Estimating the economic value of the benefits provided by the tourism/recreation and Employment supported by Natura 2000

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Abstract

The Natura 2000 network includes nearly 26,000 protected sites where human activities are permitted. It contributes to biodiversity conservation but also supports a number of economic activities, such as tourism, recreation, agriculture, and forestry, both on- and off-site. While these activities contribute to create and maintain jobs, they also support economic development at different levels. They also contribute to improved well-being and other benefits related to the human experience. It is thus important to assess and promote the socio-economic benefits Natura 2000 can provide in order to support better acceptance.

Economic valuation of the employment and other benefits of tourism and recreation supported by Natura 2000 has only been performed at local or regional levels, usually for specific sites. This study is a first attempt to provide such estimates at EU level. The methodologies developed to estimate the benefits of tourism and recreation rely on a site-based approach followed by an upscaling to the EU level. Scaling up from site level was performed on the basis of Natura 2000 area and economic and tourism characteristics of MS. To assess specifically the direct and indirect economic impacts of visitor spending, an input-output approach was then used. Three case studies were developed for Austria, Germany and the UK to illustrate these methodologies at MS level. The employment supported by the network was estimated by correlating the employment data at MS level to the dominant activities performed in Natura 2000 sites.

It is estimated that Natura 2000 sites receive between 1.2 and 2.2 billion visitor days per annum. In 2006, total visitor expenditure was estimated between 50 and 90 billion Euros. This expenditure helped in supporting employment and thus generating additional income in the region. This additional income is estimated to be in the range of 50 to 85 billion Euros, i.e. around 30% of the overall benefits provided by Natura 2000 (estimated between 200 and 300 billion Euros per annum in other studies). This economic impetus generated directly or indirectly about 4.5 to 8 million full-time-equivalent (FTE) jobs. Recreational benefits supported by Natura 2000 are estimated at around 5 to 9 billion Euros, i.e. an average willingness to pay of 4 Euros per visit to a Natura 2000 site.

About 21% of the visitors gave importance to the Natura 2000 designation while choosing their destination. This group of visitors spent about 15 billion Euros in 2006 and their expenditure generated additional 9 and 20 billion Euros in the economy (i.e. around 6% of the overall value of the benefits provided by Natura 2000). Similarly, 800,000 to 2 million FTE jobs were supported by the visitors who place a value to the Natura 2000 designation.

Finally, the overall activities undertaken in Natura 2000 sites are estimated to have supported about 12 million FTE jobs each year during the period 2006-2008, i.e. about 6% of total employment in the EU. This includes about 3.2 million jobs in recreation (26% of the total), 1.3 million in agriculture (11%), 200,000 in fishing (2%), and 70,000 in the forestry sector (1%).

These estimates are in line with similar data available in the literature. Nevertheless, they are subject to a high degree of uncertainty, in particular due to the constraint of limited data availability at site level. Hence, they should be considered as an order of magnitude rather than precise estimations and they should be used and interpreted with caution. They can be refined in the future as more complete and robust data becomes available.

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Executive summary

Natura 2000 is a large network of marine and terrestrial protected areas spanning all European Member States. Whereas its key role in preserving endangered habitats and species is well recognised, the fact that it also supports socio-economic goals such as economic development, welfare and employment is not acknowledged to the same degree.

At global level, recognition of the benefits provided by ecosystem services, including socio-economic benefits, increased significantly following publication of the study "The Economics of Ecosystems and Biodiversity" (TEEB) (2010) on the economic valuation of the benefits of ecosystem services. In the EU, the value of the socio-economic benefits of the Natura 2000 network, the main EU biodiversity instrument, have been estimated at local and regional levels in past studies, but never the overall benefits of the network. This study is a first attempt to provide these values at EU level.

The natural assets of the Natura 2000 sites, together with other features, represent a relevant attraction for visitors.

Nature-based tourism is following an upward trend worldwide. In the EU, the environmental attractions have become one of the main criteria for visitors in their selection of holiday destination. Natura 2000 sites benefit from a natural environment that may be of high interest for visitors. Some Natura 2000 sites were already a traditional tourism destination before joining the network. For other sites, their integration in the network potentially enhanced their tourism attractiveness. The main recreational activities that are proposed or being developed in the Natura 2000 sites are nature-based recreational activities, such as outdoor sports, which generally depend on the assets of the site, in terms of natural resources and environment (e.g. hunting, fishing, bird watching vs. walking, motor-biking). Depending on the specificities of the sites, cultural and educational activities may also be developed, e.g. sites where buildings representative of the regional cultural heritage are located (e.g. churches, monasteries), or where educational programs around the environmental resources of the site are organised. These features represent an additional attraction for visitors, besides the purely environmental ones.

Around 21% of the visitors to Natura 2000 are estimated to give importance to the Natura 2000 designation while choosing their destination.

The designation of a site as a nature-protected area is also an important criteria for some potential visitors, at diverse degrees depending on the area considered, the type of visitors, and the designation itself. In the present study, around 21% of the visitors are estimated to have affinity for the Natura 2000 designation, i.e. they place value on the Natura 2000 designation, and consequently, such designation is a criterion of selection of the tourism destination.

Tourism and recreation activities undertaken in the Natura 2000 network contribute to the economic development of a territory. At the same time, visitors in Natura 2000 sites benefit from a recreational experience.

Visitors to Natura 2000 sites purchase goods and services (e.g. entrance fees to the natural area, bike renting, accommodation and catering). Visitor spending generates additional income locally and causes economic impacts at local and wider levels[1], such as income and employment. Hence, tourism and recreation activities undertaken in Natura 2000 sites provide market benefits to the economy. The most common methods that are used to estimate the market benefits related to tourism and recreation are based on the visitor spending at site, regional or national level and the evaluation of their direct and indirect impacts on the value-chain in the economy. The economic impacts of visitor spending have already been assessed for a limited number of Natura 2000 sites, based on these methodological frameworks (e.g. the German National Parks *Niedersächsisches Wattenmeer*, *Bayerischer Wald*, *Eifel*, *Müritz*, *Hainich* and *Kellerwald-Edersee*, partly or completely covered by Natura 2000; *the Finnish Pallas-Ounastunturi* National Park, which belongs to the Natura 2000 network).

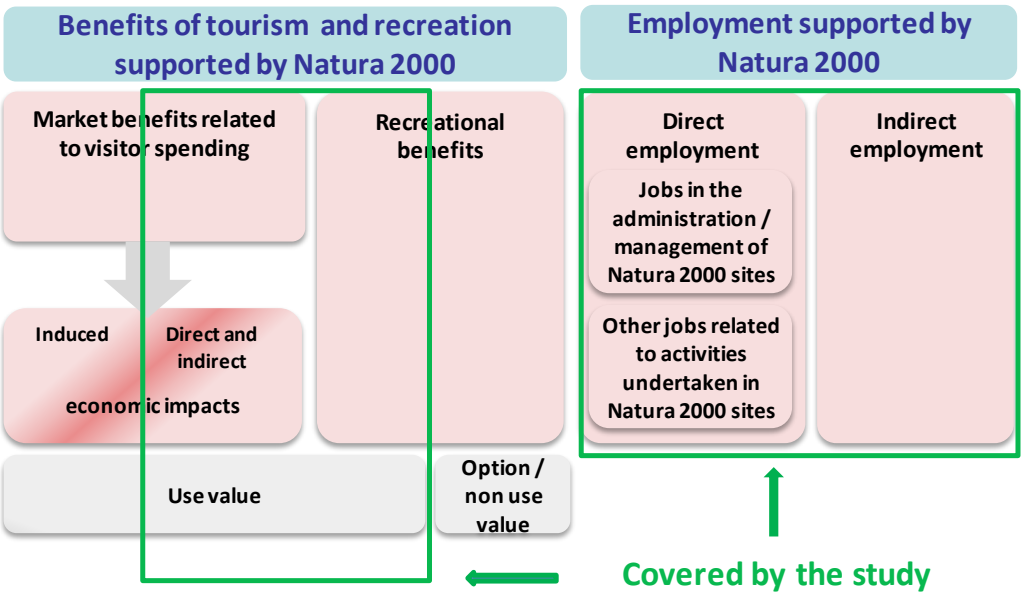
At the same time, a visit to a Natura 2000 site provides recreational benefits to visitors. These benefits are linked to human perceptions and experiences, e.g. the pleasure in undertaking an outdoor activity, the pleasure of viewing a nice landscape, the well-being and the stress reduction provided by a trek, the inspiration received that will be used in a future creative work. Although there is no market price for such benefits, they can be valued indirectly by estimating the price a visitor is willing to pay to visit the site. Specific methodological approaches used for assessing the recreational value of a nature-protected site include revealed preferences methods and stated-preferences methods. The literature provides a range of willingness-to-pay values for the recreational benefits provided by a visit to a specific nature-protected area, a specific habitat (e.g. forest) or for a specific outdoor activity (e.g. whale watching).

Finally, the overall activities undertaken in Natura 2000 sites support jobs in the field of agriculture, forestry and fisheries for example. The Natura 2000 designation also creates jobs in the management and administration of the sites.

This study estimated the economic value of the benefits provided by tourism and recreation, including the economic impacts deriving from visitor expenditure, the recreational benefits that refer to use values, and the employment supported by Natura 2000 (see Figure 1).

[1] The scope of this study is however limited to the benefits for the EU-27 as a whole and does not cover potential benefits abroad (through extra-EU import flows in final and intermediate products).

Figure 1: Scope of the study



Nonetheless, the economic benefits generated by tourism and recreation can translate into negative impacts on biodiversity conservation and ecosystems, depending on the nature of the economic activities supported (low or high impacting activities, such as construction and transport). These aspects are not covered in the economic valuation but should be part of any full cost-benefit assessment of the network.

Estimation of the benefits provided by tourism and recreation supported by Natura 2000

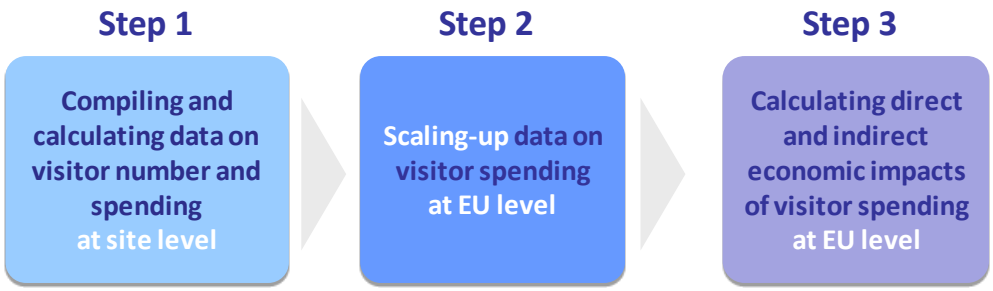
The economic valuation of the benefits provided by tourism and recreation supported by Natura 2000 faces several limitations. The main limitation is that there is a lack of data related to tourism at site level in the Natura 2000 network. Another limitation is that the recreational benefits are potentially closely related to other social and cultural services provided by ecosystems, i.e. landscape and amenity values, cultural values and inspirational services. In practical terms, a visitor can have difficulty determining the value he/she gives to a mountain view, for example, while undertaking a recreational activity such as walking. This implies that it is difficult to disaggregate the values given implicitly to other types of social benefits (e.g. cultural values) from the value estimated for recreational benefits. Moreover, market benefits and recreational benefits partly overlap, since a visitor will buy market goods and services in accordance with the value he/she is expecting to extract from them. This represents a risk of double-counting and care should thus be taken when estimating benefits related to tourism and recreation.

A site-based approach was developed in this study to estimate the economic value of the benefits related to tourism and recreation supported by Natura 2000. In order to avoid double-counting, economic impacts related to visitor expenditure and recreational benefits were estimated separately.

Natura 2000 sites receive between 1.2 and 2.2 billion visitor days per annum. In 2006, total visitor spending was estimated between 50 and 90 billion Euros. This expenditure generated additional income which was estimated in the range of 50 to 85 billion Euros.

Given that an extensive collection of primary data at site level was not possible within the constraints of this project, the effects visitor expenditure had in the economy were estimated by scaling up specific data on visitor expenditure from site to EU level and by using the consolidated EU input-output tables from Eurostat. The main advantage of this approach is that it provides comprehensive estimates of direct and indirect economic impacts of visitor spending at the EU level, within a consistent macroeconomic framework. The methodology involved three main steps (Figure 2), and the chief assumption that visitor spending is proportional to the area of the Natura 2000 sites.

Figure 2: Approach to estimate economic impacts derived from visitor expenditure



In 2006, between 1.2 and 2.2 billion visitor days to Natura 2000 were estimated, representing a total amount of spending between 50 and 90 billion Euros. Total visitor expenditure generated between 50 and 85 billion Euros of additional income in the economy, i.e. around 30% of the overall value of the benefits provided by Natura 2000 (between 200 and 300 billion Euros per annum in other studies). It represents 13% of the total value added of tourism and recreation in the EU[2] (estimated at 505 billion Euros).

In 2006, around 15 billion Euros were spent by the visitors who place a value in the Natura 2000 designation. Their expenditure generated additional income in the range of 9 to 20 billion Euros.

In 2006, visitors who have affinity with Natura 2000 sites spent around 15 billion Euros, for around 230-520 million visitor-days a year. It was estimated to generate between 9 and 20 billion Euros of additional income (i.e. around 6% of the total value of the benefits provided by Natura 2000). These figures are realistic but certainly overestimated, mainly because Natura 2000 areas without tourism activities were not considered due to a lack of information. In order to validate the approach, three case studies were analysed – for Austria, Germany and the UK. The results obtained at national level for these three countries appeared consistent with national indicators on tourism and recreation.

[2] NACE categories H55 and O92 – Input/Ouput Tables, 2006.

In 2006, a visitor to Natura 2000 was willing to pay an estimated price of 4 Euros per visit for the recreational experience. The total recreational benefits were estimated up to 9 billion Euros.

Recreational benefits were estimated by scaling-up recreational values per visit in Natura 2000 sites and other natural areas or nature-protected areas in the EU. As for tourism, scaling-up was performed on per hectare basis, based on MS groups with similar touristic characteristics and economic structures. Based on this approach, the recreational benefits supported by Natura 2000 were estimated between 5 and 9 billion Euros (i.e. a willingness to pay estimated at around 4 Euros per visit of a Natura 2000 site).

Estimation of employment supported by Natura 2000

In 2006, visitor expenditure was estimated to support between 4.5 and 8 million FTE jobs. The visitors who have affinity with Natura 2000 supported from 800,000 to 2 million FTE jobs.

The total employment supported by tourism and recreation was estimated on the basis of the economic impacts derived from visitor spending and using official figures on employment intensity per sector.

The approach to estimate benefits provided by tourism and recreation allows an appropriate estimation of direct and indirect employment generated by tourism and recreation activities. Between 4.5 and 8 million FTE jobs were supported (directly and indirectly) by the visitor expenditure. This includes from 800,000 to 2 million FTE jobs supported by the visitors who gave importance to the Natura 2000 designation. By comparison, the full implementation and management of the Natura 2000 network was estimated to directly support 122,000 FTE jobs.

Natura 2000 directly supported around 8 million FTE jobs each year during the period 2006-2008, and indirectly 4 million FTE jobs. It corresponds to about 6% of the total employment in the EU-27.

A specific methodology was developed to estimate the overall employment created or maintained by the activities undertaken in Natura 2000 sites, i.e. the employment supported by Natura 2000. A land-use approach was used to assess the main types of activities occurring in Natura 2000 sites, as reported in the Natura 2000 database[3], followed by scaling-up on a per Natura 2000 hectare basis. .

The main limitations of this approach are linked to the lack of data at site level in terms of employment and land use. Despite the limitations, consistent results with EU figures on employment and other estimates in the literature were achieved. Natura 2000 sites were estimated to have directly supported about 8 millions of FTE jobs on average, and a total of 12

[3] The European database on Natura 2000 sites is available at: www.eea.europa.eu/data-and-maps/data/natura-2000.

millions of FTE jobs (including direct and indirect jobs) each year in the EU during the period 2006-2008. This includes around 3.1 millions of jobs in recreation (excluding employment generated by hotels and restaurants; 26% of the total), 1.5 million of jobs in agriculture (11%), around 200,000 jobs in fishing (2%), about 70,000 jobs in forestry (1%), and 7 millions of jobs in the other industries (59%). Employment in the recreation sector derived from visitor spending (estimated by the input-output approach) represents half of the total employment in the recreation sector.

Uncertainties and future development

These estimates are subject to a relatively high degree of uncertainty. Firstly, the estimates were drawn from a relatively small information base. Secondly, the quality of data is uncertain in specific cases. Finally, potential substitution effects are not considered. Hence, these estimates should be considered more as orders of magnitude than as precise estimates and should be used and interpreted with caution.

The methodologies developed appear to produce estimates that are consistent with some other estimates from the literature and with economic indicators. Provision of more accurate estimates would require the involvement of all stakeholders in improving the knowledge and data base.

Despite the constraints and limitations of the study, it provides useful and realistic estimates in line with the literature and economic indicators. Regarding the assumptions, the estimates are certainly overestimated but are nonetheless in the same order of magnitude. However, a number of issues require further development to be able to provide estimates that are more accurate in future:

- The quality of estimates could be improved by the implementation of a systematic reporting process to collect data at site level related to tourism, recreation and employment. More data at site level would allow a more representative sampling of sites (for example by selecting sites based on a stratification in terms of biogeographical area) and more precise estimation of the economic benefits related to tourism/recreation and employment supported by Natura 2000. Moreover, further research is needed to value and integrate the substitution effects and increase knowledge related to land use in Natura 2000.
- The results of this study will contribute to increase the level of perception and recognition regarding the economic benefits of the network. This could be further improved by involving all types of stakeholders, increasing the knowledge regarding the overall benefits provided by Natura 2000 and ensuring the exchange of best practices related to tourism between sites.

Key concepts and definitions

This section presents definitions of tourism and recreation, and explains the benefits derived from tourism and recreation by visitors to Natura 2000 sites. The distinction between gross and net benefits is explained through the introduction of the concept of "affinity of visitors to Natura 2000".

Tourism and recreation

Often used interchangeably, tourism and recreation are two distinct concepts which may involve different types of activities. The main difference is that tourism refers to the activities done "outside" the day-to-day living environment of an individual while recreation can be both "within" or "outside" this environment. Moreover, recreation is often focused on one specific activity, while tourism may entail several recreational activities (e.g. sports, culture, relaxation), and sometimes also includes catering, transport, and accommodation.

The definition of tourism and recreation as used in this study are presented below.

Tourism

Tourism refers to the activity of visitors "taking a trip to a main destination outside their usual environment, for less than a year, for any main purpose (business, leisure, recreation or other personal purpose) other than to be employed by a resident entity in the country or place visited" (UNWTO, 2008)[4]. These trips taken by visitors qualify as tourism trips. Tourism trips can be personal or professional trips and can be classified according to their main purpose. In the context of the present study, some personal trips are particularly relevant, namely:

- **Holidays, leisure and recreation** – Sightseeing, visiting natural or man-made sites, attending sporting or cultural events, practicing a sport as a non-professional activity, using beaches, swimming pools and any recreation and entertainment facilities, cruising, gambling, attending summer camps for youth, resting, fine dining, visiting establishments specialized in well-being fitness except in the context of a medical treatment, staying in a vacation home owned or leased by the household, etc.;
- **Visiting friends and relatives –** Attending weddings, funerals or any other family event; short-term caring for the sick or old, etc.;
- **Education and training –** Following particular programs of study or acquiring specific skills through formal courses, including paid study, language courses, professional or other special courses, university sabbatical leaves, etc.;
- **Culture and spirituality** – Attending religious meetings and events, pilgrimages, etc.; and

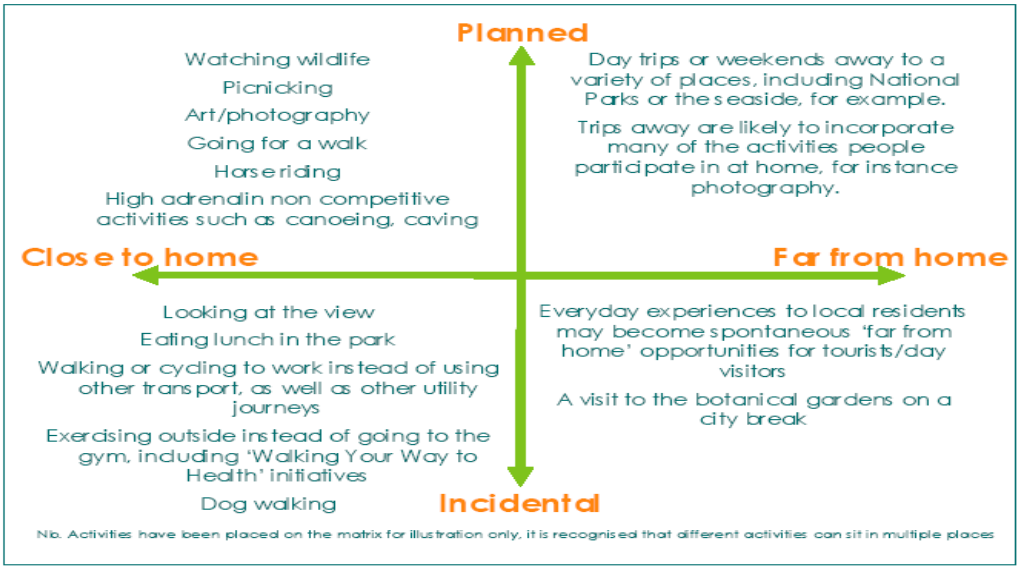
[4] Source: International Recommendations for Tourism Statistics (IRTS) of the United Nation World Tourism Organization (UNWTO).

- **Other** – Volunteer work (not included elsewhere), investigating work and migration possibilities; undertaking any other temporary non-remunerated activity not included elsewhere.

Recreation

Recreation can be defined as a pastime, diversion, exercise, or other resource affording relaxation and enjoyment (Yukic, 1970; Tribe, 2004). It includes all activities related to leisure and enjoyment, whether planned or not, and regardless of whether individuals undertaking these activities stay locally or travel outside their usual environment (Figure 3).

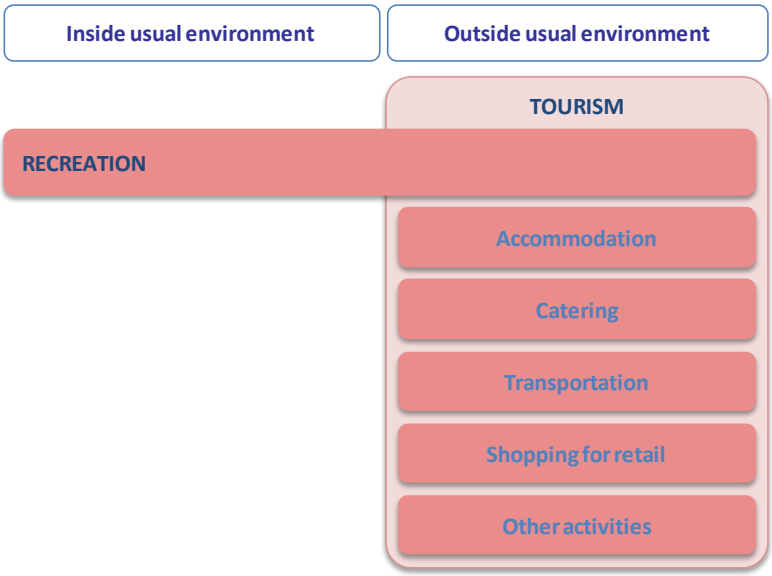
Figure 3: Defining outdoor recreation



Source: Thompson W. (2008)

Thus, only recreation activities undertaken outside the usual environment of an individual (generally far from home) can be considered touristic (see Figure 4).

Figure 4: Relationship linking tourism and recreation



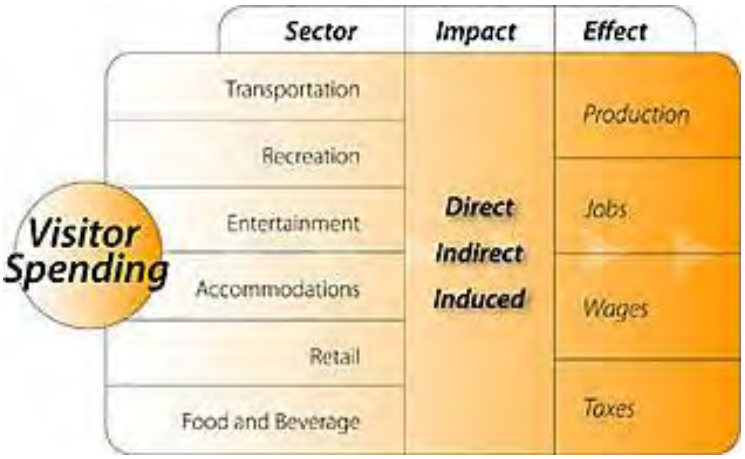
Two types of visitor categories are generally characterised: overnight or same-day depending on whether their trip includes an overnight stay or not. Distinguishing overnight visitors from same-

day visitors is crucial when assessing visitor expenditure because of the accommodation-related costs.

- **Visitor spending**

Visitor spending is defined as "the total consumption expenditure made by a visitor, or on behalf of a visitor, for and during his/her trip and stay at destination"[5]. It includes all spending on goods and services made by a visitor. The main determining factors of visitor expenditure are the duration of the stay, visitor type (same-day or overnight visitor) and the type of accommodation (Stynes et al., 2000). Visitor spending is generally split into several categories, viz. transportation, recreation, entertainment, accommodation, retail, and catering (Figure 5).

Figure 5: Flows of tourism spending through an economy



Source: The Tourism Economics[6]

- **Market benefits provided by tourism and recreation supported by Natura 2000 and their economic impacts**

Spending of Natura 2000 visitors provides market benefits to local economies. These market benefits stem directly from visitor spending on tradable goods and services, for example entrance fees for nature-protected areas or cultural attractions located within the protected area, guided tours, hunting permits, accommodation, and catering. Valuation of the market benefits can be made on the basis of existing market prices of products and services.

Market benefits generate additional income and cause direct, indirect, and induced impacts in several sectors of the economy, which correspond to changes in sales, tax revenues, income, and employment (see Figure 6: Direct and indirect economic impacts derived from visitor spending):

- **Direct economic impacts** are the changes in sales, tax revenues, income, and employment due to tourism activity. They are generated by the influx of income stemming from visitor spending in the economic sectors related to tourism and

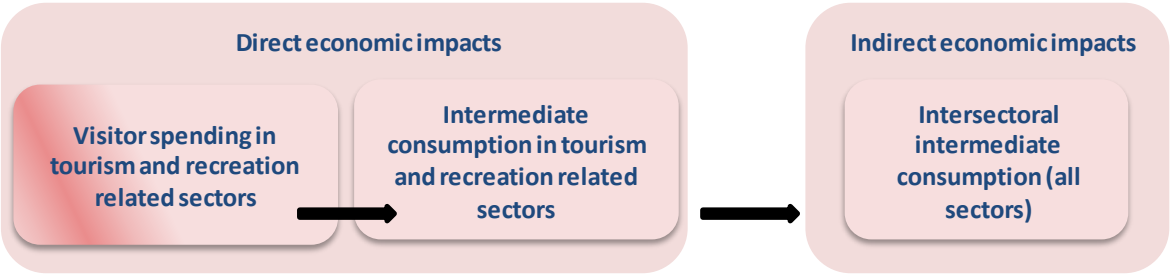
[5] From Recommendations on Tourism Statistics United Nations- World Tourism Organization 1994 Series M No 83 available at unstats.un.org/unsd/publication/Seriesm/SeriesM_83e.pdf

[6] Available at: www.tourismeconomics.com/services-economic-impact.php

recreation. They include the intermediate consumption between industries of the tourism/recreation sector;

- **Indirect economic impacts** are the changes in sales, tax revenues, income, and employment in all other sectors which benefit indirectly from visitor spending in the economic sectors related to tourism and recreation; and
- **Induced economic impacts** include the changes in sales, tax revenues, income, and employment generated by the spending of employees of both the tourism/recreation industries and the industries that provide goods and services to the tourism/recreation sector.

Figure 6: Direct and indirect economic impacts derived from visitor spending



- **Non-market benefits provided by tourism and recreation supported by Natura 2000**

Visitors may also gain non-market benefits from Natura 2000 sites through human perceptions and experiences, human well-being, and self-development. Non-market benefits are not traded on specific markets and there is neither ownership nor pricing. It is thus not possible to assign a market value to these benefits, e.g. rock-climbing is usually free of charge. Three types of non-market benefits relate to tourism and recreation:

- Recreational benefits that are linked to the experience of recreational activities;
- Landscape and amenity values that are linked to the perceptions of a nice landscape; and
- Cultural values and inspirational services that are related to both the cultural heritage within the area and the access to education.

- **Gross benefits supported by Natura 2000**

The gross benefits of the Natura 2000 network are the overall benefits provided by the sites forming the network. They include both the benefits stemming from the existence of these natural sites and from their designation as Natura 2000 sites.

- **Net benefits supported by Natura 2000**

Net benefits of the Natura 2000 network are the additional benefits that are generated through the Natura 2000 designation.

- **Affinity of visitor with Natura 2000**

The affinity of visitor with Natura 2000 refers to both the level of awareness and the interest of a visitor in visiting sites with a Natura 2000 designation. A visitor has affinity with a Natura 2000 site when he places a value on the Natura 2000 designation. This implies that the designation of

the site is used as a criterion in his choice of tourism and recreation site. Therefore, the affinity of a visitor with Natura 2000 measures the extent to which a Natura 2000 designation plays a role in a visitor's decision to visit a site.

A visitor's level of affinity with Natura 2000 is a key concept in the calculation of tourism and recreation benefits. **It is frequently used in the literature to account for the benefits supported by a natural site with a specific designation.** In the present study, it can help to determine whether the economic impacts that visitor spending provides to local communities are directly attributable to the Natura 2000 designation. **The affinity of visitors to Natura 2000 designation could be taken into account to determine the added value provided by the Natura 2000 network for tourism and recreation**.

- **Employment supported by Natura 2000**

Activities undertaken in Natura 2000 sites generate flows of income in the economy resulting in changes in employment (i.e. creation of jobs). Changes in employment concern all economic sectors. Jobs are said to be "supported by Natura 2000" when they are maintained and created by the activities undertaken in Natura 2000 sites. This includes indirect employment supported by tourism and recreation, i.e. the employment created by the flows of income generated by visitor spending in the tourism sector and in other economic sectors.

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Chapter 1: Introduction

Natura 2000 is the largest network of marine and terrestrial protected areas implemented across all European Member States, covering almost 18% of the total EU terrestrial area. Its crucial role in preserving endangered habitats and species is well recognised. Local communities generally highlight the costs and restrictions related to the implementation and maintenance of the network. On the other hand, they seem not to understand the socio-economic benefits of Natura 2000, such as economic development, welfare increase, and employment. A better recognition of the Natura 2000's socio-economic benefits by all stakeholders (civil citizens, site managers, conservation professionals, and local authorities) will contribute to create support for the development of the network, and the implementation of initiatives integrating both conservation and economic development.

At a global scale, the recognition of the benefits provided by ecosystem services, including socio-economic benefits, has significantly increased following the study "The Economics of Ecosystems and Biodiversity" (TEEB). It covered as far as possible the issue of the economic valuation of the benefits related to ecosystem services and in particular addressed the value of protected areas. Concerning the Natura 2000 network in particular, several studies were conducted at local and regional levels with the aim to characterise the socio-economic benefits provided by Natura 2000 and to value them and put into perspective with the costs of implementation. However, there is no available evidence regarding the overall economic value of the benefits provided by Natura 2000. To fill this knowledge gap, the European Commission is conducting three studies dealing with the estimation of the benefits provided by the Natura 2000 network:

- Study on the overall economic value of the benefits provided by the Natura 2000 network;
- Study on the benefits of conservation measures; and
- **The present study on the estimate of the economic value of the benefits provided by tourism and recreation, and employment supported by Natura 2000[7].**

This report presents the outcomes of the latter.

1.1 Aims and objectives

This study aims to provide a better understanding of the benefits provided by tourism, recreation, and employment supported by Natura 2000. The results of this study would contribute to increase awareness of touristic and employment potentials in Natura 2000 and better-informed management and policies regarding the design of Natura 2000. The main aims of this study were:

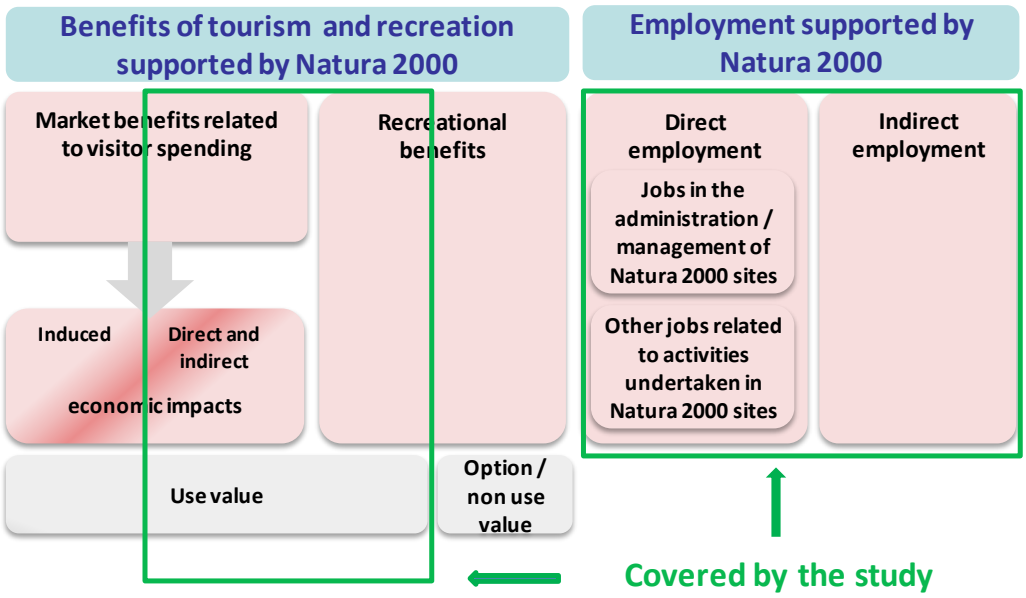
[7] Contract No. 07.0307/2010/581498/SER/B.3

- To review the existing approaches for the economic valuation of the benefits provided by tourism/recreation and employment in nature protected areas, highlighting the advantages and limitations of different approaches;
- To develop a robust methodology for estimating the benefits supported by Natura 2000 and to test its feasibility through three case studies;
- To apply the methodology and provide gross estimates of the value of these benefits for the entire Natura 2000 network; and
- To assess the progress achieved and elaborate recommendations for both future developments of the valuation approaches and enforcement of the overall Natura 2000 benefits recognition process.

1.2 Scope

This study estimates the economic impacts at EU level derived from visitor spending in Natura 2000 sites, the value of the recreational benefits, and the direct and indirect employment supported by Natura 2000 (Figure 7).

Figure 7: Scope of the study



The priority is given to the estimation of the gross benefits of the two sectors (tourism/recreation and employment), vs. the net benefits supported by Natura 2000 (i.e. the added value of Natura 2000 designation). In particular, this study focuses on:

- Direct economic impacts of the market benefits provided by tourism or recreation in Natura 2000 areas, i.e. the direct economic impacts stemming from visitor spending;
- Indirect economic impacts of the market benefits provided by tourism or recreation, i.e. the impacts that occur in economic sectors other than tourism-related sectors;

- Recreational benefits that refer to use value, e.g. the feeling of well-being when a visitor does an outdoor activity. This includes:
  - cultural values and inspirational services; and
  - landscape and amenity values.
- Direct and indirect employment supported by Natura 2000, including employment:
  - related to the management and the administration of the Natura 2000 sites and the network, including the staff in charge of the conservation measures in the area;
  - in sectors benefiting from the provisioning services provided by Natura 2000, e.g. agriculture, forestry, fishing;
  - in sectors benefiting from the regulating services provided by Natura 2000, including mining, energy and water suppliers; and
  - in sectors benefiting from the cultural services provided by Natura 2000, including tourism and recreation.

The scope of the study does not include:

- induced market benefits;
- the option and non-use values of non-market benefits, i.e. the benefits that derive from the knowledge an individual has about the existence of Natura 2000;

Furthermore, the study does not account for the use values corresponding to ecosystem services that are not provided by recreation and tourism.

The geographical scope of the study includes all 27 Member States. Although the aim is to assess the benefits of Natura 2000 sites, other protected areas were also considered (in particular when they included Natura 2000 sites) to ensure sufficient data.

1.3 Approach and methodology

The methodology consisted of the following steps:

- Literature review of the state of play in addressing benefits provided by tourism, recreation and employment in natural protected areas to identify the typologies of benefits, valuation methods, and existing estimates (see Box 1).

- Identification of the key issues for the economic valuation approach of the benefits provided by tourism and recreation and employment, and a comparative assessment of the different approaches;
- Development of the valuation methodologies to estimate benefits provided by tourism and recreation and employment;
- Collection of the primary data through questionnaires submitted to site managers, complemented by the existing estimates extracted from the literature (see Box 2);
- Testing the developed methodology through three case studies, viz. Austria, Germany, and the UK;
- Scaling up the approach for the overall Natura 2000 network;
- Cross-validation of the estimates; and
- Elaboration of recommendations for future methodological developments.

Box 1: Literature review of valuation methodologies and estimates on tourism and employment

The aim of this literature review was to provide a rapid assessment of all relevant and up-to-date evidence on valuation studies and methodologies, in particular in Natura 2000 sites or related to tourism, recreation and employment. Rather than being exhaustive, the review aimed to provide a relevant assessment. Around 90 publications were identified that focused on studies:

- With a worldwide geographical scope
- Focused on Natura 2000 sites or natural areas, nature protected areas or national parks
- Dealing with the assessment of ecosystem services in general, or related to tourism, recreation, or employment in particular; it also included reference studies on scaling-up .

In particular, the literature review targeted:

- Research on key methodological issues, past, and recent methodological developments
- Case studies testing key methodological issues
- Databases related to tourism, employment, and nature protected areas

Several sources of information were used to document the literature review, that were searched using different combinations of key words:

- Eurostat[8], for MS and EU statistics, in particular on tourism and employment, and policy reports that include economic analysis.
- National statistical websites, for tourism and employment-related data
- Worldwide and National Tourism organisation websites
- Natura 2000 websites:
    - The official Natura 2000 website of the Natura 2000 network
    - The Natura 2000 Barometer[9]
    - National Natura 2000 websites
- National parks websites
- Science Direct[10] and google scholar, to identify relevant scientific publications.
- Google: this general search engine was used to identify relevant grey literature (reports, other publications, and activities beyond academia).

[8] ec.europa.eu/eurostat

[9] ec.europa.eu/environment/nature/natura2000/barometer/index_en.htm

[10] www.sciencedirect.com

Box 2: Literature review of recreational benefits

The aim of this literature review was to identify studies that estimated the recreational benefits of natural areas in Europe (nature-protected areas, national parks, reserves, Natura 2000 sites, terrestrial and maritime areas). The review covered both scientific and grey literature, published in English, Spanish, French, Portuguese, and German.

A screening of the literature was then performed to identify in particular case studies that assessed recreational benefits for a specific site or area, and that included :

- Quantitative values of non-market benefits of social and cultural services in general, and specifically of recreational benefits
- A qualitative assessment of recreational benefits

In total, around 80 studies were identified, that covered a diversity of habitats (e.g. forests, grasslands, burdens, lakes, limestone pavements)

1.4 Report structure

Following this introductory chapter, the report is structured as follows:

- Chapter 2 presents an overview of the ecosystem services provided by Natura 2000 and highlights the key issues related to the valuation of their benefits;
- Chapter 3 reviews the benefits related to tourism and recreation, and employment supported by Natura 2000, as well as the existing methodologies used for their economic valuation;
- In Chapter 4, total economic impacts derived from visitor spending are estimated, along with the recreational benefits supported by Natura 2000. The methodology developed for each estimation is presented along with the results;
- Chapter 5 describes the methodologies used to estimate the overall employment supported by Natura 2000 and presents the results;
- Chapter 6 chalks out recommendations for future developments; and
- The Annex presents the case studies developed for Austria, Germany and the UK.

Chapter 2: Overview of the benefits provided by Natura 2000

In brief: Natura 2000 areas provide several ecosystem services, namely provisioning, regulating, social and cultural services, and wider socio-economic benefits, i.e. support to local and regional economies. Qualitative assessments of those benefits can be found in the literature, but quantitative assessments are scarce. The valuation of benefits provided by Natura 2000 raises key issues. In particular, the lack of data implies applying a scaling-up method under the condition that the representativeness of the features of Natura 2000 sites is covered. Moreover, it makes difficult to estimate the net benefits supported by Natura 2000, i.e. the added value that the Natura 2000 designation brings to a nature protected areas.

2.1 Natura 2000

Natura 2000 is the largest network of protected areas in the world. It currently comprises nearly 26,000 sites, covering an area of over 1.25 million km² across Europe (i.e. about 18% of the EU terrestrial area). It was established under the 1992 Habitats Directive, to strengthen the 1979 Birds Directive. The aim of the network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats, thereby fulfilling the European Union's obligations under the UN Convention on Biological Diversity. The network encompasses two types of areas, namely:

- Special Areas of Conservation (SACs) established under the Habitats Directive 92/43/EEC. SACs contain habitats of community interest which:
  - are in danger of disappearing within their natural range;
  - occur mainly in the EU; and
  - represent an outstanding example of one or more of nine European eco-regions.
- Special Protection Areas (SPAs) established under the Birds Directive 2009/147/EC. SPAs are sites especially suites to conserve habitats for threatened bird species (as listed in Annex 1 of the Directive), but which also contribute to maintaining healthy populations of all bird species.

The Natura 2000 network covers a diversity of habitats such as forests, wetlands and peatlands, grasslands, coastal areas, marine areas, inland waters, etc. Over 1,000 animal and plant species and over 230 natural and semi-natural habitats are listed in the annexes of the two EU Directives. The Natura 2000 sites vary in primary use, in addition to a number of other factors such as size,

bio-geographic features, the ecosystem services they provide, geographical location, visitor use, accessibility, and the degree of threat for habitats and species (Jacobs et al., 2005).

Natura 2000 is not a system of strict nature reserves. Although the network includes nature reserves, most of the land continues to be privately owned and the objective is to ensure that future management is sustainable from both ecological and economic points of view. The Natura 2000 network can therefore bring economic and social benefits. Benefits include the provision of ecosystem services (e.g. supply of food and timber products), creation of employment opportunities (e.g. in tourism), increased social stability and improved living conditions, as well as reduced local environmental problems (e.g. water pollution)[11].

Key issues today include management and funding of the specific sites. Accounting for the costs and benefits of conservation measures is necessary to ensure that measures taken are cost-effective and to recognise the full advantages of protecting Natura 2000 areas.

2.2 Overall benefits provided by Natura 2000

Given its diversity, the Natura 2000 network can provide a wide range of environmental benefits, besides food, livestock and timber production. These include regulating services, such as climate regulation (e.g. carbon sinks) or water regulation, but also flood protection, pollination or erosion control. In addition to these, the sites can provide a number of socio-economic benefits, such as employment, education, well-being, and recreation. Thus in this study, in line with previous studies assessing the costs and benefits associated with the Natura 2000 network (Gantioler et al., 2010; Kettunen et al., 2009), the classification of ecosystem services presented in the Millennium Ecosystem Assessment (MEA, 2005) has been rearranged to better address the nature of Natura 2000 sites.

- **Provisioning services** are defined as the products obtain from ecosystems, such as food, fuel, fibre, fresh water, and genetic resources. Provisioning services rely on underlying supporting services such as nutrient cycling or soil formation.
- **Regulating services** are defined as benefits obtained from regulation of ecosystem processes such as climate regulation, disease regulation, water purification or pollination.
- **Cultural and social services** are the non-material benefits obtained from ecosystems such as recreation, aesthetic enjoyment or spiritual fulfilment , i.e. services linked to human perception and behaviour, cultural values, landscape and amenity values, tourism, and recreation.
- **Wider socio-economic benefits** which are not ecosystem services as such, but additional economic and social benefits that stem out from the existence of Natura 2000 sites such as employment supported by Natura 2000 sites (Kettunen et al., 2009).

[11] COM(2004) 431 Financing Natura 2000

The first two categories of services are covered by a parallel study of the European Commission[12], while the last two categories are the focus of the present study.

The types of services supported by a Natura 2000 site depend on the nature of the site (e.g. forest or grassland) and the main activities associated with it (e.g. nature protection or forestry). Thus, each site is characterised by a different set of ecosystem services, some services are often grouped, e.g. a forest site typically supports timber production, carbon storage, recreation and air quality regulation and tradeoffs may occur between some ecosystem services, e.g. crop production often tradeoffs with most other services (Maes et al. 2011).

2.3 Economic valuation of Natura 2000 benefits

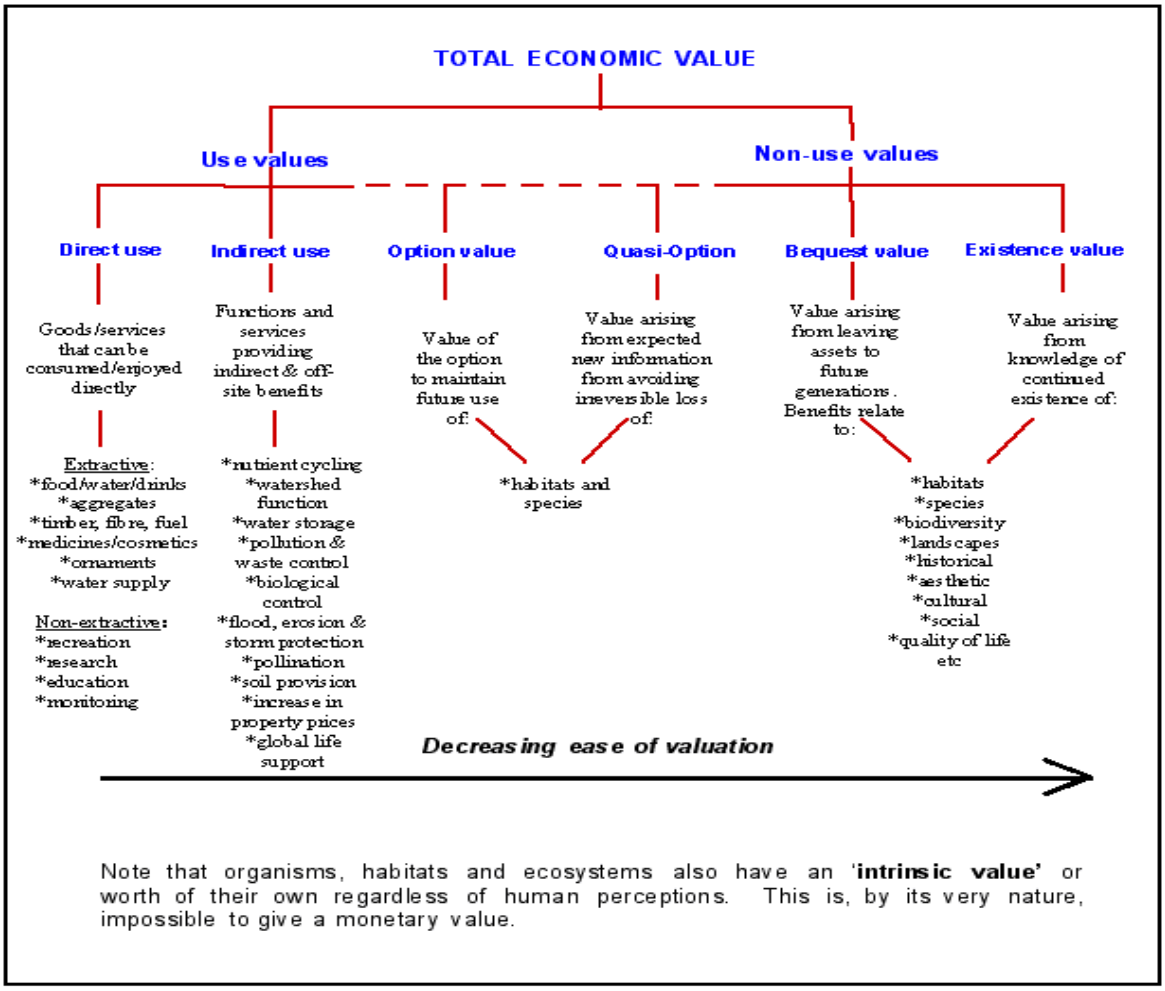
2.3.1 Total Economic Value framework

The multiple benefits of Natura 2000 sites remain poorly known and, therefore, under-developed. While many qualitative estimates of ecosystem services are available, quantitative and monetary estimates are still scarce in the literature (Balmford et al., 2002; MEA, 2005; TEEB, 2010), in particular for Natura 2000 sites. The main reason for this seems the difficulty to assess the economic benefits provided by ecosystem services. Moreover, the valuation of ecosystem services is complex since it has to reflect the current use of the services and the fact that they need to be preserved for a future use. However, over the past two decades, there have been methodological developments focused on the economic valuation of biodiversity, and the most widely used valuation framework to assess all these benefits is the Total Economic (TEV) framework (Figure 8). The TEV combines:

- **Use values** include the value derived from direct uses of services that could be productive (e.g. food provision) or non-productive (e.g. environmental amenities). Use values also include the value derived from indirect uses of the services (e.g. regulation of extreme events) as well as option values, which relate to the opportunity given to an individual to benefit from the service in the future.
- **Non-use values** encompass values of preserving ecosystem services for the benefit of future generations (bequest values), as well as the value of simply knowing that ecosystem services exist (existence values).

[12] Contract 07.0307/2010/581178/SER/B3.

Figure 8: The Total Economic Value of Natura 2000 sites



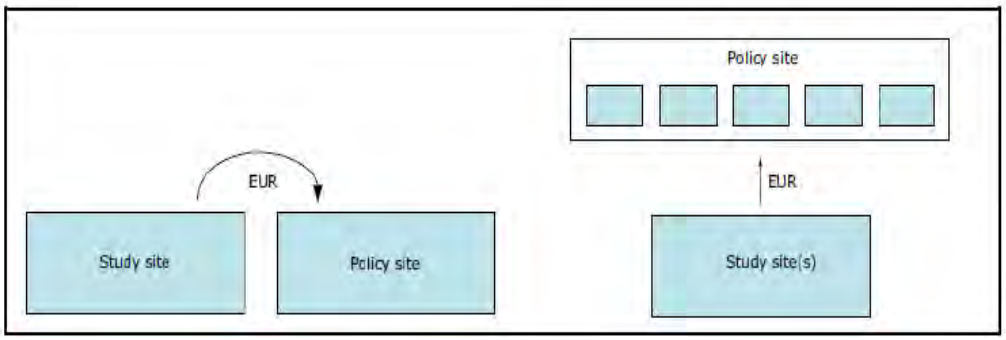
Source: Bryden et al. (2010)

2.3.2 Aggregating and scaling up from site-level benefits

Site-specific benefits take into account specific characteristics of the site and are usually based on primary data (usually produced for field surveys). However, such information is available only for a limited number of sites. Given the limited availability of data and its lack of representativeness, estimating benefits over the entire Natura 2000 network is a challenge. As illustrated in Figure 9, two approaches can be used:

- "Benefit value transfer" transfer the value obtained in one specific context (i.e. the study site) to another context (i.e. the policy site);
- "Scaling-up exercise" consists in using existing values for one or more study sites to assess values at a larger geographical scale, e.g. scaling-up data from site level to regional, national or EU level. The study sites have to share similar features, such as habitats or economic structures.

Figure 9: Benefit transfer and scaling-up



Source: EEA, 2010

Brander et al. (2010) proposed a methodology to scale up ecosystem service values to a European level that refers to the value per hectare as a value unit, and tested it on the European wetlands, which represent approximately 50,530 sites (see Box 3). One condition for the scaling-up is that the sites' socio-economic and physical differences should be taken into account to capture differences between sites and over sites. Therefore, the application of this method implies to gather relatively large number of site-specific, study-specific and context-specific variables. These important data requirements represent a major limitation to the applicability of such an approach and a main challenge in the present study.

Box 3: Scaling up ecosystem service values to a European level (Brander et al., 2010)

The methodology follows three steps:

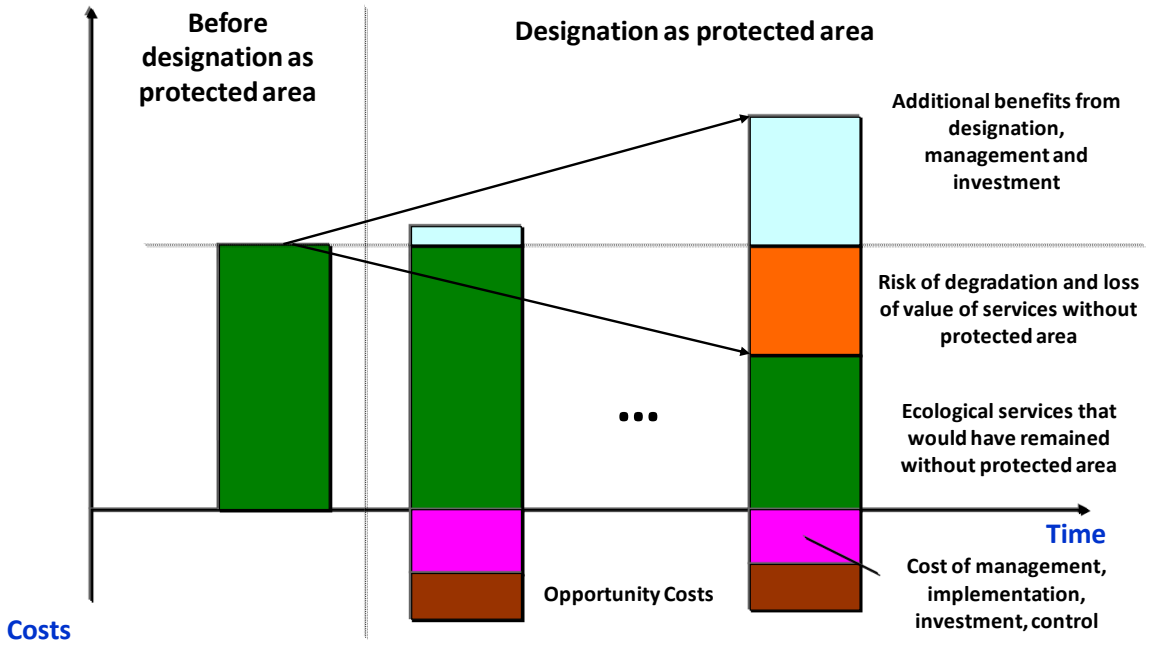
- A value per hectare is estimated for each European wetland by using a value function that makes possible to take account of the individual characteristics of both the site and the place where it is located (e.g. GDP per capita, population in 50 km radius, wetland size, flood control, fuel wood).
- For each site, the value per hectare is multiplied by the total area of the site. It results in a total value for each wetland site.
- All the values are aggregated to the regional, national and European level.

Furthermore, the possibility of substitution effects from services generated by similar ecosystems has to be examined when aggregating and scaling up from site-level benefits. Substitutes can "take the form of different services at one ecosystem site or identical services at spatially separate ecosystem sites" (EEA, 2010). Visitors may change their behaviors because of the designation of a natural area as Natura 2000, and/or because of the location of a Natura 2000 site close to the area. For instance, they could decide to visit a Natura 2000 site instead of a natural area without designation. The neglect of substitution effects can potentially create a systematic upward bias in the final values of the benefits supported by the Natura 2000.

2.4 Net benefits provided by the Natura 2000 network

As explained in TEEB (2010), protected areas designations, as for example Natura 2000 designation, can increase the value of services provided by sites (Figure 10).

Figure 10: Additional benefits from Natura 2000 designation



Source: TEEB (2010)

The designation of a site as Natura 2000 leads to the implementation of conservation measures, the establishment of management and administrative structure, and the enhancement of initiatives for local development leading to an increase in the value of the services. Regarding tourism and recreation in particular, the designation can result in an increase in the number of visitors at the site. By attracting visitors, the designation thus increases the value of benefits generated by tourism and recreation. Regarding employment, the designation of Natura 2000 implies creation of jobs. Furthermore, as shown in Box 4, the added value can be seen as a stronger influence to support other initiatives. Nonetheless, the designation of a site as Natura 2000 can also lead to some restrictions being imposed on economic and other social activities, which may have some negative economic impacts. For example, recreational industries may be restricted in the type of activities they can develop for visitors, since the activities will have to respect the natural environment.

Box 4: The added value of the Natura 2000 designation to Białowieża Forest site (PL)

Pabian and Jaroszewicz (2009) noted: "designation has brought added value to the Białowieża Forest site. [...] It gives hope for improvement of the forest management and arrangement of protected areas management within the Białowieża area [...]. For the first time it has a status strong enough to influence local spatial management plans, assuring that further infrastructure development respects nature."

To estimate the benefits of tourism and recreation and employment supported by Natura 2000, it is important to distinguish the gross and net benefits. **The gross benefits of the network are the overall benefits provided by the sites forming the network.** They include both the benefits

from the existence of natural sites and from their designation as Natura 2000 sites. **Net benefits are the additional benefits that are generated because of the Natura 2000 designation.** They derive from the difference between the positive impacts and the negative ones. Jacobs (2005) estimated that an average of 40% of benefits was specifically associated with the Natura 2000 conservation designation in Scotland.

Following are the three main issues for estimating the net benefits:

- Even without the Natura 2000 designation, the natural sites would provide some benefits, e.g. these areas would still attract visitors and some jobs would still be created on and off site. Theoretically, net benefits could be estimated by calculating the benefits generated if the site was a part of the Natura 2000 network, minus the benefits that would have been generated even if the site was not a part of the network. In practical terms, it would be difficult to assess benefits that would have been generated even if the site was not part of the network.
- Before being designated as Natura 2000, most of the sites were already nature protected areas under regional or national legislation. It is therefore difficult to estimate the additional benefits of Natura 2000 designation without counting the benefits brought by a former "nature protected area" designation.
- There is a lack of data to estimate the value of benefits before and after the designation. Fredman et al. (2007) counted the change in the number of visitors after the designation of Fulufjället as National park in Sweden, but they noted the difficulty to understand all the factors contributing to this change. Part of the increase of visitors estimated to +40% after the designation can be a direct effect of the designation, but other factors related to socio-economic changes at micro and macro level might have also contributed to it.

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Chapter 3: Benefits provided by tourism and recreation, and employment supported by Natura 2000

In brief: Visitors to Natura 2000 are partly attracted by the natural assets. Their decision to choose a site for tourism could be influenced by the designation of a site as Natura 2000. In the present study, around 21% of the visitors to Natura 2000 sites are estimated to have affinity for Natura 2000 designation. Tourism and recreation activities undertaken in Natura 2000 provide market benefits and non-market benefits that should be estimated separately given their differences in nature and to limit the risk of double counting. Among the methods that are generally used to assess the value of market benefits provided by tourism, the value-chain analysis and input-output models are relevant to estimate direct and indirect benefits in a whole economy. Non-market benefits are commonly estimated by using revealed or stated preferences methods. The literature provides existing values of recreational benefits in natural areas (including Natura 2000 sites). Furthermore, Natura 2000 supports directly and indirectly employment and several estimates are available at site or territory levels. Nonetheless, despite their positive economic impacts, tourism and recreation can have negative impacts on biodiversity and conservation measures and the positive correlation between employment and ecosystem services is not automatic.

The aim of this chapter is, first, to identify the main typologies of benefits related to tourism and recreation, and the types of jobs supported by Natura 2000, and second, to highlight the main valuation methods used to estimate the economic value of the benefits, and employment.

3.1 Benefits provided by social and cultural services

The social and cultural services provided by a Natura 2000 site (as well as any other nature area) can be classified in three sets (Gantioler et al., 2010):

- Tourism and recreation;
- Landscape and environmental amenities values; and
- Cultural values and inspirational services.

These sets are closely interlinked, which can make it difficult to assign precisely the benefits to one type of services. For example, nature-protected areas can provide cultural services through tourism activities (e.g. when visiting an archaeological monument located in a nature-protected

area). In particular, benefits provided by outdoor recreation are linked to other social and cultural benefits (e.g. health benefits and well-being, cultural and inspirational services, and landscape and environmental amenities). Visitors may take part in recreational activities by walking or renting bikes, and benefit at the same time from the physical exercise, the pleasure of the landscape scenery, a feeling of well-being or the inspiration they receive from future creative works.

3.1.1 Benefits related to tourism and recreation

The market for nature-based tourism is estimated to be increasing six times faster than tourism overall (UNWTO, 2007). In particular, tourism and recreation activity appear to be increasing in nature-protected areas. For example, in 2006, all Spanish natural protected areas received 4.5% more visitors than the previous year (Europarc-España, 2008). The assets of Natura 2000 sites represent factors of tourism attraction.

Tourism and recreation in Natura 2000

Activities related to tourism and recreation in Natura 2000 sites

Natura 2000 areas have features that can make them attractive for tourism and recreation. They often correspond to specific "endemic" landscapes of character, appreciated for their beauty and uniqueness. They provide a healthy natural environment that outdoor recreation, sports, and nature tourism require. The nature and landscape properties also provide opportunities for visitors to enjoy diverse outdoor activities, cultural, and educational experiences. Tourism and recreation activities undertaken in Natura 2000 areas can thus be divided into four main, non-exclusive categories, which provide benefits of diverse nature.

Nature-based tourism and recreation

Natura 2000 sites are first and foremost visited for their natural value. In the Natura 2000 sites "*Falkenstein, Altasee, Faulencacher und Lechtal*" in Germany and "*Nordöstliche Randalpen*" in Austria, around one third of the visitors expressed nature, landscape, and sports being the main motives of their visits (see Box 7). Nature-based tourism and recreation denotes all tourism and recreation activities dependent on natural environments in a relatively undeveloped state, including scenery, topography, water features, vegetation, and wildlife. In particular, Natura 2000 sites provide opportunities for nature-based physical and sports activities.

Physical activities include walking, berry picking, and nature watching. Sports may include sailing, horseback riding, skiing, mountain biking, trekking. In Spain, more than 60% of visitors of natural areas are estimated to perform a physical or sports activity during their visit, with hiking being the most popular activity, performed by 45% of the visitors (Torbidoni, 2011). In particular, in three Natura 2000 areas in Catalonia, it

Box 5: Type of activities undertaken by visitors in three Natura 2000 areas in Spain (Torbidoni, 2011)

- Hiking (>30'walking): 62.3%
- Rock climbing: 12.9%
- Water sports: 7.9%
- Recreational hiking (<30'walking): 7.8%
- Staying close to entrance: 5.4%
- Other activities: 2.4%
- Mountain biking: 1.4%

was estimated that more than 70% of the visitors do hiking, around 13% do rock climbing and around 8% perform water sports (see Box 5). Similarly, frequent recreational activities in urban forests involve walking, dog walking, cycling and jogging (Arnberger, 2006).

The outdoor recreation and sports activities offered in Natura 2000 sites can be classified as follows (Bundesamt für Naturschutz, 2010):

- Activities depending on the infrastructure in open landscape (e.g. golf, alpine skiing, aerial sport activities, and gliding);
- Activities depending on specific properties of nature and landscapes (e.g. rock climbing, canoeing, ski touring, and bird watching);
- Activities not depending on any special features of nature and landscapes (e.g. horseback riding, recreational bicycling, cross-country skiing, and hiking).

Cultural tourism

Specific features of the Natura 2000 sites related to cultural heritage can be attractive for visitors. Some Natura 2000 sites present traces of cultural heritage, such as historic buildings or distinctive architectural features (ancient settlements, monasteries, chapels, fountains, vernacular buildings, and objects of national construction) (see Box 6). For example, culture-based ecotourism resources can be found almost in every protected nature area of Latvia (Pilāts, 2003), including Natura 2000 sites. Moreover, some Natura 2000 sites are located in areas where culture trace can be experienced, including customs, folklore, know-how, handicrafts, local food, music, dance, etc. Moreover, the cultural heritage, material and immaterial, offered by Natura 2000 sites can be made accessible to visitors through festivals, cultural events and museums.

Box 6: Cultural and spiritual tourism at Mount Athos

The Mount Athos, which is located in a Natura 2000 area, has been classified by the Orthodox Church as an ecumenically sacred place. It is home to a priceless cultural treasure composed of artefacts and accumulated cultural knowledge, tradition and a unique way of life (based on UICN (2007)). The daily number of visitors entering Mount Athos is restricted and all are required to obtain a special entrance permit valid for a limited period.

Spiritual tourism

Spiritual tourism occurs in cases of existing specific spiritual and religious customs in a region or thanks to the presence of sacred building (e.g. churches, chapels, monasteries) or sacred natural site. Spiritual tourism can be closely correlated to cultural tourism. Some Natura 2000 sites receive visitors interested in this type of tourism.

Educational tourism

Visitors of Natura 2000 sites can be attracted by following particular programs of study or acquiring specific skills related to nature, through formal courses or guided visits. Even if many Natura 2000 sites provide guided visits and eco-museums specialised on environmental education and knowledge, this type of visits constitute a minor share in Natura 2000 sites. Nonetheless, initiatives are being developed to enhance educative tourism opportunities. An

example is the Iberaves[13], an international project to develop a training course on ornithological tourism in protected areas of the European Natura 2000 Network.

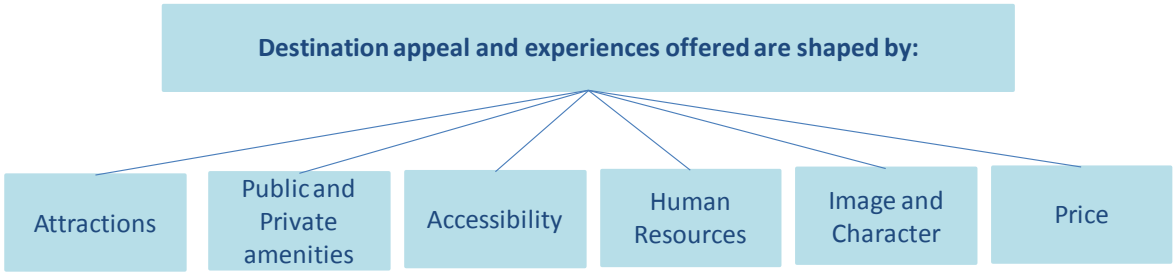
- **Natura 2000 sites as tourism destinations**

Natura 2000 sites can partially or totally encompass areas that were already protected under national designation (e.g. Finnish Natura 2000 sites) or were already a tourism destination. As illustrated by Mayer et al. (2010) for Germany, different stages and trajectories of development as tourist destination can be observed for Natura 2000 areas, or more generally, for protected areas. Some Natura 2000 areas can be recognised as a traditional tourism destination, with a visitor density higher than the national average. This is explained by the fact that for some of the Natura 2000 areas, before joining the Natura 2000 network, the areas were already under a conservation programme or nature protected designation of regional or national legislation, so may have already benefited from recognition and visibility. Another reason may be because some Natura 2000 areas are located in established holiday destinations (e.g. existence of beaches, islands, relevant natural or cultural tourist attraction), even before the protected area was created. As a result, these sites may benefit from already fully-developed touristic infrastructures and reputation, whereas other sites may be poorly accessible and unknown beyond the local communities. Some areas were proposed for joining the Natura 2000 network with the purpose of protecting nature while stimulating tourism development in less well-known areas and supporting the local and regional economy. They are characterised by a lower visitor density compared with the national average[14]. Such areas can be developed to enhance the attractiveness of a region for tourism and recreation.

- **Factors affecting tourism flows in Natura 2000 sites**

The choice to visit a Natura 2000 site depends on socio-economic factors, site characteristics, and regional context. Specific features of a site determine its attractiveness for tourists and have an impact on the decision of a visitor. These involve both intrinsic qualities of the site and environmental amenities, such as access to roads, tourist information, toilet or parking facilities, etc. (Figure 11)

Figure 11: Elements contributing to the appeal of the destination



Source: UNWTO, 2007

[13] See: 82.98.163.12/iberaves/ingles/ing_index.html

[14] The EDEN award developed by the European Commission focuses on promoting sustainable tourism in protected areas. The main purpose is to increase the visibility of non-traditional tourism destination belonging to the Natura 2000 network or being protected areas. See more: ec.europa.eu/enterprise/sectors/tourism/eden/themes-destinations/2009-nature/index_en.htm

The intrinsic features of a site are climate, culture, history, and its natural environment. Some habitats, such as beaches or mountains are tourist magnets, while other remote and non-visitor friendly landscapes may be indifferent to or repel tourists. Complex landscapes, unique or rare biodiversity typical of many Natura 2000 sites all attract tourists. In the EU, **when choosing holiday destinations, most Europeans named the overall environmental attractiveness of the location as being the major consideration for choosing a destination** (31%), followed by cultural heritage (24%) and entertainment possibilities (15%) (European Commission, 2009). In terms of image and character, the protected area status may increase the attractiveness of the area. In two Natura 2000 sites, this factor was shown to affect the choice of the destination for more than 60% of the visitors (see Box 7).

Box 7: Factors in destination choice in Natura 2000 sites

Two surveys were undertaken in Natura 2000 sites: the "*Falkenstein, Alatsee, Faulenbacher und Lechtal* "in Germany, a famous alpine tourism destination and the "*Nordöstliche Randalpen*" including the *Schneeberg* area in Austria, a popular destination for day visits from Vienna, Slovakia and Hungary (Wirth, 2008). The main outcomes include:

- Motive for the visit:

The main reason for visiting the *Falkenstein* area was the nature and landscape (33% of the respondents), and the sports opportunities (24%). In *Schneeberg*, the main reasons for visits were nature and landscape (30%) and sports (30%).

- Importance of protected areas for the destination choice:

The fact that the destination is a protected area was very important in the choice of destination for 48% of the respondents in *Falkenstein* and for 31% in *Schneeberg*. This factor was considered rather important for respectively 31% and 33% of the respondents. In total, the majority of the visitors (i.e. around 80% of respondents in *Falkenstein* and 64% in *Schneeberg*) stated that protected areas are very important or important for them in the choice of destination.

- Attitudes towards protected area:

At both sites, more than half of the respondents agreed that protected areas contribute to the marketing of an area, and denote quality for a community or region. 40% of the respondents agreed that nature protected areas guarantee a nature experience.

- Familiarity with different types of protected areas:

For both sites, "National Park" and "Nature Reserve" are the most well-known terms for nature conservation areas (90% of the respondents). "Protected Landscape" and "Natural Monument" are terms well-known by 70 to 80% of the respondents. "Natura 2000 site" was the term least well known to the respondents, nearly 60% of the respondents in *Schneeberg* and 85% of the respondents in *Falkenstein* did not know about it, and respectively only 19% and 6% of the respondents had "heard the name". The lack of knowledge about the Natura 2000 designation was confirmed by Aigelsperger et al. (2006) who interviewed 21 visitors in *Falkenstein*. Among them, 16 did not know about the Natura 2000 network and none of them recognized the logo.

Visitors can also visit a Natura 2000 site for other reasons that are not limited to a nature experience and natural attractions. In Portugal, the accessibility to a protected area (i.e. National and Natural Parks, Natural Reserves and Protected Landscapes), bird watching activities (related to the presence of birds with a threatened status), and the existence of wetlands influence the decision of a visitor (Rosalino et al., 2011).

Socio-economic factors explain some of the individual drivers, and are linked to income, household characteristics, type of accommodation, and period of the year. An important aspect regarding Natura 2000 sites is also the interest in Nature and the awareness of the existence of Natura 2000. Some visitors might give a specific value to the Natura 2000 designation, whereas others (most likely the majority) might not even be aware of the existence of the designation. Table 1 summarises affinity levels found in the literature for natural protected areas (i.e. National Parks or Natura 2000 sites). In Germany, between 11% and 46% of the visitors are estimated to have a high National Park affinity. There is no estimate available on the affinity of the visitors of Natura 2000 sites for the designation, but one study estimated the awareness of the visitors of the designation of Natura 2000 sites in Scotland. The latter estimated that **21% of visitors were aware of the Natura 2000 designation of the sites they visit**, although 62% know the sites have a conservation designation of some sort (Jacobs, 2005).

Compared to other protected nature status designations, the Natura 2000 designation seems to be less known by visitors (see Box 7).

Table 1: Level of affinity for nature protected areas

MS	Name of the nature-protected area	Share of visitors with:			Source
		High National Park affinity	National Park affinity	Awareness of Natura 2000 designation	
Austria	Hohe Tauern	18 %	34 %		Lehar et al. (2004)
	Rieserferner-Ahrn	16.8 %	22.1 %		Lehar et al. (2004)
	Landseer Berge	20 %	34.4 %		Weixlbaumer et al. (2007)
	Raab	12 %	22 %		Weixlbaumer et al. (2007)
Germany	Niedersächsisches Wattenmeer	11 %			Mayer et al. (2010)
	Bayerischer Wald	46 %			Mayer et al. (2010)
	Eifel	27 %			Mayer et al. (2010)
	Müritz	44 %			Mayer et al. (2010)
	Hainich	11 %			Mayer et al. (2010)
	Kellerwald-Edersee	26 %			Mayer et al. (2010)
Scotland	Average for Scottish Natura 2000 sites			21 %	Jacobs (2005)
France	Port Cros	23%			IRAP (1999)

The regional context sets out whether competing destinations are available nearby, with a larger supply of environmental amenities, or more attractive characteristics. While this may lead to an overall increase in tourism influx in the area, as competition increases, tourism demand may also redistribute at lower intensities among different sites. Relative prices in the country or the region may also act as incentive, e.g. the eastern European Mediterranean coast over the western Mediterranean coast.

These three different suites of factors may interact. As demonstrated by Torbidoni (2011), the motives for visiting Natura 2000 sites and the protection status of the area can be linked to the profile of the visitors (see Box 8).

Box 8: Motivations of hikers in Spanish Natura 2000 sites

Torbidoni (2011) determined three types of hikers visiting Natura 2000 sites in Spain, with different motivations and levels of knowledge about the protection status:

- Nature-minded hikers: whose main motivation for visiting the area is related to nature. The motivations receiving high scores include: "to get close to nature", "to enjoy the scenery", "to learn more about the natural environment", "to relax and disconnect". Around 85% of the hikers in this category knew about the protection status of the area.
- Sporting hikers: whose main reasons for visiting are related to physical activities and/or sports, to enhance health and physical condition. This group has a good knowledge of the protection status of the area (more than 90%).

General-purpose hikers: this category has no main reason for visiting the area. Reasons indicated may include enjoying the scenery and getting close to nature. They also have a good knowledge of the protection status of the area.

Furthermore, the protection status is an additional criterion influencing the destination choice, but it intervenes at a lower or higher level depending on the profile of visitors and the branding of the area. Consequently, **identifying the importance of the Natura 2000 designation in tourist decision to visit the area and the region is essential to estimate the gross added value of Natura 2000 in terms of benefits generated by tourism/recreation.** To do so, it appears necessary to distinguish visitors who come to a Natura 2000 site due to the designation of the site from other visitors. This avoids quantifying all the economic impacts generated by tourists passing through a Natura 2000 area, including when their visit has nothing to do with the designation. **Taking into account the affinity of visitors to Natura 2000 designation is one possible approach when determining the net added value provided by the Natura 2000 network for tourism and recreation.** Net benefits supported by Natura 2000 would be the benefits provided by tourists for whom the Natura 2000 designation of the site is the main (if not the only) motivation for visiting it.

Typology of benefits related to tourism and recreation

By enhancing the tourism and recreation potential of natural sites, and consequently attracting more visitors, the Natura 2000 network has knock-on effects on the influx of income for local communities (market benefits), that has effects on the local and regional economy. Tourism and recreation activities in Natura 2000 areas also provide recreational benefits for visitors (non-

market benefits). These activities provide additional wider socio-economic benefits through employment creation or maintenance.

- **Market benefits related to tourism and recreation and their economic impacts**

Market benefits related to tourism and recreation can be classified in five sectors, as follows[15]:

- Hotels and supplementary accommodation
- Restaurants/catering
- Entertainment and attractions
- Shopping/retail
- Transport service

Economic activity stimulated by visitors to Natura 2000 sites is likely to contribute significantly to local economic development. Particularly, many sites of high conservation value are located in remote rural areas, and often rely on income spent by visitors to support their economies in addition to income spent by local residents. **Influxes of spending in the tourism/recreation industries can have a large range of economic impacts.** They directly affect the tourism/recreation sector (direct impacts) and furthermore indirectly affect most sectors of the economy (secondary impacts). **Direct impacts** are defined as changes arising in the tourism/recreation industries from the initial tourist spending on goods and services in tourism-related sectors (accommodation, restaurants, shops, etc.). They include the intermediary consumption between tourism/recreation industries. When a visitor spends money, sales in the tourism/recreation sector increase which leads to an increased income that sustains the economic activity. Consequently, direct effects contribute to maintaining or creating employment within tourism/recreation industries. Similarly, **secondary impacts** result from visitor spending. They are generated by the goods and services which the tourism/recreation industries buy from other businesses in the area (intermediate consumption). For example, tourist accommodations buy food and services belonging to other industries (e.g. buildings and financial services). Secondary impacts create additional income and employment flows. They comprise of:

- **Indirect impacts** include sales, income and employment resulting from the sales activities which provide goods and services to the tourism/recreation sector; and
- **Induced impacts** include the sales, income and employment generated by the spending of employees of both the tourism/recreation industries and the industries that provide goods and services to the tourism/recreation sector.

In this study, direct and indirect impacts are covered. In order to avoid over-estimation, induced impacts are not covered.

- **Benefits valuation**

Methods to estimate market benefits and their effects on the economy were identified through a literature review. They include:

[15] Based on the NACE classification of Eurostat

- **Tourism Satellite Account** (TSA) is a conceptual statistical accounting framework that measures the direct economic effects of tourism within an economy, integrating the economic measure of tourism within macroeconomic statistics. According to Surugiu (2009), the TSA is a complex instrument for which it is necessary to provide a variety of statistical data to have a complete image of the total impact of tourism in the economy.
- **Multiplier models** measure the impact of extra expenditure introduced into an economy. In the case of tourism, multiplier models are used to measure the impacts on a given economy stemming from visitor spending in an area within this economy. Two main types of multiplier models are used to assess the economic benefits provided by tourism and recreation:
    - **Keynesian models** consist in identifying streams of income and employment which are successively generated by tourist expenditure. The two relevant examples of their application largely used in the literature are:
        - The MGM2 model was originally applied in the United States where multipliers are available at a county level. It is designed to estimate the economic impacts of National Park visitor spending on local economies. It consists in computing the total visitor spending in the region and in applying simple ratios to the direct turnover in order to obtain direct income and direct jobs generated by visitor spending.
        - The Value Chain Analysis consists in computing and adding up the value added brought by the different stakeholders involved in the production process of a service or a product at each step of the value chain until its delivery to final consumers. The value added of tourism is defined as the amount of turnover that is used as wages and earnings in each of the relevant sectors in which tourist expenditure may occur.
    - **Input-output models** describe the economy according to a matrix of inter-sectoral relationships and express the effect of tourist expenditure with regard to its direct, indirect and induced impacts on each sector of the economy.

Both models are derived from the following formula:

Economic Impact of Tourism = Number of tourists x Average spending per visitor x Multiplier

While Keynesian models are well established and have been used for many years in economic impact assessments, input-output models are relatively new among tourism-related economic benefits valuation methods. However, the use of input-output methods has increased in the past decade. Table 2 presents the main strengths and limitations of these valuation methods to assess the market benefits provided by tourism and recreation in Natura 2000.

Table 2: Strengths and limitations of the valuation methods to assess the market benefits provided by tourism/recreation in Natura 2000

Main methods families	Strengths	Limitations
Tourism Satellite Account	Applicable at national and regional levels	Determines only direct impacts Not applicable at site level
Multiplier models: **A - Keynesian models:** **1) MGM2 model**	Produces comparable economic impact information across areas Allows for the assessment of economic benefits in terms of both income and employment Requires a limited amount of input data	Multipliers are included in the model: they are designed for the U.S. and cannot be adapted to areas located in Europe Models' linearity leads to increases in impacts in the same proportions than increases in spending Only applicable to sites located in the US
2) Value Chain Analysis	Estimates direct and indirect impacts for both gross and net benefits Applicable at site and regional levels in Europe	Not applicable directly at the national level Requires strong assumptions when choosing multipliers
B - Input-output models	Determine direct and indirect impacts Availability of consolidated EU input-output tables	Require input data at EU level

▷ Estimated benefits of tourism and recreation at site level

In the EU, the income generated by tourism and recreation in nature-protected areas has been estimated mainly at the local level, and in some cases at regional level. Box 9 lists a set of income values estimated from visitor expenditure.

Box 9: Values on incomes generated by tourism and recreation in European nature areas

- **9,500 whale watchers for a total expenditure of US$ 3.37 million in the Açores, Portugal and 500 whale watchers for a total expenditure of US$ 0.341 million in *Ouessant*, *Sein*, *Molène* archipelago, *Iles d'Hyères* and Corsica (France) were estimated.** The total expenditure includes ticket price, accommodation, transportation, and other tourist expenditure during whale watching. (Hoyt, 2005)

- Pugh and Skinner (2002) estimated **the total net value of marine leisure and recreation in the UK in the year 2002 to be £11.77 billion** (including holiday tourism, cruising, and leisure craft services). Parsons et al. (2003) valued the direct economic income (i.e. expenditure on excursion tickets) from cetacean tourism activities to be £1.77 million per annum in West Scotland, involving approximately 242,000 tourists in the year 2000; **the total gross income generated (directly and indirectly) by cetacean-related tourism in rural West Scotland was estimated at £7.8 million.**

- Coillte and Irish Sports Council (2005) found that **the direct expenditure by Irish trail users on items such as food, drink, accommodation and trail equipment totalled €307 million annually.**

- The **estimated visitor expenditure for the SAC "*Góra św. Anny*" corresponds to €11,204 in 2010.** It is based on the number of people who rent a room at the headquarters of educational nature park "*Góry Opawskie*" and on the number of tickets sold to the museum "*Góra św. Anny*". (Source: questionnaire completed in the framework of this study)

- Mayer et al. (2010) measure the structure, size, and economic impact of tourist expenditure in the six German national parks *Niedersächsisches Wattenmeer*, *Bayerischer Wald*, *Eifel*, *Müritz*, *Hainich* and *Kellerwald-Edersee*. Results show that mean daily expenditure per person of national park visitors is considerably below the national averages for tourists in Germany: day-trippers spend between €7 and €13 per day (national average: €28), whereas overnight visitors spend between €37 and €57 (national average: €120). **The total impact of tourism ranges between €525 million in N*iedersächsisches Wattenmeer* and €1.9 million in *Kellerwald-Edersee***, reflecting the national parks' distinct trajectories as tourist destinations.

- Job (2008) presents the financial benefits derived from nature-based tourism in and around two German national parks (*Müritz* and *Berchtesgaden* National Parks) on the basis of the value-added technique. The results clearly indicate that tourism can generate considerable benefits for the regional development in a structurally weak rural periphery. Income generated by all tourists is differentiated from net income generated by tourists whose trip is motivated by the designation of the site as a natural park. **For *Müritz* and *Berchtesgaden*, a sum of net income (direct and indirect) of respectively $ 3.8 and 6.0 million is estimated to be generated by tourists sensitive to the designation of the park.**

- Huhtala (2007) estimated the expenditure of the visitors of the *Pallas-Ounastunturi* National Park (Northern Finland) to be 128 to 306 Euros. **Every euro spent by visitors corresponds to 1.27 Euros in the local economy. The total direct and indirect net income provide by tourism was estimated to 12.1 million Euros.**

Non-market benefits related to tourism and recreation

Non-market benefits of tourism and recreation include for instance the pleasure derived from doing sports, viewing landscapes, learning from the environment, improved health, etc. Box 10 illustrates the types of benefits generated by whale watching in Atlantic Islands.

Box 10: Potential values (benefits and services) from whale watching

In addition to contribute to income flows in the economy, **the recreational activity of whale watching undertaken in Atlantic Islands provides a set of social and cultural services and benefits that can be valued:**

- Recreation: recreational value (enjoyment).
- Scientific: scientific value (increased knowledge about cetaceans, their habitat, etc.). Scientific value includes information about ecological services provided by cetaceans through the process of whale watching.
- Educational: educational value.
- Cultural: Contribution to cultural values (community identity, community solidarity).
- Heritage: Can play an important role and contribute to heritage values (benefits to community, local cultures).
- Social: Contribution to the social values (opportunities to be together with family, friends) and includes the impacts of the social experience of the local host community and impact on issues such as social equity and income distribution caused by the arrival, presence or changes in the local whale watch industry.
- Aesthetic: Contribution to aesthetic value/scenic beauty, whales and other wildlife scenery, serenity of the ocean experience.
- Spiritual/ psychological: Value provided to society through perceived sense of connection based on culture, mythology and psychological aspects such as increased self-esteem, sense of accomplishment, and health benefits.
- Political: The political impact caused by the existence of the whale watch industry; the impact from information participants obtain on whale watching trips.
- Vicarious experience: The experience from listening to the stories of those who have been whale watching.
- Remote viewing: Value derived from observing whales on TV, in books, magazines, DVDs, and the Internet, which would not have occurred without the existence of whale watching.
- Environmental quality (amenity) value: The environment may be valued because it is of a certain level of physical quality. This quality may be closely related to the functional condition, or it may be only partially related.

Source: Adapted from Hoyt (2005)

Non-market benefits related to tourism and recreation cover or generate other types of social and cultural non-market benefits than the recreational ones:

- Health benefits: outdoor recreation can be used as a means of reversing the decline of physical and mental health (e.g. obesity, emotional and hyperactive problems, and mental sickness);
- Well-being and quality of life: outdoor recreation contributes to self-esteem, reduces anxiety and provides inspiration;
- Landscape and amenities values: aesthetic values are considered important for tourism and recreation, and they can act as a determinant for preferences for all major types of recreational use. As Brown and Daniel (1984) note, "the scenic beauty of the forest environment probably makes some contribution to visitor satisfaction, and in many cases is the predominant component"; and
- Cultural and inspirational values: the touristic and recreation activities can integrate a cultural or educational purpose.

Benefit valuation methods

Methods to assess non-market benefits rely on individual preferences and choices to infer economic values. Some methods exist for determining an implicit price range associated with the specific environmental non-market benefits. **Non-market benefits are measured by the amount of money people are willing-to-pay for a particular environmental good or service.**

Two main methods are generally used to estimate the economic value of non-market benefits related to tourism and recreation:

- **Travel cost methods** can capture the value of recreational activities at a particular site by looking at the expenses individuals are willing to incur to travel to the site. It is frequently used to assess benefits provided by ecosystems in natural parks. Welfare benefits derived from visiting Natura 2000 sites can be estimated and differentiated according to the travel costs specific for user groups (e.g. walkers).

Box 11: The Willingness to Pay (WTP)

A good or a service is valued for the utility or the satisfaction it brings to an individual by a WTP. The WTP expresses the equivalent sum that the individual is willing to pay to maintain the level of use and satisfaction from the use or existences of the good or service.

- **Stated preference methods** infer information about ecosystem values through valuation surveys and allow an assessment of both use and non-use values. They include the contingent valuation method and the choice experiment method:
  - The **contingent valuation method** consists in directly asking people to express, through a survey, their willingness to pay or receive for a change in the quality or the quantity provided of an environmental good or service on a hypothetical market.
  - The **choice experiment method** consists in asking the respondents to make choices based on hypothetical scenarios and infer monetary values from the choices or tradeoffs made by people during

surveys. Scenarios consist of different set of environmental services for different given prices.

Table 3 presents the main strengths and limitations of these valuation methods to estimate the non-market benefits provided by tourism and recreation supported by Natura 2000.

Table 3: Valuation methods to assess the non-market benefits provided by tourism and recreation in Natura 2000

Main methods families	Strengths	Limitations
Revealed preferences methods (Travel Cost Method)	Infer economic values from observed behaviours Particularly suited to natural parks for which people incur travel-related costs Inexpensive and quick to implement	Do not allow the assessment of income and jobs generated by tourism/recreation Tends to overestimate visitors' willingness to pay for sites
Stated preferences methods	Allows for estimating both use and non-use values	Interviewing both visitors and non-visitors is costly and time-consuming Tends to overestimate visitors' willingness to pay for sites because of the hypothetical nature of respondents' statements Numerous issues related to sample selection in order to deal with distance decay effects

▷ Estimates of recreational benefits in Natura 2000

Values of recreational benefits provided by natural areas in the EU available in the literature are provided in Box 12. For some specific types of benefits, such as health benefit, qualitative valuation is generally provided. In some cases, the value of recreational benefits cannot be specifically determined and recreational benefits are valued together with other non-market benefits.

Box 12: Recreational benefits in natural areas

Some values related to recreational benefits were identified in the literature. These considered recreational values according to area, type of habitats or ecosystems, or recreational activity:

- **Recreational benefits**
    - A value for tourism, calculated by the travel cost method for visitors staying in rural houses in Nordeste council, was estimated to around €60,000. The travel-cost method was established by a survey of usage and price on three rural hostels in Nordeste council. (Cruz et al., 2009)
    - Non-market benefits of the Scottish Natura 2000 sites related to recreation were estimated by asking visitors how much they would be willing to pay for using the Natura 2000 sites for recreational activities which resulted in an estimate of around £1.5 million per year related to use values. (Jacobs report to Scottish Executive, 2005)
    - Oviedo Pro and al. (2005) estimated the willingness-to-pay for recreation the Spanish Natura 2000 site "*Parque Natural Los Alcornocales*" to be € 21.52 per visit.
    - Forest recreation: The non-market value of trails was estimated to be €95 million in 2005; Users of forests and trails typically place a value of about €5.40 on the benefit to them of a single visit. (Coillte and Irish Sports Council, 2005)
    - Recreational beach use: King, O.H. (1995) estimated that people were willing to pay an average of £1.78 for recreational beach use in the English resort of Eastbourne.
    - Ski recreation: The total consumer surplus for ski recreation in Sweden during 1992 amounted to € 53 million and the average benefits for a person making a skiing trip were estimated to be 34 €. (Bostedt et al., 1991).
- **Health benefits related to recreation**
    - Coillte and Irish Sports Council (2005) noted that the health benefits associated with trail usage, as forest recreation, are the primary motivation for usage for about one third of all trail visitors. As the Centre for Sport Science and Health DCU mentioned in its study on "The Benefits and Values of Recreational Trail Use", trails are seen as a means of achieving physical activity goals as outlined in health promotion strategies in Ireland. They create psychological well-being. The study argues that trails therefore offer excellent potential for Ireland to address its obesity problem, and that increased trail usage could result in considerable cost savings associated with obesity reduction.
    - The study conducted by the Countryside Recreation Network[16] in the UK confirmed that the effects of "green exercise" generate many positive physical and mental health benefits regardless of the level of intensity, duration or type of activity. (Coillte and The Irish Council Sport (2005))
    - The same idea is emphasised by English Nature (2002): contact with nature is good for the mind. There are also physiological benefits of nature, including stress reduction, respiratory health and the promotion of exercise.
- **Recreational benefits including other non-market benefits**
    - For the Bialowieza Forest in Poland, a Natura 2000 site, a value of recreational and cultural

[16] Countryside Recreation Network– A Countryside for Health and Well-being.

services of €4 billion has been obtained from a willing-to-pay survey of visitors (considering around 150,000 visitors per year). (Pabian and Jaroszewicz, 2009)

- Visitors are willing to pay €3.34 per visit (2003 prices) for the landscape, wildlife and recreational benefits of Irish Forests. (Coillte and Irish Sports Council, 2005)
- The contingent valuation method is applied to estimate the maximum willingness to pay for at trip to the *Femundsmarka-Rogen-Långfjället* mountainous area. The study area is located on both sides of the Swedish-Norwegian border. The average willingness to pay for the experience of the area was estimated to be around 193 Euros. The average consumer surplus of a visit in the study area was estimated at around 57 Euros.

Key issues for the estimation of benefits generated by tourism and recreation supported by Natura 2000

The economic valuation of the benefits related to tourism and recreation faces three main challenges.

- **Estimation of the non-use values attributed to Natura 2000 areas by potential visitors**

Such benefits refer to the benefits derived from the direct use of ecosystem services by visitors coming to Natura 2000 sites. However, the sole existence of Natura 2000 sites can also be valued by potential visitors who do not come to visit the site but derive a certain pleasure out of simply knowing that these sites exist. The values associated to these non-market benefits are non-use values (bequest and existence values). **The estimation of non-use values is not covered by this study because they refer to the benefits derived from overall ecosystem services associated to the network, and not specifically associated to the benefits provided by tourism and recreation supported by Natura 2000.**

- **Market and non-market benefits related to tourism and recreation partly overlap**

The distinction between market and non-market benefits is not always clear-cut. Indeed, **the value of some non-market benefits related to tourism and recreation may be partly included in the market benefits deriving from tourist spending.** For example, the amount spent by a tourist for the renting of a bicycle in a protected area is to some extent a measure of the value associated with the amenities provided by the area, such as landscape and health related benefits. In this case, simply adding-up non-market benefits and the income flow generated by tourist spending may lead to double counting of the benefits.

- **Benefits related to tourism and recreation are nested with other social and cultural services**

As explained earlier, benefits related to tourism and recreation integrate other types of socio-cultural benefits. On one hand, the market benefits related to socio-cultural benefits other than tourism and recreation are covered by visitor expenditure (e.g. museums entrance, renting of binoculars for educational programs). On the other hand, the value of recreational benefits probably integrates already a set of other non-market benefits provided by the area, which cannot be easily separated from the first one.

Thus when estimating the benefits generated by tourism and recreation, this implies that because it is difficult to avoid the overlap of market and non-market benefits, **estimations of market benefits related to tourism and recreation and recreational benefits cannot be aggregated**. Moreover, the market benefits related to other socio-cultural services are already covered by an approach based on visitor expenditure. Consequently, **they cannot be treated independently**. Similarly, **other social and cultural benefits that are captured by recreational benefits, explicitly or not will not be considered in the final estimation exercise.** Nonetheless, they are presented in the next sections.

3.1.2 Benefits related to landscape and amenity values

Many studies show that people derive more aesthetic pleasure from natural than built environment. **Benefits related to landscape and amenity values are non-market benefits** linked to increased land value, psychological and health well-being, cultural branding, etc.

They include, in particular:

- **Landscape value:** it corresponds to the value given to visual appearance of a specific landscape, e.g. the view of a forest or a mountain.
- **Aesthetic value**: it is related to the appreciation of the beauty of nature beyond visual experience. According to Brown and Daniel (1984), aesthetic experience consists of a mixture of sensory experiences (e.g. smells, sounds, touches, and sights) and expectations.
- **Psychological well-being**: it refers to the quietness and tranquillity a site can provide to relive the stress (especially for urban residents).

▶ **Benefits valuation**

The main methods to assess benefits related to landscape and amenity values are:

- **Hedonic pricing methods** consist of comparing goods with similar characteristics but different environmental qualities. They are mostly applied to variations in housing prices, and therefore, can be relevant to assess economic benefits provided by Natura 2000 sites' landscapes. The economic values of landscape and amenity services from a Natura 2000 site can be estimated by analysing their effect on the real-estate price. It could be assumed that the price of a house located near a specific landscape is higher than elsewhere. To estimate this, data on property prices is needed, i.e. prices as well as the location itself, e.g. environmental, structural and neighbourhood attributes.
- **Stated preferences methods** involve surveys directly asking people about their willingness to pay or receive payment for agreeing to an environmental change.

▶ **Estimate of landscape and amenity values**

Box 13 provides some values identified in the literature.

Box 13: Landscape and amenity values

- In Denmark, houses in natural environments, when compared to similar houses elsewhere, sell for a 25 percent higher price (Dissing, 2002). This is particularly true where they are located within 30-45 minutes of an urban centre (e.g. Danish Lille Vildmose site) (Bostedt et al., 1991).
- Willis et al. (2003) estimated the value of a woodland view from residents' homes to £150 million per annum in Great Britain, i.e. £269 per annum per household, for those households with a woodland view on the urban fringe. It was estimated that property prices increase up by 7 % when they are close to woodland (Garrod and Willis, 1992).

3.1.3 Benefits related to cultural values and inspirational services

Cultural values and inspirational services supported by nature-protected areas are related to human perception and include the intangible benefits people obtain from contact with ecosystems. They consist mainly in identity, aesthetic, spiritual, and psychological benefits from the role natural sites play in raising awareness regarding environmental issues, the identity, and the sense the presence of a protected area brings to a region, archaeological heritage, etc. In fact, "protected landscapes and seascapes could be seen as one of the most striking outward manifestations in the intangible values inherent in cultural heritage" (UICN, 2008). Following are the values associated with cultural and inspirational services:

- **Cultural values** relate to "a set of distinctive spiritual, material, intellectual and emotional features of a society". They include also the cultural heritage, e.g. the practices, representations, and knowledge that are passed from one generation to another. Nature-protected areas can provide cultural values through their archaeological value, historic buildings, or traditional land-use patterns;
- **Spiritual values** are linked to the sacredness of nature and have direct relationship with faith, religion, or beliefs systems. The spiritual values of nature-protected areas is due to the existence of sacred natural sites (e.g. temples, monasteries, pilgrimage routes) and landscapes (e.g. sacred groves, waterfalls, mountains), e.g. the Delos Initiative[17] works on recognising the sacred natural sites in developed countries, and on highlighting the complex relationship between spiritual/cultural and natural values. Some European sacred sites are located in nature-protected areas. Some are part of the Natura 2000 network, such as the Benedictine Hermitage and Monastery of Camaldoli and the Franciscan Sanctuary of La Verna in the National Park of the Casentine Forests, the Mount Athos in Greece, the Orthodox monasteries in Buila-Vânturarit National Park in Romania, and the Cistercian Monastery of Poblet in Spain (IUCN, 2007);
- **Artistic values** are an intrinsic part of the nature which can be a source of inspiration for creative expression; and

[17] See: www.med-ina.org/delos/

- **Educational and scientific research values** relate to building knowledge and education potential through formal and informal dissemination of information. Nature-protected areas offer opportunities for educational excursions which provide insight into nature and its functioning by displaying concrete practical examples of the way natural ecosystems work. Many research programs and discoveries originated from nature-based experiments and resources. In addition, when permitted, nature sites provide genetic material for research activities (e.g. plant species).

▶ **Benefit valuation**

Although cultural values and the benefits of inspirational services are rarely valued in monetary terms, rough estimates are available in the literature. They are generally estimated on the basis of **stated preference methods (contingent valuation) and travel costs** methods.

In particular, benefits related to **education and research** are difficult to estimate since they are complex for visitors to conceptualise and difficult for economists to translate into monetary terms. Most of them rely on:

- **Travel costs methods,** in particular travel costs related to school trips undertaken to visit nature parks can provide an estimate of the value people give to educational services provided by ecosystems.
- **Market based methods** that calculate ecosystem values through cost-based approaches. Fees paid by schools or research groups on the use of sites and museums, research project funding, sales from research projects, etc. can be used to estimate the value associated with educational services.

▶ **Estimate of cultural values and inspirational services**

Box 14 provides some estimates of cultural values and inspirational services in Natura 2000 sites.

Box 14: Some cultural values and inspirational services in Natura 2000 sites

Cultural and spiritual values: The Mount Athos is located on a Natura 2000 area. It is recognized as a sacred natural site, and it provides cultural and spiritual values. "The various religious 'heirlooms'—the architecture of the building complexes and their style, the Byzantine musical tradition and the traditional way of using natural resources— are all constituent parts of its cultural importance and contribution to world heritage" (IUCN, 2007). No quantified value is available.

Cultural values: The estimated mean WTP for the survival of the wolf population in Sweden ranges between around 40 and 100 Euros depending on the valuation method applied. (Sundberg and Söderqvist, 2004)

Education and scientific research values:

- The Natura 2000 site "*Pico da Vara / Ribeira do Guilherme*" in Portugal receives 10 school groups per year and around 10 university visitors per year. A total of 10 scientific papers linked to this nature-protected area have been produced since 1968. (Cruz and Benedicto, 2009)
- In the Natura 2000 site "Central Limburg Pond Complex", guided nature walks are offered and attract between 300 and 900 people every year. The total number of participants to visits to a local fish farm varies between 600 and 950 persons per year. (Desmyttere and Dries, 2002)
- Around 1800 visitors per year visit the educational pavilion "*Świdwie*" in *Jezioro Świdwie* (Natura 2000 site). (Source: questionnaire completed in the framework of the study)
- In the Natural Park of Vale do Guadiana in Portugal, which belongs to Natura 2000, different local initiatives on environmental education are ongoing. A number of studies by Portuguese and Spanish universities are currently conducted within the area of the park. (Kettunen et al., 2009).
- Pabian and Jaroszewicz (2009) state that the Natura 2000 site, the "*Bialowieza Forest*" is "one of Europe biggest and most amazing natural laboratories". Scientific research is carried out. *Bialowieza* village is a modern scientific centre with three scientific institutes (the Mammal Research Institute of the Polish Academy of Science, the Geobotanical Station of the University of Warsaw and Natural Forests Laboratory of the Forest Research Institute) and two education centres. The national park runs a Museum and Bison Reserve with highly educated staff and a good level of nature education on offer.

3.2 Wider socio-economic benefits of Natura 2000

Biodiversity, ecosystem services, and employment are closely interlinked. Biodiversity and ecosystem services were estimated to provide, directly or indirectly, 14.6 million of jobs (i.e. 7% of total jobs) in the EU (Nunes et al., 2011). Through employment and direct income inflows, biodiversity and ecosystem services thus support local and regional development. In particular, nature-protected areas contribute to employment opportunities in locations where employment is scarce (e.g. rural areas). At the EU level (EU-15), in 1999, a total of 125,000 jobs were supported through nature protection related activities (Ecotec, 2001). In Wales, nature-protected areas support 12,000 jobs (National Trust, 2006). Although nature-protected areas, such as Natura 2000 sites, have been widely promoted for their support to job creation and maintenance in peripheral and sparsely populated areas (e.g. through the development of tourism activities), the

land protection can also make specific activities difficult to prosper. The positive relationship between the designation of an area as a nature-protected and jobs development cannot be established directly (Lundmark et al., 2010). The following sub-sections analyse to what extent the Natura 2000 network contributes to employment and to local and regional development.

3.2.1 Employment supported by Natura 2000

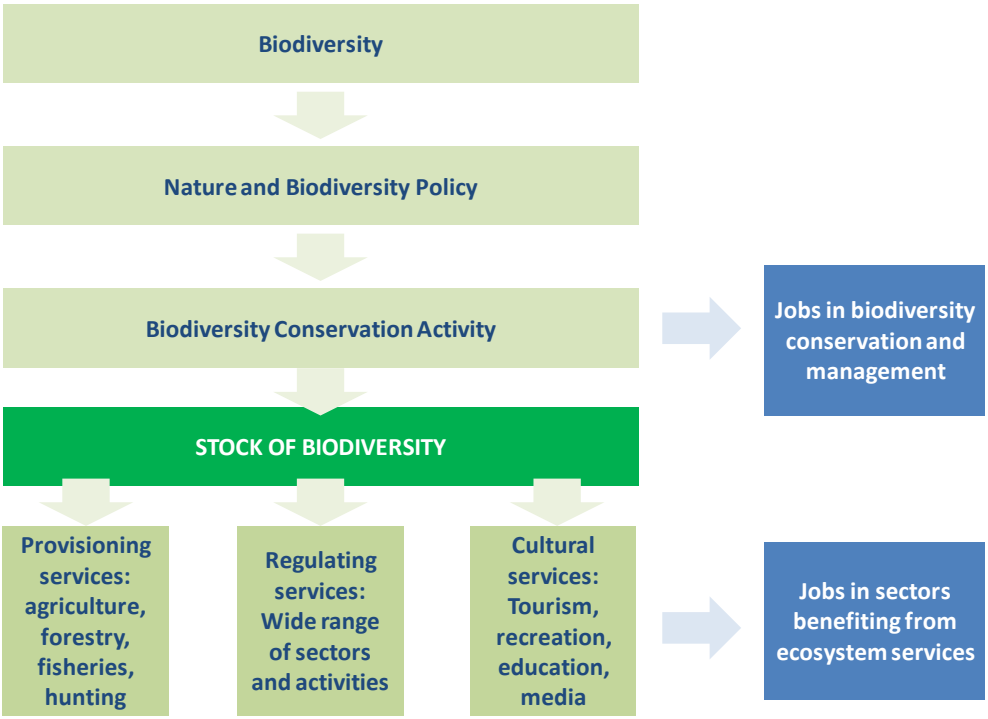
It was estimated that **employment in Natura 2000 sites alone amounts to the equivalent of 83,530 full time equivalent (FTE) jobs for the EU-15 in 2003** (Ernst and Young, 2006). More recently, **122,000 FTE jobs were expected to be directly supported by the full implementation and management of the Natura 2000 network for the EU-27.** A total of 207,000 FTE jobs (including direct and induced jobs) were estimated to be supported by Natura 2000 through management of the Natura 2000 network, suppliers and contractors, and further tourism employment (Rayment et al., 2009).

- **Direct employment**

The Natura 2000 network supports direct employment, defined as the number of off- and on-site jobs that directly stem from the ecosystem services provided by the sites and from the Natura 2000 designation. More precisely, it includes (Figure 12):

- **Employment related to the management and administration of the Natura 2000 sites and of the Natura 2000 network**: including site managers, staff in charge of the animation of the staff members working in the site, gardeners, wardens, conservation project officers, and staff carrying out protection and improvement activities on-site.
- **Employment in sectors benefiting from ecosystem services** including:
  - Sectors benefiting from provisioning services: employment supported by the maintenance of agricultural, forestry and fishery activities.
  - Sectors benefiting from regulating services: employment related to water and energy supply sectors for example.
  - Sectors benefiting from cultural services: employment related to tourism and recreation services and activities (such as hotels and guesthouses, restaurants, tours and guides), employment related to environmental education, such as education officers.

Figure 12: Links between biodiversity and employment



Source: Nunes et al., 2011

- **Estimating direct employment**

Direct employment generated by Natura 2000 can be estimated through data gathering on the number of jobs and salaries, both on- and off-site. This is usually done by sending questionnaires or carrying out telephone interviews with site managers. Data unavailability is the main limiting factor encountered when assessing direct employment benefits and it plays an important role in initial site selection. One possible way to deal with data scarcity is to rely on secondary data, gathered for other studies or project such as LIFE projects in which data on employment generated are often available (Cruz et al., 2009). Alternatively, when available data are not sufficient, specific methods can be developed to estimate employment depending on the sectors benefiting from the services provided by Natura 2000 (e.g. methods based on employment ratio by professional occupation).

- **Employment in management and administration of sites**

The implementation and management of Natura 2000 sites give significant opportunities to undertake conservation actions that create an important number of jobs. The jobs associated with nature-protected areas are expected to increase by 150% between 2010 and 2013 (Castañeda, 2010).

Another study (Gantioler et al., 2010) suggests that the Natura 2000 network supports a significant number of jobs, with substantial variations in the staffing levels across MS (Table 4). In some countries such as Spain, there is no management staff directly dedicated to Natura 2000 (Portillo, 2011).

Table 4: Annual staffing levels for the Natura 2000 network

Member State	Number of FTE[18] jobs	Member State	Number of FTE jobs
Austria	93.5	**Ireland**	192
Belgium (Flanders)	125	**Italy**	195
Belgium (Wallonia)	60	**Lithuania**	565
Bulgaria	22	**Malta**	158
Cyprus	112	**Poland**	750
Czech Republic	130	**Portugal**	1564
France	785	**Slovenia**	82
Greece	455	**UK**	626.5
Hungary	823	**Total**	**6728**

Source: Gantioler et al. (2010)

▷ Employment in sectors benefiting from ecosystem services

Such employment is in the activities related to on-land production, in primary sectors, such as agriculture, forestry, hunting, and fishing. The manufacturing sector also contributes to such employment, since its activities are based on the products provided by the ecosystem services. Information on employment in these sectors is collected through specific on-site studies. Desmyttere and Dries (2002) developed an interesting approach and considered that cultivation land under Natura 2000 sites as an indicator to assess the employment in the agricultural sector supported by the site (see Box 15).

Box 15: Employment related to ecosystem services

- In the Natura 2000 sites "Central Limburg Pond Complex" in Belgium, the fish farming activity concern 4 family businesses occupying 188 ha. Furthermore, 32 farmers are active on the site. With only 31 % of the land under cultivation situated on the site, employment opportunities are estimated to around 12 FTE. Moreover, 11 jobs are related to the fish breeding (Desmyttere and Dries, 2002).
- In Sweden, 155 jobs are related to the Forestry sector in the National Parks. (Lundmark, et al., 2010)
- In the Peak District National Park covered at 30% by Natura 2000, there are 19% jobs in manufacturing over a total of 15,000 jobs, 12% in quarrying (related to tourism). (Halahan, 2002)
- Sectors related to Energy Supply employ 1,233,000 people, and mining supports 859,000 jobs at the EU level, related to the ecosystem service (Nunes et al., 2011).

Employment in sectors benefiting from social and cultural services seems to be significant in proportion compared to other sectors benefitting from ecosystem services (see Box 16 for example for tourism and recreation services).

[18] Full time Equivalents (FTEs). Part time or seasonal jobs are aggregated into FTEs.

Box 16: Employment related to tourism and recreation services

- In the Peak District National Park, 52% of jobs are in services (mainly related to tourism). (Halahan, 2002)
- In 2000, 59 full-time and one part-time jobs were estimated to be created as the direct result of cetacean-related tourism, with 38% of these positions being seasonal in Scotland. (Parsons et al., 2003)
- 145 direct jobs and 18 indirect jobs are supported by tourism in the *Pallas-Ounastunturi* National Park. (Huhtala, 2007)

Indirect employment

Indirect employment is defined as the number of jobs indirectly created through the economic activities generated by Natura 2000. This includes for example jobs created in a company providing laundry services for a hotel located in a Natura 2000 site.

Estimating indirect employment

The most common approach used **to estimate indirect employment is through multipliers.** Employment multipliers are ratios that estimate the number of indirect jobs created in an economy according to the number of direct jobs and the expected size of the leakages likely to happen given the economic structure. The key issue therefore is the choice of a suitable multiplier for the economy under consideration. IEEP (2002) and Rayment et al. (2009) provide specific multipliers applicable to the Natura 2000 network (see Box 17).

Box 17: Employment multipliers to estimate indirect employment

- Kettunen et al. (2009) suggest that 0.5 is a common standard multiplier used in the literature to estimate indirect employment generated by Natura 2000 site. A standard 0.5 multiplier was used to estimate the indirect jobs supported by the Natura 2000 site of Salaca River (Latvia).
- To estimate indirect employment from the Natura 2000 site in Central-Limburg (Belgium), a multiplier between 0.3 and 0.4 was used, based on studies from Belgium and Netherlands. (Kettunen et al., 2009)
- Total employment supported by the Management of the Natura 2000 network (i.e. 207,400 FTE jobs) was estimated by Rayment et al. (2009) using a multiplier of 1.7 (direct + indirect + induced to direct effects) for natural resource based activities.
- IEEP (2002) notes that "for each 3 to 5 FTE jobs created directly by Natura 2000 site related activities, an additional job is created by the impact of the revenue from site. In addition, where the site is the prime reason for a tourist visit, one job for site-related activities can support 4–6 additional jobs through tourist expenditure in the form of travel, accommodation or shopping en route" (IEEP (2002).
- Halhead (1987) estimates an employment multiplier between 0.2 and 0.5 for the Highlands in Scotland to estimate indirect employment.

Box 18 provides data on total employment supported by Natura 2000 sites or other nature-protected areas.

Box 18: Estimation of direct and indirect employment

- Based on interviews carried out with site managers and empirically multipliers, Getzner et al. (2002) assess the regional employment in four Austrian model regions due to the establishment of Natura 2000 (primary sector, tourism, manufacturing, retail, industry and mining). The overall effect on employment varies across parks and across scenarios built to deal with uncertainties and lack of information. For instance, **the sum of both direct and indirect employment effects in the *Waldviertel* region ranges from 3 to 14 full-time jobs.**
- Based on an analysis of payroll-related spending, the *Parc de Mercantour* is estimated to contribute to 80 FTE direct jobs and 22 FTE indirect jobs. Employment generated by employees' spending are estimated to further increase employment generated by the Natural Park. All in all, **the *Parc de Mercantour* is estimated to support a total of 130 FTE jobs.** (IRAP, 1999)
- **55**.9 FTEs were directly employed by the Natura 2000 site in Central-Limburg (Belgium) in 2001. It was estimated that the site also generated between 65 and 85 FTE indirect jobs. (Kettunen et al., 2009)
- In Latvia, the Natura 2000 site of Salaca River supported 11 direct FTEs (on- and off-site) and about 5.5 FTE indirect jobs in 2002. (Kettunen et al., 2009)

Table 5 summarises the strengths and limitations of the methods to estimate employment supported by Natura 2000.

Table 5: Strengths and limitations of valuation methods to assess employment supported by Natura 2000

Valuation methodologies	Main methods families	Strengths	Limitations
Direct employment	**Costs-based approach**	Is a straightforward method for jobs related to management of Natura 2000, since costs of management are relatively well known. Can be applied at site or MS level depending the data which is available	Requires assumptions on the average wage rate per FTE jobs.
	Site-based approach	Can cover all the economic sectors	Requires an extensive amount of primary data Require data on land use on Natura 2000 sites
Indirect employment	**Multiplier model**	Gives an estimate of indirect employment from direct employment	Requires strong assumption in order to transfer multipliers from one region to another Data unavailability i.e. multipliers are not calculated but taken from the literature

3.2.2 Contribution to local and regional development

The Natura 2000 network contributes to the local and regional development through the income of the employees whose work is directly or indirectly financed by Natura 2000. A Scottish study suggests that jobs supported by Natura 2000 encouraged retention of the rural population and helped to diversify the local economy and also created a positive identity for the area and contributed to community life (RSK ERA Ltd; 2001). In particular, spending created by site-related employees and volunteers are indirectly part of the benefits provided by employment supported by natural protected areas. In line with the assessment of the impacts of tourists spending on local economies, spending of site-related workers can be expressed in terms of income and jobs generated. However, very few studies attempt to assess these benefits because of a lack of data on both employees' and volunteers' expenditure. Therefore, a very simplistic technique sometimes used in the literature consists of attributing a share of the local turnover to site workers spending. Although this method is quite straightforward, it is largely biased and results of such calculations should be interpreted with caution.

3.3 Costs of negative impacts of tourism and recreation on biodiversity conservation and ecosystems

The United Nations Environment Programme and Conservation International have indicated that most of tourism's expansion is occurring in and around the world's remaining natural areas (TIES, 2006). Tourism is increasingly looked upon as a potential benefactor to conservation objectives (Tsaura et al, 2006). In particular, it can be an important source of funding for biodiversity conservation. However, it cannot be seen as a complete panacea since "to generate revenue you have to have a high number of traffic, tourists, which inevitably means a higher pressure on the environment" (Cater, 1995). Actually, activities related to tourism and recreation can have negative effects on biodiversity conservation and ecosystems, including damages related to increase visitation (e.g. waste treatment, air and visual pollution, disturbance of species) and land use changes (e.g. infrastructure building). An accurate and complete picture of the benefits provided by the Natura 2000 network should also take into account costs of the negative impacts. Assessing the negative effects of tourism and recreation goes beyond the scope of this study. However, this section provides a review of negative impacts of tourism and recreation for specific Natura 2000 areas and other natural environments in Europe.

The negative impacts of tourism and recreation is mostly linked to the level of sustainability of the related activities, put into perspectives with the carrying capacity of an area. The carrying capacity has been defined as "the maximum number of people who can use a site without an unacceptable alteration in the physical environment and without an unacceptable decline in the quality of experience gained by visitors" (Mathieson and Wall, 1982). However, two common misconceptions relating to theories of tourism are that the carrying capacity of a particular area is constant, and that sustainability is negatively correlated with scale. Moreover, whether a particular tourist product is considered to have positive or negative effects on the environment

does not depend on scale. It rather depends on the choice of management practices that are applied to each individual destination.

In the case of ecotourism, defined as responsible travel to natural areas that conserves the environment and improves the welfare of local people (TIES, 2006), although it is intended for small groups, even a modest increase in population, however temporary, puts extra pressure on the local environment and necessitates the development of additional infrastructure and amenities. **The rapid growth of such tourism leads to increased demand which for fragile sites can have detrimental impacts on biodiversity conservation and ecosystems** (TIES, 2006).In fact there is often little evidence that ecotourism is any less detrimental than other types of tourism, despite its intentions (Fennell, 1999). For example, the environment often suffers because local communities are unable to meet the infrastructure demands of ecotourism. Although ecotourists claim to be educationally sophisticated and environmentally concerned, they rarely understand the ecological consequences of their visits and how their day-to-day activities, such as the meals they eat, the toilets they flush and the water they drink, append physical impacts on the environment and how they impact broader regional economic and ecological systems. Ecotourism activities may also disturb fauna and flora, through trampling where they have worn down the marked trails and created alternate routes, contributing to soil impaction, erosion, and plant damage. Where the ecotourism activity involves wildlife viewing, it can scare away animals, disrupt their feeding and nesting sites, or acclimatise them to the presence of people (Tsaura et al., 2006).

- **Direct and indirect costs**

Negative impacts of tourism on biodiversity conservation and ecosystems can also represent direct or indirect costs. Direct costs, caused by the presence of tourists, include environmental impacts such as erosion, trampling, waste, and disturbance of animals. Indirect costs are caused by the infrastructure created in connection with tourism activities. The following habitats, species and ecosystems can be impacted, as illustrated in Table 6 for Natura 2000 sites or other European nature-protected areas:

- Fauna and flora, impacted through introduction of exotic species, disturbance of wildlife, spread of pathogens, presence of barriers to native animal movement (e.g. by roads) and habitat damage (fragmentation and reduction). The consequences are the decline of population (e.g. road kills) and the reduction of the richness and abundance of species;
- Trails impacted by erosion and littering due to excessive presence of visitors;
- Forests: pressure on forests intensified when tourism-related firewood use;
- Fresh-water resources: water pollution through inappropriate waste disposal or pressure on fish stocks;
- Marine resources, with continued reduction in the size and viability of fish populations;
- Land resources impacted through their use for roads and accommodation; and
- Geological resources, minerals and fossils.

Table 6: Negative impacts of tourism on biodiversity conservation and ecosystems in Europe and Natura 2000 sites

Impact	Example	Direct/ indirect	Sources
Fauna	Finland. Ecological impact of tourism on birds in protected areas at north-eastern Finland. The number of visitors seems to have negatively affected open nesting species nesting on the ground.	Direct	Kangas et al. (2008)
	Greece, Valley of Butterflies (Natura 2000 site code: GR4210006): thousands of butterflies gather in a unique ecosystem. This phenomenon, even if it is a matter for protection, has become a tourist resource. Many tourists visit the area every day in order to admire the unique environment, and they have impacts on the special fauna and its habitat.	Direct	Spilanis & Vayanni (2003)
Flora	Clearing of vegetation for infrastructure or damage from trampling, horse riding, mountain biking and off road vehicles.	Direct	Pickering & Marina (2007)
Trails (erosion and littering)	Northern Finland, Pallas-Yllästunturi National Park. Impacts of tourism on vegetation on campsites	Direct	Kangas, K. et al. (2007)
	Samaria Gorge in Crete (Natura 2000 site code: GR4340014): Hundreds of visitors every day during the summer, walking and littering in the gorge.	Direct	Spilanis & Vayanni (2003)
Forests	Removal of trees for fuel in local camps	Indirect	Vaughan (2000)
Fresh-water resources	Water pollution through inappropriate waste disposal	Direct	Vaughan (2000)
	Scotland. River Bladnoch (Natura site code: UK0030249). Continued reduction in the size and viability of salmon populations due to the deterioration of spawning grounds and possible unsustainable harvesting.	Direct/in direct	Jacobs (2005)
Marine resources	Developments or activities below high-water mark, causing beach erosion and affecting the breeding potential of coastal species, such as fish or crustaceans important for local fisheries.	Direct/in direct	Vaughan (2000)
	Coral reef damage through uncontrolled scuba-diving, and by untreated sewage or other pollutants from tourism developments.	Direct/in direct	Ceballos-Lascuráin (1996)
Land resources	Greece, Aegean Islands (part of Natura 2000). Construction of large-scale infrastructure, the urbanisation and congestion resulting from increased tourist numbers, the exteriorisation of the operational	Indirect	Spilanis & Vayanni (2003)

Impact	Example	Direct/ indirect	Sources
	costs of hotels, and increases in energy and water consumption and in the production of solid wastes.		
	Northern Finland, Pallas-Yllästunturi National Park. Impacts of tourism on soil on campsites	Direct	Kangas, K. et al. (2007)
Geological exposures, minerals and fossils	Climbing and caving impacts are negligible; most impacts from collecting of minerals, rocks and fossils.	Direct	Ceballos-Lascuráin (1996)

- **Opportunity costs**

Destruction of the natural environment represents opportunity costs in terms of loss of the very resource which attracted tourists in the first place. Some of these costs include damage of the living resources that the tourism is intended to protect. Examples include disturbance caused by electric lights at tourist facilities, harassment as a result of unnaturally close human contact, leading to behavioural change or driving animals off reserves, exposing them to danger, and feeding of wildlife by tourists which can lead to increased dependency on humans. Furthermore, increasing the public awareness of animal species in certain areas may make more difficult the ability of wildlife management authorities to control specific animal populations if tourists favour the protection of certain attractive but "troublesome" species. Other external costs of tourism are financial; for example if a protected area or wildlife reserve seeks funding for a politically attractive visitors centre and pave a new road for recreational vehicular traffic at the expense of arguably more important (but less noticeable) projects, such as enhancing or acquiring habitat or removing exotic species (Isaacs, 2000).

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Chapter 4: Estimation of benefits provided by tourism and recreation supported by Natura 2000

In brief: Market benefits provided by tourism and recreation to the economy and recreational benefits received by visitors were estimated separately. In a first step, an approach based on an input-output model, using data on visitor spending at site/regional level and EU-27 level supply-use tables, was implemented to estimate market benefits. In 2006, around 1.7 billion visitor days to the Natura 2000 network per annum were estimated, i.e. 184 visitors/day/site. The total visitor expenditure was estimated between 50 and 90 billion Euros. It generated economic impacts which were estimated between 50 and 85 billion Euros. Visitors with affinity for Natura 2000, who represent around 21% of the total number of visitors, contributed between 9 and 20 billion Euros in 2006. The second step scaled up recreational values at site level to estimate the recreational benefits at the network level. A visitor is willing to pay approximately 4€ per visit to Natura 2000, generating between 5 to 9 billion Euros of benefits. Despite the limitations, the methodologies adopted appear to provide consistent estimates compared with existing ones taken from the literature.

This chapter describes the methodological approaches used to estimate the benefits provided by tourism and recreation supported by Natura 2000, and presents the main results. Two different approaches were adopted to estimate market and non-market benefits. Both approaches were developed with the objective to provide a robust methodology taking into account the lack of socio-economic data on Natura 2000 sites, and under the time constraints of the study that does not allow an extensive data collection.

As discussed in Chapter 3, several issues need attention when estimating the benefits provided by tourism and recreation.

- Total benefits provided by tourism/recreation combine both market and non-market benefits.
- The value of market benefits related to visitor spending and the value of recreational benefits may overlap. For example, tourists visit a nature-protected area to watch whales and agree to pay for a guided tour. This amount indirectly provides a quantification of the recreational and cultural values attached to this activity. On the other hand, the existing or potential market price of recreation is also integrated when estimating the willingness to pay to visit the site, considering the total benefit it provides. As a result, it might not always be relevant to add up all the market and non-market benefits to estimate overall benefits, as this might result in double counting.

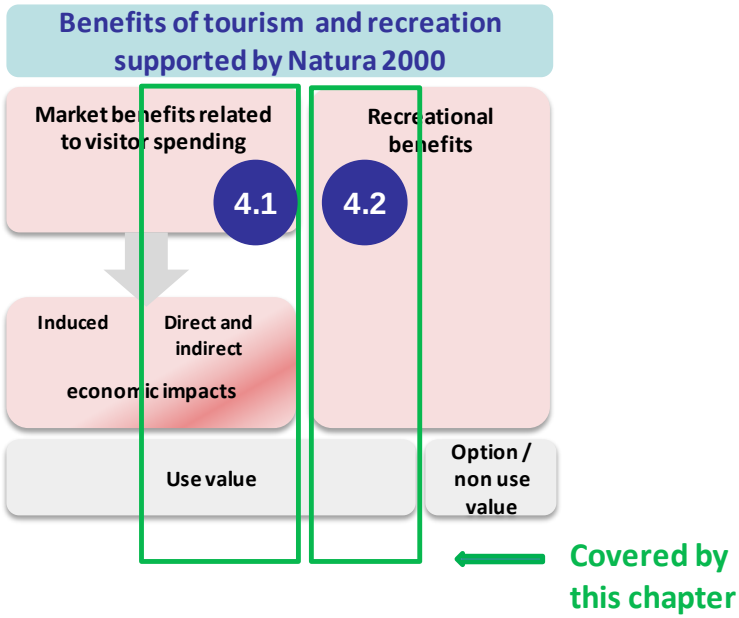
- Benefits provided by tourism/recreation may include benefits related to other social and cultural services. For example, the visit to a museum or an archaeological site can count for both benefits related to a recreational activity and to cultural services. The difficulty in distinguishing between these two values is due to the fact that the main reason of the visit is difficult to known. Thus the estimated value of tourism/recreation may overlap with the estimated value of other social and cultural services.

Both market and non-market benefits related to tourism and recreation are estimated separately in this study and cannot be simply added up to provide total value of benefits.

Specific sections are dedicated to each of these benefits below (Figure 13):

- Section 4.1 presents the methodology developed to value the market benefits and their economic impacts and presents the results;
- Section 4.2 presents the approach developed to value the recreational benefits and presents the results.

Figure 13: Benefits estimated in Chapter 4



4.1 Estimation of market benefits and their economic impacts

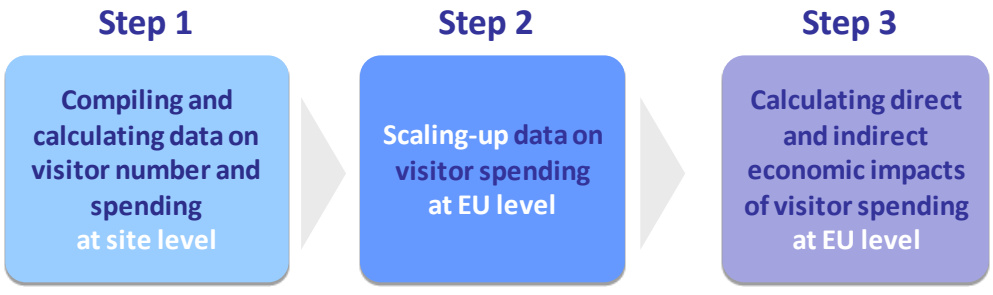
4.1.1 Methodology

Overview

The methodology to estimate the market benefits provided by tourism/recreation and their direct and indirect economic impacts is based on input-output framework, applying supply-use tables at the EU-27 level and on spending data drawn from site/regions. The main strength of this approach is that it takes into account in a comprehensive way the economic impacts generated by the flow of visitor expenditure in Natura 2000 sites for all stages of the value chain, at the scale of the EU-27. Furthermore, this approach takes into account the specificities of the EU economies, namely the intensity of intra- and inter-relationships into and between economic sectors, by using the consolidated input-output tables at the EU-27 level provided by Eurostat. The latter registers the overall economic flows inside the industries of one sector and between sectors. Their use allows the calculation of both the direct impacts and indirect impacts of visitor spending in the economy. In comparison, an approach based on a TSA would have not allowed the estimation of indirect effects. Moreover, an approach based exclusively on a value chain analysis would have not been applicable directly at national level, and would have required strong assumptions when choosing multipliers, such as using study/region or site specific multipliers to estimate EU wide economic benefits, and could have lead to biased estimates.

Three main steps were followed to give an estimation of the economic value of the market benefits provided by tourism/recreation supported by Natura 2000 and their economic impacts (Figure 14).

Figure 14: Approach to estimate market benefits and their economic impacts



- Step 1: Relevant parameters linked to tourism/recreation (e.g. visitor expenditure and number of visitors) at site level were collected from existing literature and through a questionnaire-based survey for a set of sites representative of Natura 2000 and EU.
- Step 2: Visitor spending was calculated at EU level.

- Step 3: Finally, direct and indirect economic impacts of visitor spending were calculated at EU level. Calculations were carried using an input-output analysis, based on consolidated supply-use data for the EU-27.

Key assumptions of the methodology.

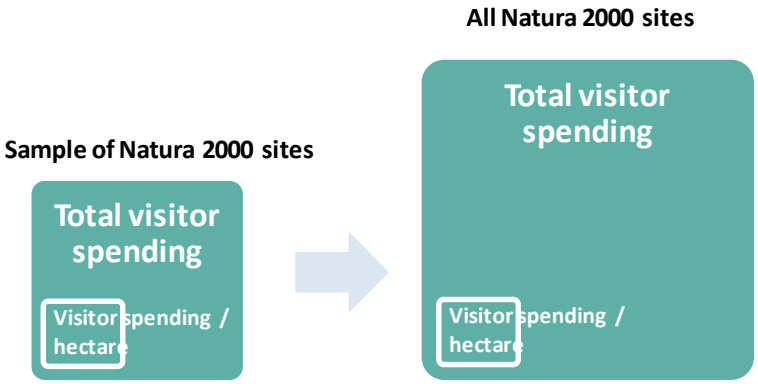
- **Assumption 1: Visitor spending is proportional to the area of the Natura 2000 area.**

As this study potentially concerns a large number of sites (more than 25,000 sites) and considering that there is a lack of primary data at site level, such scaling-up is considered relevant and necessary to produce EU wide estimates.

As discussed in Chapter 3, primary data related to tourism and recreation is available for specific sites, territories (e.g. Scotland), habitats (e.g. wetlands, forests), activities (e.g. whale watching), and profile of visitors (e.g. occasional/uniformed, informed nature-based visitors). All these variables should be used in theory to scale up benefits at network level. However, available data does not cover sufficient activities related to tourism and recreation, types of visitors, and different habitats to be able to do so.

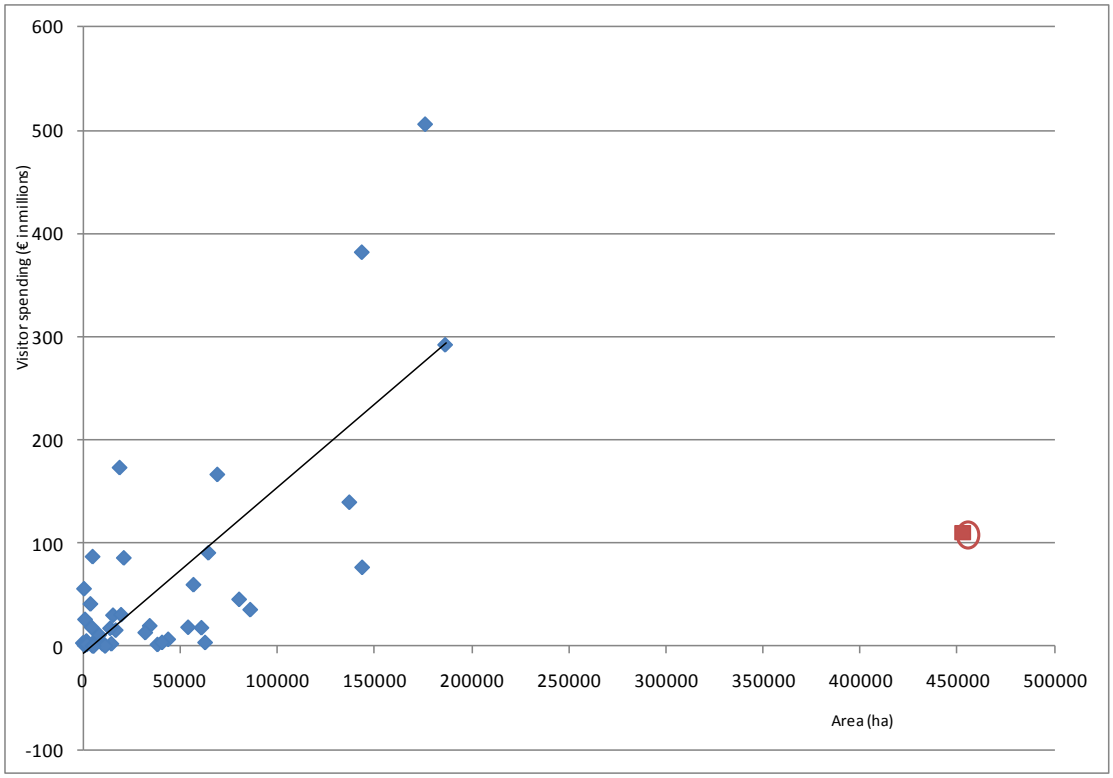
Therefore, **a site-based approach is considered as the most feasible to scale-up values related to tourism and recreation** because primary data is available for Natura 2000 sites, with different characteristics and nature of services. The relevance of the estimates depends to a large extent on the representativeness of the sites selected for the analysis. In order to ensure a minimal degree of representativeness, criteria such as geographic situation, GDP level and tourism attractiveness were used to group MS and select the sites of the sample. **The scaling-up was then done under the assumption that total visitor spending is proportional to the area of the Natura 2000 area** (Figure 15).

Figure 15: Scaling-up visitor spending to the area of the sites



This is a simplification, as the area of the site is only one of several drivers of visitor spending, such as wildlife, landscape, location, existing infrastructure, type of visitors and site accessibility. However, our sample of 47 protected areas shows that area correlates fairly well with visitor spending. Visitor spending increases linearly with the area of the site: the correlation coefficient is 0.29 (see Figure 16). When the park with the extreme value (Cairngorms National Park, UK) is removed from the sample, the correlation coefficient increases to 0.59.

Figure 16: Visitor spending and size of area for a sample of 47 protected areas (including Natura 2000 areas) in EU-27



Note: the park with the extreme value is circled in red.

Obviously, the more representative the sample of sites, the more likely this assumption will hold: with a representative sample, the average area in hectare would incorporate most of the information of the total population of sites regarding diversity of location, etc. Scaling-up on a per hectare basis would in this case yield to a very limited bias. Therefore, this implies applying a second assumption.

- **Assumption 2: The sample of Natura 2000 areas studied is representative of the socio-economic and bio-geographical diversity.**

Data related to tourism and recreation was only available for some sites in a limited number of MS, which made direct scaling up from national to EU level impossible. Four country groups were thus defined, with similar economic structure and tourism intensity. The tourism and recreation data of all sites from different MS within a group were aggregated to scale up from site to group level and from group to EU level. The grouping was done on the basis of:

- GDP per capita in Purchase power standard (PPS), i.e. the value of all final goods and services produced within a country in a given year divided by the average population. It allows comparison of the national income between countries, taking into account the relative cost of living and the inflation rates. The average GDP per capita in PPS for the EU is assessed to be 100 (Eurostat, 2007).
- Tourism intensity, i.e. the number of nights spent by residents and non-residents in collective tourist accommodation establishments per 1,000 inhabitants. It reveals the level of tourism development of a country taking into account the

accommodation capacity and the touristic attractiveness of the country. The average tourism intensity for the EU is assessed to be 4671 (Eurostat, 2007).

The groups were defined to represent a specific economic structure and tourism development (see Table 7). The figures of 4,500 and 105 were used to ensure a more consistent division:

- Group A: MS with a tourism intensity higher than 4500 and a GDP per capita in PPS higher than 105;
- Group B: MS with a tourism intensity lower than 4500 and a GDP per capita in PPS higher than 105. Group A and B correspond to Western and Northern European MS;
- Group C: MS with a tourism intensity higher than 4500 and a GDP per capita in PPS lower than 105. It corresponds to Mediterranean MS;
- Group D: MS with a tourism intensity lower than 4500 and a GDP per capita in PPS lower than 105. It corresponds to Eastern European MS.

Table 7: Classification of MS into four groups, 2007

Classification criteria	Tourism intensity > 4,500 (EU 27 = 4,671)	Tourism intensity < 4,500 (EU 27 = 4,671)
GDP per capita in PPS > 105 (EU27= 100)	**Group A** Austria Denmark France Ireland Luxembourg Netherlands Sweden	**Group B** Belgium Finland Germany United Kingdom
GDP per capita in PPS < 105 (EU27=100)	**Group C** Cyprus Italy Greece Malta Portugal Spain	**Group D** Bulgaria Czech Republic Estonia Hungary Latvia Lithuania Poland Romania Slovakia Slovenia

It should be noted that these country groups differ in the share of Natura 2000 (Table 8). Groups C and D have approximately twice the amount of Natura 2000 areas compared to groups A and

B. Furthermore, within a group, there are differences between countries in terms of the area covered by Natura 2000.

Table 8: Natura 2000 land area per group of MS

Group A	Total area (km^2)	Natura 2000 land area (km^2)	% Natura 2000 land area	% Natura 2000 / total Natura 2000 group
Austria (AT)	83 ,859	12,318	14.7%	7.8%
Netherlands (NL)	41,526	5,725	13.8%	3.6%
Denmark (DK)	43,093	3,859	9.0%	2.4%
France (FR)	549,192	68,771	12.5%	43.6%
Ireland (IE)	70,280	9,155	13.0%	5.8%
Luxembourg (LU)	2,597	474	18.3%	0.3%
Sweden (SE)	414,864	57,426	13.8%	36.4%
Total	**1,205,411**	**157,728**	**13.1%**	**100.0%**

Group B	Total area (km^2)	Natura 2000 land area (km^2)	% Natura 2000 land area	% Natura 2000 / total Natura 2000 group
Germany (DE)	357,031	55,113	15.4%	43.9%
Finland (FI)	338,145	48,732	14.4%	38.9%
United Kingdom (UK)	244,820	17,711	7.2%	14.1%
Belgium (BE)	30,528	3,858	12.6%	3.1%
Total	**970,524**	**125,414**	**12.9%**	**100.0%**

Group C	Total area (km^2)	Natura 2000 land area (km^2)	% Natura 2000 land area	% Natura 2000 / total Natura 2000 group
Spain (ES)	504,782	137225,0	27.2%	54.5%
Italy (IT)	301,333	57,706	19.2%	22.9%
Cyprus (CY)	5,736	1,626	28.3%	0.6%
Greece (GR)	131,940	35,793	27.1%	14.2%
Malta (MT)	316	41	13.0%	0.0%
Portugal (PT)	91,990	19,204	20.9%	7.6%
Total	**1,036,097**	**251,595**	**24.2%**	**100.0%**

Group D	Total area (km^2)	Natura 2000 land area (km^2)	% Natura 2000 land area	% Natura 2000 / total Natura 2000 group
Latvia (LV)	64,589	7,304	11.3%	3.4%
Poland (PL)	312,685	60,796	19.4%	28.1%
Estonia (EE)	45,226	8,036	17.8%	3.7%
Slovenia (SI)	20,273	7,201	35.5%	3.3%
Bulgaria (BG)	110,910	37,649	33.9%	17.4%
Czech Republic (CZ)	78,866	11,073	14.0%	5.1%
Hungary (HU)	93,030	19,937	21.4%	9.2%
Lithuania (LT)	65,301	7,864	12.0%	3.6%
Romania (RO)	238,391	42,639	17.9%	19.7%
Slovakia (SK)	48,845	14,133	28.9%	6.5%
Total	**1,078,116**	**216,632**	**20.0%**	**100.0%**

Source: Natura 2000 Barometer

The sites that are included in the study are located in Austria, France, and Sweden (Group A), Germany and the UK (Group B), Spain (Group C), and Poland and Slovakia (Group D) (see Table 9). The share of each country's Natura 2000 land area in the total Natura 2000 land area of its respective group ranges from around 8% for Austria to 55% for Spain.

Table 9: Sample of Natura 2000 areas considered in the study

Group	MS	Name of the site	Biogeographical region	Habitats (dominant)	Total Area (ha)	Natura 2000 area (ha)
Group A	Austria	Blockheide Gmünd-Eibenstein	Continental	Arable land and market gardens	106	106
		Naturpark Raab	Continental	Mixed deciduous and coniferous woodland	14,770	14,770
		Naturpark Ötscher-Tormäuern	Continental	Mixed deciduous and coniferous woodland	17,000	17,000
		Hohe Tauern - Salzburg	Alpine	Coniferous Woodland	80,500	80,500
		Hohe Tauern – Kärnten	Alpine	Coniferous Woodland	44,000	44,000
		Hohe Tauern – Ostirrol	Alpine	Coniferous Woodland	61,100	61,100
	France	Parc national Port-Cros	Mediterranean	Posidonia beds	700	700
		Grand Site Sainte Victoire	Mediterranean	Quercus ilex and quercus rotundifolia forests	34,500	29,336
	Sweden	Fulufjallet National Park	Alpine and Boreal	Alpine and Boreal heaths	38,483	38,483
Group B	Germany	Bayerischer Wald	Continental	Natural dystrophic lakes and ponds	32,351	31,777
		Müritz	Continental	Hard oligo-mesotrophic waters with benthic	32,200	10,164

Group	MS	Name of the site	Biogeographical region	Habitats (dominant)	Total Area (ha)	Natura 2000 area (ha)
				vegetation of Chara spp.		
		Hainich	Continental	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	7,513	7,513
		Kellerwald-Edersee	Continental	Luzulo-Fagetum beech forests	5,724	5,724
	UK	Brecon Beacons National Park	Atlantic	European dry heaths	137,200	3,311
		Mourne Area of Outstanding Natural Beauty	Atlantic	Large shallow inlets and bays	57,000	20,253
		East Devon Pebblebed Heaths	Atlantic	European dry heaths	1,214	1,214
		Sunart Oakwoods Initiative Area	Atlantic	Old sessile oak woods with Ilex and Blechnum in the British Isles	10,247	10,247
		Kinloch and Kyleakin Hills	Atlantic	Northern Atlantic wet heaths with Erica tetralix	5,267	5,267
		Cairngorms National Park	Atlantic	Siliceous alpine and boreal grasslands	452,800	113,200
		Loch Lomond and the Trossachs National Park	Atlantic	Old sessile oak woods with Ilex and Blechnum in the British Isles	186,500	17,332
		North York Moors	Atlantic	European dry heaths	143,600	44,427
		Yorkshire Dales	Atlantic	Blanket Bogs	176,200	68,669
		Peak District	Atlantic	Semi-natural dry grasslands and scrubland facies on calcareous substrates	143,800	47,890
		Exmoor National Park	Atlantic	European dry heaths	69,280	12,600
Group C	Spain	Parque nacional Aigüestortes i Estany de Sant Maurici	Alpine	Siliceous rocky slopes with chasmophytic vegetation	14,119	13,925
		Parque nacional Archipiélago de Cabrera	Mediterranean	Pesidonia beds	10,021	10,021
		Parque nacional Cabañeros	Mediterranean	Calcereous fens with Cladium mariscus and species of the Caricion davallianae	40,856	40,856
		Parque nacional Caldera de Taburiente	Macaronesia	Canary island endemic pine forests	4,690	4,354
		Parque nacional Doñana	Mediterranean	Cisto-lavenduletia dune sclerophyllous scrubs	54,252	54,252
		Parque nacional Garajonay	Macaronesia	Macaronesian Laurel Forests	3,986	3,785
		Parque nacional	Atlantic	Arrecifes	8,480	1,176

Group	MS	Name of the site	Biogeographical region	Habitats (dominant)	Total Area (ha)	Natura 2000 area (ha)
		Islas Atlánticas de Galicia				
		Parque nacional Ordesa y Monte Perdido	Alpine	Alpine and subalpine calcareous grasslands	15,608	15,608
		Parque nacional Picos de Europa	Atlantic	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer	64,660	23,783
		Parque nacional Sierra Nevada	Mediterranean	Mountain Cytisus purgans formations	86,208	86,208
		Parque nacional Tablas de Daimiel	Mediterranean	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	1,928	1,928
		Parque nacional Teide	Macaronesia	Canary island endemic pine forests	18,990	13,571
		Parque nacional Timfaya	Macaronesia	Fields of lava and natural excavations	5,107	5,107
		Congost de Mont-Rebei Reserve	Mediterranean and Alpine	Quercus ilex and quercus rotundifolia forest	1,000	1,000
		Port D'arnes Reserve	Mediterranean and Alpine	Quercus ilex and quercus rotundifolia forest	1,200	1,200
		Can Maçana Reserve	Mediterranean and alpine	Quercus ilex and quercus rotundifolia forest	1,000	1,000
Group D	Poland	Drawieński National Park	Continental	Lowland hay meadows	11,538	11,538
		Ojcowski National Park	Continental	Petrifying springs with tufa formation	2,146	1,866
		SAC Góra św. Anny	Continental	Petrifying springs with tufa formation	5,084	5,084
		SAC Góry Opawskie	Continental	Alkaline fens	5,583	5,583
		Bialowieza Forest	Continental	Galio-Carpinetum oak-hornbeam forests	62,997	62,997
		Tatra National Park	Alpine	Acidophilous Picea forests of the montane to alpine levels	21,164	21,164
	Slovakia	Slovensky Raj National Park	Alpine	Medio-European limestone beech forests of the Cephalanthero-Fagio	19,753	15,696

- **Assumption 3: Between 19 to 23% of the visitors of Natura 2000 sites have affinity with Natura 2000.**

As explained in Chapter 3, the use of the affinity of visitors with Natura 2000 could be used to estimate the additional value the Natura 2000 designation provides. A distinction between visitors according to their affinity with Natura 2000 allows to capture the direct benefits from Natura 2000 designation:

- "Natura 2000 visitors", who have affinity with Natura 2000: They come to a Natura 2000 site partly/mainly because of its designation, and thus place value on it. It can be interpreted that the economic impacts derived from the "Natura 2000 visitor" spending are linked in some way to the fact the site belongs to the Natura 2000 network.
- Other visitors, who do not have affinity to Natura 2000: They visit the site independently of the fact that it belongs to Natura 2000. This means that visitors would have decided to visit the site regardless of the status of the site or that they could pass through a Natura 2000 area without being aware of this designation. The economic impacts derived from their spending are not directly due to the site being designated as a Natura 2000 site.

To estimate the net additional value of Natura 2000, the tourists for whom the existence of the site as part of the Natura 2000 network is the main (if not the only) motivation for visiting can be considered, including the related spending. Due to a lack of information, the share of these visitors cannot be valued. Consequently, the net additional value of Natura 2000 cannot be estimated in the present study.

As presented in Chapter 3, the affinity of visitors for nature-protected areas was studied in the literature (seeTable 1). Only one study directly estimated affinity for Natura 2000 sites (Jacobs 2005). In the present study, the share of visitors who have affinity for Natura 2000 areas was thus based on this estimate, i.e. 21% of visitors who have affinity for Natura 2000 areas. In order to perform a sensitivity analysis, we calculated the standard deviation of the sample of data on visitor affinity for National parks in Austria, Germany, and France (see Table 1). Accordingly, between 19% and 23% of the total number of visitors were estimated to have affinity with Natura 2000.

Detailed methodology

Step 1 – Compiling and calculating data on visitor number and spending at site level

Data on visitor number and spending by spending category were obtained for a sample of 47 protected natural areas that includes around 10,600 km² of Natura 2000 areas, i.e. 1.41% of the Natura 2000 network (see Table 9: Sample of Natura 2000 areas considered in the study).

The steps for data collection, selection, and computation are detailed below.

- **Data collection**

Visitor and expenditure data in Natura 2000 sites and other protected areas were collected from the scientific and gray literature and from existing databases. Furthermore, additional sites with available and accessible data related to tourism/recreation were identified, by contacting professional networks in the sustainable tourism/recreation field, such as Pan Park and Ecoparc, and main national contacts for the Natura 2000 network. Structured questionnaires were also sent to site managers for selected Natura 2000 sites.

This information was then reviewed, to identify primary data on:

- Number of visitors, which is the sum of same-day visitors and overnight tourists; and
- Direct visitor expenditure, per spending category and total.

When the total amount of visitor spending is not directly available at site level, visitor spending could be considered by type of visitor (same-day visitors vs. overnight visitors) for data collection and calculation, using primary data on:

- Number of visit days of overnight tourists or same-day visitors; and
- Visitor spending by spending category and per day.

Selection of sites

As highlighted in previous studies (Getzner et al., 2002; Gantioler et al., 2010), collecting a sufficient quantity of reliable information was one of the main challenges of the study. The project team recognises that data limitations and the need to rely on secondary data will not allow for a perfect representation of sites, areas and MS. Therefore, a three-tier approach was used to select sites, based on:

- **The availability and accessibility of existing data,** which implied that data on protected areas (i.e. other than Natura 2000) were also used to estimate Natura 2000 benefits and to counter the limitations of data availability and accessibility. This was done **assuming that there is a similarity in spending per hectare regardless of the designation of a nature-protected area.**
- The **representativeness of the sites in terms of tourism development and attractiveness** of the area, including tourism density and type of dominant habitats.
- The representativeness of the sites **in terms of economic structure and types of tourism destination. This is necessary to be able to scale-up outcomes from site to group level.** Therefore, as a minimum one MS per group is covered by the list of sites.

Overall, the sample covers six biogeographical regions (Continental, Alpine, Mediterranean, Boreal, Atlantic, and Macaronesian) and the dominant habitats of the sites are diverse (e.g. woodlands, heaths, and grasslands). The visitor density varies between 0.66 and 2514 visitor days per hectare.

Data calculation

In order to use input-output tables, **visitor spending was redistributed to the corresponding categories of the NACE classification of Eurostat**. Information on visitor spending is usually available for most of these categories (especially accommodation and catering/restaurants, which are the major ones), which ensures that results will provide a comprehensive picture of the direct and indirect impacts. The correspondence with NACE categories is usually straightforward, as illustrated in Table 10 below in the case of accommodation.

Table 10: Extract of NACE classification for accommodation

Spending category	NACE CODE	Description
Accommodation	55.1	Hotel
	55.2	Camping sites and other provision of short-stay accommodation
	55.21	Youth hostels and mountain refuges
	55.22	Camping sites, including caravan sites
	55.23	Other provision of lodgings n.e.c.

In the case of missing data, estimations from other primary data identified in the literature or in the case studies were made. **Such estimates were made under assumptions that varied depending on both the site considered and the type of missing or existing data** (see Box 19). Following are the main variables:

- Share of same-day visitors and overnight visitors in the sites;
- Structure of visitor spending in the sites;
- Daily visitor spending per type of visitors; and
- Share of visitors with affinity with Natura 2000.

In addition, primary data were available for different years. Depending on primary data, this implies conversion of primary data into Euros and/or the application of Harmonised Index of Consumer Prices (HICP)[19] to obtain data for year 2006.

[19] Source: Eurostat

Box 19: Examples of calculations under specific assumptions to estimate visitor spending

1 - Estimating visitor spending for Spanish Natura 2000 areas

Number of visitor is the primary data for all Spanish parks considered in the sample. Mean daily expenditure and spending structure by category are similar in all parks and taken from Murcia Turistica (2005), which provides data on average spending per visitor interested in nature-based tourism and recreation in the Murcia Region in 2004. Visitor spending was estimated under the assumption that **mean daily expenditure and visitor spending structure in all Spanish parks in the sample are identical to the mean daily expenditure and spending structure of nature-oriented visitors in the Murcia Region.**

2 - Estimating visitor spending for Natura 2000 areas in the UK

The visitor spending structure and mean daily expenditure of the visitors of the Forest of Bowland Area of Outstanding Natural Beauty are used to compute the average spending structure of visitors in the UK.

3 – Estimating visitor spending per category for Parc National Port-Cros (France)

Primary data on total visitor expenditure in 1998 comes from IRAP (1999). An exchange rate of 1€/6.63Fr was used to convert primary data into Euros. In order to allocate the total expenditure to each spending category, the average spending structure of all parks in the sample for which primary data on visitor expenditure per categories was available was applied to total visitor expenditure. The assumption made here is that visitors' spending structure in Parc National Port-Cros is identical to the average spending structure of all parks in the sample for which primary data on visitor expenditure per categories is available.

- **Data analysis**

In short, the approach developed in Step 1 faced several limitations, and consequently did not allow accurate estimation f the data on visitor number and spending for the sample of Natura 2000 sites:

- The data collection process was not always described in the sources. A comparison among those studies that did describe it suggests there was a lack of consistency between the data of the different studies.
- To deal with the limited data availability, some assumptions had to be made (see above under section "Key assumptions of the methodology"). These assumptions increase the uncertainty of the estimates of visitor spending at site level.
- It is important to note that **the sample does not include sites where there is no tourism/recreation activity**. Consequently, the total number of visitors in Natura 2000 might be overestimated.

Step 2 – Estimation of visitor spending at EU level

- **Scaling up data from site to group level**

In this step, the total average spending (including VAT) for all visitors and for "Natura 2000 visitors" (with low and high affinity) was calculated by spending category for each group of MS.

The upscaling is based on the share of Natura 2000 areas studied within a group over the total Natura 2000 area of the group.

For each group and each spending category, the calculation process was as following:

- Total expenditure of visitors in the Natura 2000 area leads directly to average visitor expenditure per hectare of Natura 2000 area. This was done for each Natura 2000 area of the sample.
- Average visitor expenditure per hectare for all the Natura 2000 area of the group was therefore calculated.
- Visitor spending per hectare calculated at site-level was scaled up to the group level on the basis of the share of Natura 2000 area located in the group (see Table 8).

Furthermore, spending of "Natura 2000 visitors" was calculated by applying two scenario to highlight the amount of spending captured by the sites that is partly due to the sites being Natura 2000: 19% and 23% of total visitors have affinity with Natura 2000.

Finally, average spending per group was computed by weighting each site's spending per hectare with its share of Natura 2000 area in the group.

Scaling up data from group to EU level

In this step, total domestic spending (excluding VAT) supported by the Natura 2000 network was estimated, for all visitors as well as for visitors with high/low affinity for Natura 2000 areas.

First, estimates were obtained per spending categories by summing the outcomes for the four Groups. They were processed to correspond with NACE codes, and the average VAT rates applicable for EU 27[20] were extracted (see Table 11).

Table 11: NACE spending categories and VAT RATES for EU 27

	Accommodation	Catering	Retail		Entertainment /Recreation	Transportation	Other services
NACE Codes	H	H	DA15	DN36	O92	I60	O93
NACE Categories	Hotel and Restaurant Services	Hotel and Restaurant Services	Food products and beverages	Furniture; other manufactured goods n.e.c.	Recreational, cultural and sporting services	Land transport; transport via pipeline services	Other services
VAT Rates	9.63%	14.69%	13.65%	20.47%	14.02%	9.94%	20.47%

The estimates of visitor spending included imports. The latter were subtracted to estimate domestic spending, with the purpose of focusing only on the impacts generated by domestic production.

Furthermore, a sensitivity analysis was conducted to cover the assumptions taken that can introduce biases. The sensitivity analysis was performed by applying the weighted standard variation of visitor spending (in €/visitor day) in the 47 parks of the sample to the overall visitors' spending in the network. The standard variation of visitor spending was weighted according to the number of visitors in each park. Finally, **the sensitivity analysis was performed by applying**

[20] Source: European Commission (2011), VAT Rates Applied in the Member States of the European Union. Available at: ec.europa.eu/taxation_customs/resources/documents/taxation/vat/how_vat_works/rates/vat_rates_en.pdf

+/- 26% to the total spending, corresponding to a high or low level of spending. This sensitivity analysis is a way to consider the potential variability of spending due to several socio-economic factors (e.g. consumer purchasing power, budget restrictions for recreation due to economic crisis).

In 2006, the total visitor expenditure was estimated between 52 and 90 billion Euros for Natura 2000 network (Table 12). Under assumption 3 (i.e. between 19% and 23% of the total number of visitors have affinity with Natura 2000), the expenditure generated by visitors with affinity with Natura 2000 is assessed between 9.7 and 21 billion Euros under the scenario of low/high spending. It would represent between 5 and 9 billion Euros if 10% of all visitors had affinity with Natura 2000 and between 26 and 45 billion Euros if 50% of all visitors had affinity with Natura 2000.

Table 12: Domestic spending per code NACE for all Natura 2000 areas at EU level (excluding VAT; €_2006; in millions)

		Accommodation and catering	Retail		Entertainment /Recreation	Transport	Other services	TOTAL
		H	DA15	DN36	O92	I60	O93	
		Hotel and restaurant Services	Food products and beverages	Furniture, other manufactured goods n.e.c.	Recreational, cultural and sporting services	Land transport, transport via pipeline services	Other services	
All visitors	**Domestic spending**	36,824	3,130	2,344	17,120	7,612	4,344	**71,374**
	Sensitivity - 26,5%	27,084	2,302	1,724	12,591	5,598	3,195	**52,494**
	Sensitivity + 26,5%	46,564	3,958	2,964	21,648	9,625	5,493	**90,252**
"Natura 2000 visitors" (i.e. 19% of total visitors)	**Domestic spending**	6,837	581	435	3,178	1,413	807	**13,251**
	Sensitivity - 26,5%	5,028	427	320	2,338	1,039	593	**9,745**
	Sensitivity + 26,5%	8,645	735	550	4,019	1,787	1,020	**16,756**
"Natura 2000 visitors " (i.e. 23% of total visitors)	**Domestic spending**	8,629	733	549	4,012	1,784	1,018	**16,725**
	Sensitivity - 26,5%	6,347	539	404	2,951	1,312	749	**12,302**
	Sensitivity + 26,5%	10,912	927	695	5,073	2,256	1,287	**21,150**

Data analysis

The estimates on visitor spending at EU level were calculated:

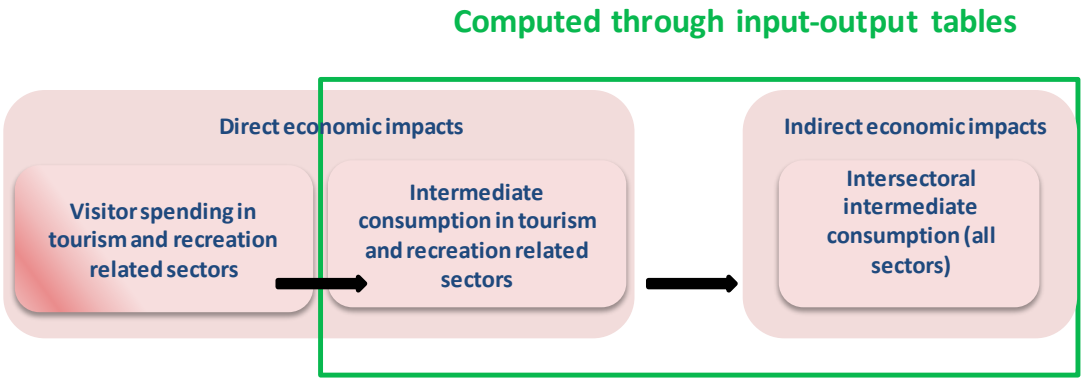
- On the basis of a limited amount of data at site level for a sample of sites;
- Scaling up data from site to EU level under several assumptions.

The scaling-up approach may cause an overestimation of the estimates since it did not take into account the potential substitution effects neither the overall variability of socio-economic characteristics across the EU and the specificities of Natura 2000 sites (e.g. accessibility and interest of sites).

Step 3 - Calculating direct and indirect economic impacts of visitor spending at EU level

In this step, the estimates of visitor expenditure at EU level were fed into an input-output model to estimate the direct and indirect economic impacts of the visitor expenditure. The direct and indirect economic impacts that were computed through the input-output model are presented in Figure 17.

Figure 17: Economic impacts of visitor spending calculated by using input-output tables



The input-output analysis takes into account all the relationships among sectors and is consistent with national and EU macroeconomic accounting frameworks. Consequently, **this approach does not allow to easily distinguish the direct impacts from the indirect ones. For this reason, in this study, the direct and indirect impacts are estimated together.**

Following, three different scenarios were compared:

- "baseline" or "no change" scenario, which incorporates total tourism-related spending at EU level (i.e. not restricted to Natura 2000 areas);
- "N2000" scenario, which is based on the use of the estimation of total spending in Natura 2000 areas; and
- "N2000+" scenario, which is based on the spending restricted to "Natura 2000 visitors'".

Calculations of the economic impacts of visitor spending captured by Natura 2000 were carried out using the most up-to-date Input-Output tables consolidated[21] for the EU. The following modified assumptions on tourist-related spending were applied:

- The baseline scenario only consisted in calculating the total value-added generated by the **existing final demand**.[22]

[21] Consolidated Input-Output tables for the EU consistent with the European System of Accounts (ESA 1995) are available for 2007. Source: Eurostat

[22] Final demand is comprised of household spending (or demand), government spending, corporate investment and foreign demand (exports). Visitor spending is distributed across different categories of household demand (accommodation services, food products, leisure activities, etc.), based on the scoping of the WTO.

- The "N2000" scenario used a modified final demand vector, i.e. subtracting tourism-related spending in Natura 2000 areas from total spending, for the relevant categories.
- The "N2000+" scenario was based on related spending in Natura 2000 areas from "Natura 2000 visitors".

The direct and indirect economic impacts were calculated by adding up the value added generated by the visitor spending from all the concerned sectors. The difference between the baseline scenario and the "N2000" scenario provides the estimates of the direct and indirect economic impacts derived from tourism spending in Natura 2000 areas (all visitors). The difference between the baseline scenario and the "N2000+" scenario provides the direct and indirect economic impacts derived from the spending of "Natura 2000 visitors" in Natura 2000 areas and due, at least partly, by the sites being Natura 2000.

Through this approach, estimates were developed that take into account both direct economic benefits, such as additional value-added generated in the accommodation/catering sector, and indirect ones, as well as the flow of revenues generated downstream, such as revenues generated by additional spending in business services, transport, etc.

4.1.2 Application of the methodology

Three case studies were developed for Austria, Germany and the UK to test the methodology at national scale. The results of the case studies are summarised in Table 13 and the detailed case studies are presented in the Annex.

Table 13: Results of the three case studies in €2006

	Austria	Germany	UK
Total average domestic spending _**all visitors**	€ 329 million	€ 2,582 million	€ 1,494 million
Economic impacts derived from visitor spending _ **all visitors**	€ 370 million i.e. 415 €/ha/year	€ 2 billion i.e. 602 €/ha/year	€ 1.7 billion i.e. 1,390 €/ha/year
Total average domestic spending _ **only "Natura 2000 visitors"**	€ 69 million	€ 542 million	€ 323 million
Economic impacts derived from visitor spending _ **only "Natura 2000 visitors"**	€ 78 million i.e. 87 € /ha/year	€ 493 million i.e. 126 €/ha/year	€ 353 million i.e. 292 €/ha/year

In Austria, expenditure of visitors in Natura 2000 sites is estimated at around 330 million Euros, generating around 370 million Euros of economic activity. This represents 2.6% of the total domestic tourism expenditure estimated in the framework of the TSA for the year 2006 (see Table 14).

The UK and Germany present higher domestic spending estimates than Austria, 1,494 million Euros and 2,582 million Euros respectively. These estimates represent 1.2% and 2.4% respectively of national domestic tourism expenditure calculated in the TSA framework.

Table 14: Comparison of the estimate with TSA in €, 2006

	Austria	Germany	UK
Domestic tourism expenditure (source: TSA)	€ 12,819 million	€107,521 million	€ 120,420 million
Share of average domestic spending _**all visitors**	2.6%	2.4%	1.2%
Share of average domestic spending _ **only "Natura 2000 visitors"**	0.05%	0.05%	0.03%

The shares of domestic visitor spending in the Natura 2000 network in total domestic tourism spending are of the same order of magnitude (i.e. between 1.2% and 2.6%), although the UK has a lower share than Austria and Germany. The difference between the three countries can be explained by the trend towards nature destinations for holidays. In the UK, only 2.4% of the respondents stated that Nature is the primary motivation for going on holidays, compared to 8.2% in Austria and 12.4% in Germany (European Commission, 2009).

The economic impact of visitor expenditure represents 415, 602 and 1,390 €/ha/year for Austria, Germany and the UK respectively. Considering only the expenditure of visitors with affinity with Natura 2000, it is 87, 126 and 292 €/ha/year for Austria, Germany and the UK.

These results can be compared with the following estimates found in the literature:

- Van Rensburgh et al. (2009) estimate that the economic benefits of domestic tourism in the National Park "Burren Park" in Ireland is around 71 €/ha/year;
- Job et al. (2005) estimate the revenue from tourism in the National Park Müritz in Germany at around 12 million Euros a year, corresponding to around 373 €/ha/year.

The economic impact of visitor spending (all visitors) that are estimated in the present study are higher than the figures taken from the literature, whereas **the economic impacts derived from the spending of visitors with affinity with Natura 2000 (from 87 to 292 €/ha/year) are in the same order of magnitude as found the literature.** In Germany, the estimate for the National Park Müritz is higher than the national estimate. Compared to the other German Natura 2000 areas studied in the present study, the National Park Müritz has a high level of spending (e.g. around 34€/visit day compared to around 16€/visit day for the Park Hainich).

4.1.3 Results and caveats

The direct and indirect economic impacts derived from visitor spending in the Natura 2000 network were calculated by scaling up visitor data from site level to EU level on an area basis. The estimation of these impacts leads directly to estimate the direct and indirect employment supported by new economic opportunities related to tourism/recreation supported by Natura 2000 (see Chapter 5). The overall results include:

- **Economic impacts derived from spending of all visitors in the Natura 2000 network**:

- Economic impacts generated by visitor spending, and direct and indirect employment related;
- Economic impacts generated by visitor spending, and direct and indirect employment related – Scenario low spending;
- Economic impacts generated by visitor spending, and direct and indirect employment related – Scenario high spending.

- **Economic impacts derived from the spending of "Natura 2000 visitors":**
  - Economic impacts generated by visitor spending, and direct and indirect employment related – for "Natura 2000 visitors" (i.e. 19% of total visitors), scenario low spending;
  - Economic impacts generated by visitor spending, and direct and indirect employment related – for "Natura 2000 visitors" (i.e. 23% of total visitors), scenario high spending.

The estimates achieved by this approach have a relatively high degree of uncertainty. The main reasons are:

- **A relatively small information base**;
- **The lack of data consistency** because data were taken from diverse sources;
- **The use of assumptions** to perform the estimates and compensate for the absence of data. Several assumptions had to be taken to extrapolate primary data and calculate data at site level. Moreover, the sample of sites was established with the ambition of being as representative as possible, but it was not possible to cover all the features and specificities of Natura 2000. For example, the sample of sites does not include sites where there are no tourism/recreation activities. This leads to an overestimation of the total number of visitors in Natura 2000;
- **The exclusion of potential substitution effects**; and
- **A lack of knowledge about the affinity visitors have with the Natura 2000 designation**.

A sensitivity analysis was conducted on visitor spending. The main objective was to consider the uncertainties related to data and the assumptions used, and to test their impacts on the estimates. Nonetheless, **the results could be overestimated mainly because the sample does not include sites where there is no tourism and recreation activity and because the effects of substitution effects are disregarded. Consequently, the estimates should be seen more as an order of magnitude than precise numbers.**

In 2006, the total number of visitor days to Natura 2000 was estimated between 1.2 and 2.2 billion per annum, i.e. around 184 visitors per day and per site. Visitor expenditure was estimated between 50 and 90 billion Euros. It generated an additional income estimated between 50 and 85 billion Euros (VAT excluded), i.e. between 54 and 94 billion Euros in $€_{2011}$.

- It corresponds to 1,112 €/ha of Natura 2000, i.e. 1,231 €/ha in $€_{2011}$.
- Equivalent to 0.57% of the GDP_{2006}.

Under different scenarios of levels of spending, the economic impacts varied between:

- Around 50 billion Euros (VAT excluded) for all visitors under a low spending scenario, i.e. 54,450 million Euros in $€_{2011}$. It corresponds to around 818 €/ha, i.e. 905 €/ha in $€_{2011}$.
- Around 85 billion Euros (VAT excluded) for all visitors under a high spending scenario, i.e. 94 billion Euros in $€_{2011}$. It corresponds to 1,406 €/ha, i.e. 1,557 €/ha in $€_{2011}$.

In 2006, around 230,000 and 520,000 million visitor days per annum were estimated for visitors with affinity with Natura 2000. The spending of this group of visitors was estimated around 15 billion Euros. The economic impacts derived from their spending were estimated between 9 and 20 billion Euros (VAT excluded), i.e. between 10 and 22 billion Euros in $€_{2011}$.

- It corresponds to 234 €/ha of Natura 2000, i.e. 258 €/ha in $€_{2011}$.
- Equivalent to 0.12% of the GDP_{2006}.

Under different scenarios, the economic impacts of visitor spending varied between:

- Around 9 billion Euros (i.e. around 10 billion Euros in $€_{2011}$) considering the spending of visitors with affinity (i.e. 19% of total visitors) and under a low spending scenario. It corresponds to 150 €/ha, i.e. 168 €/ha in $€_{2011}$; and
- Around 20 million Euros (i.e. around 22 billion Euros in $€_{2011}$) considering the spending of visitors with affinity (i.e. 23% of total visitors) and under a high spending scenario. It corresponds to 330 €/ha, i.e. 365 €/ha in $€_{2011}$.

Table 15 presents the estimates on visitor spending and Table 16 summarises the economic impacts derived from visitor spending captured by the Natura 2000 network.

Table 15: Visitor spending in the Natura 2000 network - in 2006

EU-27	€ million
all visitor spending	71,374 [52,494 – 90,252]
only "Natura 2000 visitors" spending	14,989 [9,745 – 21,150]

Table 16: Economic impacts of visitor spending in the Natura 2000 network – in 2006

EU-27	Number of visitor days (in millions)	€ million	€/ha	Contribution to GDP (%)
Economic impacts _**all visitor spending**	1,748 [1,292 – 2,203]	66,883 [49,192-84,575]	1,112 [817 – 1,406]	+0.57 [0.42-0.72]
Economic impacts _ **only "Natura 2000 visitors" spending**	367 [238 – 519]	14,045 [9,132-19,820]	234 [150-330]	+0.12 [0.08-0.17]

The economic impacts at EU level appear consistent with the estimates of benefits supported by Natura 2000 that can be derived from other studies.

The study "Estimating the overall economic value of the benefits provided by the Natura 2000 network"[23] estimates the value of the overall benefits at between 200 and 300 billion Euros per annum. The economic impacts of tourism and recreation activities would represent around 30% of the value of the overall benefits and around 6% considering only the expenditure of visitors with affinity with Natura 2000.

The economic impacts derived from visitor spending are also consistent with other regional or site-based estimates of the benefits of the Natura 2000 network (Table 17). The economic impacts derived from the spending of "Natura 2000 visitors" were estimated between 150 to 330 €/ha/year in this study, compared with around 71€/ha/year for the annual benefits provided by domestic tourism at site level for the Burren Park in Ireland. The difference could be explained by the fact that domestic tourism includes a higher number of same-day visitors (who do not spend money for accommodation. Furthermore, the gross estimates are lower than the economic benefits provide several ecosystem services (including recreation) estimated for the Lower Danube Green Corridor in Romania. The economic impacts derived from the spending of all visitors in the Natura 2000 network would be an order of magnitude too high (i.e. between 817 and 1,406 €/ha in 2006).

Table 17: Existing estimates related to the benefits of the Natura 2000 network

Type of estimate	Existing estimate from the literature	Computed estimate in this study
Economic benefits provided by Natura 2000 in Scotland	Computed applying the Scottish network benefit cost ratio to the estimated overall costs associated with the network general (e.g. walking) and specialist (e.g. angling) recreational visits (IEEP, 2010; Jacobs, 2005) **40.6 billion €/year**	EU-27, economic impacts derived from the spending of all visitors: **between 50 and 85 billion Euros in 2006** EU-27, economic impacts derived from the spending of visitors with affinity for Natura 2000: **between 9 and 20 billion Euros in 2006**
Economic benefits provided by tourism in protected areas	Burren Park in Ireland, domestic tourism (Van Rensburgh et al., 2009) **71 €/ha/year**	EU-27, economic impacts derived from the spending of visitors with affinity for Natura 2000 **150-330 €/ha/year in 2006**
	Lower Danube Green Corridor in Romania Several ecosystem services including recreation, fisheries, forestry, animal fodder and nutrient retention (Ebert et al., 2009) **500 €/ha/year**	

[23] IEEP (2011), Estimating the overall economic value of the benefits provided by the Natura 2000 network, on behalf DG Environment, European Commission

Type of estimate	Existing estimate from the literature	Computed estimate in this study
Increase in GDP due to the implementation of the network	Spain (Fernandez et al., 2008) **[0.1% – 0.26%]**	EU-27, economic impacts derived from the spending of visitors with affinity for Natura 2000: **[0.08%-0.17%]**

The economic impacts of tourism and recreation estimated in this study are also consistent with economic indicators related to tourism in the EU-27. At EU level, the category "Travel and Tourism" directly contributes[24] about 2.9% to GDP in 2011 and about 7.8% to GDP when considering indirect and induced income impacts[25]. The present study assesses that the economic activity derived from all visitor spending contributes between 0.42% and 0.72% to GDP and the activity derived from the spending of visitors with affinity with Natura 2000 contributes between 0.08 and 0.17% to GDP. Furthermore, the value added of "Tourism and Recreation"[26] given by the European Input-Output tables for the year 2006 is estimated at around 505 billion Euros. The economic impacts derived from visitor spending calculated in the present study would represent around 13% of that. Considering only the spending of visitors with affinity with Natura 2000, the impact would represent around 2.8%. Unfortunately, there is currently a lack of estimation of the market size of eco-tourism or nature tourism in the tourism sector in Europe.

In conclusion, in this study, **the results achieved are realistic. In particular, the estimates of economic impacts derived from the spending of visitors with affinity for Natura 2000 seem consistent with other existing estimates**, where as the economic impacts derived from the spending of all visitors in the Natura 2000 network would be an order of magnitude too high. Future developments of the methodology to tend to more accurate estimates are exposed in Chapter 6.

4.2 Recreational benefits

The purpose of this section is to estimate the value of the recreational benefits supported by Natura 2000. As explained in Chapter 3, the value of recreational benefits may be partly taken into account in the value of the economic impacts related to visitor spending. Furthermore, all social and cultural services provided by nature-protected area are interlinked, which can make it difficult to capture specific benefits separately. For this reason, recreational benefits may include benefits related to landscape and environmental amenities and cultural and inspirational services.

[24] Direct contribution of Travel and Tourism to GDP primarily reflects the economic activity generated by industries such as hotels, travel agents, airlines and other passenger transportation services (excluding commuter services). But it also includes, for example, the activities of the restaurant and leisure industries directly supported by tourists (WTTC, 2011).

[25] Total contribution of Travel and Tourism to GDP includes wider effects from investment, the supply chain and induced income impacts (WTTC, 2011).

[26] NACE categories H55 and O92 – Input/Ouput Tables, 2006.

4.2.1 Methodology

The recreational benefits were estimated from site-level data, using a two-step approach:

Step 1 – Data collection and calculation at site level

Values of recreational benefits provided by natural areas and nature-protected areas in the EU (most of them covered by Natura 2000) and in Natura 2000 sites in particular were identified in the literature. The values considered correspond to the value visitors are willing to pay to enjoy the recreational benefits of nature areas (Table 18). Studies that included non-use values and qualitative assessment and studies whose scope was outside the EU were not considered.

Table 18: Recreational values per visit in nature areas

Natural areas	Natura 2000 Area (ha)	€2006/ visitor day	Source
France - All forests	n/a	4.9	Calculated on the basis of Merlo and Croitoru (2005)
Ireland - All forests	n/a	9.1	Calculated on the basis of the average from Coillte and Irish Sports Council (2005)
Scotland - Natura 2000 network - General Scottish visitors	708,948	0.37	Calculated on the basis of Jacobs (2005)
Scotland - Natura 2000 network - Specialist Scottish visitors	708,948	0.81	Calculated on the basis of Jacobs (2005)
Scotland - Natura 2000 network - General non-Scottish visitors	708,948	0.52	Calculated on the basis of Jacobs (2005)
Scotland - Natura 2000 network - Specialist non Scottish visitors	708,948	0.89	Calculated on the basis of Jacobs (2005)
Finland - All National Parks (33)and state-owned recreation areas (7)	n/a	19.84	Calculated on the basis of Huhtala, A. (2004)
Spain - Los Alcornocales	167,767	12.37	Calculated on the basis of Oviedo Pro and al. (2005)
Spain - National Parks	n/a	5.79	Calculated on the basis of Merlo and Croitoru (2005)
Spain - Other Protected Areas	n/a	5.79	Calculated on the basis of Merlo and Croitoru (2005)
Spain - Ordesa y Monte Perdido	15,608	6.89	Calculated on the basis of Barreiro and Perez and Perez (1997) quoted in Gonzalés et al. (2010)
Spain - Teide	13,571	13.96	Calculated on the basis of Leon et al. (1997) quoted in Gonzalés and al. (2010)
Spain - Caldera de Taburiente	4,354	12.24	Calculated on the basis of Leon et al. (1997) quoted in Gonzalés and al. (2010)
Spain - Aigüestortes i Estany de Sant Maurici	13,925	9.30	Calculated on the basis of average from Riera et al. (1998) and Farré (2003) quoted in Gonzalés et al. (2010)

Natural areas	Natura 2000 Area (ha)	€2006/ visitor day	Source
Spain - Doñana	54,252	14.78	Calculated on the basis of average from Judez et al. (2003) and Martin-Lopez et al. (2009) quoted in Gonzalés et al. (2010)
Spain - Delta del Ebro	3,382	45.63	Calculated on the basis of Farré and Duro (2010)
Greece - National Parks	n/a	16.70	Calculated on the basis of Merlo and Croitoru (2005)
Greece - Recreational Sites	n/a	2.23	Calculated on the basis of Merlo and Croitoru (2005)
Greece - National Marine Park of Zakynthos	6,958	6.42	Calculated on the basis of Togridou (2006)
Italy - All forests	n/a	2.78	Calculated on the basis of Merlo and Croitoru (2005)
Portugal - All forests	n/a	3.12	Calculated on the basis of Merlo and Croitoru (2005)
Cyprus - All forest	n/a	2.78	Calculated on the basis of Merlo and Croitoru (2005)
Poland - Tatra National Park	21,164	0.25	Calculated on the basis of Getzner (2009)
Slovakia - Slovensky Raj	15,696	0.21	Calculated on the basis of Getzner (2009)

The selected studies were then analysed to extract recreational values per visit (i.e. visitor-day). When the value per visit was not available directly, it was calculated based on primary data that was available (e.g. number of visitors day, Natura 2000 area, total willingness to pay for recreation) when possible. Finally, to be comparable to the estimate of economic impacts derived from visitor spending, the annual values identified were converted into prices of year 2006 (€2006) using the Harmonised Index of Consumer Prices from Eurostat. The recreational values calculated in the approach are presented in Table 19.

Table 19: Sample for natural areas identified in each MS group

Group	Park/Site/Ecosystem	Total area (ha)	Natura 2000 area (ha)	Number of visitor day/year	€2006/ visitor day
Group A	France - All forests	15,140,611	n/a	394,000,000	4.90
	Ireland - All forests	440,000	n/a	17,500,000	9.14
Group B	Scotland - Natura 2000 network - General Scottish visitors	708,948	708,948	1,816,850	0.37
	Scotland - Natura 2000 network - Specialist Scottish visitors	708,948	708,948	47,152	0.81
	Scotland - Natura 2000 network - General non-Scottish visitors	708,948	708,948	894,950	0.52
	Scotland - Natura 2000 network - Specialist non Scottish visitors	708,948	708,948	39,172	0.89
	Finland - All National Parks (33)and		n/a	2,000,000	19.84

Group	Park/Site/Ecosystem	Total area (ha)	Natura 2000 area (ha)	Number of visitor day/year	€2006/ visitor day
	state-owned recreation areas (7)				
Group C	Spain - Los Alcornocales	1,677,667	1,677,667		12.37
	Spain - National Parks	622,000	n/a	4,920,000	5.79
	Spain - Other Protected Areas	2,316,000	n/a	14,445,000	5.79
	Spain - Ordesa y Monte Perdido	15,608	15,608	616, 700	6.89
	Spain – Teide	18,990	13,571	3 ,567 ,701	13.96
	Spain - Caldera de Taburiente	4,690	4,354	371,558	12.24
	Spain - Aigüestortes i Estany de Sant Maurici	14,119	13,925	355,633	9.30
	Spain – Doñana	54,252	54,252	376,287	14.77
	Spain - Delta del Ebro	8,455	3,382	139,463	45.63
	Greece – National Parks	337,000	n/a	271,000	16.70
	Greece - Recreational Sites	6,166,000	n/a	1,500,000	2.23
	Greece - National Marine Park of Zakynthos	13,460	6,958	350,000	6.42
	Italy - All forests	8,600,000	n/a	118,000,000	2.78
	Portugal - All forests	3,349,000	n/a	6,000,000	3.12
	Cyprus - All forest	385,600	n/a	73,400	2.78
Group D	Poland - Tatra National Park	21,164	21,164	2,000,000	0.25
	Slovakia - Slovensky Raj	19,753	15,696	700,000	0.21

- **Data analysis**

Due to the need to perform calculations in order to compensate the lack of recreational values, some recreational values calculated are not accurate ones. This introduces a bias in the result. Moreover, the representativity of the sample can be questioned since it includes a limited number of habitats and geographical areas.

Step 2 – Calculation at EU level

Firstly, the recreational benefits supported by the Natura 2000 network were estimated for each MS group. The approach consisted in calculating an average value of willingness to pay per visit for each of the four MS groups (see Table 7: Classification of MS into four groups). For each group, the average €/visit value was computed by weighting each natural area's €/visit value with its share in the number of visitor days of the overall group, on the basis that estimates drawn from sites with a high number of visitor-days are likely to be more precise than those based on relatively low number of visits.

Four weighted averages were obtained (Table 20).

Table 20: Weighted averages for recreational value/visit

Group	Weighted averages for recreational value (in €) per visit
Group A	5.08 €/visit
Group B	10.36€/visit
Group C	3.60 €/visit
Group D	0.24 €/visit

Then, the average value for the EU-27 was computed by weighting each group's €/visit value with its share in the total number of visitor days the Natura 2000 network received at EU level. As calculated in Chapter 4.1, the average number of visitor days was 1.7 billion visitor days a year per annum.

- **Data analysis**

The scaling-up approach performed to obtain recreational values at EU level does not take into account the variability of the value of nature for recreation which depends on the characteristics and the location of the site, the socio-economic characteristics of the beneficiary population, and the context of the valuation. Furthermore, it disregards the potential substitution effects. The consequence is that the results obtained cannot be considered as reliable estimates.

4.2.2 Results and caveats

The estimates achieved by this approach were drawn from a relatively small information base. The approach implies that not all the characteristics of the Natura 2000 network and the specificities of sites could be taken into account, nor the parameters that affect the price a visitor is willing to pay (i.e. sociologic, economic, environmental parameters). Furthermore, the possibility of relevant substitutes or complementary sites and their effects on the estimation of willingness-to-pay were not regarded. **Nonetheless, the estimates obtained seem to provide realistic orders of magnitude of the recreational benefits supported by Natura 2000.**

In total, **in 2006, the recreational benefits supported by Natura 2000 were estimated between 5 and 9 billion Euros for the whole Natura 2000 network**.

The amount a visitor of a Natura 2000 area is willing to pay for the recreational benefits provided by the site is estimated to about 4 € per visit (Table 21).

Table 21: Value of the recreational benefits supported by Natura 2000 – in 2006

EU-27	€$_{2006}$/visit	Number of visitor days (in millions)	€ million
Value of the recreational benefits **_all visitors**	4.07	1,748 [1,292 – 2,203]	7,111 [5,262 – 8,96]
Value of the recreational benefits **_only "Natura 2000 visitors"**	4.07	367 [238 –519]	1,493 [971 -2,107]

Values taken from the literature of the price a visitor is willing to pay to visit a Natura 2000 site, where the whole area is Natura 2000, vary from 0.25 € per visit (for the Tatra National Park in Poland) to 14.77 € per visit (for the Doñana Park in Spain). An average value of 4 € per visit reflects the diversity of attitudes toward natural areas, different behaviours towards nature tourism, and the variation in purchasing power across the EU.

These estimates can be compared with other recreational values of Natura 2000 sites or natural areas available in the literature (Table 22).

Table 22: Comparison with existing estimates from the literature

Type of Indicator	Existing estimate from the literature (€/year)	Estimates in this study
Value of the recreational benefits of General Scottish visitors to Natura 2000 sites (Jacobs, 2005)	£908,425 (i.e. € 1,271,795)	EU – 27 Value of the recreational benefits provided by Natura 2000: **Between 5 and 9 billion Euros** in 2006 (all visitors) **Between 1 and 2 billion Euros in 2006** (only "Natura 2000 visitors")
Value of forest recreational benefits:		
in the National parks in Spain in 2001 (Muñoz y Benaya, 2007)	€ 25 million	
for the woodlands in the UK (Scarpa, 2003)	£400 million (i.e. around €280 million)	
for all forest in Portugal in 2001 (Merlo and Croitoru, 2005)	€ 16.5 million	
for all forests in France, in 2001 (Merlo and Croitoru, 2005)	€ 1,718 million	
for all forest in Cyprus, in 2001 (Merlo and Croitoru, 2005)	€ 1.8 million	
Value of outdoor recreation in Finland (in 33 Finnish national parks and 7 state-owned recreation areas) (Huhtala, 2004)	€ 75 million	

The value of the recreational benefits for all forests in France would represent about 25% of the total value Natura 2000 visitors are willing to pay annually (in France, 40% of Natura 2000 areas are forests). The value of the recreational benefits for the woodlands in UK would represent less than 5%; the value of outdoor recreation in Finland would represent about 1%.

In conclusion, despite the lack of primary data for Natura 2000 areas and recreation, **it was possible to provide estimates that have a realistic order of magnitude.** The estimates could be refined by covering all existing habitats and ecosystems in Natura 2000 areas and by limiting the collection of primary data exclusively to Natura 2000 sites.

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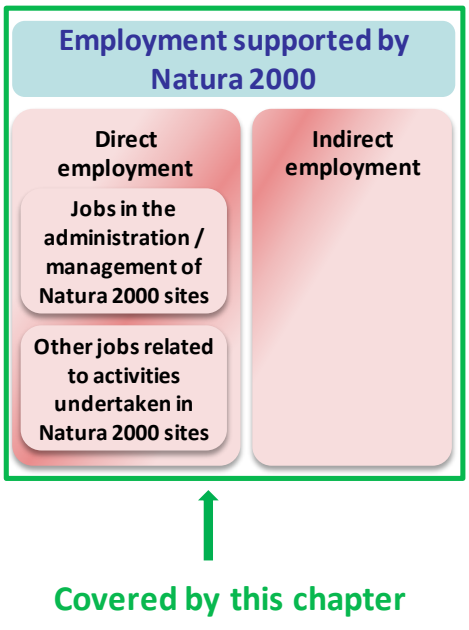
Chapter 5: Estimation of employment supported by Natura 2000

In brief: Two methodological approaches were used to estimate employment supported by Natura 2000 (i.e. employment created and/or retained due to the flows of money in the economy generated by the activities undertaken in the network). First, the direct and indirect employment supported by tourism and recreation in Natura 2000 sites was estimated by applying multipliers drawn from the input-output analysis developed in Chapter 4. Second, the overall employment supported by Natura 2000 was estimated using the Natura 2000 descriptive database and applying a land-use approach. Tourism and recreation activities in Natura 2000 support between 4.5 and 8 million FTE jobs, and between 800,000 and 2 million FTE jobs if only visitors with affinity with Natura 2000 is considered. A total of about 12 millions of direct and indirect FTE jobs (including 8 millions of direct FTE jobs) are estimated to be supported by Natura 2000.

Economic development through the activities undertaken in Natura 2000 creates employment. This chapter presents the estimate of the overall employment supported by Natura 2000 in the EU-27 (see Figure 18). Both employment specifically supported by tourism and recreation and overall employment supported by the network are estimated using two specific methods:

- Employment specifically supported by tourism and recreation are estimated by applying the multipliers drawn from the input-output analysis (chapter 5.1);
- Overall employment supported by the network is estimated by applying a land-use approach (chapter 5.2).

Figure 18: Employment supported by Natura 2000 estimated in this chapter



5.1 Employment provided by tourism and recreation

5.1.1 Methodology

The total employment supported by tourism and recreation can be estimated on the basis of the economic impacts derived from visitor spending (see Chapter 4). Employment related directly and indirectly to the flow of revenues generated by tourism and recreation was estimated using official figures on employment intensity per sector (also available in the supply-use tables available from Eurostat).

5.1.2 Results and caveats

The estimates achieved by this approach are subject to a high degree of uncertainty since they derived from the estimates of economic impacts related to visitor spending. As explained, the latter are likely to be overestimated, the main reasons being the lack of primary data, the scaling-up approach that does not take into account all the characteristics of Natura 2000 sites, and the consequence of disregarding the substitution effects. Therefore, these estimates of employment supported by visitor spending should be considered more as an order of magnitude than as precise quantification.

In 2006, tourism and recreation activities in the Natura 2000 network supported around 6 million FTE jobs, varying between:

- Around 4.5 million FTE jobs, considering the spending of all visitors in Natura 2000 sites, under a low spending scenario (equivalent to 0.06 FTE jobs/ha); and
- Around 7.8 million FTE jobs, considering the spending of all visitors in Natura 2000 sites, under a high spending scenario (equivalent to 0.01 FTE jobs/ha).

That corresponds to between 0.06 and 0.10 FTE job per hectare.

In 2006, the economic impacts derived from the spending of visitors with affinity for Natura 2000 supported around 1.3 million FTE jobs, varying between:

- Around 838,000 FTE jobs, considering only visitors with affinity with Natura 2000 (i.e. 19% of total visitors) and under a low spending scenario, i.e. 0.01 FTE jobs/ha; and
- Around 1.8 million FTE jobs, considering only visitors with affinity with Natura 2000 (i.e. 23% of total visitors) and under a high spending scenario, i.e. 0.02 FTE jobs/ha.

That corresponds to between 0.01 and 0.02 FTE jobs per hectare.

Table 23 presents the results on employment.

Table 23: Employment supported by tourism and recreation activities in Natura 2000 - in 2006

Employment supported by tourism and recreation activities _**all visitors spending (**thousand FTE jobs)	6,134 [4,512 – 7,757]
Employment supported by tourism and recreation activities _**only "Natura 2000 visitors" spending** (thousand FTE jobs)	1,288 [0.838 – 1,818]

In particular, the employment in the recreation sector can be assessed (Table 24):

- The economic impacts of the spending of **all visitors** in the Natura 2000 network generated around 1.2 million FTE jobs in the recreation sector;
- The economic impacts of the spending of **visitors with affinity for Natura 2000** generated around 262,000 FTE jobs in the recreation sector.

Table 24: Employment in the recreation sector generated by visitor spending in Natura 2000 - in 2006

Employment in the recreation sector supported by tourism and recreation _**all visitors spending** (thousand FTE jobs)	1,246 [0.916 – 1,576]
Employment in the recreation sector supported by tourism and recreation _**only "Natura 2000 visitors"** spending (thousand FTE jobs)	0.262 [0.170 – 0.370]

Overall, the findings on the employment supported by Natura 2000 computed in this study are in line with the results obtained in other works.

It is estimated in this study that between 0.011 and 0.024 full time job per hectare are supported by Natura 2000, considering only the spending of "Natura 2000 visitors". It is precisely in line with the outcomes of WWF and IEEP (2002) that estimated that 0.02 jobs/ha were supported by the Natura 2000 site "Lille Vildmose" in Denmark (Table 25). Moreover, the tourism related employment represents 5% of the overall employment at EU level in 2006[27]. Based on the estimates from this study, the employment generated by tourism and recreation supported by Natura 2000 would represent from 12% to 23% in tourism related employment.

Table 25: Existing estimates related to the employment supported by Natura 2000

Type of estimate	Existing estimate from the literature	Estimates from this study
Employment generated by the network	Spain 12,792 FTE (Fernandez et al., 2008)	EU-27 Employment supported by tourism and recreation _all visitors spending: [4,511,661– 7,756,686 FTE] Employment supported by tourism and recreation _ only "Natura 2000 visitors" spending: [837,619-1,817,729 FTE]
Employment generated by one Natura 2000 site	Denmark, Lille Vildmose site 0.02 FTE/ha (WWF and IEEP, 2002)	EU-27 Employment supported by tourism and recreation _all visitors spending: [0.06- 0.10] FTE/ha Employment supported by tourism and recreation _ only "Natura 2000 visitors" spending: [0.011 - 0.024] FTE/ha

Moreover, as presented in section 3.2.1., Natura 2000 management supported 83,530 FTE jobs for the EU-15 in Natura 2000 sites in 2003 (Ernst and Young, 2006). These jobs are highly related to the implementation and maintenance of Natura 2000. More recently, **122,000 FTE jobs were estimated to be directly supported by the full implementation and management of the Natura 2000 network**. This is based on the estimate that wages comprise 50% of the costs of the network and an average wage rate of 25,000 euro per FTE job[28]. A total of 207,000 FTE jobs (including direct and induced jobs) were estimated to be supported by Natura 2000 by applying a multiplier of 1.7, considering management of Natura 2000 network, suppliers and contractors, plus further tourism employment (Rayment et al., 2009). The number of jobs derived from the management needs of Natura 2000 appears lower than the number of jobs derived from the visitor spending in the Natura 2000 network (around one sixth).

In conclusion, **the results achieved by applying the methodology seem realistic and in line with existing estimates.**

[27] Eurostat

[28] Data were taken from MS responses to EU questionnaire survey on costs of managing N2K sites.

5.2 Overall employment supported by Natura 2000

The purpose of this analysis is to estimate the overall employment supported by Natura 2000. The results will complete the estimates of employment generated by tourism and recreation.

5.2.1 Methodology

In addition to jobs directly or indirectly generated by visitor spending in Natura 2000 sites, employment is also linked to the management of the site and to the existence of other activities, such as agriculture, not directly related to visitor spending. The methodology adopted to estimate the overall employment supported by Natura 2000 is based on the land uses in Natura 2000 sites in relation to the activities performed in the sites. It consists of three main steps, namely:

- Step 1 – Calculation of the Natura 2000 area affected by economic activities at MS level
- Step 2 – Data collection and calculation of employment supported by Natura 2000 at MS level
- Step 3 – Calculation of direct and indirect employment supported by Natura 2000 at EU level

Step 1 – Calculation of the Natura 2000 area affected by economic activities at MS level

The European Natura 2000 descriptive database[29] was reported for 16 MS in total for several Natura 2000 sites. Table 26 presents an extract of the database for the Bulgarian Natura 2000 site called "Plazh Shkorpilovtzi". As shown in Table 26, the database provides information on both the activities that have an impact on a Natura 2000 site and the area of the site that is affected by these activities. The activities refer to the "reference list of threats, pressures and activities"[30] provided by the European Topic Centre on Biological Diversity.

[29] The European database on Natura 2000 sites consists of data submitted by Member States to the European Commission. This data is subject to a regular validation and updating process. The European Topic Centre for Biological Diversity, based in Paris, is responsible for validating this data and creating an EU wide descriptive database. The database is available at www.eea.europa.eu/data-and-maps/data/natura-2000.

[30] The reference list of threats, pressures and activities is available here: bd.eionet.europa.eu/activities/Natura_2000/reference_portal

Table 26: Extract from the European database on Natura 2000 for "Plazh Shkorpilovtzi » site

Activity	Inside/ Outside	Intensity	Percentage of the area affected (in %)	Influence	Total Area of the site (ha)
Roads, motorways	I	B	2	-	5 125.65
Canalisation	O	C		0	5 125.65
Landfill, land reclamation and drying out, general	O	B		-	5 125.65
Discharges	O	C		-	5 125.65
Trampling, overuse	I	B	10	-	5 125.65
Trampling, overuse	O	C		-	5 125.65
Disposal of household waste	I	B	100	-	5 125.65
Disposal of household waste	O	B		-	5 125.65
Genetic pollution	O	C		-	5 125.65
Roads, motorways	O	B		-	5 125.65
Soil pollution	I	C	5	-	5 125.65
Motorised vehicles	I	C	20	-	5 125.65
Electricity lines	O	C		-	5 125.65
Shipping	O	C		-	5 125.65
Sport and leisure structures	I	C	20	-	5 125.65
Camping and caravans	O	B		-	5 125.65
Camping and caravans	I	B	35	-	5 125.65
Other leisure and tourism impacts not referred to above	I	A	100	-	5 125.65
Soil pollution	O	C		-	5 125.65
Taking / Removal of flora, general	I	B	10	-	5 125.65
Artificial planting	O	C		-	5 125.65
Trapping, poisoning, poaching	I	C	15	-	5 125.65
Leisure fishing	I	C	10	-	5 125.65
Urbanised areas, human habitation	O	A		-	5 125.65
Dispersed habitation	I	C	20	-	5 125.65
Artificial planting	I	C	2	-	5 125.65

- **Calculation at the sample level**

In the present study, the information reported in the European Natura 2000 database was used to estimate the Natura 2000 area affected by economic activities (Table 27). It covers in total around 36 million hectares (i.e. around 48% of the Natura 2000 network), split as follows per MS.

Table 27: Total Natura 2000 area reported in the database per MS (in ha)

	Natura 2000 area (in ha)
Bulgaria	4,957,143
Czech Republic	992,841
Germany	2,945,366
Estonia	1,581,751
Spain	8,145,806

	Natura 2000 area (in ha)
Finland	1,756,110
France	4,926,756
Greece	2,010,739
Hungary	881,215
Ireland	1,820,252
Italy	1,375,721
Luxembourg	944
Latvia	786,003
Malta	5,831
Poland	3,617,442
Slovakia	257,484
Total	**36,061,441**

For each activity, the Natura 2000 area stated to be impacted by this activity was computed by multiplying the total surface area of a Natura 2000 site by the percentage of the area affected by this activity. It was done for each site included in the database[31]. Finally, the total Natura 2000 area affected by economic activities was estimated for each MS.

Economic activities were then gathered according to their correspondence with the following NACE categories:

- A 01. Agriculture, hunting and related service activities
- A 02. Forestry, logging and related service activities
- B 05. Fishing, operation of fish hatcheries and fish farms, service activities
- O92. Recreational, cultural and sporting activities
- All other NACE categories

For example, the NACE category A 01 gathers activities referred to in the "reference list of threats, pressures and activities" such as cultivation, grazing, livestock farming and animal breeding.

The Natura 2000 area affected by human activities, as reported in the database, was estimated per NACE category and for each MS. Table 28 presents the results for Germany, Ireland, and France.

[31] The STATA software (Data Analysis and Statistical Software) was used.

Table 28: Natura 2000 area reported in the Natura 2000 database and affected by economic activities per NACE category – Germany, Ireland and France (in ha)

MS	NACE category						
	A01	A02	B05	O92	C	D	I
Germany	217,704	236,745	100,969	1,357,606	2,386	534,820	330,687
Ireland	500,892	13,599	257,674	132,356	1,245	85,629	5,930
France	1,411,951	351,717	61,859	361,423	29	14,638	20,741

At this stage, Luxembourg and Malta were excluded from the sample since no data on the area affected by economic activities are reported in the database.

- **From the sample level to the MS level**

The weight of each NACE category in the Natura 2000 area of the sample was calculated for each MS (for example, around 53% of the German Natura 2000 area of the sample is affected by economic activities that belong to the A01 NACE category; see Table 29).

Table 29: Share of Natura 2000 area affected by economic activities in the total Natura 2000 area reported in the database, per NACE category – Germany, Ireland, and France

MS	Total Natura 2000 area reported in the database (in ha)	NACE category						
		A01	A02	B05	O92	C	D	I
Germany	2,945,366	7.4%	8%	3.4%	46.1%	0.1%	18.2%	11.2%
Ireland	1,820,252	27.5%	0.8%	14.2%	7.3%	0.1%	4.7%	0.3%
France	4,926,756	28.7%	7.1%	1.3%	7.3%	0	0.3%	0.42%

Then, for each MS, the results obtained at the sample level were scaled-up to the MS level by applying the share of the Natura 2000 area affected by economic activities of the sample to the total Natura 2000 area of the MS. Table 30 gives the total Natura 2000 area affected by economic activities for Germany, Ireland, and France.

Table 30: Total area affected by economic activities in Natura 2000 sites– Germany, Ireland, and France (in ha)

NACE Category	A01	A02	B05	O92	C	D	I
Germany	407,363	442,993	188,931	2,540,321	4,466	1,000,743	618,775
Ireland	251,925	6,840	129,598	66,569	626	43,067	2,982
France	1,970,896	490,950	86,347	504,499	41	20,433	28,951

- **Data analysis**

The intermediary results cannot be considered as precise estimates. The main reasons are the lack of consistency of data, the limited sample and the large-scale extrapolations to upscale at MS level, which do not take into account the variability of socio-economic and environmental characteristics. These characteristics can have an impact on both the nature and the intensity of the economic activities performed in Natura 2000 sites.

Step 2 – Data collection and calculation of employment supported by Natura 2000 at MS level

For the MS included in the European database, data was collected from Eurostat on:

- Annual employment per NACE categories for years 2006 to 2008 (in FTE); and
- Land use with heavy environmental impact by NUTS 2 regions for the year 2009.

The average annual jobs from 2006 to 2008 were taken for each of the above-mentioned NACE categories. At this stage, Bulgaria and Estonia were excluded from the sample since data on employment are missing for several years or several economic activities.

In parallel, data on land use was used to assess the area of land dedicated to each of these NACE categories in the EU-27 following the correspondence described in Table 31.

Table 31: Correspondence between land use and NACE categories

Land use	NACE Category
Agriculture	A 01. Agriculture, hunting and related service activities
Forestry	A 02. Forestry, logging and related service activities
Hunting and Fishing	B05. Fishing, operation of fish hatcheries and fish farms, service activities
Recreation, Leisure, Sports	O92. Recreational, cultural and sporting activities
All other uses	All other NACE categories

The areas affected by type of land use are presented for Germany, Ireland, and France in

Table 32.

Table 32: Land use in Natura 2000 sites per Member State (2009, in ha)

Land use	Agriculture	Forestry	Hunting and fishing	Recreation, leisure, sports	All other uses	Total land use
NACE categories	A01	A02	B05	O92	C + all others + I	
Germany (including former GDR from 1991)	18,470,300	10257,000	258,000	1,102,600	5,623,500	35,711,400
Ireland	5,115,900	620,000	26,500	259,000	966,900	6,988,300
France	29,727,500	12,494,100	549,700	994,200	11,110,800	54,876,300
All - Sample	133,333,000	77,216,100	7,496,900	7,797,000	61,162,600	287,005,600
Total	46.46%	26.90%	2.61%	2.72%	21.31%	100.00%

Employment per hectare at national level was then computed for each of the above-mentioned NACE categories for each MS of the sample (see Table 33 for examples of Germany, Ireland, and France).

Table 33: Employment per hectare and per economic activity in Germany, Ireland, and France (2006-2008, in FTE jobs)

Activities stated for Natura 2000 sites in the database	Agriculture	Forestry	Hunting and fishing	Recreation, leisure, sports	All other uses
NACE categories	A01	A02	B05	O92	C + all others + I
Germany (including former GDR from 1991)	0.0413	0.0041	0	0.6	6.4
Ireland	0.0187	0.0047	0.1057	0.1911	1.9393
France	0.0264	0.0040	0.0316	0.4502	2.1628

For each MS, employment supported by the Natura 2000 network (i.e. employment related to activities undertaken in Natura 2000 sites) was then estimated by applying the rate of employment per hectare and per NACE category to the Natura 2000 areas affected by the corresponding economic activity, as identified in Step 1 (see Table 34 for Germany, Ireland, and France).

Table 34: Total employment supported by Natura 2000 per economic activity in Germany, Ireland, and France (2006-2008, in FTE)

Activities stated for Natura 2000 sites in the database	Agriculture	Forestry	Hunting and fishing	Recreation, leisure, sports	All other uses	Total
NACE categories	A01	A02	B05	O92	C + all others + I	
Germany (including former GDR from 1991)	16,841	1,801	0	1,524,132	10,405,334	11,948,107
Ireland	4,704	32	13,693	12,723	90,520	121,672
France	51,974	1,941	2,728	227,131	106,903	390,677

- **Data analysis**

One of the limitations of this approach is that the employment ratios are calculated at MS level and thus are not specific to the Natura 2000 sites. This bias might be significant given the difference in nature between activities undertaken outside and inside (or next to) Natura 2000 sites, especially in the case of agricultural activities (e.g. intensive vs. organic farming).

Step 3 – Calculation of direct and indirect employment supported by Natura 2000 at EU level
Per hectare employment in Natura 2000 sites were then scaled up at group level on a per Natura 2000 hectare basis. For each group, the average FTE/ha was computed by weighting each MS's FTE/ha with its share of Natura 2000 area in the overall group to ensure that the results obtained fit appropriately within the global picture. For Group B, Germany was excluded from the sample at this stage since the employment per hectare ratio appears extremely high compared to the ratios of other MS (i.e. 2.1 for Germany vs. between 0.03 and 1.8 for the other MS). Direct employment supported by Natura 2000 in each group derives from the multiplication of each group's employment rates with their Natura 2000 total area, per NACE category. The results were then added up for all the categories to obtain a global estimate of direct employment (Table 35).

Table 35: Direct employment supported by Natura 2000

Group	MS for which data is available in the sample	Average employment rate (FTE/ha)	Total direct employment (thousands FTE)
Group A	France, Ireland	0.066	1,037
Group B	Finland	0.104	1,306
Group C	Italy, Greece, Spain	0.083	2,082
Group D	Latvia, Poland, Slovakia, Hungary, Czech Republic	0.150	3,249

Overall EU direct employment resulted from the sum of each group's direct employment. According to recommendations from the literature (Kettunen et al., 2009; Rayment et al., 2009), a multiplier of 0.5 was then applied to direct employment to estimate the overall (direct + indirect) employment supported by the network.

- **Data analysis**

In this step, as explained earlier, the scaling-up approach on a per Natura 2000 hectare basis is an important limitation in the approach since it does not take into account characteristics and specificities at site level that can have an impact on the activities undertaken in the site and on the workforce intensities.

5.2.2 Results and caveats

The methodology developed in this study provides estimates and is easily implementable. Total employment supported by Natura 2000 was estimated on the basis of incomplete and relatively poor quality data taken from the European Natura 2000 descriptive database. Moreover, the

grouping of the activities affecting Natura 2000 sites and the matching with NACE categories could be sources of error. Furthermore, the European employment ratios per hectare and per activity are not specific to the Natura 2000 sites. Therefore, **the results obtained have to be interpreted taking into consideration these limitations and constraints.**

Natura 2000 sites have directly supported on average about 8 million FTE jobs each year in the EU during the period 2006-2008, and indirectly 4 million FTE jobs (Table 36).

Table 36: Overall employment supported by Natura 2000 per annum in 2006-2008

	Agriculture	Forestry	Fishing	Recreation	All other NACE categories	Total
Direct employment supported by Natura 2000	905,342	48,783	130,096	2,102,452	4,741,289	7,927,962
Total employment (direct + indirect) supported by Natura 2000	1,358,013	73,174	195,144	3,153,678	7,111,933	11,891,942
Share in overall employment supported by Natura 2000	11%	1%	2%	26%	59%	100%

Industries and services other than recreation are the most significant sectors in terms of number of jobs, with respectively 59% and 26% of the total jobs supported by Natura 2000. About 11% of the jobs supported by Natura 2000 are in the agricultural sector. There are only a few jobs supported by Natura 2000 in the forestry and fishing sectors (1% and 2% respectively). By comparison, in the EU-27 in 2010, jobs in agriculture, forestry and fishing represented about 5.1% of total employment, jobs in industry about 25.2% and jobs in services around 62.9%. The fact that Natura 2000 areas support more jobs in the primary sectors that are highly dependent to ecosystem services than the European average is consistent.

Employment generated by activities corresponding to the NACE category "O92. Recreational, cultural and sporting activities" can be compared to the employment generated by visitor expenditure estimated in Chapter 5.1.2 by applying an input-output model. The visitor expenditure in Natura 2000 sites generated around 6 million FTE jobs (direct and indirect) in all economic sectors in 2006, including between 900,000 and 1.5 million FTE jobs in the recreation, leisure and sports sectors. The FTE per land-use approach estimates that around 12 million direct and indirect FET jobs are supported by the economic activities undertaken in the Natura 2000 sites, including 3 million FTE jobs in the recreation, leisure and sports sectors. About half of the employment in the recreation, leisure and sports sectors would be due to the income generated by visitor expenditure, the other half being due to other sources of income.

These estimates can be compared with other estimates taken from the literature (Table 37). Nunes et al. (2011) estimated employment in industries highly dependent on ecosystem services.

They estimate around 11 million FTE jobs for the agriculture sector, around 3 million FTE jobs in forestry and 400,000 FTE jobs in fishing. Based on the present study, jobs in agriculture that are supported by Natura 2000 would represent around 10% of the employment in agriculture highly dependent of ecosystem services. Jobs in the forestry sector that are supported by Natura 2000 would represent around 2.4% of the employment in forestry highly dependent of ecosystem services. Jobs in fishery would represent around 50% of employment in fishery sector that are highly dependent on ecosystem services.

Employment in services dependent on cultural services (including recreation) was estimated at around 29 million FTE jobs. The study estimates around 3 million FTE jobs supported by Natura 2000 in the recreation sector, i.e. about 10% of the employment in the services activities that are dependent on the cultural services provided by ecosystems are supported by Natura 2000.

Table 37: Existing estimates related to the employment supported by Natura 2000

Type of estimate	Estimates from the literature (Direct and indirect employment, thousands FTE)	Estimates from the study, by applying the FTE per land use approach (Direct and indirect , thousands FTE)
Overall employment supported by Natura 2000		About 12,000
Employment in primary industries highly dependent on ecosystem services (Nunes et al., 2011) (EU)		
Agriculture	11,223	1,358
Forestry	2,988	73
Fishing	400	195
Employment in services activities dependent on cultural services (including recreation) provided by ecosystems (Nunes et al., 2011) (EU)	29,105	Only in recreation sector: 3,154

With about 12 millions of FTE jobs supported in the EU-27, Natura 2000 is estimated to have supported annually about 6% of the total employment in the EU-27 during the period 2006-2008 while accounting for about 18% of the land area. In total, at EU level, the tourism related employment represents 5% in overall employment[32]. The findings on the employment supported by tourism and recreation in Natura 2000 sites calculated in this study are in line with existing estimates from the literature when the input/output method is used and affinity rates ranging from 19% to 23% are applied to visitor spending. However, at the same time, they appear well above existing estimates from the literature when no affinity rates are applied or using the FTE per land use method.

[32] Eurostat

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Chapter 6: Conclusion and recommendations

In brief: The methodologies developed appear to be useful, and the results achieved seem in line with existing estimates. Nonetheless, methodological and data limitations have been revealed, and consequently the results on the total economic benefits supported by Natura 2000 should be interpreted with care. Further development of the methodology could improve these estimates.

Innovative approaches are presented in this study and provide a first attempt to define and quantify total benefits supported by Natura 2000 at EU level. The results on the economic value of benefits related to tourism/recreation and employment supported by Natura 2000 are consistent but subject to a relatively high degree of uncertainty, given the relatively small information base and the absence of a shared protocol for data collection at site level. Hence, **these estimates should be considered as an order of magnitude rather than as precise estimates.** Nevertheless, **the methodologies proposed have the benefit to be immediately implementable and appear to produce realistic estimates, in line with the literature and with economic indicators.**

The results can be made more accurate as better data become available. Nonetheless, the numerous limitations of the approach warrant further developments. These results aim to improve the awareness of the benefits that the Natura 2000 can support, and encourage the sustainable development of tourism and recreation in those areas.

6.1 Recommendations for the interpretation of the results

The table below summarises the results of the study and assesses their level of robustness and reliability.

Table 38: Results of the study

Approach	Numbers	What they relate to	Level of robustness / reliability	Needs
Tourism (and market-based benefits of recreation)	Around € 50-85 billion/year in 2006 for 1.7 million visitor-days considering all visitors Between € 9-20 billion/year for	Scaling up from a representative sample of 47 Natura 2000 sites	Order of magnitude rather than precise estimate, results comparable with economic indicators of tourism (e.g. the	More data on tourism at site level (number of visitors and tourism spending) Better determination of the affinity of

Approach	Numbers	What they relate to	Level of robustness / reliability	Needs
	230-520,000 visitor-days considering visitors with affinity for Natura 2000 designation		estimated value added of tourism and recreation for EU-27 is € 505 billion)	visitors for Natura 2000 designation Inclusion of substitution effects
Recreation (non-market benefits)	4 € / visit i.e. between € 5-9 billion over the overall Natura 2000 network	Scaling up from site-level recreational values taken from the literature (National parks, Natura 2000 sites, specific habitats such as forests)	Rough order of magnitude rather than precise estimate, results comparable with other recreational values for Natura 2000 sites	More values from Natura 2000 case studies developed under a comparable protocol; Values on activities and attractiveness of sites
Employment	Around 6 million FTE jobs derived from visitor expenditure Around 1.3 million FTE jobs derived from the expenditure of visitors with affinity with Natura 2000 Around 8 million FTE jobs directly supported by Natura 2000, around 4 million FTE jobs indirectly	Related to the economic impacts of the visitor expenditure calculated from a representative sample of 47 Natura 2000 sites. Related to the data on activities impacting Natura 2000 areas taken from the European Natura 2000 database, and data on land use and employment from Eurostat.	Order of magnitude rather than precise estimate Rough order of magnitude rather than precise estimate	Refinement of data on visitor expenditure (see above) More data on land use in Natura 2000 areas and on employment intensity per activity

- **The estimates show an order of magnitude, not a precise quantification**

As described in the discussion of the results, the estimates were produced by applying several assumptions to compensate for the absence of primary data and the uncertainty as to the quality of available data (e.g. data reported in the European Natura 2000 database). Consequently, it is not reasonable to consider them as exact estimates. Nonetheless, the comparison of the results with economic indicators and estimates taken from the literature suggests that the estimates are realistic and in the same order of magnitude.

- **The economic value of benefits of Natura 2000 should be presented by putting it into perspective with the intrinsic value of Natura 2000.**

In practice and in general, the use of public expenditure to preserve and protect habitats and biodiversity is not well accepted by the society, and economic benefits deriving from these costs are requested to favour the acceptance. Equally, governments are more comfortable with economic benefits as a means of prioritising expenditure and appraising projects. Increasingly however, the value of the environment, biodiversity, wildlife etc. is increasingly being appreciated by people per se on moral, ethical and even aesthetic grounds. Therefore, careful attention must be paid not to put an over emphasis restricted on economically quantifiable parameters.

- **The dissemination of these results should be adapted to the public that is targeted, with different key messages put forward.**

The results should be presented by taking into consideration the level of knowledge and understanding, the expectations and the considerations of each public that is targeted. This will determine the format and the content of the dissemination and affect the level of clarification and explanation, and the complementary tools that should be implemented.

- **For non-economists**: Granting a monetary value to environmental amenities can be seen as a first step towards the development of environmental markets on which environmental goods could be sold at prices determined according to the law of supply and demand. Thus, the concept of non-market benefits and the possibility to give them an economic value could be an issue for persons that do not have an economic background or more generally that are not familiar with the idea of monetising environmental amenities. Both sets of benefits (i.e. non-market and market ones) should be presented in simple intelligible terms and their level of reliability should be clearly pinpointed when spread to non-economists. Nevertheless, it should be noted that presenting the results to people that are not familiar with these concepts is an excellent opportunity to increase their knowledge and understanding of the value of non-market environmental benefits.
- **For site managers, conservation professionals**: In order to both pinpoint the limitations of the methodology and allow refining estimates in the future, messages related to site management, in terms of more systematic and widespread data collection, reporting and opportunities for development should be provided together with the results. Tourism and recreation activities can cohabit with biodiversity conservation and can together provide benefits to society.
- **Tourism and recreation professionals**: The messages to deliver to tourism and recreation professionals should raise their awareness on the potential of Natura 2000 sites for local and regional economies, and develop entrepreneurship on Natura 2000 areas. Information on how to develop touristic initiatives on Natura 2000 sites and on the potential of nature-based tourism could be delivered together with the results.

- **Citizens**: Restrictions and costs associated to Natura 2000 should be put in perspective with the benefits obtained at local and regional levels. The analysis provided with the results should be simple and accessible.

- **The diffusion of the results of this study should take advantage of the existing networks.**

The results could be disseminated:

- Through the "European Ecotourism Network" which is currently set up through the European Leonardo Networking project "Ecolnet";
- Through the network of national representatives for Natura 2000.

- **When spreading results to Natura 2000 stakeholders, the Commission could seize the opportunity to raise their awareness on the economic potential of tourism development in nature-protected areas.**

The diffusion of the achieved results could be undertaken within a wider initiative on the promotion of the Natura 2000 network, and the potential of tourism on the sites. Best practices and innovative initiatives implemented at site level could be shared and highlighted.

It will be relevant to encourage administration, managers and experts of the Natura 2000 network to interact and to become familiar with:

- Tourism related tools for making tourism more sustainable (e.g. 50 regional, national, international sustainable tourism certification programmes for SME tourism businesses, for protected areas, for destinations, for tour operators offering nature experiences/Ecotourism; 100 universities with courses related to tourism and nature protection; 20 international on-line channels informing consumers about sustainable travelling and nature)
- National and international sustainable tourism related networks (rural, marine, coastal, mountain, urban, rural, forest)
- The public and independent DestiNet portal as common platform (DestiNet is a UN registered type II partnership for sustainable development with European Environment Agency, UN World Tourism Organisation, UNEP and Ecotrans as partners; www.destinet.eu.com).

6.2 Recommendations to improve the Natura 2000 recognition process

- **Involve stakeholders**

The recognition process should be implemented at three levels: European, national and local level.

- **At European level**

It will be relevant to:

- Identify key stakeholders in the EU members states (e.g. 27 national work groups/committees on (eco)tourism/recreation and nature protection/environment);
- Use the DG Enterprise tourism unit "knowledge networking for competitive and sustainable European tourism" approach (FAST-LAIN project) to set up and run a "European N2000 and tourism/recreation knowledge network" to exchange, disseminate and raise awareness at professionals and consumers (N2000 benefits, case studies, best practice examples, training and education, certification and marketing, European "job creation, income, halting the loss of biodiversity through conscious/sustainable tourism and recreation", etc.)

- **At national level:**

National Tourism Associations (e.g. German Tourism Association's committee on "nature, environment and tourism" (DTV-NUT) should be used to implement a concerted national approach together with regional destination management, tourism marketing, etc. The objective is to discuss how Natura 2000 can be made known and mutual benefits can be realized.

- **At local level:**

Citizens, tourism professionals, destination managers, etc. must be better informed in order to recognise the link between protected area (N2000) and attractiveness of the site for tourists. Moreover, intensive community PR efforts and local involvement in all sites should be implemented. There is a potential to enhance the branding that could attract more visitors in a medium-long term.

- **Increase awareness regarding the impact of tourism in the Natura 2000 areas**

Much of the resistance to and criticism of environmental activities such as those of Natura 2000 comes from special interest groups neighbouring sites or from less ethical sectors of the business community. Program research and marketing efforts should highlight both forms of benefit particularly intensively within local populations to generate local pride in the sites and their achievements.

6.3 Future methodological developments

Further developments to improve the accuracy of the estimates produced on the basis of our methodology are highlighted in this section.

- **Assessment of market benefits of tourism and economic impacts of visitor expenditure**

- **Improve the availability and quality of primary data**

The lack of primary data on visitor spending, number of visitors, type of visitors, etc. at site level leads us to focus only on a small sample of sites, likely to be not representative enough of the

whole population of Natura 2000 sites. In particular, no information was available to determine the share of Natura 2000 areas without any tourism activities. In this context, the use of certain assumptions, such as the scaling-up process based on per hectare values might appear relatively strong. In order to cope with this potential lack of representativeness and to reduce the uncertainties associated with the scaling-up process, broad groupings of sites and MS were formed rather than taking each site/MS in isolation, based on a set of driving factors, such as GDP and tourism attractiveness. However, the current approach still does not allow take into consideration some potentially relevant variables (e.g. landscapes, habitats, wildlife, location, infrastructure, accessibility) that can be important explanatory factors for expenditure levels in the case of tourism and recreation. The ambition would be to integrate individual features of sites as far as possible.

Furthermore, the consistency among the data collected from different sources is questionable and results in issues of comparability. For example, depending on the sources, visitor numbers could be estimated based on the number of visitors paying an entrance fee or based on the number of cars parked close to the entrance of the site, or even based on survey at certain locations within the site. Clearly, estimates based on entrance fees may be the easiest to replicate and standardise among sites and MS.

Actions should be taken to improve the quality and availability of data, such as:

- Improve the collection process of primary data (e.g. number of visitors, level of spending, employment) at site level;
- Increase the knowledge of the distribution of tourism activities throughout the Natura 2000 network;
- Develop a standardized tool for Natura 2000 sites to ensure the collection of data related to visitors and spending is done by site managers in a standardized form and provide appropriate guidance;
- Improve the reporting process from site to national level, and from national to EU level in order to minimize information loss; and
- Provide training for site managers for the correct use of the reporting tool.

▷ **Improve the scaling-up approach**

The scaling-up approach could be improved by identifying the explanatory variables of the level of tourism in Natura 2000 sites and applying a meta-analytical regression model. This implies improving data collection of the main characteristics of the site and on economic indicators at site level.

▷ **Consider the substitution effects**

It was not possible to value the impact of the potential substitution effects in the methodology developed in this study, i.e. the extent to which tourism activities in Natura 2000 areas relocate from other areas and expenditures generated by tourism replace other expenditures in other sectors of the economy. The neglect of substitution effect creates an upward bias which may be significant when estimating benefits on broad regions or national economies. It would be relevant to value at regional level, for several regions, the impact of potential substitution effects

to refine the estimate, i.e. assess the amount of expenditure that would occur outside a region if the Natura 2000 areas did not exist in this region.

- **Assessment of recreational benefits**

  - **Strengthen the recognition of non-market benefits (including recreational benefits)**

The lack of recreational values appears in an obvious way. Values are only available when specific field research is undertaken. Estimating non-market benefits generally involves extensive field surveys (e.g. to set-up a consultation process) and consequently, an organised reporting process of these values at site level is not a priority at this stage. As a first step, measures should target the lack of awareness of what recreational values are and how they can be appropriately assessed.

Actions could be taken to:

- Provide training for site managers to improve understanding, identification and valuation of non-market benefits;
- Ensure more intense educational and program research activity on the intrinsic rather than economic value of nature protection.

  - **Improve the collection of recreational values**

A protocol for a questionnaire process on recreational values could be developed. Furthermore, elaborating additional case studies in Natura 2000 sites would strengthen the understanding of the factors that influence the price a visitor is willing to pay. This could be achieved under LIFE funding or Interreg funds, for example. Five years might be needed to have a useful number of case studies.

- **Assessment of employment supported by Natura 2000**

  - **Inform the land use over the Natura 2000 network**

The methodology developed to estimate the overall employment benefits is based on land use on Natura 2000 areas. Since the land use was not directly accessible, the methodology consisted in using data on activities impacting sites conservation that are reported by sites. A better information on land use would allow to provide interesting information on types of employment, local and regional activities supported by Natura 2000 etc. Site managers could be involved to establish robust information on land use, and it could be made through the existing reporting process. Nonetheless, actions should be implemented to support them, such as:

- Define precisely the terms and variables used in the land-uses databases (e.g. Give orientation on how to consider the area impacted);
- Distinguish between the impacts of activities on the conservation measures of the sites, and the statement of existing activities; and
- Organise workshops or interactive tools to help people fill the database with accurate information.

- **Increase the knowledge on the intensity of employment on Natura 2000 areas**

The requirements of Natura 2000 can affect the way activities are undertaken. For example, agricultural activities could be less intensive than in areas that are not part of the network, and might employ more people. The intensity of employment in Natura 2000 areas should be taken into account to estimate more accurately the employment supported by the network.

- **Assessment of the net benefits supported by Natura 2000**

In this study, net benefits were approached by using the level of affinity of visitors for Natura 2000. There is a strong interest and relevance in calculating the added value provided by the designation of an area as "Natura 2000" by applying the affinity for Natura 2000 areas. Currently, there is a lack of knowledge on the level of people's affinity to Natura 2000 sites. Actions could be undertaken in order to improve knowledge about visitors' motivations for visiting Natura 2000 sites and to refine the level of affinity for Natura 2000 sites. For example, a systematic collection process of primary data related to visitors' motivations for visiting Natura 2000 sites could be implemented by promoting regular surveys in a representative set of Natura sites in each MS or by implementing a consultative process.

Alternatively, net benefits could be directly estimated by collecting data on sites that are eligible to become part of the Natura 2000 network. This would allow a comparison of the visitors and site characteristics before and after designation (e.g. number of visitors and spending before and after the designation).

The table below summarises the proposals for future methodological development and better recognition in the coming years.

Table 39: Future methodological developments

Approach	Now	Next two years	Five years	More than 10 years
Tourism (and market-based benefits of recreation)	The overall value of benefits can be calculated by a site-based approach, extrapolating data from a small and disparate sample of Natura 2000 sites Difficult to identify a relationship between Natura 2000 and tourism indicators ('top-down approach'). Net benefits cannot be calculated. The substitution effects are not assessed.	Design of a reporting tool and trial in a few sites => database for a representative set of sites Better understanding, identification and quantification of the drivers of the level of tourism in Natura 2000 sites Collection of data related to tourism for eligible	Implementation of the reporting tool at EU level => database for a large number of Natura 2000 sites Modelling of same-day visitors Collection of data for new Natura 2000 sites; comparison of before/after designation	EU database on tourism activities and benefits Calculation of net benefits on the basis of the situation before/after.

Approach	Now	Next two years	Five years	More than 10 years
		Natura 2000 sites		
Recreation (non-market benefits)	Site-based, very few sites with valuation data	More case studies at site level for Natura 2000 following protocol to allow comparability => a small sample of sites	More case studies at site level for Natura 2000 => a representative sample of sites	Methodological progress in the evaluation of recreational benefits and other non-market benefits
Employment	Employment derived from visitor expenditure can be calculated The land-use approach is limited because of lack of information.	See above Improve the data provided and complete the European Natura 2000 database	See above Increase knowledge of Natura 2000 land use and intensity of employment of activities in these specific areas.	See above Data on land use throughout the Natura 2000 network Calculation of overall employment supported by Natura 2000

In conclusion, this study has shown that there are potential economic benefits with the creation and extension of the Natura 2000 network.

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Annex: Case Studies

The purpose of these case studies is to test the methodology on a more restricted scale than the EU and to validate the process. **The scale chosen by the project team is the MS scale**.

According to the general methodology described in Chapter 4, three main steps were undertaken to give an estimation of the economic value of the market benefits provided by tourism/recreation supported by Natura 2000 at MS level as described below:

- Step 1: Relevant parameters linked to tourism/recreation (e.g. visitor expenditure and number of visitors) at site level were collected from existing literature and existing case studies for a set of reasonably representative Natura 2000 sites.
- Step 2: Data on visitor spending were scaled up at MS level under the assumption that visitor spending is proportional to the area of the Natura 2000 site.
- Step 3: Total direct and indirect economic effects derived from visitor spending, and related employment were calculated at national level. Calculations were performed using an input-output model, based on MS-specific supply-use data.

The case studies for Austria, Germany and UK are presented below.

I. Case study for Austria

a. Natura 2000 in Austria

In Austria, there are currently 159 designated Natura 2000 sites, these areas covering approximately 15% of the Austrian territory. Depending on the area, the Birds Directive, the Habitats Directive, or both directives are applied (Umweltbundesamt, 2007). Nature conservation is placed under the jurisdiction of each of the nine regional administration bodies, the federal provinces. Accordingly Natura 2000 sites are regulated by federal state law. Management plans for the sites are a discretionary clause in all of the federal states but in Burgenland management plans are compulsory. All management plans for Natura 2000 sites include data about the subjects of protection, the delimitation of areas, the evaluation of the conditions of the subjects of protection, necessary preservation objectives and appropriate measures as well as intended monitoring actions (Ellmauer et al., 2005). The integration of recreation and tourism concerns in management planning processes is in the early stages[33].

Designation types in Austria, regional development and tourism

Altogether there are 14 different designation types with varying levels of protection. Nationally designated areas are national parks, nature reserves, protected landscape areas, nature parks and other designation types like "natural monument". Internationally designated areas are Ramsar areas, biosphere reserves, biogenetic reserves, Nature 2000 sites, areas awarded the Council of Europe Diploma and wilderness areas (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, 2003). It has to be considered, that conservation areas often overlap (Umweltbundesamt, 2007).

Conservation is the primary objective in all designation types, but in particular the specific concept varies. The aim of wilderness areas is the preservation of their natural condition for future generations - regional development is of little importance, because no human activity can take place. The objective of Ramsar areas is the protection and the "wise use" of wetlands, regional development is requested in the outlying area. Biosphere reserves or nature parks integrate regional development in the conservation-concept.

Economic development is to be continued within Natura 2000 sites, because they very often include towns, villages, farms and businesses. Natura 2000 puts limits on unconstrained developments that damage nature, but the aim is to find ways to protect biologically unique sites in ways that are both good for the environment and good for development. Ideally, policy, businesses and residents identify the potential of the designation, and Natura 2000 contributes to regional development[34].

The identification of this potential might be a challenge under certain conditions, like in the Natura 2000 site "Verwall". The mediation between different interest groups, the involvement of landowners as well as ongoing informative meetings had contributed significantly to the

[33] See: www.alpnatour.info

[34] Cf. Dimas, 2008, Speech

acceptance of the designation. Due to this intensive participation of the resident population tensions have been reduced. Only then can the protection status contribute to regional development (Vorarlberger Naturschutzrat, 2006).

Economic tourism effects of Natura 2000-sites – State of research in Austria

So far there are no studies in Austria concerning the precise question of the economic effects of tourism and recreation of Natura 2000, but there are some studies with similar contents. The most comprehensive survey is in "Conservation policy and the regional economy" (2002), created by WWF Austria, the University of Klagenfurt and E.C.O. - the Institute of Ecology. The main objective of the research is the calculation of economic value of the benefits provided by Natura 2000 sites in four selected regions. The effects on all economic sectors are measured; tourism is discussed but not calculated separately. Also, in 2002 a project by WWF and IEEP (Institute for European Environmental Policy) was implemented. The objective was the estimation of the positive socio-economic impact of Natura 2000. Six case studies in selected Natura 2000 sites in Europe were prepared, the Austrian case study "Promoting the Benefits of Natura 2000" was also written by E.C.O. In addition to the estimation of the positive impacts of the designation on species and habitats also some expected future economic evaluations are also given. Another perspective is provided by the paper "Natura 2000 - The economic impact on the Enns Valley and Styria" (2004) compiled by the Styrian Economic Chamber. This analysis calculates the expected economic loss caused by the designation of a Natura 2000 site.

Regional economic effects of other types of protected areas have also been worked out. The German Federal Ministry of Agriculture, Forestry, Environment and Water Management in cooperation with the Environmental Office Klagenfurt provides a comparative survey of 13 collegiate studies under the topic "Protected Areas as a tool for sustainable regional development". The object of this overview is the identification of key strengths and weaknesses of protected areas, as well as fragmentary approaches to estimating the economic impacts. A specific look at standard economic data of Austrian national parks is given by the Austrian Institute of Economic Research with the paper "Evaluation of the economic effects of national parks" (1999). More recent data is contained in the survey "Headcounts, added value and motivation research at the national park Hohe Tauern and in the nature park Rieser Ahrn" (2004). The national park Gesäuse provides economic calculations of the expenditures of the park management, formulated in the study "Evaluation – 5 years national park Gesäuse" (2008). In addition, the paper "Tourism potentials of the Austrian nature parks" contains some assessments of the economic effects of nature parks.

Based on a first review of the studies mentioned above, the following conclusions can be drawn:

- Economic value of Natura 2000 sites is affected by the acceptance of the regional population and the recognition of a designation as an opportunity for regional development.
- Economic value of the benefits provided by tourism/recreation and employment are most likely measurable in protected areas that are appropriately and continuously managed by conservation authorities.
- Natura 2000 cannot be considered separately from other types of protected areas, because they often overlap. To strive for a calculation which contains only

effects by Natura 2000 sites, benefits of other protected areas have to be excluded.

b. Estimation of benefits provided by tourism and recreation

The methodology presented in Chapter 4.1 was applied to estimate the economic impact of visitor spending in Natura 2000 sites.

Assumptions used for Austria

Based on the available data for Austria, the following assumptions were made:

- Assumption 1: visitor spending is proportional to the area of the site.
- Assumption 2: the structure of visitor spending is identical for visitors whenever the site they visit is located in the same National park.
- Assumption 3: the share of visitors with affinity with Natura 2000 sites is estimated between 19% to 23% of total visitors.

Step 1 - Collection of relevant data and calculation of estimates at site level

- **Data collection**

Data on Austria were extracted from the literature review (Getzner at al., 2002; Lehard, 2004) and completed contacting Austrian site managers. Under the selection criteria defined in Chapter 4, six sites appeared interesting to be studied:

- Blockheide Gmünd-Eibenstein
- Naturpark Ötscher- Tormäuer
- Naturpark Raab
- Nationalpark Hohe Tauern – Salzburg
- Nationalpark Hohe Tauern - Kärnten
- Nationalpark Hohe Tauern – Ostirrol

For each site, its total area is part of the Natura 2000 network. In total, the sample of Austrian sites covers about 217,476 ha of Natura 2000, i.e. to around 17% of the total Natura 2000 area of Austria. **The sample of Austrian Natura 2000 sites is considered representative in terms of visitor density** (i.e. the sites have a visitor density ranged between 3.5 and 943.4 visitor days per hectare and per year) (see Table 40).

Table 40: Site sample for Austria

Site	Total Area (ha)	Natura 2000 Area (ha)	No. of visitor days	Visitor density (visitor day/hectare)	€/visitor day	% Natura 2000 in the sample
Blockheide Gmünd-Eibenstein	106	106	100,000	943.40	30.47	0.05%
Naturpark Raab	14,770	14,770	52,000	3.52	43.39	6.79%
Naturpark Ötscher-Tormäuer	17,000	17,000	100,000	5.88	157.56	7.82%
Hohe Tauern - Salzburg	80,500	80,500	1,138,860	14.15	40.60	37.02%
Hohe Tauern - Kärnten	44,000	44,000	165,180	3.75	40.60	20.23%
Hohe Tauern - Ostirrol	61,100	61,100	446,720	7.31	40.60	28.10%
Total		217,476				100.00%

- **Calculation of visitor expenditure at site level**

As presented in the developed methodology, the main objective of the calculations is to estimate the amount of expenditure per category for the selected Austrian Natura 2000 areas, related to all visitors and related to visitors with a high/low level affinity for Natura 2000 areas.

Firstly, the total spending at site level was calculated for all sites. For the Hohe Tauern Park, it was supposed that mean daily expenditure and visitor spending structure in the parts of the Hohe Tauern Park that are located in the Kärnten and Salzburg regions are identical to the ones in the part located in the Ostirrol region (Assumption 2).

Secondly, the total amount of expenditure in the Natura 2000 areas generated by visitors with high/low level affinity for Natura 2000 was calculated. An average share of visitors with high affinity for national parks in Austria was provided by Weixlbaumer et al. (2007) and Lehar et al. (2004) (see Table 1: Level of affinity for nature protected areas), but no results are available related to the affinity for Natura 2000 areas. The project team believes that **Natura 2000 affinity is likely to be lower than national park affinity**, since among other intuitive reasons, the "national park" designation under regional or national legislation has a higher recognition and visibility. It benefits from many decades of existence and generally, solid marketing programs. Then, applying the share of affinity for national park affinity might lead to an overestimation in the absence of additional solid evidence. For this reason, Assumption 3 were used to estimate the total amount of expenditure in the Natura 2000 areas generated by visitors with high/low level affinity for Natura 2000.

The total expenditure per category (accommodation, catering, retail, entertainment/recreation, transportation and other services) are presented in Table 41 for all visitors,

Table 42 for low level of "Natura 2000 visitors" (i.e. 19% of total visitors) and Table 43 for high level of "Natura 2000 visitors" (i.e. 23% of total visitors).

Step 2 - Scaling-up data from site to national level

Under Assumption 1, the average amount of spending per hectare of Natura 2000 area is estimated by category of spending, and for all visitors and for visitors with low/high level of affinity. Under the same assumption, data estimated at site level are scaled-up to national level multiplying the average amount of spending per hectare of Natura 2000 area by the total Austrian Natura 2000 area (i.e. 1,231,800 hectares). Finally, the sensitivity analysis was done applying +/- 26% to the total spending. The outcomes are presented in Table 44.

Step 3 - Calculation of direct and indirect economic and employment impacts for Austria

Final demand tables of the input-output tables for Austria (year 2007) were adapted as presented in the developed methodology. Similarly, calculations were made under the following scenarios:

- "No Natura 2000 scenario" (NO N2000): Total domestic spending minus Natura 2000 related spending, for each category;
- "Natura 2000 scenario" (N2000): Total domestic spending including Natura 2000 related spending, for each category;
- N2000 - NON2000: domestic economic benefits supported by Natura 2000.

Table 45 presents the final outcomes of the economic impacts of spending generated by all visitors, under a scenario of normal spending. Based on the outcomes, the impact of tourism and recreation in terms of employment was estimated.

Table 41: Expenditure of all visitors in the selected Austrian Natura 2000 areas (€/ha; €_2006)

Site	Accommodation	Catering	Retail	Entertainment /recreation	Transportation	Other services	Total
Blockheide Gmünd-Eibenstein	13,315.12	7,410.89	4,590.10	1,508.80	320.66	999.60	28,145.16
Naturpark Raab	48.42	51.16	30.63	10.21	0.39	8.77	149.57
Naturpark Ötscher- Tormäuer	67.79	72.68	332.46	262.56	171.94	0.00	907.44
Hohe Tauern - Salzburg	0.00	346.50	16.22	46.87	131.04	21.80	562.42
Hohe Tauern - Kärnten	0.00	91.95	4.30	12.44	34.77	5.78	149.24
Hohe Tauern - Ostirrol	0.00	179.07	8.38	24.22	67.72	11.27	290.66

Table 42: Expenditure of visitors with low affinity in the selected Austrian Natura 2000 areas (€/ha; €_2006)

Site	Accommodation	Catering	Retail	Entertainment /recreation	Transportation	Other services	Total
Blockheide Gmünd-Eibenstein	2,472.04	1,375.88	852.18	280.12	59.53	185.58	5,225.33
Naturpark Raab	8.99	9.50	5.69	1.90	0.07	1.63	27.77
Naturpark Ötscher- Tormäuer	12.59	13.49	61.72	48.75	31.92	0.00	168.47
Hohe Tauern - Salzburg	0.00	64.33	3.01	8.70	24.33	4.05	104.42
Hohe Tauern - Kärnten	0.00	17.07	0.80	2.31	6.46	1.07	27.71
Hohe Tauern - Ostirrol	0.00	33.25	1.56	4.50	12.57	2.09	53.96

Table 43: Expenditure of visitors with high affinity in the selected Austrian Natura 2000 areas (€/ha; €_2006)

Site	Accommodation	Catering	Retail	Entertainment /recreation	Transportation	Other services	Total
Blockheide Gmünd-Eibenstein	3,120.31	1,736.69	1,075.66	353.58	75.14	234.25	6,595.64
Naturpark Raab	11.35	11.99	7.18	2.39	0.09	2.05	35.05
Naturpark Ötscher- Tormäuer	15.89	17.03	77.91	61.53	40.29	0.00	212.65
Hohe Tauern - Salzburg	0.00	81.20	3.80	10.98	30.71	5.11	131.80
Hohe Tauern - Kärnten	0.00	21.55	1.01	2.91	8.15	1.36	34.97
Hohe Tauern - Ostirrol	0.00	41.96	1.96	5.68	15.87	2.64	68.11

Table 44: Domestic spending per code NACE for all Natura 2000 areas in Austria (excluding VAT; €_2006; in millions)

		Accommodation	Catering	Retail		Entertainment /Recreation	Transportation	Other services	Total
		H		DA15	DN36	O92	I60	O93	
		Hotel and Restaurant Services		Food products and beverages	Furniture; other manufactured goods n.e.c.	Recreational, cultural and sporting services	Land transport; transport via pipeline services	Other services	
All visitors	**Domestic spending**	249		14		53	13		329
	Sensitivity - 26,5%	183		10		39	10		242
	Sensitivity + 26,5%	315		18		67	17		417
Visitors with low affinity	**Domestic spending**	46		3		10	2		61
	Sensitivity - 26,5%	34		2		7	2		45
	Sensitivity + 26,5%	59		3		13	3		78
Visitors with high affinity	**Domestic spending**	58		3		13	3		77
	Sensitivity - 26,5%	43		2		9	2		56
	Sensitivity + 26,5%	74		4		16	4		98

Table 45: Economic benefits derived from visitor spending and employment related to tourism supported by Natura 2000 in Austria – All visitors, normal spending.

Economic and employment benefits related to tourism supported by Natura 2000 sites in Austria			
NACE category	Nace code	Change in net valued added (2006 mio €)	Change in jobs (thousands)*
Products of agriculture, hunting and related services	A01	6,0	-
Products of forestry, logging and related services	A02	0,2	-
Fish and other fishing products; services incidental of fishing	B	0,0	-
Coal and lignite; peat	CA10	0,0	-
Crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying	CA11	0,1	-
Uranium and thorium ores	CA12	-	-
Metal ores	CB13	-	-
Other mining and quarrying products	CB14	0,2	-
Food products and beverages	DA15	12,2	0,5
Tobacco products	DA16	-	-
Textiles	DB17	0,2	-
Wearing apparel; furs	DB18	0,0	-
Leather and leather products	DC	0,0	-
Wood and products of wood and cork (except furniture); articles of straw and plaiting materials	DD	0,5	-
Pulp, paper and paper products	DE21	0,5	-
Printed matter and recorded media	DE22	1,4	-
Coke, refined petroleum products and nuclear fuels	DF	0,7	-
Chemicals, chemical products and man-made fibres	DG	0,7	-
Rubber and plastic products	DH	0,6	-
Other non-metallic mineral products	DI	0,8	-
Basic metals	DJ27	0,3	-
Fabricated metal products, except machinery and equipment	DJ28	1,2	-
Machinery and equipment n.e.c.	DK	0,8	-
Office machinery and computers	DL30	0,0	-
Electrical machinery and apparatus n.e.c.	DL31	0,3	-
Radio, television and communication equipment and apparatus	DL32	0,3	-
Medical, precision and optical instruments, watches and clocks	DL33	0,1	-
Motor vehicles, trailers and semi-trailers	DM34	0,1	-
Other transport equipment	DM35	0,1	-
Furniture; other manufactured goods n.e.c.	DN36	3,4	0,1
Secondary raw materials	DN37	0,0	-
Electrical energy, gas, steam and hot water	E40	5,1	-
Collected and purified water, distribution services of water	E41	0,6	-
Construction work	F	7,1	-
Trade, maintenance and repair services of motor vehicles and motorcycles; retail sale of automotive fuel	G50	2,5	-
Wholesale trade and commission trade services, except of motor vehicles and motorcycles	G51	8,8	-
Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods	G52	2,5	-
Hotel and restaurant services	H	157,0	5,5
Land transport; transport via pipeline services	I60	51,6	1,6
Water transport services	I61	0,0	-
Air transport services	I62	0,3	-
Supporting and auxiliary transport services; travel agency services	I63	4,1	-
Post and telecommunication services	I64	3,4	-
Financial intermediation services, except insurance and pension funding services	J65	7,2	-
Insurance and pension funding services, except compulsory social security services	J66	1,7	-
Services auxiliary to financial intermediation	J67	0,5	-
Real estate services	K70	14,8	-
Renting services of machinery and equipment without operator and of personal and household goods	K71	5,9	-
Computer and related services	K72	0,8	-
Research and development services	K73	0,0	-
Other business services	K74	16,3	-
Public administration and defence services; compulsory social security services	L	0,1	-
Education services	M	0,3	-
Health and social work services	N	0,2	-
Sewage and refuse disposal services, sanitation and similar services	O90	3,0	-
Membership organisation services n.e.c.	O91	0,3	-
Recreational, cultural and sporting services	O92	34,8	0,6
Other services	O93	10,0	0,3
Private households with employed persons	P	-	-
Total		369,8	8,6

* associated with the demand for the corresponding products (differs from a sectoral split)

c. Results

▷ Economic benefits derived from visitor spending

In 2006, the spending of visitors of Austrian Natura 2000 sites generated economic impacts that are estimated to around 370 million Euros (VAT excluded), i.e. around 409 million Euros in $€_{2011}$.

- It corresponds to around 415 €/ha of Natura 2000 (i.e. around 459 €/ha in $€_{2011}$).
- Equivalent to 0.14% of GDP in 2006.

Considering several scenario of levels of spending, the economic impacts varied between:

- Around 272 million Euros (VAT excluded) under a low spending scenario, i.e. around 301 million Euros in $€_{2011}$. It corresponds to around 305 €/ha (i.e. around 338 €/ha in $€_{2011}$).
- And around 468 million Euros (VAT excluded) under a high spending scenario, i.e. around 518 million Euros in $€_{2011}$. It corresponds to around 525 €/ha (i.e. around 581 €/ha in $€_{2011}$).

In 2006, the economic impacts derived from the spending of visitors with affinity for Natura 2000 were estimated to around 78 million Euros (VAT excluded), i.e. around 86 million Euros in $€_{2011}$.

- It corresponds to around 87 €/ha of Natura 2000 (i.e. around 96 €/ha in $€_{2011}$).
- Equivalent to 0.03% of GDP in 2006.

Considering several scenario of share of "Natura 2000 visitors" and levels of spending, the economic impacts varied between:

- Around 50 million Euros in 2006 (i.e. around 56 million Euros in $€_{2011}$), considering the spending generated by "Natura 2000 visitors" (i.e. 19% of total visitors) and under a low spending scenario. It corresponds to 57 €/ha (i.e. 63 €/ha in $€_{2011}$); and
- Around 110 million Euros in 2006 (i.e. around 121 million Euros in $€_{2011}$), considering the spending generated by "Natura 2000 visitors" (i.e. 23% of total visitors) and under a high spending scenario. It corresponds to around 123 €/ha (i.e. 136 €/ha in $€_{2011}$).

The outcomes are summarised in the table below:

Table 46: Economic impacts provided by visitor spending captured by Natura 2000 in Austria

AUSTRIA	€ million 2006	€/ha 2006	Contribution to GDP (2006, %)	€ million in $€_{2011}$	€/ha in $€_{2011}$
Economic impacts _ all visitors spending	370 [272-468]	415 [305 – 525]	0.14 [0.11-0.18]	409 [301-518]	459 [337-581]
Economic impacts _only "Natura 2000 visitors" spending	78 [51-110]	87 [57-123]	0.03 [0.02-0.04]	86 [56-121]	96 [62-136]

▷ **Employment supported by tourism and recreation**

The economic impacts derived from visitor spending support around 8,620 FTE jobs (between 6,340 and 10,900 jobs depending on low/high spending scenario).

The economic impacts derived from the spending of visitors with affinity with Natura 2000 support an average of 1,810 FTE jobs. Considering several scenario of share of "Natura 2000 visitors" and levels of spending, they support:

- 1,180 FTE jobs, considering only the spending of "Natura 2000 visitors" (i.e. 19% of total visitors) for the scenario "low spending".
- 2,550 FTE jobs, considering the spending of "Natura 2000 visitors" (i.e. 23% of total visitors) for the scenario "high spending".

Table 47: Employment supported by tourism and recreation in Natura 2000 sites in Austria

Employment supported by tourism and recreation _all visitors spending (FTE jobs, 2006)	8,620 [6,340 – 10,900]
Employment supported by tourism and recreation _only "Natura 2000 visitors" spending (FTE jobs, 2006)	1,810 [1,180 – 2,550]

d. Assessment of the results

Estimates found in this study appear consistent with existing estimates of benefits related to Natura 2000 (Table 48). In particular, it was estimated that the tourism generates around 71 €/ha/year in the Burren Park in Ireland (Van Rensburgh et al., 2009). The estimate found in the case study (i.e. around 87 €/ha/year derived from the spending of visitors with affinity with Natura 2000) is in the same order of magnitude. Moreover, it was evaluated that the implementation of the Natura 2000 network in Spain contributes to an increase in GDP estimated between 0.1% and 0.26% (Fernandez et al., 2008). In the present study, the increase in GDP derived from visitor spending is evaluated between 0.11% and 0.18% considering spending from all visitors and between 0.02% and 0.04% considering only "Natura 2000 visitors".

Table 48: Comparison of existing estimates and estimate computed in this study

Type of estimate	Existing estimate from the literature	Computed estimate in this study for Austria
Economic benefits provided by Natura 2000 **€/ha**	Netherlands, all ecosystem services 4,000 €/ha/year (Kuik et al., 2006)	Austria – Economic impacts derived from visitor spending _all visitors: 415 € /ha/year in 2006

Type of estimate	Existing estimate from the literature	Computed estimate in this study for Austria
Economic benefits provided by tourism in NP **€/ha**	Burren Park in Ireland, domestic tourism (Keynesian multiplier) 71.47 €/ha/year (Van Rensburgh et al., 2009)	Austria – Economic impacts derived from visitor spending _only "Natura 2000 visitors": 87 €/ha/year in 2006
Economic benefits provided by tourism in protected areas **€/ha**	Lower Danube Green Corridor in Romania Several ecosystem services including recreation, fisheries, forestry, animal fodder and nutrient retention 500 €/ha/year (Ebert et al., 2009)	
Increase in GDP due to the implementation of the network	Spain [0.1% – 0.26%] (Fernandez et al., 2008)	Austria - Economic impacts derived from visitor spending _all visitors: [0.11%-0.18%] Austria – Economic impacts derived from visitor spending _only "Natura 2000 visitors": [0.02%-0.04%]

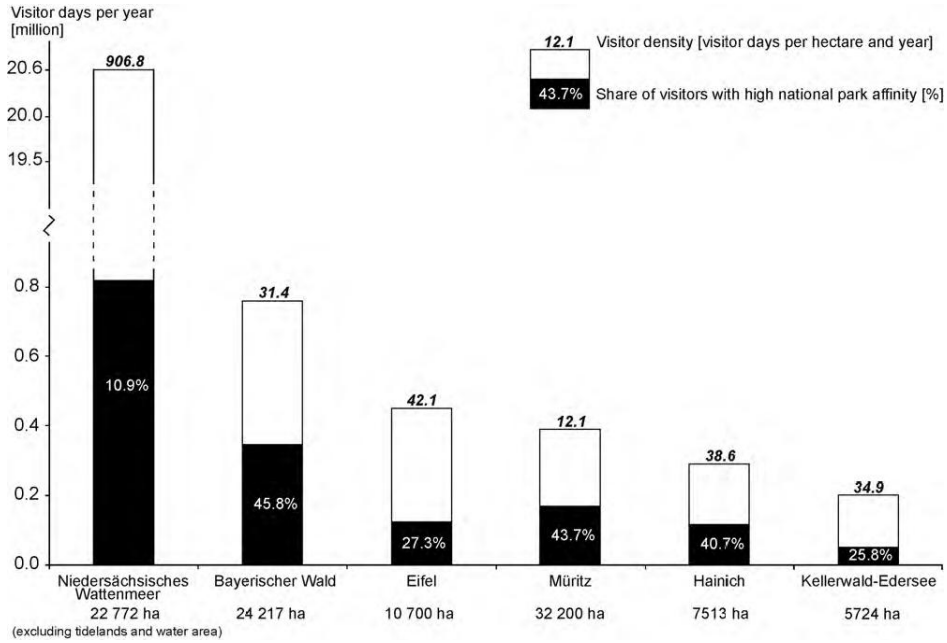
As a conclusion, despite the assumptions made and under the constraints of the study, consistent estimates were provided by the approach adopted. Future developments of the methodology to tend to more accurate estimates are exposed in Chapter 6.

II. Case study for Germany

a. Estimation of benefits related to tourism and recreation

Mayer et al. (2010) carried out a comprehensive study on the economic impact of tourism in six German national parks. The six national parks represent different tourism characteristics in terms of visitor density and type of tourism destination (traditional/ non-traditional) (see Figure 19).

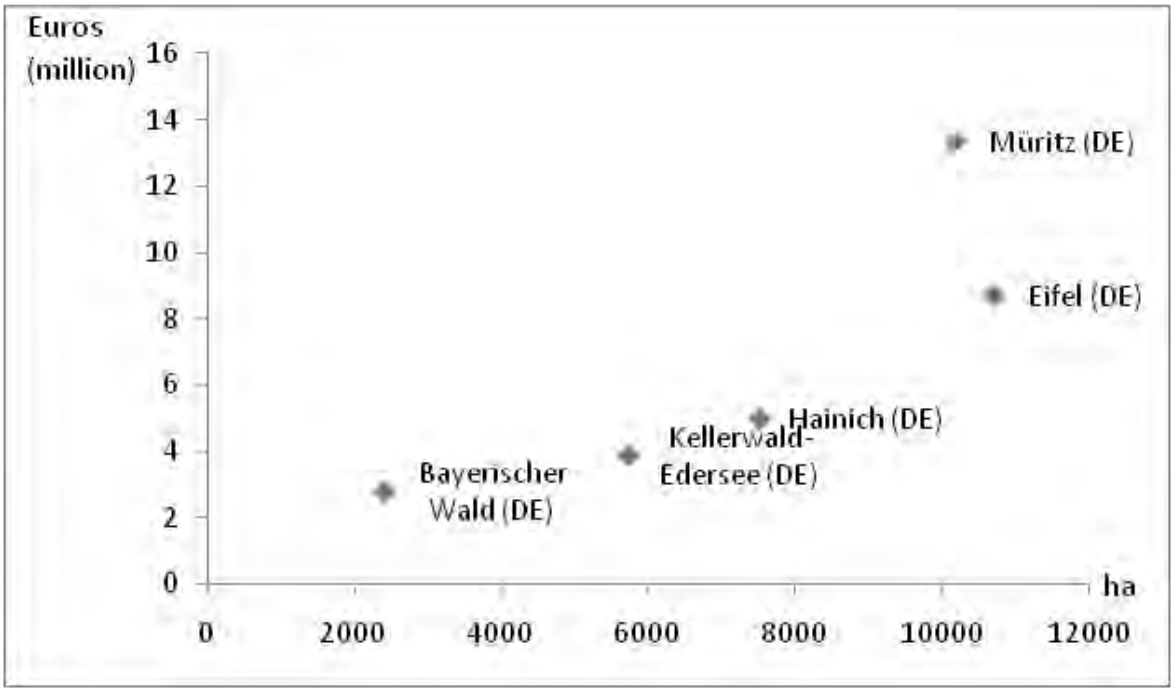
Figure 19: Total visitor days, share of visitor days with high national park affinity and visitor density



Source: Mayer et al., 2010

Interviews were conducted at site level to collect the necessary data. The study of Mayer et al. (2010) provides detailed data enough to apply our methodology. Moreover, total area and total spending tend to exhibit a positive and significant correlation for the sample of sites (Figure 20).

Figure 20: Visitor spending and size of area for a set of Natura 2000 areas in Germany



Source: Mayer et al. (2010)

Assumptions used for Germany

Based on the available data for Germany, the following assumptions were made:

- Assumption 1: visitor spending is proportional to the area of the site.
- Assumption 2: the structure of visitor spending is identical for visitors whether they visit National Park or Natura 2000 areas.
- Assumption 3: the share of visitors with affinity with Natura 2000 sites is estimated between 19% to 23% of total visitors.

Step 1 - Collection of relevant data and calculation of estimates at site level

- **Data collection**

Four sites were retained to form the German sample: Bayerischer Wald, Müritz, Hainich and Kellerwald-Edersee. They represent 25,818 ha of Natura 2000, i.e. 0.5% of the total Natura 2000 area in Germany.

The research study conducted by Mayer et al. (2010) provides the following primary data:

- Visitor density (visitor days per hectare and year)
- Structure of tourist expenditure by types of visitor (same-day / overnight) and by site

- The spending categories are: Accommodation, Catering, Retail and Other Services
- Mean daily expenditure of overnight visitor per day by accommodation
- Proportion of visitors with high national park affinity by site

Additionally, the areas of the National Parks that are covered by Natura 2000 were collected using Natura 2000 databases and the National parks' websites.

Table 49 presents the main characteristics of the sites which compose the sample for Germany

Table 49: Site sample for Germany

Name of the site	Total Area (ha)	Natura 2000 Area (ha)	No. of visitor days	Visitor density (visitor day/hectare)	€/visitor day	% Natura 2000 in the sample
Bayerischer Wald	2,417	2,417	75,894	31	36	9.36%
Müritz	32,200	10,164	389,620	12	34	39.37%
Hainich	7,513	7,513	290,002	39	17	29.10%
Kellerwald-Edersee	5,724	5,724	199,768	35	19	22.17%
Total		25,818				100.00%

Calculation of visitor expenditure at site level

As presented in the description of the methodology, the objectives of the calculations are:

- To estimate visitor expenditure by category for the Natura 2000 area included in the six German national parks.
- To estimate the amount of expenditure by category for the Natura 2000 area included in the six German national parks, related to visitors with affinity with national parks.

Based on the data provided by the study, the project team directly calculated the following data:

- Number of visitors by day in 2007 (calculated from the visitor density and the area)
- Amount of spending by category (excluding accommodation) for same-day visitors
- Total amount of visitor expenditure by category

Under Assumption 1 and Assumption 2, the share of Natura 2000 area within the National parks was applied to the total amount of spending and, the total amount of visitor spending in the Natura 2000 area of all sites of the German sample was estimated.

Step 2 - Scaling-up data from site to national level

Firstly, under the assumption that visitor spending is proportional to the area (Assumption 1), the expenditure per hectare in the Natura 2000 area of German National Parks generated by all visitors and visitors with high/low level affinity for national park was estimated (see Table 50,Table 51 and Table 52). Secondly, data estimated at site level are scaled-up to national level. The average amount of spending per hectare of Natura 2000 area is multiplied by the total

German Natura 2000 area. Finally, the sensitivity analysis was done applying +/- 26% to the total spending (see Table 53).

Step 3 - Calculation of direct and indirect economic and employment impacts for Germany

Final demand tables of the input-output tables for Germany (year 2007) were adapted as presented in the developed methodology and calculations were made under the following scenarios:

- "No Natura 2000 scenario" (NO N2K): Total domestic spending minus Natura 2000-related spending, for each category
- "Natura 2000 scenario" (N2K): Total domestic spending including Natura 2000-related spending, for each category
- N2K - NON2K: domestic economic benefits supported by Natura 2000.

Table 54 presents the final outcomes of the economic impacts of spending generated by all visitors, under a scenario of normal spending. Based on the outcomes, the impact of tourism and recreation in terms of employment was estimated.

Table 50: Expenditure of all visitors in the selected German Natura 2000 areas (€/ha; €_2006)

Site	Accommodation	Catering	Retail	Entertainment /recreation	Transportation	Other services	Total
Bayerischer Wald	376.17	440.61	228.55	0.00	0.00	83.69	1,129.01
Müritz	169.13	145.02	57.66	0.00	0.00	34.67	406.48
Hainich	143.07	329.63	64.73	0.00	0.00	112.64	650.08
Kellerwald-Edersee	221.84	317.74	79.64	0.00	0.00	44.47	663.70

Table 51: Expenditure of visitors with affinity for Natura 2000 (i.e. 19% of total visitors) in the selected German Natura 2000 areas (€/ha; €_2006)

Site	Accommodation	Catering	Retail	Entertainment /recreation	Transportation	Other services	Total
Bayerischer Wald	69.84	81.80	42.43	0.00	0.00	15.54	209.61
Müritz	31.40	26.92	10.71	0.00	0.00	6.44	75.47
Hainich	26.56	61.20	12.02	0.00	0.00	20.91	120.69
Kellerwald-Edersee	41.19	58.99	14.79	0.00	0.00	8.26	123.22

Table 52: Expenditure of visitors with affinity with Natura 2000 (i.e. 23% of total visitors) in the selected German Natura 2000 areas (€/ha; €_2006)

Site	Accommodation	Catering	Retail	Entertainment /recreation	Transportation	Other services	Total
Bayerischer Wald	88.15	103.25	53.56	0.00	0.00	19.61	264.58
Müritz	39.64	33.98	13.51	0.00	0.00	8.12	95.26
Hainich	33.53	77.25	15.17	0.00	0.00	26.40	152.34
Kellerwald-Edersee	51.99	74.46	18.66	0.00	0.00	10.42	155.53

Table 53: Domestic spending per code NACE for all Natura 2000 areas in Germany (excluding VAT; €_2006; in millions)

		Accommodation	Catering	Retail		Entertainment /Recreation	Transportation	Other services	Total
		H		DA15	DN36	O92	I60	O93	
		Hotel and Restaurant Services		Food products and beverages	Furniture; other manufactured goods n.e.c.	Recreational, cultural and sporting services	Land transport; transport via pipeline services	Other services	
All visitors	**Domestic spending**	2,169		140		0	273		2,582
	Sensitivity - 26,5%	1,595		103		0	201		1,899
	Sensitivity + 26,5%	2,743		177		0	345		3,265
”Natura 2000 visitors” (i.e. 19% of total visitors)	**Domestic spending**	403		26		0	51		480
	Sensitivity - 26,5%	296		19		0	37		352
	Sensitivity + 26,5%	509		33		0	64		606
“Natura 2000 visitors” (i.e. 23% of total visitors)	**Domestic spending**	508		33		0	64		605
	Sensitivity - 26,5%	374		24		0	47		445
	Sensitivity + 26,5%	643		42		0	81		766

Table 54: Economic impacts derived from visitor spending and employment supported by tourism and recreation in Natura 2000 in Germany – All visitors, normal spending

Economic and employment benefits related to tourism supported by Natura 2000 sites in Germany			
NACE category	Nace code	Change in net valued added (2006 mio €)	Change in jobs (thousands)*
Products of agriculture, hunting and related services	A01	31,7	-
Products of forestry, logging and related services	A02	1,1	-
Fish and other fishing products; services incidental of fishing	B	0,3	-
Coal and lignite; peat	CA10	0,3	-
Crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying	CA11	0,2	-
Uranium and thorium ores	CA12	-	-
Metal ores	CB13	-	-
Other mining and quarrying products	CB14	0,5	-
Food products and beverages	DA15	108,9	2,3
Tobacco products	DA16	0,0	-
Textiles	DB17	0,7	-
Wearing apparel; furs	DB18	0,0	-
Leather and leather products	DC	0,2	-
Wood and products of wood and cork (except furniture); articles of straw and plaiting materials	DD	5,1	-
Pulp, paper and paper products	DE21	3,4	-
Printed matter and recorded media	DE22	6,3	-
Coke, refined petroleum products and nuclear fuels	DF	2,5	-
Chemicals, chemical products and man-made fibres	DG	5,0	-
Rubber and plastic products	DH	4,0	-
Other non-metallic mineral products	DI	3,2	-
Basic metals	DJ27	0,9	-
Fabricated metal products, except machinery and equipment	DJ28	5,4	-
Machinery and equipment n.e.c.	DK	4,1	-
Office machinery and computers	DL30	0,3	-
Electrical machinery and apparatus n.e.c.	DL31	3,2	-
Radio, television and communication equipment and apparatus	DL32	0,5	-
Medical, precision and optical instruments, watches and clocks	DL33	0,3	-
Motor vehicles, trailers and semi-trailers	DM34	0,5	-
Other transport equipment	DM35	0,2	-
Furniture; other manufactured goods n.e.c.	DN36	40,6	1,5
Secondary raw materials	DN37	0,5	-
Electrical energy, gas, steam and hot water	E40	26,9	-
Collected and purified water, distribution services of water	E41	11,0	-
Construction work	F	14,6	-
Trade, maintenance and repair services of motor vehicles and motorcycles; retail sale of automotive fuel	G50	6,5	-
Wholesale trade and commission trade services, except of motor vehicles and motorcycles	G51	77,8	-
Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods	G52	15,3	-
Hotel and restaurant services	H	1 244,4	69,5
Land transport; transport via pipeline services	I60	12,5	-
Water transport services	I61	0,3	-
Air transport services	I62	1,0	-
Supporting and auxiliary transport services; travel agency services	I63	20,2	-
Post and telecommunication services	I64	15,6	-
Financial intermediation services, except insurance and pension funding services	J65	39,7	-
Insurance and pension funding services, except compulsory social security services	J66	3,0	-
Services auxiliary to financial intermediation	J67	4,8	-
Real estate services	K70	161,9	-
Renting services of machinery and equipment without operator and of personal and household goods	K71	33,9	-
Computer and related services	K72	5,2	-
Research and development services	K73	0,1	-
Other business services	K74	128,3	-
Public administration and defence services; compulsory social security services	L	9,9	-
Education services	M	4,9	-
Health and social work services	N	2,1	-
Sewage and refuse disposal services, sanitation and similar services	O90	10,9	-
Membership organisation services n.e.c.	O91	4,6	-
Recreational, cultural and sporting services	O92	15,8	-
Other services	O93	246,9	5,7
Private households with employed persons	P	-	-
Total		2 348	78,9

* associated with the demand for the corresponding products (differs from a sectoral split)

b. Results

▷ **Economic benefits of tourism/recreation**

In 2006, considering all visitors visiting Natura 2000 areas, the economic impacts of tourism/recreation in Natura 2000 in Germany were estimated to around 2 billion Euros (VAT excluded), i.e. 2.6 billion Euros in €$_{2011}$.

- **It corresponds to around 602 €/ha of Natura 2000,** i.e. 666 €/ha in €$_{2011}$.
- **Equivalent to 0.1% of GDP in 2006.**

Under several scenario of levels of spending, the economic impacts varied between:

- Around 1.7 billion Euros (VAT excluded) for all visitors under a low spending scenario, i.e. 1.9 billion Euros in €$_{2011}$. It corresponds to around 443 €/ha, i.e. 490 €/ha in €$_{2011}$; and
- Around 3 billion Euros (VAT excluded) for all visitors under the assumption of high spending, i.e. 3,286.63 million Euros in €$_{2011}$. It corresponds to around 761 €/ha, i.e. 843 €/ha in €$_{2011}$.

In 2006, the economic impacts of tourism/recreation considering only the spending of visitors with affinity for Natura 2000 were estimated to around 493 million Euros (VAT excluded), i.e. around 546 million Euros in €$_{2011}$.

- **It corresponds to around 126 €/ha of Natura 2000,** i.e. around 140 €/ha in €$_{2011}$.
- **Equivalent to 0.02 of GDP in 2006.**

Considering several scenario of share of visitors with affinity with Natura 2000 and levels of spending, the economic impacts were estimated to:

- Around 320 million Euros (i.e.355 million Euros in €$_{2011}$) considering a low share of visitors with affinity with Natura 2000 (i.e. 19% of total visitors) and under the assumption of low spending. It corresponds to around 72€/ha (i.e. 79 €/ha in €$_{2011}$);
- Around 700 million Euros (i.e. 770 million Euros in €$_{2011}$) considering a high share of visitors with affinity with Natura 2000 (i.e. 23% of total visitors) and under the assumption of high spending. It corresponds to 178 €/ha (i.e. 197 €/ha in €$_{2011}$).

The outcomes are summarised in the table below:

Table 55: Benefits provided by tourism and recreation supported by Natura 2000 in Germany

GERMANY	€ Million in 2006	€/ha	Contribution to GDP (%,2006)	€ Million in €$_{2011}$	€/ha in €$_{2011}$
Economic impacts _all visitors spending	2,348 [1,727-2,970]	602 [442 – 762]	0.10 [0.07 – 0.13]	2,599 [1,911-3,287]	666 [490-843]
Economic impacts _only "Natura 2000 visitors" spending	493 [320-696]	126 [71-178]	0.02 [0.01-0.03]	546 [354-771]	140 [79-198]

▷ Employment related to tourism and recreation

Tourism and recreation supported around 78,940 FTE jobs (between 58,060 and 99,820 jobs depending on low/high spending scenario).

Tourism and recreation related to "Natura 2000 visitors" supported:

- Around 10,780 FTE jobs, considering a share of 19% of visitors with affinity with Natura 2000 for the scenario "low spending".
- Around 23,390 FTE jobs, considering a share of 23% of visitors with affinity with Natura 2000 for the scenario "high spending".

Table 56: Employment supported by tourism and recreation in Natura 2000 in Germany

Employment supported by tourism and recreation_ **all visitors spending (FTE jobs, 2006)**	78,940 [58,060 – 99,820]
Employment supported by tourism and recreation_ **only "Natura 2000 visitors" spending (FTE jobs, 2006)**	16,580 [10,780 – 23,390]

Job et al. (2005) estimate the revenue from the tourism in the National Park Müritz to around 12 million Euros a year, corresponding to 373 € per hectare. This revenue supports around 628 jobs, equivalent to around 0.02 jobs per hectare.

The results achieved in this case study correspond to 602 €/ha of Natura 2000 and 0.014 jobs per hectare considering all visitors spending; and to less than 0.01 considering only "Natura 2000 visitors" spending.

III. Case study for the UK

a. Estimation of benefits related to tourism and recreation

Similarly as for Austria and Germany, the methodology presented in Chapter 4.1 was applied to estimate the economic impact of market benefits related to tourism and recreation.

Main assumptions used for UK

Based on the available data for UK, the following assumptions were made:

- Assumption 1: visitor spending is proportional to the area of the site.
- Assumption 2: When data are not available, mean daily expenditure and visitor spending structure identical to the average mean daily expenditure and average spending structure of all parks in the UK sample for which primary data on visitor expenditure per categories is available.
- Assumption 3: the share of visitors with affinity with Natura 2000 sites is estimated between 19% and 23% of total visitors.

Step 1 - Collection of relevant data and calculation of estimates at site level

- **Data collection**

Data on UK were extracted from the literature review (e.g. CELLO mruk, 2010; Loch Lomond and the Trossachs National Park, 2005, Lehard, 2004, Buchanan, 2006; Council for National Parks, 2006; Mourne Heritage Trust, 2005) and completed contacting site managers. For some sites (e.g. North York Moors, Peak District, Yorkshire Dales), the number of visitors per year could be estimated applying the Scarborough Tourism Economic Activity Monitor (STEAM) to the sites considered.

Finally, under the selection criteria defined in Chapter 4, eleven sites appeared interesting to be part of the sample of sites:

- Brecon Beacons National Park
- Mourne Area of Outstanding Natural Beauty
- East Devon Pebblebed Heaths
- Sunart Oakwoods Initiative Area
- Kinloch and Kyleakin Hills
- Cairngorms National Park
- Loch Lomond and the Trossachs National Park
- North York Moors
- Yorkshire Dales

- Peak District
- Exmoor National Park

Part of total of the area of those sites are covered by Natura 2000. For example, the total area of East Devon Pebblebed Heaths, Sunart Oakwoods Initiative Area and Kinloch and Kyleakin Hills are part of the UK Natura 2000 network. In total, the sample of UK sites covers about 344,409 ha of Natura 2000, i.e. around 19% of the total Natura 2000 area of UK. The sample of UK Natura 2000 sites is considered representative in terms of visitor density (i.e. the sites have a visitor density ranged between 4 and 412 visitor days per hectare and per year) (see Table 57).

Table 57: Site sample for UK

Site	Total Area (ha)	Natura 2000 Area (ha)	No. of visitor days	Visitor density (visitor day/hectare)	€/visitor day	% Natura 2000 in the sample
Brecon Beacons National Park	137,200	3,311	4,046,200	29	34	0.96%
Mourne Area of Outstanding Natural Beauty	57,000	20,253	1,886,026	33	32	5.88%
East Devon Pebblebed Heaths	1,214	1,214	500,000	412	52	0.35%
Sunart Oakwoods Initiative Area	10,247	10,247	40,000	4	52	2.98%
Kinloch and Kyleakin Hills	5,267	5,267	30,000	6	52	1.53%
Cairngorms National Park	452,800	113,200	1,590,000	4	69	32.87%
Loch Lomond and the Trossachs National Park	186,500	17,332	4,110,000	22	71	5.03%
North York Moors	143,600	44,427	9,113,677	63	42	12.90%
Yorkshire Dales	176,200	68,669	11,489,830	65	44	19.94%
Peak District	143,800	47,890	3,113,416	22	25	13.90%
Exmoor National Park	69,280	12,600	1,399,400	20	119	3.66%
Total		344,409				100.00%

- **Calculation of visitor expenditure at site level**

As presented in the developed methodology, the main objective of the calculations is to estimate the amount of expenditure per category for the selected UK Natura 2000 areas, related to all visitors and related to visitors with a high/low level affinity for Natura 2000 areas.

First, the total spending per category (accommodation, catering, retail, entertainment/recreation, transportation and other services) was calculated for the Natura 2000 areas of the sample. Under Assumption 2, some data on spending that were not available could be estimated. More precisely, Assumption 2 corresponds to the following:

- Visitors' spending structure in Mourne Area of Outstanding Natural Beauty, North York Moors, Yorkshire Dales and Peak District National Parks is identical to the average spending structure of all parks in the UK sample for which primary data on visitor expenditure per categories is available.
- Mean daily expenditure and visitors' spending structure in East Devon Pebblebed Heaths, Sunart Oakwoods Initiative Area and Kinloch and Kyleakin Hills are identical to the average mean daily expenditure and average spending structure of all parks in the UK sample for which primary data on visitor expenditure per categories is available.

Secondly, Assumption 3 was used to estimate the total amount of expenditure in the Natura 2000 areas generated by "Natura 2000 visitors".

The outcomes are presented in Table 58 for all visitors and in Table 59 for "Natura 2000 visitors" (i.e. 19% of total visitors scenario).

Step 2 - Scaling-up data from site to national level

Under Assumption 1, the average amount of spending per hectare of Natura 2000 area is estimated by category of spending, and for all visitors and for "Natura 2000 visitors" with low/high level of affinity. Under the same assumption, data estimated at site level are scaled-up to national level multiplying the average amount of spending per hectare of Natura 2000 area by the total Natura 2000 area located in the UK (i.e. 1,771,100 hectares). Finally, the sensitivity analysis was done applying +/- 26% to the total spending covering . The outcomes are presented in Table 60.

Step 3 - Calculation of direct and indirect economic and employment impacts for Austria

Final demand tables of the input-output tables for UK (year 2007) were adapted as presented in the developed methodology. Similarly, calculations were made under the following scenarios:

- "No Natura 2000 scenario" (NO N2K): Total domestic spending minus Natura 2000 related spending, for each category
- "Natura 2000 scenario" (N2K): Total domestic spending including Natura 2000 related spending, for each category
- N2K - NON2K: domestic economic benefits supported by Natura 2000.

Table 61 presents the final outcomes of the economic impact of spending generated by all visitors, under a scenario of normal spending. Based on the outcomes, the impact of tourism and recreation in terms of employment was estimated.

Table 58: Expenditure of all visitors in the selected UK Natura 2000 areas (€/ha; €_2006)

Site	Accommodation	Catering	Retail	Entertainment /recreation	Transportation	Other services	Total
Brecon Beacons National Park	66.80	233.79	179.05	76.72	168.56	290.95	1,015.86
Mourne Area of Outstanding Natural Beauty	245.24	228.29	201.02	139.71	142.40	86.71	1,043.36
East Devon Pebblebed Heaths	5,006.12	4,660.21	4,103.42	2,851.87	2,906.75	1,769.97	2,1298.34
Sunart Oakwoods Initiative Area	47.45	44.17	38.89	27.03	27.55	16.78	201.86
Kinloch and Kyleakin Hills	69.23	64.45	56.75	39.44	40.20	24.48	294.55
Cairngorms National Park	112.19	51.51	17.98	29.94	20.09	11.17	242.88
Loch Lomond and the Trossachs National Park	457.06	291.51	459.47	244.02	113.23	0.00	1,565.29
North York Moors	624.64	581.48	512.01	355.84	362.69	220.85	2,657.51
Yorkshire Dales	674.53	627.92	552.90	384.26	391.66	238.49	2,869.76
Peak District	124.71	116.09	102.22	71.04	72.41	44.09	530.56
Exmoor National Park	369.83	383.48	429.96	146.35	204.50	866.24	2400.36

Table 59: Expenditure of "Natura 2000 visitors" (i.e. 19% of total visitors scenario) in the selected UK Natura 2000 areas (€/ha; €_2006)

Site	Accommodation	Catering	Retail	Entertainment /recreation	Transportation	Other services	Total
Brecon Beacons National Park	12.40	43.40	33.24	14.24	31.29	54.02	188.60
Mourne Area of Outstanding Natural Beauty	45.53	42.38	37.32	25.94	26.44	16.10	193.71
East Devon Pebblebed Heaths	929.42	865.20	761.83	529.47	539.66	328.61	3,954.18
Sunart Oakwoods Initiative Area	8.81	8.20	7.22	5.02	5.11	3.11	37.48
Kinloch and Kyleakin Hills	12.85	11.97	10.54	7.32	7.46	4.54	54.68
Cairngorms National Park	20.83	9.56	3.34	5.56	3.73	2.07	45.09
Loch Lomond and the Trossachs National Park	84.86	54.12	85.30	45.30	21.02	0.00	290.61
North York Moors	115.97	107.96	95.06	66.06	67.34	41.00	493.38
Yorkshire Dales	125.23	116.58	102.65	71.34	72.71	44.28	532.79
Peak District	23.15	21.55	18.98	13.19	13.44	8.19	98.50
Exmoor National Park	68.66	71.20	79.82	27.17	37.97	160.82	445.64

Table 60: Domestic spending per code NACE for all Natura 2000 areas in UK (excluding VAT; €_2006; in millions)

		Accommodation	Catering	Retail		Entertainment /Recreation	Transportation	Other services	Total
		H		DA15	DN36	O92	I60	O93	
		Hotel and Restaurant Services		Food products and beverages	Furniture; other manufactured goods n.e.c.	Recreational, cultural and sporting services	Land transport; transport via pipeline services	Other services	
All visitors	**Domestic spending**	916		142		248	188		1,494
	Sensitivity - 26,5%	674		104		182	138		1,098
	Sensitivity + 26,5%	1159		179		314	238		1,890
"Natura 2000 visitors" (i.e. 19% of total visitors scenario)	**Domestic spending**	170		26		46	35		277
	Sensitivity - 26,5%	125		19		34	26		204
	Sensitivity + 26,5%	215		33		58	44		350
"Natura 2000 visitors" (i.e. 23% of total visitors scenario)	**Domestic spending**	215		33		58	44		350
	Sensitivity - 26,5%	158		24		43	32		257
	Sensitivity + 26,5%	272		42		74	56		444

Table 61: Benefits and employment related to tourism supported by Natura 2000 in UK – All visitors, normal spending

Economic and employment benefits related to tourism supported by Natura 2000 sites in Austria			
NACE category	Nace code	Change in net valued added (2006 mio €)	Change in jobs (thousands)*
Products of agriculture, hunting and related services	A01	37,74	-
Products of forestry, logging and related services	A02	0,80	-
Fish and other fishing products; services incidental of fishing	B	1,48	-
Coal and lignite; peat	CA10	1,61	-
Crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying	CA11	12,41	-
Uranium and thorium ores	CA12	0,00	-
Metal ores	CB13	0,00	-
Other mining and quarrying products	CB14	0,56	-
Food products and beverages	DA15	80,55	3,5
Tobacco products	DA16	0,00	-
Textiles	DB17	2,79	-
Wearing apparel; furs	DB18	1,05	-
Leather and leather products	DC	0,89	-
Wood and products of wood and cork (except furniture); articles of straw and plaiting materials	DD	6,28	-
Pulp, paper and paper products	DE21	9,09	-
Printed matter and recorded media	DE22	15,62	-
Coke, refined petroleum products and nuclear fuels	DF	6,15	-
Chemicals, chemical products and man-made fibres	DG	11,49	-
Rubber and plastic products	DH	11,18	-
Other non-metallic mineral products	DI	4,53	-
Basic metals	DJ27	3,72	-
Fabricated metal products, except machinery and equipment	DJ28	8,41	-
Machinery and equipment n.e.c.	DK	4,12	-
Office machinery and computers	DL30	0,12	-
Electrical machinery and apparatus n.e.c.	DL31	2,42	-
Radio, television and communication equipment and apparatus	DL32	1,07	-
Medical, precision and optical instruments, watches and clocks	DL33	1,14	-
Motor vehicles, trailers and semi-trailers	DM34	2,98	-
Other transport equipment	DM35	0,64	-
Furniture; other manufactured goods n.e.c.	DN36	53,62	3,4
Secondary raw materials	DN37	0,19	-
Electrical energy, gas, steam and hot water	E40	15,91	-
Collected and purified water, distribution services of water	E41	1,72	-
Construction work	F	11,26	-
Trade, maintenance and repair services of motor vehicles and motorcycles; retail sale of automotive fuel	G50	17,62	-
Wholesale trade and commission trade services, except of motor vehicles and motorcycles	G51	20,38	-
Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods	G52	0,17	-
Hotel and restaurant services	H	602,38	37,5
Land transport; transport via pipeline services	I60	178,61	11,2
Water transport services	I61	1,26	-
Air transport services	I62	4,26	-
Supporting and auxiliary transport services; travel agency services	I63	44,20	-
Post and telecommunication services	I64	27,35	-
Financial intermediation services, except insurance and pension funding services	J65	17,37	-
Insurance and pension funding services, except compulsory social security services	J66	10,85	-
Services auxiliary to financial intermediation	J67	2,32	-
Real estate services	K70	33,83	-
Renting services of machinery and equipment without operator and of personal and household goods	K71	8,57	-
Computer and related services	K72	20,20	-
Research and development services	K73	4,73	-
Other business services	K74	92,10	-
Public administration and defence services; compulsory social security services	L	2,37	-
Education services	M	9,38	-
Health and social work services	N	5,29	-
Sewage and refuse disposal services, sanitation and similar services	O90	5,46	-
Membership organisation services n.e.c.	O91	6,23	-
Recreational, cultural and sporting services	O92	142,19	10,1
Other services	O93	112,39	11,2
Private households with employed persons	P	0,00	-
Total		1681,05	77,0
* associated with the demand for the corresponding products (differs from a sectoral split)			

b. Results

▷ **Economic impacts of tourism and recreation**

In 2006, the economic impacts of tourism and recreation in Natura 2000 in the UK were estimated to 1.7 billion Euros (VAT excluded), i.e. 1.9 billion Euros in €$_{2011}$.

- **It corresponds to around 1,390 €/ha of Natura 2000,** i.e. around 1,540 €/ha in €$_{2011}$.
- **Equivalent to 0.09% to GDP in 2006.**

Under scenario of levels of spending, the economic impacts varied between:

- Around 1 billion Euros (VAT excluded) for all visitors under a low spending scenario, i.e. 1.3 billion Euros in €$_{2011}$. It corresponds to around 1,024€/ha, i.e. 1,113 €/ha in €$_{2011}$.
- Around 2.1 billion Euros (VAT excluded) for all visitors under a high spending scenario, i.e. around 2.4 billion Euros in €$_{2011}$. It corresponds to 1,760 €/ha, i.e. 2,353 €/ha in €$_{2011}$.

In 2006, the economic impacts generated by the spending of visitors with affinity with Natura 2000 were estimated to around 353 million Euros (VAT excluded), i.e. around 391 million Euros in €$_{2011}$.

- **It corresponds to around 292 €/ha of Natura 2000,** i.e. 324 €/ha in €$_{2011}$.
- **Equivalent to 0.02% to GDP in 2006.**

Under scenario of levels of spending, the economic impacts varied between:

- Around 230 million Euros (i.e. 254 million Euros in €$_{2011}$) considering the spending of 19% of total visitors who have affinity with Natura 2000 and under a low spending scenario. It corresponds to 190€/ha, i.e. 210 €/ha in €$_{2011}$; and
- Around 498 million Euros (i.e. 551 million Euros in €$_{2011}$) considering the spending of 23% of total visitors who have affinity with Natura 2000 and under a high spending scenario. It corresponds to 412 €/ha, i.e. 456 €/ha in €$_{2011}$.

The outcomes are summarised in the table below:

Table 62: Benefits provided by tourism and recreation supported by Natura 2000 in UK

UK	€ Million in 2006	€/ha	Contribution to GDP (%, 2006)	€ Million in €$_{2011}$	€/ha in €$_{2011}$
Economic impacts _all visitors	1,681 [1,236-2,126]	1,392 [442 – 762]	0.09 [0.06-0.11]	1,861 [1,369-2,353]	1,541 [1,133-1,948]
Economic impacts _only "Natura 2000 visitors"	353 [229-499]	292 [190-413]	0.02 [0.01-0.03]	391 [254-552]	324 [210-457]

▷ **Employment supported by tourism and recreation**

Tourism and recreation supported around 77,020 FTE jobs (between 56,650 and 97,400 jobs depending on low/high spending scenario).

The economic impacts derived from the spending of visitors with affinity with Natura 2000 supported:

- Around 10,520 FTE jobs, considering the spending of visitors with affinity with Natura 2000 (i.e. 19% of total visitors scenario) for the scenario "low spending".
- Around 22,820 FTE jobs, considering the spending of visitors with affinity with Natura 2000 (i.e. 23% of total visitors scenario) for the scenario "high spending".

Table 63: Employment supported by tourism and recreation in Natura 2000 in UK

Employment supported by tourism and recreation _ **all visitors spending (FTE jobs, 2006)**	77,020 [56,650 – 97,400]
Employment supported by tourism and recreation **_only "Natura 2000 visitors" spending (FTE jobs, 2006)**	16,180 [10,520 – 22,820]

Results are discussed in Chapter 4.

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