgaden & Mueritz national parks (Germany) amount to almost €14 million/ year (Job and Metzler, 2005).

At **national level**, in 2009 the Metsähallitus Natural Heritage Services and the Finnish Forest Institute (Metla) carried out a national level assessment on the economic impacts of nature tourism and nature-related recreation activities on local economies (Metsähallitus, 2009). The study consisted of the key government owned nature areas, including 35 national parks (e.g. a number of Natura 2000 areas) and 10 other recreation areas (Box 9 below). According to the study, total annual revenue linked with the visitor spending in national parks was €70.1 million and supported local employment by creating 893 person-years. In general, it was estimated that €1 public investment to protected areas provided €20 return.

Unfortunately, no studies quantifying and monetising the overall benefits arising from tourism and recreational activities on protected areas (e.g. Natura 2000 sites) at national level could be found in other EU Member States. Similarly, no information was available allowing a systematic comparison of tourism and recreation related benefits across individual sites in different countries (e.g. taking into consideration their size, level of attractiveness, and resources dedicated to promoting tourism).

Box 9: Example 7 - Income streams created by tourism at national parks and recreational areas in Finland

In 2009, the Metsähallitus Natural Heritage Services and the Finnish Forest Institute (Metla) carried out a national level assessment on the economic impacts of nature tourism and nature-related recreation activities on local economies. The study consisted of the key government owned nature areas, including 35 national parks and 10 other recreation areas.

Method: The assessment was based on / adopted from the MGM2 model used in the U.S. The model combines information on the number of and spending by visitors to nature areas and assesses the impacts of the total spending on local economies (i.e. the revenue and jobs created based on the multiplier effect). The assessment was based on data of visitor rates and spending collected in 2005-2009.

Results: Total annual revenue linked with the visitor spending in national parks was €70.1 million and supported local employment by creating 893 person-years. Total annual revenue linked with the visitor spending at other important recreation areas was €16.9 million and supported local employment by creating 217 person-years. In general, €1 public investment provided €20 return.

Source: Metsähallitus. 2009. Kansallispuistojen ja retkeilyalueiden kävijöiden rahankäytön paikallistaloudelliset vaikutukset (Report 3017/52/2009) 16 pp.

Employment supported by Natura 2000 sites.

A number of examples are available demonstrating the role of Natura 2000 in creating employment and jobs (Annex III). In general, the existing information is mainly based on employment at **site level** and only a few aggregate estimates are available for Natura 2000 related employment at national level (e.g. Spain in Example 3). However, in some cases the employment associated with individual sites can also be significant. For example, Parc de Mercantour in France was estimated to support a total of 130 fulltime jobs in 1998 (Credoc, 2008).

As for the existing information at **national level**, in Ireland the designation and management of Natura 2000 sites is estimated to maintain 136 full time jobs, with associated expenditure of €6.5 million / year (Ireland Interview, pers. com). Similarly, a recent study of the economic value of protected areas in Wales (e.g. Natura 2000 sites) concluded that the parks directly or indirectly support nearly 12 000 jobs, produce a total income of approximately €250 million and generate €300 million in GDP (National Trust, 2006). In Sweden, it has been calculated that the research and monitoring of Natura 2000 alone has created 10-20 additional positions at national level (Sweden Interview, pers. com). The total number of people working on the management of protected areas (e.g. Natura 2000) is estimated to be around 250, with associated salaries of €15 million.

Estimating the benefits of restoration.

The management of protected areas often requires investment in restoring natural habitats and ecological functions in the area, e.g. restoration of the favourable conservation status of Natura 2000 sites. In addition to supporting biodiversity conservation, restoration of ecosystems is also known to result in a number of socio-economic bene-

fits, e.g. improved capacity of an ecosystem to purify water and mitigate impacts of flooding (e.g. TEEB, 2009). Identifying and assessing these benefits is considered important in order to increase the public support to protected areas.

Only a limited number of examples were available quantifying socio-economic benefits related to the restoration of protected areas in Europe. In the lower Danube Basin benefits associated with the restoration of floodplains (e.g. a number of Natura 2000 areas) were estimated to be on average €500 per ha/year (Box 10 below). These benefits were expected to arise from the restoration and/or improvement of a number of ecosystem services in the area, including recreation, fisheries productivity and nutrient retention of the floodplains. In France, the net benefits of increased water quality and improved opportunities for recreation, resulting from the restoration of a part of the Gardon river (Gardon-aval) were predicted to amount to around €36 million (Credoc, 2008) whereas in Belgium the restored Uitkerkse polder area, currently serving as a nature reserve, receives around 150 000 visitors a year, generating local revenue of around €3.5 million / year (Box 11 below).

Box 10: Example 8 - The benefits supported by floodplain ecosystems in the lower Danube basin, Romania

Many of the typical habitats of the Lower Danube are protected under the Ramsar Convention for the protection of wetlands of international importance as well as under the EU Birds and Habitat Directives. The Lower Danube Green Corridor (LDGC) is an ambitious wetland protection and restoration project facilitated by WWF. It encompasses 11,574 km² of natural areas from the Iron Gates on the border of Serbia and Romania to the Danube Delta in Romania and Ukraine. The project aims to restore a floodplain area of 2,236 km² when fully implemented, to moderate floods, restore biodiversity, improve water quality, and increase possibilities for better livelihoods. In the framework of this project, the WWF Danube-Carpathian Programme has carried out a climate change adaptation case study which looks into floodplain restoration along the lower Danube.

Method: The study calculated an average € / ha / year value across the area covered by the project, building on average € / ha / year values from existing economic valuation studies for different benefits provided. In addition, the study also looked into quantitative values, building on research that has been carried out on flood retention capacity of case study areas.

Note: The project did not specifically focus on flood protection benefits provided by protected areas such as Natura 2000 sites, but rather on restoration measures carried out in a wider wetland ecosystem. Nevertheless, parts of the project area are protected under the Birds and Habitats Directive, and thus the study was considered relevant for inclusion.

Results: If the LDGC agreement to restore a total area of 2,236 km² is fully implemented and the restoration of floodplains and former side channels along the entire Danube is included, potential flood control benefits would amount to nearly 2,100 million m³ in flood retention capacity and would lower Danube extreme flood peaks by 40 cm. In addition, based on highly differing economic values for several ecosystem services, an average value was calculated to be around €500 per ha/year for provision of ecosystem services for fisheries, forestry, animal fodder, nutrient retention and recreation through floodplain restoration.

Source: Ebert S., Hulea O. and David Strobel 2009. Floodplain restoration along the lower Danube: A climate change adaptation case study. *Climate and Development* 1 (2009) 212–219. Earthscan

Box 11: Example 9 - The benefits of restoring the Uitkerkse polder in Belgium (Flanders)

Prior to 1992, part of what is now known as the 'Uitkerkse polder' served as a dumping ground. Nowadays, after restoration of the landscape (e.g. remediation of soil) this coastal polder consists of 400 ha of nature reserve.

Method: In 2006, a study was conducted to estimate the socio-economic significance of the polder. It was based on 420 interviews of the actual and potential visitors to the polder area, e.g. tourists, inhabitants and local employers of the nearby city.

Results: This survey revealed that the polder visitors, around 150,000 a year, generated on average annual economic revenues amounting to €3.5 million. These were mainly made up of hotel and catering expenditures. Furthermore, the attractiveness of the polder underlined the potential growth in visitor rates and related revenues in the future.

Source: Based on summary by the interviewed government representative; no other reference yet available.

3.1.3 Level of stakeholder appreciation and awareness in Member States

As part of the project, a survey assessment was carried out to estimate the level of appreciation and awareness of Natura 2000 related ecosystem services among key stakeholders. The aim of this assessment was to establish an overview of the (perceived) role of Natura 2000 in providing different ecosystem services across the EU.

The assessment was undertaken by way of stakeholder interviews conducted in different EU Member States. Altogether 111 individuals from 23 Member States²⁶ participated in the survey, including representatives of national governments, NGOs, stakeholder groups and academia (see Table 20 below). The interviewees were requested to estimate (on a scale of 1-5) how important they saw Natura 2000 in terms of providing different ecosystem services at local, national and global level respectively. These estimates were then co-analysed to form an indicative overview of the level of awareness and appreciation and the estimated / perceived relevance of Natura 2000 in providing different ecosystem services.

Table 20: Overview of the respondents participating in the survey

Respondents	Number
Government official (regional & national)	58
NGOs / stakeholder groups	34
Research	15
Other	4
Total	111

The outcomes of the assessment indicate that benefits arising from Natura 2000 related ecosystem services are considered to function mainly at local and national level (Figure 7 and Figure 9). Regulating and cultural services were identified as the most relevant ecosystem services provided by Natura 2000 sites, including the regulation of climate (e.g. mitigation of climate change), purification of water and maintenance of water flows, safeguarding natural pollinators, preservation of landscape and amenity values, and support of tourism and recreation. In addition, the role of Natura 2000 in preserving genetic and species diversity was recognised to be of high importance (e.g. maintaining healthy populations of species beneficial to human wellbeing). On the other hand, the relevance of Natura 2000 sites in providing different goods, such as sustainably produced food, fibres, natural medicine and pharmaceutical products, was considered rather low. In addition, Natura 2000 areas were not believed to play a very

²⁶ Survey not conducted in Belgium, Finland, Denmark and Greece.

significant role in regulating outbreaks of diseases (e.g. human health), maintaining air quality and mitigating natural hazards.

Figure 7: Estimated / perceived relevance of Natura 2000 in providing different ecosystem services at local, national and global level (on a scale of 1-5)

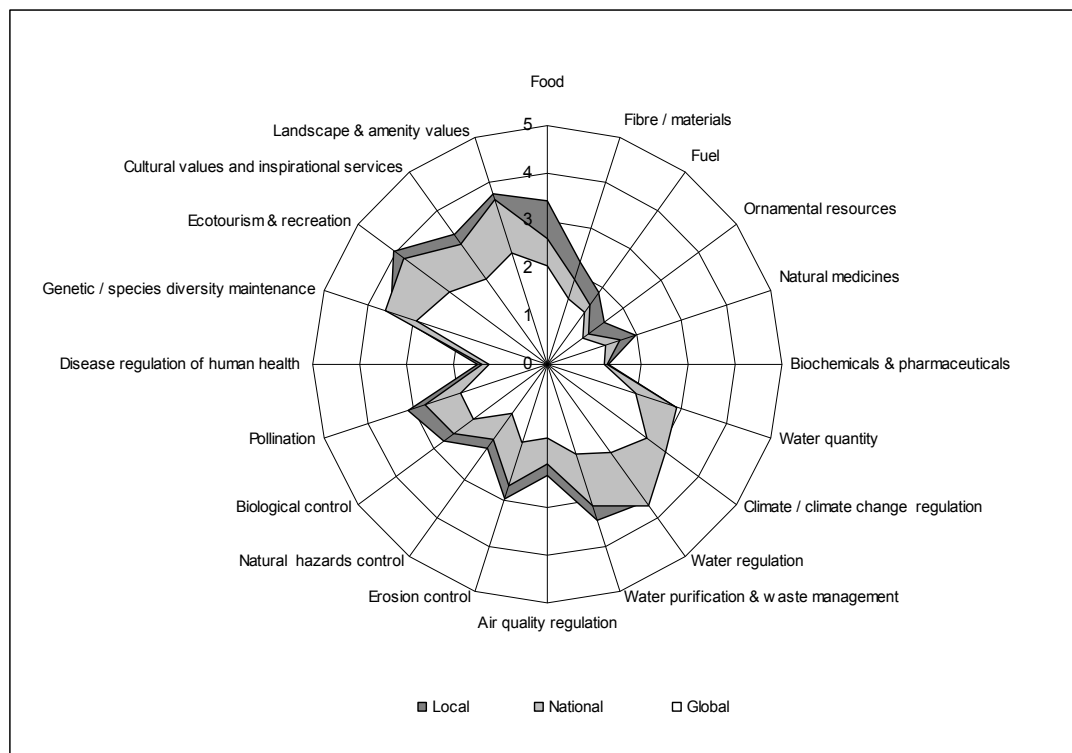
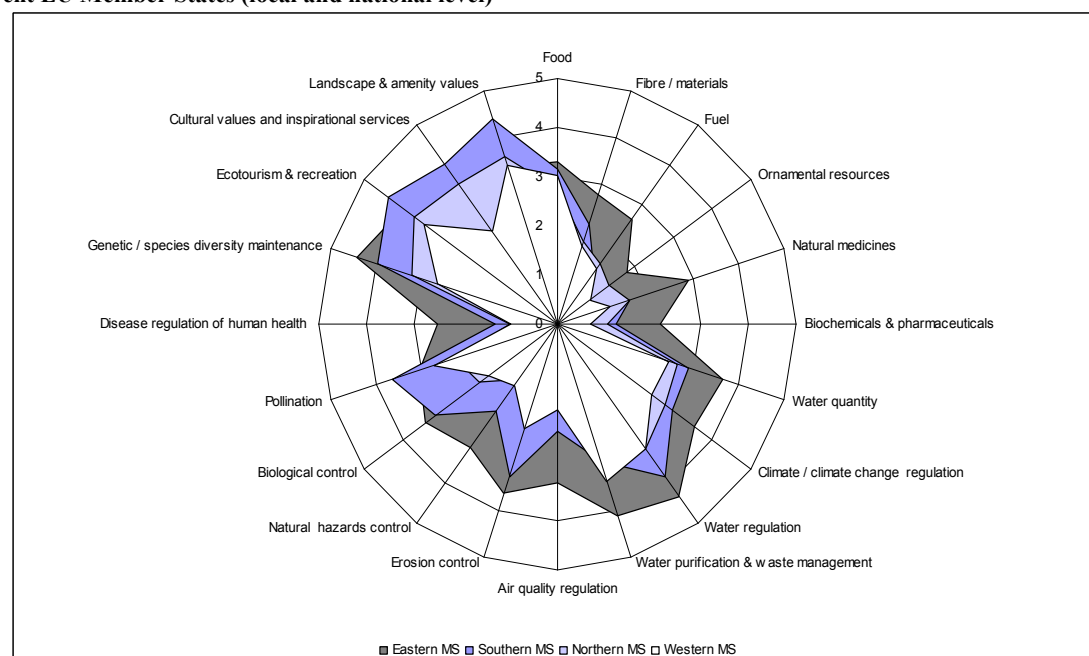


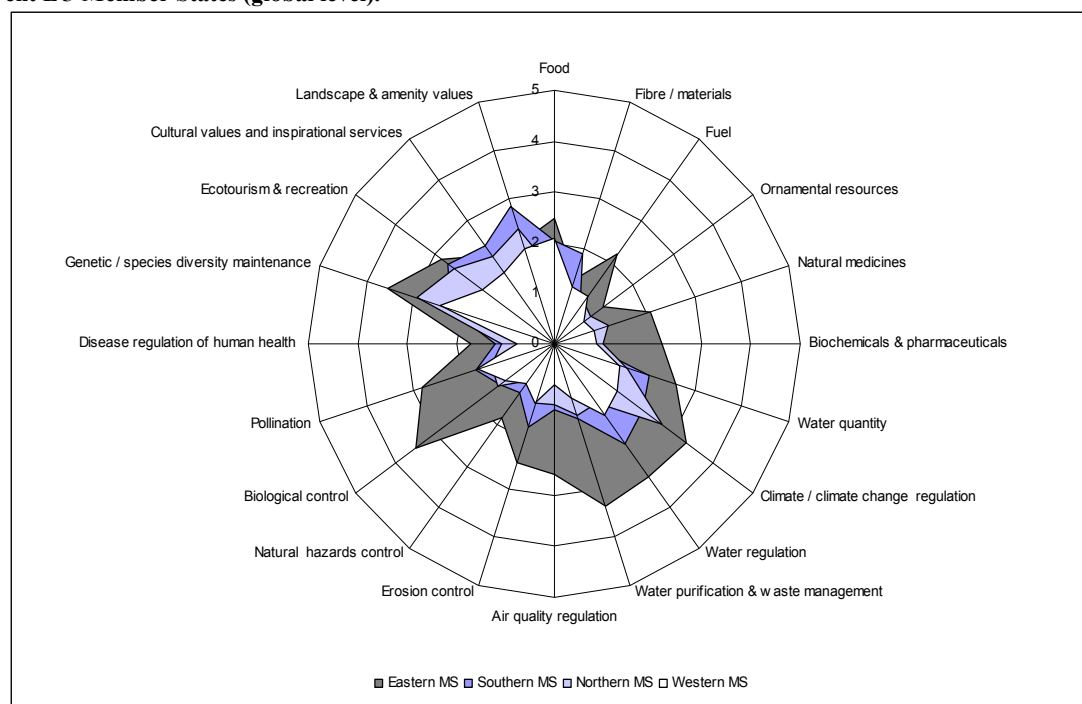
Figure 8: Estimated / perceived relevance of Natura 2000 in providing different ecosystem services in different EU Member States (local and national level)



The assessment also revealed that the appreciation of Natura 2000 related ecosystem services was in general the highest in the Eastern Member States (i.e. Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovakia) (Figure 7 and Figure 8). On the other hand, the Southern Member States (i.e. Cyprus, Italy, Malta, Portugal, Slovenia, and Spain) seemed to have the highest appreciation of different cultural services provided by Natura 2000. In general, the Western Member States (i.e. Austria, France,

Germany, Luxembourg, and the Netherlands) seemed to associate Natura 2000 the least with the provisioning of different ecosystem services.

Figure 9: Estimated / perceived relevance of Natura 2000 in providing different ecosystem services in different EU Member States (global level).



In general, the assessment of stakeholder views and perceptions carried out in the context of this project clearly indicates that Natura 2000 is believed to play an important role in maintaining a number of key ecosystem services across different Member States. Naturally, this rapid survey does not provide an exhaustive assessment of the different benefits associated with Natura 2000 in the EU. Furthermore, a more detailed look at individual responses reveals that there are often significant differences between respondents in terms of the importance of Natura 2000 in providing different ecosystem services. However, it is hoped that the assessment provides a representative snapshot of the current level of appreciation and awareness among the key stakeholders in the EU.

3.2 Developing a common methodology for Natura 2000

The methodological analysis mainly aims to provide guidance on how to collate and aggregate the often heterogeneous information on Natura 2000 monetary benefits at different scales (e.g., national level, Community level). The results will be turned into suggested components for a **common methodology** in evaluating benefits associated with Natura 2000, to allow **future updates** as well as to describe general needs for **future actions** on benefit valuation. It does not offer solutions for every methodological challenge usually linked to benefits assessment (e.g., uncertainties related to valuation methods, explaining biophysical relationships between ecosystem services and protected areas), as this goes far beyond the scope of this report. Its objective is to present a way forward to address the most urgent problems in order to give the best possible reflection of the overall socio-economic value associated with the Natura 2000 network at the national and/or Community level.

The chapter builds on insights gained from interviews with Member State representatives, national experts and stakeholders as well as on information from different case studies and general benefits valuation research analysed during the process of this project. Some key studies have been described in more detail for different sections of the methodology, to provide an impression of the diversity of possible approaches, and at the same time offering interesting solutions. If already described in a separate box of the synthesis Section 3.1, **the same numbering of relevant examples** has been used for this section. If results are described within the text of the previous chapter, a reference is given within this chapter in order to facilitate the consultation of results.

The objectives of the chapter are:

- Outlining the need for defining a common typology of benefits linked to Natura 2000 as well as presenting a possible way forward (**Section 3.2.1**), as a prerequisite for the following objective
- Suggesting components of a standardised valuation framework within which an analysis of benefits should be completed, based on characteristics of the Natura 2000 network (**Section 3.2.2**)
- Describing the policy context according to which Natura 2000 sites should be classified before starting to gross and scale up monetary values from a study area to a policy area, according to related approaches presented (**Sections 3.2.4 and Section 3.2.5**)
- Providing a better understanding of the spatial provision of benefits linked to Natura 2000 (e.g., where benefits occur) necessary for successfully scaling and grossing up, but also for formulating relevant policies (**Section 3.2.6**).

3.2.1 Classifying ecosystem services and socio-economic benefits

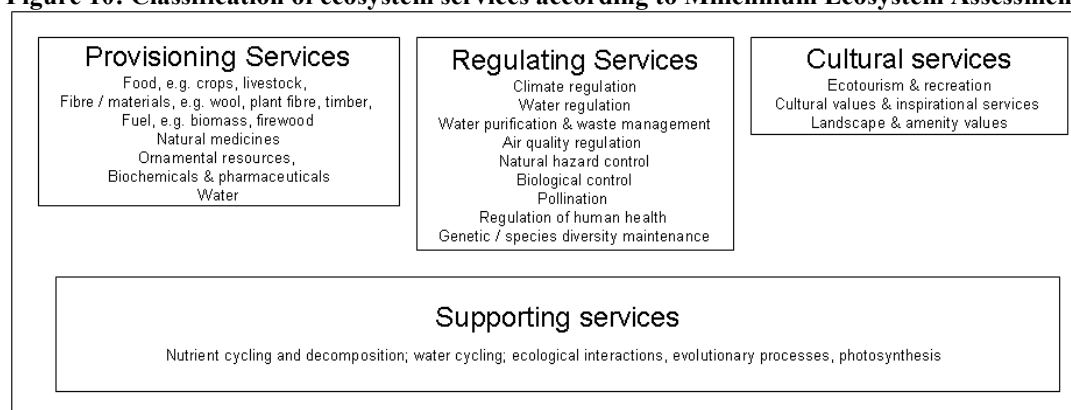
Review of existing typologies of benefits associated with Natura 2000

First assessments of the socio-economic benefits of the Natura 2000 network (ten Brink et al., 2002; Halahan, 2002) generally distinguished between three broader types of benefits:

- environmental (e.g., biodiversity, water regulation and purification),
- social (e.g., employment, rural development) and
- economic benefits (e.g., provision of food and raw material).

This approach draws a clear line between benefits considered to have mainly an environmental value and those that have a social and economic impact. The Millennium Ecosystem Assessment (MA, 2005) partly overthrew this differentiation. By building understanding of how ecological and environmental processes underlie the provision of ecosystem services, the MA fostered recognition of the importance of these services and the underlying processes for social and economic development. It distinguishes between four types of services important for human well-being: provisioning, regulating, cultural, and supporting services (see Figure 10).

Figure 10: Classification of ecosystem services according to Millennium Ecosystem Assessment



Source: adapted from Credoc 2008

With the wider use of the MA classification, assessments of the socio-economic benefits associated with Natura 2000 increasingly focused on capturing the values of a full range of services and goods, instead of concentrating on values provided by a few services, such as the provision of wild food, tourism or recreational opportunities. However, as described in Chapter 3.1, few studies currently exist which focus on the value of more than one protected Natura 2000 site and/or more than one particular benefit. Existing examples commonly used the MA or a similar framework as a basis for a typology of benefits associated with the network, although no coherent approach to categorising benefits associated with Natura 2000 could be identified.

Examples 10 and 4 below illustrate the use of **different typologies**, largely determined by the objectives of the valuation. According to the authors of Example 10, their classification allowed a clear identification of who has an economic interest in the presence of ‘nature’, water and landscape in the area subject to the analysis, and permitted the mapping of existing flows of money. The study of Example 4 had as its main objective to undertake a cost-benefit analysis of the Natura 2000 programme in France. Therefore the authors aimed at clearly connecting both costs and benefits to the management measures needed to achieve the objectives of the protected area, resulting in the typology of benefits described below.

Box 12: Example 10 - Expected revenues linked to Natura 2000 and the Water Framework Directive

The authors of the study distinguished between different functions that maybe fulfilled by a certain Natura 2000 area. These included:

- support functions: nature as support for human activities and waste products, e.g. living, working and the adsorption of emissions of substances in the air and surface water.
- production functions: nature as a producer and provider of water, oxygen, biomass and minerals.
- regulatory functions: functions maintaining the natural balance on earth, e.g., by filtering air, storing carbon dioxide or purifying water.
- information functions: nature as a source of information (e.g., education)
- recovery functions: nature as a source of human well-being (recreation) and human health.

Please consult text within Section 3.1.2 for results.

Source: Bade, T. & van der Schroeffer O. 2006. Water flows and cash flows. About European guidelines, water and regional economies. Triple E, Netherlands.

Box 13: Example 4 - Estimated net benefits of managing Natura 2000 in France

The study distinguished between

- direct,
- indirect and
- social benefits.

Direct benefits included all advantages linked to the presence of a site, and were estimated by changes in revenues arising from new economic activities (e.g., including subsidies received for sustainable farming). Indirect benefits refer to all those effects connected to the general management of a site and resulting environmental and social benefits (e.g., ecotourism). Social benefits include all values not captured by the market, whether linked to the use of the site or its existence and cultural value.

Source: Hernandez S. and Sainteny G. 2008. Evaluation économique et institutionnelle du programme Natura 2000: étude de cas sur la plaine de la Crau. Lettre de la direction des études économiques et de l'évaluation environnementale. Hors Série N°08 – Juillet 2008.

Both examples illustrate how **heterogeneous approaches** can be, depending on the objectives of the valuation studies (e.g., linking benefits to management measures for a cost-benefit analysis) and the perspective they take (e.g., economic interest and financing of protected areas). Although this heterogeneity is reflective of the difficulty encountered in capturing the diversity of socio-economic benefits associated with the network across the Member States, agreeing on a common typology of benefits associated with Natura 2000 is a necessary first step for the eventual aggregation of benefits at the national and European level.

Developing a standard approach for classifying the socio-economic benefits of Natura 2000

The development of a standard typology for assessing the benefits at European level would need to be based on a number of considerations. It would need to take into account the objectives of the Habitats and Birds Directive, facilitate the identification of related benefits and at the same time minimise the risks attached to the use of a given typology for benefits valuation.

The commonly used MA classification was never developed to fit all purposes. Its objective was never to provide an already 'ready to apply' framework for economic valuation of benefits arising from biodiversity and ecosystems. The MA classification, on which the following Table 21 is mostly based, can create difficulties in the valuation process, as some services fall within more than one category and thus increase the risk of double counting, i.e. that the benefit is counted twice in a monetary valuation (Balmford et al., 2008; O' Gorman and Bann, 2008). Pollination for example is defined as regulating service, but its value is also captured in the production of crops, which relies on various species for pollination. Also many other regulating services strongly interlink with the provision of different ecosystem goods (e.g. water regulation and food). This applies even more so to the range of supporting services (e.g., nutrient cycling, photosynthesis and evolutionary processes), which are the main motor for the provision of all ecosystem services. Benefits arising from increased resilience at the site level, and beyond, also need to be considered. This refers to the ability to resist pressures without losing functionality and hence ability to provide services and goods by not flipping into another state/regime or simply degrading.

Therefore several attempts were undertaken to further refine the MA system, to allow a more specific approach and to avoid the risk of double counting. Fisher et al. (2007), for example, distinguished between intermediate and final services. Balmford et al. (2008) made a distinction between processes and benefits, whereby benefits were defined as end products of core and beneficial ecosystem processes. The use of these refined classifications has not yet been specifically discussed for the valuation of benefits associated with Natura 2000, but the approach has been applied in some studies valuating biodiversity more generally. One of the conclusions pointed out by O'Gorman and Bann (2008) in their analysis of the value of ecosystem services in the UK was that although some of the refined approaches are helpful in avoiding double counting, they limit the range of ecosystem services which are taken into account for the valuation, with the risk of only capturing a small segment of the range of benefits provided by ecosystems. Nonetheless, they excluded supporting services and some regulating services (e.g., pollination, biological control) when estimating the overall benefits arising from biodiversity in the United Kingdom. One argument was that the value of supporting services can be considered as infinite and without those services no other ecosystem service would be provided.

Consequently, although the MA classification provides a first indication on how to structure the multitude of benefits and services provided by ecosystems, different packaging might be needed depending on the purpose of the analysis.

The table below offers a suggestion of how to ‘re-pack’ the MA classification and presents an overview of benefits generated from ecosystem services by Natura 2000. It does not capture all the benefits likely to arise from the network and might still miss out important aspects which remain difficult to clearly capture (e.g., resilience). However, it provides an initial comprehensive list slightly more tailored to the needs of Natura 2000. In addition, it gives an indication of the quantitative information to be looked into for an analysis of the overall value of the network.

Table 21: Socio-economic benefits from ecosystem services provided by Natura 2000 and quantitative basis to describe those benefits

Provisioning Services		
Ecosystem service	Benefit	Quantitative basis
Food provision	Cereal crops	- Sustainable/organic crop production in tonnes and/or hectares (e.g., HNV farming) - Sustainable/organic livestock in tonnes and/or hectares (e.g., HNV farming) - Sustainable/organic fish production in tonnes live weight (e.g., proportion of fish stocks caught within safe biological limits or certified) - Number of wild species used as food - Wild animal/plant production - Fruit and juice from traditional orchards
	Vegetables (incl. herbs)	
	Fruit	
	Livestock	
	Fish (incl. aquaculture and fisheries)	
	Wild/not-cultivated products (e.g., wild mushrooms, game, wild herbs)	
	Other (e.g., honey)	
Water quantity	Freshwater resources	Total freshwater resources used in million m³ from a site
Raw materials	Fibre crops	- Sustainable/organic forest growing stock, increment and fallings (e.g., HNV forest) - Industrial roundwood in million m³ from natural and/or sustainable managed forests (e.g., HNV forest) - Pulp and paper production in million tonnes from natural and/or sustainable managed forests (e.g., HNV forest)
	Timber (incl. paper, wood fuel)	
	Wool	
	Leather and skin	
	Ornamental resources	
	Cork	

	Wild/not-cultivated products (e.g., reeds, sedges)	• Cork production in million tonnes from natural and/or sustainable managed forests (e.g., HNV forest) • Forest biomass for bioenergy in million tonnes of oil equivalent (Mtoe) from different resources (e.g. wood, residues) from sustainable managed forests (e.g., HNV forest) • Sustainable/organic wool production in million tonnes (e.g., HNV farming)
	Bio-fuels	
	Other (e.g. straw, peat for horticulture)	
Natural medicines – Biochemicals & pharmaceuticals	Sustainably produced/harvested medical natural products (flowers, roots, leaves, seeds, sap, animal products etc.);	• Number of species from which natural medicines have been derived • Number of drugs using natural compounds
	Ingredients/components of biochemical or pharmaceutical products	
Provisioning of genetic resources for maintaining food security	Local breed varieties	• Number of crop varieties for production (e.g., HNV farmland) • Livestock breed variety (e.g., HNV farmland) • Number of fish varieties for production (e.g., HNV farmland)
	Local game varieties	
	Local crop varieties	

Regulating services		
Ecosystem service	Benefit	Quantitative Basis
Air quality regulation	Clean air	• Atmospheric cleansing capacity in tonnes of pollutants removed per hectare
Climate/climate change regulation	Carbon sequestration	• Total amount of carbon sequestered / stored = sequestration / storage capacity per hectare x total area (Gt CO₂) • Cooling effect of
	Temperature control	
	Precipitation control	
Moderation of extreme events	Avalanche control	• Trends in number of damaging natural disasters • Probability of incident • Infiltration capacity/rate (e.g. amount of water/surface area) - volume through unit area/per time • Soil water storage capacity in mm/m • Floodplain water storage capacity in mm/m
	Flood protection	
	Storm damage control	
	Fire control	
Water purification & waste management	Clean Water	• Removal of nutrients by wetlands (tonnes or percentage) • Water quality in aquatic ecosystems (sediment, turbidity, phosphorous, nutrients etc)
Erosion control	Nutrients maintenance and soil cover, preventing negative effects of erosion (e.g. impoverishing of soil, increased sedimentation of water bodies)	• Soil erosion rate by land use type
Pollination	Maintenance of natural pollinators and seed dispersal agents (e.g. birds and mammals)	• Abundance and species richness of wild pollinators • Range of wild pollinators (e.g. in km, regular/aggregated/ random, per species)
Biological control	Maintenance of natural enemies of plant and animal pests, regulating the populations of plant and animal disease vectors etc.	• Abundance and species richness of biological control agents (e.g. predators, insects etc) • Range of biological control agents (e.g. in km, regular/ aggregated/random, per species)
Disease regulation of human health Regulation of vectors for pathogens	Avoidance of diseases	• Changes in disease burden as a result of changing ecosystems

Noise regulation	Quiet	Persons/year where defined threshold in dB is not exceeded due to natural sound absorbers
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Cultural & social services		
Ecosystem service	Benefit	Quantitative Basis
Landscape & amenity values	Increased land value Psychical well-being Cultural branding	- Changes in the number of residents - Changes in the number of visitors to enjoy its amenity services - Number of products which's branding relates to cultural identity
Ecotourism & recreation	Hiking Camping Nature walks Jogging Winter sports Water sports Angling Wildlife watching Horse riding Hunting Cycling	Number of visitors to protected sites per year
Cultural values and inspirational services, e.g. education, art and research		- Total number of visits, specifically related to education or cultural reasons - Total number of educational excursions - Number of TV programmes, studies, books etc. featuring sites and the surrounding area

Source: adapted from TEEB 2009, building on O' Gorman and Bann 2008, Gantioler et al. 2008 and Kettunen et al. 2009a

The next table provides an overview of **wider socio-economic benefits** that cannot be traced to one single ecosystem service, but rather are influenced by a range of services (e.g., ecotourism, food provision, raw materials). They have been identified as of 'high relevance when demonstrating the value of Natura 2000 sites' in the benefits valuation toolkit developed by Kettunen et al. (2009a). Given the importance interviewed stakeholders have attributed to the value of Natura 2000 for rural and regional development, it was considered important to list them amongst the benefits to be taken into consideration for any analysis on the value of the network.

Table 22: Wider socio-economic benefits from ecosystem services provided by Natura 2000 and quantitative basis to describe those benefit

Wider socio-economic benefits	
Benefit	Quantitative Basis
Direct employment	Number of jobs and salaries (Full Time Equivalents) off and on-site
Indirect employment	Number of jobs and salaries (Full Time Equivalents) off and on-site x multiplier
Supporting of the local economy through direct spending of the reserve	Spending on local and regional services
Supporting local economy through spending generated by direct employment and volunteers	Spending on local products and services by site employees and volunteers as percentage of local turnover.
Supporting rural and regional development, e.g. contributing to rural/regional economies development and bringing in EU, national and/or regional financial support.	- Contribution of site/network related economic activities to total rural / regional economy - Financial support received for the protection of a habitat or species

Which concrete socio-economic benefits are mostly relevant for a certain site or region strongly depends on many site-specific factors, such as habitats and species of Community interest protected by the site, its conservation objectives and related management measures. The benefits valuation toolkit (Kettunen et al., 2009a) offered insight into the range of ecosystem services which can be investigated to identify the socio-economic benefits of a site. However, in order to be able to gather an overall estimate of the value of the network, clear guidance on the socio-economic benefits to be taken into account for a broader analysis is needed. The table above should offer an initial way forward for the description of benefits in such a valuation study.

Additional benefits arising from Natura 2000

Interviews with Member State representatives and stakeholders made evident the importance of explaining the **additional value** arising from Natura 2000, particularly compared to other forms of designation (e.g., national parks), but also compared to benefits arising through sustainable land management (e.g., sustainable forest management). This underlines the interest of decision-makers and stakeholders in understanding how policy changes and resulting activities affect economic welfare, and in thus identifying the *marginal* economic impact of Natura 2000 designation (see 3.2.3).

Over the course of this project, no studies could be found that have tried to identify and value in detail additional benefits associated with the network. A study has only recently been launched by the UK Department for Environment, Food and Rural Affairs (Defra, 2010) aiming to understand how national protected areas such as Sites of Special Scientific Interest (SSSIs) interact with other forms of designation regarding the benefits they provide. It will look into and compare benefits supported by a range of sites with different scenarios of designation, including Natura 2000. However, no detailed results are available as yet.

Another attempt to identify additional benefits of Natura 2000 was undertaken by the study on the economic benefits of the network in Scotland (Jacobs, 2004). According to the authors, these included

- enhanced visitor values
- marketing opportunities and
- enhanced leverage of funds invested at the sites.

However, the study did not attempt any valuation of these benefits.

As described in Section 3.1.2, an assessment was also undertaken in Galicia (Spain) (Blanco et al., 2005). However, the study focused on the added value residents put on the existence of a site (by determining the willingness to pay for a future increase regarding the coverage) rather than looking into added benefits resulting from changes in the ecosystem services the network provides.

It can be assumed that the additional benefits arising from Natura 2000 strongly relate to the objectives of the two nature Directives themselves:

Coherence - As mentioned in the introduction to this section, both Directives highlight the importance of creating a coherent ecological network. When proposing Sites of Community Importance (SCIs) or Special Protection Areas (SPAs), Member States have *inter alia* to consider areas that support the achievement of this objective, and

not only those sites ensuring the protection and restoration of priority species and habitats listed in the different annexes (Gellermann, 2001). This can lead to a higher number of sites being proposed than eventually covered at the national level.

Benefits beyond borders - Given the Habitats Directive's aim to protect species and habitats of Community interest, an important reference level is that of the Community. This can affect the number of sites proposed, but also emphasises the importance of the sites for the conservation benefits Natura 2000 provides beyond the local and national level and across borders.

Increased resilience - Another important factor is the network's contribution to an increased resilience of ecosystems ensuring the provision of ecosystem services and goods beyond the site level. The increased 'health' of habitats and species approaching a favourable conservation status can positively affect the provisioning of ecosystem services inside and outside the boundaries of a specific site.

Natural heritage – As part of its objectives the Habitats Directive states that '*measures taken pursuant to this Directive shall take account of economic, social and cultural requirements and regional and local characteristics*'. Though different interpretations exist on what this exactly means for the implementation of the different measures, it was from the outset clear that the Directive and with it the creation of the network of protected areas was thought to contribute to sustainable development not only by conserving ecological values, but by incorporating social and economic aspects as well. Depending on the conservation objectives of a site, Natura 2000 still allows the continuation of certain socio-economic activities, which can lead to the generation of more direct use values (see Figure 11) than may be possible under other forms of designation.

Compared to the additional benefits described in the Scotland study, these aspects are far less concrete and very difficult to translate into monetary terms. They influence the quantity and quality of benefits provided by ecosystems, and take into account the spatial scale at which benefits are supplied (e.g., beyond site level, beyond national borders). These aspects will need to be carefully considered in any valuation study on the overall value of the Natura 2000 network. In this regard, it will be important that a sample of study sites is identified which allows the comparison of different forms of conservation initiative and their impact on the delivery of socio-economic benefits (see also Section 3.2.3 on policy scenarios).

Challenges

The typology suggested by the authors of this report, as presented in Table 21, excludes supporting ecosystem services, in reason of the difficulty in clearly defining a quantitative basis rather than for the risk of **double counting**. As mentioned previously, it also very likely still fails to cover a large range of benefits that may be associated with Natura 2000, but which remain difficult to capture in quantified or economic terms (e.g., resilience). However, it includes regulating services such as pollination or biological control, which are absent in the other approaches described above. It only partly 'disaggregates' ecosystem services to 'final' benefits as in the end it is difficult to determine where to draw a line, as the 'ultimate benefits' would mainly encompass physical and psychical health. In addition, by referring to regulating services rather than to end benefits, it underlines the importance of Natura 2000 in providing these services.

Many studies define the typology of socio-economic benefits from the perspective of the economic valuation work that is carried out. In this regard, the authors of this report have taken a different approach, including in the perspective the importance of awareness raising and communicating the vast range of benefits rising from Natura 2000. This might increase the risk of double counting, but it can also be seen as an attempt to not underestimate the overall value of the network, due to the difficulty of taking into consideration the **multiplier effect** linked to the services it supports. The risks of under-estimating the monetary values of biodiversity seem currently to be higher than the risks of over-estimating them, and thus preference should be given to approaches that reduce the former.

3.2.2 Defining a standard valuation framework for assessing benefits

The socio-economic benefits of protected sites can be valued using different valuation frameworks. Which one is applied very much depends on the spatial scale of the study, its objectives in informing policy-making as well as other factors (e.g., confidence in using stated preference valuation methods). They represent different ways of looking at the value of a specific site or of a network of protected areas.

One of the most widely used approaches in many of the studies identified during this project is the **Total Economic Value - TEV** (Pearce and Warford, 1993). It categorises ecosystem services and goods in terms of the way they are used. The example below provides an insight on how the framework was applied in determining benefits associated with Natura 2000 in Scotland.

Box 14: Example 2 - Assessment of the net economic benefits of Natura 2000 sites in Scotland

The study commissioned by the Scottish Executive Environment and Rural Affairs Department (SEERAD) measured benefits arising from both use values (e.g. recreational use) and non-use values. More concretely it assessed:

- **Direct use values:** They refer to the direct use of an environmental good. In case of the study they predominantly referred to general (e.g. walking) and specialist (e.g. angling) recreational visits to Natura 2000 sites.
- **Non-use values:** They can arise irrespective of any special use, relating to the fact that people are willing to pay to protect environmental resources so that other people can use them and just so they personally know the resources will continue to exist. In this study, non-use values were estimated for the general public and visitors to Scotland.
- **Indirect use values:** They relate to indirect benefits provided by ecosystem services such as many regulating services, e.g. water storage and flood protection. These were identified but not quantified due to study constraints.

Source: Jacobs 2004. Environment Group Research Report. An Economic Assessment of the Costs and Benefits of Natura 2000 Sites in Scotland (Research Report 2004/05). 75 pp.

A ‘classical’ **cost-benefit analysis (CBA)** framework was often chosen for studies that aim at specifically comparing costs to benefits arising at the site level. Such studies looked into the balance of costs and benefits usually with the objective of determining the cost-effectiveness of a conservation programme via calculating its net benefit/loss. They focused on values captured by the market (e.g., food provision, tourism), but neglected non-market values (e.g., many regulating services, non-use values) in their final balance due to the difficulty in comparing them to the costs. In the TEV framework values covered by a costs-benefit analysis would mostly refer to direct use values. The following example demonstrates how a cost-benefit balance sheet can be applied.

Box 15: Example 4 - Estimated net benefits of managing Natura 2000 in France

Based on a study on the economic and institutional evaluation of the Natura 2000 programme in France, the authors carried out a cost-benefit analysis, taking into account direct costs and opportunity costs as well as direct and social benefits. Although the study looked also into non-market values, these were not used for the cost-benefit balance sheet.

Benefits - site 'de la Crau'	€/ha/year
Direct benefits (hay production)	25
Direct benefits (compensation measures)	60.7
Social Benefits	182
Costs - site 'de la Crau'	€/ha/year
Direct costs	36.28
Social costs (804 ha of steppe at la Crau) Costs linked to compensation measures	Not estimated 60.7 (□)
Opportunity costs	24.04
BENEFITS □ COSTS	146,68

Source: Hernandez S. and Sainteny G. 2008. Evaluation économique et institutionnelle du programme Natura 2000: étude de cas sur la plaine de la Crau. Lettre de la direction des études économiques et de l'évaluation environnementale. Hors Série N°08 – Juillet 2008.

On some occasions, studies focused not on one specific framework, but used different approaches to estimate overall values associated with Natura 2000 or biodiversity in general. The authors of the study presented in Example 4 complemented their cost-benefit analysis with a separate analysis on non-market values. By sending questionnaires they determined communities' willingness to pay for specific conservation programmes and related ecosystem services. Resulting values amounted to €182/ha/year, and although not added to the results of the cost-benefit analysis, they were included in the final synthesis.

Similarly, the study on the valuation of benefits associated with Natura 2000 in Scotland (see Example 2) compared costs and benefits on a site level for five case study areas, but also looked into broader welfare benefits by determining the willingness to pay at the site level and at the national level of certain non-use values. In addition, the study also took into account economic impact benefits relating to incomes, revenues, jobs and investments.

Assessing the **economic impact** of protected sites represents another framework for benefits valuation. It takes into account the specific value a protected area has relative to its impact on the economic development of a certain territory. Related studies are usually carried out at the local, regional or national level and very often as a minimum analyse the economic impact of a study area related to employment effects. However, the assessment is not based on welfare values and thus cannot be added to any values delivered by an analysis of TEV. Nevertheless, the framework was applied in several Natura 2000 or other protected area valuation studies, either complementary to other frameworks (see Example 2) or as the principal approach (see Example 3 and 11).

Box 16: Example 3 - Global economic costs of the Natura 2000 Network in Spain

The aim of the evaluation was not to determine the overall benefits of the Natura 2000 network in Spain, but to determine the overall economic effects of the network (i.e. impacts on GDP) at national and regional level by looking at the costs as well as indirect effects of Natura 2000. This means that the study also analysed the economic impact caused by Natura 2000 in a territory measured as

- Variations in GDP
- Productivity and
- Employment rates.

Source: Fernández, M., Moreno, V., Picazo, I., Torres, A. & Martínez, B. 2008. Valoración de los costes indirectos de gestión de la Red Natura 2000 en España. Dirección General de Medio Natural y Política Forestal, Ministerio de Medio Ambiente y Medio Rural y Marino. Madrid. Unpublished

Box 17: Example 11 - Impacts of large-scale protected areas on regional economies in Germany

In several studies on the regional economic impact of national parks and Nature Parks in Germany, the authors used information on income and employment effects to determine the economic value of the sites linked to tourism.

1. By multiplying the demand volume with the actual daily expenditures of different target groups the study calculated the gross revenues resulting from park visitors.
2. Then the revenues were divided according to benefiting sectors (such as hotels, retail, services), taking into account relative VAT rates and value-added rates. The objective of this was to emphasise the importance of the site for different sectors.
3. After deduction of VAT from gross revenues, net revenues were calculated. The value-added rates indicated the percentage of net revenues that directly result in wages, salaries and profits – and so represent the direct income from a site.
4. At the second stage the indirect income effects were determined, taking into account all income effects from activities which are carried out to create a certain service in the area.
5. To determine employment effects created by visitors, the absolute income effects are divided by the average national income per person in the study area. This resulted in a so-called employment equivalent, describing the number of people who could derive their income from the protected areas.

Please consult text within Section 3.1.2 for results.

Source: Job H. & Metzler D. 2005, Impacts of large-scale protected areas on regional economies. *Natur und Landschaft*, 80. Jahrgang — Heft 11

Economic Impact Assessments allow extension of the analysis to the wider economic impact of protected areas such as Natura 2000. However, the more complex the assessment (e.g. taking multiplier effects into account), the more difficult it is to aggregate the results from different study areas, requiring the application of economic modelling. Nevertheless, it represents an interesting approach to describing existing interactions between protected areas and local, regional and national economies. Whether this is focused on one specific ecosystem service (e.g., tourism) or takes into account a range of services (e.g., gross added value from a range of provisioning services) it can help to further complete the picture on the overall value of a network of protected areas.

Which of the frameworks described above would be best able to determine an estimate of the overall socio-economic value of Natura 2000 or whether it should be a mix of the different approaches is further analysed below.

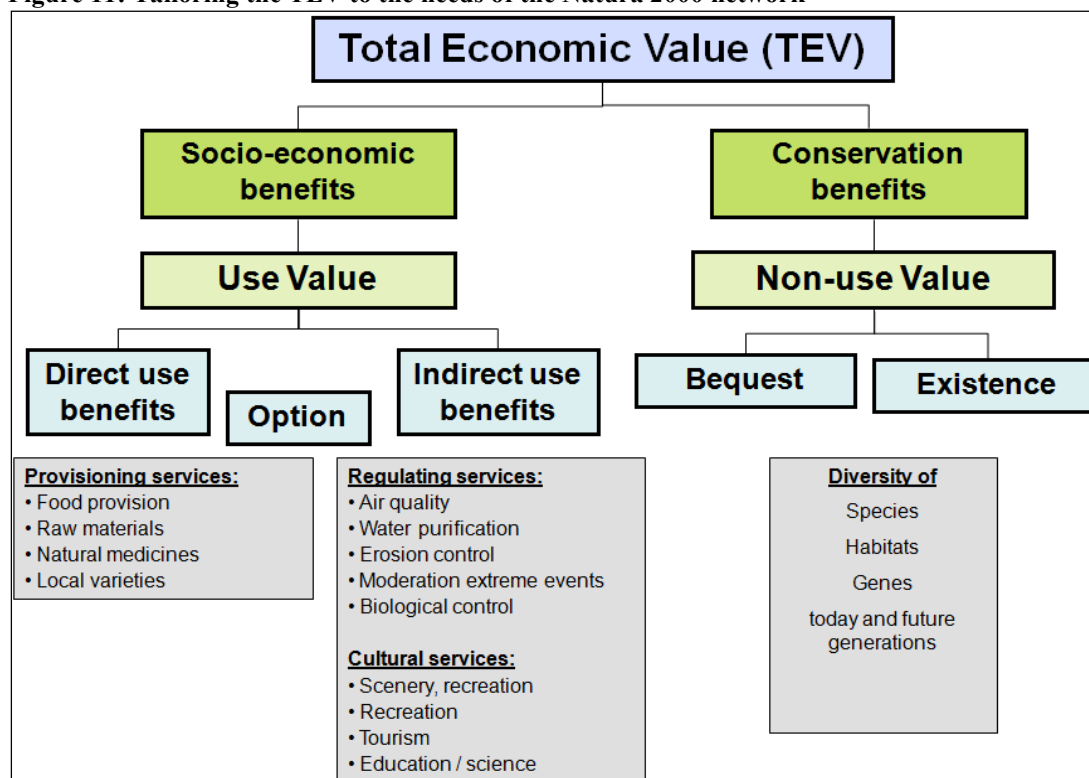
A standard valuation framework: The Total Economic Value

The TEV framework is one of the most widely used valuation frameworks, not only for benefits valuation studies on Natura 2000. It provides a logical framework that allows taking a wide range of welfare values into account, including non-use values arising, for example, from the existence of a habitat or species. It should also form the basis of any standard valuation framework applied for Natura 2000.

However, there is a need to tailor the framework to the objectives of the Natura 2000 network. As emphasised in the previous chapters, the main objective of the two nature Directives and the resulting network of protected areas is and should remain the conservation and restoration of habitats and species representing Europe's natural heritage. Their main focus is therefore the conservation and restoration of ecological values (**conservation values**) and reflects the intrinsic value arising from habitats and species protected under the two Directives. The conservation of habitats and species of Community interest and associated management activities influence the quantity and quality of services and goods provided by ecosystems within and outside the boundaries of the network, and by extension support the provision of socio-economic benefits for human well-being. However, this is not the primary objective of the Natura 2000 network per se.

As defined in this study, within the TEV framework **socio-economic benefits** primarily link to use values arising from direct use benefits (mainly provisioning services), indirect use benefits (mainly regulating and cultural services) as well as any related option value of these benefits for the future (see Figure 11 below). In this regard, the framework takes a different perspective than its usual definition, as it focuses on the **benefit flow related to management activities** (or their absence) rather than on the 'use' of ecosystem services. Thus, direct use benefits are mainly defined as those socio-economic benefits that directly result from management activities at Natura 2000 sites (e.g., single tree selection for timber production or hay production from semi-natural grasslands). Cultural services (including tourism), usually defined as non-consumptive direct use value, were included under indirect use benefits due to the difficulty of clearly linking the provision of these benefits to the application of certain management activities (as also applies for regulating services). Recreation, for example, results from a multitude of management activities which either generally shape the landscape in question or aim to reduce the impacts (or increase the recreational value) of visitors to a site (e.g., path system, visitors centres). Resilience can represent an "insurance value", which may in part be captured by "option value". However, where there is a risk of a "critical threshold" being passed, it is likely that the option value will be a significant underestimate of the insurance value / value of resilience (TEEB, 2010).

Figure 11: Tailoring the TEV to the needs of the Natura 2000 network



Source: adapted from Beaumont et al. 2006 and Pearce & Moran 1993

A similar approach was taken by Hernandez and Sainteny (see Example 4) which distinguished between direct and indirect benefits, allowing the direct connection of benefits (e.g., hay production) to certain management measures (e.g., mowing). On the other hand, it makes it difficult to transfer values from direct use benefits to other Natura 2000 sites, as the management measures specifically relate to the conservation objectives of a site. This could be solved by defining typical management activities for certain land use types in order to be able to transfer those values to other areas with similar land use types. If the conservation objectives of a site require the absence of such management activities, this means that the amount of direct use benefit is limited (e.g. wild Natura 2000 sites). The use of indirect benefits, on the other hand, allows one to determine the flow of benefits coming from a site for an entire region, rather than focusing on the benefits provided at a site (e.g., ecotourism, impact of regulation services on provisioning services outside protected areas).

In addition, the framework above defines non-use values as so called **conservation benefits** rather than including them under the wider term of socio-economic benefits. This allows emphasising the role of use values as regards the socio-economic importance of Natura 2000, without diminishing the role of non-use values in determining the total economic value of the network. Conservation benefits (benefits emphasising the anthropocentric perspective and so different from conservation values) emphasise the importance that people give to the existence value of certain habitats and species protected by Natura 2000 today and for future generations. It represents an interface between the anthropocentric perspective of benefits for human well-being and the intrinsic value of habitats and species. Stated preference methods are the main tool to capture those values (see Table 23).

Consequently, the study breaks the TEV down into two major components, socio-economic benefits and conservation benefits.

$$\text{TEV} = \text{SEB} + \text{CB}$$

In addition, it advises following the approach of O' Gorman and Bann (2008), which distinguish between market value and consumer surplus when presenting the TEV of ecosystem services in England.

$$\text{TEV} = \text{MV} + \text{CS}$$

Market value (MV) refers to values captured by the market and identified through market prices, production function and cost-based approaches. **Consumer surplus** refers to the individual willingness to pay for a service or good beyond the actual market price. This can normally be determined by either revealed preference (e.g., hedonic pricing) or stated preference methods. The first derives indirect price information by revealing the preference of individuals whereas the second creates hypothetical markets revealing the willingness to pay. Consumer surplus values can be additional to the market price (which is particularly important if the market price is low) or they can entirely reflect the value of services and goods where no such market price exists (e.g., many regulating services, but also non-use values).

The Table below provides an overview of the most important existing methodologies. A detailed discussion of the different methods is presented in the benefits valuation toolkit for Natura 2000 (Kettunen et al., 2009a).

Table 23: Valuation methods

Approach		Method
Market valuation	Price-based	Market prices
	Cost-based	Avoided cost
		Replacement cost
		Damage cost avoided
	Production-based	Production Function approach
Revealed preference		Factor Income
		Travel cost method
Stated preference		Hedonic pricing
		Contingent valuation
		Choice modelling/conjoint analysis

The approach described above offers a way to distinguish between values representing 'real money' (market value), and 'potential to be real' (becoming real if markets are set up) and broader 'welfare benefits' (reflecting social perception of benefits). The latter two are represented by consumer surplus values (**indicative values**). This can be important when communicating benefits associated with Natura 2000 to local stakeholders, who are usually more interested in what concrete benefits occur in the short-term, rather than in values that might potentially occur in the long-term. However, it is essential that indicative values not yet captured by the market are analysed as well and in the long-term made explicit by different policy instruments to show how indicative values can be transformed into actual market values.

O' Gorman and Bann (2008) presented market values separately from cost-based approaches (e.g., avoided cost), although still as part of the TEV framework. The same strategy is suggested for any valuation of the overall benefits of the Natura 2000 network. Cost-based approaches base their assumption of the value of a given good or service on an estimate of costs (or savings) and strictly speaking do not measure the

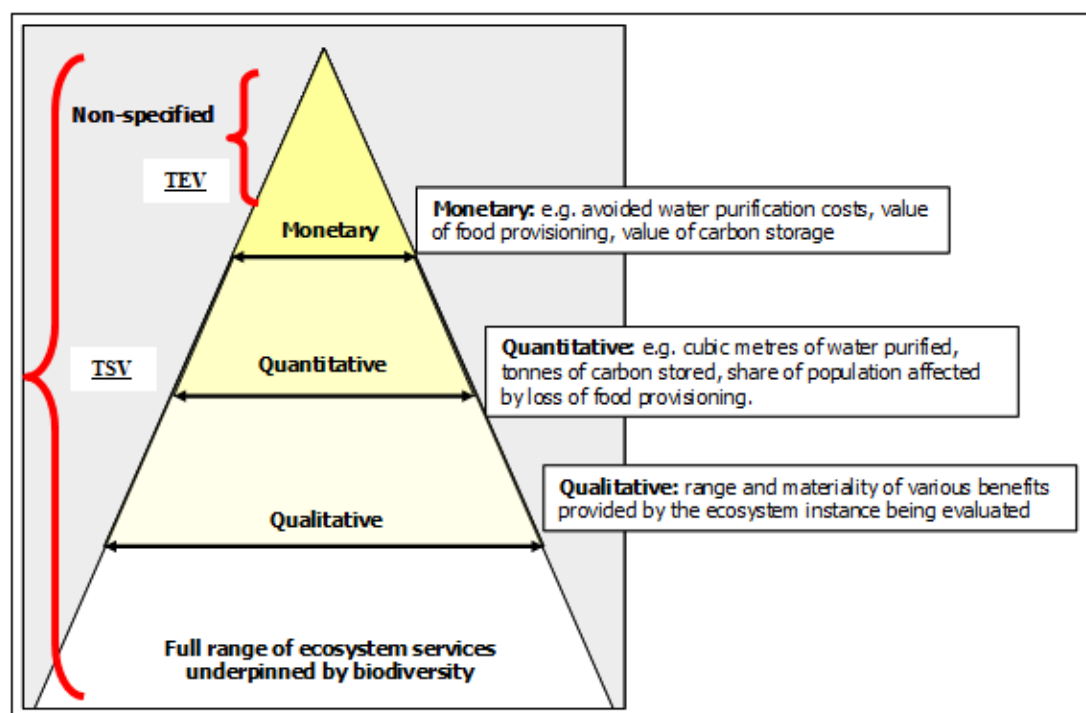
flow of benefits per se (see Defra 2007 and Kettunen et al. 2009a for further discussion).

A standard valuation framework: The Total System Value

The TEV framework often leads wrongly to the assumption that all values have been considered, and neglects those values which are difficult to monetise. In the assessment of territorial ecosystem services carried out for England (O' Gorman and Bann, 2008) as well as in TEEB (2009), the authors refer to **Total System Value (TSV)**, which implies that economic approaches alone can not be used to estimate TSV.

The total value of the Natura 2000 network (TSV) can be represented by a combination of monetary values, quantitative numbers and qualitative insights (and unknowns), with generally less information and insight being available at the monetary level (TEV), and a broader view at qualitative level. This is illustrated in the “benefits pyramid” below.

Figure 12: The benefits pyramid and Total Economic Value versus Total System Value



Source: adapted from TEEB 2009

The benefits valuation toolkit for Natura 2000 (Kettunen et al., 2009a) provides insight on how to address all three levels of information at the site level, and how to present the three analyses to communicate an ‘overall’ value of the network, though not additive.

It is understood that the ambition of deriving a consolidated EU-wide picture on the qualitative, quantitative and monetary benefits of the Natura 2000 network is very difficult and cannot be the aim of one single study. However, by representing other components in addition to the TEV, the analysis comes one step closer in providing a reflection of the total value of the system. As shown in several examples on Natura 2000 benefits valuation (e.g., Example 2 on the benefits of Natura 2000 sites in Scotland and Example 6 on benefits linked to the Burren national park), the presentation of information from Economic Impact Assessment was seen as one way forward in

providing additional information on the value of a site or network. O' Gorman and Bann (2008) in their valuation of ecosystem services in England decided to provide as much information as possible on the value of ecosystem services by presenting another set of information, namely their 'contribution to the economy'. The indicator captures a range of information, either on Gross Value Added (GVA), estimates of income or results from in-depth Economic Impact Assessments (e.g. calculating multiplier effects). Based on data available, the authors presented the information for every individual ecosystem service analysed. Although values cannot be added to TEV, it allows the capturing of important fragments of the TSV.

As regards Natura 2000, the team suggests likewise to analyse the **economic contribution of the Natura 2000 network**. However, rather than presenting the information individually for every ESS, it is recommended to provide an overview of the economic contribution of wider socio-economic benefits associated with Natura 2000 (see Table 24). As a minimum this could capture information on total employment (direct and indirect) or income from productivity. Presenting the economic contribution of Natura 2000 would allow for the importance attributed to the value of Natura 2000 for rural and regional development by different stakeholders to be reflected whilst also taking into account the **value of public financing**.

Considering the above, benefits arising from Natura 2000 could be captured according to the following illustrative matrix.

Table 24: Illustrative table on how to present information on the TEV and other components of TSV of Natura 2000

Provisioning Services					
Ecosystem service	Benefit	Market Value	Indicative Value		TOTAL
			CS	WTP including cost-based approaches	
Food provision					
Water quantity					
Raw materials					
Natural medicines – Biochemicals & pharmaceuticals					
Genetic/species diversity maintenance					

Wider socio-economic benefits	
Benefit	Economic Contribution
Direct employment	
Indirect employment	
Supporting of the local economy through direct spending of the reserve	
Supporting local economy through spending generated by direct employment and volunteers	

Supporting rural and regional development, e.g. contributing to rural/regional economies development and bringing in EU, national and/or regional financial support.	
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It is recommended to carefully consider whether it is appropriate to present a summation of the benefits, as shown in Table 25 below. This will depend to a great extent on the robustness of the information collected, as decision-making could otherwise be misguided by biased information.

Table 25: Illustrative table of how to present information on the overall value of Natura 2000

TEV			TOTAL TEV	Economic Contribution
MV	Indicative Value	Conservation Benefits		

A standard valuation framework: Ecosystem services or habitats approach

The framework for valuing the benefits associated with Natura 2000 further depends on whether future valuation will mainly build on existing valuation studies or whether primary valuation will be conducted as part of the study itself.

Considering the current robustness and the quantity of data available, an **ecosystem services approach**, as reflected in Table 24 above, is most likely to be applied if no primary valuation work is carried out. Rather than referring to a certain land use type (e.g., wetland), habitat (e.g., alluvial forests) or species (e.g., wolf) and the ecosystem services associated with it, the ecosystem services approach analyses ecosystem services provided in a certain area covered by a variety of land use types, habitats or species (e.g., avalanches moderated by forests and rocky habitats in a protected area). The approach is easier than the analysis perspective as it allows greater flexibility regarding the use of valuation studies and the transfer of benefits (O' Gorman and Bann, 2008). This also allows for extending the range of ecosystem services to be analysed and presented as part of the study.

However, the approach simplifies the complex interactions between the provision of ecosystem services and existing habitats. Using a **habitat/land use type approach** would require identification of the ecosystem services/benefits specific to a certain habitat or land use type (e.g., woodland: raw material, carbon sequestration, air quality). It follows that the approach is better suited to informing discussions on the development of policy instruments addressing different ecosystems, for example, by capturing the specific value of protected habitats. It would also allow the value of ecosystem services provided by certain species to be captured, where only a little information is at present available. Example 12 below illustrates an economic analysis of values associated with the Scarce Large Blue butterfly, which, however, focuses on conservation benefits in general rather than on the provision of ecosystem services. An in-depth analysis of use values provided by species protected under the Habitats and Birds Directives could focus on those species playing the role of 'keystones', as being key to the structure and functioning of an ecosystem and so to the provision of ecosystem services.

A habitat/land use type approach is therefore recommended where estimates do not only build on existing valuation work. This has been captured in the formula below.

$$V(ES_k) = \sum_{i=1}^k A(LU_i) \times V(ES_{ki})$$

Total Value (V) of Ecosystem Services ES in €/ha/year for ecosystem type k is V(ES)_k, where

A(LU_i) = Area of i (Land Use in hectares)

V(ES_{ki}) = Annual value of k ES (Ecosystem Services) for each i LU_i (€ ha⁻¹ yr⁻¹).

Source: Glaves et al. 2009

If primary valuation is carried out at a larger scale (e.g., Community level), it is suggested that the focus be on the provision of **selected benefits** (for example focusing on those perceived as particularly relevant according to Section 3.1.3), and to use a sample of case studies covering a range of different habitats rather than valuating the benefits arising from individual habitats. For example, in the valuation of the benefits of Natura 2000 in Scotland (see Example 2), the authors defined a range of case studies considered reasonably representative of the wider Natura 2000 network as regards different habitat types.

Box 18: Example 12 - An economic analysis of the Scarce Large Blue butterfly in the region of Landau, Germany

The Scarce Large Blue, *M. teleius*, is a highly endangered butterfly, listed in many Red Data Books and in Annexes II and IV of the Habitats Directive. The authors of the study analyse the economic demand of conserving Scarce Large Blue butterflies, focusing on its non-use value. Through the contingent valuation method a hypothetical market is created and the willingness to pay determined. Aggregated economic benefits for each project level (differing in size) per year were as follows:

- Project level 1 €259,720
- Project level 2 €297,374
- Project level 3 €425,979

The demand curve was then compared to the supply curve, which is determined by the aggregated and marginal costs for the various conservation levels. The aim was to determine so the optimum level of conservation for the appropriate design of agri-environment schemes. Results show that the aggregated benefits are much higher than the aggregated costs: For project 1 (meadow area of 4 ha) the lower bound of the confidence interval for the aggregated benefit exceeds the aggregated costs by more than two orders of magnitude. For project 3 (64 ha of meadows) the lower bound exceeds the aggregated costs by more than one order of magnitude.

Source: Wätzold, Frank, Nele Lienhoop, Martin Drechsler and Josef Settele (2008): Estimating optimal conservation in the context of agri-environmental schemes. *Ecological Economics* 68 (2008) 295 – 305

Top-down and bottom-up analysis

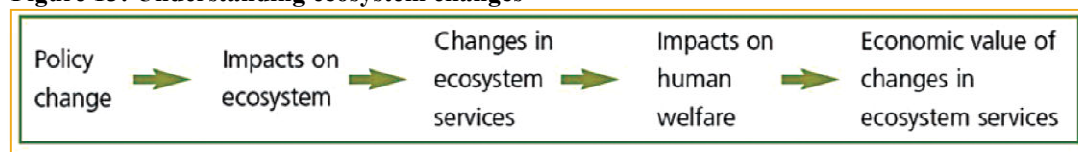
If primary valuation work is carried out, generally two approaches can be taken, which differ in the way information on the monetary value of benefits associated with Natura 2000 is collected: a top-down or bottom-up analysis. The **bottom-up analysis** focuses on gathering data at a sample of sites, which can be used to gross up and scale up to larger areas (see Section 3.2.4). The **top-down approach** can involve a greater number of stakeholders at site-level as well as national and international level, by distributing, for example, questionnaires to a wider group potentially deriving benefits from the Natura 2000 network.

It is recommended that a top-down analysis be applied to complement bottom-up analyses at a series of sites. This particularly refers to the valuation of conservation benefits, where questionnaires could be sent to a wider range of stakeholders and the general public (see Section 3.2.5 on beneficiaries).

3.2.3 Define policy scenarios and baselines

Ideally, a study on the overall benefits of the Natura 2000 network would measure the change in the provision of benefits caused by the implementation of the network. To be able to carry out such an analysis, different scenarios would have to be analysed to gather a better understanding of how Natura 2000 changes the economic value of ecosystem services provided (see Figure 13). This would also allow the supply of benefits over time (long-term benefits) to be observed rather than presenting only an image of the benefits at a certain point in time. To be able to define the marginal benefits of Natura 2000, however, the baseline, i.e. the range of benefits provided without the existence of any conservation scheme, needs to be clearly defined.

Figure 13: Understanding ecosystem changes



Source: TEEB 2009

The following example in Box 19 demonstrates how such scenarios could be presented. In the case of the analysis of the benefits of the Natura 2000 network in Scotland two main situations are described. The baseline scenario refers to the complete absence of any protection scheme over a defined period of 25 years, whereas the policy-on scenario refers to the complete designation and implementation of all Natura 2000 sites over the same period of time.

Box 19: Example 2 - Assessment of the net economic benefits of Natura 2000 sites in Scotland

The assessment framework of the study referred to the following two scenarios:

- The **policy-on situation** is where "all 300 Natura 2000 sites within Scotland are fully designated and implemented (comprising 223 cSACs and 132 SPAs, with 55 overlapping) over a period of the next 25 years", and
- The **policy-off situation** can be defined as "The complete withdrawal of all conservation protection (including SSSIs, ESAs and other conservation and land management related expenditure) within the 300 Natura 2000 sites, over a period of the next 25 years."

Source: Jacobs 2004. Environment Group Research Report. An Economic Assessment of the Costs and Benefits of Natura 2000 Sites in Scotland (Research Report 2004/05). 75 pp.

A marginal assessment of the benefits of Natura 2000 would also have to consider different conservation schemes, such as national protected areas, or forms of extensive land use (e.g., high nature value farmland) which might represent alternative sources of benefits. In this regard, it is important to point out that the comparison should also refer to the provision of conservation benefits, which can be specific to habitats and species covered by the different conservation schemes or land use types (see also discussion on added value of Natura 2000 in Section 3.2.1).

Example 6 below illustrates the degree of complexity which can be reached in applying different scenarios for valuation of benefits associated with Natura 2000.

Box 20: Example 6 - Estimated benefits arising from the Burren national park in Ireland

The authors of the study adopted a land portfolio allocation (LPA) model to examine the effect of various policies and subsidies on the farming practices of the 20 farms located in the Burren Natura 2000 landscape in Ireland. According to the study, the LPA model helps to understand these processes and can provide fundamental insights into decisions taken by the farm household. First, it will determine whether or not the farming for conservation systems are financially and economically viable and secondly, how market and policy trends impact on viability, land use and the associated amenity and biodiversity.

Source: Rensburg T. V., Kelley H., Yadav L. (2009) Farming for Conservation of the Upland Landscape and Biodiversity in the Burren, Working Paper No. 153. NUIG. Report prepared for the BurrenLIFE Project.

With regard to an initial analysis of the overall economic value of the benefits of Natura 2000, this level of complexity would probably go beyond what is needed to adequately inform policy-making. All the same, besides a simple ‘policy-on’ and ‘policy-off’ scenario, the following aspects should be considered:

Conservation initiatives - A proportion of Natura 2000 sites will be subject to additional designations at the national level (e.g., national parks, Sites of Specific Scientific Interest - SSSIs) or international level (e.g., Ramsar, World Natural Heritage Sites) (see Figure 6 in Section 2.2.1). It is important to understand how Natura 2000 interacts with other conservation initiatives, to be able to evaluate the relative benefits of different types of designation. This also includes wider sustainable development initiatives such as agri-environment schemes. The relative scale of benefits could be made evident by analysing the degree of human activity permitted, what minimum management measures are required (level of designation) and how this affects the provision of benefits.

Conservation Status – The condition of a habitat and species can strongly influence the quality and quantity of benefits provided. In order to understand the benefits of the Natura 2000 network an understanding of the effects of the conservation status on the provision of ecosystem services is required. This would also allow taking into account the flow of benefits resulting from the restoration of sites (see Section 3.1.2 for examples). As regards the Habitats Directive, this can be linked to the achievement of a favourable conservation status as reported according to Article 17 of the Directive. As no similar status and trends assessment for bird species is yet available an analysis could be linked to the level of endangerment (e.g., Red Data lists).

For a primary valuation analysis, a representative sample of sites addressing the above aspects should be gathered. In addition, it should take into consideration characteristics such as geographical location, size and, if possible, distance to beneficiaries (e.g., population density) (see Section 3.2.5).

If no such primary work is carried out, the analysis should at least attempt to broadly classify the selection of valuation studies according to the above characteristics. If applied to all Natura 2000 sites, this would allow a more specific transfer of benefits from the study to the policy sites (see Section 3.2.4).

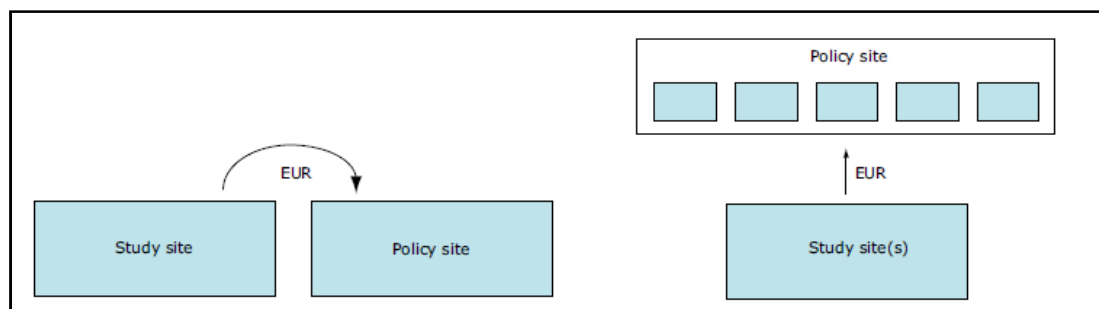
As regards the suggested period for the policy-on scenario, it is recommended to use a timeframe of 25 years for the mid-term and a timeframe of 50 years for a longer-term analysis. This would correspond with the EU mid-term target for 2020 of halting (and restoring to the extent possible) biodiversity and ecosystem services loss, probably including a sub-target for achieving a good conservation status for habitats and species of Community interest. It would also be in line with the long-term EU vision for 2050 that *‘biodiversity and ecosystem services are preserved, valued and, insofar as possible, restored so that they can continue to support economic prosperity and human well-being as well as avert catastrophic changes linked to biodiversity loss’*²⁷.

It is important to note that any marginal assessment of the benefits of Natura 2000 ought to be accompanied by a marginal assessment of the costs. Gross benefits present only a partial picture as they do not take the costs of alternative solutions into account. This might bias decision-making due to inaccurate assumptions on the actual benefits of a scheme. The gross benefits of investing, for example, in conventional farming might seem higher than the gross benefits of investing in extensive farming in Natura 2000 areas, but taking into account different costs and calculating the net benefits may lead to a completely different picture. For a detailed discussion on costs compared to benefits please consult Chapter 4.

3.2.4 Grossing and scaling up from site

In order to assess the Total Economic Value of the Natura 2000 network, one needs to gross up existing Member State aggregates or, in cases where these are not available, benefit estimates from individual Natura 2000 sites. The transfer of economic values of individual ecosystem goods or services from a particular study site to another policy site has become a common tool to estimate the value of natural resources. Commonly, this approach is known as **benefit transfer** or, in more neutral terms, value transfer. A related approach of transferring economic values is called scaling up (see Figure 14). In the scaling-up exercise, economic values from a particular study site are transferred to another geographical setting, for instance to a regional, national or global scale. Here, local values are used to estimate the value of all ecosystems (or ecosystem services) of similar characteristics in a certain region.

Figure 14: Benefit Transfer and Scaling up



Source: EEA 2010

²⁷ (COM(2010) 4/4 Communication of the European Commission on [Options for an EU vision and target for biodiversity beyond 2010](#).

Insights from experiences at national level

Only few of the interviewed country representatives mentioned aggregated benefits at the national level or gave insight on the applied methodologies. In fact, only the UK (see Box 21), Spain (see Example 3) and the Netherlands (see Example 1) provided some information to that effect. The limited quantity of information collected relating to scaling-up approaches is mainly attributable to its novelty as an issue on the research agenda. Even though a number of valuation studies exist which focus on the Natura 2000 network (or protected areas in general) and its social and economic benefits, the issue of scaling-up is currently less discussed in the responsible ministries or administrations.

Box 21: Insights from the United Kingdom

It has become clear from the interviews that the need to aggregate values at the national, regional and site level is increasingly recognised. However, the methodology to achieve this has not been defined and most organisations appear to be still in the process of working out their methodology to assess the benefits afforded by protected areas.

Reference was made to Jacobs (2004) (Example 2) on the costs and benefits of Natura 2000 sites in Scotland, but the report does not provide any substantial information on the value-transfer technique applied, stating that “the accuracy of these estimates is relatively poor in that they are based on extrapolation of the case study area visitor values (for which specialist user values are merely benefit transfer values).”

In terms of quantitative figures, Shiel et al. (2001) identified that 1,000 jobs (in full-time equivalents) were created locally as a direct impact of reserves by the Royal Society for the Protection of Birds (RSPB). This is an aggregated figure based on estimates for seven RSPB reserves.

Box 22: Example 3 - Global economic costs of the Natura 2000 Network in Spain

The report provides estimates of the effects of the Natura 2000 network on regional GDP and employment and states that multipliers, or “linkage effects,” can be calculated for production, employment, labour income and value-added. The methodology to retrieve aggregate figures is explained as follows: The value-added multiplier for the Natura 2000 network is an estimate of the total value-added that would be generated in the entire economy (regional and Spanish) by each Euro of increased direct spending for Natura 2000 sites – hence the impact on the GDP (i.e. the total value-added), at regional and national level. The employment multiplier is an estimate of the gross number of jobs that would be created throughout each regional economy from an increase in spending for Natura 2000 sites or an increase in Natura 2000-related economic activity (e.g. eco-tourism), large enough to stimulate the addition of one new job. The investments into the Natura 2000 network were integrated within a general economic circulation model which consists of social accounting matrices at national and regional level, drafted from Input-Output Tables (IOT). The objective was [...] to identify the direct, indirect and induced effects of these investments by applying the theory of Leontief multipliers.

Source: Fernández, M., Moreno, V., Picazo, I., Torres, A. & Martínez, B. 2008. Valoración de los costes indirectos de gestión de la Red Natura 2000 en España. Dirección General de Medio Natural y Política Forestal, Ministerio de Medio Ambiente y Medio Rural y Marino. Madrid. Unpublished

Box 23: Example 1 - Estimated gross benefits of Natura 2000 sites in the Netherlands

The study was based on benefit transfer and extrapolation of a generic € / ha / year. Benefits reported in the analysed literature were converted to a value annual income based on a time horizon of 20 years and a discount rate of 4 per cent, unless the relevant studies used other parameters.

For each of the analysed studies the location, the (area) size and population were described, so far as mentioned in the original study. For studies where sizes were not explicitly reported, the report estimated using surfaces information on Natura 2000 habitats. In addition, Natura 2000 sites were classified according to certain habitat types (e.g., North Sea, Wadden Sea and Delta, rivers, dunes).

Source: Kuik, O., Brander, L. & Schaafsma, M. 2006. Globale Batenraming van Natura 2000 gebieden. 20 pp

For most Member States, the non-existence of methodologies for scaling-up benefits can be explained by the poor availability of primary valuation studies. The previous sections have shown that, in most Member States, there is no developed methodology with regard to the valuation of the socio-economic benefits associated with the Natura 2000 network. The UK, Spain, the Netherlands and France provide some approaches; other countries indicate that they are not familiar with specific methodological approaches to ecosystem valuation and that no valuation studies have been conducted.

A few countries are in the planning stages of methodology development. For example, Malta indicates that benefit valuation work is expected to be carried out for the Natura 2000 site in Mellieha. However, the majority of countries indicate that there are no plans regarding the development of a methodology to assess the socio-economic benefits of Natura 2000 sites. This also implies that no grossing up of benefit estimates will be carried out in the near future.

The reasons indicated for not already having or being in the process of planning a methodology to assess the socio-economic benefits includes:

- Limited funding/costly analysis
- Limited professional capacity, e.g. no or few economists specialised in the field of benefit valuation
- Insufficient incentives for economists to specialise in this field due to the limited potential for this work.

Scaling-up national aggregates to the European level

Different techniques are available to transfer values from a study site to one or more policy sites. While simple techniques just transfer the estimated value (e.g. € / ha) from the study site to the policy site, more complicated techniques take account of different factors which can influence the value at the policy site, such as demographic factors, household income, specific characteristics of the ecosystem service or good, and the availability of substitutes.

Box 24: Overview of benefits transfer approaches supporting scaling-up of benefits

Unit value transfer: This method estimates the value of an environmental good or service at a policy site by simply multiplying a mean unit value estimated at a study site (usually expressed per household or per unit of area) by the quantity of that good or service at the policy site.

Adjusted unit transfer: This method makes simple adjustments to the transferred unit values to reflect differences in site characteristics. The most common adjustments are for differences in (household) income between study and policy sites and for differences in price levels over time or between sites.

Value or demand function transfer: These methods use functions estimated through valuation applications (travel cost, hedonic pricing, contingent valuation, or choice modelling) for a study site together with information on parameter values for the policy site to transfer values. Parameter values of the policy site are plugged into the value function to calculate a transferred value that better reflects the characteristics of the policy site.

Meta-analytic function transfer: This method uses a value function estimated from multiple study results together with information on parameter values for the policy site to estimate values. The value function therefore does not come from a single study but from a collection of studies.

Source: EEA 2010

Optimal choice between the available methods depends largely on the characteristics of both the study and the policy site, on the quality and number of primary valuation studies that serve as the basis for the transfer, and on the quality of the economic values to be transferred. While meta-analytic function transfer provides the most accurate results, it is also most demanding in terms of data quality. Therefore, it is usually not applied in large-scale value transfers (i.e. extrapolations to the European or global level). The consultation process has shown that, with few exceptions, monetary values for the economic and social benefits of the Natura 2000 network are difficult to determine. On the basis of the available data, a scaling-up of values from individual Member States to the European level could potentially take place in the form of **unit value transfer**. Under the current situation and without having additional data available, more complex and accurate approaches do not seem feasible.

Besides **measurement errors** in the primary studies underlying the scaling-up exercise, **transfer errors** caused by the transfer of study-site values to the policy site may occur, for instance by not taking into account differences between the study site and the policy site. These errors occur irrespective of the accuracy of the original values. To avoid or minimise them, it must be ensured that differences in the characteristics of the evaluated goods (including their quality and also the availability of substitutes), as well as the relevant population of beneficiaries (i.e. the affected population) are taken into account. In this context, the issue of double counting requires particular consideration. As a Natura 2000 site usually provides a wide range of different ecosystem services of which some are complementary to each other, one needs to be cautious when aggregating the benefits of each of the services. Particularly regulating services and supporting services can be considered ‘additive’, which means there is a risk that the same benefit be counted multiple times.

Finally, specific **scaling-up errors** caused by the conversion of study-site values to value ecosystem services of a larger geographical area at the policy site may occur. There are two aspects of this scaling up: i) scaling up the economic value per household, and ii) scaling up in terms of the size of the affected population that the economic unit value should be aggregated over. To avoid or minimise these third-level

errors, primary studies valuing the same ecosystem services and of similar scale (in terms of geographical area and the “level” of the affected population) should be selected for unit value transfer. In addition, there is the risk of **generalisation error**, by assuming that values can be easily transferred from a habitat type (e.g., forests) in one area to a habitat in another area without taking local, regional and national characteristics into account. This can be partly addressed by promoting primary valuation work which addresses a certain range of characteristics and classifying policy sites accordingly.

In general, it needs to be stressed that a scaling-up exercise can only be as robust as the primary valuation studies or country aggregates on which it is based. Existing uncertainties in the underlying estimates are exponentiated through the extrapolation and the result of such an exercise would therefore imply significant uncertainties.

However, the result of a scaling-up exercise would certainly help to estimate the dimension of the benefits associated with the Natura 2000 network and could be used to communicate the social and economic value of the network to the public and relevant stakeholders. A search for additional ecosystem service values – stemming from sources not collected in the framework of this project – would in any case be required.

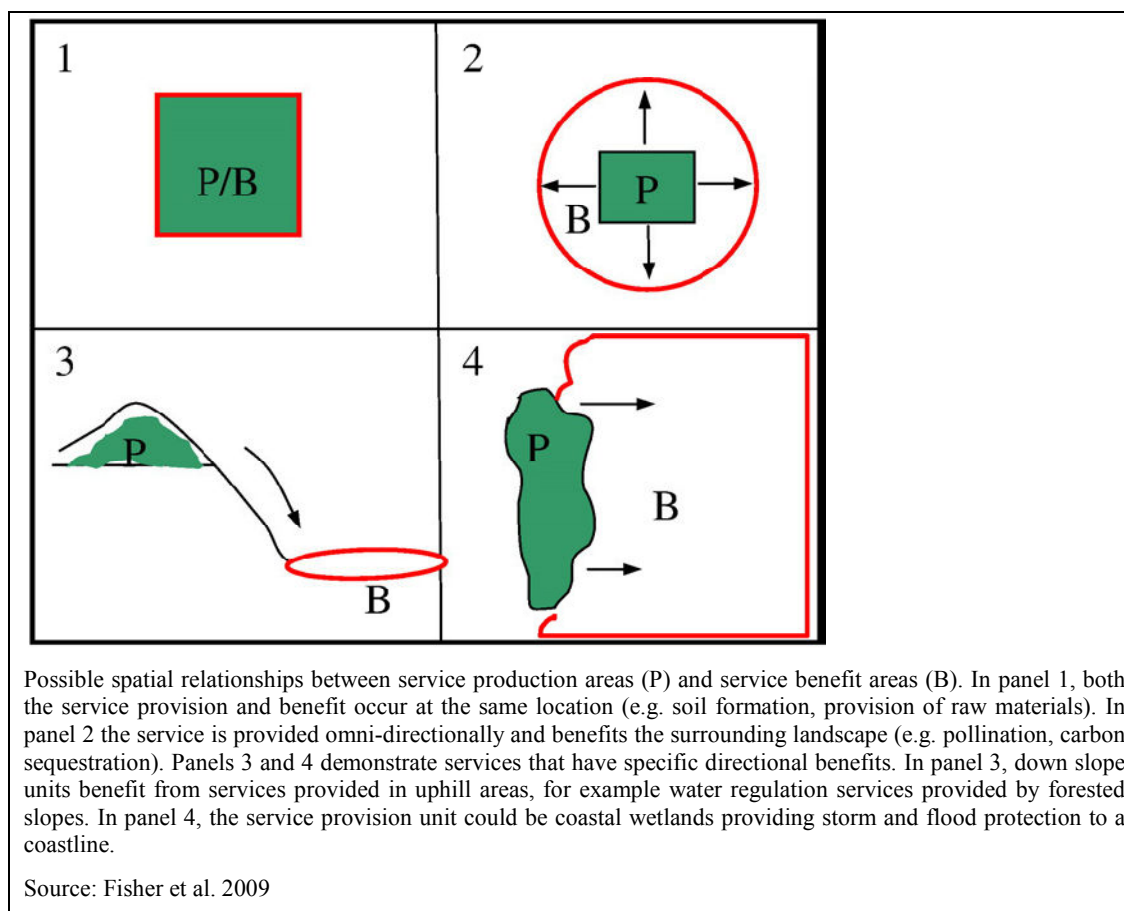
3.2.5 Identifying beneficiaries

Identifying beneficiaries and their geographical location is another key aspect when determining the Total Economic Value of the network.

Firstly, this is important when **communicating** the benefits arising from Natura 2000 (e.g., to increase public support) and when looking for **innovative ways of financing** the network (Kettunen et al., 2009a). In order to be able to identify all relevant flows of money related to Natura 2000 sites and water habitats, the authors of Bade and van der Schroeffer (2006) in Example 10 had to determine which parties have actually an interest in the revenues provided by the area analysed. According to the study, this approach allowed them to immediately employ the results in discussions about the financing of the network, in particular with regard to Public-Private Cooperation projects. Hernandez and Sainteny (2008) in Example 4 limited their analysis to the farmers affected by Natura 2000 measures as well as to the residents of the concerned region due to their immediate focus on benefits arising from agricultural activities. Jacobs (2004) in Example 2 clearly distinguished between the sum of non-use values accruing to the general public, and non-use and use values occurring to visitors to Scotland. As use values mainly referred to benefits linked to recreation and eco-tourism, visitors to Scotland were identified as the main beneficiaries in the study.

Secondly, stakeholders derive different benefits from a service and so attach **different values** to its provision. What may be a benefit to one stakeholder can represent a cost to another. In addition, service production and eventual benefit realisation can occur at different geographical locations and spatial scales (Fisher et al., 2009). The following figure illustrates various possible **spatial relationships** between ecosystem service supply and demand.

Figure 15: Spatial relationship between provision of ecosystem services and realisation of benefits



The value of a range of ecosystem services is expected to decline with increasing distance between beneficiaries and the site of service provision. This so-called distance decay could be factorised by placing a lower weight on values from ecosystem services occurring further away. According to TEEB 2010, only a handful of studies have so far attempted this approach, but it could be discussed if primary valuation work for Natura 2000 is carried out.

This shows that not only characteristics linked to a site itself (e.g., types of habitats, size of the area), but also aspects related to the beneficiaries can influence the nature and magnitude of benefits provided by the network (e.g., vicinity to particularly highly populated areas). In Berlin, for example, real estate prices were estimated twice as high for areas next to open space (100 to 200m) than for areas more distant (more than 800m) from open space. Spaces next to small protected areas elicited the highest prices (Luther and Gruehn 2001).

These so called ‘drivers of benefits’ are still difficult to fully factorise into an overall valuation of the benefits of Natura 2000, even if primary work is carried out. If case studies are to be undertaken, it is suggested that at least a **range of different beneficiaries** (e.g., general public regarding non-use values, site visitors and farmers) should be addressed. For an analysis based on available literature, a representative sample of beneficiaries considered in the different studies should be selected. Alternatively certain beneficiaries should be clearly prioritised based on the degree to which they are affected by the supply of the ecosystem services provided by the network.

4 COMPARING COSTS AND BENEFITS

The following two sections provide a general discussion on the relation between costs and benefits associated with Natura 2000 (Section 4.1) and offer insights from a range of examples on cost-benefit comparisons in different Member State and a potential way forward in getting a picture of the net benefits of the network (Section 4.2).

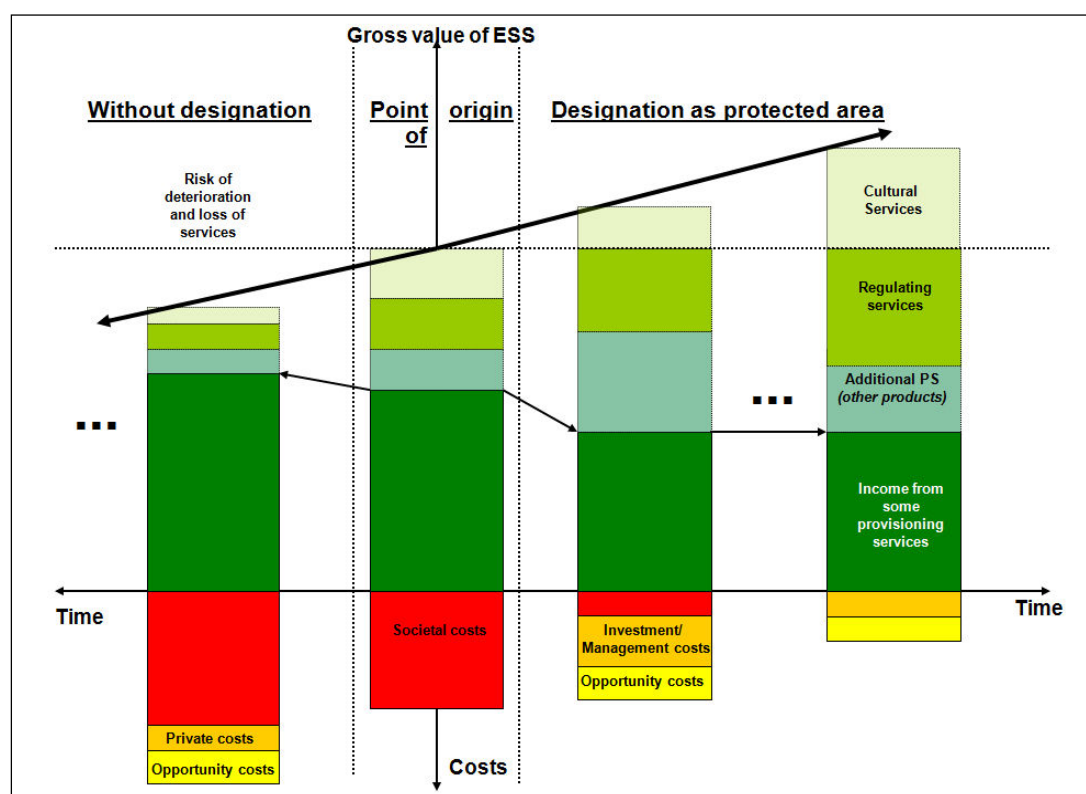
4.1 Seeing costs and benefits in perspective

To state that a protected area provides a range of ecosystem services is effectively shorthand for saying that the ecosystem protected within a designated area offers a range of services and goods. The designation is not essential for the overall existence of these services, but affects their quantity, quality and composure. How the flow of services will be influenced depends to a significant degree on the activities that are permitted or prohibited within the area. This can be influenced by the type of land use as well as the nature of designation and related investment in and management of the site. Without any form of designation or conservation, the flow of benefits risks being unbalanced (e.g., in favour of provisioning services), with some services becoming eroded (e.g. regulating services, cultural services) or even completely lost in extreme cases where the site is under strong environmental pressures or facing potential conversion (e.g., built-up land). However, without any form of designation conservation benefits risk more rapid deterioration than socio-economic benefits from ecosystem services due to the immediate loss of sensitive habitats and species. Consequently, the benefits of Natura 2000 are represented by the incremental benefit of increased volume and diversity of flows, combined with benefits of avoided loss of ecosystem services and biodiversity over time.

However, not only are the activities on a site decisive regarding the flow of benefits provided, they also influence the nature and magnitude of costs and by whom they are borne. Figure 16 illustrates the likely development of ecosystem service provision and related values as well as the nature of costs under different scenarios and over time. Not included in the figure below is the likely development of conservation benefits (see Section 3.2.2) over time, which would add another dimension to the increase or decrease in benefits associated with Natura 2000.

Benefits that are lost due to the deterioration of a site over time (**‘without designation’ scenario**) will be manifested as societal costs, private costs or opportunity costs (costs of income forgone to public and private entities) on the other side of the equation. For example, due to the loss of natural flood protection, society might have to invest in costly man-made alternatives as well as bear the costs linked to the increased risk of damages. Beverage companies might incur costs from investing in more costly technical solutions necessary to achieve the same quality of product as would be possible if a high water quality was ensured by natural protected areas. Potential income forgone from tourism related to a Natura 2000 site might result in opportunity costs for the private (e.g., tourism industry) and the public sector (e.g., taxes). It is likely that most of the costs to society resulting from the loss in quantity and quality of ecosystems services might arise because of a failure to make them explicit to producers and consumers. On the other hand, the supply of benefits can be biased towards provisioning services or in extreme cases be nearly completely lost (e.g., built-up area).

Figure 16: Analysing the net benefit of Natura 2000 over time



Source: adapted from TEEB 2009, and ten Brink 2010 - Presentation on Public Goods from Private land: Ecosystem services & PES, Workshop: Public Goods from Private Land RISE and CEPS, February 2010

The ‘**with designation**’ scenario does not only include costs related to the implementation and management of a site (e.g., investment or management costs). Certain activities on the site can be limited, affecting so the amount of certain services provided (e.g., provisioning services, tourism). This is captured by the opportunity costs of a site or network, which reflects benefits likely incurred from different land use depending on property rights and legal opportunities. However, an increase in the quality and quantity of benefits from other ecosystem services (due to a shift in activities) likely offsets opportunity costs, investment and management costs, and reduces the magnitude of costs to be borne by society.

It could also be argued that for many Natura 2000 sites the level of opportunity costs related to change in management activities should generally be lower, as the network includes a range of sites where activities prior to designation were already such that they qualified for Natura 2000 (e.g., extensive orchards) and thus no changes were required. They should also be lower with regard to other forms of designation, as the network still allows a wider range of activities to be carried out (e.g., semi-natural grasslands). These examples also demonstrate to what extent costs and benefits occurring under the different scenarios can be affected by the **point of origin** and related policies in place at that point in time (e.g., whether site was already designated as national protected area).

A fair and transparent comparison between welfare benefits and costs supplied by the Natura 2000 network should take all the before mentioned aspects into account. How-

ever, there is a need to emphasise that the project revealed an imbalance between understanding the benefits that might occur due to the implementation of the Natura 2000 network (including the costs that might result from failing to do so -‘costs of policy inaction’), and the overall costs associated with it. This will affect which of the above facets can feasibly be considered in an analysis of the costs and benefits in the near future, and are further elaborated below.

4.2 Way forward on comparing costs and benefits

Given that the current information on the monetary value of socio-economic benefits provided by Natura 2000 is very limited, at this stage it is not advised to net the monetary benefits at Community level. However, different studies gathered in the framework of this project provide important insights, also on potential steps forward, based on a range of comparisons undertaken between costs and benefits at the site, regional and national level. This ranges from classical cost-benefit analysis to economic assessments and broader comparisons.

Box 25: Example 2 - Assessment of the net economic benefits of Natura 2000 sites in Scotland

The study calculates a benefit cost ratio (BCR) as a sum of the present value benefits divided by present value costs. The discount rate to convert future costs and benefits into equivalent present day values was 3.5% for the first 30 years and 3% from years 31 to 50.

Types of costs include management, opportunity and indirect costs (administrative/policy costs) (see Section 2.2.8), which are compared to benefits such as general and specialist visitor use values, and visitor and non-visitor non-use values. Full conservation protection of all 300 Natura 2000 sites (i.e. policy-on scenario) was estimated to have an overall benefit cost ratio (BCR) of around 7 over a 25-year period. This means that overall national welfare benefits are seven times greater than the national costs and represent good value for money.

When the costs and benefits associated specifically with Natura 2000 designation are considered in isolation (marginal costs and benefits related to the SACs and SPAs designations), this resulted in a BCR of 12, according to the study.

Source: Jacobs 2004. Environment Group Research Report. An Economic Assessment of the Costs and Benefits of Natura 2000 Sites in Scotland (Research Report 2004/05). 75 pp.

Though the authors of the study above calculated the benefit cost ratio (BCR) of marginal benefits compared to marginal costs, the main focus of the analysis was to form a picture of the total costs and benefits. This was considered as the most appropriate way forward for informing policy-making. According to an interviewed representative, opponents of a designation concentrated only on the total costs irrespective of the form of designation. Accordingly, the study aimed to present all benefits arising from nature conservation. Already the fact that the study demonstrated a potentially large number of benefits arising from nature conservation was considered sufficiently helpful in defending conservation policy and designations. However, it was also commented that the problem remains that whilst costs tend to be short-run, easier to identify and concentrated locally, the benefits tend to be longer term, broadly dispersed, harder to estimate and lower per head. Hence, there is usually less political momentum in supporting such a policy than there is in opposing it even when, in aggregate, the benefits considerably outweigh the costs.

The example above also demonstrates that for a fair comparison of the overall costs and benefits associated with Natura 2000 figures need to result from **the same policy**

scenarios. As for the benefits (see Section 3.2.3), a **time period** of 25 years for the mid-term and a timeframe of 50 years for a longer-term analysis, in line with the new EU Biodiversity vision and target was suggested. The same period should be applied for any related cost analysis, and should ideally cover the period up to and a few years after a certain percentage of the network has reached favourable conservation status (which currently amounts to 17 per cent of habitats included in Annex I of the Habitats Directive for EU-25; see Chapter 1). This should allow comparison of the costs engendered in order to meet the target and the benefits arising from its achievement. In addition, ideally and depending on the objectives of the comparison (e.g., informing the wider public or financing discussions, development of new financing mechanisms), the scenarios should explore as far as possible the **marginal costs and benefits** of the network compared to other forms of designation (see added costs, Section 2.2.1, and added benefits of Natura 2000, Section 3.2.1). The clear definition of the baseline scenario (point of origin) upon which to base the ‘without designation’ and ‘with designation’ scenarios is therefore of utmost importance.

The authors analysing the benefits of farming conservation in the Burren national park in Example 6 calculated return rates for different scenarios, ranging from the pursuit of farming practices in line with the objectives of the protected area to traditional, more extensive and conventional agricultural activities.

Box 26: Example 6 - Estimated benefits arising from the Burren national park in Ireland

The authors of the study determined the rate of return as regards the application of farming practices according to the BurrenLife project (BLP farming practices). For different activities, including a comparison with conventional and traditional agricultural activities, the value of potential output and costs was determined, as well as the subsidies received. The analysis demonstrated that payoffs (output values minus direct and indirect costs) were quite small or negative (not financially viable) if no external benefits such as amenity services were taken into account (economically viable). If all operating costs of the farming programme and all direct payments are considered (most conservative estimate) the return rate would still amount to 235 per cent.

Source: Rensburg T. V., Kelley H., Yadav L. (2009) Farming for Conservation of the Upland Landscape and Biodiversity in the Burren, Working Paper No. 153. NUIG. Report prepared for the BurrenLIFE Project.

An interesting fact of the analysis above is that the farming practices envisaged for meeting the conservation objectives of the site would not in themselves be considered financially viable for the farmers. However, if payments are considered which flow to farmers from public funding sources to conserve values such as amenity, the practices become economically viable, with a high rate of return expected. The example illustrates the importance of clarifying **who the beneficiaries are** (e.g., broader public, visitors to a site) (see Section 3.2.5), **who bears the costs of the supply** (e.g., farmers) and who should cover for those costs (public/private payment for ecosystem services versus Polluter Pays principle), in order to inform the development of an adequate financing and funding framework.

This applies more so for a valuation of the total net benefits of the network, which ideally should encompass a wide range of different benefits and beneficiaries (see Section 3.2.5), but should also take into account to which stakeholders the costs fall. The best approach would be to evaluate the costs and benefits according to different **land use types** (e.g., agricultural, forests, marine) to facilitate identification of the different stakeholders. Depending on the objectives of the analysis, the focus could be further narrowed to certain ecosystem services provided by a land use type (e.g., flood

protection from wetlands). The approach would reduce the complexity of the analysis but risk at the same time providing an incomplete picture and biasing the comparison.

The current cost estimates have not been based on concrete policy scenarios and only in a few cases (e.g., UK) have marginal costs been calculated (see Section 2.2.1). This makes any fair comparison with a future potential analysis of the overall gross benefits of the network difficult. For any such analysis it is recommended to only broadly compare them with the cost estimates resulting from this report, clearly emphasising where the comparison might be skewed. If a new update of the cost estimates is carried out, separately from a valuation of the gross benefits of the network, it is important to ensure that a similar framework (e.g., policy scenarios, categories of costs) allows a more thorough comparison in the future.

In the mean time, a **case study approach** would create an opportunity to explore in more depth how costs and benefits of Natura 2000 relate. In an overall assessment of the benefits of the network a range of case studies could be carried out, which either undertake a classical **cost-benefit analysis**, such as for Natura 2000 sites in France (see Example 4) or a wider comparison such as the network in Scotland (see Example 2). Choosing a representative set of sites would not only allow for comparison of marginal costs and benefits, but also more thorough analysis of how different ‘drivers’ of costs and benefits influence the results.

If the objective is a broader estimate of the net benefits at Community level, it is recommended to undertake a comparison of selected components of the two assessments (**selective comparison**), for example by comparing direct costs with market values, or to carry out an **economic impact assessment** similar to the evaluation of Natura 2000 in Spain (see Example 3). The latter was not based on a cost-benefit analysis, and focused on economic benefits such as productivity or employment rate only, but revealed nevertheless a positive economic impact caused by Natura 2000.

All the examples of this report that undertook a comparison between costs and benefits (see this Section and Section 3.1.2), came to the conclusion that **benefits mostly exceed the costs** associated with Natura 2000, whether related to a marginal assessment, taking into account overall costs and benefits or analysing the network’s economic impact. Though by no means yet representative, it gives an indication of the likely ratio between costs and benefits. However, it also shows how the results are strongly influenced by the various factors taken into account in the analyses (e.g., policy scenario, beneficiaries, typology of costs and benefits). As for the scale of the overall costs compared to the benefits of Natura 2000 at the Community level, only hints are available as yet. A very broad comparison, still biased by many gaps and uncertainties, between the estimates of the gross benefits of the network in the Netherlands (see Example 1) and the estimate of the overall costs estimates of this report (see Section 2.1.3), would indicate that the benefits arising in the Netherlands alone would cover already roughly 65 per cent of the overall costs linked to the implementation of Natura 2000.

5 HOW TO INCREASE AWARENESS OF THE NET BENEFITS OF NATURA 2000

Interest in the value of protected areas (including the value of Natura 2000) is growing amongst policy makers and scientific researchers and there is an increased evidence base and range of toolkits to help identify values (e.g. Natura 2000 benefits valuation toolkit - Kettunen et al., 2009a; WWF Protected Areas Benefits Assessment Tool - Dudley and Stolton, 2009). An understanding of the socio-economic benefits provided by protected natural areas is important for a number of reasons: at the policy-makers level, it can help inform investment decisions on how and where to invest in certain management practices, it can facilitate the development of new financing tools as well as motivating policies to reduce pressures on the network as a whole. However understanding of the benefits is also critically required at the level of land-owners and farmers who interact with the sites from day to day and whose decisions ultimately determine the status of the site. Ensuring that those who are impacted by restrictions in protected areas understand the reasons for protection and have the capacity to benefit from the opportunities that the sites present will be vital in the ensuring the success of the Natura 2000 network. In addition, increasing awareness of the socio-economic benefits can influence the willingness to pay of different stakeholders and so ultimately have an impact on the overall economic value associated with the network.

The country missions to the Member States attempted to establish the extent to which the benefits associated with the network were understood by the public and policy makers and if they were being integrated into policy making. The interviews tried to establish what factors influence the public's perception of the benefits of the network and what measures have been used successfully to communicate with stakeholders. The following section summarises the results of this work, looking at the current awareness of the benefits of the network (Section 5.1), examining the awareness initiatives already undertaken (Section 5.2), and establishing the key factors for future work on awareness raising (Section 5.3).

5.1 Current awareness of the benefits of the network in the EU

5.1.1 Current awareness in the general public and policy makers

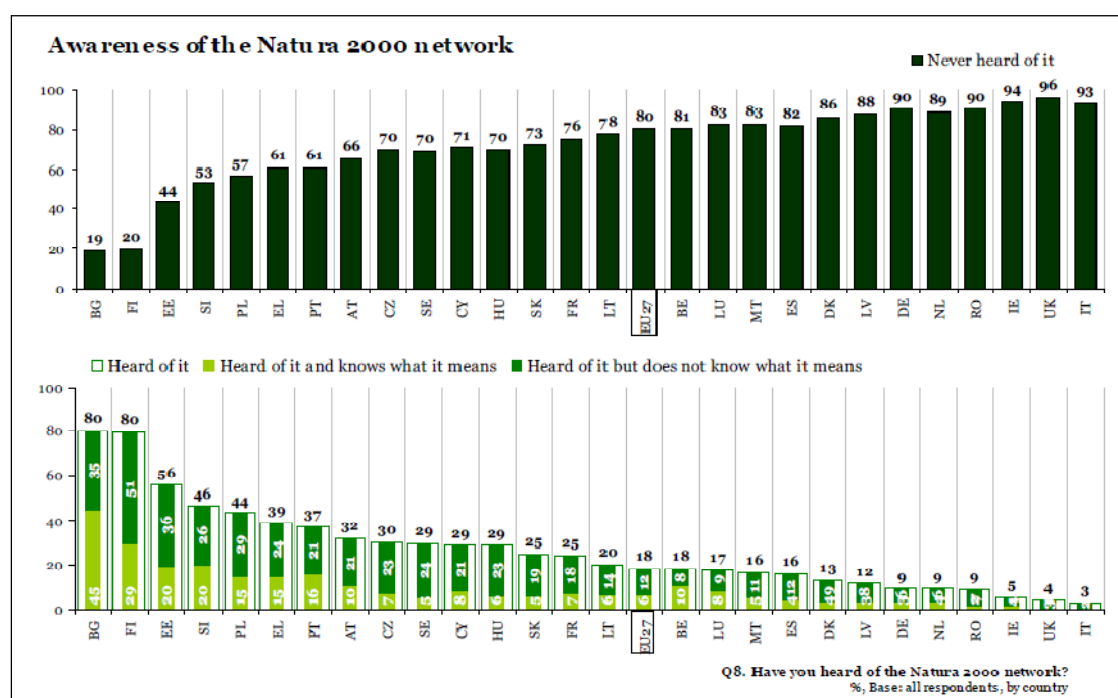
There was widespread acknowledgement amongst those interviewed that awareness of the benefits associated with the Natura 2000 network amongst the public, stakeholders and policy-makers is a crucial element of ensuring the network is implemented and managed effectively. Awareness of the benefits can assist in the designation of new sites as well as increasing the availability of funding for ongoing management. In particular, it was considered important to dispel the impression that designation as Natura 2000 brings a negative economic impact, which remains a barrier to the complete implementation of the network.

In many cases, however, there was very little knowledge amongst the public of the network's existence at all and therefore questions about the awareness of its benefits were often irrelevant. In these cases, interviewees provided their views on the overall public awareness of the existence of the sites. The results broadly correlate with the

Eurobarometer study (see Figure 17) with the exception of Bulgaria, which suggested that awareness was lower than the graph demonstrates. Those parts of the population who tend to have more dealings with the network (such as farmers, landowners etc.) were more aware of its implementation and it was noted that often the rest of the public only hear about Natura 2000 sites when there is a conflict regarding land use. This can lead to positive perceptions due to the avoided destruction of landscapes through infrastructure development as well as to negative impressions due to perceived hindrance of economic development. However, examples were mentioned where the public intuitively understood that natural areas provide benefits and support their protection, even if they do not necessarily know of, or associate these benefits to, Natura 2000 areas.

Amongst those groups that have heard about the network, knowledge about the socio-economic benefits was generally low. Often, the predominant perception is that Natura 2000 represents a burden on economic well-being, particularly among landowners and farmers. Local authorities and national policy makers were more likely to have an understanding of the benefits of Natura 2000, but this was almost more typical of those working in environmental sectors, especially amongst those who work in the field. In Greece, it was commented that awareness on biodiversity and Natura 2000 has become to be seen as less important than climate change and has attracted less attention from politicians and the media. The recession has also adversely affected concern about nature conservation.

Figure 17: Awareness of the Natura 2000 network.



Source: Eurobarometer 2007

5.1.2 Factors influencing public opinion towards Natura 2000

It was clear that a number of factors influenced the general public and stakeholders' perceptions towards nature and the likely socio-economic costs or benefits of protected areas. Some of these are summarised here.

Cultural and historical influences

Cultural and historical aspects clearly influence the public's attitude towards protected areas. This may depend on how a resource has been traditionally used or the proximity of people to nature. In Ireland, the attitude towards Natura 2000 has been significantly damaged in certain communities by the taking away of turbarry rights (i.e. the right to cut turf from bogs for fuel) which for many has been a traditional source of fuel. Subsequent national campaigns supporting the network have been unable to overturn this negative impression.

Greater proximity to natural areas, and the ability to access natural areas more easily, may have a positive impact on people's attitudes towards nature and thus protected areas. This was noted in the Baltic nations (Estonia, Latvia and Lithuania) where people are often surrounded by nature and intuitively understand the services it provides and be more open to exploiting opportunities as they arise (see Box 28). In Lithuania, two public opinion polls of those living close to protected areas on whether protection was necessary were positive and demonstrated growing support. The situation may be contrasted with Sweden, where the majority of the population does not live in close proximity to protected areas, and so the public often do not perceive the benefits from remote rural areas nor appreciate their potential for economic and social development.

Box 27 : Landowners exploiting business opportunities from natural areas, Latvia

In Latvia, there is some understanding by the public and landowners that sites important for nature can provide opportunities for profit. An example of this was provided when farmers agreed to restore ditches and ponds for the introduction of amphibian species. Once the project was completed, farmers took the opportunity to develop recreational activities and to attract tourists to the sites. This was done in form of leaflets left in local public areas and the advertisement of the areas as sites to view nature.

Consistent regulatory framework

In some cases, the regulatory framework may be contributing to negative impressions (see Box 29). Indeed, the perceived 'strict restrictions' on Natura 2000 have negatively impacted on the view of the network. The manner in which designations are made is also important. In Lithuania, the owners of the land on which Natura 2000 sites are designated are informed only after a site is designated, which led to less acceptance of the protected areas. In Ireland, even the national responsible authority viewed designation in a negative light and portrayed this perception to the landowners. This indicates a certain lack of communication from the EU to Member States on the positives of the network, and problems in managing the messaging around the benefits of Natura 2000 from the beginning.

Box 28 : Over-protected land rights, Cyprus

It has been expressed that in Cyprus, attitudes towards Natura 2000 have been adversely impacted as "Land rights are over-protected by Constitution and Law" and because "the existing development planning system together with the high value of land" encourages land owners to opt for rapid development (hotels, luxury holiday homes, and other housing and leisure development) rather than conservation and protection of biodiversity. Additionally, there is little support and history of sustainable tourism or sustainable farming in Cyprus. Natura 2000 is seen as restricting owners "natural rights" to develop the plot of land and reap the financial benefits. Hence the need to provide financial incentives or compensation to existing land owners.

Adequate payments

Often in the early stages of designation, the impression of the people directly affected by the network depends on the adequacy of compensation for loss of income. A number of case studies (such as Estonia and Romania) demonstrated that once payments began, attitudes towards the network and the related socio-economic benefits improved. Indeed, adequate payment is seen in some parts as a benefit of Natura 2000 in itself as it protects rural livelihoods.

5.2 Initiatives and approaches taken to promote awareness of the network

Work to increase awareness of the benefits of sites is closely related to the manner in which the conservation work itself is conducted. Indeed, the way that one goes about conservation activities influences the perception that local stakeholders will have of the relative costs or benefits of the network as a whole. The example of Termoncarraigh in Ireland is a demonstration of how approaching the issue of land management with sensitivity to local concerns and providing an adequate compensation for conservation measures can result in a positive perception of the potential benefits associated with the network as well as achieving biodiversity goals.

In most Member States, efforts have been made to promote the benefit aspects of the network to improve public acceptance of designation. Two types of approaches have been used: those that are general in scope but attempt to reach a wide range of people, and those that are more narrowly targeted and personalised, usually directed at people impacted by designation. The former includes awareness campaigns such as news briefs, information packs, national television campaigns, art competitions and walks in the countryside. They are often of high intensity but their impact tends to diminish when the campaign ends or funding runs out. The latter, on the other hand, frequently consists of forums, training sessions, the situating of staff in a community, and formal integration into the education syllabus. These tend to require input sustained over a longer period, and their impact tends to be more ingrained. It is not possible to directly compare the impacts of each approach, but initial impressions of the interviewees are reflected below.

5.2.1 Government initiatives to improve awareness of Natura 2000 benefits

Central governments and public agencies have used a wide variety of methods to communicate Natura 2000, with mixed results. The efforts included both those concentrated on people most directly impacted by Natura 2000 designation, and more general efforts targeted at the general public.

The requirement of the Convention of Biological Diversity (CBD) to produce a national Biodiversity Action Plan has encouraged some Member States to undertake large national campaigns on biodiversity. These have often focussed around biodiversity in general rather than Natura 2000 more specifically. Although it is difficult to assess the impacts, these have been described by the NGOs as having little impact, arguing that they have not been able to create long-lasting shifts in public perception.

Targeted and regional events (concerts in Natura 2000 sites, nature tours guides) tend to be a popular instrument to address the public and increase awareness. Some regions and Member States (e.g. Northrhine-Westfalia, Schleswig-Holstein; see Box 33) have

attempted brochures and printed material to explain the importance of Natura 2000 for protecting biodiversity, but these brochures are not as effective as (good) publicity. Hungary, however, suggested that leaflets with information on new Natura sites helped farmers involved to realise whether actually they are “affected” by Natura 2000.

Other countries have tried to establish quite original awareness initiatives. In the UK, Natural England has instigated ‘The Future of Farming Awards’ to recognise the most innovative farmers who have successfully integrated the management of biodiversity, landscape and access into the main business of their farms. In Italy, a regional championship to determine the farmer with the most extensive alpine meadows has been launched.

There is some evidence that projects with a high level of personalised engagement with local stakeholders and farmers provided the better pay offs. In Slovenia, a large national campaign on Natura 2000 which involved personal engagement with local mayors (alongside more traditional printed methods) proved very effective in gaining their support and had a favourable impact on community attitudes to Natura 2000. In Estonia, careful and intensive stakeholder engagement with local farmers by the Environment Board in Matsalu before Natura 2000 was implemented ensured that farmers were very much aware of the potential benefits that designation could bring and were able to benefit from it. In the neighbouring area of Saaremaa, which faced similar issues, poor consultation led to several years of hostile conflict after designation.

Other examples include the re-introduction of charismatic species (Box 30), positive messaging campaigns (see Box 31) and direct training of farmers to meet criteria for Natura 2000 payments (see Box 32).

Box 29: Introduction of charismatic species, Ireland

The introduction and/or protection of a charismatic species can help with promotion of an area. The Golden Eagle reintroduction in Glenveigh national park in County Donegal (Ireland) has acted as a source of tourist attraction, as has the reintroduction of the White Tailed Eagle in County Kerry. In the latter case, the tourism industry realised the potential importance of the bird to attracting tourists to the area and their support was instrumental to ensuring the reintroduction went ahead. These cases are changing public opinion and raising awareness, although farmer concerns about damage to their flocks of sheep are proving difficult to change.

Box 30: Awareness campaigns in Bulgaria

During designation, the messages of the large Ministry of Environment awareness campaign were:

- land ownership will not change
- land use will not change dramatically
- sustainability will be the major goal, including the promotion of traditional land use practices
- land sales will not be restricted or other common activities.

Currently, public hearings are being organised before orders for each Natura 2000 site under the Birds Directive (SPAs) are adopted. The campaign did not include significant messages related to socio-economic benefits of the network.

Box 31: Training of farmers in Estonia

For agricultural and forestry land, the Ministry of Agriculture arranges training to raise awareness of Natura 2000 although these are not obligatory for receiving payments from Rural Development Plans. The semi-natural habitats require particularly sensitive management; e.g. meadows, pastures. The response from the farmers and landowners has been very positive and exceeded expectations. Farmers have been attracted to the training sessions as good knowledge of the policies is considered necessary to pass the ground checks and receiving payment. In some cases, farmers have expressed considerable interest in conserving the habitats themselves, not solely for their entitlements to payments.

Box 32: Awareness campaigns in Schleswig-Holstein (Germany)

In order to increase public awareness of biodiversity and Natura 2000 benefits in Schleswig-Holstein, several events have been held to engage local residents. The campaigns have set out to create a sense of understanding and responsibility for the network, which has led to cooperation with relevant regional and local actors in defining management measures and preparing of management plans. This has been done through:

- engaging local action groups
- holding events and presentations in affected areas in order to involve relevant stakeholders
- applying a participative approach within the preparation of the management plans.

Local action groups are financially supported by the federal state, with the staff costs for a manager subsidised by up to 70%. Currently there are 6 local groups that focus in particular on areas where a high number of stakeholders are affected/ involved and/or land use intensity and thus high conflict potential exists.

5.2.2 NGO initiatives to increase awareness of benefits

NGOs have adopted a wide-range of initiatives of their own to raise awareness, both related to Natura 2000 sites and biodiversity in general. Many have focussed on a smaller scale than those established by governments and have included more hands-on approaches, such as directly managing sites, inputting to education programmes in schools or the use of volunteers on camps. A common theme is the attempt to make the connection of nature to daily life, so that people can see the potential of Natura 2000 to make a positive contribution to their own livelihoods (see Box 34).

A number of NGOs, such as the IPCC in Ireland and ELF in Estonia have adopted very practical approaches to raising awareness of the benefits of nature such as actively bringing people to the sites or arranging volunteering activities and organising community groups. In Ireland, the IPCC has also focussed on working with school curriculums, writing reports, and promoting the amenity and cultural heritage aspects of the sites.

Box 33: An eco-tourism project based on viewing wild bears, Maramures, Romania

The initiative by WWF in Maramures in northern Romania provides a good example of where efforts to improve the public's awareness of the benefits of natural areas overlap with conservation efforts. The project sets out to provide locally-run enterprises to allow tourists to view bears in the wild. By ensuring that the benefits return to the local communities, it is hoped that land owners will be encouraged to manage the forests in a way that is favourable to the conservation of bears. Viewing hides have been set up and a local museum based on the local area and history is due to open shortly. They intend to scale this project up to a regional level. The project is located in Tibles Mountain (Maramures County).

Eco-tourism provides an opportunity to develop initiatives that are mutually beneficial for Natura 2000 sites and for rural development. Some NGOs have complained that these opportunities are not being exploited by the national governments who at times more focus on national parks. Exploring eco-tourism options in areas outside the national parks could provide an incentive to locals to protect the sites. Indeed, WWF Romania suggest that general awareness campaigns by NGOs are very unlikely to have a significant impact on public perception and that it is substantially more effective to link Natura 2000 sites to the production of traditional products and to local identity.

There have been other approaches that were not targeted at Natura 2000 sites but provide insights into the role that NGOs can play in raising awareness of sites under direct threats of destruction. For example, a campaign led by a Birdlife partner in Malta involving celebrities was successful in helping bring to an end the practice of spring-hunting. The key was the ability to obtain sufficient high-profile exposure to pierce the public consciousness and the organisation felt that a similar approach could be easily applied to the protection of Natura 2000 sites. In Greece, the Hellenic Society for the Protection of the Environment and Cultural Heritage (HSPE) have published a book on biodiversity and use local and national media to promote the national importance and benefits of biodiversity. Greenpeace in Sweden led a campaign for a marine protected area that caused significant conflict between Greenpeace and the local fishermen but was successful in stopping environmentally damaging activities by raising awareness of the issues in the general public.

5.3 Key factors for successful communication to promote the socio-economic benefits of Natura 2000

This section synthesises the key lessons from the interviews on how to most effectively communicate the benefits of Natura 2000. These key factors include the following and are described below:

- Early engagement and civil involvement
- Consistent and appropriate implementation
- Communicating the link between conservation measures and associated socio-economic benefits of Natura 2000
- Prompt and appropriate payment
- Delivering local successes
- Supporting education programmes and developing skills
- Engaging other government departments
- Choosing the appropriate scale for communication.

5.3.1 Early engagement and involvement into the project

The promotion of civil involvement is an important opportunity for Natura 2000 sites. Concerted actions in relation to a single site can bring neighbours together and encourage locals to think about the whole community rather than just their personal benefit. By allowing farmers to enter on their own discretion, strengthening relationships to the community and providing rewards that were seen as sufficient compensa-

tion, projects can build up trust and mutual respect. Time is required to communicate directly to farmers. Presenting the plans in places where farmers feel comfortable and making oneself available to speak to farmers in their own time is important. As a result of such a case in the west of Ireland, farmers in the region now have a greater understanding of wildlife management and are more likely to view future measures favourably.

5.3.2 Consistent and appropriate implementation

It is important that the implementation of the Directive is fair and consistent in order to earn positive perceptions of the network. Over-restrictive interpretation of the Directive locally tarnishes the reputation of the network as a whole. For example in Bulgaria, many rules and conditions surrounding cross compliance and rural development measures have been poorly adapted, to the national context because of contradictions with the mainly extensive farming practices characterising Bulgarian agriculture. In Romania, implementation has been interpreted so strictly in certain areas that even actions such as repaving roads in villages have been restricted due to Natura 2000 regulations, which has soured the public's perception of the network. On the other hand, under-restrictive interpretation can also negatively affect the public opinion. Inconsistent application of the requirements, particularly regarding the implementation of Article 6, can weaken the perception of Natura 2000 as an effective tool in conserving regional landscapes from major infrastructure developments.

5.3.3 Prompt and appropriate payments

The delivery of payments has been shown, perhaps not surprisingly, to alter the perception of Natura 2000 to landowners of Natura 2000 areas. The realisation of payments has been very important for improving the perception of Natura 2000. For example, in Estonia, the time lag between the implementation of restrictions (2004) and the first payments (2006 -2008) initially reinforced scepticism, but these quickly changed once payments began. For example, in the island of Saaremaa, Estonia, due to particularly poor communication of the Natura 2000 designation process, attitudes towards designation were extremely hostile, with a very public national campaign against the network. However, support for the campaign subsided once the payments started and farmers began to benefit from designation.

However, depending on the situation, the payments of compensation for management approaches may not be sufficient on their own. Quite often, it is not easy to communicate to farmers what payments are available. In Ireland, two case studies BurrenLIFE and Termoncarragh showed that the payments for certain management practices resulted in a positive uptake of the schemes with good ecological benefits, provided there was careful communication with the community. In Romania, one of the issues experienced is the difficulty in communicating to farmers, who often may be isolated and unaccustomed to the policy changes, of what is entitled to them.

5.3.4 Communicating the link between conservation measures and related socio-economic benefits

The Member State representatives emphasised that clear data on monetary values and case studies illustrating the benefits of Natura 2000 can be more effective than traditional communication tools. It is important to communicate this data to all sectors of society, but they emphasised in particular the targeting of all government departments and civil servants (including departments for finance and agriculture), local authority planners and landowners. In certain cases, awareness of the benefits can be signifi-

cantly more effective and cost efficient than enforcement and should provide a strong basis for protection of the sites.

The lack of comprehensive scientific data on the benefits remains a stumbling block to engaging other government departments and sectors of society. For many Member States, it is still too early in the process as they struggle with implementing management plans and the question of the broader ecosystem benefits associated with natural areas can appear disconnected from reality. In order to win the support of the local population, which was seen as one of the most important objectives of any valuation exercise, it is important to first emphasise the importance of the short-term benefits (e.g. job creation, economic development) and then slowly introduce and explain long-term benefits. Particularly, it will be important to demonstrate the link between management measures undertaken to achieve the conservation objectives of the site and the resulting socio-economic benefits. This would help in addressing some of the conflicts that still exist.

Box 34: Need for benefits data in Tallinn, Estonia

There are currently two thematic plans being developed for Tallinn: one is for street network and highways, the other for urban greenery. Due to contradictions between the two thematic plans, both are at a standstill. Information on the benefits would be particularly useful in these cases to help planners make informed decisions (esp. concerning air pollution and health issues).

It is not just data on socio-economic benefits that can be useful for awareness. Compiling accurate and up-to-date information on biodiversity (related to the conservation value) can also be used to improve awareness of nature conservation and protected areas (see Box 36).

Box 35: Biodiversity data centre, Ireland

In Ireland, the weakness on communicating the benefits of biodiversity in the past was not being able to track changes on biodiversity. The National Biodiversity Data Centre attempts to counter this by working on making all the information on the resources available. The priority for the centre is to develop a national biodiversity data centre framework, establish a mapping system and develop the internet resource for people to access information quickly (including, for example, the Red List data for the country). They have developed priority lists to communicate the value of biodiversity. This work involves hard data management on the status of the biodiversity.

5.3.5 Delivering local successes

It is important to show examples of real people with stories of successful implementation of nature conservation, demonstrating benefit to communities. Initiating a project – helping to restore areas, building walls, providing stock - can have a positive impact on awareness. A negative view of Natura 2000 can turn to a more positive opinion (e.g. in Estonia) and as a result more people would like to be involved in its successful implementation.

Latvia encourages the commissioning of work that would enable entrepreneurs to understand the money-making potential of sites, in particular in relation to tourism. This would have the impact of reversing the negative impression prevalent about Natura 2000 sites and encourage conservation of sites. In Abruzzo in Italy, local businesses contribute a part of their profits to the Natura 2000 site's management authority. This is looking to be copied by Med SOS in Greece.

To a certain degree, adequate quality of sites is required before the full awareness potential can be realised. Therefore, direct investment into protecting and/or restoring sites will be necessary if stakeholders and/or other government departments realise the benefits of the sites. This relates both to the monetary and non-monetary values.

Local action, for example where residents save their local site from development, is of great importance as it reinforces local pride in the areas, and is therefore often more beneficial than government, ‘top-down’ approaches (see Box 37).

Box 36: Community activism in Ireland to protect peatlands

In Ireland, a number of case studies demonstrate how communities have succeeded in changing public attitudes through their own initiative. They demonstrate that bottom-up approaches can very effectively engage a community and strengthen awareness and pride in local natural areas. In Abbeyleaks, County Laois, a local group prevented Bord na Mona (Ireland’s primary turf development company) from developing a site close to the village. The village is a heritage site and the community felt strongly that such a development would detract from the heritage value of the area. The substantial effort required and subsequent success resulted in greater community pride in the bog and awareness of the benefits provided. In County Waterford, the Fenner Bog Conservation Group has greatly increased awareness of the bogs in the area, improved access to the sites and developed and communicated the science of the areas. In the Slieve Bagh Mountains between Northern and the Republic of Ireland, a community group has been established to promote the area for long distance walking and to protect it from inappropriate development by spring water companies and windfarms.

5.3.6 Supporting education programmes and developing skills

An interesting approach to make long term change is to work through the formal education system by developing books and tools to help teachers communicate the national curriculum. These would include tasks for students to research and get involved in, which help achieve their curriculum goals and help change attitudes and lifestyles. It can be integrated into art, languages, geography, history and so on. While general campaigns finish and lose interest, integrated education schemes are taught year after year and can last for a long time. The Irish Peat Conservation Council have developed a very successful school programme, covering primary and secondary level, which has been copied by conservation groups across Europe, including France, Estonia and Latvia.

It has also been pointed out that education at university level is essential in order to create the skills in environmental economics for research into the benefits of nature to be made possible in the future. This may include the integration of environmental economics into more conventional economic courses.

5.3.7 Appropriate scale for communication

The size of the country affects the success of a national campaign. Malta and Luxembourg, it was suggested, may be suitable for national campaigns as the countries are small and access to natural areas is easy (thus understanding is higher) than may be the case in more populous countries.

It was noted, therefore, that in order to increase awareness on the network, it will be important to use a local approach, and one that is connected to the local situation and history. Importantly, Natura 2000 should not be perceived as something ‘imposed by Brussels’ or even the national government. This may mean that part of the communication is the responsibility to regions. Promotion of protected areas will have to be

specifically tailored regionally and locally, as each region has its own individual history, culture and priorities. This can be noted already in the approaches cited in the responses. For example, Latvia cited encouraging entrepreneurs, Lithuania suggesting to link it to health, and Malta suggested linking it to cleaner air.

5.3.8 Engaging other government departments

A recurring theme was the need to include other ministries in the discussions to avoid ‘preaching to the converted’. Little emerged on how to do this but it was clear that inviting them to the events and meetings on the subject, involving them in the research work from an early stage and showing how nature conservation can help meet their departmental objectives will be crucial for the integration of nature conservation policies throughout governments.

6 CONCLUSIONS AND RECOMMENDATIONS

The following chapter highlights key conclusions from the previous chapters and provides a summary of the key recommendations.

Costs of Natura 2000

The cost exercise was a very valuable process, with a large majority of Member States (25 out of 27) answering the cost questionnaire and providing further insights into their approaches in the interview process. Depending on different extrapolation methods overall costs for the EU-27 were estimated to range between €5.5 and €5.8 billion per annum. There are very wide variations in average costs, which range from €14 per hectare in Poland to more than €800 per hectare in Cyprus, Luxembourg and Malta. Differences across Member States can be explained by a wide variation regarding characteristics such as the size of sites, population density and income (drivers of costs), but also regarding aspects such as the maturity of the network and conservation strategies. In addition, it has also been a difficult exercise as emphasised by the range of challenges encountered and described throughout Chapter 2 on costs. Some of them are re-highlighted below, including recommendations on potential future solutions.

Marginal costs - The issue of differentiating costs between Natura 2000 sites and national protected areas was considered challenging, particularly from a top-down perspective. A bottom-up analysis would allow getting greater specificity on the costs of Natura 2000 and offer a range of additional insights (e.g., costs of current management to costs needed to meet conservation objectives) and complement information gathered in a top-down exercise (e.g., administrative staff working on Natura 2000).

Costs of achieving Favourable Conservation Status – The use of a bottom-up analysis and a range of case studies would allow better addressing the challenge of determining cost evolution over time as the site moves up to favourable conservation status. This could also help explore to what extent cost mark ups on top can help to successfully approximate related costs.

Opportunity costs - The issue of opportunity costs should be explored in more detail. It is important to clarify what type of compensation payments (one-off and recurrent) can be considered as opportunity costs. In many cases land purchase costs can also be considered as a (capitalised) measure of opportunity costs.

Mandatory cost assessments - It was noted that it was difficult for Member States to obtain data from different authorities as the questionnaire was not a mandatory exercise. It was suggested that cost estimates should be made part of mandatory reporting activities on Natura 2000 and should be linked to respective reporting periods and at least every 5 years. Reporting could also be part of the assessment on whether future sub-targets under the new EU Biodiversity Strategy are to be achieved (e.g., on whether sufficient funding for the Natura 2000 network is ensured).

Data collection and databases - The need to develop a cost database was often emphasised. The development of a database could be linked to the Natura 2000 reporting requirements and according platforms. This would also allow collecting

data more regularly, and represents an opportunity to include costs in a standardised form across the EU. In order to improve costs estimates it was recommended to stimulate a web exchange of information.

Experience sharing and coordination - Sharing experience and methods with other Member States was considered helpful to clarify how to assess certain costs, e.g. one-off compensation payments, and address certain challenges (e.g., identifying marginal costs). In addition, greater central coordination at Member States and EU level was considered useful, and the further development of a common EU methodology would be welcomed.

The importance of this exercise lies in feeding into the discussions on the financial perspective for the implementation of the network in general and on integration of Natura 2000 into different policy programmes in particular (e.g., Cohesion Policy, Rural Development Programmes). This suggests a five- or seven-year **time period for formal requests** on cost estimates to Member States. Naturally more regular cost exercises could be valuable at country or regional level to help make greater use of funding opportunities (e.g., Life+ and Structural Funds), and annual reports would be useful to allow a consistent and comprehensive update of cost estimates in line with financial reporting periods (e.g., national accounts).

To support this exercise, **additional guidance** is needed (indeed some would argue invaluable) to help standardise and harmonise the approach. The exercise to date has been a very important step in the process and has helped clarify which issues need to be further addressed to reduce the scope for interpretation which currently leads to a wide range of different approaches. In order to obtain comparable data that address the question of costs and financing required to complete the network and meet conservation objectives guidance is particularly needed regarding the clarification of favourable conservation status, annuity period for land purchase costs, land use types versus habitats types or collection of site level data.

Importantly, a clearer guidance should be complemented by **two new activities**:

1. A **bottom-up site questionnaire** on costs of Natura 2000 sites (and perhaps also protected areas more widely), and arguably also including other questions on funding and on benefits to help obtain information regarding use in different domains. Ideally this would involve both a statistical analysis to develop cost functions at EU and/or national level and help identify drivers of costs.
2. A **case study approach** to explore in more depth what the drivers of costs are, how costs evolve over time, and how they link to achieving favourable conservation status (e.g., restoration). This arguably could be done in conjunction with an analysis on the benefits associated with Natura 2000, how those benefits influence the costs (e.g., cost savings, restoration) and how understanding of benefits helps raise additional financing and from which sources. The timeline of the analysis should be over the period up to and indeed a few years after a site has reached favourable conservation status.

Benefits associated with the network

Even though our knowledge on the value of biodiversity, ecosystems and their service is steadily increasing, there is still an apparent **lack of quantitative / monetary and well-documented information on the socio-economic benefits associated with protected areas, including Natura 2000, in Europe**. According to the review carried out in the context of this study, existing information on the socio-economic significance of Natura 2000 is mainly related to benefits arising from direct and indirect employment supported by Natura 2000 sites. In addition, data is available on the socio-economic impacts of cultural ecosystem services, in particular tourism and recreation. However, there is a clear shortage of well-documented examples demonstrating and, in particular, quantifying the value of other ecosystem services relevant in the context of the network, such as sustainable production of certified products from Natura 2000 sites, role of Natura 2000 areas in purifying water and maintaining healthy populations of species (such a pollinators and natural enemies of pests).

In addition, the available information (e.g. information on employment and tourism linked with Natura 2000) is based on a rather sporadic collection of local case studies and examples, making it difficult to form a coherent picture of the benefits associated with Natura 2000 on a broader scale. Only a **handful of studies exist that try to assess the gross / net benefits of Natura 2000 at regional or national level**. These studies also often focus on a **limited number of socio-economic impacts** (e.g. excluding several ecosystem services), therefore falling short in addressing the true welfare benefits arising by Natura 2000 sites.

Nevertheless, there is a growing interest in understanding the value of nature in general, the value of Natura 2000 in particular, and in an **increased evidence base**. This report collected a range of studies in different Member States on the costs and benefits of the Natura 2000 network and protected areas in general. Around 12 of the most interesting examples have been presented in this report. Insights and lessons learned from those examples as well as from recommendations provided by Member State representatives and key stakeholders have been used in further developing a typology of benefits and a standard valuation framework to support the assessment of the overall monetary value of the Natura 2000 network.

Typology of Natura 2000 benefits – The definition of a common typology of benefits linked to Natura 2000 is a prerequisite for developing a standardised framework for assessing the value of the network and thus the first necessary step to allow aggregating and presenting benefits at the national and/or European level. To this effect, it is suggested to slightly ‘**re-pack**’ the **MA classification**, taking into account the objectives of the Habitats and Birds Directive, facilitate the identification of related benefits and reduce at the same time some of the risks attached to the use of a certain typology for benefits valuation. A way forward is presented in Table 21.

A further understanding of the “**additional**” **benefits of Natura 2000** is required. Aspects such as coherence, benefits beyond national borders, increased resilience beyond Natura 2000 sites and the conservation of natural heritage will need to be carefully considered in any study on the overall monetary value of the Natura 2000 network. The identification of a sample of study sites would allow comparison of different forms of conservation initiatives and their impact on the delivery of socio-economic benefits.

Standard Valuation Framework – The **Total Economic Value** (TEV) framework should form the basis of any standard valuation framework applied for Natura 2000. However, this should be tailored to the objectives of the network.

The suggested framework of this report breaks down the TEV into two major components, **socio-economic benefits** and **conservation benefits**. Socio-economic benefits primarily link to use values arising from direct use benefits (mainly provisioning services), indirect use benefits (mainly regulating and cultural services) as well as any related option value of these benefits for the future (as a reflection of 'the insurance' value of resilience). Conservation benefits (benefits emphasising the anthropocentric perspective and so different from conservation values) emphasise the importance that people give to the existence value of certain habitats and species protected by Natura 2000 today and for future generations. It represents an interface between the anthropocentric perspective of benefits for human well-being and the **intrinsic value** of habitats and species.

The authors also advise to differentiate between **market value** and consumer surplus, which together with the value of cost-based approaches forms an **indicative monetary value** of the network. This allows one to distinguish between values representing 'real money', and 'potential to be real' (becoming real if markets are set up) and broader 'welfare benefits' (reflecting social perception of benefits). This can be important when communicating benefits associated with Natura 2000 to different stakeholder groups.

In addition, the report suggests taking the **economic impact** of Natura 2000 into account (e.g., direct and indirect employment, supporting rural and regional development). Although not additive to TEV, it helps to provide a better approximate of the **Total System Value** (TSV) and highlights the importance of Natura 2000 for its wider socio-economic benefits.

Considering the apparent lack of monetary valuation studies available on Natura 2000, for an aggregation of values on a national or Community scale, it is recommended to undertake **additional primary valuation work**.

If primary valuation work is carried out to determine aggregated values of the network at national or Community level, the authors suggest:

- **Applying a habitat/land use type approach** - This would require identifying ecosystem services/benefits specific to a certain habitat or land use type (e.g., woodland: raw material, carbon sequestration, air quality), but would be useful down the line for discussions on adequate policy instruments.
- **Defining clear policy scenarios** - This should ideally refer to a baseline scenario on which to build policy-on and policy-off scenarios. A representative sample of sites (**case study approach**) should look more concretely into the **marginal values** of the network, i.e. what impact changes in the policy framework have on the provision of benefits provided by the network. This should particularly address the following two aspects: conservation status (favourable, unfavourable etc) and conservation initiatives (interaction of Natura 2000 with other forms of designa-

tion). A concrete **time period** should be defined (see conclusions on comparing costs and benefits).

- **Using benefit transfers taking into account different factors** (adjusted unit transfer to meta-analytic transfer) - Identify drivers of benefits (e.g. size, distance from urban environment, sustainability, beneficiaries) and in case consider factorising values if sufficient information available. The **spatial interconnections** between the source of the services (e.g., Natura 2000 sites), the beneficiaries (e.g. cities), and the pathway (e.g., rivers, groundwater aquifers) are particularly critical to communicate.

If no primary valuation work is carried out to determine aggregated values of the network at national or Community level, the authors suggest:

- **Applying an ecosystem services approach** - Considering the current robustness of data, an ecosystem services approach is the most likely type to be used. The ecosystem services approach analyses ecosystem services provided in a certain area covered by a variety of land use types, habitats or species. It is easier from an analysis perspective and would allow an extended range of ecosystem services to be analysed and presented, depending on primary studies available.
- **Classifying studies according to certain characteristics** - The analysis should at least attempt broadly classifying the selection of valuation studies according to the characteristics such as size of sites, conservation status and protection scheme the site falls under. If applied to all Natura 2000 sites, this would allow a more specific transfer of benefits from the study to the policy sites.
- **Using unit value transfer** - A scaling-up of values from individual Member States to the European level could potentially take place in the form of unit value transfer. An adjusted unit transfer is recommended if studies can be classified according to characteristics above.

Generally the report advises to extrapolate aggregate values for some ecosystem services. This particularly applies for those ecosystem services where a higher number of primary studies is available (e.g., recreation, flood protection) or where a higher interest in undertaking primary valuation work is given. For each ecosystem service the way forward to adequately aggregate and scale up values from study to policy sites should be identified.

A key aspect of undertaking benefit valuation work is whether and how authorities take this information into account in their **policies/instruments/investment decisions**. It will be important to clearly define these aspects in the objectives of the analysis, as many valuation studies have been criticised for failing to address these issues.

Comparing costs and benefits

The designation of an area is not an essential prerequisite to the overall existence of ecosystem services, but affects their quantity, quality and composition. However, activities on a site are not only decisive regarding the flow of benefits provided, but also influence the nature and magnitude of costs and on whom they fall.

A **fair and transparent comparison** between welfare benefits and costs supplied by the Natura 2000 network needs to balance different components on each side of the equation, so as to compare the like with the like.

The project revealed a current **imbalance** between understanding the benefits that might occur due to the implementation of the Natura 2000 network (including the costs that might result from failing to do so -‘costs of policy inaction’), and the overall costs associated with it.

Due to a lack of **primary valuation work** the current information on the monetary value of socio-economic benefits provided by Natura 2000 is very limited, and at this stage it is not recommended to net the monetary benefits at Community level.

If a future analysis at the EU level focuses on the gross benefits, it is recommended to undertake only a **selective comparison** with the cost estimates of this report. This refers to a comparison of selected components such as direct costs and market values. If it falls within the scope of a given study, an additional **economic impact assessment** can also be carried out.

If primary valuation work is undertaken, a **case study approach** would offer the opportunity to explore in more depth how costs and benefits of Natura 2000 relate. In an overall assessment of the benefits of the network a range of case studies could be carried out, either applying a classical **cost-benefit analysis** or a wider comparison.

Examples of studies that have undertaken comparisons between costs and benefits of Natura 2000 at the site, regional and national levels have provided important insights on **potential steps forward**.

The following key factors should be considered:

- For a fair comparison of the overall costs and benefits associated with Natura 2000 figures need to result from **the same policy scenarios**.
- It is suggested that the scenarios should refer to a **time period of 25 years** for the mid-term and a timeframe of **50 years** for a longer-term analysis, in line with the new EU biodiversity vision and target.
- Ideally and depending on the objectives of the comparison (e.g., informing the wider public or financing discussions), the scenarios should explore as far as possible the **marginal costs and benefits** of the network compared to other forms of designation, as well as the costs of reaching and the benefits of achieving **favourable conservation status**.

Awareness-raising of net benefits

An understanding of the socio-economic benefits provided by protected natural areas is important for a number of reasons: at the policy-makers’ level, it can help **inform investment decisions** on how and where to invest in certain management practices, it can **facilitate the development of new financing tools** as well as motivating policies to reduce pressures on the network as a whole. However understanding of the benefits is also critically required at the level of stakeholders such as landowners and farmers who interact with the sites from day to day, whose decisions ultimately determine the

status of the site, and where awareness of the socio-economic benefits can help to **overcome conflicts** and create win-win situations. In addition, increasing awareness of the socio-economic benefits can influence the willingness to pay of different stakeholders and so ultimately have an impact on the overall **economic value** associated with the network.

There was widespread acknowledgement amongst those interviewed in the framework of this project that awareness of the socio-economic benefits associated with the Natura 2000 network amongst the public, stakeholders and policy-makers is a crucial element of ensuring the network is implemented and managed effectively.

Major steps forward have been made where clear and robust assessments have been carried out that are either high profile (e.g., Scotland assessment in Example 2) or have strong practical functions (e.g. where linked to flood control and investment decisions, such as in Example 8).

The key lessons from the interviews on how to most effectively communicate the benefits of Natura 2000 and from the examples provided include the following:

- **Early engagement and civil involvement:** It was clearly demonstrated that early engagement with landowners and the building of mutual trust greatly improves perceptions of Natura 2000
- **Prompt and appropriate payment:** Attitudes towards designation have changed once landowners have learnt how to secure payment, providing measures are not excessively onerous.
- **Consistent and appropriate implementation:** It is important that Natura 2000 measures are not overly zealous, but also not overly indolent regarding the implementation of the requirements of the two nature Directives
- **Delivering local successes:** Demonstrations of how Natura 2000 can provide benefits to the community help to alter perceptions
- **Education and skills:** Incorporation of nature conservation into the education system can provide more long-lasting changes to perceptions of protected areas
- **Choosing the appropriate scale for communication:** It was noted that in order to increase awareness on the network, it will be important to use a local approach and one that is connected to the local situation and history.
- **Engagement of other government departments:** The benefits associated with Natura 2000 need to be better understood by the Agriculture and Finance Departments to ensure their continued implementation.

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ANNEX I

Exchange Rates used for cost estimates (1 January 2010)

Currency	1 EUR =
Czech Koruna	CZK 26.44
Estonian Kroon	EEK 15.65
Latvian Lat	LVL 0.71
Lithuanian Lita	LTL 3.45
Swedish Krona	SEK 10.27
UK Pound	GBP 0.89

ANNEX II

Extract from questionnaire – Question 4 on cost estimates linked to existing Sites

QUESTIONNAIRE - TO MEMBER STATES ON THE FINANCING REQUIREMENTS TO EFFECTIVELY MANAGE NATURA 2000												
Question 4: Financing Requirements for the <i>Existing</i> Natura 2000 sites (In answering questions 4 and 5, it is not necessary to answer question 3)												
Management Actions		Guidance number	Key Activities	Total cost (specify currency)	Basis for Estimate - methods/data sources (add separate paper annex to offer necessary details)							
ONE OFF COSTS												
Finalisation of Sites		1	Scientific studies, administration, consultation etc									
Management Planning		2	Preparing management plans, establishing management bodies, consultation etc									
		1+2	Subtotal: One-off costs management	0								
		3	Land purchase									
		4	one-off (ie not regular annual) payment of compensation for development rights									
		5	Infrastructure needed for the improvement / restoration of habitat or species									
Investment costs		6	Infrastructure for public access, interpretation works, observatories and kiosks, etc (contributing to conservation)									
		3-6	Subtotal: Investment	0								
		1-6	Subtotal: One-off Costs	0								
		RECURRENT COSTS										
Management planning		Key Activities		Total annual cost	Basis for Estimate - methods/data sources (add separate paper annex to offer necessary details)							
		7	Running costs of management bodies									
		8	Review of management plans									
		9	Public communication									
		7 to 9	Subtotal: management planning	0								
		Habitat management and monitoring					Land/Marine use Classification					
		10	Conservation management measures— maintenance and improvement of habitats favourable conservation status	Agricultural	Forests	Other terrestrial	Inland waters	Wetlands	Coastal	Marine	TOTAL	Basis for Estimate
		11	Conservation management measures— maintenance and improvement of species' favourable conservation status								0	
		12	Implementation of management schemes and agreements with owners and managers of land or water for following certain prescriptions								0	
		13	Provision of services; compensation for rights foregone and loss of income; developing acceptability 'liaison' with neighbours								0	
		14	Monitoring								0	
		15	Maintenance of facilities for public access to and use of the sites, interpretation works, observatories and kiosks etc.								0	
		16	Risk management (fire prevention and control, flooding etc)								0	
		17	Surveillance of the sites								0	
10 to 17		Subtotal: Habitat management and Monitoring		0	0	0	0	0	0	0	0	0

NATURA 2000 FINANCING REQUIREMENTS QUESTIONNAIRE GUIDANCE NOTES.

OVERALL AIM OF THE EXERCISE

The ultimate aim of this project is to secure greater funding for the Natura 2000 network by providing an updated estimate as to the funding needs of the network that can be used to inform the EU Budget discussions.

This costing exercise forms part of broader Commission research to estimate and understand the costs, benefits and funding opportunities associated with the Network. Nature conservation is routinely recognized as an issue of critical importance to European society. It is a priority issue under the EU's sixth Environmental Action Programme and the completion, and effective management of the Network is central to the EU's commitments to halt biodiversity loss and to the European Union's (EU) long term sustainable development.

Furthermore, the December 2005 European Council invited the Commission to undertake a full, wide ranging review of EU spending during 2008/2009. Having an up to date, robust estimate of financing requirements for Natura 2000 is essential if the Commission is to ensure full and due consideration is given to the needs of nature conservation when establishing appropriations for the next Financial Perspective period (post 2013). This work will also be influential in developing future EU funding instruments and in helping to secure national funding.

SPECIFIC PURPOSE OF THIS QUESTIONNAIRE

This questionnaire is designed to obtain an estimate of the financial resources required to complete and effectively manage Natura 2000 at land and sea.

Estimates should, therefore, be consistent with managing all sites so as to ensure they make their contribution to the overall favourable conservation status of the network as defined in Articles 1e and 1i of the Habitats Directive²⁸. They should relate to the implementation of the management measures foreseen in the Directives, in particular in relation to Article 6 of the Habitats and Article 4 of the Birds Directive.

Individual Member States' cost estimates should relate to all sites²⁹ for which they have responsibility. It is important to stress that estimates should relate to what is still required and not to what is currently spent, or what has already been spent. The aim is to present an estimate of future costs. Ultimately, this information will then be used, by the Commission, to estimate the average annual financing requirements to optimally manage the network over the forthcoming years. However, the Commission encourages those countries who have annual estimates of actual expenditure to provide them as additional information.

²⁸ Favourable conservation status does not appear in the Birds Directive but it can be seen as a tool for determining the ecological requirements of the various bird species under Article 2 and the EC has argued that the obligation extends to the Birds Directive in its own guidance on hunting under the Birds Directive.

²⁹ Note that site specific cost estimates are not needed; only the national aggregates across sites should be reported – see further below and the questionnaire.

The Commission is aware of the complexity and difficulties inherent in this task and are aware that a number of assumptions and simplifications will need to be made. Our ambition is to construct the most robust estimate achievable based on the existing experiences, knowledge and expert judgment of the Member States.

METHODOLOGY

This is the third such review the Commission has conducted but the first incorporating the current 27 Member States. The present questionnaire is designed to be generally consistent with the previous requests and consistent with the cost classifications adopted by the Commission in relation to Natura 2000 financing.

It is very difficult to be overly prescriptive about the approach should adopt given differences in relation to data availability, management approaches, government structures and accounting practices in different Member States. Essentially, the basis for the estimate should be what is currently spent from all sources (Government tiers, the Commission and NGOs). The next stage will be to build on that actual data to extend the estimate by including further expenditure required to complete the network and ensure all sites are managed in accordance with management plans and the requirements of the birds and habitats Directives. This second stage will, to a large extent, rely on expert judgment but there are some basic principles that should guide analysis to ensure consistent estimates across the EU. These are presented in the next section.

GENERAL GUIDELINES FOR COMPLETING THE QUESTIONNAIRE

Principles to observe when completing the questionnaire

Type of costs to include: A central distinction in the questionnaire is between ‘one-off’ costs and ‘recurrent costs’. This distinction is very important to enable annual average estimates of financing requirements to be made. ‘One-off’ costs are land purchase and capital investment type costs which are estimated to be incurred between October 2008 and the completion of the network. Recurrent costs are those that are generally associated with the on-going managements activities to maintain or improve sites. Once the Commission has a single estimate of total requirements for investment purposes, it can average these expenditures over the number of years it is anticipated will be required to complete the network. The annual estimate can then be added to the estimated requirements for recurrent annual expenditures to get a single annual cost number to help inform budget discussions. The Commission intends to average one-off costs over 10 years.

Type of activities to include: Ideally, only activities related to the achievement of Natura 2000 conservation objectives should be included. This means costs that are directly related to the protection, management and monitoring of the sites but not the costs incurred in meeting broader, socio-economic objectives. In practice many activities, such as the provision of access paths, information centres, signage or public communications will meet conservation and social objectives in which case they should be included.

Avoid double counting: SACs and SPAs in some cases overlap or coincide³⁰. For sites with both SAC and SPA designations, the activities should be those necessary to achieve management targets under both Directives but care must be taken to avoid double counting. Some actions on sites with both designations will contribute to the management objectives stipulated in the birds and habitats Directives. Such activities should only be recorded once.

The treatment of costs associated with restricted activities: Natura 2000 designation may impose restrictions on farming practices, fishing effort or other economic activities. Costs can be incurred either by restrictions on their activity or by the need to change the way the activity is carried out. There may also be instances where ongoing compensation is provided to site owners or other previous users of a site. For the purposes of this questionnaire, only include such costs where they are associated with actual payments made which arise from managing the Natura 2000 network. Note that an important feature of this questionnaire is the distinction between:

- Compensation for the foregone opportunities of alternative uses.
- Payments to landowners in return for carrying out positive management interventions.

Note that only include or estimate costs which will result in actual expenditures. The designation of a Natura 2000 site may limit the number and types of projects which can be undertaken on the site as described in Article 6(3) of the habitats Directive. Potential economic losses associated with limiting such activities should not be included unless there is a requirement to pay compensation.

The scope of nature conservation activities included: This exercise is concerned only with expenditures directly associated with the Natura 2000 network (which include on site and those off-site expenditures that are directly associated to the site), not the broader activities required, outside the network, which will need to be undertaken to achieve the full objectives of the nature Directives.

The treatment of staff and other undistributed costs: The reporting basis for this questionnaire is activities, not cost items. Some expenses, such as staff costs (particularly central agency staff) and utility bills, will be incurred in undertaking multiple activities and will not be attributable to specific activities or sites. Such undistributed costs and overheads should be fully accounted for although their allocation between activities is a matter of expert judgment. The questionnaire does include a question on total staff costs and numbers. This information will be very valuable in demonstrating the contribution that nature conservation makes to economic activity and employment.

Climate Change issues. Climate change is increasingly influencing nature conservation. However, for the purposes of estimating costs, future actions to adapt to climate change would introduce an additional level of complexity to an already challenging task. Where climate change considerations are already influencing actions, they should be reflected in the estimates. It is not expected that Member States will assess future anticipated actions in response to climate change.

³⁰ See annex 2 for a description of the various designations

General guidance on the source of information for cost estimates

Financing needs are based on activities relating to the management requirements at Natura 2000 sites or to network costs. To establish consistency and compatibility across Natura 2000 sites, some form of uniform system of reporting on costs is clearly required. The key reference used in this questionnaire is Annex III of the Commission Communication on Financing Natura 2000 (2004), which established a preliminary list of necessary measures and activities for the establishment and management of the Natura 2000 network. The Communication classification has subsequently been articulated in the Financing Natura 2000 Guidance Handbook³¹. As noted, this is generally consistent with the earlier classifications. It is not based on the nature of the costs incurred, like labour, fuel or utility charges but on the type of the activities to be financed. The Commission adopted four broad cost classifications. These are shown in table 1 together with the categories adopted for this questionnaire.

Table 1 – Changes in the broad cost categories

EC 2004	EC 2008	Type of cost
Finalisation of sites	Finalisation of sites	One-off
Investment costs	Investment costs	One-off
management planning and administration	Management planning	One-off
	Management planning	Recurrent
ongoing management actions	Habitat management and monitoring	Recurrent

The only difference is splitting “management planning and administration” into its one-off and recurrent elements. The reason for doing this stems from the need to separately identify one-off expenditures from recurrent costs. This distinction is important for the purposes of deriving annual financing requirements, which take into consideration the timescale needed to finalise the network and the on-going costs once it is finished. Additionally, investment costs, such as land purchase can vary substantially depending on the management approaches adopted. It is therefore important to understand what proportion such costs are of the overall financing needs.

The types of activities Member States undertake will also depend on the status of their current sites, notably the proportion in favourable conservation status and the proportion completed.

Status of Network completed: For countries with incomplete networks, the information provided should incorporate estimates of designated and candidate sites and an estimate for important sites identified but not yet notified to the Commission. In some instances, especially in the marine environment, the network may be incomplete without any sites identified to complete it. Here again expert judgment will be needed.

Site Condition. For designated sites, specific activities will be needed to upgrade those sites in unfavourable conservation status to favourable conservation status³². These can be one-off capital costs or time limited activities to improve habitat condi-

³¹ http://circa.europa.eu/Public/irc/env/financing_natura/library?l=/contract_management/handbook_update&vm=detailed&sb=Title (table 3 page 10).

³² This guidance refers to ‘maintaining sites in favourable conservation status’ or to ‘favourable condition’. These should be interpreted to mean ‘ensuring that individual sites make their contribution to overall favourable conservation status of the network’.

tion. It may, for example, involve changes to infrastructure (eg. water management, stock fencing, access points) that is needed to manage the site. For the purposes of this exercise actions related to habitat or species condition are not treated as one-off costs but are included under habitat management and monitoring.

Ongoing management costs. These costs will typically recur over many years in the course maintaining favourable conservation status.

Investment costs. It is important to emphasise that the costs to be estimated are those still to be incurred (from October 2008) in the course of completing or improving the network not the historic or sunk costs invested already.

Constructing Cost Estimates for identified sites but where Management Plans do not exist

Not all sites will have management plans, some may not be fully established or designed others may not be in accordance with the requirements of the birds and habitats Directives. Where management plans are unavailable or inappropriate, cost estimates will have to be estimated from alternative sources. Some sites will already have been identified to fill the gaps. For SACs, cost estimates should include consideration of all agreed Sites of Community Interest (pSCIs) and any other sites where discussions are ongoing between the Member State and the European Commission and are likely to be adopted as SCIs in the near future³³.

For one-off investments and pre designation costs, estimates can be based on existing sites or planning processes. For recurrent management costs, average unit costs of actions per hectare can be derived from a number of sources for a range of habitat types on land and at sea. The best proxy will be actual expenditure within the Member States for sites in similar habitats or regions, so where possible, the unit costs of actions should be assessed locally. This should ensure consistency in estimates between similar actions at similar sites. Generic costs can also be used as a benchmark, or to estimate costs where local information is not available.

There are a few reports available which have calculated unit management costs for different habitat types. Care must be taken if using an estimate from another country to ensure the costs are converted to the domestic currency correctly. Specifically, unit values taken from actions in other countries should be converted into Purchasing Power Parity equivalent values using conversion factors. This is explained in annex 1 at the end of this guidance document. Some suggested sources for obtaining unit values are:

- GHK's UK Biodiversity Action Plan valuation costing database (2006). This gives a range unit costs for a variety of habitats in the UK. (<https://statistics.defra.gov.uk/esg/reports/bioactionplan/default.asp>). See Annexes 1-30 contained in the weblink for unit costs for a variety of management operations for different habitats.
- 'Estimating Natura 2000 Needs' (Esteban, 2005). This contains crude unit costs per ha for different habitats. This is available from the RSPB in the UK.

³³ See annex 2 for a description of the various designations

- National rural development programmes and measures (eg. agri-environment scheme prescriptions, Natura 2000 payment measures, non-productive investments) from comparable parts of the EU, which contain unit costs.
- Marine protected areas costs. There is little work done to estimate marine costs. Work has been done demonstrate how costs vary significantly according to size and location. Indications of unit costs can be obtained from studies such as Balmford, 2004³⁴).

By multiplying unit costs by the scale of actions needed to achieve favourable condition, overall costs estimates can be made for each site, and then for country's complete site networks.

Estimating costs for the gaps in the network

As noted, the Natura 2000 network remains incomplete in some areas (as identified in the European Topic Centre's Natura 2000 Barometer). Where gaps remain in designation of the Natura 2000, the additional cost of designating and managing a completed network must be identified and included to obtain a fair estimate of financial needs the completed network.

For potential SPAs, a major source of biodiversity data is BirdLife International's Important Bird Area (IBA) inventories. These have been upheld in various judgments of the European Court of Justice as the best available scientific data to guide SPA designation. Digitised IBA boundaries for the EU-25 is available to Member State Governments, either from the European Division of BirdLife or from national BirdLife Partners, as a reference for SPA designation (see BirdLife's Website <http://www.birdlife.org/>) for the address of the Secretariat and national BirdLife Partners).

For offshore marine Natura 2000 sites there have been relatively few identified to date. This represents one of the most significant gaps in the Natura network. Member States should use the best available information to estimate the number, area and key characteristics of future marine sites as a basis for cost estimates. Guidelines for establishing offshore marine sites can be found at http://ec.europa.eu/environment/nature/natura2000/marine/docs/marine_guidelines.pdf.

All estimates should include consideration of, and separately report on, pre-designation administrative costs and investment costs.

Table 2 is intended to help summarise some of the foregoing points. It is designed to illustrate the range of activities which require funding and which may require different approaches to estimating them.

Table 2 - Approaches to estimating different cost components

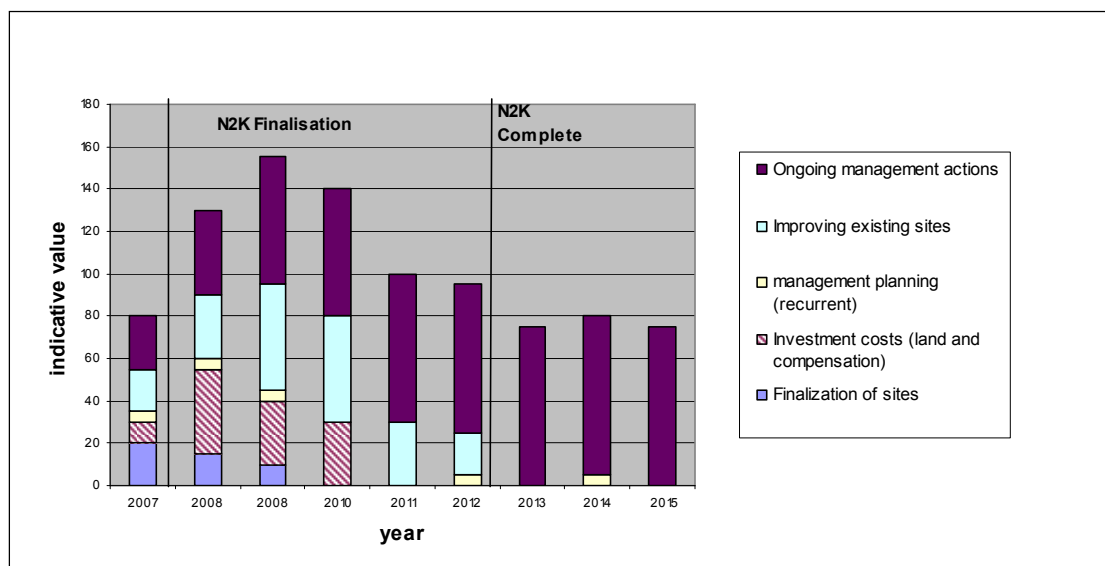
Activity	Source for estimate
Finalisation of	Any outstanding requirements should be extrapolated from pre-

³⁴ Balmford A, et al (2004) The Worldwide Costs of Marine Protected Areas. PNAS 101 (26). <http://eprints.whiterose.ac.uk/472/>

sites	vious expenditure trends to date.
Investment costs	The investment costs of relevance are only those that will be incurred in the future for completion of the network from October 2008. These may include land purchase or one-off compensation payments. Future costs can be extrapolated from past experience.
Improving existing sites	Some sites will be designated and partially funded but will not yet be in favourable condition. Where such sites have management plans, they should be the basis for costing actions to improve sites and species status.
Maintaining existing sites	Where sites are currently maintained in favourable condition, actual annual expenditure should also reflect actual desired expenditure and so should be the basis for the estimate.
Costing (estimating the costs of) identified but not designated sites	Some Member States will have candidate sites not yet designated. For such sites, recurrent costs can be extrapolated from existing sites with similar habitats and features. If no such comparable sites exist, average per hectare costs can be extrapolated from sites in other countries.
Costing (estimating the costs of) gaps in the network	For some habitats (especially in the marine environment) or species, Member States may be aware that the network has gaps but may not have identified specific sites to designate. Here, estimates can be made on the extent of habitat to be designated. Per hectare costs are available from a number of sources but expert judgment will be needed.

Figure 1 below illustrates the different characteristics of the Natura 2000 cost requirements. Initially, in the forthcoming years, it is anticipated that some expenditure will be required to finalise site designation and substantial amounts may be needed for investment purposes. There will be intermittent expenditure on management planning activities over time. Actual habitat and species management activities can be divided between those required to improve degraded sites and those needed to maintain 'good' sites. These former should be time limited to when the sites are in favourable status. Once favourable status is achieved, it will be the recurrent, ongoing management costs that will predominate expenditure. To estimate annual financing requirements we need to know the 'lumpy' investment and improvement costs which can then be averaged out over a fixed period. In terms of this illustration, any expenditure in the first column (2007) would not be included in future cost requirements.

Figure 1 – Indicative cost profile of an Member States Natura 2000 network



SPECIFIC GUIDANCE ON COMPLETING THE QUESTIONNAIRE

Please refer to the attached Excel workbook for the actual questionnaire. The workbook contains 6 individual spreadsheets.

Q1. *How many identified Natura 2000 sites are there in your country and what is the total area of these sites?*

Include all identified sites (SACs, SCIs, cSACs, pSACs, dSACs, SPAs) whether or not they have been designated or notified to the Commission (i.e. different data from those the Commission possesses on the formally designated sites).

Q2. *What proportion, by area, of the identified Natura 2000 sites have the following land/marine classification?*

This question asks for area based on landuse type rather than habitat classification. The reason for this is that funding availability and income opportunities are more closely related to landuse rather than specific habitat type. Please use table 3 below to re-classify habitats into land/marine classifications. The habitat types are based on the “Interpretation Manual of European Union Habitats” published by the European Commission in 2007³⁵. Having a geographical breakdown of financing needs by landuse type will provide valuable information in relation to EU funding instruments.

Table 3 – Land/Marine Classification

Land use	Habitat types
Agricultural land	Utilised agricultural area only, including orchards under cultivation
Forests	Forests, including <i>dehesa</i> , <i>montado</i>
Other terrestrial	Include alpine areas, garigue, all other areas that are not included in the other categories (eg pasture that is not classified as utilised agricultural area). Include abandoned farmland and or-

³⁵

http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm#interpretation

See:

	chards. Natural, semi natural grassland, heath and scrub, rocky habitats and caves.
Inland waters	Rivers, lakes, freshwater.
Wetlands	Marshes, swamps, bogs, mires, fens, estuaries [may be some cross-over with coastal areas].
Coastal	Sand dunes, beaches, mud flats, inshore waters (out to 12 nautical miles) [may be some cross-over with wetlands].
Marine	Offshore marine areas (outside 12 nautical miles)

Source: Financing Natura 2000 guidance handbook page 9

IMPORTANT NOTE 1: There follows three critical questions on financing needs. Question three is a simplified form of questions four and five. The Commission expects all those Member States who are can, to complete the detailed questions four and five. For countries that do so, it is not then necessary to complete question three. The Commission, however, recognizes that some Member States will not be able to supply data in the detail requested in questions four and five. For countries unable to complete questions four and five, please complete question three only.

IMPORTANT NOTE 2: The exercise of estimating the needed costs for the Natura 2000 network is clearly not an easy one and it will not in most cases be possible to get a precise number that will stand the test of time. It is more important to have numbers that are approximate estimates than no number at all. Indications from Member States as to which numbers are solid estimates, rough estimates, and speculative estimates would be valuable to help in interpreting the answers.

Questions three to five require data on costs. A coding system is used to identify cost categories and table 4 below includes the details of what types of activities should be included under each of the 17 codes (column 2).

Table 4 - List of Natura 2000 Management activities

Category	Guidance Note	Further Description	
Finalising of sites	1	Include the total costs associated with planning and finalising your country's Natura 2000 network. These costs might include: • The scientific studies/inventories for the identification of sites (egg mapping, condition assessments etc) • The administration costs of processing the sites • Public consultation (public meetings, workshops, publication of outcomes etc) • Capacity building for staff	
Management Planning (one-off)	2	Include the total costs associated with developing management plans for the Natura 2000 sites. These costs might include: • Preparation of management plans, strategies and schemes • Establishment of management bodies (start-up funding) • Public consultation (public meetings, workshops, publication of outcomes etc)	
		Types of Activities	Further description
Investment costs (one-off)	3	Land purchase	Purchase of land in service of environmental protection and management schemes.

	4	Payment of compensation for development rights	Include any <i>one-off</i> payments to landowners or stakeholders associated with restrictions imposed on activities by Natura 2000 designation
	5	Infrastructure needed for the restoration of habitat or species	Includes an array of measures for the creation of infrastructures specific to the management of the environment, e.g. for water management in peat bogs and mines. Can include equipment acquisition (for equipment relevant to the running of protection and management institutions and actions such as office and IT equipment, monitoring materials, boats, diving equipment, cameras, etc.)
	6	Infrastructure for public access, interpretation works, observatories and kiosks, etc	Infrastructure for public use that is conducive to environmental protection and management (e.g. infrastructure increasing the amenity value of sites such as signage, trails observation platforms and visitor centres).
Management planning (recurrent)	7	Running costs of management bodies	Maintenance of buildings and equipment, including running costs incurred to meet depreciation of infrastructure; consumables; travel expenses; rents; leases; etc.
	8	Review of management plans, strategies and schemes	Review and updating of management plans and strategies.
	9	Public communication	Includes establishing communication networks, production of newsletters and awareness and information materials, setting-up and maintenance of internet pages.
Habitat management and monitoring (recurrent)	10	Conservation management measures – maintenance and improvement of habitats' favourable conservation status	Including restoration work, provision of wildlife passages, management of specific habitats, preparation of management plans.
	11	Conservation management measures – maintenance and improvement of species' favourable conservation status	Including restoration work, provision of wildlife passages, management of specific species (flora and fauna), plans.

	12	Implementation of management schemes and agreements with owners and managers of land or water for following certain prescriptions	Includes: • <i>Agri-environmental measures</i>, e.g. wildlife-friendly production methods, habitat restoration on agricultural land, extensive livestock breeding, conservation of meadows, etc • <i>Forest-environmental measures</i>, e.g. creation of no exploitation zones, retention of dead wood, control or eradication of invasive alien species, afforestation or reforestation activities, management of specific vegetation, etc. • <i>Aqua-environmental measures</i>, e.g. habitat maintenance in aquaculture zones etc. (relates to aquaculture rather than fishing). • Common Fisheries Fund (payments related to activities which contribute to good fisheries management)
	13	Compensation for rights foregone and loss of income; developing acceptability 'liaison' with neighbours	Costs of compensation, e.g. to farmers, foresters or other land owners or users for income foregone as a result of management prescriptions needed for Natura 2000.
	14	Monitoring	Refers mainly to costs related to monitoring and surveying activities, e.g. development of monitoring plans, methods and equipment; training of personnel.
	15	Maintenance of facilities for public access to and use of the sites, interpretation works, observatories and kiosks etc.	Including costs related to guides, maps, related personnel.
	16	Risk management (fire prevention and control, flooding etc)	Includes wardening and fire-control plans, development of relevant infrastructures, the acquisition of equipment and carrying out of risk minimisation activities.
	17	Surveillance of the sites	Includes on going surveillance, wardening and patrolling activities. Can include personnel costs, consumables, travel, etc in order to implement surveillance and guarding activities, including surveillance for the control of harmful recreational activities and the control of harmful economic activities.

Source: Natura 2000 Financing Handbook reference:

http://circa.europa.eu/Public/irc/env/financing_natura/library?l=/contract_management/handbook_update&vm=detailed&sb=Title

Q3. What are the financing needs associated with maintaining a complete network of Natura 2000 sites in favourable conservation status ?

[Q3. should only be answered by Member States unable to provide cost estimates in the detailed specified in Q4 and Q5. Those Member States that can complete Q4 and Q5 do not complete 3]

Part A:

This section requests summary information for existing and new sites and asks for costs to be broken down between one-off costs and recurrent costs.

Guidance note number and key activities: These refer to table 4 above.

Existing sites: Under this item, include all those sites, which have already been designated.

New Sites: Under new sites, include sites, which have been identified or are in the process of being designated. Also include estimates for gaps in the network where specific sites have yet to be identified.

Basis For estimate: Space is provided for Member States to provide additional information on methodology or data sources used which may be of value to the Commission in understanding and interpreting the data. We recognize that Member States will adopt different approaches to completing the questionnaire and therefore encourage compilers to provide as much additional information as is necessary to assist the Commission in reviewing the data.

One-Off Costs: Include an estimate of the one-off- costs necessary to complete the network and those necessary to establish new sites. These estimates should be for the total on-off costs not annualized or discounted future values. These costs should exclude existing expenditure to date.

Recurrent Costs: These are divided between on-going management planning activities and habitat management ones. The detailed list of what to include in the respective categories is given in table 4 above. As with one-off-costs, the costs are split between existing and new sites.

Part B:

This section asks for one-off and recurrent costs for new and existing sites but disaggregated by land-use type. Funding requirements, funding sources and potential income streams vary greatly by landuse type. Having this information will greatly assist the European Commission in understanding the most appropriate funding sources and instruments to best support the Network.

*Q4. What are the financing needs associated with maintaining **existing** Natura 2000 sites in favourable conservation status ?*

Existing sites refers to sites that have already been designated as Natura 2000 sites.

[Member States completing Q4 and Q5 do not need to complete Q3]

The format for both questions 4 and 5 is the same. The only distinction is that question 4 refers to existing sites and question 5 to new sites. This is a very important

distinction to understand because it will inform the Commission about the extent of the actions needed to still complete the Network. A second reason for making the distinction is because information about existing sites should be easier to estimate given that many activities are currently funded. For new sites, especially in relation to gaps in the network, a number of assumptions will have to be made. The guidance notes for question 4, below, also refer to question 5.

This section requests summary information for existing and new sites and asks for costs to be broken down between one-off costs and recurrent costs.

Guidance note number and Key Activities: These refer to table 4 above.

Basis For estimate: Space is provided for Member States to provide additional information on methodology or data sources used which may be of value to the Commission in understanding and interpreting the data. We recognize that Member States will adopt different approaches to completing the questionnaire and therefore encourage compilers to provide as much additional information as is necessary to assist the Commission in reviewing the data.

One-Off Costs: Include an estimate of the one-off- costs necessary to complete the network and those necessary to establish new sites. These estimates should be for the total on-off costs not annualized or discounted future values. These costs should exclude existing expenditure to date. There is no requirement to disaggregate costs by landuse type.

Recurrent Costs: These are divided between on-going management planning activities and habitat management ones. The detailed list of what to include in the respective categories is given in table 4 above. Understanding the difference in cost between activities is very important to understanding funding needs and opportunities. Some activities relate to direct conservation actions others relate to compensation type payments or payments for the delivery of public goods. Currently, these costs can be met from different funding sources. Understanding the relative scale of these costs will aid understanding of the most appropriate funding instruments to adopt.

For recurrent costs, Member States are requested to disaggregate funding needs by landuse type. Funding requirements, funding sources and potential income streams vary greatly by landuse type. As with the disaggregation by activities, this information will greatly assist the Commission in understanding the most appropriate funding sources and instruments to best support the Network.

*Q5. What are the financing needs associated with establishing and maintaining **new** sites, necessary to complete the network of Natura 2000 sites in favourable conservation status?*

‘New sites’ refers to sites that have been identified and are in the process of designation. It also refers to gaps in the network where important habitats may have been identified but where specific sites have yet to be selected.

Question 6.

(a) What is the current total staff numbers employed and the total remuneration for staff undertaking Natura 2000 activities ?

(b) Please estimate the anticipated staff numbers employed and the total remuneration when the network is complete.

This question asks for staff remuneration (wages, salaries, all other emoluments) and for the number of full time equivalent jobs employed in maintaining the network. The question asks for an estimate of current outlays (those associated with the existing network) and those expected to be incurred when the network is complete. Nature conservation adds value to local economies, diversifies income opportunities in rural areas and creates considerable employment in the EU. We ask for this information to help demonstrate the economic significance of the Natura 2000 network.

Contact Details

For further assistance in completing this questionnaire, please contact:

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Completed questionnaires should be returned to Ctibor Kocman by the end of November 2008.

ANNEX 1 TO QUESTIONNAIRE GUIDANCE

Purchasing Power Parity (PPP) Conversion factors

In some instances, Member States may not have domestic data to estimate costs. In such cases, some costs may be inferred from actual examples in another Member States. It is important, when using estimates from other countries, to convert monetary values using a 'purchasing power' exchange rate, not a market rate. This is explained below.

It is not appropriate to convert costs at official exchanges rates because of different purchasing power in different countries. The amount of goods a currency can purchase within two nations can vary drastically. For example, a US dollar exchanged and spent in Tanzania will buy more food than the same a dollar spent in the America. PPP adjusts exchange rates by accounting for these differences in the cost of living.

The table below presents an illustrative list of purchasing power conversion factors to be used when converting values from one country to another. Just for the purposes of

illustration, assume Romania will have to designate 20 hectares of wood pastures. It checks the GHK database in the UK and sees that in the UK average costs are £180 per hectare per year for maintaining wood pastures. It will cost £3,600 per year for 20 hectares. To convert to Romanian currency (Lei) column 2 below should be used not column 5. So $£3,600 * 2.18 = 7,848$ Lei. This is significantly less than the result if the official exchange rate is used $£3,600 * 5.29 = 19,044$ Lei.

Source: http://siteresources.worldbank.org/ICPINT/Resources/ICP_final-results.pdf

EU-27	PPP		Money		Comparative price level
	Ex rate (\$1)	Ex rate (£) <i>PPP</i>	Ex rate (\$) <i>Money</i>	Ex rate (£) <i>Money</i>	
Austria	0.87	1.34	0.8	1.45	0.92
Belgium	0.9	1.38	0.8	1.45	0.95
Bulgaria	0.59	0.91	1.57	2.85	0.32
Cyprus	0.42	0.65	0.46	0.84	0.77
Czech Republic	14.4	22.15	23.95	43.55	0.51
Denmark	8.52	13.11	5.99	10.89	1.20
Estonia	7.81	12.02	12.58	22.87	0.53
Finland	0.98	1.51	0.8	1.45	1.04
France	0.92	1.42	0.8	1.45	0.97
Germany	0.89	1.37	0.8	1.45	0.94
Greece	0.7	1.08	0.8	1.45	0.74
Hungary	128.51	197.71	199.47	362.67	0.55
Ireland	1.02	1.57	0.8	1.45	1.08
Italy	0.88	1.35	0.8	1.45	0.93
Latvia	0.3	0.46	0.56	1.02	0.45
Lithuania	1.48	2.28	2.78	5.05	0.45
Luxembourg	0.92	1.42	0.8	1.45	0.97
Malta	0.25	0.38	0.35	0.64	0.60
Netherlands	0.9	1.38	0.8	1.45	0.95
Poland	1.9	2.92	3.24	5.89	0.50
Portugal	0.71	1.09	0.8	1.45	0.75
Romania	1.42	2.18	2.91	5.29	0.41
Slovakia	17.2	26.46	31.04	56.44	0.47
Slovenia	147.04	226.22	192.65	350.27	0.65
Spain	0.77	1.18	0.8	1.45	0.81
Sweden	9.24	14.22	7.24	13.16	1.08
United Kingdom	0.65	1.00	0.55	1.00	1.00

ANNEX 2 TO QUESTIONNAIRE GUIDANCE

Types of Designations

Special Areas of Conservation (SACs) are sites that have been adopted by the European Commission and formally designated by the government of each country in whose territory the site lies.

Sites of Community Importance (SCIs) are sites that have been adopted by the European Commission but not yet formally designated by the government of each country.

Candidate SACs (cSACs) are sites that have been submitted to the European Commission, but not yet formally adopted.

Possible SACs (pSACs) are sites that have been formally advised to UK Government, but not yet submitted to the European Commission.

Draft SACs (dSACs) are areas that have been formally advised to UK government as suitable for selection as SACs, but have not been formally approved by government as sites for public consultation.

Special Protection Area (SPA) An area classified under Article 4 of the Birds Directive.

Source: JNCC - UK

ANNEX III

Table of collected cases studies in Member States

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Regional socio-economic effects of Natura 2000 in Austria	Austria	Y	Not specified	<u>Cultural services: tourism & recreation</u> <u>Provisioning services: food production</u>	Qualitative Quantitative Monetary	Exact content unclear as no access to the book. However, should include information on employment and income generated for regional economies in Austria.	unclear	Getzner, M., Jost, S., Jungmeier, M. (2002): Naturschutz und Regionalwirtschaft - Auswirkungen von Natura-2000-Gebieten in Österreich. Frankfurt a. M.
Value of improved ecological status (WFD) in the Scheldt River Basin. Flemish case study of Dender sub-basin.	Belgium	some sites within river basin district	modified water body	<u>cultural: amenity value, recreation</u>	monetary	Willing to pay (WTP) more for greater improvement in ecological status, varying between sites, services/attributes and in function of respondent profile. WTP €184 /household/yr for overall good ecological status at Flemish sites.	Stated preference - choice experiment	Liekens, I., De Nocker, L., Schaafsma, M., Wagtendonk, A., Gilbert, A. and Brouwer, R. (2009) Aquamoney Case Study Report - International Scheldt Basin. 27 August 2009 RMA/2009/R/138.
Ecosystem valuation of Belgian river sheldt - protection plan assessment	Belgium	Y	estuary, river	<u>regulating and provisioning ES (various)</u>	quantitative monetary	Assessment of flood protection plans with varying implications for ecosystem composition and function. Largest economic benefit associated with freshwater river tidal area (RTA) (€100561/ha) followed by freshwater river expansion (REx) (€97057/ha), mostly associated with metal sequestration, sedimentation and nutrient purification functions. Greatest ecosystem benefit associated with protection plans leading to the creation of combined RTA +Agricultural Inundation Areas (AgIA), REX + AgIA, and restoring upstream river valleys, through AgIA, Wet River Valley and Wetland creation. Benefits outweigh the €500 million costs for these pathways.	Various including contingent valuation method, avoided costs, hedonic pricing...	Ruijgrok, E.C.M. (2007) Blending ecology in actual economic decisions - the Dutch national guideline for ecosystem valuation applied on the Scheldt estuary in Belgium. Witteveen + Bos

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Scheldt River Basin natural capital	Belgium	Y	estuary/intertidal	<u>regulation: protection</u>		Social CBA to indicate best management options for Scheldt region (heavily modified and under increasing flood risk), using area-specific valuation figures. Restoration of natural capital found less costly than man-made interventions but benefits insufficient to justify outlay (Hedwige Polder case) (3300 EUR/ha investment; 7000EUR pa maintenance) . Developing wetland at Kalkense Meersen cost effective (no figures found in available documentation).	contingent valuation	De Nocker L., Liekens I., Broekx S., Bulckaen D., Smets S. and Gauderis J. (not dated) Natte Natuur in het Schelde-estuarium – Een verkenning van de kosten en baten. Using a cost-benefit analysis to select the optimal flood protection measures. VITO.
Economic value of natural landscape in Flanders	Belgium	N	various	<u>cultural: recreation and aesthetic/non-use; provisioning, regulating.</u>	monetary	WTP for conversion of agricultural area without environmental or landscape value into environmental landscape with stated characteristics. WTP found to vary in function of landscape type and respondent characteristics. Forests>open water, heathland, swamp > pioneer vegetation, grassland, marshland. WTP increased for easily accessible nature. Conversion scenario for 190 ha agricultural land to highly biodiverse wetland and grassland with recreational access, 1 million households in 50 km radius and various neighbouring land-uses generates total cultural value €170m/yr . Value of various regulating ecosystem services drawn from existing literature. Water purification benefit based on change in denitrification potential and the marginal abatement cost calculated as € 3.8 million (= 51660 kg N * 74 €/kg N)	WTP- choice experiment. Regulating service value from existing literature based on hedonic pricing, avoided costs etc.	Liekens I., Schaafsma M., Staes J., De Nocker L., Brouwer R. and Meire P. (2009) Economische waarderingsstudie van ecosysteemdiensten voor MKBA. Studie in opdracht van LNE, afdeling milieu-, natuur- en energiebeleid, VITO, 2009/RMA/R308.

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Uitkerse Polder restoration	Belgium	Y	flood-plain/polder	<u>cultural: recreation and tourism</u>	quantitative monetary	400 ha nature reserve which had therefore been protected from urbanisation. 150000 visitors per year generating average annual revenue of €35m . Further potential for visitor growth indicated due to attractiveness of area. Local support for designation due to economic benefits	survey of visitors and local residents	Interviewee, no reference available yet
Broader socio-economic benefits: job creation	Bulgaria	Y and N	Not specified	<u>Broader socio-economic benefits: direct employment supported by PAs / Natura 2000</u>	Quantitative Monetary	80 people employed (11 PAs / Natura 2000 sites managed by State Forestry Agency); Total salary costs for these people 500 000 EUR / year	Salary costs	Country case study interview
Tourism / recreational value of Vitosha National park	Bulgaria	Y	Not specified	<u>Cultural services: tourism & recreation</u>	Quantitative	1.5 - 1.8 million visitors / year	Total number of visitors to the park	Country case study interview
Value of natural wetland hydrological regime for fishing (Danube Islands)	Bulgaria	N	Wetland / floodplain	<u>Regulating services: Hydrological regime supporting fish provisioning</u>	Monetary	Costs of restoration: 283 600 EUR (one off) for the period of 2004-2006 (Area restored 218.72 ha)	Costs of restoration (one off)	Action plan for the protection and restoration of floodplain forests on the Bulgarian Danube Islands (2003-2007) http://www.greenbalkans.org/userfiles/file/dokumenti_download/Action%20plan_Danube%20Islands_ENG.pdf
Value of natural firewood	Bulgaria	N	Forest	<u>Provisioning services: fuel (firewood)</u>	Quantitative	80% rural people use local firewood for heating; 8-10 m³ / family / year (allowed amount)	Quantification of beneficiaries	Country case study interview
Nature-Based Tourism in the Sumava National park, Czech Republic 1997 - 2004	Czech Republic	Y and N	Not specified	<u>Cultural services: tourism & recreation</u>	Quantitative Monetary	Number of visitor nights 1.1 - 1.3 / year (2008); cost per visit increased 33% between 1997-2004: 2100 CZK / 82 USD (1997) and 2800 CZK / 109 USD (2004); Total gross annual expenditure on recreation in the park: 1.65 - 2.2 billion CZK / 64 - 86 million USD = 9-12% total domestic expenditure on recreation	Annual surveys / questionnaires, travel cost method	Viktor Trebický & Martin Čihák (2008) Martin Čihák, Viktor Trebický and Jindřiska Stanková (2008)

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Nature-Based Tourism in four National parks, Czech Republic (in summer 2000)	Czech Republic	Y and N	Not specified	<u>Cultural services</u> : tourism & recreation	Quantitative Monetary	Total number of recorded visitors 390 074 / nine day survey period = about 43 340 / day	Annual surveys / questionnaires, travel cost method	Martin Cihar, Jan Stursa & Viktor Trebický (2002)
Natura 2000 area avoiding construction of third runway (Billund)	Denmark	Y and N	Forest	<u>Regulating services</u> : noise pollution	Qualitative Monetary	An assessment made necessary due to the presence of a Natura 2000 site revealed that a similar noise reduction compared to the construction of a runway could just as well be achieved by changing the take off procedure. The assessors discovered that if aeroplanes left as quickly as possible and turned 30 degrees right, away from Billund, at 150m above ground, the number of homes exposed to noise would be reduced by 75%. The assessment ended up saving the airport authorities €40 million as well as protecting the old growth forest.	Cost savings	WWF Germany, NATURA 2000; Successful – flexible – modern; Facts and findings, April 2009
Natura 2000 related employment (Nedrema wooded meadow, Parnumaa)	Estonia	Y	Woodland (wooded meadow)	<u>Broader socio-economic benefits</u> : direct employment supported by Natura 2000	Quantitative Monetary	Creation of one full time job to manage 100ha of wooded meadow (based on Natura 2000 payments); Additionally seasonal employment of 2-3 people during summer months (1-2 months)	Quantification of beneficiaries	Interviewee, no reference available yet

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Regional income streams created by national parks and recreational areas	Finland	Y	Not specified	Broader socio-economic benefits: regional income created by national parks / Natura 2000 areas	Quantitative Monetary	Total annual revenue linked with the visitor spending in national parks (35) was 70.1 million EUR and supported local employment by creating 893 person-years; Total annual revenue linked with the visitor spending at other important recreation areas (10) was 16.9 million EUR and supported local employment by creating 217 person-years; In general, 1 EUR public investment provided 20 EUR return	Annual surveys / questionnaires, MGM2 input-output model for estimating impacts of visitor spending on local economies (the US)	Metsähallitus (2009) http://www.metsa.fi/sivusto/met-sa/fi/Eraasiatjaretkaily/Virkistyskay-tonsuunnit-tely/suojelualueidenmerkityspaikal-loudele/Documents/Kavioiden%20paikallistoloudeelliset%20vaikutukset.pdf
An economic and institutional evaluation of the Natura 2000 programme in France	France	Y	Not specified	Range of services and values	Qualitative Quantitative Monetary	The study developed a methodology on how to evaluate the economic impact of Natura 2000 in France. It focuses on three case studies, where it takes a look at the costs occurring, the financing provided and its likely impact on the economy. In this regard it particularly focuses on contractual agreements with farmers, hunters and forest owners as well as fishing licences, and educational trips and tourism. For example, contractual agreements with farmers amounted to €1.3 million over a period of five years at one site. Licences for fishing amounted to €82,500 for one year.	Market prices Financing	Credoc 2006, Evolution économique et institutionnelle du programme Natura 2000 en France. Paris http://www.credoc.fr/pdf/Rapp/R251.pdf

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Case study related to the economic and institutional evaluation of the Natura 2000 programme in France	France	Y	grassland	<u>Range of services and values</u> (e.g., employment, non-market values, impact on economic activities)	Quantitative Monetary	Hernandez and Sainteny (2008) carried out a cost-benefit analysis, by calculating the overall value of benefits linked to certain management activities at a site and comparing it to the costs (including direct, indirect and opportunity costs) arising from the same activities on a per hectare and annual basis. The authors carried out a conjoint analysis, and determined the willingness to pay of a group of people living next to the site regarding different programmes of management activities, and determined the costs related to each of these programmes. The calculated overall benefits amounted to €182/ha/year , and net benefits to €142ha/year (Hernandez and Sainteny, 2008). Benefits were thus estimated to be around 7 times higher than the actual costs associated with the Natura 2000 site (Hernandez and Sainteny, 2008).	Market prices Conjoint Analysis Choice experiment	Hernandez S. and Sainteny G., 2008. Evaluation économique et institutionnelle du programme Natura 2000: étude de cas sur la plaine de la Crau. Lettre de la direction des études économiques et de l'évaluation environnementale. Hors Série N°08 – Juillet 2008 http://www.natura2000.fr/IMG/pdf/CREDOC-D4E_4pages-natura2000_2008.pdf
The economic impact and benefits provided by different protected areas (e.g. Parc du Mecantour)	France	Y and N	Not specified	<u>Broader socio-economic benefits</u> : direct employment supported by PAs / Natura 2000	Quantitative Monetary	The annual income of the park amounts to roughly € 3.8 million per year. Personnel expenditures have a direct impact on the local and regional economy. In 1998, total employment was estimated at 130 FTE.	Total number of employees.	Credoc, 2008. Les retombées économiques et les aménités des espaces naturels protégés. Paris
The economic impact and benefits provided by different protected areas (e.g. restoration Gardon-aval)	France	Y and N	Wetlands	<u>Cultural services</u> : Recreation <u>Regulating services</u> : water quality	Quantitative Monetary	The benefits resulting from the restoration of part of the river were estimated to be higher than the costs. The net difference between costs and benefits amounted to €36 million .	Travel cost CVM	Credoc, 2008. Les retombées économiques et les aménités des espaces naturels protégés. Paris

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
The economic value of Danube wetlands (Germany)	Germany	Y and N	Wetlands	<u>Regulating services:</u> water regulation	Monetary	Benefits of Danube wetlands estimated at 954DM (roughly € 900) per ha and year for ecological services provided (Meyerhoff 1999: 86) Benefits of the Biotopische Isarmündung estimated at 10,00DM (roughly €9,500per) ha und year (Hampicke und Schaefer, 1997).	CVM	Hofmeister, F. (2006): Die Rückgewinnung von Feuchtgebieten als Lösungsmöglichkeit für aktuelle Umweltprobleme, Dissertation, Heidelberg, and references within
Tourism in large protected areas and national parks in Germany (Rhoen biosphere reserve & Bayerischer Wald national park)	Germany	Y and N	Not specified	<u>Cultural services:</u> tourism & recreation	Quantitative Monetary	Daily expenditures of over-night tourists were estimated at 25€ for the biosphere reserves Rhoen, and 46 € for the national park Bayerischer Wald, which are both covered by Natura 2000 sites.	Market prices	Neidlein H.C. & Walser M. 2005, Natur ist Mehr-Wert. Ökonomische Argumente zum Schutz der Natur, Bundesamt fuer Naturschutz, Skripten 154 http://www.bfn.de/fileadmin/MDb/documents/skript154.pdf
Tourism in large national park: Wattenmeer (Germany)	Germany	Y and N	Not specified	<u>Cultural services:</u> tourism & recreation	Quantitative Monetary	In the national park Wattenmeer, a study determined what impact the number of national park tourists had on the overall number of tourists in the region. It was calculated that NP tourists amounted to 1.4 per cent (in a strict sense) and 23 per cent (in a wider sense) of total tourists in the region. The gross economic income arising from NP tourism amounted to 101 and 117 million € in 2003.	Market prices	Neidlein H.C. & Walser M. 2005, Natur ist Mehr-Wert. Ökonomische Argumente zum Schutz der Natur, Bundesamt fuer Naturschutz, Skripten 154 http://www.bfn.de/fileadmin/MDb/documents/skript154.pdf

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Socio-economic effects of tourism in national parks (Bayerischer Wald, Berchtesgarden & Mueritz national parks, Germany)	Germany	Y and N	Not specified	<u>Cultural services</u> : tourism & recreation	Quantitative Monetary	Detailed overview of the social (employment) and economic (income) impacts of tourism in three national parks. According to the studies, the direct and indirect yearly income amounted to 6.5 million for the national park Bayerischer Wald, 4.6 million for the national park Berchtesgarden and 2.8 million for the Mueritz national park.	Market prices	Job H. & Metzler D. 2005, Impacts of large-scale protected areas on regional economies. Natur und Landschaft, 80. Jahrgang — Heft 11 Job H., Der Nationalpark Bayerischer Wald als regionaler Wirtschaftsfaktor, Praesentation Universitaet Wuerzburg End results probably included in the following book: Job, H., Woltering, M. und Harrer, B. (2009): Regionaloekonomische Effekte des Tourismus in deutschen Nationalparken. 176 pages , 978-3-7843-3976-4, Issue 76
Value of nature and urban environment in Berlin	Germany	Y and N	Not specified	<u>Cultural services</u> : amenity and landscape	Quantitative Monetary	In Berlin, real estate prices were twice as high for areas next to (100 to 200m) open space than prices for areas more distant (more than 800m) from open space. Prices amounted to 494€ per square metre. The highest prices were available for space next to small protected areas.	Real estate pricing	Luther M., Gruehn D. (2001): Der Einfluss der Freiraumqualität auf den Bodenwert, in: Stadt und Grün, Nr. 5/2001, S. 320–324

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Ecosystem services from meadow orchards in Baden Württemberg	Germany	Y and N	Orchards	<u>Provisioning services</u> : food	Quantitative Monetary	In Baden Württemberg 260 farmers joined forces to establish an orchard-apple juice project, to make the cultivation of orchards profitable. The additional management effort is compensated by marketing the fruit at a higher price. The farmers receive three times the market price for conventionally produced fruit from the regional juice producers, which continue to process the fruit. In 2003, Germany produced around 7.5 million litre of traditional orchards apple juice with a value of 10-15 million € .	Market prices	Neidlein H.C. & Walser M. 2005, Natur ist Mehr-Wert. Ökonomische Argumente zum Schutz der Natur, Bundesamt fuer Naturschutz, Skripten 154 http://www.bfn.de/fileadmin/MDb/documents/skript154.pdf
Restoration of Elb wetland (Germany)	Germany	N	Wetland	<u>Regulating services</u> : water purification	Quantitative Monetary	The restoration of 1 ha of the Elb wetland reduced the amount of nitrogen by 200 kg, which corresponded to a monetary value of 585 € per ha .	Avoided costs CVM	Hartje V., Meyerhoff J., Dehnhardt A. (2003): Monetäre Bewertung einer nachhaltigen Entwicklung der Stromlandschaft Elbe, Endbericht BMBF-Forschungsvorhaben Nr. 03395947/1 im Rahmen des Programms Elbe-Ökologie. TU Berlin
An economic analysis of the Large Blue butterfly	Germany	Y	Grassland	<u>Regulating services</u> : Pollination	Quantitative Monetary	A study undertaken by Lienhoop et al. (2008) aimed to assess the monetary value of natural pollination, particularly taking into account the conservation of the Large Blue (<i>Maculinea teleius</i>). Research was based on the assessment of the production of fruits and compared insect pollination with manual pollination and came to the result that natural pollination has a value of approx. € 1.5 billion/year (according to WTO-prices).	unclear	Lienhoop, Nele, Frank Wätzold, Martin Drechsler and Josef Settele (2008): Wie viel Artenschutz ist gesellschaftlich optimal? Eine ökonomische Analyse am Beispiel des Hellen Wiesenknopf Ameisenbläulings. Natur und Landschaft. Issue 12/2008

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
An economic analysis of the Large Blue butterfly	Germany	Y	Grassland	Range of services and values including <u>non-use values</u>	Monetary	The study takes a look at the economic value of conserving Large Blue butterflies, focusing particularly on non-use value by creating a hypothetical market willingness to pay. Aggregated economic benefits for each project level per year were as follows: Project level 1 €259,720 Project level 2 €297,374 Project level 3 €425,979 Figures showed that the aggregated benefits are much higher than the aggregated costs: For project 1 (meadow area of 4 ha) the lower bound of the confidence interval for the aggregated benefit exceeds the aggregated costs by more than two orders of magnitude. For project 3 (64 ha of meadows) the lower bound exceeds the aggregated costs by more than one order of magnitude.	CVM- Market Stall	Wätzold, Frank, Nele Lienhoop, Martin Drechsler and Josef Settele (2008): Estimating optimal conservation in the context of agricultural environmental schemes. Ecological Economics 68 (2008) 295 – 305

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Value of restoring forest ecosystems in Lower Saxony	Germany	N	Forests	Cultural services: landscape and amenity <u>Non-uses values</u>	Quantitative Monetary	The study values the restoration of forest ecosystems in Lower Saxony from mostly plantations to forests with attributes such as "habitats for endangered and protected plant and animal species", "species diversity" "forest stand structure", "landscape diversity", increased "share of broad-leaved area", increased "amount of dead wood" and small "percentage of non-native species". . The most important reasons for <u>being willing to pay were the attribute "number of habitats for protected and endangered species" in the Lüneburger Heide and "species diversity" in the Solling and Harz region.</u> Welfare measures for the LÖWE forest conversion programme were estimated between € 31.30 and € 52.4 per person to an according fund, in the Lüneburger Haide.	Choice experiment	Meyerhoff J., Liebe U., Hartje V. 2009. Benefits of Biodiversity Enrichment due to Forest Conversion. Evidence from two Choice Experiments in Germany. Working paper on management in environmental planning. Technical University Berlin.
Broader socio-economic benefits: job creation by Natura 2000 sites in Greece (e.g. Dadia, Messelogi and Kerkini Lakes & Vai palm tree forest)	Greece	Y	Not specified	<u>Broader socio-economic benefits:</u> direct employment supported by Natura 2000	Qualitative Quantitative	Dadia Natura 2000 site: conservation activities and related visitor economy has created around 70 jobs; Kerkini Lake: women's cooperative cultivates preserved eels in / from the lake, there is a pilot programme for fishermen to supplement income by boat services to bird watchers; Messelogi Lake: Natura 2000 site has created jobs for 25 guards; Vai palm forest: increased tourism in the areas since Natura 2000 designation	Quantification of beneficiaries and jobs	Country case study interviews

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Broader socio-economic benefits: <u>estimated</u> job creation by Natura 2000 sites in Greece	Greece	Y	Not specified	Broader socio-economic benefits: direct employment supported by Natura 2000	Quantitative	<u>Estimate</u>: on average each Natura 2000 site Management Body has employed 20 scientific staff and up to 10 administrative and technical staff. On this basis, 60 jobs have been created in the period 2001 - 2003 and up to 300 jobs could be created in the future; <u>Estimate</u>: there are around 60 nature information centres around Greece in Natura 2000 sites which employ 120 staff	Quantification of beneficiaries and jobs	Country case study interview
Natura 2000 area functioning as a water reservoir (Mount Parnassus)	Greece	Y and N	Mountain ecosystem	<u>Regulating services</u> : Water provisioning	Quantitative	¼ of water supply to the Copaida agriculture area (the most productive food production area in Greece) comes from Mount Parnassus reserves	Quantification of water supply	Amanatidou Elisabeth, Study of Self-Employment Opportunities of Graduates of the "Anti-Pollution Technologies" Department of the Western Macedonia Technical Institute (2007)
Creation of new markets for sustainable honey production at Przemkowskie Heathland Natura 2000 site	Hungary	Y	Heathland	<u>Provisioning service</u> : honey <u>Regulating service</u> : pollinations	Qualitative	Establishment of a viable honey production at Przemkowskie Heathland	Qualitative analysis	Andrzej Ruszewicz (Fundacja Zielona Akcja) in CEEWEB brochure on the value of ecosystem services
Broader socio-economic benefits: job creation in Ireland	Ireland	Y	Not specified	Broader socio-economic benefits: direct employment supported by Natura 2000	Quantitative Monetary	Employment linked to designation & management of Natura 2000: 136 FTE staff; Expenditure associated with employment of FTE staff: 6.5 million EUR / year	Quantification of beneficiaries and jobs	Country case study interview

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Willingness to pay to conserve agricultural landscape in Burren Heritage site	Ireland	N	Limestone pavements & orchid grasslands	<u>Cultural services</u> : aesthetic value (states to be the most likely attribute behind WTP)	Monetary	Estimated marginal willingness to pay / person / year to conserve the karst limestone pavements € 59.24 and the orchid rich grasslands € 56.40.	Survey & Willingness to Pay (WTP) estimate (choice modelling method)	Rensburg et al. 2009. Socio-economics of Farming for Conservation in the Burren. BurrenLIFE Project.
Benefits provided by the Burren Heritage site	Ireland	N	Limestone pavements & orchid grasslands	<u>Cultural services</u> : tourism & recreation; <u>Broader socio-economic benefits</u> : beneficial externalities of conservation	Monetary	Aggregate benefits provided by the Burren park's limestone pavements and the orchid rich grasslands were estimated to amount to €842/ ha/ year (prediction based approach) or €4,420 / ha / year (traditional CE approach). Based on these values, the total benefit from the karst limestone pavements and the orchid rich grasslands is estimated to be €15.89 (67.93) million and €9.38 (€64.6) million per year respectively. In addition, the total revenue (e.g. multiplied effects) from domestic tourists was estimated to be about €71.47 / hectare / year. All in all, the total rate of return on government support to the park was estimated (conservative) to be around 353 – 383%, (without or with tourism), and 235% if all operating costs of the farming programme and all direct payments are considered.	Survey & Willingness to Pay (WTP) estimate (choice modelling method); data on tourism expenditure; Land Portfolio Allocation model	Rensburg et al. 2009. Socio-economics of Farming for Conservation in the Burren. BurrenLIFE Project.
Benefits (marginal value) of ecosystem services in Ireland (based on extrapolation to national level)	Ireland	N	Not specified	<u>Variety of services</u> : pollination, soil quality, pest control, agricultural production, fisheries, overall human welfare and several forest ecosystem services	Monetary	Estimated current marginal value of ecosystem services in Ireland in terms of their contribution to productive output and human utility is estimated at over EUR 2.6 billion / year.	Production function method (with weightings from previous studies), benefit transfer & extrapolation	Bullock et al. 2009. The Economic and Social Aspects of Biodiversity Benefits and Costs of Biodiversity in Ireland. http://www.npws.ie/en/Biodiversity/EconomicValueofBiodiversity/

Case study / example	MS	Natura 2000 site (Y / N)	Location / ecosystem	Benefits addressed / valued (if possible, according to MA typology)	Type of information (qualitative / quantitative / monetary)	Estimated value	Method used	Reference
Broader socio-economic benefits: job creation in Lazio region	Italy	Y	Not specified	Broader socio-economic benefits: direct employment supported by Natura 2000	Quantitative	Employment linked to designation & management of Natura 2000: 19 staff	Quantification of beneficiaries and jobs	Country case study interview
Potential revenues from tourism in Dwejra Heritage Site (Gozo)	Malta	Y and N	Not specified	Cultural services: tourism & recreation	Quantitative Monetary	Estimated potential profit from tourism: 418 000 EUR in 2011	Quantification of potential revenues from tourism, based on extrapolations from previous year / existing data	Country case study interview
Broader socio-economic benefits: job creation in Romania	Romania	Y	Not specified	Broader socio-economic benefits: direct employment supported by Natura 2000	Quantitative	Employment linked to Natura 2000 activities in Romania: 163 staff	Quantification of beneficiaries and jobs	Country case study interview
Benefits of tourism related to Danube Delta pelicans	Romania	Y	Delta area / wetland	Cultural services: tourism & recreation	Quantitative	Number of tourists visiting the delta area: 70 000 / March - August 2009 and 142 845 / Feb - Oct 2008; Number of businesses providing accommodation in Danube Biosphere Reserve: 100	Quantification of tourism streams	Country case study interview
Benefits provided by restoration of floodplains in the Lower Danube Green Corridor	Romania	Y	Delta area / wetland	Provisioning services: fisheries, forestry, animal fodder; Regulating services: nutrient retention; Cultural services: recreation	Monetary	If the total pledged floodplain area in the Lower Danube Green Corridor were restored, estimated value of the resulting additional ecosystem services would be EUR111.8 million annually (225,000 ha x EUR500/ha).	Benefit transfer & extrapolation; Calculation of average estimates based on existing studies	Ebert et al., 2009. Floodplain restoration along the lower Danube: A climate change adaptation case study. CLIMATE AND DEVELOPMENT 1 (2009) 212–219

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Ecosystem services provided by Morava floodplain grasslands	Slovakia	N	Floodplain grassland	<u>Provisioning services</u> : production of hay <u>Regulating services</u> : flood control, nutrient retention	Quantitative Monetary	Estimates flood retention capacity: 100 million m ³ (Slovak side); Estimated nitrogen retention: 415 tons (taken up by grassland vegetation); Estimated value of hay: average net benefit from hay over 3.4 millions Sk (79 093 EUR) for the whole meadow area; Estimated monetary value of the nitrogen sink in the Morava floodplain (1727 ha): around 29.8 millions Sk (682 860 EUR) / year; Total social economic benefit from the conservation and sustainable use of the Morava floodplain amounts to 13 000 - 20 000 Sk (300 - 458 EUR) / ha	Quantification of biomass production and ecological / hydrological characteristics; Market price method; Replacement cost method	Seffer & Stanova (eds). 1999. Morava River Floodplain Meadows - Importance, Restoration and Management. DAPHNE - Centre for Applied Ecology, Bratislava.
Broader socio-economic benefits: net benefits of Natura 2000 in Spain	Spain	Y	Not specified	<u>Broader socio-economic benefits</u> : employment / spending supported by Natura 2000	Quantitative Monetary	Increase in national GDP: 0.1 - 0.26% (three different scenarios); Andalucía, Aragón and the Canarias islands are the three regions that are supposed to benefit the most from Natura 2000: GDP increases between 0.26 - 0.44%, and 1346 and 5957 jobs created	Input-output analysis; Multipliers	Project TRAGSATEC (Tecnologías y Servicios Agrarios) in country case study interview
Benefits of Monte Aldude Natura 2000 site, Navarra	Spain	Y	Not specified	<u>Provisioning services</u> : wood, game, energy; <u>Regulating services</u> : water purification, climate change regulation <u>Cultural services</u> : recreation	Monetary	Detailed results unclear	unclear	Interviewee, no reference available yet

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The economic impact and benefits provided by different protected areas (e.g. Peñas de Aia)	Spain	Y and N	Not specified	<u>Cultural services</u> : Recreation	Quantitative Monetary	Willingness to pay for the conservation of the natural park: 13.4% of the respondents replied that they would be willing to pay 60€ on average when visiting the park. People living next to the park would be willing to pay more than those living more distant. The willingness to pay was estimated at 21.52€ / visit in 2002.	CVM	Credoc, 2008. Les retombées économi-ques et les aménités des espaces naturels protégés. Paris
The economic impact and benefits provided by different protected areas (e.g. Los Alcornocales)	Spain	Y and N	Not specified	<u>Cultural services</u> : Recreation	Quantitative Monetary		Travel cost	Credoc, 2008. Les retombées économi-ques et les aménités des espaces naturels protégés. Paris
Benefits provided by Natura 2000 Network in Galicia	Spain	Y	Not specified	<u>Variety of services</u> : e.g. recreation	Monetary	Willingness to pay (WTP) to conserve three national parks (Baixa Limia, Invernadoiro and Fragas do Eume) in their current state in Galicia: 7 EUR / family / year; WTP for increased conservation / improved provisioning of services (i.e. from 36,000 ha to 280,000 ha, 15% assumed increase in the level of protection): 113 EUR / family / year	Willingness to pay (surveys)	Prada Blanco et al. 2005. Beneficios y costes sociales en la conservación de la RED NATURA 2000. Fundación Caixa Galicia. 268 pp. http://www.fundacioncaixaagalicia.org/portal/site/WINS001/menuitem.9f6721d90f15feac1b931b9351dm.9f6721d90f15feac1b931b9351d001ca/?vgnextoid=55e791633568d110VgnVCM1000000b0d10acRCRD&vgnextchannel=86aec2ab5d2fa110VgnVCM1000000b0d10acRCRD
Tourism / recreational value of the Fulufjället national park	Sweden	Y	Not specified	<u>Cultural services</u> : tourism & recreation	Quantitative Monetary	Number of visitors to the site: 53 000 / year in 2003; Visitor spending: around SEK 5 million (about EUR 50 000) within the park and SEK 12 million (about EUR 132 000) in the surrounding areas	Quantification of visitors and their spending	Fredmand et al. 2005 in Country Case Study

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Broader socio-economic benefits: job creation in Sweden	Sweden	Y	Not specified	Broader socio-economic benefits: direct employment supported by Natura 2000	Quantitative Monetary	Employment linked to Natura 2000 activities in Sweden: creation of 10-20 additional positions linked with research and monitoring of Natura 2000; Number of people working on management of protected areas: 250, with total remuneration for these placements EUR 15 million.	Quantification of jobs	Country Case Study
Benefits provided by Swedish coastal zones	Sweden	N	Coastal ecosystems	<u>Provisioning services</u> : trout fishing <u>Regulating services</u> : nutrient retention & water purification	Quantitative Monetary	Benefits of the reduction of eutrophication in Stockholm archipelago, leading to a one-metre increase in water transparency: about SEK 60 million per year (travel cost method) and SEK 500 million per year (contingent valuation method). This in comparison with estimated costs of restoration SEK 57 million per year.	Travel cost method; Contingent valuation method	Söderqvist et al. 2004. in Country Case Study
Benefits provided by Swedish forest ecosystems	Sweden	N	Forests	<u>Provisioning services</u> : timber, non-timber products <u>Regulating services</u> : soil protection, carbon sequestration <u>Cultural services</u> : recreation	Monetary	Value of timber harvest (lowest and highest value in 1987-1999): 2050 - 2370 mil EUR / year; Value of non-timber goods (lowest and highest value in 1987-1999): 277 - 223 mil EUR / year; Value of recreation (1987-1999): 2370 mil EUR / year; Value of protection of soil and noise (1987-1999): 20 mil EUR / year; Value of carbon sequestration: (lowest and highest value in 1987-1999): 630 - 1050 mil EUR / year;	Unknown	Skånberg. 2001. Monetary Forest accounts for timber and other forest related goods and services for Sweden 1987-99 in Country Case Study

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Estimated / extrapolated benefits of Natura 2000 in the Netherlands	the NL	Y	All Natura 2000 habitats	Variety of services: raw materials, recreation and tourism, benefits of one's natural surroundings, ecosystem functions & non-use values (Note: not MEA typology) <u>Variety of services - note: not MEA typology:</u> Support functions: Nature as support for human activities and waste products, e.g. living, working and the adsorptions of emissions of substance in the air and surface water. Production functions: Nature as a producer and provider of water, oxygen, bio mass and minerals. Regulatory functions: functions maintaining the natural balance on Earth, e.g. by filtering air, storing carbon dioxide or purifying water. Information functions: Nature as a source of information (e.g., education) Recovery functions: Nature as a source of human well-being (recreation) and human health.	Monetary	Estimated average value of benefits provided by nature in NL 4000 EUR / ha / year Estimated / extrapolated gross welfare benefits of Natura 2000 areas in the NL 4.5 mil EUR / year	Benefit transfer & extrapolation; Calculation of average estimates based on existing studies	Kuik, O., Brander, L. & Schaafsma, M. 2006. Globale Batenraming van Natura 2000 gebieden
Profits from water services linked to Natura 2000	the NL	Y	Wetland		Quantitative Monetary	Bade and van der Schroeffer (2006) based their estimate on information on current spending, using it as a direct evidence of the importance they attach to services and goods provided by Natura 2000. The authors take into account only flow of money considered identifiable ('hard'), such as turnover, profits after taxes, added value (e.g., real estate) and taxation. It was tested at two Natura 2000 sites to identify the economic value linked to certain nature and water functions of an area. One of the sites was analysed because of its high concentration of recreational activities, the other one because of its strong productive function related to inland fishery and inland navigation. The annual real estate value for nature or water was so estimated to amount to € 705 million at the recreational site and to € 251 million at the site with a high productive function. The latter was estimated to generate economical revenues with an amount of 91 million annually for the regional economy through indirect and direct flows of money.	Financial Eco-nomical Decision-making Support model (FEDS)	Bade T. and van der Schroeffer O., 2006. Water flows and cash flows. About European guidelines, water and regional economies. Triple E, Netherlands

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Economic Impact of national parks in Wales	the UK	Y and N	Not specified	Broader socio-economic benefits; direct and indirect employment/income supported by PAs / Natura 2000	Quantitative Monetary	A recent study of the economic value of protected areas in Wales concluded that the parks support nearly 12,000 jobs , produce a total income of approximately €250 million and generate €300 million in Gross Domestic Product.	Direct and induced effects on employment, output, GDP and income	National Trust (2006): Valuing our Environment – Economic Impact of the national parks of Wales, Great Britain
The economic impact and benefits provided by different protected areas (e.g., marine protected areas)	the UK	Y and N	Marine	<u>Range of services and values</u> (e.g., nutrient flow, carbon capture and storage, food production, fishery, raw materials, recreation and tourism, and existence value)	Quantitative Monetary	The overall value of benefits provided by the marine ecosystem varied between 2.2 billion and 4.4 billion GBP (3.3 to 6.6 billion EUR) over a period of 20 years, using the scenario of 'marine protected areas' implemented in the UK	Market prices and others?	Credoc, 2008. Les retombées économiques et les aménités des espaces naturels protégés. Paris
The economic impact and benefits provided by different protected areas (e.g. UK forests)	the UK	N	Forests	<u>Conservation of fauna and flora</u>	Quantitative Monetary	The willingness to pay for an 'ideal' forest was estimated at £38.15/household/year (48,11€) in case of choice modelling and £29.16/household/year (36,7€) when using contingent valuation method (UK Forestry Commission)	Choice modelling CVM	Credoc, 2008. Les retombées économiques et les aménités des espaces naturels protégés. Paris
Measurement of annual flows from agriculture	the UK	N	Grasslands	<u>Range of services and values</u> (e.g., landscape, water provision and regulation, waste treatment)	Monetary	Study by Defra on 'A Framework for Environmental Accounts for Agriculture' concluded that the overall net impact on income of annual flows from agriculture (including positive and negative) amounted to 654 million GBP in 2007.	Occurring costs Revealed preference	Buckwell A., 2009. Public Goods from private land", Rise Task Force. Rise Foundation and references within