life+mgn
making good natura

Manual for the valuation of ecosystem services and implementation of PES schemes in agricultural and forest landscapes

Making Good Natura
LIFE+11 ENV/IT/000168

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Report on Action B11:
Manual for the valuation of Ecosystem Services and implementation of PES schemes in agricultural and forest landscapes – *Application of the governance model, “MAKING GOOD NATURA” in Natura 2000 sites and other areas*

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PREFACE

Where does this Manual come from?

This Manual is one of the products of the LIFE project, "Making Public Goods Provision the Core Business of Nature 2000" (11 ENV/IT/000168), an outcome of Action B11, made available by the beneficiary CURSA. The Manual, together with other tools, such as the WebGIS platform on the project website (www.lifemgn-serviziecosistemici.eu), are intended to be operational tools for the replicability of project results.

What is the Manual do?

The Manual is your friend: it helps users take decisions in the field and indicates how and when different activities should be undertaken. It takes you by the hand from project outset to the valuation of ecosystem services (ES), and to the final agreement on payment schemes. The Manual allows you to objectively assign a role to the territory that you are analysing and above all allows you to communicate that role in terms of the value that this territory has helped to maintain for the local community, ensuring the continued sustainable flow of ecosystem services.

Who is the Manual for?

The Manual has been written for use by technicians and management bodies, administrators of Natura 2000 sites, but also protected areas, municipalities and more generally, territorial management institutions that wish to valorise the territory they manage or in which they work in terms of ES. The technicians, whether they are civil servants, professionals or private enterprises can use the manual to verify the potentials, including economic potential, of the site for a more holistic planning approach, which, in the case of forest management, can provide for addition of new activities. This manual emerges from the LIFE project that conceptualised it, and is therefore primarily directed at the managers of Natura 2000 sites who are bound to achievement of conservation objectives and can, indeed must, do so by pursuing the planning and enhancement of ecosystem services.

Objectives of the Manual

The principal objective of this manual is to render replicable the application of the LIFE+ project, Making Good Natura (LIFE MGN) in other areas and sites, whether or not they are recognised protected areas. The approach of the project, indeed, if we exclude the specific goals of species and habitat conservation supported by LIFE MGN, may be adapted and applied to other situations in order to valorise natural capital (NC) and flows of ecosystem services. This objective steers the global community toward greater recognition of the value of natural capital, and tries to leverage economic and financial rewards to support local communities that continue to guarantee flows of these services.

Effective and efficient use of the Manual

The Manual is built on the principle of adaptive management, and thus aims to provide guidelines for the main tasks to be implemented in the field. However, with a vision of full autonomy of each implementer, the manual can be interpreted best by keeping fixed only the principles that lie at its base. The contents of the Manual have benefited from implementation of the project, meaning it has been written over time, taking into consideration outcomes of specific project activities. Throughout the Manual, we try to give effective guidance on order of the project activities necessary for the application of LIFE MGN for valuation and implementation of payment for ecosystem services

(PES) schemes tied to natural capital. At the same time, we have tried to help users economise by keeping costs of each specific activity under control.

What's in the Manual?

In the Manual you can find out who needs to be involved and what needs to be done to apply the LIFE MGN method. You will find descriptions of the methodology and instruments used, specifically, the questionnaires that were developed to provide baseline information, questionnaires for residents and tourists, interviews conducted to understand perceptions of individuals and quality of management and services offered. You will also find information on how to conduct assessments of management effectiveness, environmental balance, how to go about implementation of a PES scheme, and how to confront and engage with stakeholders.

How to use the Manual

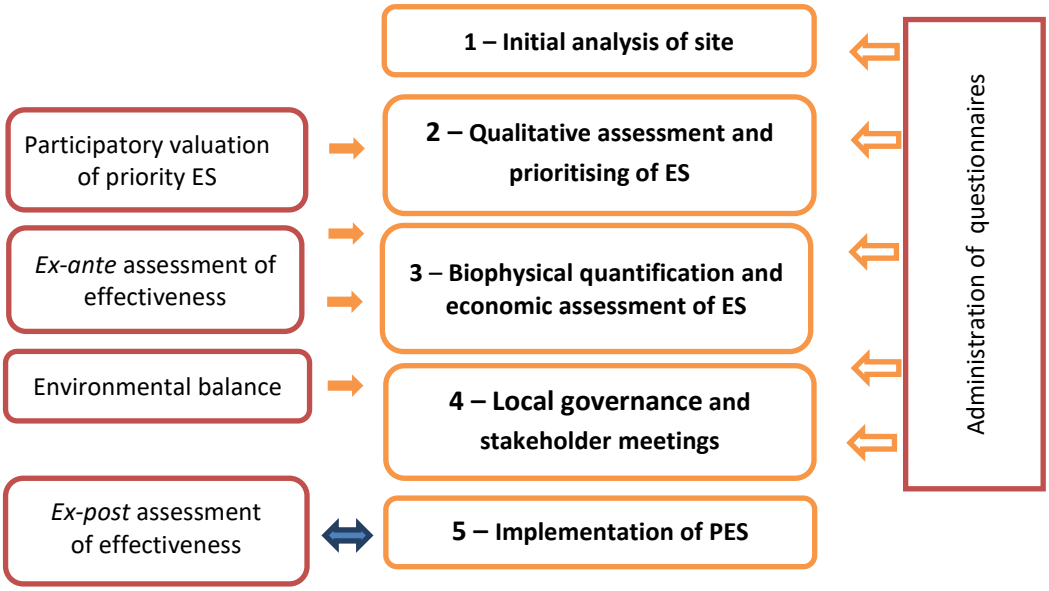
The Manual describes how to proceed in a stepwise fashion. As such, users may simply follow the Manual in order to replicate the LIFE MGN model in a manor deemed most appropriate for a particular site. It may be useful to consult the project website in order to better understand how to proceed. Users can also consult the Manual for Action B10 on GIS tools to learn about the WebGIS platform on the project website.

What are the minimum technical requirements for users of the Manual?

The Manual has been designed for application at any level. It is possible to use it to guide a qualitative or rapid approach. Likewise, it provides a framework for a full assessment, including the writing of agreements for financing. It is assumed that the skills required for application of these approaches are most often already held by those occupied in the environment sector. As such, this manual will benefit those who are accustomed to working with public administration and are open to engagement, learning and discussion.

What are the steps required by the Manual?

The Manual is subdivided by activity to reflect the LIFE MGN model. The first steps involve definition of the study area, assessment of cartographic resources and socio-economic analysis, leading to an initial qualitative assessment of ES that are of highest concern. Following this, stakeholder meetings are required to validate this choice of ES and proceed to the economic assessment. The effectiveness of management and environmental balance of the area are evaluated contextually in this phase. In the next step, involvement of the local community is sought and the process can proceed through meetings involving discussions on governance, which, make possible the signing of actual agreements. The steps are illustrated in the following figure:


1 – Initial analysis of site
2 – Qualitative assessment and prioritising of ES
3 – Biophysical quantification and economic assessment of ES
4 – Local governance and stakeholder meetings
5 – Implementation of PES
Participatory valuation of priority ES
Ex-ante assessment of effectiveness
Environmental balance
Ex-post assessment of effectiveness
Administration of questionnaires

Glossary of terms and acronyms

Over the course of the LIFE MGN project, we have acquired – as have our stakeholders and partners – a technical vocabulary that is fundamental to project implementation. Following some initial confusion, we made collective decisions on how to use this set of technical terms. To simplify the work that is required for application of the LIFE MGN model, we have included a glossary of common terms (ATTACHMENT 1). Principal acronyms used in this document are listed below.

ARPA/APPA Agenzia Regionale/Provinciale di Protezione dell'Ambiente/Regional or County Environmental Protection Agency
CAP Common Agricultural Policy
CLC2006 CORINE Land Cover 2006
EARDF European Agricultural and Rural Development Fund
ERDF European Regional Development Fund
ES Ecosystem Services (or Environmental Services)
GIS Geographic Information System
INEA Istituto Nazionale Economia Agraria/National Research Center on Agricultural Economy
ISPRA Istituto Superiore per la Protezione e Ricerca sull'Ambiente/National Agency for Environmental Protection
ISTAT Istituto Nazionale di Statistica/Italian National Statistics Institute
IUCN International Union for Conservation of Nature
LIFE Funding Programme from EU Commission
MGN Making Good Natura
MP Management Plan
NC Natural capital
PA Protected Area(s)
PAME Protected Areas Management Effectiveness
PES Payment for Ecosystem Services
UAA Utilised Agricultural Area
UNEP United Nations Environmental Programme
WebGIS GIS portal available on the project website
WTA Willingness to Accept
WTP Willingness to Pay
WWF World Wildlife Fund

1. INTRODUCTION TO THE MANUAL – THE LIFE MGN MODEL

This Manual has been realised to support management bodies that intend to apply the LIFE MGN Model to Natura 2000 sites, protected areas, and other areas where ES may be enhanced. The model and its various components (figure 1), were elaborated following an analysis of the scientific literature on ES, with the goal of responding to the *Aichi Targets* reported in the Strategic Plan for Biodiversity 2011-2020 (the Plan). The Model derives from the principal regulatory instruments of the EC in the areas of environmental and species conservation, expressly, the Birds Directive and the Habitat Directive, which, through Articles 2 and 8, carry the obligation of species and habitat conservation and the obligation of co-financing for conservation on the part of Member States. With the signing of the Plan, state signatories must integrate assessments of ES in plans and strategies that carry environmental impacts (Aichi Targets 1 and 2) and include assessment of ES from economic and other perspectives in national strategies and plans regarding biodiversity. In Europe, the Natura 2000 network represents areas with high biodiversity value that provision ES with a wide variety of collectively enjoyed economic and social benefits. Arguably, inadequate availability of financial resources has made necessary the consideration of innovative mechanisms for financing the management of these sites. This project responds to Art. 8 of the Habitats Directive. Through implementation of the LIFE MGN Model, it intends to give management bodies for sites the functional tools to allow them to evaluate and implement these market-based mechanisms with the scope of pursuing conservation objectives in their management plans, and/or conservation measures.

In order to measure benefits brought about through introduction of PES, PES-like schemes, and self-financing schemes, a methodology is employed to assess management effectiveness. This methodology includes an *ex ante* and *ex post* phase in order to assess effects of such instruments both before and after application. Considering that the analysis of the effects produced by PES schemes can be observed only after a certain time span following their application, in this project, the *ex post* assessment has been carried out through a simulation of potential effects that the PES scheme may bring in terms of environmental and social benefits at both local and global scales.

The governance model defined by the project represents the management model for a territory that, if applied in the context of Natura 2000 sites, allows for responses to the following types of questions: Which governance process must be engaged in order to safeguard biodiversity and guarantee a flow of ES in agroforestry sites? Are financial resources adequate for the management of the site? Are these resources utilised efficiently to achieve conservation objectives? How may the performance of management bodies by assessed?

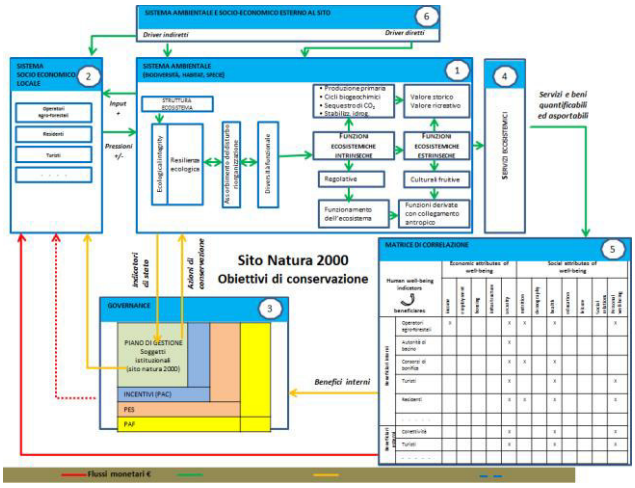


Figure 1: The LIFE MGN Model applied to Natura 2000 sites

The following graphic (figure 2) continues to delve into the approach for application of the Governance Model to Natura 2000 sites (figure 1), which is broken down in the various parts of this manual.

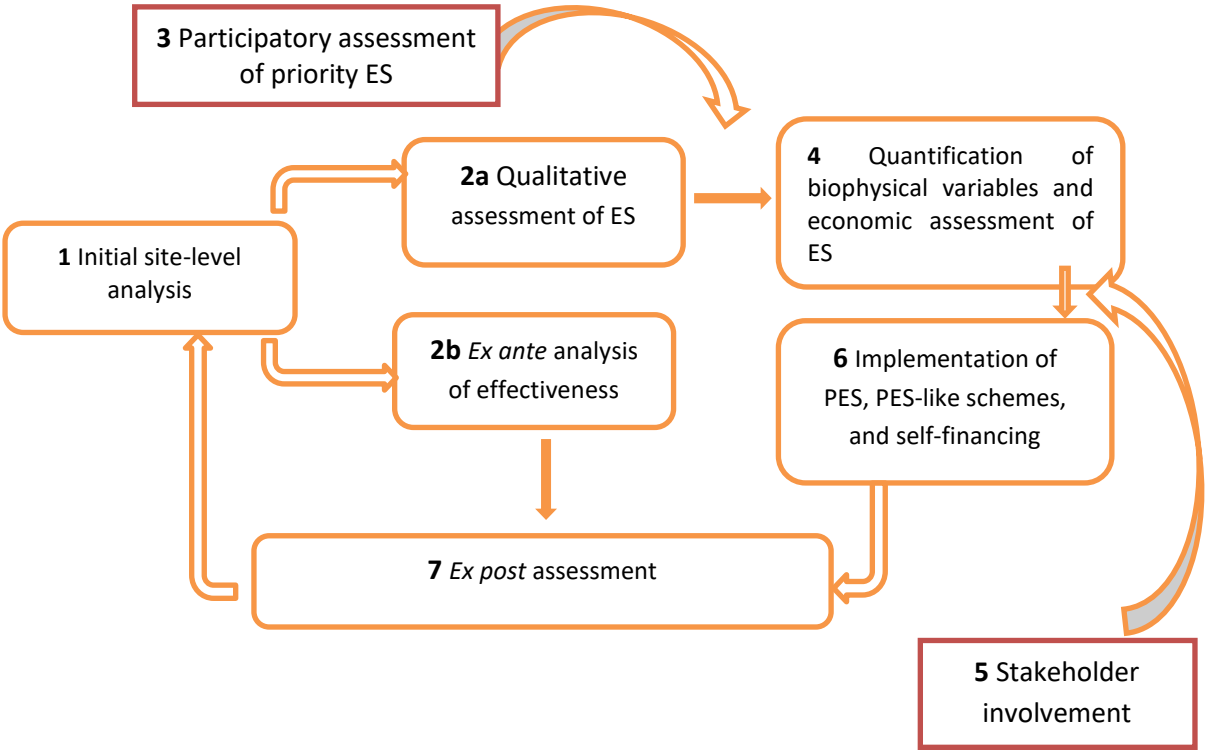


Figure 2: Detail of application of LIFE MGN Model to Natura 2000 sites

The **initial site-level analysis** consists of the study of existing relationships between ecological and environmental, and socio-economic aspects of the study area. To this end, a data collection phase is necessary to collate the necessary documentation regarding the site and its contiguous 20km buffer zone. Specifically, this phase involves collection of official maps (CORINE land cover and habitat maps), management plans/measures for safeguarding biodiversity, and the use of specific questionnaire instruments with representatives of management bodies.

Cartographic data is necessary for the **quantitative assessment of ES**, by which Natura 2000 habitats data and CORINE land cover products can be used to reveal potential ES flows from particular areas. This process also permits users to highlight existing relationships between ES and differences in land use with the intent of constructing supporting data and documentation for a preliminary evaluation of relevant services for each site.

During the qualitative analysis of ES, assessors may move forward with the ***ex-ante* analysis of effectiveness,** which consists in the evaluation and measurement of results obtained through site management with respect to achievement of objectives defined by the Habitat Directive and the Birds Directive generally, and the Management Plan specifically. The methodology proposed is inspired by and adapted from the PAME approach (Protected Areas Management Effectiveness), which is employed for assessment of management effectiveness of national parks. The present Manual draws upon this approach, following experimental results and successive application in all parks, presented in two publications edited by FrancoAngeli Editore[1]. The *ex-ante* assessment process must contribute to clarification of management objectives of the site by measuring the effects generated by specific management interventions. Further to this, results achieved should be brought into relation with the economic and financial management approaches of management bodies.

In this way, the assessment of effectiveness proposed in the LIFE MGN Model (figure 3) is called upon to respond to the needs of both management bodies of sites and public decision makers that require – during the phase of strategic programming – an instrument for assessment to verify and monitor progress in policy established to achieve particular objectives, and to reflect on opportunities to maintain or alter these objectives in the future in relation to the results achieved (Vecchi and Gioioso, 2007). Management effectiveness represents one of the five principles of good governance (White Paper, COM/2001/0428 def.).

[1] La valutazione di efficacia per le Aree Protette. Proposta di un modello di analisi – MEVAP - e di un manuale applicativo, FrancoAngeli, Milano 2012. ISBN 9788820415501; Il nostro capitale. Per una contabilità ambientale dei Parchi Nazionali italiani, FrancoAngeli, Milano, 2014. ISBN 9788820457495

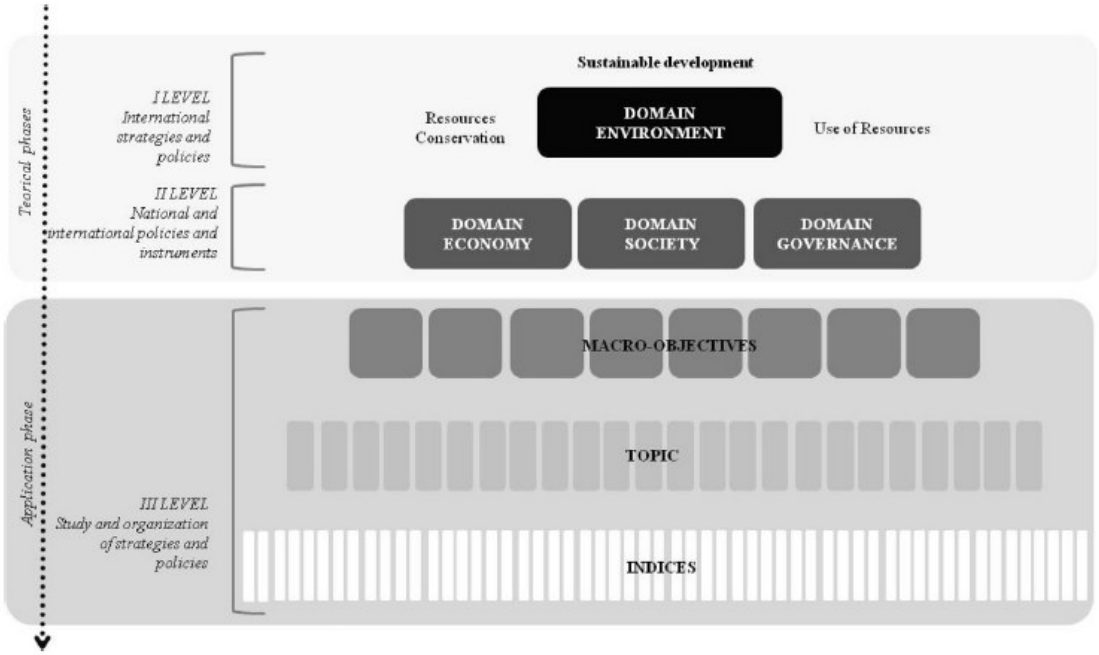


Figure 3: Theoretical model

The evaluation of management effectiveness, further, will be tied to the environmental balance with the objective of integrating the economic value of ES benefits in the conventional accounting systems in order to improve management of natural capital. To this end, the framework accounts for flows of goods and services and their interaction between the environmental, economic and social spheres of Natura 2000 sites by measuring these flows both in physical and monetary terms. In particular, the structure of the model, based on the bioeconomic theory of Georgescu-Roegen, is articulated into physical accounts and economic accounts, through which it is possible to identify stocks and flows, where natural capital and labour constitute the stocks or agents that transform the flows of ES into flows of products. The structure of the environmental accounting model, which is applied to sites, maintains the structure of accountability of natural resources and is articulated in a dimension of capital (an environmental capital account) and a dimension of flow (an environmental flow account) as is the physical account section (quantitative and qualitative analysis of natural resources) and the monetary account (assessment of costs and benefits attributed to the protection or management of natural resources). For each account, specific items have been identified in order to evaluate externalities due to application of PES schemes in each Natura 2000 site under study (PES column in figure 4; for a mor detailed explanation see Section 7.3).

		Ante PES	PES
Physical accounts	Physical accounts *stock* (indicatori)	Analisi qualitativa e quantitativa habitat	Analisi qualitativa e quantitativa habitat
	Physical accounts *Flow* (indicatori)	Analisi servizi ecosistemici	Analisi flussi scaturiti dall'applicazione del PES
Economic accounts	Benefici (€) *flow*	**B1 = Finanziamenti** *a) Statali, regionali, Comunali, Comunitari, Altro;* *b) Accordi agro ambientali;* *c) Indennità compensativa RN2000.* **B2 = Benefici ambientali** *a) Valore economico SE ;* *b) Δ+ attività economiche (es. ecoturismo);*	**B1** **B2** **B3 = Benefici PES**
		B Tot. ante PES = B1 + B2	**B Tot. PES = B1 + B2 + B3**
	Costi (€) *flow*	**C1 = Costi one – off** *a) Costi di gestione;* *b) Costi di investimento.* **C2 = Costi ricorrenti** *a) Costi di pianificazione della gestione* i. Costi amministrativi; ii. Revisione di piani, Comunicazione ecc. *a) Costi ambientali:* i) Costi indiretti; ii) Spese di protezione (manutenzione ripristino, prevenzione); iii) Danni ambientali.	**C1** **C2** **C3 = Costi di attuazione del PES** *a) Costi di transazione;* *b) Costi di monitoraggio.*
		C Tot. ante PES = C1 + C2	**C Tot. PES = C1 + C2 + C3**
	Beneficio NETTO	**Bt ante PES – Ct ante PES (1 + r) - t > 0***	**Bt PES – Ct PES (1 + r) - t > 0***

*Sources: Gudger and Barker, 1993; Pearce et al., 1989

Figure 4: Structure of the Environmental Balance

On the basis of results obtained from the qualitative analysis of ES and from observations provided by management bodies of sites on ES held to be important for these territories, it is possible – through the participatory involvement of local institutions and socio-economic actors – to arrive at the priority ES for a site. The **participatory assessment of priority ES** is one of the essential steps for constructing an appropriate territorial management approach due to the fact that the actors in this step are the principal subjects that need to be involved in implementation of PES and self-financing schemes.

The **biophysical quantification and economic assessment** step supports decision makers in the identification of specific actions that can be put in play for conservation of habitats and species that generate ES.

The measurement of ES becomes useful for the identification and quantification of economic and social benefits that may be derived in relation to the potential beneficiaries of a service. Socio-economic benefits described in the matrix (box 5 in figure 1) have an impact (internal benefits) on the governance system of the site, contributing to meeting of conservation objectives in management plans, and to the monetisation of benefits for internal economic subjects. As such, monetary flows that may benefit the local socio-economic system may arrive from external beneficiaries in order to compensate flows of benefits from the site. On the basis of ES identified, the methodological workflow proceeds with the identification of PES/PES-like/self-financing schemes most appropriate with respect to the context and needs of the territory.

The information retrieved from these preliminary studies conducted on a site constitute the elements for analysis for the application of the LIFE MGN Model to Natura 2000 following a DPSWR schema (figure 5), which plays a role in the **implementation of the PES** scheme. For each site, it is necessary to identify drivers that exert pressures on habitats and species present in the site that effect delivery of ES, and how these drivers and pressures may be brought into relation with beneficiaries (internal and external to the site) in order to produce benefits to improve management effectiveness of Natura 2000 sites. The steps illustrated in the figure should be reproduced for each ES selected for the site in order to identify the beneficiaries of the ES, and how the suggested PES

scheme may have positive impacts both on the conservation status of habitats and species and on management planning and conservation measure for a site. The PES scheme can be implemented alongside conservation actions or can contribute to the actions themselves.

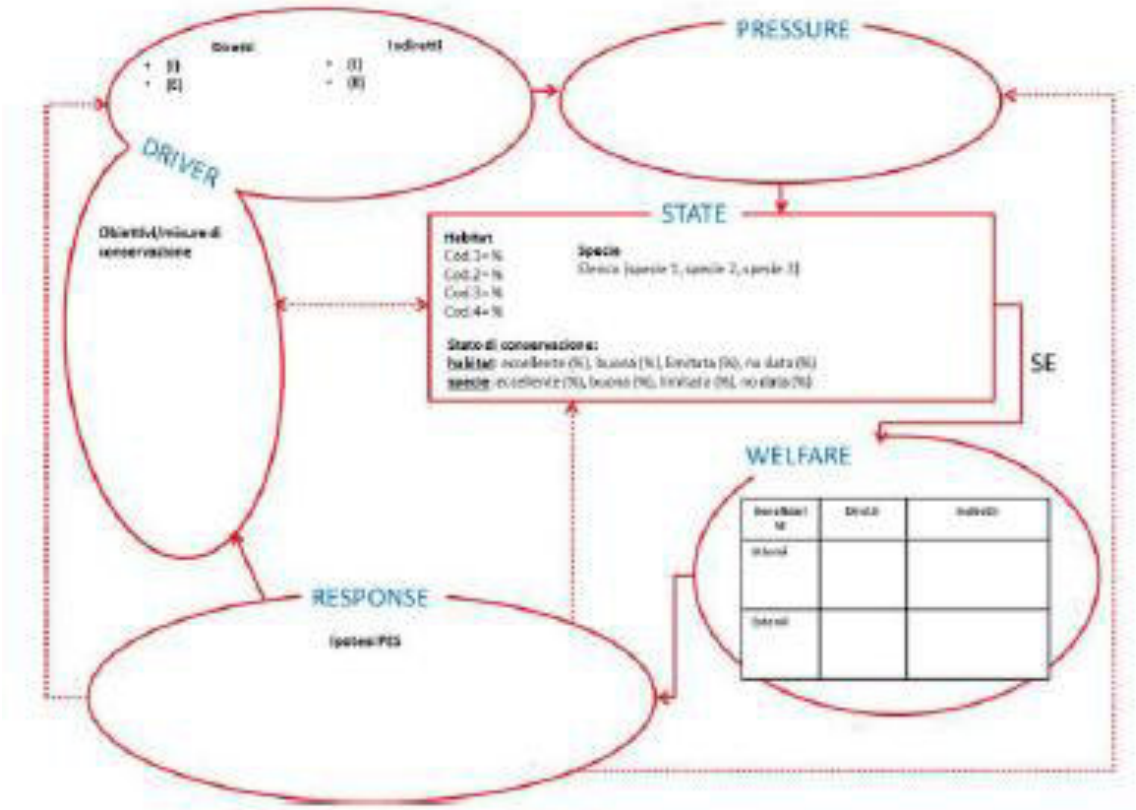


Figure 5: DPSWR scheme applied to project sites

The ***ex post* assessment** must be applied by the management body and has the objectives of examining the effectiveness of the PES scheme in terms of environmental benefits and socio-economic impacts observed, and bringing about improvements in governance. The results obtained by application of the PES scheme need to be compared to results of the *ex ante* assessment in order to verify that objectives have been reached, and evaluate coherence between objectives. The *ex post* analysis, then, is an essential tool that is required in order to verify and monitor the effectiveness of these instruments in achieving identified conservation and management objectives, comparing pre-defined targets with the results obtained. Each of the assessment criteria can put to use qualitative and quantitative methods, even if the latter is weighted more heavily in the evaluation of policy effectiveness. In this context, the implementation of PES schemes, which may all or in part coincide with conservation actions in the management plan and conservation measures, should work to improve territorial governance.

2. THE LIFE MGN MODEL – FROM THEORY TO PRACTICE

2.1 Instruments in the methodology

To carry out the assessment methodology for ES, it is necessary to acquire adequate knowledge and materials, consisting of environmental, socio-economic, financial, administrative and, most importantly, cartographic information. The methodology requires, at minimum, the use of GIS tools with a database that includes the CORINE dataset and habitats map (among other essential data requirements). We heavily stress that only after this information has been collected, assessors may proceed in a sequential fashion to the administration of questionnaires to management bodies, then to important stakeholders, and finally to residents, tourists, visitors and institutions, etc.

The methodology, indeed, begins with the analysis of spatial data using software support to understand the value of natural capital and the environmental and geographic context of the site. From here, it is possible to proceed to the application of the questionnaire to management bodies. At this point, the assessor should already have an idea of which ES are of most relevance to the area. Stakeholder meetings are then used to narrow the assessment to the focal ES. This selection process, obviously, is mediated by the objective of the project, which is to activate novel forms of financing to sustain conservation actions in Natura 2000 sites.

Once three ES have been selected and validated at the local level, it is possible to begin considering potential PES schemes with the help of questionnaires administrated to residents, visitors and stakeholders. This information feeds into a qualitative and quantitative analysis of ES supply and demand. Once beneficiaries and suppliers have been identified, their participation is sought in order to agree upon the terms of a contract, proceeding to an evaluation of the effectiveness of management and environmental balance of the site.

What is CORINE land cover data, and why is it needed?

The CORINE land cover map is a thematic digital base map layer (shapefile) at the 1:100 000 scale, developed under the CORINE Land Cover Project of the EU, which makes available standardised and comparable information for all countries adhering to the project. Land cover is divided into 44 classes in 3 levels with a minimum cartographic unit of 25 hectares.

The CORINE land cover map serves as a base for the mapping of ES for a diversity of applications. The map can be utilised for the qualitative evaluation of potential flows of ES (see qualitative mapping of ES and project report on the site www.lifemgn-serviziecosistemici.eu). Furthermore, CORINE can act as the spatial basis for the quantification of ES, such as F2 – forage, pasture, F4 – wood, fibre, F4 – mushrooms and truffles, R1 – carbon sequestration, R2 – local climate regulation/air purification, R3 – regulation of water (recharge of aquafers), R4 – water purification, R5 – protection from erosion and geological instability (landslides, slope instability), and R6 – protection from hydrologic instability.

What is the Natura 2000 habitats map and why is it needed?

The habitats map contains a spatial representation of habitats in Natura 2000 sites in digital format (shapefile), following the categorisation of habitats of community interest. These are listed in Attachment 1 of Directive no. 92/43/CEE and categorised into habitat classes using four-character codes. The habitats map is necessary for mapping potential flows of ES (see qualitative mapping of ES).

What is a digital elevation model (DEM) and why is it needed?

A DEM, or digital elevation model, is a spatial representation of the distribution of elevations in an area in digital (raster) format. A DEM is required for delimiting watersheds and for quantifying certain ES, such as F5 – mushrooms and truffles, R3 – regulation of water (recharge of aquifers), R4 – water purification, R5 – protection from erosion and geological instability (landslides, slope instability) and R6 – protection from hydrological instability.

What is the Questionnaire for Management Authorities and why is it needed?

This questionnaire (self-compiled that can be found commented in ATTACHMENT 2) is divided into various sections and constitutes a knowledge base for the site. We use the term "management authorities" because in this project, we took into consideration sites of the Natura 2000 network that – in relation to diverse national and regional legal contexts – each have an authority with management responsibility. The same may be said for natural protected areas. Whether they are local or national, management is always trusted to a person or body with management authority.

In the case in which the Manual is put to use in an area of a type other than cited above, this questionnaire should be given to a person who manages the area, or otherwise a representative with the highest management authority concerning the territory in question. For instance, if we consider an area of several hundred hectares that contains only municipal (public) property, our management authority will be the municipality. However, if the area has been entrusted to a private entity or other public institution, our authority will be the private entity or institution identified. If we are interested in an area of private property or similar, its owner/manager will be the person to which we give the questionnaire.

The questionnaire, as it has been structured, investigates all principal aspects of the site, and is divided into 5 sections. In the first section, we are interested in basic information about the site and its management authority. In the main section of the survey, we find four sub-sections that investigate environmental, socio-economic, and governance aspects of the site.

The information solicited in the questionnaire runs from knowledge of cartographic data and instruments possessed by the management authority for knowledge of the territory to the analysis of research supported by the authority, including national and international projects realised in the area. It asks about knowledge of ES and PES and about categories of stakeholders that maintain the highest levels of involvement in management. Economic data on expenses for management of the site, for employment of staff, and other economic and human resources are also solicited by the questionnaire. Finally, authorities are asked about potential threats or risks to conservation within the site.

The questionnaire can also be administered to more than one authority with territorial competence. Besides the risk of making your research more complicate, this additional information could help supply increasingly detailed information from the area on which the assessment can be based.

The data collected by this instrument may be difficult to relate to the spatial dimensions of the territory and this is why it is advisable to ask about availability of maps relevant to the site. The questionnaire requires a substantial amount of time to complete and may be self-compiled, although it is necessary to guarantee a certain amount of technical support during its administration.

What is the Questionnaire for Residents, and why is it needed?

This questionnaire (ATTACHMENT 3) has been designed for residents of an area and constitutes a brief interview that may be conducted by a researcher or self-compiled. Residents of the municipalities within the territory of interest are asked to evaluate aspects related to their quality of life and are asked about their knowledge of institutions and environmental values. The information requested regards their degree of satisfaction with life within the area with respect to major services that are available to them as citizens.

The other questions ask mainly about values attributed to ES, to the environment and to their knowledge of social and economic benefits that have been brought about by the institution of the site. The interviewee is asked about informational and educational activities developed by the management authority and about development of commercial activities grounded in existence of the site such as agritourism enterprises, restaurants, tourism agencies, environmental guides, horseback riding and others.

The questionnaire, thus, is designed to provide information on well-being of citizens, on their points of view on the institution, and on their perception of economic benefits. All of this information becomes particularly useful for assessing management effectiveness but is also essential for developing a general understanding of local governance.

The questionnaire is administered to residents or people living in the area (those who work there or have knowledge of the site). The optimal number of interviews required is around one-hundred, a number that can vary in relation to the type and geographical extent of the area. If the site is located in a small mountain area, it is highly probably that residents include those that live in the valley bottoms or in the nearest towns (including those municipalities not involved in site management). If the site consists of an extensive forested area around which towns are located, all citizens may be considered potential residents. If instead the site is located near a large urban centre, you may want to restrict interviews to only the administrative units, houses and buildings within the site boundaries. Each situation will require a different approach. It is essential, however, to involve the people who call the area their home. The minimum number of interviews in this case is kept to thirty individuals.

What is the Stakeholder/Privileged persons Questionnaire and why is it needed?

This questionnaire (ATTACHMENT 4) is designed for the principal stakeholders of each site in order to solicit a deeper perspective, above all from economic actors. This instrument, modelled after the DELPHI methodology (Bolognini, 2001) requires an initial meeting followed by a second administration which, in our case, can be skipped thanks to a direct face-to-face meeting with stakeholders.

The questions are open-ended and constitute a first analysis of points of strength, opportunity, weakness, and threats that concern tourism and recreational activities related to the site. Stakeholders are asked to indicate the necessary steps they would recommend to improve these services in their area, and which territorial actors (public and private) need to be involved.

One part of the instrument looks at ES and the perception of subjects regarding those ES tied to tourism. Stakeholders are asked whether they believe it is possible to design a form of payment to maintain these functions in order to assess the willingness and perception of economic actors that may hold a certain degree of representation locally.

Following this, the questionnaire investigates forest management to give an idea as to whether it is coherent with the maximisation of services, and if the initial institution of the site had

positive or negative impacts in both economic terms, and in terms of incentives given to enterprises and citizens.

In this case, the number of interviewees may be smaller than that required for other questionnaires due to the fact that we are asking for more qualitative information, and because we are asking these questions to persons occupied in specific niches (generally businesses). Around twenty subjects should be sufficient, but fewer interviews are possible depending on the characteristics of the site. This instrument should be administered as soon as possible, such that you, together with the management body and stakeholders, can evaluate how to proceed in the application of the Model. This questionnaire, and the DELPHI methodology, are more complicated to administer because they require availability of time and economic resources from commercial operators, who are generally quite busy. We suggest that the administrator of these instruments proceeds carefully and with few expectations. Most importantly, try to get introduced by an authority, institution or manager of the site in order to build trust with these actors. Offer your maximum degree of collaboration and flexibility at this phase. You may decide to proceed with a second round involving a "chat" rather than a second questionnaire in order to be less demanding on your participants. You should aim to conduct around twenty appointments.

What is the Questionnaire on the Value of Recreation and why is it needed?

The instrument for evaluation of recreational services (ATTACHMENT 5) derives from our classification of ES (which takes from the MEA, 2005) and is focused on cultural service C2. The survey can be administered to tourists or visitors that benefit from the site from a recreational standpoint. The instrument aims to understand who these beneficiaries are, which activities they enjoy at the site (e.g., hiking, climbing, biking, picking mushrooms, etc.), what they are looking for in terms of services, their perceptions of the environment, and the strengths and weaknesses of the area. Tourists are asked for recommendations and information that can be used to improve opportunities offered by tourism.

The questionnaire, which is anonymous, can be administered by you or data collector, or may be self-compiled. It is designed to be easily understood. Questions also regard economic aspects tied to visits. Data is collected on the number of persons present (friends and family) and their relative expenditures on equipment, parking, food and accommodation, etc. This information allows us to quantify results in monetary terms – in other words, to assign a monetary value to ES tied to recreational value. Among the information requested from tourists is data on distance travelled to the site, number of days of the visit, and accommodation selected in order to calculate the cost of the trip and willingness to pay. Following this, specific questions are used to gather data on whether visitors were already familiar with the site, when they visited for the first time, and whether they are returning or regular visitors. We also ask how they distribute their visits (and the purpose of the visits) over different seasons.

An important component of this instrument is a section that gather data on whether and how visitors have participated in initiatives organised by the managing body, their level of satisfaction with these events, and whether they are familiar with the Natura 2000 network. These responses generate feedback on the management and maintenance of the site and the possibility to introduce visitor fees or other types of self-financing mechanisms.

Also in the case of this instrument the number of interviewees is decided in relation to the recreational and tourism opportunities offered by the area and the accessibility of these. For instance, at our latitude, if the site is accessible by a busy trail that is easily accessible in one season, it may be worth carrying out another set of interviews in different seasons. The recommended total number of interviews is 100 (30 is the minimum), but if the area is designated for strict conservation and even access by foot is prohibited, then we have made an error in selecting that service for

questioning! Joking aside, if the area is truly impervious to human access, the number of interviews can be considered as indicative, and we leave it to your discretion to evaluate the exact number needed for application of the LIFE MGN Model.

What is the Questionnaire on Aesthetic Value and why is it needed?

This questionnaire (ATTACHMENT 6) asks questions relative only to cultural ecosystem services (C1) following our classification (MEA, 2005). It corresponds to the aesthetic value of the landscape. Indeed the questionnaire is very short and is based almost exclusively on an evaluation of preference for different landscapes shown in a series of photographs. Following this, we ask for consideration of value based on places present in the site in order to assess attachment of the population to those monuments or landscapes in aesthetic terms, but also in terms of spiritual sentiments and identity.

This questionnaire is to be administered near the site to visitors, residents and others. There is no minimum number of interviews that need to be conducted. You are free to conduct as many as necessary, as a function of the characteristics of the site and its spatial extent, but we can safely say that 100 interviews is an optimal result. If the site is very small and is not particularly well known, around 30 interviews is more than sufficient.

3. ASSESSMENT OF THE MANAGEMENT EFFECTIVENESS OF A SITE

3.1 Analysis of the natural characteristics of the site

In order to properly assess management, it is necessary to understand the natural heritage of the site and the conservation status of its various parts. We apply a part of the MGN methodology with the Management Authority questionnaire. Data from this instrument helps us immediately identify the habitats, ecosystems and species present in the area in order to gauge their environmental value. Environmental information is primarily collected through a review of the literature, which spans from local knowledge recorded in documents to scientific publications in national and international journals. If the site is located near a research institution such as a university, it is probable that theses and research papers of interest will be available.

Internet searches also yield useful information, but unfortunately it is often of less scientific rigour. However, as a first approach, this information can be helpful in revealing particular issues and policies.

Another important source of information, as already related above, is the management authority, who, in the most straightforward cases, are also closely involved in the management, maintenance and conservation of the site. This analysis can be conducted through face-to-face interviews or through use of a self-administered questionnaire, potentially with follow-up. The manager may have an official or unofficial “wish book”, or management plan that includes a prioritised list of actions regarding conservation of species and habitats. This instrument, if available, regardless of whether it has been officially adopted as a management plan (or in some cases under a different title, such as conservation measures or measures for safeguarding biodiversity, etc.), can provide much useful information on the status of the environment and on the conservation measures that have been identified.

Nonetheless, it must be clear that the goal of the LIFE MGN project is to contribute to reaching conservation objectives in each site, and as such, it is necessary to begin with information regarding the environment. If, in the end, the project manages to organise a PES scheme or other form of self-financing, this can be said to have been achieved only in order to increase to economic and financial resources to be used for conservation.

Analysis of management (analysis of management capacity, organisational footprint, financial flows, activation of projects, fund raising, etc.) and of documents where these data may be found.

The methodology contains an important section of analysis that is aimed at understanding the manager of the site. It is important to understand well the financial and human resources available to the management institution for conservation. This knowledge is important both for a comprehensive assessment and for an effective analysis of the most critical issues. The difficulties involved in finding financial data is owed to the lack of detailed accounting data, with columns for deposits and expenditures. As such, it becomes difficult to analyse site governance in detail.

3.2 Methodologies for assessment of management effectiveness

There are many methodologies available globally for analysis of effectiveness and efficiency and databases such as those maintained by UNEP and IUCN contain data on these variables with regard to protected areas management. Such methodologies have been grouped under the acronym, PAME (Protected Areas Management Effectiveness) because they were created for the

assessment of protected areas. All of these methodologies attempt to evaluate how protected areas are managed in terms of conservation effectiveness, conflicts between local peoples, and use of economic and human resources. An important reference framework for managers is adaptive management, which requires conservation actions to be evaluated with the passage of time, using feedback from the system in terms of successes and failures. These feedbacks can help attentive managers to change their approaches to conservation in light of new knowledge. Methodologies range from very simple to very complex. For LIFE MGN, we have adapted the MEVAP methodology developed by the working group led by Dr. Davide Marino at the University of Molise.

What are indices and indicators?

To apply our evaluation methodology, raw data is collected, analysed and assessed in relation to the questions we wish to answer. These questions include, but are not limited to: which species present in the area are important from a conservation perspective? How many are they, and what is their conservation status? How active are local non-governmental and civil society organizations? How has land use changed over the last ten years? The answers to our questions provide numerical or quantitative indicators. In other cases, qualitative indicators may be of interest. Putting together a series of data and indicators of different types, it is possible to obtain – using a decided upon codification scheme – a value that we call an index. This index may be included in an assessment report of the methodology and, when combined with other indices, can provide useful information regarding a site.

3.3 The MEVAP, mediated through and adapted to MGN

The MEVAP is a relatively complex PAME methodology, as we have already said, but for LIFE, we have adapted and simplified it such that it is now much more practical to apply. It is based on information collected at the site on various themes (during the desk study phase and during interviews with managers and others) but it is also based on at least three questionnaires that must be administered to three groups of important stakeholders: tourists, residents and institutional and private stakeholders.

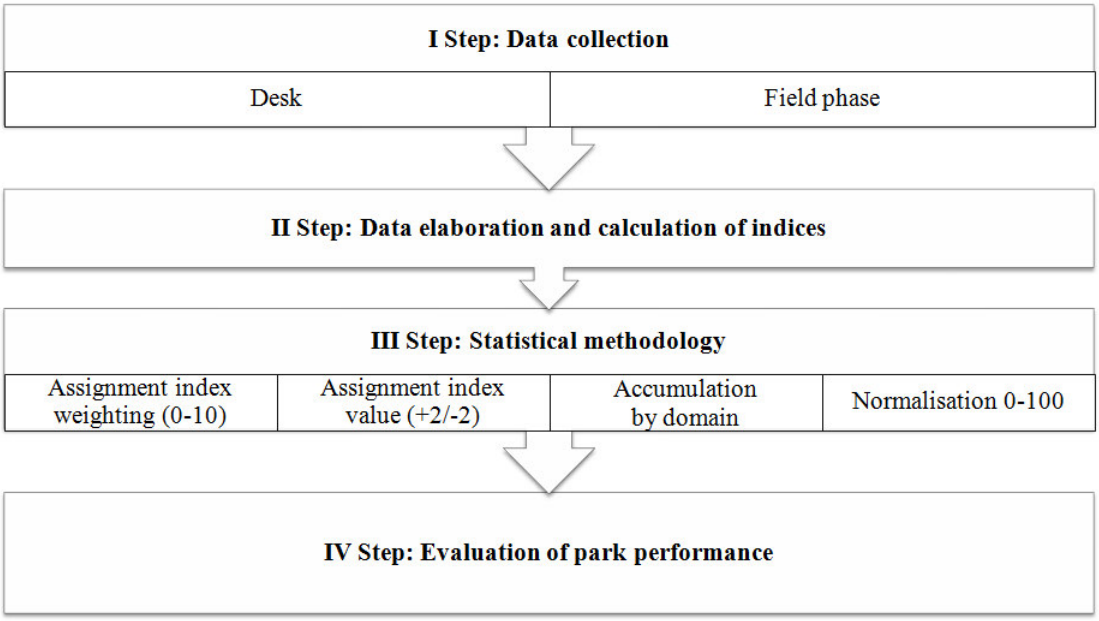
The methodology is based on four major lines of investigation or domains: the environment, society, the economy, and governance. Each of these domains is articulated into macro-objectives, which are divided into thematic areas that frame a series of indices and indicators. For example, for the environment domain there are indices that describe natural capital (macro-objective), and in particular, biodiversity (thematic area). For the economy domain, some indicators explore the macro objective “green economy”, while others refer to pressures on the site (e.g., the macro-objective, “pressure of the local socio-economic system”).

Throughout the phase of development of our methodology, we have narrowed our list from over ninety indices in our initial methodology to only thirty (5 in the environment domain, 10 in governance, 7 in society, and 8 in economy), which are sufficient for reading the context and analysing governance of the site (ATTACHMENT 7).

Process for application of the MEVAP methodology to LIFE MGN

This section gives potential users of the methodology a complete, stepwise description for correctly applying MEVAP (see table 1). The first step involves collecting the necessary data that allows for the calculation of indices (second step). The third step guides users through a statistical procedure that leads to evaluation of management (final step).

Table 1: Procedure for the application of the MEVAP methodology



First step: data collection

The data collection phase can be performed with the help of a simple survey form that allows for the successive cataloguing of information in a Microsoft Excel© database.

The collection of this information allows the researcher to collate all data needed for application of the MEVAP methodology, and further allows for a preliminary measurement of objectives reached by the management body. The type and nature of the information required mean that data collection is structured into two phases, comprising a desk review and a subsequent field research phase. Before these, however, an initial meeting with the site management body is recommended.

The acquisition of data during the desk review phase requires an examination of the calculable indicators using information available through official government channels (the national statistical institute, the ministry of environment, etc.), research institutes (ISPRA, universities, etc.), occasional reports (e.g. WWF and other NGOs), through consultation of websites of the management bodies of interest (Natura 2000 sites, AAPP, etc.), and finally, analysis of GIS data (CLC). In each circumstance, the availability and quality of data acquired will depend on the time of collection and the frequency at which data is updated. Once information and results have been collected during the desk phase, planning the field assessment phase can start, with the two-fold objective of 1) verifying and integrating the data acquired during the desk phase, 2) retrieving missing data necessary to complete the survey forms.

Data collected during both the desk and field research phases should be organised by domain. It is worth stressing that a best practice involves proceeding by thematic area, first in the desk phase and then in the field, immersing yourself in each specific component (environment, economy, society, governance). The aim is to gain familiarity with the information, including during the interview with the site management authority. In the field research phase, it is useful to begin with the local authorities (ARPA, municipalities, river basin authorities, etc.) for whom, given the

institutional tasks assigned to them, may hold detailed information essential for completion of the snapshot of knowledge required for MEVAP.

Second step: elaboration of data and calculation of indicators and indices

At the conclusion of the data acquisition period, you will need to begin to calculate and evaluate the indicators and indices. When analysing indices, it is wise to take into consideration the availability of data, the quality of information associated with the index under analysis, and most of all, the time series of data supporting the comprehensive evaluation process. Finally, even as our assessment should aim to be as objective as possible, there will always be a subjective component due to the perceptions obtained through dialogue with the site management authority.

The indices employed in the evaluation methodology of MEVAP are, by their nature, classified into two areas, referred to as “management” and “territorial”, which refer to their respective macro-objectives. This distinction allows you to highlight correlations between the operations of the management entity in relation to the environmental characteristics of the territory in which the area under investigation is found, and management of the territory by local authorities (the region, province, municipality, etc.) and the economic actors present. This analysis can show strengths and weaknesses through the process of achieving sustainable development objectives. Graphical interrelationships between the various macro-objectives, by domain, provide the elements necessary for description of the context as well as an evaluation of the position assumed by the area (ATTACHMENT 8).

The area of interest referred to as “management” is constituted by indices that are able to provide analysis regarding activities and interventions carried out by or promoted by the management authority (park, protected area, Natura 2000 site). These activities may cover the conservation and maintenance of natural resources, local socio-economic development projects adhering to principles of environmental sustainability, access to goods and services available in the area for environmental education and scientific research, and finally management capacity for the territory and efficient management underlying governance processes. The “territorial” indices were defined as such because they describe the environmental, social and economic context in which the area of interest is located. These indices describe activities carried out and promoted by the local administration (e.g., the municipality) and that consequently do not depend on the operations of the site management entity.

Third step: assigning points to indicators and normalisation of results

To allow for measurement of the performance of the area and their graphic representation following the MEVAP model, we assign a value from 0 to 100 to each macro-objective through a statistical and mathematical procedure based on scores calculated for each index according to weights assigned to them. The value associated to each index is attributed on the basis objectives or targets stabilised by national and international policies for which each index was selected by thematic area.

The reference targets, derived from national and international programmes and policies, are grounded in each circumstance in qualitative criteria (not directly quantifiable) that provide indications on the interpretation of results.

The scale of values proposed and used in the MEVAP methodology is as follows:

-2	Distance-to-target/objective:	**-50 e -100%**
-1	Distance-to-target/objective:	**0 e -50%**
0	Standstill	
+1	Distance-to-target/objective:	**0 e 50%**
+2	Distance-to-target/objective:	**50 e 100%**

The value assigned to the index, as opposed to its weighting, varies with variation in the context of each area that is the object of analysis. The weighting associated with each individual index was decided upon through a participatory process involving protected areas experts and academics. This phase concerned an important step in the definition of the methodology that allowed for the successive attribution of final scores to each of the indices and to the macro-objectives of the methodology (ATTACHMENT 8).

The *weighting of index* was attributed with reference to a range of values between 0 and 10 on the basis of the importance compared to the MEVAP model (macro-objectives/thematic areas) and is valid regardless of the area chosen for evaluation. Following the valuation practice, the score – which is identified with the assignment of a value and a weighting to each index – was calculated using the following formula:

$$Si = Vi \times Wi$$

where:
Si = Score of index;
Vi = Value of index (-2; +2);
Wi = Weighting of index (0 – 10).

The score attributed to each index must be normalised in order to change the scale, and thus to change the graphical representation (Cartesian coordinates) of the macro-objectives. The following describes the mathematical steps to achieve this.

For calculation of the coordinates, the following formula is applied to each macro-objective. We provide an example using the macro-objectives, “natural capital” and “maintenance and resource management”:

$$X\ (\text{Natural capital}) = \{[(\text{Mean G} + 100)/2 - (M)] \times 100\}/ N$$

(The same procedure is valid for the coordinate Y represented, in this case, by “maintenance and resource management”)

where:
Mean G = mean of the normalised scores of the indices that make up the macro-objective;
M = value shown in column M that represents the average of the values inherent in the second correction factor calculated for each index;
N = difference between L (average interval values in I and M (average interval values in K), that is, the difference between the averages of the first and the second correction factor.

Si (column F) = value (column D) x weighting (column E);
Si normalised (Column G) = score of the index (column F) x 100/20;
Si maximum achievable for index (column H) = 2 x weighting of index (column E);
First correction factor (column I) = Maximum score achievable for index (column H) + 20 x 5/2;

Minimum score achievable for index (column J) = -2 x weighting of index (column E);
Second correction factor (column K) = Minimum score achievable for index (column J) + 20 x 5/2;
Residual (column N) = average of first correction factor (column L) – average of second correction factor (column M).

Table 2: Example of application of MEVAP calculation

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Macro-objective objective	*Thematic area*	*Name of index*	*Value scale*	*Index weighting*	*Pi*	*Pi normalised*	*Pi Max index*	*1st correction factor*	*Pi min index*	*2nd correction factor*	*Average for column I*	*Average for column K*	*Residual (L-M)*
Natural capital	Biodiversity	Conservation status of habitats	2	10	20	100	20	100	-20	0	100	0	100
Natural capital	Biodiversity	Conservation status of species	1	10	20	100	20	100	-20	0			
Maintenance and management of resources	Forest and landscape resources	Management of pasture areas	-1	9	-9	-45	18	95	-18	5	**85**	**15**	**70**
Maintenance and management of resources	Forest and landscape resources	Management of forest areas	0	5	0	0	10	75	-10	25			

Fourth step: evaluation of the performance, positioning in the MEVAP model and reading of results

Each macro-objective investigated gets a score on a scale of 0 to 100 and is compared with the other macro-objectives of the same domain on a Cartesian graph, where at the apex, you have the nadir when both macro-objectives obtain the maximum score.

The realisation of graphs, made possible by mathematical calculations, represents the final step in the application of the MEVAP methodology. In this phase, in fact, it is possible to measure the position assumed by the study area with respect to the hypothetical nadir (100, 100). This step allows us to understand the orientation of the area relative to the paths defined in the graphical representation of the MEVAP model. As such, environmental resources, human activities and actions undertaken by the management body are related both to the territory and to the strategies and policies identified.

Figure 6 shows, for instance, the positions taken by three hypothetical sites with respect to two macro-objectives in the environment domain, "natural capital" and "maintenance and management of resources". Specifically, we can take note of the position of park A with respect to parks B (high conservation of natural capital and low maintenance of resources) and C (high maintenance of resources and low conservation of natural capital). The position of park A is better because it is closer to the hypothetical nadir. Park B shows, on the one hand, the worth of important natural heritage in terms of biological diversity (characterised by the environmental and territorial context in which the protected area is located). On the other hand, however, we can see the difficulty on the part of the park management authority in terms of managing this natural heritage and its resources. The opposite situation characterises park C.

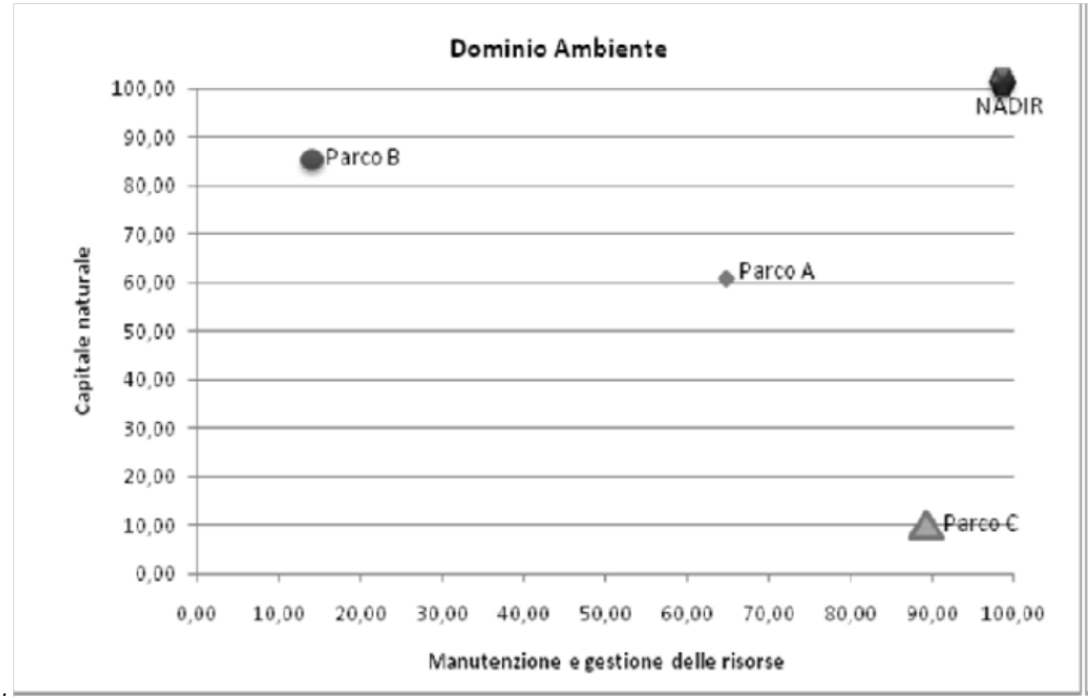


Figure 6: Position of parks in the MEVAP model: some illustrative examples

4. MAPPING AND QUANTIFICATION OF ES FOR A HYPOTHETICAL NATURA 2000 SITE AND FOR OTHER TYPES OF AREAS (E.G., AAPP, PUBLIC FORESTS, WILDLIFE PARKS)

A diversity of approaches and methods may be applied in order to map and quantify the flows, or potential flows of ecosystem services from a site. Each technique has advantages and disadvantages regarding, for example, the spatial resolution or precision of results, the complexity of its application or amount of data required. Selection of the appropriate tool always presents a compromise between resources available (local data, statistics, specialised analysts) and the best results obtainable. In any case, your choice should take into consideration the final use of your expected results. In order to identify priorities and orient conservation strategy, activities and management, qualitative and geographical approaches are both adequate and relatively straight forward to apply.

4.1 Qualitative mapping of ES

It is possible to attribute potential levels of ES flows (ATTACHMENT 8 and ATTACHMENT 9) on the basis of the biodiversity or particular ecological function expected for each habitat (local field data) or land cover type (CORINE 2006 data). Assuming proportionality between the expected level of biodiversity and an ES flow, it is possible to identify qualitative levels for potential flows based on the following scale:

- 3-very important,
- 2-moderately important,
- 1- somewhat important,
- 0-not significantly important

Using the levels above for each individual ES in relation to each habitat that makes up a site, it is possible to create GIS maps. Using a weighted average of the levels for an entire site (sum of levels, weighted by surface area of each habitat, divided by the total surface area of the site), it is possible to obtain the average level of supply of the ES under consideration for the entire site. Comparing the different ES, a classification of supply (ranking) can be defined and you can identify the most important ES for the site under investigation. For example, a site with large areas of mixed forest (CORINE class 131) will primarily be identified for its capacity for protection from soil erosion (R5) or mitigation of hydrological instability (R6) (see ATTACHMENT 1). Another site with high prevalence of fields and meadows, on the other hand, will be more important in terms of production of forage (F1) or supply of species for hunting (F3).

On the grounds of land cover data (CORINE 2006), this potential supply has been calculated for all Italian Natura 2000 sites. The results may be visualised and analysed using the dedicated WebGIS portal. A user manual is available for training and use of the WebGIS portal (www.lifemgn-serviziecosistemici.eu).

4.2 Quantitative assessment of ES

The following sections contain descriptions of the methodology used to quantify and assess each ES in monetary terms. For further details on this methodology, please consult **Report B1.1** on the project website: www.lifemgn-serviziecosistemici.eu

F1 - Cultivation

Analysis of supply

The supply of food products can be determined on the grounds of the average productivity of the soil (disaggregated by type of food product). This data is generally available from statistical agencies (e.g., ISTAT for agriculture) or local databases (associations or agricultural organisations and consortia). In the absence of direct data, it is possible to obtain estimates of the average productivity (t/ha) on the basis of provincial or regional data (sources are ISMEA/ISTAT for Italy).

Analysis of demand

Demand may be quantified using national data on per capita food consumption (e.g., INEA 2012; EFSA 2011) (table 3) multiplied by the population of the area under study.

Table 3: Food consumption in kg per capita 2010 (INEA 2012).

Products	Consumption (kg per capita)
Wheat, corn	160.0
Rice	10.4 *
Potato	44.1
Fresh tomatoes	8.6
Processed tomatoes	47.6
Apples	22.5
Pears	11.5
Peaches	15.9
Grapes	14.0
Lemons	40.7
Oranges	21.5
Oils and vegetable oils	35.0
Sugar	43.6
Wine (litres per capita)	35.9

* data from 2009

Monetary valuation

The service has a value equal to that of products available at the average market price (Power 2010). This value can be derived from the relative price by food group (source: ISMEA).

F2 - Forage and pasture

Analysis of supply

The most precise quantification of supply comes from data on the average annual production of forage on the pastures internal to the site. In case this data is not available, it is possible to estimate potential production using a model developed for the Alps that takes into account the topography, land use, average production per typology of meadow/pasture and growth period (Egger et al., 2005; Schirpke et al., 2013). In this model, the average production is corrected using slope inclination and exposition, which act to accelerate or slow the growth of vegetation, and the amount of water available during the period of growth (Egger et al., 2005). Where it is not possible to apply this model or where it is not applicable (for example, in the case of poor pastures in Mediterranean climates), it is possible to use average productivity values available at the regional or provincial level (table 4). In Italy, ISTAT provides values for the regional level for various forage types.

Table 4: Average forage production per Region (ISTAT 2003).

Administrative Region	Meadows (t/ha)	Pastures (t/ha)
Piemonte	15.4	2.6
Valle d'Aosta	20.0	3.5
Lombardia	29.9	3.3
Trentino-Alto-Adige	25.2	4.9
Veneto	26.0	4.8
Friuli-Venezia-Giulia	14.9	3.7
Liguria	11.8	3.4
Emilia-Romagna	13.8	7.6
Toscana	8.0	5.3
Umbria	4.8	3.7
Marche	9.7	6.8
Lazio	9.1	3.3
Abruzzo	9.6	2.4
Molise	5.3	2.9
Campania	10.5	4.5
Puglia	3.1	0.9
Basilicata	4.9	1.6
Calabria	5.1	2.3
Sicilia	3.3	2.1
Sardegna	11.8	2.8

Analysis of demand

The direct demand for F2 may be quantified using data on average consumption per livestock head (subdivided by type) and the dimension of the herds or farms present in the area. An indirect estimate of demand for F2 is linked to data on consumption of products derived from livestock (cheese, meats). This may be quantified using national data on per capita food consumption (in Italy: INEA, 2012; EFSA, 2011) (table 5), multiplied by the population of the study area. The result (total local consumption of products derived from livestock) may then be converted back to the number of animals necessary to provision this quantity of food. From the 'number of animals necessary', we can then calculate the average consumption of forage per livestock head and arrive indirectly at an estimate of demand for F2.

Table 5: Food consumption, kg per capita 2010 (INEA 2012).

Products	Consumption (kg per capita)
Fresh milk	70.0
Butter	2.9*
Cheese	22.6*
Total meat	90.0
Beaf	23.0
Pork	38.0

* data 2009

Monetary valuation

The economic value of the service is calculated as its cost of substitution. Market prices oscillates between €10 and €15 per quintal (for an example, see http://www.pratodiano.it/prodotti.php, http://www.forumdiagraria.org/cavalli-f17/prezzo-fieno-t4985.html).

F3 – Hunting and fishing

Assessment of supply

Species hunted

In the absence of a census or register of animals hunted, the quantification of supply of F3 may be estimated based on the area of land or water known to support the species of interest and the estimated density of the species in its optimal condition. For hunting, deer, hares and chamois are related to two distinct systems:

- Hills or plains for deer and hare
- Mountains and alpine areas for chamois

The quantification of supply may be estimated using a calculation of total suitable area based on a reclassification of the CORINE land cover data and based on national literature (e.g., Bon et al. 1996; Spagnesi & Toso 1999; Grassi 2005; Vigorita & Cucè 2008), and on animal counts that may be potentially sustained by the site based on density (animals/100 ha) recorded in the area (ATTACHMENTS 10 AND 11). These densities are estimated based on available literature and then taking as a conservative guideline, values of 50-70% of the maximum recorded densities. This means quantification is realistic only for natural land cover mosaics with total surface areas above 100 ha (or 1 km^2). Finally, for chamois (also potentially for bighorn sheep and ibex, where present) we consider only sites where its presence has been confirmed, while in our calculation, we include only land cover at elevations higher than 600m.

Species fished

For fishing, it is essential to have direct data (e.g., number of licenses, catch data), as the productivity of water bodies is commonly influence by stocking of fish (fry or adults) and removal. From direct data, we may calculate the mean annual catch (e.g., per km^2 or linear km of coast/shoreline). An indirect (modelling) approach would involve understanding local variables

connected to suitability of the water body for the principal species of fish (e.g., depth, flow velocity, current). This is normally not practical for our purposes.

Assessment of demand

The demand for species that are hunted or fished depends on the number of hunters and fishers in an area. A quantification of demand may be derived from census data of members of local associations, which usually also contribute to the maintenance of habitats and stock of prey. With this data, however, we risk missing occasional fishers/ hunters and tourists, which, in some areas, may constitute an important addition to the number of beneficiaries of these services (e.g., in the case of fishing tourism sites). In such cases, tourism statistics may have relevant data, where available.

Monetary valuation

As with other provisioning services, the value of this service may be approximated using the market price of goods. In Italy, wild meats may not be legally sold on the market. As such, the price of these goods may be estimated using market prices in nearby countries where this is permitted (Slovenia, Austria), as was done in the case of a study for the *Parco Naturale Adamello Brenta* (De Marchi & Scolozzi 2012). For sites where hunting and fishing are not permitted legally, the calculated value should be understood as a potential value for these services.

The price of these goods, however, do not include non-use or indirect values. For instance, hunting and fishing may generate income in terms of cost of travel, food and accommodation in the surrounding area, cost of equipment, permits or licenses. We may calculate, for example, that each hunter spends an average of €1720 each year for this activity (Federcaccia 2011, in De Marchi & Scolozzi 2012).

An approximation of the total monetary value of this service may be obtained using the following formula:

$$Expenses_{tot} \times No.\ practitioners + Value_c \times No\ animals\ (+ Cost_{licence} \times No\ licences)$$

For $Expenses_{tot}$: Total annual expense for the activity (e.g., including for equipment, travel)
$Value_c$: Specific value per animal and type of wild meat, determined by the average price of the meat on the market multiplied by the average weight of the species at age where hunting is permitted (€/kg). In the case of deer and chamois, this value should be added to the average price per trophy.

F4 – Wood, fibre

Assessment of supply

The quantification of productivity requires the following data:

- Surface area per forest type,
- The incremental value per type and per region (In Italy, INFC, 2005)

Reference information for an estimate of forest surface area at the provincial level has been derived from CORINE Level IV and V data (CLC2006). This represents the most detailed, recent spatial data for mapping the principal forest types present at the national level. To these classes, we have found corresponding forest types in the most recent national forest inventory and carbon sequestration data (INFC, 2006) (ATTACHMENT 12). For each polygon of forested area in the CORINE

2006 dataset, we can attribute an annual potential productivity using INFC data adapted to the CORINE classes (ATTACHMENT 13), as follows:

Annual productivity

where:
a = forest area with prevalence of species *i* in region *r* included in the site
Ic = current increment of species/group of species in *I* and region *r*
The evaluation is based on the limitations of the local road network by distance (up to 1000m).

Assessment of demand

The demand for woody biomass can be approximated from the average consumption in the community or region of interest. For consumption of industrial timber, we use direct data for the amount of timber available from forest management plans or local statistics. For domestic consumption (firewood), considering that:

- 19.9% of families use wood more than four times a year (with significant consumption of wood), with significant differences between mountains (municipalities > 600 m.a.s.l.) 35.3%, hills (300-600m) 20.5% and plains (< 300m) 14.9% (Caserini et al., 2008);
- Consumption varies notably between urban centres of different size (table 6).

Demand may be estimated as follows:

demand (t/year)=

where
i : municipalities intersecting the area of the Natura 2000 site
Fam_i : families of the municipality *i* (considering 1 family = 1 dwelling/household)
$Cons_i$: average consumption per household according to the population classes of the municipality *i*
$QuotaCons_i$: percentage of families that use wood in the municipality *i* according to its altitude

Table 6: Wood consumption by size of populated place or urban centre (from Caserini et al., 2008)

	Wood biomass for energy consumption (t)	**Average consumption per household (t)**
Total for Italy	19 111 481	4.3
Up to 5000 inhabitants	9 416 914	5.3
5 001 – 20 000 inhabitants	6 466 704	4.3
20 001 – 50 000 inhabitants	1 281 647	2.4
50 001 – 100 000 inhabitants	801 721	3.2
Over 100 000 inhabitants	1 152 495	3.3

Monetary valuation

The potential value of the service may be estimated from the market price of the relative product. In the case of firewood, prices for 2013 vary between €296/t (pellets) to €151/t (mixed split logs), with an average value of €223.5/t (source: http://www.centroconsumatori.it).

F5 – Mushrooms and truffles

Analysis of supply

The productivity of forests for mushrooms and truffles is quite variable, and depends on local conditions (e.g., micro-climate, soils, vegetation cover), but also harvesting pressure and other disturbances. As such, in the absence of direct data pertaining to an area (e.g., a survey of harvesters or number of permits sold), estimates based on generalised local productivity data are possible, but not of very high quality.

By way of example, you can assume an average annual productivity of mushrooms and truffles in the range of 1.5 – 3 kg per hectare of forest (Croitoru & Gatto 2001; Goio 2006). It follows that an estimate of supply of this service may be obtained by multiplying the suitable forest area (CORINE classes 231, 243, 244, 311, 312, 313, 321, 322, 324 below 2000 m of altitude with slope inferior to 80%) by this figure for average annual productivity.

Assessment of demand

Mushrooms and truffles do not constitute primary or raw materials, hence, no specific demand exists. In approximate terms, it is possible to estimate potential demand based on numbers of potential beneficiaries (harvesters), taking into account the population of nearby municipalities and the maximum recommended consumption per week (0.25 kg/person ➔ 13 kg/year; source: www.coldiretti.it).

Monetary valuation

The value of the service may be estimated from the average market price of the good that is potentially supplied. Considering only mushroom (because of large variation in the price of truffles due to the characteristics of each individual sample), from their average price of €22.50/kg between fresh and dried (De Marchi & Scolozzi 2012) it is possible to estimate monetary value as follows:

$$\text{Value (€)} = \text{Area}_{\text{suitable}} \times \text{Productivity}_{\text{average}} \times \text{Price}_{\text{average}}$$

F6 – Medicinal plants

Assessment of supply

The 'Medicinal and Aromatic Plants Working Group' focusses on ten wild plant species that are considered a priority: *Achillea millefolium, Artemisia abstinthium, Carum carvi, Gentiana lutea, Hypericum perforatum, Melissa officinalis, Menthe piperita e Mentha spicata, Origanum sp., Salvia officinalis, Thymus vulgaris, Thymus serpillum*. These species (with the exception of *Gentiana lutea*, which is threatened at the European level) are reasonably common and are not associated with particular Natura 2000 habitats. As such, the assessment of supply requires census data on medicinal plant use (e.g., botanical studies).

Assessment of demand

It is not possible to quantify the specific demand for this service.

Monetary valuation

In some cases, permits are required for collection of medicinal plants, but generally, in protected areas, even occasional collection is prohibited. As a consequence, the economic value of this service in protected areas is not associated to actual harvest, but to existence value or bequest value, which can be defined using contingent valuation, by willingness to pay for potential future use.

F7 - Genetic resources

Assessment of supply

The maintenance of animal genetic resources (AGR) and plant genetic resources (PGR) is usually limited to traditional or customary land use systems, while the benefits may be interesting at the regional and global levels. Being a services that bundles practices and the particular environmental conditions of the place, the valuation of the supply of genetic resources may be performed only in the presence of specific data that is directly derived from registers of local species or varieties, for instance, local registers of autochthonous livestock breeds with limited geographical distribution that are maintained by the National Association of Shepherds (*Associazione Nazionale della Pastorizia*).

Assessment of demand

For genetic resources, it is not possible to evaluate demand. At the level of the individual producer or productive activity, the resources is easily substitutable (e.g., with other races/varieties available), whereas at the global level, demand for solutions to global environmental change is theoretically unlimited (e.g., to address the vulnerability and risk to the decreasing number of varieties and species in use).

Monetary valuation

The definition of economic value for this service is complex. Usually local landraces and PGR are characterised by modest yields (e.g., in terms of the amount of meat or grain harvested). As a consequence, they risk extinction because of their replacement by high yield varieties or breeds. Their conservation value may be characterised as a public rather than a private good. The community of beneficiaries usually does not possess the resources to compensate suppliers of the service and only public entities (e.g., conservation agencies) that recognise the importance of agrobiodiversity may play a significant role as users of the service. In some cases, a specific type of certification – a geographical indication – may be able to satisfy a particular demand and thus see a certain willingness to pay for the product (and the service attached). In any case, the conditions of the supply and demand reference very specific mechanisms (e.g., local initiatives) and as such, it is not possible to generate even a rough estimate for the value for genetic resources.

F8 – Fresh (potable) water

Assessment of supply

The assessment of supply may be calculated through an analysis of the water balance of the study area using hydrology models or simple estimates of the capacity of watersheds (precipitation – evapotranspiration). An indirect quantification may be based on the total amount of potable water available in an area for public consumption.

Assessment of demand

Demand for potable water can be calculated on the basis of the resident population of the area of interest using average consumption statistics per person (available from the national statistical agency).

Monetary valuation

The value of potable water is equal to the price of water multiplied by the volume of water available or withdrawn from the source. The price of water may be known using water bills (e.g., €0.4/m^3 in Morri et al. 2014) or using the average market price.

R1 – Carbon sequestration

Assessment of supply

Sequestration of carbon (C) is calculated only for the forests categorised as 'tall forest stands'. It is calculated separately as stocks (quantity of C stored in woody tissue, carbon storage) and as processes or flows (annual amount of carbon sequestration).

The stock is calculated using the average above ground biomass (trunks, stumps and large branches) per hectare per forest type in the region. The proposed method involves an adaptation of that used in the National Carbon Accounting method (Federici et al., 2008), which in turn is based on the IPCC methodology (IPCC, 2003). The methodology considers three of five carbon sinks (above ground biomass, below ground biomass and litter). The contribution to forest soils of dead woody material is not considered because this quantity depends highly on forest management, for instance, on the differences between tall trunks and coppice, which are not possible to differentiate between the Natura 2000 habitats.

The process of sequestration is estimated only for the above ground component of the forest due to a lack of data on the volumetric quantity of roots, soil carbon storage and amount of litter. We use data relative to the current increment, as a function of tree phytomass present for each type of forest, differentiated by region. The phytomass is then converted into carbon, considering a generalised ratio of carbon/phytomass (0.5) (Pilli et al., 2014) and a ratio of fresh weight to dry weight specific to the type of forest.

Quantification of the stock (tC of forest carbon at the site):

data from INFC:

Mepi = Above ground phytomass per hectare per region by forest type (ATTACHMENT 14)
Rad = Root/shoot ratio, which converts above ground biomass to below ground biomass (Attachment 15, ATTACHMENT 16)

Let = Relation C litter– above ground C per hectare to convert above ground biomass to litter (Attachment 1)
tC (site-i, region-r) = above ground biomass (trunks, large and small branches) + below ground biomass + litter

with
$a_{t,i}$ = area of forest type t in site i

Quantification of process (tCa of forest per year per site):

data from INFC:

Incr = Current increment in above ground tree volume per hectare per region per forest type (Attachment 1)
BEF = Conversion factor BEF (above ground biomass/growing stock, Biomass Expansion Factor) (Attachment 17)
WBD = Basal density of wood, dry weight/fresh weight (t/m^3) (Attachment 17)
tC/year (site-i, region-r) = Incr x BEF x WBD x 0.5

Note: in the absence of INFC data, you must make use of habitat and CORINE land cover data by referring to values and corresponding coefficients in ATTACHMENTS 14-18.

Valuation of demand

Notwithstanding the fact that carbon sequestration is the most globally recognised ecosystem service (i.e., there is a major intergovernmental institution, the IPCC, that deals specifically with this service), it is not possible to define a simple relationship between well-being and quantity of CO_2 in the atmosphere. As a result, it is impossible to quantify demand on the part of beneficiaries for this service (the global population). Nonetheless, the service 'responds' to the necessity of balancing anthropogenic CO_2 emissions, to which we associate the phenomenon of climate change.

Monetary valuation

This service is valued socially (for the global community) and is quantifiable on the basis of social damages avoided by non-emission or sequestration of CO_2 in the atmosphere (Stern, 2007). The calculation of social costs is complicated by our limited knowledge of highly complex climatic processes and by the difficulty involved in ascertaining economic values in conditions of high uncertainty. Diverse estimates have yielded highly heterogeneous results: from $32 to $326 USD per tonne of C (InVEST User Guide, Carbon Storage and Sequestration, 2014)

In lieu of a simple answer, an approximation of the value of this service is proposed defined by the price of emission trade permits on the market. Drawing on a real world example, in May 2008, the European Climate Exchange (ECX) price for carbon was $153 USD / t C, but in 2012 this value had fallen to under $12 (€10). This value oscillates every 10 minutes (http://www.theice.com/emissions.jhtml).

European Directive 2003/87/CE decreed that as of January 1st, 2005, no industry in the energy, steel, mineral, ceramics or paper sectors are permitted emit greenhouse gasses without authorisation. Each industry that does not obtain a number of emission permits sufficient to cover emissions during the preceding year is obliged to pay a sum for emissions in excess, at a cost of €100 per tonne of carbon (tC). Following these guidelines, we can assume that the maximum value of

carbon sequestration is equivalent to the sanction for excess emissions (compensated by sequestration). In order to circumvent the problem of oscillations in the price of emission permits, we can monetise this service by referring to this potential maximum value of €100/tC. In this case (and more generally where dealing with monetary valuation), the ideal would be to calculate a range of values between min and max.

R2 – Local climate regulation/air purification

Assessment of supply

In the absence of specific studies (e.g., collection of atmospheric data, estimates of leafy cover by specific vegetation types, estimate of rate of deposition, calculations of capture of airborne pollutants by surface area covered by vegetation), we propose an approach that is applicable to Natura 2000 sites. We estimate sequestration of PM_{10} based on average coefficients of annual capture by vegetation type in kg/ha. The choice of PM_{10} as pollutant is justifiable by the fact that its capture by plants is not influenced by their metabolic activity (photosynthesis, respiration) that, in turn, is tied through complex relationships to numerous local variables (e.g., micro-climates). On the other hand, small particulates are among the most abundant and damaging pollutants in Italian urban areas, including minor and dispersed populated centres (and as such, problems are not only limited to metropolitan centres).

Capture coefficients have never been defined for Natura 2000 habitats. Thus, we propose a first approximation using data available in the literature (Beckett et al., 2000) by CORINE land cover class (table 7). Multiplying the surface area of each CORINE land cover class included in the site by the relative capture coefficient, we obtain a rough estimate of the capacity of capture of PM_{10} for the site. Given that the process of capture of small particulates is proportional to the quantity of particulates in the area (no available data), these estimates must be understood to be purely indicative and to show only potential of the site.

Table 7: Capture coefficients for PM10 by CORINE land cover class (level III).

CORINE land use categories	**Coefficient**[a]	**Methodology**
311. Broad-leaved forest	160 kg ha^{-1} $year^{-1}$	1/3 value per conifere
312. Coniferous forest	490 kg ha^{-1} $year^{-1}$	approx. average of max values of Escobedo & Nowak 2009, Nowak et al. 2006, computed on fully wooded areas (x 4)
313. Mixed forest	325 kg ha^{-1} $year^{-1}$	average of the previous

a. The coefficients do not take into account the contribution of low bushes and grassy cover types.

Assessment of demand

For quantification of demand, we use data on emissions (from environmental monitoring) or potential emissions per land use type or productive activity (e.g. factory, road, agricultural land, etc.). These data are considered for a buffer area around the site (defined based on the size of the site) in order to calculate mean annual pollution (or potential in the case of an estimate).

Monetary valuation

A method based on avoided costs is an approach that is well adapted to this ES and that corresponds to reduction of damage incurred. In this approach, the value of the service is equal to potential social costs, or negative externalities on society, caused by emission of the quantity of PM_{10} removed by plants. The values of these negative externalities may be drawn from work by Nowak et al. (2008), which estimates of an average cost of €4828.22 (2007) for each tonne of PM10 emitted into the atmosphere (range: 2800 – 16 200 $1992/t, data in Matthews & Lave, 2000).

R3 – Water recharge

Assessment of supply

In the case that data is available regarding precipitation, soil permeability, velocity of surface and subsurface flow (Anuraga et al., 2006), the choice between various dedicated instruments (e.g., ARIES, InVEST, SWAT, VIC) depends on the specific questions to be answered (e.g., generalised indications or precise quantification). Either way, these tools require specialised knowledge and capacity (Vigerstol & Aukema, 2011). VIC (Variable Infiltration Capacity) is likely best adapted tool of those listed above due to its ability to estimate movements in volume between atmosphere, surface and sub-surface water through precipitation, evapotranspiration, infiltration and runoff. It also deals well with local phenomena such as snow, ice covered surfaces and meltwater. The principal disadvantage of VIC, other than the complexity of its application and calibration to individual cases, is its scale of application. It is usually applied at the large watershed scale (from regional to continental scale) and at low resolution (typically using 1km grids), with results that are not well suited to smaller Natura 2000 sites.

A more approximate approach was developed by Morri et al. (2014) based on coefficients of retention for different types of cover and forest management for the Marche region (

Table). By multiplying these coefficients by the relative surface area of each land cover type, we can obtain an approximation of the volume of water stored in the watershed (subtracted from the runoff).

Table 8: Coefficients of retention in relation to forest management (adapted from Morri et al., 2014).

Forest cover	**Retention ratio (% of retained runoff)**
Coppice woods	88.4
Mature forests	83.5
Transitional forests	80.0
Unmanaged and mixed-aged forests	83.1
Reforestation	89.6

Assessment of demand

For quantification of demand for water, we refer to data available on water consumption for domestic, industrial and agricultural use within the watersheds intersecting the site.

Monetary valuation

This service is among those least visible from the standpoint of beneficiaries (e.g., residents) and as such, methods of contingent valuation (WTP/WTA) are difficult to apply or yield meaningless results. An indicator of value could be built upon avoided costs for obtaining the same service artificially. In this case, we calculate the cost of an artificial reserve with the same functions of the ecosystems of interest. In other words, we estimate the equivalent capacity required (volume in m^3) to match water absorbed into sub-surface storage. In the study cited above, this cost is estimated at €9.8/m^3 (Morri et al., 2014).

R4 – Water purification

Assessment of supply

In order to quantify this service, we need to have knowledge of, and be able to localise, both point sources and nonpoint sources of pollution load (demand). The service depends exclusively on the function of ecosystems that are interposed between sources of pollutants (up slope) and recipient bodies (rivers, lakes, seas) and their relative beneficiaries (down slope). These conditions limit the significance of this service for Natura 2000 sites. Generally, the largest protected areas may be found in the upper parts of watersheds (mountains). These do not have 'up slope' areas with possible nonpoint sources of pollutants. Smaller sites (e.g., in valley bottoms) may not play a significant role with respect to the large areas characterised by diffuse, nonpoint sources (e.g., intensive agricultural land uses). With data available regarding potential load of pollutants (e.g., N_{tot}, P_{tot}/year), the specific capacity of removal for each soil type or cover type, and precipitation and mean flow, it is possible to quantify this service (kg P or N removed/year) using available models, including InVEST 2.6 and BASINS.

Assessment of demand

The demand for purification of water is equal to the quantity of pollutants present in the water body, including those emitted by point and nonpoint sources. This demand may be estimated using coefficients of release of nitrates and phosphates specific to land uses or land covers within the basin of interest (e.g., Lin, 2004).

Monetary valuation

The value of the service can be defined on the basis of avoided costs of equivalent purification by mechanical, chemical and/or physical means, using the following simple calculation: **cost per kg removed x kg removed.**

R5 – Protection from erosion and geological instability (landslides, slope instability)

Assessment of supply

This service depends on the presence of areas at risk in terms of geological instabilities or erosion to which functioning ecosystems may contribute to stability, and on the presence of beneficiaries, residents or activities that are at put at risk by these instabilities (demand). To quantify this service (protection from erosion), being in possession of the necessary data (at least that which is relative to slope, geology, soil type and precipitation), we may apply one of numerous models

available, for example, EUROSEM (European Soil Erosion Model), EROSION-3D, WATEM, USLE, RUSLE2 (for details, see http://www.soilerosion.net/). Erosion protection may be approximated in terms of avoided erosion potential using a map of erosion potential and defining the specific contributions of forests areas. Specifically, this approach, developed for two Italian watersheds (Morri et al., 2014), consists in the calculation of the difference in erosion potential between forested and non-forested areas within equal slope inclination classes. To quantify the probability of landslides, we refer to the inventory of Italian landslide phenomena (Inventario dei Fenomeni Franosi in Italia, IFFI) (APAT, 2007).

Assessment of demand

For the regulation of instabilities, demand may be quantified using data from the inventory of Italian landslide phenomena (IFFI). The IFFI provides a detailed picture of the distribution of landslides in Italy, and includes a map for each region (APAT, 2007). For regulation of erosion, demand can be defined using maps of erosion potential (Van der Knijff et al. 1999; Grimm et al. 2003).

Monetary valuation

The method of avoided costs and costs of substitution are among the most appropriate for monetising this service, which consists in limiting or avoiding damage due to natural phenomena. The cost of artificial protection with equivalent function in the case of landslides, or the cost of restoring soil fertility in the case of erosion potential may be good indicators of economic value. For slope stability, an approach applicable to Natura 2000 sites where maps are available for hydrogeological risk uses costs of substitution for equivalent engineering solutions for forests in areas at risk. This approach, developed for the Parco Naturale Adamello Brenta (De Marchi & Scolozzi, 2012), is constructed on the groundwork laid by a previous study of the forests in Valdastico (Notaro & Paletto, 2012), and involves the multiplication of the area of forest cover by different categories of risk in order to arrive at the relative cost of substitution, as follows:

- Area at high hydrogeological risk: €254.27/ha (2012)
- Area at risk from avalanches: €608.89/ha (2012)
- Area at moderate hydrogeological risk: €159.86/ha (2012).

If erosion potential maps are available, Morri et al. (2014) propose an approach for estimating the cost of protection against erosion. They multiply the volume of avoided erosion potential by the average soil density (1.4 t/m^3) and the cost of restoration (estimated at €41/ m^3 for the Marche region).

R6 – Protection against hydrological instabilities

Assessment of supply

To precisely quantify this service, it is necessary to utilise hydrographic models at the watershed scale that are capable of estimating flooding events, provide infiltration flow rates during exceptional precipitation events (historical sequences on a decadal scale) and identify areas at risk from flooding. Many hydrological models cited above for regulation of water and erosion (see R3 and R5) may be applied for this purpose. Among these, the SWAT model is most informative and may be applied using the open source software, Automated Geospatial Watershed Assessment (http://www.epa.gov/nerlesd1/land-sci/agwa/), which was developed by the U.S. Environmental Protection Agency (EPA) and the Department of Agriculture (USDA) Agricultural research Service

(Miller et al., 2002; Kepner et al., 2009). The practical applicability of this model to Natura 2000 sites is severely limited by the quantity of data necessary and by the technical competence required to calibrate the model. The ARIES system provides a simplified model to identify areas of concentration of surface water flows – hence at risk from flooding ('sinks') – but this model depends on a remote GIS server to store local data.

For a spatial assessment, we can use interception rates or a qualitative scale of capacity defined for different land use classes, as proposed by Nedkov & Burkhard (2012). With infiltration data for each vegetation type, it is possible to arrive upon a rough calculation in terms of potential volume of water stored during precipitation events by multiplying the coefficients in table 9 by the surface area of each corresponding land cover type (see also table 10).

Table 9: Interception rates (from Nedkov & Burkhard, 2012).

Interception rates of selected vegetation types according to different data sources.

Type of vegetation	Interception				Source
	mm		% of annual precipitation		
	Average	Dimension	Average	Dimension	
Forests		0.15–7.5			Kittredge (1948)
		0.3–7.5			Zinke (1967)
Coniferous forests	3.9	0.3–7.6			Zinke (1967)
			30		Tate (1996)
			26		Carlyle-Moses and Price (2007)
Spruce forests	4.3	2–5.2			Nedyalkov and Raev (1988)
			29		Florov and Dimitrov (1968)
Pine forests	1.8	0.9–4			Nedyalkov and Raev (1988)
	5.2	4.8–5.4			Polyakov et al. (2008)
Deciduous forests		0.2–2			Zinke (1967)
			13		Carlyle-Moses and Price (2007)
Hardwoods	4.8	0.5–9.1			Zinke (1967)
Eastern hardwood forest			13	10.0–16.0	Tate (1996)
			14		Florov and Dimitrov (1968)
Beech forests	3.1 (2.9)	2.6–3.2			Polyakov et al. (2008)
Oak forests	2.4 (1.9)	0.9–2.8			Polyakov et al. (2008)
			21		Tate (1996)
Litter	5.8	0.5–11.2			Zinke (1967)
Litter coniferous forests			5		Tate (1996)
Litter deciduous forests			3		Tate (1996)
Shrubs	1	0.3–1.8			Zinke (1967)
Grasslands	1.3	1–1.5			Zinke (1967)
			15	10.0–20.0	Tate (1996)

Table 10: Interception capacity of different land cover types: from 0=not significant to 5=maximum (from Nedkov & Burkhard, 2012).

Land cover	Interception
Discontinuous urban fabric	0
Road and rail networks	0
Mineral extraction sites	0
Non-irrigated arable lands	1
Fruit trees and berries	3
Pastures	2
Agriculture and natural vegetation	2
Broad-leaved forests	4
Coniferous forests	5
Mixed forests	5
Natural grasslands	2
Moors and heatlands	2
Transitional woodland-shrub	3
Bare rocks	0
Sparcely vegetated areas	0

Assessment of demand

The demand is defined by the presence of artificial productive or urban land cover (e.g., industrial, residential, roads) in areas at risk from hydrological instability. In the absence of maps of risk, demand may be estimated using hydrological models cited above or historical data (e.g., past floods and slides). An approximation would involve analysis of the intersection between arbitrary areas internal to water courses (buffers) or areas with high potential of accumulation of precipitation (DEM analysis and determination of 'flow accumulation'), and urban areas. From these intersecting areas, we can find the population or number of activities at risk.

Monetary valuation

This service, as with preceding services (R3 - R5), is difficult to monetise as it does not have a direct use value and depends on the probability of extreme events. The calculation of avoided costs is complicated by the uncertainty of hydrologic phenomena and weather events and by specific local risk factors (e.g., the presence of activities or buildings with high value or density). The value of this service may be found in a similar mode to R5, beginning with costs of protective structures or regulation of flow with functions analogous the those of forest ecosystems. An example could be the cost of laminated basins capable of collecting volumes similar to those stored by forested land covers, which may be calculated as indicated above.

R7 - Pollination

Assessment of supply

Starting with the assumption that bees and other pollinators require habitats for hives or nesting and require food (flowers) nearby, a module included in InVEST permits us to map their potential presence. These maps can be used to estimate an index of pollinator abundance capable of having an impact on each cell of agricultural area in the model. It takes into account the flight range for each pollinator species and their potential density, which depends on land cover. This model uses

a simple function in order to translate abundance of bees into value to agriculture in each agricultural cell.

The InVEST model may be easily applied to Natura 2000 sites where the service is of real importance (presence of surrounding agricultural fields). The data necessary include: land use, pollinator species that can be associated with species cultivated, relative attributes regarding density of nests or hives, range of action, seasonality and food preferences. In synthesis, the method consists of the following steps: Selection of pollinators potentially present at the site within a maximum range of action; selection of habitats that are critical for the selected pollinators and verification of their presence at the site; and selection of crops associated with the pollinator within their maximum range. For more detail, refer to the InVEST manual (Tallis et al., 2013).

A less involved approach requires the definition of an arbitrary maximum distance from the site – the distance of probable visits (e.g., a buffer of 1.5 km) – and identification of the cultivated areas within this buffer (areas receiving benefits from the service).

Assessment of demand

Demand can be quantified in terms of surface area cultivated (ha) or number of farms that benefit from pollination services, using data relative to the area cultivated within a predetermined distance from the site.

Monetary valuation

In the literature, cases of monetary valuation are based on avoided costs or cost of substitution. For example, these have been calculated for several tropical crops based on the costs of artificial manual or mechanical pollination (Allsopp et al., 2008). A more approximate approach consists in the attribution of a commercial value to agricultural products that depend on pollination services (Losey & Vaughan, 2006).

R8 – Pest control

Assessment of supply

To quantify supply, it is necessary to have data available on habitats that support species useful for pest control within a site, data related to adjacent cultivated crops, and specific information on both the biology of pests and useful species. In order to assess this service correctly, the following steps are required as a minimum:

1. Mapping: ascertain the concurrence of beneficial species (and their habitats) in the site and the crops in their vicinity. Select the useful species with the highest range of action and identify the crops that may benefit within this range of the site;
2. Quantification: Recognise the species that are harmful for target crops and the average potential damage caused by pests (e.g., kg of product damaged per individual). Estimate the effectiveness of reduction of pests by beneficial species (e.g., predation of pests per individual of useful species). Estimate the potential abundance of useful species and pests in the area of interest. Calculate the removal potential for pests and the relative quantity of agricultural products potentially 'saved'.

In practice, knowledge about biological relationships between useful species and pests is still quite limited and has been developed only for a handful of crop types (certain arable crops). In the literature, numerous studies qualitatively demonstrate the existence of biological control, yet few

try to quantify this phenomenon (Griffiths et al., 2008). A generic estimate may be made by identifying the cultivated areas within an arbitrary distance (the average range of action of the beneficial species, e.g., 2.5 km) and by utilising data from the literature on potential rates of damage (e.g., Losey & Vaughan, 2006: 15% - 39% of harvest), which may be avoided with pest control. Multiplying the average production (e.g., in kg/ha) by the total area benefiting from the service (within 2.5 km of the site) and by a factor of damage avoided by pest control (0.15), we can obtain an estimate of the harvest saved thanks to the service.

Assessment of demand

The demand may be quantified by identifying the surface area of cultivation benefiting from the service within a distance from the site representing the range of action of the beneficial species.

Monetary valuation

Referring to avoidance of damage, the economic value of the service is equal to the cost (avoided) of the potential damage caused by the pest in absence of the beneficial species (Losey & Vaughan, 2006). In practice, this is obtainable as follows: the mean value of production (€/ha) is multiplied by the area that benefits from biological control (ha) and by the proportion of production that is potentially damaged (e.g., 0.15).

R9 – Habitat for biodiversity

Assessment of supply

A simple quantification of this service consists in a count of the habitats present, or potentially present, within the site. In order to perform a quantitative assessment, we use rarity and vulnerability as attributes of these habitats. For example, the InVEST module (Tallis et al., 2013) evaluates the quality and rarity of habitats as functions of four factors: the relative impact of each threat, the relative sensitivity of each habitat type to each type of threat, the distance between habitats and the source of the threats, and the degree to which the territory is legally protected. As such, the inputs required include a map of land use and land use change, the sensitivity of the various land use types to each threat, spatial data on the distribution and intensity of each threat, and the relative location of the protected area.

Assessment of demand

Given the non-linearity (and limited knowledge) of the relationships between the number of species or habitats and their benefit flows, it is not possible to quantify a specific demand for this service. The demand for biodiversity is for the most part associated with the flows of specific environmental benefits, and thus can be reference to other particular services (e.g., pollination, biological control).

Monetary valuation

The value of biodiversity in and of itself is complex and multi-dimensional and includes both use and non-use values. The use values are generally linked to services we have already dealt with (regulation and provisioning), while the non-use values closely approximate the intrinsic value of biodiversity. Specifically, non-use values are subdivided into bequest value, derived from the benefit of knowing that the ecosystem good or service will be available for future generations) and the existence value (the value associated to a good, even if it goes unobserved or is never used). For

these values, the most suitable methods for measurement are those of 'declared preference', in which, as in contingent valuation, subjects are asked to associate the good to a monetary value (Gios & Notaro, 2001). Contingent valuation is based on questionnaires and requires particular attention to sampling design (in order to obtain significant results), and to design of the questionnaire (in order to be free of ambiguities).

C1 – Aesthetic value

Assessment of supply

Sites in the Natura 2000 network present distinctive characteristics that are often quite diverse in a variety of contexts. Other characteristics held equal, a change in maintenance of a landscape, its vegetation structure, the presence of an abandoned landscape or a highly modified one, for instance, with numerous infrastructural elements and presence of trash, can have a negative impact on the observer's visual perception of the landscape (Beza, 2010). Drawing on eco-field theory (Farina et al. 2005; Farina 2006), a landscape exists only if there is an observer (both human and animal observers can be counted) that perceives and interprets the landscape as an 'interface between needs and resources'. Considering these assumptions, and following a review of the literature, we have proposed a questionnaire to be employed for assessment of the landscape. This questionnaire can elicit preferences through, for example, photographs specific to each site that reproduce the various types of habitats and/or possible visual scenes with the substitution of characteristic elements (for example forest in the place of meadows, homogenisation of land use, missing vegetation, etc.) and the presence of undesired elements (e.g., garbage, infrastructure). The preference values obtained through administration of the questionnaire – with reference to each land use type – can be subsequently extended to larger landscapes using qualitative mapping.

Assessment of demand

We hold that it is not possible to quantify the demand (if not in terms of the number of potential beneficiaries) because, generally, the entire population may appreciate and benefit from an aesthetically pleasing landscape. Nonetheless, through the questionnaire, it is possible to draw out results on preferences (relative values) with regard to landscape configuration. These results may be used to provide information on the most desirable types of landscapes.

Monetary valuation

The beauty of a panorama or landscape influences values in relation to this good within a territory (Luttik 2000; Tyrväinen & Miettinen 2000). This process underlies the method of hedonic value, developed in the 1960s and used to estimate the monetary value of beauty of a panorama through quantification of a 'revealed willingness to pay'. The method seeks to identify how much of the difference in the values of the properties is due to a difference in the specific environmental characteristics. Typically, this difference is observable in a difference in price of the rooms in a hotel with or without a view of the natural panorama (e.g., a lake, a mountain, a forest). This method involves the following steps:

- Specification of the type of resource and the relationship with the ES (e.g., property near the site),
- Collection of information on the ES in different situations and areas (e.g., property value) in which there is variation in the quality and quantity of the ES (e.g., with/without panorama, with specific visual elements in the panorama),
- A statistical (econometric) analysis.

The application of this method requires a large amount of data (cases) and complex analysis to exclude non-pertinent variables (e.g., the influence of other variables or other visible natural areas that are found outside of the site).

C2 – Recreational value

Assessment of supply

In agreement with the most notable studies examined, we propose a brief questionnaire to be administered to the site manager or to tourism enterprises to capture the primary outdoor activities (and the physical area they require), important attractions (natural and cultural monuments, amenities, etc.) that may be visited, and to assess potential limits on access. Data obtained may be mapped in cases in which location of an activity or attraction is provided. An example of some possible questions is listed below:

Activity	Yes	No	Measurement units
Trekking			Km of foot paths
Hiking destinations			Number and category (alpine huts, peaks)
River fishing			Km
Lake fishing			Km^2
Birdwatching			Km^2
…			…

Assessment of demand

Demand for recreational activities is not easily quantified as recreation qualifies and a general need of the entire population. It may be useful, regardless, to give a questionnaire, with a map for support, to visitors of a site (tourists and residents) to understand their motivations for their visit, and more to the point, which activities or attractive elements drew them to the place, where these activities are practiced, and where attractive elements are known to be. The results of this survey can provide cartographic data on each activity or class of attractive element (e.g., monumental trees, waterfalls and water bodies), from which we can obtain a sense of the density of activities and preferences by producing cartographic overlays from each respondent's data to create a single density map.

Monetary valuation

The monetary value of recreation of a site may be obtained from data on the expenditures of visitors and tourists. This is the sum of all expenses from visitors for purchase of goods and services used during their visit or vacation. According to findings on tourism statistics (Department of Economic and Social Affairs, 2010), the expenses involved in tourism represents the real value of tourism products, which for parks and protected areas, is comparable to the recreational value for a site. In the absence of data on tourist expenditures, monetary measurement of recreational value of a site may be estimated from park income, where entrance fees exist, or through methods for measuring the cost of the trip. The method for cost of trip measures the willingness to travel (expenditures of time and money) in order to enjoy a site, using the following steps:

- Collection of information (through interviews and questionnaires) on costs of the trip, motivation, frequency, attributes of the destination and data on the visitor (ATTACHMENT 5);
- Estimation of the cost of travel (including associated costs, e.g., for food and accommodation) and of time spent travelling.
- Calculation of the total cost of the trip using the following formula:

Total cost = Cost of travel + Extra Costs + Time Cost

Using this method, through use of specific questions in the questionnaire or interview, it is easier than using tourism expenditures to distinguish the recreational value of a site (use value, but not consumptive use) from the aesthetic value (non-use value) or from values of other adjacent natural areas.

C3 – Inspiration for culture, the arts, educational and spiritual values and identity

Assessment of supply

We again propose administration of a questionnaire to managers and residents in which we ask each to identify the places or sites in which certain values or services are considered important, the degree of appreciation, etc. Data obtained in this way can be used to plot sites and places on a map. An example of possible subjects for the questionnaires include:

- Existence of monuments or places of historical or identity value, how many, where and why?
- Existence of places of religious, patriotic or cultural importance, how many, where and why?

Assessment of demand

Demand is not easily quantifiable, as in the cases of recreational and aesthetic value, and as is supply. As such, evaluation of this service is grounded in an investigation of preferences.

Monetary valuation

The value of inspiration may be monetised only when there are tangible economic benefits tied to the site in terms of production, presentation, and exposition of artistic works (e.g. books, images, videos) and cultural events (e.g., festivals). The method, as above, involving trip costs can give some indications regarding appreciation of elements of artistic or spiritual inspiration if this is not limited only to residents near the site. Sociological, anthropological/ethnographic research with questionnaires or interviews are the only means that are potentially effective for revealing values that are so intangible (qualitatively and relatively).

5. BENEFICIARIES AND STAKEHOLDERS: SELECTION AND ENGAGEMENT

Who is a stakeholder?

Any individual, group or institution interested in the ES identified in the pilot project site; whoever can influence or is potentially influenced by a project activity and can either benefit or lose by its implementation, whether conditions change or remain the same. In our project, the following categories of stakeholders can be identified:

- Provider – manager of the ecosystem service: The individual, group or institution that maintains or contributes to maintenance of the ecosystem service provided in the pilot site of the project.
- User of the ecosystem service: The individual, group or institution that benefits directly and indirectly from the use of the ecosystem service delivered in the pilot project site;
- Intermediary – facilitator: individual, group or institution that can facilitate the definition and sharing of a voluntary agreement for a payment for ecosystem services (PES) scheme.

These categories can be divided into:

- Direct/primary: The social and economic actors directly interested in and/or responsible for, in positive or negative terms, of the management/maintenance of the ES or those who use it directly and draw direct benefits from it.
- Indirect/secondary: The social and economic actors who do not participate directly in, or do not lose out directly from, the effects of an activity or a measure connected to the project, but can influence positively or negatively the process or the direct/primary stakeholders.

What does stakeholder analysis mean?

Stakeholder analysis allows for identification of key social and economic actors. These actors will be engaged one way or another in the different phases of the process in order to reach the objectives of the project (i.e., set up a shared governance model for a PES or a self-financing mechanism that sees an increase in conservation effectiveness in the pilot site). Stakeholder analysis is used to identify the role and influence of different social and economic actors that are either interested by, or connected to the ecosystem service delivered in the pilot project site.

Why is stakeholder analysis important?

Achieving the objectives of the project depends on the correct selection of interested actors, whom must work together with the project team or researcher to identify a PES schemes or a self-financing mechanism considered sustainable from economic and social perspectives, and in compliance with regional or national regulatory frameworks. An in-depth stakeholder analysis can therefore support the project leaders in identifying:

- Interests of actors that can influence or be influenced by the project;
- Potential conflicts that can jeopardize the outcome of the project;
- Opportunities and relationships that can be developed during implementation of the project;
- Actors that must be engaged and actors who should be encouraged to participate at different stages of the project;
- Adequate stakeholder engagement strategies and approaches;
- Approaches to reduce negative impacts to vulnerable and disadvantaged actors.

Full participation of stakeholders both during project development and implementation is quite crucial, even though it does not guarantee ultimate success.

When do you carry out the stakeholder analysis?

Stakeholder analysis can be carried out during all stages of the project cycle, but it is recommended at the beginning of the project. During this stage, stakeholder analysis is a key component of the *context analysis*, comprising an initial identification of key interested actors, important and influential actors, and how they can be best involved in the project.

During project development, a detailed stakeholder analysis, including all main actors, will contribute to model the development of strategic actions and inform *risk analysis*. During implementation, stakeholder analysis will contribute to identify whom, how and when the interested partied should be engaged in the project and programme of activities.

Finally, during assessment and review of the project/programme and the sharing of results, stakeholder analysis will enable evaluation of the effectiveness of engagement of interested parties, both in terms of support and opposition.

How is stakeholder analysis developed and how is it used?

Given potential impacts on behaviour and the influence of stakeholders on the success of a project, it is often advisable to ensure adequate space and time for the stakeholder analysis at the project outset and development phases. This way, legitimate interests and concerns will be addressed more effectively during implementation, evaluation and review of the project. There are several ways to approach the stakeholder analysis. The three most common approaches include workshops, focus groups and interviews. All three approaches can be used during the project cycle, appropriately adapted to the evolving needs of the project. Regardless of the approaches selected, there are three fundamental steps to stakeholder analysis:

1. Identify key stakeholders and their interests (positive and negative) relative to the project;
2. Assess influence, importance and project impact on each of the interested stakeholders;
3. Identify the most effective stakeholder engagement approach.

Identify key stakeholders and their interests (positive and negative) relative to the project

All ecosystem services are connected to two groups of stakeholders: providers/site managers of the service, and users/beneficiaries. To analyse the groups of stakeholders, it is possible to either start from the situation analysis and think through the stakeholders who are associated with each ecosystem service; or start from the analysis of stakeholders who may be tied one way or another to the pilot site, and connect them to the ecosystem service based on their role, concerns or opportunities.

Key questions during this phase are the following:

How are ES used? Who uses them? Who maintains them and who threatens their conservation?

Who is most dependent on the ES considered? Is it for survival or for economic benefit? Are the benefits from this ES substitutable by other services or resources?

Who has rights over the ES in the site or over the resource on which the ES considered depends – including legal jurisdiction and rights of use?

Are different sectors of the public administration involved? Are national, regional or local bodies to be included due to specific legislation?

Who are the people or groups that are most knowledgeable and capable of maintaining and managing the ES? Who is currently in charge of managing the ES? Who guarantees its maintenance? Who makes its use possible? With what results?

Are included groups and their interests stable both geographically and temporally, or are there regular or seasonal variations?

Are there events or trends that currently intersect with stakeholders (e.g. initiatives that favour local development, regulatory reforms, land abandonment, population increase or decrease)?

Was a similar initiative carries out in the same area as the current project (e.g. self-financing mechanisms for protected areas or payments to utilise natural resources)? If so, to what degree was the project successful? Who was responsible and how did local stakeholder respond?

The first step is to brainstorm all possible stakeholders by using the guideline questions above. To have a first list of possible stakeholders, responses to ATTACHMENT 2 will help. The different social and economic actors are there listed by group and typology.

Table 11: Stakeholder analysis

Stakeholders	***Role in relation to ES***	***Interest***	***Position***	***Relevance to the project***

The second step is qualitative analysis, including the assessment of stakeholders related to the ES identified. The specific social and economic context of the site is analysed. The management authority and the different actors involved in the management of the pilot site, including trade unions, intermediary groups or actors able to provide useful information are contacted and asked to provide the names of potential stakeholders related to the specific ES. The list of stakeholders can increase or decrease as the analysis proceeds and in-depth understanding is gained. Table 11 allows to carry out this second step, by identifying key stakeholders and their interests.

In the first column of the matrix, stakeholders are listed based on responses to the questions above and numbered for easier referencing. The role in relation to the ecosystem service is described (providers/site manager, user, intermediary; direct or indirect) in the second column for each stakeholder.

In the third column, the interest of the stakeholder is described in relation to the nature and use of the ecosystem service (e.g. means of subsistence, profit, lifestyle, cultural and spiritual values). In the fourth column, the position of each stakeholder is indicated (e.g. property, rights of use, administrative or legal responsibility, intellectual property rights and social obligation).

The last column refers to the relevance of the different stakeholders in the project. The level of importance (low, medium and high) for each stakeholder is assessed based on how much their

participation is indispensable to the application of the governance model. The level of importance is high when the definition and implementation of a PES scheme or a self-financing mechanism is not possible without their participation; average when their engagement can be useful yet not indispensable; low when their engagement bears no influence on outcomes.

Following the initial analysis, each stakeholder group is known as in-depth as possible and the individual (or group of individuals) who can physically join the process (or can decide who will represent them) is identified, by creating a "List of stakeholders" complete with contact information.

For a more detailed analysis of each group or single individual stakeholder, it is possible to use the outline in table 12.

Table 12: In-depth analysis of interested stakeholders

STAKEHOLDER	**RESPONSE**
What is their interest in the ecosystem service?	
What can we expect from them?	
Points of strength	
Points of weakness	
Threats	
Opportunities	
Engagement priority (1-indispensible, 2 high, 3 medium, 4 low)	
Which type of collaboration are we seeking?	
Are there previous collaborations?	
Are contacts already established?	
Reference person	
Mailing address	
Email	
Phone/Fax	
Cellular phone	

Tables 11 and 12 can be used together to create a Word file for each individual stakeholder. Alternatively, the Excel files in the Attachments contain comments and useful indications for compiling and analysing in detail the characteristics of each individual stakeholder.

Assess influence, importance and project impact on each of the interested stakeholders

Key questions for the second step of the stakeholder analysis can include the following:

Who is *directly* responsible for decisions of importance to the project?

Who holds positions of responsibility in the organisations and interested institutions?

Who has influence in the pilot project site?

Who will be interested in the outcomes of the project?

Who will promote/support the project, provided they are included?

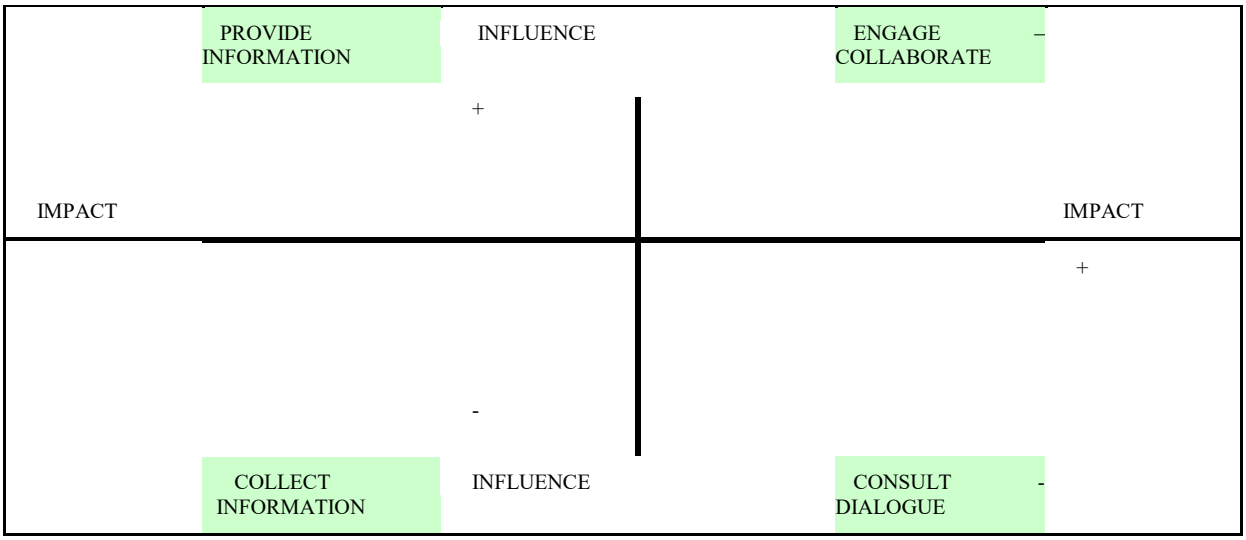
Who will block/obstruct the project, if not included?

Who was included in the project area in the past?

Who was never included until today, but would like to be involved?

The second phase of the stakeholder analysis should assess the influence, importance and level of impact of the project, and consequently, effects on the expected results. A simple grid can help to define how different types of stakeholders could be included in the different phases of the process (table 13).

Table 13: Impact and influence of stakeholders (the boundaries of the project are indicative)



Stakeholders are organised according to their potential influence on decisions and the potential impacts of project decisions upon them. This analysis can be carried out by using sticky notes and flip charts.

It is recommended that relations within and among stakeholders in each sector of the grid are taken into account (e.g. responsibilities, rights, levels of conflict); as well as possible strategies, approaches and methods to engage different stakeholders in the management of the process aimed at implementing PES schemes (See LIFE Project Report Actions B.4 – B.9; www.lifemgn-serviziecosistemici.eu).

The following questions could be used to position the different stakeholders in table 13.

What is their relation with the ecosystem service?

Can they influence the success or the failure of the project?

What is their relation to the site manager/project partner responsible for the action?

Where are they located in the grid compared to where we think they should be located in terms of influence/impact?

Identify the most effective stakeholder engagement strategy

The third (and last) step refers to the selection of the stakeholder engagement strategy, whereby different stakeholders will be engaged differently during the different stages of the project: collection and provision of information, consultation, dialogue, collaborations and partnerships. Once the opinions of the stakeholders have been collected and understood, a decision can be taken regarding the feasibility and continuation of the collaboration. This will depend on the level of

engagement and on the possibility of reaching the final objective of the project. The use of an inclusive and transparent approach during initial project development and following implementation will contribute to create a sense of belonging and commitment.

If it is not possible to include all key stakeholders from the beginning, it will be necessary to include them in a step-wise fashion. Depending on the position of the group or the individual stakeholder in terms of impact/influence on the project (Table 13), the stakeholder engagement strategy can include the following:

Provide information: When a stakeholder is located in this quadrat, it is sufficient to provide the social and economic actor with adequate information on the project, its objectives and its general impacts on the territory. We do not expect a response or a direct return from this stakeholder. Information sharing will however be useful and sufficient to prevent and manage possible conflicts and will include project newsletters, invitation to access the website and online social networks (Facebook and Twitter), as well as invitations to participate in local project presentation events. Data collected will be added to List of Stakeholders and sent to the project communications manager.

Collect information: The data collected will include information for the development of a possible PES scheme, the inclusion of other stakeholders, as well as context situations and expectations that could influence positively or negatively the development of actions within the project. Actions will include submitting questionnaires to tourists, hikers, and residents to collect information on the use of the ES and willingness to pay to maintain it. These stakeholders need to be informed appropriately on the project and goals of the project and when possible, with follow-up information on the development of the project as outlined above.

Consult – dialogue: The economic and social actors included in this quadrat can influence and determine the process. For this reason, they need to be consulted and engaged throughout the process. Approaches to ensure consultation and dialogue have to be identified on a case-by-case basis. Actions can include personal visits to the office or home of the person identified, phone interviews as well as follow up invitations to the meetings of the working group to ensure the maximum level of participation to the process. Even though they are not indispensable, these types of stakeholders could play a decisive role in ensuring a positive outcome and the achievement of the objectives of the project. These stakeholders also need guaranteed access to information on the project as outlined above.

Engage – collaborate: Engagement and collaboration with these stakeholders is indispensable to the definition and implementation of PES schemes or self-financing mechanisms. These stakeholders will have to be active part in the definition and implementation of the PES scheme, and develop an agreement, memorandum of understanding or another legal tool to formalize the implementation of the PES scheme. Besides compulsory information sharing, consultation and dialogue, participation of qualified moderators needs to be guaranteed in the working groups or in one-to-one meetings. Lack of engagement or unavailability to collaborate in the realization of the project will lead to the failure in reaching the final objective.

Methodologies to guarantee the effective and efficient participation of social and economic actors are multiple and will depend not only on the phase of the process, but also on the type of actors involved. For the purposes of the LIFE MNG project, the European Awareness Scenario Workshop (EASW) methodology was considered of practical application and easy to use. The methodology was designed to promote social participation in innovation processes and sustainable development. The methodology was promoted in 1993 by the European Union in the Community Programme Values Interfaces Research – Society. The objectives of EASW are to reduce the distance between those who work in programme development, research and development, and those who

benefit directly and indirectly to processes of change. The EASW methodology is a structured participatory approach aimed at:

- Capturing emerging perspectives/perceptions/ideas held by different social actors in strategic sustainability areas;
- Developing a platform for possible trajectories supporting local development projects;
- Favouring exchange of information, opinions and ideas among citizens, associations, technicians, public administrators and representatives of the business sector;
- Identifying and discussing diverse perceptions on problems and solutions;
- Favouring public debate in local communities on possible planning scenarios from diverse points of view.

The EASW methodology includes structured workshops for citizen and local stakeholder groups to meet in working groups as well as in plenary sessions to build the three phases of the methodology:

1st phase: a shared assessment on the points of strength and weakness, threats and opportunities of the territory;
2nd phase: positive and negative visions on which to reflect *ex post*;
3rd phase: strategies and actions to promote adaptation of the territory analysed and lived.

The methodology has the advantage of obtaining significant results in a very short time frame. The workshop generally lasts two to three days and includes:

- Listening and sharing activities among different categories of sectorial actors/citizens, following a structured approach;
- Creation of future scenarios across sectors and a common vision for the territory (identifying convergent elements among different scenarios);
- Definition of ideas-proposals for change with actions, supporting roles and follow-up pilot projects. Mix between creative phases of work and "participatory project development";
- Negotiation to select the priority areas of work. Mix between working groups and plenary sessions.

The identification of the best engagement approaches for each stakeholder group and during the different phases of the project as outlined in the EASW methodology is summarized in table 14.

Table 14: engagement approaches during the different phases of the process

Stakeholder group		Phases of development of the process			
		Initial phase	1^phase	2^ phase	3^ phase
Sharing	Collect information				
	Provide information				
	Consult and dialogue				
	Engage and collaborate				

Engagement methodologies, facilitation and meetings organisation

The participatory process has to engage all local stakeholders and institutions governing the territory and managing the sites. It will have the following objectives:

- Identify possible PES schemes or self-financing mechanisms for the ecosystem services identified as a priority in each of the pilot sites;
- Increase knowledge and awareness on the value of natural capital in the Natura 2000 sites included in the project and the ecosystem services provided.

The EASW methodology can be simplified and adapted to address specific needs. It can include one or more working group meetings involving all interested stakeholders, as well as follow up one-to-one meetings with the social and economic actors identified as strategic for the definition and sharing of a PES scheme and/or a self-financing mechanism.

The working groups are not an alternative to the one-to-one meetings with selected stakeholders. Similarly, the one-to-one meetings cannot completely substitute the working groups which include all stakeholders identified during the stakeholder analysis. What needs to be assessed in each individual case (depending on the interest demonstrated by the stakeholders) is whether additional working groups are needed or whether it is preferable to begin right away with one-to-one meetings.

Three meetings of the working groups should achieve the following objectives:

1st Working Group meeting: identify enabling conditions and expectations of different social and economic actors interested in the selected ecosystem services and in defining a possible PES scheme or a self-financing mechanism. Brainstorming and collection of ideas related to the valorisation of the selected ES;

2nd Working Group meeting: Points of strength and weakness, threats and opportunities of PES schemes or self-financing mechanisms proposed for the different ES in the project sites. Brainstorming and collection of ideas for further possible PES schemes or self-financing mechanisms;

3rd Working Group meeting: sharing and assessment of effectiveness of the governance tools identified for the PES scheme or the self-financing mechanisms. Presentation of the draft agreement or memorandum of understanding.

Managing the first Working Group meeting with stakeholders

- letter of invitation (ATTACHMENT 19) to all selected stakeholders, signed by the manager of the Natura 2000 site, and including the following information:
- general presentation of the project and explanation of the rationale for engaging the specific stakeholder;
- invitation to participate actively in the first meeting of the Working Group;
- reference to the website of the project for further information.

All invited actors need to be listed by category to later assess the level of interest demonstrated in their responses to the proposal for collaboration.

A follow-up phone call will solicit a response and verify the participation of stakeholders in the first meeting of the Working Group. Specific attention will be devoted to the stakeholder categories identified as strategic for the different ecosystem services.

When participants arrive and register to the meeting, it is essential to collect the following information:

- Personal information of all participants, specifying the category/organisation, and using the appropriate registration form (ATTACHMENT 20);
- Submit the questionnaire at once (ATTACHMENT 22), requesting its compilation at the time of registration and before the beginning of the meeting. The questionnaire assesses current knowledge on Natura 2000 sites, awareness on the value of ecosystem services, and knowledge of PES schemes.

Provide participants with a folder including the following documents:

- Meeting Agenda, with information on the timing and length of the meeting (ATTACHMENT 21);
- Flyer or other material briefly introducing the project;
- Material for carrying out the activities of the meeting (at least two sticky note pads, white paper for note-taking and a pen);
- Final questionnaire to assess the outcomes of the meeting (ATTACHMENT 23).

Introduce the meeting, including acknowledgments, welcome participants, outline the meeting agenda (to be written on a large board or on a PowerPoint, and given to participants in a folder), confirm the schedule for the meeting and request whether there are any special needs.

General presentation of the project and of the ecosystem services identified: If the meeting of the Working Group is based on the site and not on a single ES, include a general presentation of the project and its objectives (it is possible that people who never participated in the project may attend). Presentation of the different ecosystem services, providing information on their economic valuation and indication on the role that interested stakeholders may play (providers and users of ES).

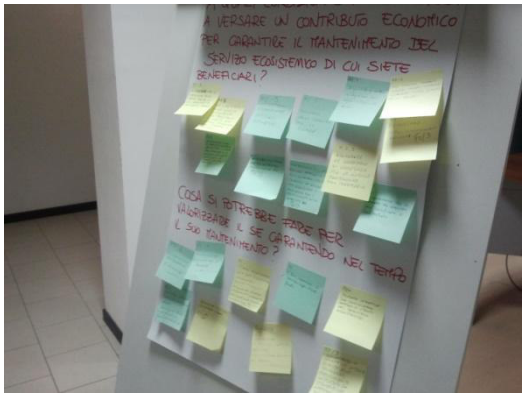
Collection of contributions from participants: set up three 70X100 cm posters regarding the ES identified, and include the following questions at the top:

1st Poster: What do we need to ensure the maintenance of the ecosystem service? What are the conditions and what are the expectations for committing to its maintenance?

2nd Poster: What conditions and expectations influence the availability of economic contributions that support the maintenance of the ecosystem service, through a possible PES scheme or a self-financing mechanism?

3rd Poster: How do you value the ecosystem service? (Ask participants to write a personal thought on how the specific ES could be given a value, based on monetary recognition of the commitments taken to maintain the ES, or as a form of self-financing in the management of the Natura 2000 site).

Two coloured sticky notes (e.g. yellow for stakeholders who identify themselves as providers of the ES, and orange for those who identify themselves as users of the ES) are used by participants to respond to the questions on each of the three posters.



Photos 1 and 2: Posters with questions and use of sticky notes help to organize assessments, ideas, proposals, and contributions of stakeholders in the plenary session.

Read all sticky notes on the posters by question and cluster similar responses. This step involves free brainstorming activity of participants. It is recommended that the reading and clustering activities be carried out by providing space for comments and reflections from participants, e.g., sharing of possible clustering options.

Discussion and debate on the list of responses from the three posters.

Taking note of the topics raised for discussion if they are considered important and adding them to the reading of the posters will simplify tracing the discussion in the meeting report. A final brief presentation outlines how the participatory approach will be carried out (providing a brief overview of the contents and methods of work in the following meetings as well as possible agreement on one-to-one meetings with selected key stakeholders). Request to fill the final questionnaire which assesses the meeting, and collect the completed questionnaires at the end of the meeting or before participants leave.

Meeting report, analysis of data and information collected during the plenary meeting

After the first plenary meeting of stakeholders, a draft detailed report is prepared with information from the sticky notes, observations and contributions provided during the course of the open debate. The meeting report is important for two reasons:

It quickly provides participants with a review of the results obtained during the meeting, thus supporting continuous interest and attention to the process. The meeting report needs to be sent to all participants of the meeting soon after the meeting;

It allows for keeping track of the information and contributions provided by the different stakeholders at the meeting in an organised fashion. The information in the report includes analysis of responses in Questionnaire 1 (at the beginning of the meeting), responses in the sticky notes, and inclusion of the key stakeholders. These are the basis for formulating a first hypothesis of a PES scheme which may be applicable to the specific context.

The first hypotheses of PES schemes will be verified and perfected during one-to-one meetings with the single interested stakeholders.

The role of the mediator or facilitator

Generally speaking, facilitation is defined as an approach that simplifies a process or makes something possible. Facilitation activates and guides creation and support for engagement and commitment to a specific objective. The facilitator accompanies working groups, guiding the process in the most fluid possible way to achieve an objective. A facilitator is therefore:

- a role adopted consciously, explicitly and competently
- a mediator among diverse actors and opinions
- a motivator of process and participants
- a listener/communicator
- solution driven
- a constructive conflict manager
- a guarantor above parties
- an expert in groups, processes, techniques, but not necessarily content
- a catalyser of the facilitation process
- the custodian of the group's objectives

In a PES scheme, a facilitator can be "internal" or "external".

Mediator - facilitator internal to the PES: he/she is normally an institutional stakeholder – and in any case an authoritative one – recognized by the different parties; he/she plays an active role in the functioning of the PES scheme. The internal facilitator does not limit the debate to achieving a voluntary PES agreement, but intervenes with his/her activities and commitments to activate the process and obtain the expected outcomes. In a PES scheme that includes two private actors, the internal facilitator can easily be an "institutional" actor (public entity or the manager of the natural protected areas) who has a direct or indirect interest in finalising a PES scheme. When the PES scheme depends on a public institution as either a provider or user, the internal facilitator is more easily carried out by another public institution operating at a higher level (e.g. the Region in the case of a Province involved in the management of a Natura 2000 site).

Mediator – facilitator external to the PES: he/she facilitates dialogue among the different parties, stimulates the process, collects and organises information from the different meetings, proposes hypotheses for PES schemes that are assessed and shared among the different actors. However, he/she does not actively manage a PES scheme; does not provide resources or carries out activities needed for the functioning of a PES. The facilitator plays a more traditional role, guiding the process while not being directly involved in the scheme. The role of mediator – facilitator of the process carries a cost that has to be 'accounted for' in the economic balance sheet of the PES scheme as a management cost. The role of the facilitator can be finalised with the signing of a PES scheme or can continue over time by monitoring activities and supervising the agreement, verifying and assessing the obtained results, thus becoming an arbiter for the different parties.

The mediator – facilitator guides the process from beginning to end, coordinating the different phases, from the initial stakeholder analysis, management of plenary meetings, definition of initial hypotheses for PES schemes, management of one-to-one meetings, to the shared definition of a final scheme arrived at by bringing together the observations and expectations of the different parties.

In the management of the meetings, the facilitator must:

- Introduce the meeting and the agenda;
- Ensure all participants have the information required for the agenda;
- Propose and manage discussion times and different phases of activity of the working groups by using the most appropriate tools (posters and sticky notes);
- Remain impartial, without intervening in terms of content (opinions and proposals), but only in terms of the communication dynamics. This helps the group find solutions without forcing options that he/she would consider more valid.

Between meetings, the facilitator has to:

- Organise the meeting reports and send them to all participants, maintaining the attention and interest level of stakeholders;
- Organise and analyse the information provided by the different parties during the plenary session and in the one-to-one meetings;
- Update – modify the initial hypotheses for PES schemes in relation to meeting outcomes.

One-to-one meetings

Once the first potential for a PES scheme has been identified for each ecosystem service, strategic stakeholders and their respective roles in the scheme are immediately identified (provider, beneficiary, facilitator). At this point a number of one-to-one meetings with the representatives of the strategic stakeholder groups are set up in order to share a draft of the PES scheme and define acceptable and sustainable conditions for the different parties. This mediation work is carried out by

the internal or external facilitator over a number of meetings with individual stakeholders, and are preparatory to the final meeting which will include all interested actors.

The right interlocutors must be identified, including capable people who can appropriately represent the key stakeholders, with decision-making authority. Likewise, people involved in different one-to-one meetings should always be the same. Personal encounters optimize debate time and decrease chances of misunderstanding that may arise from diverse approaches and assessments of different individuals. When different people are involved at different times, meeting outcomes may be only partially or incorrectly communicated back to the final decision-makers.

In the first one-to-one encounter, a brief introduction can be prepared to review the objectives of the project, the method adopted for managing the process, the activities already carried out and the results obtained, as well as the steps that will need to be taken in order to define and share the PES scheme. The meeting will also highlight the role that the specific stakeholder may play in the process and in the shared PES scheme.

Besides material with general information on the project, a copy of the meeting report with the names of all stakeholders (even if it was already sent previously) should be provided. Despite having participated in the meeting, having received the meeting report by e-mail or letter and possibly a newsletter of the project, it is best to avoid taking for granted an interlocutor's complete and correct understanding of the process and its objectives.

At the risk of being repetitive, providing an overview of the process underway facilitates the management of the one-to-one meetings, solves possible misunderstandings, and clarifies doubts that may negatively influence the development of the process.

The objectives of the one-to-one meetings are dual:

1. Present and share the PES scheme with an indication of the roles of the different stakeholders;
2. Present and share a hypothetical governance model for the agreement on the PES scheme (Convention, Memorandum of Understanding or Contract).

Incentives for engagement of different stakeholders

It is useful to remember that a PES scheme is defined as a 'voluntary' agreement among different parties. Reciprocally recognizing the role played by each individual actor involved is indispensable. On the one hand, the role of the site manager - provider of the ecosystem service and his/her commitment to the maintenance of the service over time needs to be recognized by the beneficiary of the service addressed in the PES scheme. On the other hand, the economic value (real or expected) of the ecosystem service needs to be assessed in relation to the benefits to the user.

Within this context, the main incentives needed to engage and motivate the identified strategic stakeholders for the PES scheme can be the following:

- Perception and sharing of the monetary and non-monetary value of the ecosystem service and its direct relation to the derived benefits;
- Recognition of the role of the manager-provider of the ecosystem service and his/her property – the dependency of the relative value of the service on the manager's commitment and effort to maintain it. A direct relationship between the activity of the manager-provider of the ecosystem service and its maintenance must be evident and shared among all interested parties of the PES;
- Recognition of reciprocal benefits in the definition of the PES agreement, focusing attention on understanding the advantages derived by ensuring conditions for

maintenance of the ecosystem service over the medium and long term. It must be clear how the PES option may differ from alternative management strategies and uses which may bring other immediate advantages. Recognising advantages for another person when this does not bring personal disadvantages is quite effective.

PES are currently a new idea, and not yet easy to understand for stakeholders that so far have benefited from ecosystem services which were often freely accessible. The risk of PES being perceived by citizens and beneficiaries alike as a new kind of 'tax' is high. Therefore, regulation recognising the legitimacy of PES schemes and identifying different forms of implementation (acting on incentives to define agreements rather than obligations) could represent an important lever.

Article 70 of Law No. 221 of December 28, 2015, 'Provisions on the Environment to Promote the Green Economy and to Restrict the Excessive Use of Natural Resources' (Law No. 221), GAZETTA UFFICIALE, No. 13 (Jan. 18, 2016) delegates the introduction of payment schemes for ecosystem services to the government and represents an important opportunity to identify and favour the use of more effective incentives to engage stakeholders interested in being involved in a PES scheme.

Possible conflicts among stakeholders

As a voluntary agreement, PES schemes can be defined only when conditions of reciprocal sharing are present among all interested actors. In some cases, the process that leads to the definition of a PES scheme can also raise conflicts among the actors involved. Causes can be the following:

- The PES scheme challenges historically consolidated interests or practices, where one or more stakeholders are connected to the use of the natural resource on which the ecosystem service depends. The PES scheme can either disadvantage them or leads to increasing benefits for competitors;
- Different competitors can claim legal rights or exclusive title (or simply a greater share of the title compared to a competing stakeholder) over the economic value generated by the ecosystem service;
- The definition of a PES scheme can highlight and challenge illegal management practices, or at least, the illicit use of the natural resource on which the ecosystem service depends.

Lessons learnt through collaboration with stakeholders

Attention to the development and enhancement of ecosystem services, and expectations from actors potentially interested in the definition of PES schemes will require dialogue and collaboration with a greater variety of stakeholders. Knowing how to manage an open and transparent process among all stakeholders will be the basis for a successful PES scheme over the medium and long term. Experience in the management of nature conservation projects has highlighted lessons for collaborating with stakeholders:

- The objectives of any collaboration initiative need to be clarified before stakeholder engagement takes place.
- The objectives contribute to identifying and guiding the interests that need to be represented in the collaboration process, and those that may be left out.
- Sufficient time must be invested in exploring stakeholder opinions, values and perspectives, and understanding the human and institutional dimensions.
- All key stakeholders need to be involved in project development and policy and project implementation if successful outcomes are to be secured.
- Deciding who is 'in and who is 'out' in a collaborative project will influence project outcomes and sustainability.

- Stakeholder participatory processes must not be exclusive, controlled, or dominated by any one group.
- All actors participate to the process with their own views and prejudices.
- Collaboration among stakeholders requires space to listen to and learn from each other. Spaces for stakeholders must be created to meet and develop shared visions and agendas.
- Monitoring and assessment of collaborative processes is as important as measuring specific project outcomes.

6. PES AND PES-LIKE MODELS

6.1 Introduction to financial mechanisms and "non-marketable" goods and services

During the LIFE Making Good Natura project, several mechanisms for self-financing were analysed from other projects led by public institutions and protected areas management bodies (Marino et al., 2012; Marino et al., 2014). These studies are available and can be downloaded from the project website. In the majority of the cases examined, however, the mechanisms include entry tickets or 'sale' of products that are easily identifiable. The greater challenge stands in the creation of financial markets for products that are not normally exchanged on the market. Ecosystem services are generally categorised as provisioning, regulating and cultural services. Provisioning services include timber, with its own market, but also harvesting of wild berries or other products that do not generally rely on an effective market. In some cases, regulating services have a mediated market, e.g., carbon credits. In the case of erosion protection, the ES does not have its own market and valuation techniques are used instead. Among cultural services, some are more easily given a value while others such as aesthetics or landscape services rely on the value of real estate that 'benefits' from that landscape.

Why are agreements and negotiations important?

Agreements and negotiations are important regardless of the outcomes achieved. If meetings are properly organised and involve citizens, stakeholders and institutions, the discussion and negotiation preceding an agreement are moments of learning for the community. The relevance of the meeting and the main outcomes are in the process rather than in the result. However, we ought to be able to reach an agreement in order to find sources for self-financing more effective management of our natural heritage, and pay those who guarantee the delivery of ecosystem services. Agreements are important because they sanction the payment mechanism. Agreements emerge from a negotiation process, which comprises the methodology used to qualitatively assess ecosystem services, valuation, recognise the 'provider' or manager of the ES, recognise the intermediary and the institution that guarantees the agreement, and lastly, quantify costs to the beneficiary. The agreement is the final outcome of many months of work. But mostly, the agreement is important because it is the written contract that makes the mechanism work.

Preparing a negotiation process

The negotiation process follows a rigorous analysis of quantitative and monetary values of a specific ES. The negotiation process does not preclude previous meetings with stakeholders, citizens and institutions carried out to evaluate the ES. However, once the ES and a possible mechanism for the PES scheme have been identified, all interested subjects are invited to join the discussion. As pointed out by Wunder (2005), disadvantaged social groups are included as the resulting PES scheme may be undermined by their exclusion. All possible representatives are included in the development of the PES scheme in weighing pros and cons, potentially using a SWOT-type analysis (points of strength and weakness, external threats and opportunities) that ensures the appropriate pathway is taken.

As such, citizens' voices must be heard with respect to environmental conservation and the guarantees that the agreement provides for effective maintenance of the site. Social actors in local communities need to be respected through the provision of guarantees. Only then are economic actors consulted to ensure that social actors do not block the development of the PES scheme.

Community interests and economic interests should be both addressed (ideally through a win-win solution), but in the case of conflicts community interests should be prioritized.

For example, hotel owners may ask tourists to pay a fee that serves to maintain the environment of the site (for cultural and recreational ES), including paths, huts, environmental restoration and water protection. However, those hotels may become less affordable to tourists. A more appropriate approach would be to unite forces and focus on the message to the tourist (e.g. through online channels): restaurant owners may apply a small fee on food consumption to support the same PES scheme, and a part of the local civil society (NGOs, civil protection, associations) may volunteer in the restoration and maintenance activities. In practice, the PES scheme would contribute to the 'institutionalization' of traditional practices of cooperation and collaboration already present in many mountain areas. Overall, the negotiation process would see the engagement of the whole community to achieve a common objective. It would include a range of community meetings, small meetings, or even 'one-to-one', 'face-to-face' meetings that are transparent and geared at achieving the final objective.

What is a PES?

The most common definition draws from Wunder (2005: 3): "(1) a voluntary transaction where (2) a well-defined service (or a land-use likely to secure that service) (3) is being 'bought' by a (minimum of one) ES buyer (4) from a (minimum of one) ES provider (5) if and only if the ES provider secures ES provision (conditionality)." Pure PES, according to this definition, are only possible when agreements are made between private entities. In some cases, however, inclusion of government institutions leads to the development of a mixed agreement, a PES-like scheme (Wunder et al. 2008) characterised by inclusion of a mediator, a guarantor, a seller and a buyer. PES schemes are also characterised by the duration of the contract and presence of a monitoring system that secures ES provision.

What is a self-financing mechanism?

A self-financing mechanism refers to a mechanism whereby a 'provider' of the ecosystem service ensures that the delivery of the service is 'paid for' by a second party. A self-financing mechanism is different from a PES, strictly speaking, as it is an agreement negotiated between a site manager and a public institution or another public/private institution that recognises a contribution to management of the natural ecosystem securing its delivery. This is the case for hydroelectric facilities in Italy. Based on current legislation (the Galli Law), part of the fees paid to the hydro company for water is transferred back to the administration that manages the watershed and maintain the infrastructure needed to secure its continued delivery (hydraulic projects and/or forest management).

The role of the provider

The provider of the service benefits directly from the PES in monetary terms and thus holds the greatest share of responsibility for success of the agreement in the group. The provider must secure and manage the delivery of the ES over time, implementing traditional, or at times, exceptional measures to maintain the environment in which he/she lives and works. He/she signs the agreement and must respect the commitments as stipulated in the contract and for the duration of the contract itself.

The role of the buyer

The buyer or the beneficiary of the service benefits from the delivery of the ES and for this reason he/she is willing to pay the ES provider. Without the buyer, the PES agreement and the payment would not be secured over time. The buyer signs the contract and may also take on commitments to maintain the territory that go beyond payment.

The role of the guarantor

The guarantor, generally a public institution or possibly the site manager, plays a very delicate role in monitoring maintenance of the conditions and commitments of the agreement. In the case of the site manager, the conservation of the environment that is financed by the agreement is his/her foremost priority.

The role of the community

The local community ensures that the agreement is maintained and environmental conservation objectives are achieved. Besides the institutional role of the public administration and/or the site manager, civil society monitors the public administration in terms of transparency and accountability. Periodically, the site manager should invite citizens to analyse the implementation of the agreement and discuss issues that need to be addressed.

6.2 Instruments identified for ES and mechanisms developed in the LIFE MGN

Table 15 lists the services, possible approaches to payment, instruments and lastly agreements and PES schemes that were identified as part of the LIFE MGN project. For each service, the table also details whether PES agreements were signed, meaning that they have been organised or identified (even so, in some cases we still refer to agreements and/or self-financing mechanisms as we are still far from agreement on PES or PES-like schemes). Follow the Table a Figure with biogeographic distribution of projects' sites and agreements organized during the project (Table 16).

Table 15: Services, possible approaches to payment, instruments and lastly agreements and PES schemes that were identified as part of the LIFE MGN project

ES SERVICE	PAYMENT APPROACH	OBJECT OF PAYMENT	INSTRUMENT	MECHANISMS DEVELOPED IN THE LIFE MGN PROJECT
REGULATING carbon sequestration	The beneficiary pays the owner or site manager of the natural capital (NC) from which the ES flows in order to: manage, cultivate, use methods and production processes that guarantee the quantity and quality of the ES	INDIRECT USE VALUE	Carbon credit payments	Sale of carbon credits through an intermediary, derived from saving X cubic meters of a commission of timber with respect to the national/regional average, which correspond to sequestering X tons of CO_2 equivalent to sustainable forest management practices adopted over time by the entity
PROVISIONING, water supply	The beneficiary pays the owner or site manager of the NC from which the ES flows to: manage, cultivate, use methods and production processes that guarantee the quantity and quality of the ES	DIRECT AND INDIRECT USE VALUE	Payment for environmental costs associated with water supply	Payment on behalf of the company to the site manager for water supply services, provided funds are used to directly or indirectly restore, maintain and improve ecological function of ecosystems providing for potable water
PROVISIONING, hunting and fishing	The beneficiary pays the owner or site manager of the NC from which the ES flows to: manage, cultivate, use methods and production processes that guarantee the quantity and quality of the ES	DIRECT USE VALUE	Payment for resources in terms of hunting and fishing	Auction sale for captured wild fauna (boar) with proceeds directed to conservation activities
REGULATING, habitat for wildlife	The beneficiary pays the owner or site manager of the NC from which the ES flows to: manage, cultivate, use methods and production processes that guarantee the quantity and quality of the ES	OPTION VALUE	Biodiversity Prospecting	Convention between the park, voluntary associations and civil protection based on the criterion of performance. According to this criterion, associations that subscribe contracts for forest fire prevention (e.g., Bosnian pine - *Pinus leucodermis Antonie* - at risk), receive a financial reward which decreases according to the area covered by the fire
		EXISTENCE VALUE	Biodiversity bank	

ES SERVICE	PAYMENT APPROACH	OBJECT OF PAYMENT	INSTRUMENT	MECHANISMS DEVELOPED IN THE LIFE MGN PROJECT
CULTURAL, aesthetic value of landscape	The beneficiary pays the owner or site manager of the NC from which the ES flows to: manage, cultivate, use methods and production processes that guarantee the quantity and quality of the ES	INDIRECT USE VALUE	Public-private PES scheme (e.g. tour operator pays the farmer); public-private incentives (e.g. agro-environmental schemes); territorial brand for wood and food products.	Contribution for overseeing actions and restoring the landscape aimed at maintaining the aesthetic value
	The beneficiary pays to access the territory for recreational uses	DIRECT USE VALUE (non-consumptive)	Entrance fee, tax on overnight accommodation	
CULTURAL, Ecosystem benefits	The beneficiary pays the owner or site manager of the NC from which the ES flows to: manage, cultivate, use methods and production processes that guarantee the quantity and quality of the ES	INDIRECT USE VALUE	Public-private agreements (population receiving an ES pays the population delivering the ES)	Contribution to conservation of functional attributes of the site aimed at maintaining fish habitat
	The beneficiary pays to access the territory for harvest/recreational uses	DIRECT USE VALUE	Ticket/card; payment per weight; mushroom and truffle picking	Payment of a daily grant to a manager from amateur collectors and professionals for collection of berries and mushrooms

ES SERVICE	PAYMENT APPROACH	OBJECT OF PAYMENT	INSTRUMENT	MECHANISMS DEVELOPED IN THE LIFE MGN PROJECT
CULTURAL, recreational	The beneficiary pays to access the territory for recreational uses	DIRECT USE VALUE (non-consumptive)	Tickets, overnight tax, voluntary contribution	Agreement with the TIM telecommunications company for payment via SMS of a voluntary contribution (€ 1) for maintenance and conservation actions by tourists who walk the trails for which information is available digitally
				Agreement with the railway company for integrated ticket for tourists, providing travel to the managed forest, informational materials and meals at a local farm
				Agreement with tour operators to accompany and develop programs related to the LIFE MGN project with proceeds in part destined for conservation
PROVISIONING, energy	The beneficiary pays the owner or site manager of the NC from which the ES flows (e.g. biomass).	DIRECT USE VALUE	Private- private, public-private; public-public; collective contracts for a local energy supply chain	
PROVISIONING, forage and pasture	The beneficiary pays the owner or site manager of the NC from which the ES flows to manage, cultivate, use sustainable production processes that guarantee the quantity and quality of the ES	DIRECT AND INDIRECT USE VALUE	Payment for environmental costs associated with maintenance of the pasture	Leasers of pastures who carry out activities for the conservation of meadows - pastures (e.g. mowing, maintenance walls, cleaning) based on a contract
				Leasers of pasture within military zones financed to carry out activities for the conservation of meadows - pastures (e.g. mowing, maintenance of walls, etc…)
PROVISIONING, timber	The beneficiary pays the owner or site manager of the NC from which the ES flows to manage, cultivate, use sustainable production processes that guarantee the quantity and quality of the ES	DIRECT AND INDIRECT USE VALUE	Payment for environmental costs associated with maintenance of the forest	Auction of timber lots with specifications on activities for training / information and forest conservation

ES SERVICE	PAYMENT APPROACH	OBJECT OF PAYMENT	INSTRUMENT	MECHANISMS DEVELOPED IN THE LIFE MGN PROJECT
PROVISIONING, genetic resources	The beneficiary pays the owner or site manager of the NC from which the ES flows to manage, cultivate, use sustainable production processes that guarantee the quantity and quality of the ES	EXISTENCE VALUE	Public agreement for subsidies that support projects that account for genetic resources	Agreements with the civil protection organization to safeguard the Bosnian pine (*Pinus leucodermis Antonie*) from forest fires
REGULATING, water recharge	The beneficiary pays the site operator who in turn allocates a share to increase groundwater recharge with hydraulic arrangements and conservation of forests	DIRECT AND INDIRECT USE VALUE	Public-private agreement to manage and sell potable water	
REGULATING, flood control	The beneficiary pays the site operator to use his/her area as a lamination basin for the prevention of potentially destructive flooding events	SUBSTITUTION VALUE	Tax or lease on areas that maintain the service	

Figure 7. Biogeographic regions and projects' sites (sites in red, biogeographic regions are Alpine in green, Continental in yellow and Mediterranean in light brown)

Table 16: Agreements finalized and/or organized during LIFE MGN project

SITE	***SERVICE***	***ESTIMATED VALUE (€)***	***Description of PES agreement***
SPA IT2040401 PR Orobie Valtellinesi	F2 - Forage, pasture	1.575.175,80 €	The farmer uses good conservation practises on alpine pastures in the area and obtains certification of the Park
	F3 - Hunting and fishing	1.037.478,00 €	Agreement between manager and hunters to dedicate work days to maintenance and management of natural capital
	R3 - Regulation of water (recharge of aquifers)	448.314.915,00 €	The agreement was born from the site management body and the revenue generated from a regional rent received by the province is usable for environmental restoration initiatives and maintenance of the resource
SPA IT20A0402 Lanca di Gerole	F3 - Hunting and fishing	€ 6.840,00	Sport fishing license fees used for maintenance of aquatic habitats
	R6 - Protection from hydrologic instability	€ 103.730.000,00	Granting of a percentage of rent paid by managers of land to the region for protection from landslides
SPA IT20B0501 Viadana	F4 - Mushrooms and truffles	€ 492,00	Maintenance of poplar silviculture activities financed with part of proceeds from regional fees
	R6 - Protection from hydrologic instability	€ 699.338.000,00	Granting of a percentage of rent paid by managers of land to the region for protection from landslides
	C2 - Recreational value (ecotourism...)	€ 41.573,00	Activation of measures of the RDP or ROP of the Lombardia Region to create light infrastructure for enjoyment of the Natura 2000 site with the involvement of agriturism companies
SCI IT2020002 Sasso Malascarpa	R3 - Regulation of water (recharge of aquifers)	€ 7.458.083,00	Use of silvicultural techniques and management of alpine grazing areas to favour infiltration of water to guarantee supply of ES.
	C1 - Aesthetic value	n.d.	The agreement involves annual compensation for conservation action by a mobile telecommunications company that owns a repeater located at the site.

SITE	*SERVICE*	*ESTIMATED VALUE (€)*	*Description of PES agreement*
SPA IT2020301 Triangolo Lariano	R1 - Carbon sequestration	1.399.638,99 €	Sale of carbon credits arising from savings of a quantity of wood in cubic meters with respect to the national/regional average that corresponds to the storage of tonnes of CO2 equivalents resulting from sustainable forest management practices undertaken over time by the management body
	C2 - Recreational value (ecotourism...)	1.193.873,57	Signing of two agreements planned providing 1) discounts for hikers combining purchase of train tickets and tourism experience at the site and 2) advertising by the railway company using media channels and promotional materials
	C3 - Inspiration for culture, the arts, educational and spiritual values and identity	more than 0 but n.d.	Activation of a telephone number to allocate small payments (€1) via SMS to cover costs of safeguarding and restoration of cultural recreational services
SPA IT2070303 Val Grigna	F2 - Forage, pasture	235.200,00 €	Discount on rent paid by herders in alpine areas to pay for local conservation actions on pastures
	F5 - Mushrooms, berries, non timber forest products	81.400,00 €	Payment of a daily fee by local citizens/users that is reinvested for mushroom and berry picking
	C2 - Recreational value (ecotourism...)	74.341,85	Activation of a telephone number to allocate small payments (€1) via SMS to cover costs of safeguarding and restoration of cultural recreational services
SCI IT2070021 Valvestino	R1 - Carbon sequestration	€ 15.478.836,84	Sale of carbon credits arising from savings of a quantity of wood in cubic meters with respect to the national/regional average that corresponds to the storage of tonnes of CO2 equivalents resulting from sustainable forest management practices undertaken over time by the management body
	R3 - Regulation of water (recharge of aquafers)	€ 137.142.220,00	Use of silvicultural techniques and management of alpine grazing areas to favour infiltration of water to guarantee supply of ES.
	R5 - protection from erosion and geological instability (landslides, slope instability)	€ 2.886.636,00	Granting of a percentage of rent paid by managers of land to the region for protection from landslides
	C2 - Recreational value (ecotourism...)	442.383,13	Activation of a telephone number to allocate small payments (€1) via SMS to cover costs of safeguarding and restoration of cultural recreational services

SITE	*SERVICE*	*ESTIMATED VALUE (€)*	*Description of PES agreement*
SCI IT2070022 Corno della Marogna	F7 - Genetic resources	€ 9.997,34	Buying and selling (on the part of the management body) of seeds, with proceeds allocated to maintenance of the production value of seed forests and seeds of various species
	R1 - Carbon sequestration	€ 8.666.537,98	Sale of carbon credits arising from savings of a quantity of wood in cubic meters with respect to the national/regional average that corresponds to the storage of tonnes of CO2 equivalents resulting from sustainable forest management practices undertaken over time by the management body
	C2 - Recreational value (ecotourism...)	€ 442.383,13	Activation of a telephone number to allocate small payments (€1) via SMS to cover costs of safeguarding and restoration of cultural recreational services
SPA IT2070402 Alto Garda Bresciano	F4 - Primary materials (wood, fibre)	€ 18.175,88	A quantity of timber (used sustainably) is put on the market to partially fund conservation activities
	F8 - Fresh water	€ 4.918.433,79	Monetary contribution for stewardship and restoration activities to maintain provisioning of fresh drinking water
SPA IT2040601 Bagni Masino, Val di Mello	R3 - Regulation of water (recharge of aquafers)	€ 220.171.865,00	Contribution on the part of BIM Adda for stewardship and restoration of water regulation services
	C2 - Recreational value (ecotourism...)	€ 405.795,41	Activation of a telephone number to allocate small payments (€1) via SMS to cover costs of safeguarding and restoration of cultural recreational services
	C1 - Aesthetic value	n.d.	Activation of a telephone number to allocate small payments (€1) via SMS to cover costs of safeguarding and restoration of cultural recreational services
SCI IT2040019 Bagni Masino	R3 - Regulation of water (recharge of aquifers)	€ 60.875.785,00	Contribution on the part of BIM Adda for stewardship and restoration of water regulation services
	R5 - protection from erosion and geological instability (landslides, slope instability)	€ 179.425,00	Contribution on the part of BIM Adda for stewardship and restoration of water regulation services
	C2 - Recreational value (ecotourism...)	€ 405.795,41	Activation of a telephone number to allocate small payments (€1) via SMS to cover costs of safeguarding and restoration of cultural recreational services

SITE	*SERVICE*	*ESTIMATED VALUE (€)*	*Description of PES agreement*
SCI IT2040020 Val di Mello	R3 - Regulation of water (recharge of aquifers)	€ 134.951.950,00	Contribution on the part of BIM Adda for stewardship and restoration of water regulation services
	R5 - protection from erosion and geological instability (landslides, slope instability)	€ 397.151,00	Contribution on the part of BIM Adda for stewardship and restoration of water regulation services
	C2 - Recreational value (ecotourism...)	€ 405.795,41	Activation of a telephone number to allocate small payments (€1) via SMS to cover costs of safeguarding and restoration of cultural recreational services
SCI/SPA IT8050055 Monti Alburni	R5 - protection from erosion and geological instability (landslides, slope instability)	€ 128.006.850,50	Criterion of performance in phase of evaluation
	C2 - Recreational value (ecotourism...)	€ 1.295.980,00	A tourism business allocates part of their income (20%) derived from tourism activities and defined by the tour operator to the maintenance of trails that perform protection and preservation functions for existing natural capital
SCI IT8050025 Monte Stella	C2 - Recreational value (ecotourism...)	€ 675.374,00	A tourism business allocate part of their income (20%) derived from tourism activities and defined by the tour operator to the maintenance of trails that perform protection and preservation functions for existing natural capital
SCI IT8050006 Balze di Teggiano	F3 - Hunting and fishing	€ 55.590,00	Self-financing based on sale of wild boar products to mitigate damage to cultivation caused by boar. The park will reinvest these resources in conservation activities and maintenance of functioning of agroforestry ecosystems of the park

SITE	SERVICE	*ESTIMATED VALUE (€)*	*Description of PES agreement*
SCI IT9310014 Fagosa	F7 - Genetic resources	€ 1.408.809,50	The PES agreement is implemented through annual contracts signed by the park management authority and voluntary civilian protection associations for protection against forest fires. The agreement has the objective of ensuring better management of Bosnian pine through management of forest fires, which represent one of the main threats to survival of this species.
	F8 - Fresh water	€ 15.683.877,72	This PES scheme sees involvement of the Lucano acqueduct that, as management body responsible for integrated hydrological services, pays an annual sum to the park for specific conservation activities aimed at water resources management
	C2 - Recreational value (ecotourism...)	€ 1.800.000,00	The aim is to introduce a visitor fee or tourist tax that would be proposed to the constituent "Union of Municipalities" to be donated to the maintenance and enhancement of sustainable tourism activities
SCI IT9310008 Petrosa	C1 - Aesthetic value/C3 - Cultural inspiration	€ 36.686,00	The PES scheme sees that a portion of the financial resources of the park annually allocated to municipalities for cultural and enogastronomic initiatives (in a specific chapter of the budget), are destined to associations for initiatives aimed at increasing the level of awareness of the aesthetic and cultural values of the La Petrosa site
SPA IT4090006 Monte Carpegna	F2 - Forage, pasture	190.410,00 €	Herders commit to grazing herds in the military polygon, respecting regulations set by the management body, benefiting from a fee paid by herders for improvement of the quality of the ecosystem
	F3 - Hunting and fishing	3.000,00 €	Realisation of an agreement between the provincial meat processing centre and the park management body for a meat supply chain that valorises the park using park branding
	F8 - Fresh water	384.592,50 €	The company, Hera SPA, commits to paying the park for fresh water services. The payment is made on the condition that money is used to finance (directly or indirectly) management activities in the territory dedicated to restoration, mantenance and improvement of the ecological function of ecosystems from which this ecosystem service flows.

SITE	SERVICE	*ESTIMATED VALUE (€)*	*Description of PES agreement*
SCI ITA020007 Ficuzza & SCI ITA020008 Busambra	C2 - Recreational value (ecotourism...)	326.814,00 €	The agreement, signed by a consortium dedicated to promotion of culture and environment, stipulates constitution of an ad hoc fund in which contributions by each visitor will be set aside. The money set aside, in concert with the region, will be used to finance specific conservation initiatives, defined by management needs of the site.
			The agreement, signed by a tour operator, stipulates setting aside a percentage of the amount paid by the participants of initiatives that involve the SCI. This amount will be set aside in an ad hoc fund and subsequently, in cooperation with the region, destined to specific conservation objectives defined according to the needs of the site.
SCI ITA060006 Sambughetti	C2 - Recreational value (ecotourism...)	71.880,00 €	The agreement, signed by an association that promotes environmental education initiatives, stipulates the contribution of an amount of money for each participant to an ad hoc fund that has been created to finance, in concert with the region, specific conservation objectives and management of the site

6.3 What is monitoring?

Monitoring refers to an activity carried out over a length of time and repeated regularly for a defined number of cycles. Monitoring helps to assess progress in the implementation of the agreement or the PES scheme and can include the valuation of the 'delivery' of ES flows over time.

Why is monitoring important?

Monitoring provides a guarantee to the local community that the agreement works and the environment and site are in an optimal state of conservation. Further, monitoring ensures that both parties respect the agreement and the commitments made. Finally, it regularly informs the community and identifies possible challenges before it is too late.

How is monitoring carried out?

Monitoring plans are decided upon when the PES agreement is signed, and detail who, what, how and when monitoring is to be carried out. In the case of carbon credits, for example, monitoring lasts for about 20 years (e.g. a tract of forest is left standing and sold for credits). During this time, the beneficiary/buyer commits to decreasing their ecological footprint and reduce emissions, and these commitments are reviewed once a year by means of a written company report stipulating respect for the agreements. The supplier guarantees that the forest remains standing and has not been subject to any type of use, and monitoring likewise occurs once a year. The reviewer verifies compliance through a site visit and through photographic proof.

Monitoring is premised upon on the delivery of the ES and payment of its economic value. These factors influence the review frequency. For example, an agricultural field located within a catchment basin used in concession by a private bottling company is subject to a PES-like scheme whereby farmers are given compensation to avoid use of pesticides and fertilizers, based on the number of hectares in use. In this case, the agreement details payment and regular monitoring every three months to ensure hazardous substances affecting water quality are not found, and once a year to provide a more in-depth analysis of soil samples.

6.4 Drafting a PES agreement or a self-financing mechanism

Drafting a formal tool for a payment of ecosystem services scheme and/or for a self-financing mechanism is the last step in the process of mapping and quantification of ES as well as identification and engagement of stakeholders. It represents a crucial aspect in the entire cycle, bringing together information and a range of needs into a legal framework. The final agreement defines rights and duties for the parties involved and is enforceable by law.

The process from analysis to formalization of the agreement as a contract or a convention between parties is rigorous with respect to enforcement under current law, and to the objectives of conservation. It further provides parties involved with precise obligations and an equal allocation of risk.

The schemes developed through the efforts of the Life MGN project did not always resemble PES or PES-like schemes. In some cases, the final schemes are more appropriately defined as self-financing mechanisms. Here the structure is similar, but obligations differ.

Formally structuring the relationship between buyer and seller of the ES requires including specific aspects in the contract or convention. Table 16 summarises the general structure of the contracts and conventions signed under the LIFE MGN project.

Table 16: General structure of the contracts and conventions signed under the LIFE MGN project

Summary of articles
Premise
Objectives
Definition of the transaction structure
Rights and duties of the parties
Terms and mode of payment
Monitoring and review
Communication
Duration and terms for renewal
Resolution and suspension
Changes
Final dispositions

The following contains an in-depth presentation of key aspects underlying the agreements signed under the LIFE MGN project.

Premise and objectives

The premise clarifies the reciprocal interests of the parties in signing the agreement under consideration. In the schemes proposed by the MGN team, premises were structured to clarify the context and the general objectives of the agreement, which include the objectives of EC COM (2011) 244 final - *Our life insurance, our natural capital: an EU biodiversity strategy to 2020,* as well as with the characteristics and the motivations which led to the decision to sign the agreement by the parties involved.

Definition of the transaction structure

The number and type of actors involved in a scheme can vary depending on the complexity of the context (e.g. area of the provisioning site, type of services provided, delivery). In some cases, it involves regulating relationships between multiple buyers and sellers, intermediaries or other subjects who represent their interests (similar to the figure of the 'mediator'). In Figure 8, six possible structures are shown, varying in terms of complexity and number of actors. These include relationships between two mediators (one representing the buyers and one representing the sellers – see 1, 2 and 3) and direct relationships between buyer and seller (4, 5 and 6). For example, in the LIFE MGN project, the contract for "carbon sequestration" regulates relationships between two mediators (CURSA and PHORESTA) and conforms to Quadrat 1. Conversely, in the case of payments for 'hunting and fishing resources', the Natura 2000 site SPA IT2040401 regulates the relationships between a provider/seller, in this case the *Parco delle Orobie Valtellinesi* and a mediator for buyers/beneficiaries, the hunters that are members of the management committee, *Comitato di Gestione del Comprensorio Alpino di Caccia*. The latter conforms to the structure presented in Quadrat 2. As evinced by the cases developed in the project, real world cases are even more complex, involving other types of actors as reviewers or intermediaries. For each of the cases

encountered in the project, the approach focused on structuring agreements as clearly as possible, spelling out the definition of roles and respective rights and duties.

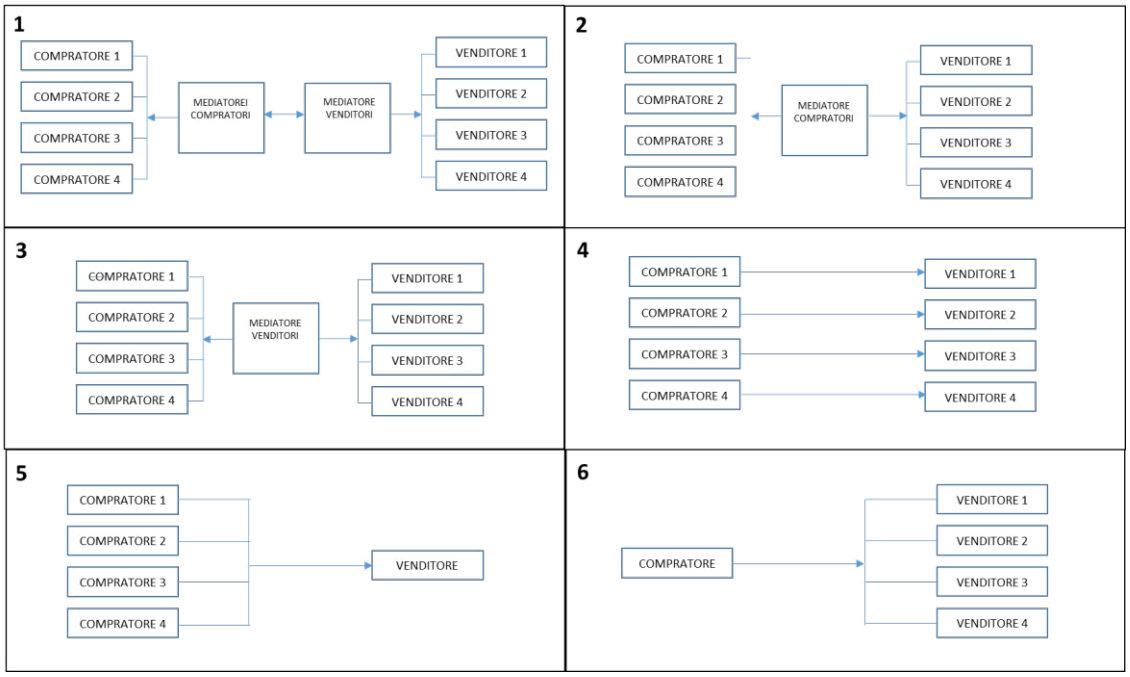


Figure 8: Possible transaction structures

Terms and mode of payment

There are several aspects related to payment that need to be clarified in a PES scheme. Payment generally occurs when land uses guarantee the provision of a specific ecosystem service (input-based), or when actual provisioning of the services is assessed (output-based). Ideally, the payment should be based upon the delivery of the ES, given that the objective of the scheme is to secure flow. In reality, it is exceedingly complex, especially with certain types of ES, to measure flow. In the vast majority of cases, schemes are input-based, and payments are based on areal extension of ES delivery (€/ha).

Payments can be both monetary or in kind. Monetary payments are more easily administered, even though at times, payments in kind are preferable, e.g. when the buyer/beneficiary can provide structural or infrastructural interventions at a cost lower than the market price. The rate is also important. As mentioned earlier in the Manual, it is connected (or should be connected) to the economic value identified for a specific service. Finally, the definition of the terms related to the payment must include timing and deadlines.

Throughout the course of the LIFE MGN project, a variety of examples for terms and mode of payment were identified. These varied according to context, expectations and willingness to pay (buyer) or provide assistance for the maintenance and the restoration of the ecosystems involved (seller). Some of the payments were output-based (e.g. Carbon Convention and Animal and Fish Resources), while others were input-based (e.g. Convention for the Prevention of Forest Fires and the Protection of the Bosnian pine and *Pinus heldreichii* in the Natura 2000 SCI IT 9310014). Several schemes were based on monetary transactions, but a few of the sites also included payments in kind (e.g., Convention for the valorisation of the animal and fish resources in the site SPA IT2040401).

Monitoring and review

Monitoring and review activities apply to:

1. Compliance with the terms of the contract (contract compliance);
2. Monitoring the effectiveness of the measures for conservation.

The first aspect defines and implements a system of verification and monitoring of the real delivery of the ecosystem service and the contractual commitments undertaken.

The second aspect assesses whether the scheme has actually led to an effective improvement in the delivery of the service and in the quality of the ecosystems involved in its delivery. From this perspective, the monitoring system allows for prompt identification of negative impacts, which were unforeseen at the time of project development.

A monitoring system should be efficient (cost-wise), accurate, independent and replicable. Evidence collected during monitoring is primary data used to increase the efficiency and effectiveness, and potentially to renegotiate the contract on the basis of evidence. In the schemes developed by LIFE MGN, and in order to guarantee independence, the monitoring system was generally managed collegially (with the full participation of all parties, only in some cases including the participation of a third person) or by a guarantor.

Duration and terms for renewal

The duration of the contract impacts the efficiency of the scheme in terms of performance (the possibility to obtain long term benefits). Generally speaking, a longer duration secures provision and benefits of the service. However, terms for renegotiation should be included to address issues such as insufficient levels of payment to compensate the value of the service provided.

In the LIFE MGN project, the agreements generally identified terms that would guarantee delivery of benefits, for 3-5 years, identifying both options for renewal and anticipated suspension of the contract.

Dissolution and suspension of the contract

In Italian legislation, the civil code addresses many of the issues raised in the agreements: Art. 1373 regulates the anticipated dissolution of the contract; Art. 1453 regulates the severance agreement when not fulfilled; Art. 1454 regulates the notice to comply; Art. 1456 regulates the termination clause; and Art. 1458 regulates the effects of the resolution.

By referring to the civil code, the contracts developed by the MGN team provide, on the one hand, the option of opting out of the contract should grave violations occur, and on the other, a guarantee of continuity in performance. A similar approach was adopted for cases of unilateral termination, demanding parties to guarantee the completion of tasks underway, as well as requiring a long warning time and, where necessary, the payment of a penalty. Other clarifications included in the finalised schemes were clear definition in terms of obligations and faculties attributed to each part – in addition to being described in the various articles that regulate the various stages of the scheme, these were also summarized and reaffirmed in ad hoc contexts; a condition that changes to the agreement is accepted only if written and consensual; specific provisions on clarity, fairness and transparency of information (conveyed through different channels); and communication of the content and results of the schemes, not only for the actors involved but also for the resident population or otherwise affected parties.

7. PES, ENVIRONMENTAL BUDGET AND ASSESSMENT OF EFFECTIVENESS

7.1 How do you assess the management of an area in terms of conservation?

The management of an area for conservation goals can be assessed in different ways, considering land use, land consumption, connectivity of the ecological network, or even the ease by which you can order the meat of a protected species in a restaurant near a protected area. The Protected Areas Management Effectiveness (PAME) assessment methodology discussed earlier can also applied, and for analysis of effective management, MEVAP (See Section 3.3.) is a recommended methodology. When dealing with a protected area, international criteria for assessing habitat and species conservation have been well defined. For Natura 2000 sites, additional monitoring is carried out by site managers and periodic and standardized reports are sent to the national agency to assess the conservation status of the site. The MEVAP methodology uses indicators and indices to assess the state of environmental conservation, whether in a protected area of elsewhere.

7.2 How do you assess the management of a site from social and economic perspectives?

The MEVAP methodology is used to analyse the economic and social sectors of the sites, whether protected or not. Two of the four domains focus on the socio-economic context and are assessed with specific reference to the opportunities generated by the activities of the site manager. Social analysis relies on interviewing economic stakeholders, tourists and residents (See Attachments). Analysis of the economy tied to the site assesses the shift toward a more sustainable economic system.

7.3 How do you calculate the environmental budget of a site?

The Environmental Accounting model is described in this section (figure 4) by phases of implementation (table 17).

Natural assets

The value of natural assets is calculated from the qualitative and quantitative analysis of the natural, social and economic funds derived from the flow of ecosystem services (ATTACHMENT 24). It includes:

- Description and analysis of habitats (stock);
- Description and analysis of the identified ecosystem services and their PES schemes and self-financing mechanisms (flow).

Economic assets

Economic accounting relies on a more complex structure, adding environmental benefits and costs to management revenue and costs.

Natural heritage assets (stock)

Valuation of natural heritage assets includes an estimate of the Total Economic Value (TEV) of natural capital (stock) in the Natura 2000 site under study. Given the complexity in calculating TEV, which is possible nonetheless according to the theoretical model (See figure 4), TEV is not considered in the final calculation of the Environmental Budget.

Benefits (flow)

Benefits are considered according to the following sections (See table 18, Benefits and ATTACHMENT 24):

1. Funding (B1) – Funding available for Natura 2000 sites, including EU funds, regional, national and agro-environmental schemes.
2. Environmental benefits (B2):
    - Estimate of the economic value of environmental services flowing from the site (See Chapter 4)
    - Positive externalities due to the site: financial support for economic activities.
3. PES benefits (B3) – Economic valuation of the multiple benefits (social, environmental, economic) brought by the implementation of PES schemes and self-financing mechanisms. The calculation of these benefits is tightly associated to the amounts indicated in the agreements signed. In addition, the calculation of final benefits derived from the PES scheme (Engel et al. 2008)[2] is based on the sum of these payments with the economic benefits of the ES associated with the PES scheme that contributing to guaranteeing its fruition over time.

Costs (flow)

Costs are divided into the following sections (See table 18, Costs; ATTACHMENT 24):

- One-off costs (C1) – Costs of creating the site, drafting the management plan and investing in land acquisitions, compensation payments and infrastructural costs. These include:
    a) Management costs associated with setting up the site, drafting the management plan/conservation measures;
    b) Investment costs such as land acquisition, infrastructure costs for improving/restoring habitats and species as described in the conservation measures/management plans;
- Recurring costs (C2) – day-to-day expenses of the management authority, including review of management plans, monitoring of habitats and conservation actions. Specifically:
    a) Management planning costs: administrative costs related to the management of the site;
        i. Review of management plans, conservation measures, communication.
    b) Environmental costs:

        i. Indirect costs related to compensation for businesses (e.g. farms, livestock farms, forest enterprises) located within the boundaries of the site for bans and restrictions (e.g. ban on timber cutting, grazing ban etc);

        ii. Expenses to protect/maintain/prevent damage to the site;

[2] Engel S., Pagiola S., Wunder S., (2008) Payments for Environmental Services in Developing and Developed Countries, Volume 65, Issue 4, 1 May 2008, Pages 663–674, Ecological Economics.

iii. Expensed incurred due to environmental damage from the economic sector. Given methodological complexities, this item is not included in the final calculation of costs and benefits.

- Implementation costs associated with PES (C3), including:
    a) transaction costs calculated as number of working days per person (€/h), travel and organisation of meetings.
    b) monitoring costs related to activities during the review of the PES.

Cost-benefit analysis

The environmental budget estimates the economic net benefit resulting from the management of the Natura 2000 sites involved in the project. The overall balance between economic and environmental costs and benefits provides an estimate of the total net economic benefit (table 18). A further step considers externalities created by the implementation of the PES to improve the environmental governance process in Natura 2000 sites. The analysis considers time as a factor providing for the assessment of present and future scenarios.

The accounting equation used is the following (Source: Gudger and Barker, 1993; Pearce et al., 1989):

$$Bt - Ct - Et (1 + r) - t > 0 \text{ o } < 0$$

Where

Bt is advantage over time t;
Ct is the cost over time t;
Et is the externality due to the implementation of PES;
r is the discount rate.

Table 18: Structure of the Environmental Budget

Costs -		
C1	ONE-OFF COSTS	Amount €
a)	***Management costs***	
	Costs associated with setting up the site	
	Costs associated with management planning (e.g. drafting the management plan/conservation measures)	
b)	***Investment costs***	
	Land acquisition, habitat and species restoration	
C2	RECURRING COSTS	
a)	***Management planning costs***	
	Administrative costs	
	Plan reviews/ communication	
b)	***Environmental costs***	
	Indirect costs (opportunity costs)	
	Expenses: protection, maintenance, restoration	
	Environmental damage	
Total Costs		

C3	Transaction costs of PES scheme	
C4	Monitoring costs of the PES scheme	
Total Costs PES		

Benefits		
B1	FUNDING AVAILABLE TO NATURA 2000 SITES	
B2	ENVIRONMENTAL BENEFITS	
a)	*R1 – Carbon sequestration €/year*	
	C2 – Recreational value (eco-tourism and others) €/year	
	C3 – Source of inspiration for culture, arts, educational and spiritual values €/year	
	Other types of ecosystem services	
b)	*Δ+ Economic activities*	
Total Benefit		

B3	PES BENEFITS	
	(example) C2 – Recreational value (eco-tourism and others) €/year	
Total PES Benefits		

Table 19: Cost and benefit Analysis ante PES e Post PES.

		Amount €
Cost Benefit Analysis ante PES	Total Benefits before implementation of PES scheme	
	Total Costs before PES scheme	
	NET BENEFIT before PES scheme	
Cost Benefit Analysis post PES	Total Benefits post PES	
	Total Costs post PES	
	NET BENEFIT post PES	
	PES NET BENEFIT	

7.4 Accountability and transparency

A lesson that came out of the LIFE Making Good Natura project is that local communities appear to be willing to play a part in the organisation of PES or other types of agreements. We therefore recommend a bottom-up process that engages residents. The weaker partner in this process is the public administration, often coinciding with the management authority and/or playing the part of the mediator or guarantor. Public institutions may be weaker because of conflicts in local politics. By focusing on accountability and transparency of public policies, institutions must therefore invest in engaging the population, while being transparent in their choices and clear about their use of funds and PES revenues. In several cases of agreements which included provisions to fund the public institution to carry out infrastructural projects and manage volunteers, a common request by the parties involved was to ensure the maximum level of public transparency in reporting. Public institutions are key to the organisation and management of a PES but must gain the trust of the community.

7.5 *Ex ante* evaluation

The MEVAP methodology applies *ex ante* evaluation of management effectiveness over time based on responses to questionnaires filled by the management authority. This evaluation visually shows the effectiveness of local actions.

7.6 *Ex post* evaluation

Ex post evaluation follows the outcomes of the PES agreements, to determine changes in conservation objectives, implementation mechanisms, and social and economic development. Visual aids are also used to immediately show increases in some of the indices.

7.7 Communicating the objectives of conservation and social and economic development to local communities

The LIFE MGN project has not always led to finalised PES schemes or agreements that improved the socio-economic conditions of the local community or guaranteed conservation standards for habitats and species. Despite this, knowledge of the Natura 2000 network and its values increased in the community. There is still work to be done among the community and for the community to ensure that ES flows are rightly and equitably compensated for the community which has continued to deliver them over time.

8. GUIDELINES FOR FARMERS, RESIDENTS, LOCAL COMMUNITIES AND STAKEHOLDERS INVOLVED IN THE MANAGEMENT OF THE AREAS

As highlighted in other LIFE projects, data from stakeholders involved in LIFE MGN confirmed a negative trend in terms of awareness and satisfaction with the management of Natura 2000 sites, as well as limited knowledge of the sites themselves. Only 47.9% of respondents identified Natura 2000 as a system of natural protected areas set out by the European Union policy on biodiversity. Further, there is a high level of dissatisfaction with regard to the management of the sites. 42% of respondents were unsatisfied, 45.8% had an average opinion, 46.5% did not consider Natura 2000 to have had an impact on the quality of life and well-being in the community, and only 3.5% of respondents were highly satisfied with the current management of the sites. Knowledge of economic opportunities related to the management of the Natura 2000 sites was also quite scarce, with 82.6% of the sample unaware of how economic activities may be directly tied to Natura 2000 sites locally. Studies recently carried out in Italy identified similar trends, pointing to low awareness of the possibilities for social and economic actors to engage in the management of Natura 2000 sites.

The current regulatory, social, cultural and economic context allows for full recognition of the role of farmers in maintaining the values of rural areas and promoting sustainable development for biodiversity conservation. This strategic role is further reaffirmed by the EC 'Habitats' and 'Birds' Directives, which identify rural areas as containing priority habitats that are maintained by agricultural activities, for instance, secondary grasslands. However, in Italy there is no analysis on farms situated within the boundaries of Natura 2000 sites, their land use and specifically, used agricultural surface. Within this context, it is still quite a challenge to promote Payment for Ecosystem Services (PES) or other self-financing mechanisms on the basis of management-based, economic and voluntary agreements.

The remainder of the chapter provides guidelines for different stakeholders involved in the management of Natura 2000 sites, protected areas or areas of high biodiversity value. The focus is specifically on farmers as the sector with the highest impact in terms of land use extension. Useful indications are provided to access opportunities for the valorisation of ecosystem services.

KNOWLEDGE: Adequate knowledge of the natural heritage with which social and economic actors relate through their activities and interests is the basis for achieving appropriate conservation. Of primary importance are property relationship, in terms of ownership or use of the territory, inside the boundaries of Natura 2000 sites (or other types of protected areas). These relationships impact owners of farms in different ways. On the one hand, the presence of agricultural land inside a Natura 2000 site can lead to specific constraints and regulatory requirements that are partially compensated under the first pillar of the EU Common Agricultural Policy (CAP) under 'conditionality'. Failure to comply with these regulations leads to sanctions from the payment agency submitting the CAP contribution. On the other hand, owning property inside a Natura 2000 site can also have positive effects. These include privileged access to Rural Development Programme (RDP) funding calls, for example through measures specifically earmarked for agriculture and forestry enterprises operating within Natura 2000 site boundaries, or higher scores during project assessment and selection. Premiums for management interventions in Natura 2000 sites can be also funded through other EU structural funds such as the European Regional Development Fund (ERDF) or channels such as the LIFE Programme.

However, information sharing and communication is quite limited due to lack of specific funding. The individual owner may be better served by conducting his or her individual search for information specific to the territory of interest. Fortunately, today, access to information, data and maps is facilitated by the existence of dedicated online portals.

General information on the Natura 2000 network is easily accessible through the webpage of the Italian Ministry for the Environment:

http://www.minambiente.it/pagina/rete-natura-2000

To verify whether a property or economic activity is located within the boundaries of a Natura 2000 site (or a different type of protected area), it is possible to access the interactive maps of the European Environmental Agency:

http://www.eea.europa.eu/themes/biodiversity/interactive/natura-2000-european-protected-areas

Furthermore, farmers can access information on their possible relationship to the Natura 2000 Network by consulting their own farm holding file, compulsory for funding requests from the CAP or RDP. The digital farm holding file is normally managed by agricultural trade unions, who can easily provide all necessary information.

In addition to verifying territorial overlap with the Natura 2000 site, information on flora and fauna, types of habitats of interest to the European Union and connections between activities and maintenance of species and habitat in a satisfactory conservation status is also available.

The ecosystem services provided may be also related to different types of habitats and species present in the territory of interest, influenced by or dependent upon specific anthropogenic activities. Information on specific ecosystem services is available in the MGN reports as well as in the present Manual.

AWARENESS: Knowledge is the first step towards acquiring awareness of the diverse values (not only economic) of natural heritage, the individual's role in its management, and the impacts and effects of one's activities, which can be positive or negative depending on management.

Individual perception on the value of 'heritage' is always influenced by multiple factors (culture, time, personal relations, feelings). Thus, subjectivity inevitably influences awareness on the value of the natural heritage providing a range of ecosystem services. Likewise, ecosystem services influence our well-being through complex, nonlinear relations that are not always easily or immediately comprehensible. The value of a forest may be perceived as revenue from the sale of timber in the short term, or deriving from multifunctional uses (e.g. ecotourism, harvest of wild berries) in the medium and long terms. Its value may be perceived at the individual level as an 'intangible', non-monetary good, and the forest may be seen as non-substitutable from the perspective of personal well-being. The latter may thus be classified as a 'cultural' ecosystem service, which is not always quantifiable monetarily. Individual perception and awareness of values influences the selection of ecosystem services (among all those possible) and selection of potential voluntary agreements.

Of equal importance is awareness on one's role in the management or use of an ecosystem that can generate benefits for individuals, interest groups or more generally, the collective. An individual's activity can maintain or make ecosystem services accessible over time. Users may obtain direct and indirect benefits. Choices over management decisions influence the availability of ecosystem services, favouring some at the expense of others, and determining the selection of supply for different potential users. For example, a decision to cut down trees for timber can reduce or eliminate an ecosystem's recreational value. Awareness on one's role as a provider or user of an ecosystem service, and the reciprocal recognition of the role of the other actors involved is the basis for defining a possible agreement for a PES scheme.

The following questions can be used to spur reflection on one's perceived value of the natural heritage of a territory and one's role in relation to specific ecosystem services, either as provider or user.

Self-identification as provider of the ecosystem service:

What is the value commonly attributed to the natural heritage of your territory?

Besides the value currently perceives, do you recognise other values that may be competitive over the medium or long term?

Can exclusive rights to use the natural heritage from which an ecosystem service depends be claimed? Can the same rights be claimed by other actors (e.g. in the case of the commons)?

Does the provision of an ecosystem service depend on the presence and maintenance over time of a specific activity? Is it carried out through exclusive rights?

How is the real economic value of a specific activity calculated such that it guarantees the maintenance of the ecosystem service over time?

The economic value for the maintenance of an ecosystem service can be calculated on the basis of cost of staff, tools and materials needed. It can be also calculated as revenue lost in relation to uses that may be possible but incompatible with maintaining a specific ecosystem service. For example, if recreational activities excluded harvest of wood, the 'recreational value' could economically include lost revenue. Revenue could be calculated in relation to the annuities provided by the rotation of tree harvests and regulated by forestry legislation.

Self-identification as user of the ecosystem service:

Is sufficient information available to identify the ecosystem services in a territory and the actors (public and private) which are involved in its management?

How much is the decision to live in a specific territory (as resident or tourist) influenced by your perception of the value of the ecosystem services?

Is it possible to identify the actors in charge and their role in the management of activities which maintain the ecosystem service?

What are the conditions for willingness to pay for the ecosystem service received as a direct or indirect beneficiary?

Is information available to assess the adequacy of payment for the ecosystem service?

Responses to the suggested questions can help users acquire awareness, assess the value of the ecosystem services, and recognise the role of different social and economic actors in maintaining or using the ecosystem service over time. These are the premises for reaching an agreement for a PES scheme.

RESPONSIBILITY: Awareness of the value of the ecosystem services, of a provider's role in ensuring their maintenance over time, and of the role of the beneficiaries supports responsibility of the different institutional, social and economic actors.

Responsibility in management options: Decisions by providers influence the capacity of ecosystems to deliver different types of services and guide local development models. Owners or land tenants have the responsibility to sustainably manage natural heritage by taking into account

personal needs and the needs of other users involved in the PES scheme as well as the overall well-being of the collective. Responsibility requires acceptance of limits and rules derived from conservation measures.

Responsibility in the definition of rules: Public institutions are responsible for the definition of rules guiding management. They also recognise private rights to use of resources as leading to the protection of collective interests (such as biodiversity conservation).

Responsibility for sustainable use: Users have the responsibility to sustainably use the benefits provided by ecosystem service flows, guaranteeing the right to the same benefits over the long term and to future generations. Users' responsibility requires acceptance of limits to use in order to remain within the carrying capacity of the ecosystems delivering them.

MULTIFUNCTIONALITY: Sustainable management and sustainable use of ecosystem services is more easily met through a multifunctional ecosystem approach. If we consider the forest solely in terms of saleable timber, we risk losing sight of opportunities connected to multifunctional management approaches, able to guarantee greater revenue over the medium and long term.

The multifunctional approach ensures the economic sustainability of smaller farms located in marginalised rural areas, by valorising the ecosystem services that are connected to traditional agro-silvo-pastoral activities, as well as the numerous options for diversification (agritourism enterprises, social and educational farms, product transformation and short value chains).

Multifunctional agriculture includes diverse functions from productive, environmental, recreational, educational and cultural perspectives. The promotion of multifunctional agriculture on farms represents a way to promote and implement working practices that are based on the maintenance of ecosystem services.

The choice to implement a multifunctional strategy is influenced by an entrepreneur's economic assessment. In our view, in the near future, conditions will further facilitate this choice for a larger number of businesses, especially when located inside a Natura 2000 site, a protected area or other area of high biodiversity value.

Further, multifunctional farms are supported by legislation, including Decree no. 228 of 18/05/2001 (Orientation Law). Art. 14 and Art. 15 provide opportunities for building relationships with the public administration, which have not been fully exploited yet. The legislation eases bureaucratic ties for projects and activities that are connected to multifunctional agriculture, proposing opportunities for developing direct relationships (based on collaboration agreements and conventions) among farmers or consortia of agricultural enterprises and the public administration (ATTACHMENT 25).

SUBSIDIARIETY: Voluntary agreements such as PES (private – private) and PES-like schemes (public– private) offer better opportunities when the subsidiarity principle is applied. Current legislation would enable implementation of public-private subsidiarity in the management of ecosystem services. However, this approach requires decision-makers (politicians and public officials) in the public administration to significantly change their perspectives.

Innovation capacity, stubbornness, initiative and courage are needed to promote PES schemes between public and private actors. However, public institutions may have to give up direct management to invest in the capacity and initiative of interested private actors and citizens.

Some PES schemes and related governance tools identified in the LIFE MGN project offer useful examples of best practices that focus on the engagement of social and economic actors in day-to-day management. Limits and problems connected to the economic crisis and budgetary

challenges for public institutions in charge of these sites are likely to encourage and incentivise the definition of public-private agreements aimed at valorising ecosystem services through PES schemes.

FORESIGHT: Ecosystem services facilitate our understanding on the interdependence between our level of well-being and the health of our natural world. Further, PES schemes provide opportunities for economic development and employment connected to the sustainable management of a territory. Here, a natural site may add value by attracting potential users of different ecosystem services.

To better capture these opportunities, it is necessary to include the participation of all actors involved in the management of natural heritage through common and farsighted vision. A shared vision of the future ought to overcome personal and individual interest, and help us direct attention to safekeeping our commons. Our suggestion is to direct investment into continuous cultural growth, education, and to raising awareness in future generations.

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ATTACHMENTS

ATTACHMENT 1: GLOSSARY

Aesthetic value: The value of a landscape or a single element (plant, animal or stone) perceived by a person.

Agroforestry: Mixed system of crops and trees providing wood, non-timber forest products, food, fuel, fodder and shelter.

Air purification (ES): Air quality regulation performed by vegetation.

Assessment site: The site that has been selected for the ecosystem services assessment. This will be a site with a defined area that conforms to the criteria of sites relevant for use of the MGN methodology and the definition of a site.

Beneficiaries: A person or group of people that enjoys goods and services through active or passive consumption or simple appreciation of the existence of the ecosystem service. If there are no beneficiaries, natural elements or processes cease to be ecosystem services.

Benefit transfer: The method of using a value from one site where an assessment of ecosystem services has already been done, and applying it to another site. Depending on the context, the value can be adjusted to make it more relevant. Refer to Guidance 3 for more details.

Biodiversity (a contraction of 'biological diversity'): The variability among living organisms, including those that inhabit terrestrial, marine and other aquatic ecosystems, and the ecological interactions of which they are a part. Biodiversity includes diversity within species, between species, and between ecosystems.

Biological control (ES): Natural control of parasites, pests and disease transmitted by vectors that attack plants, animals and people (birds, bats, wasps, toads, fungi, etc.).

Biomass: The mass of tissues in living organisms in a population, ecosystem, or spatial unit.

Carbon: A non-metallic element existing in different forms and occurring in carbon dioxide, coal, oil, and all organic compounds. Carbon dioxide (CO_2) is a colorless, odorless, incombustible gas present in the atmosphere and formed during respiration and burning of carbon-based fuels.

Carbon sequestration (ES): The process of increasing the carbon content of a reservoir other than the atmosphere. Trees and plants remove carbon dioxide from the atmosphere as they grow, effectively locking it in their tissues. In this fashion, forest ecosystem act as carbon reservoirs.

Catchment (sometimes referred to as a watershed): The dividing line of high ground between two hydrological basins. Often understood to be the land area that drains into a particular watercourse or body of water.

Certifier: A person or an institution that certifies the quantity of an ES flow that is the object of a contract. This could be a public entity (a research institution or public administration) and/or a privately employed professional.

Cultural (ecosystem) services: The non-material benefits people obtain from ecosystems, for example through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experience, including e.g., knowledge systems, social relations, and aesthetic values.

Cultural Value: Aesthetic, spiritual and existence value perceived by people with respect to ecosystems, landscapes species.

Crops: Cultivation of vegetable resources as food.

Decision-maker: A person whose decisions, and the actions that follow from them, can influence a condition, process, or issue under consideration.

Deforestation: Conversion of forest to non-forest.

Degradation of an ecosystem service: For provisioning services, decreased production of the service through changes in area over which the services is provided, or decreased production per unit area. For regulating and supporting services, a reduction in the benefits obtained from the service, either through a change in the service or through human pressures on the service exceeding its limits. For cultural services, a change in the ecosystem features that decreases the cultural benefits provided by the ecosystem.

Discounting: Reducing the value of future goods to a representative present value, based on economic theory.

Double-counting: Erroneously including the same ecosystem service more than once in an analysis.

Economic valuation: Economic value is measured as the most someone is willing to give up in other goods and services in order to obtain a good, service, or state of the world.

Ecosystem: A dynamic complex of living communities and their non-living environmental components, interacting as a functional unit.

Ecosystem service: 'The aspects of ecosystems utilized (actively and passively) to produce human well-being' (Fisher et al. 2009). These include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services (such as nutrient cycling) that maintain the conditions for life on Earth. The concept of 'ecosystem goods and services' is synonymous with ecosystem services.

Ecosystem stability (or ecosystem robustness): A description of the dynamic properties of an ecosystem. An ecosystem is considered stable or robust if it returns to its original state after a perturbation, exhibits low temporal variability, or does not change dramatically in the face of a perturbation.

Edible wild fauna (ES): The provision by an ecosystem of edible fauna, including birds, mammals and fish that are used by local communities, hunters and fishers.

Equitable: Fairness of rights, distribution and access. Depending on the context this can refer to resources, services or power.

Existence value: Value related to the satisfaction that individuals derive from the mere knowledge that species and ecosystems continue to exist.

Flood prevention (ES): The capacity of a territory to reduce extreme events in the case of floods and inundation. Wetlands may absorb water and forested areas can reduce the velocity of, and damage inflicted by, high water.

Forest: A system in which trees are the predominant life forms. Forest statistics used in this toolkit are based on areas that are dominated by trees (perennial woody plants taller than five meters at maturity), where the tree crown cover exceeds 10%, and where the area is more than 0.5 hectares. 'Open forests' have a canopy cover between 10% and 40%, and 'closed forests' a canopy cover of

more than 40%. ‘Fragmented forests’ refer to mosaics containing a combination of forest patches and non-forest lands.

Genetic resources (ES): Genes and genetic information used in animal and plant breeding or in biotechnology.

Greenhouse gases (GHG): Any gas that absorbs infrared radiation in the atmosphere.

Gross value: The total value without deductions; such as the amount of sales, salary, profit, etc. before taking deductions for expenses, taxes, or other costs (as distinct from net value).

Habitat for biodiversity (ES): The provision of an essential habitat for the survival of plants and animals. Every ecosystem contains a diversity of habitats that may be essential for the lifecycle of a species. Certain habitats are associated with high species diversity, which in turn makes them more genetically diverse than others, and these are noted as ‘biodiversity hotspots’.

Human well-being: See Well-being.

Hydroperiod: This term is used to describe the timing, duration and depth of flooding, and can range from a twice daily tide to a seasonal flood lasting days or months.

Intermediary: A person or institution that facilitates the exchange between beneficiaries and providers.

Intrinsic value: The value of something in and for itself, irrespective of its utility for people.

Land cover: The physical coverage of land, usually expressed in terms of vegetation cover or lack of it. Related to, but not synonymous with, land-use.

Land use: The human use of a piece of land for a certain purpose (such as irrigated agriculture or recreation). Influenced by, but not synonymous with, land-cover.

Landscape: An area of land that contains a mosaic of ecosystems, including human-dominated ecosystems. The term cultural landscape is often used when referring to landscapes containing significant human populations or in which there has been significant human influence on the land.

Local knowledge (or indigenous knowledge): The knowledge that is unique to a given culture or society.

Monitoring: An activity that is required, especially in case of regulating services. Monitoring is needed to prevent unsustainable use of ecosystem services. Monitoring should be integrated into PES processes, assuming the function of an instrument with the capacity to provide ‘measures’ of change over different phases of a project. Monitoring requires ‘signals’ in order for managers to activate corrective activities in cases in which environmental outcomes do not reflect the changes taken regarding systems of environmental accounting and valuation.

Market price: The minimum amount that people who buy the good are willing to pay for it. A good’s market price is not equal to its economic value (See economic value).

Methane (CH_4): A hydrocarbon that is a greenhouse gas with a global warming potential most recently estimated at 25 times that of carbon dioxide.

Medicinal plants (ES): Plant species containing active substances, used for curing sickness and in the production of medicines.

Mitigation: An anthropogenic intervention to reduce negative or unsustainable uses of ecosystems or to enhance sustainable practices.

Monetary value: The amount of value an item or a service has in relation to if it were sold for cash to a willing buyer.

Monitoring: To observe, record, or detect (an operation or condition) over time to identify trends.

Natural Capital (NC): The ecosystem stocks that generate renewable flows of ecosystem goods and services. We may divide NC into non-renewable resources (e.g. fossil fuels), renewable resources (e.g. woody tissues) and ecosystem services (e.g. pollination). NC comprises the natural material goods of the Earth (e.g. soils, air, water, flora and fauna) and their relative ecosystem services that render life possible on our planet.

Net value: The amount left after all deductions are made. For example, the net value of wheat would be the price obtained from sale minus the costs for production, marketing, transport and labour plus any other subtractions (such as subsidies).

Nitrous oxide (N_2O): A powerful greenhouse gas with a global warming potential of 298 times that of carbon dioxide.

Non-linearity: A situation in which the relationship between driver and outcome is not constant. Relationships where there is a sudden discontinuity or change in rate are sometimes referred to as abrupt and often form the basis of thresholds. In loose terms, they may lead to unexpected outcomes or 'surprises'.

Non-wood forest products: These include plants and other species, including mushrooms, edible or non-edible wild vegetable species, berries, roots, etc.

Opportunity cost: The benefits forgone by undertaking one activity instead of another.

Pasture, forage (ES): Pastures and meadows used for grazing or for forage production for domestic and wild animals such as cattle, sheep, goats and deer.

Policy-maker: A person with power to influence or determine policies and practices at an international, national, regional or local level.

Pollination (ES): An ecosystem service performed primarily by insects such as bees that is essential for production of fruits, vegetables and seeds.

PES: Financial mechanism between private companies or public and private entities for the economic restoration of natural capital and ecosystem services flows. The ecosystems that generate ES must be managed to maintain or increment these ES flows.

Precision: Also called sampling error, the level of precision, is the range in which the true value of the population is estimated to be. This range is expressed in percentage points. Thus, if a researcher finds that 80% of the community harvest firewood with a precision rate of ±5%, then the researcher can conclude that between 75% and 85% of farmers in the population have adopted the new technology.

Provisioning services: The products obtained from ecosystems, including, for example, genetic resources, foods and fibres and fresh water.

Provider of ES: Defined as the individuals, communities, companies or institutions that may contribute, through management of natural capital, to the production and provision of ES flows. The

natural capital can be contained within private property (farms, forests), public lands (commons), or given in concession from a public entity to a private one.

Provisioning services (ES): These ES include goods such as food, water, wood, fibre, combustibles and other primary materials, but also genetic material and ornamental species.

Raw material (ES): wood (timber or biomass), fibre and other materials provided by ecosystems.

Recreational value: The value of relaxation and recreation activities offered by ecosystems.

Regulating services: The benefits obtained from the regulation of ecosystem processes, including, e.g., the regulation of climate, air and water quality, pests and some human diseases, and assimilation of waste.

Scale: The measurable dimensions of phenomena or observations. Expressed in physical units, such as meters, years, population size, or quantities moved or exchanged. In observations, scale determines the relative fineness and coarseness of different details and hence any patterns that the data may form.

Site: An operative or potential management unit with a defined boundary. For example, a protected area, community forest, farm co-operative, Important Bird and Biodiversity Area, Key Biodiversity Area, Alliance for Zero Extinction site, etc. A 'site' should not be thought of as being as broad as the country-scale. It must make sense in relation to the management and institutional context of the area being considered.

Stakeholder: A person, group or organization that has a stake (interest), investment or share in something (e.g. local community, site managers, NGOs, government, farmers, traders etc.). In this context this would be in relation to the decisions and activities surrounding a particular site.

Soil erosion prevention (ES): Soil and soil fertility conservation performed by forest or shrub coverage.

Supporting services: Ecosystem services that are necessary for the production of all other ecosystem services. Some examples include production of biomass, production of atmospheric oxygen, soil formation and retention, nutrient cycling, water cycling and provision of habitat.

Sustainable (in relation to the environment): Capable of being maintained at a steady level without exhausting natural resources so that an ecosystem may yield continuous benefits to present populations and future generations without causing ecological damage. Thus, sustainability is a characteristic or state whereby the needs of the present and local population can be met without compromising the ability of future generations or populations in other locations to meet their needs.

Potable water (ES): Underground water, rain water and inland water for agricultural, domestic and industrial use.

Threshold: A point or level at which new properties emerge in an ecological, economic, or other system, potentially invalidating predictions based on mathematical relationships that apply at lower levels. For example, species diversity of a landscape may decline steadily with increasing habitat degradation to a certain point, then fall sharply after a critical threshold of degradation is reached. Human behaviour, especially at group levels, sometimes exhibits threshold effects. Thresholds at which irreversible changes occur are especially of concern to decision-makers. (See also Nonlinearity.)

Trend: A pattern of change over time, over and above short term fluctuations.

Valuation: The process of expressing a value for a particular service in a certain context (e.g. of decision-making) usually in terms of something that can be counted, often money, but also through methods and measures from other disciplines (e.g. sociology, ecology). See also Value.

Value: The contribution of an action or objective to user specific goals, objectives, or conditions. See also Valuation.

Water purification (ES): Purification of water through adsorption and filtrating activities of plants and soils.

Water recharge (ES): the service performed by the hydraulic network to store and preserve water underground.

Well-being: A context- and situation-dependent state involving a good life, freedom and choice, health and bodily well-being, good social relations, security, peace of mind and spiritual experience.

Wetlands: Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters

ATTACHMENT 2. QUESTIONNAIRE FOR MANAGEMENT AUTHORITIES

LIFE/11/ENV/IT/168 *Making Good Nature*

Questionnaire on the administrative status, function and management of the Natura 2000 sites involved in the MGN project

In this section, the introduction will have to adapted to each project in order to reach the objectives. References to the MGN Project are kept to ensure better understanding.

Introduction to the questionnaire

The key objective of the questionnaire is to acquire information on the environmental and management context of the pilot sites included in the MGN Project. The information will provide CURSA and EURAC with an introductory knowledge framework functional to the definition and implementation of Actions A2 and A3.

Local authorities, partners to the project, will complete the present questionnaire in all of its parts and for each of the Natura 2000 Network sites identified and included in Actions from B4 to B9. These actions are described in Part C of the Technical Application Forms of the MGN Project.

Some questions specifically request for documentation to be attached. A summary of the documents required is in the last page of the questionnaire. CURSA and EURAC will provide assistance to partners in the completion of the questionnaire, if required.

The questionnaire proposed is divided into five sections:

A. *General information*: it contains information to identify the pilot site and the questionnaire compiler;
B. *General overview:* partners briefly describe the site from an ecological, administrative and management perspective;
C. *Economic and financial overview*: partners provide information on the economic and financial resources devoted to the sites object of study;
D. *Environmental, economic and social aspects (Qualitative aspects):* partners provide brief qualitative information on the environmental, economic and social aspects of the site. In some cases, the information requested will require involving other knowledge holders.
E. *Ecosystem services*: partners provide information on local activities, whether active or not, which can lead to the development of self-financing mechanisms.

A- GENERAL INFORMATION

Name of the site	
Code Natura 2000	
Management Authority	
Law or decree establishing the site	
Address of the Management Authority	
Name of compiler	
Position	
Phone/fax	
E-Mail	
Date of compilation (dd/mm/yyyy)	
Additional compiler	
Position and contact	
Additional compiler	
Position and contact	
Additional compiler	
Position and contact	

This field could change based on the area of study.

This information is connected to an area recognised in legislation but may not be important.

B – GENERAL OVERVIEW

1. **Is the Natura 2000 Site connected to the system of Protected Areas (PAs, Reserves, Sites of National Importance, Sites of Regional Importance)?**

   □ yes (*How? E.g. "ecological corridor", stepping stones, others)*_____

   □ no

2. **In what catchment is the Site located?**

   The objective of the question is to assess the ecological connectivity (and isolation) of the site.

   _____

3. **Is there a check list of the flora present in the site (n. of total species, endemic species, protected species, species in attachments II and IV, others)?**

   □ yes (*attach documentation to the questionnaire*)
   □ no

4. **Is there a check list of the fauna present in the site (n. of total species, endemic species, protected species, species in attachments II and IV, others)?**

   □ yes (*attach documentation to the questionnaire*)
   □ no

5. **Is there a *red list* of the flora present in the site/area (IUCN classification "EX", EW", "CR", EN", "VU", "LR", DD", NE",** "RE", "NA" "LC**)"[3]?**

   □ yes (*attach documentation to the questionnaire*)
   □ no

6. **Is there a *red list* of the fauna present in the site/area (IUCN classification "EX", EW", "CR", EN", "VU", "LR", DD", NE",** RE", "NA**", "**LC**)"?**

   □ yes (*attach documentation to the questionnaire*)
   □ no

   These questions assess the conservation status and natural aspects of the area. They are a knowledge base that can be analysed in more or less detail.

7. **Is information available on the quality of surface water and groundwater?**

   □ yes, on site (*attach documentation to the questionnaire*)
   □ yes, from other institutional bodies (*indicate who could provide this information*)_____
   □ no

3 Extinct "EX", Extinct in the wild "EW", Critically endangered "CR", Endangered "EN", Vulnerable "VU", Near threatened "LR", Data deficient "DD" Not evaluated "NE", RE (Regionally Extint), NA (Not Applicable), LC (Least Concern)

8. Is GIS data available (thematic shape files) for the site?

□ yes
□ no
If so, **Which ones? (Specify scale of cartographic maps and GIS data and year of reference for the data)**

□ Habitat map, Annex I of EEC Directive *(shape file)* _____
□ Species map, Annex II of EEC Directive *(shape file)*_____
□ General map of habitats *(shape file)* _____
□ General map of species *(shape file)*_____
□ Land use map *(shape file)*_____
□ Geologic map *(shape file)*_____
□ Hydrogeological risk map (*shape file)*_____
□ Hydrogeological map *(shape file)*_____
□ Map of the hydrographic network *(shape file)* _____
□ Soil map *(shape file)* _____
□ Map of forest fires *(shape file)* _____
□ Vegetation map *(shape file)*_____
□ Map of forest cover or forest types *(shape file)*_____
□ Road map (roads, cycling lanes, path, parking, other) *(shape file)*_____
□ Orthophotos *(specify resolution)*_____
□ DTM *(raster file) (specify resolution)*_____
□ Other (*specify*)_____

Available cartographic information is very useful for the assessment of the different services.

9. Is GIS data available for the adjacent area (20 km buffer)?

□ yes
□ no
If so, **Which ones? (Specify scale of cartographic maps and GIS data and year of reference for the data)**

□ Land use map (shape file) *(specify scale)*_____
□ Road map (roads, cycling lanes, path, parking, other) *(shape file)*_____
□ Map of potential sources of pollution (industrial sites, landfills, gas stations, others) (*shape file*) _____
□ DTM (*raster file) (specify resolution)*_____
□ Other (*specify*)_____

10. Who are the institutions with competences in the administrative - management fields for the site, in the territory under study?

□ Region *(specify)* _____
□ Province *(specify)*_____
□ Municipality *(specify)* _____
□ Civic use institutions *(specify)* _____
□ Other (*specify*) _____

11 Who are the public institutions present in the site, in the territory under study (with competences in the environmental – administrative field)?

□ Regional/provincial agencies for Environmental Protection _____
□ Catchment management authorities_____
□ Reclamation consortia_____

□ Mountain communities/Mountain institutions (reference to the Italian National Union of Mountain Towns and Communities) _____
□ Others (*specify*) _____

12. List the regional regulatory framework for the Natura 2000 network

_____

13. Does the site have a Management Board (M.B.)?

□ yes
□ no

If so,

Who manages it?

□ Local institutions
□ Region
□ Other actors:_____

Questions address the local and institutional governance to identify stakeholders and public-private roles in the management of the area

Who is included?

□ all private land owners included in the site
□ representatives of private land owners included in the site
□ all public land owners included in the site
□ representatives of public land owners included in the site
□ representatives of the Province
□ representatives of the Region
□ representatives of agricultural organisations
□ representatives of environmental associations
□ representatives of industrial organisations
□ representatives of sport fishing associations
□ representatives of hunting associations
□ other (*specify*)_____

In the table below, indicate whether participation and consultation with local citizens is expected in the Management Board

	Participation		**Consultation**	
	Citizens	Stakeholders	Citizens	Stakeholders
YES				
NO				

14. Does the site have a 1) Management Plan (where needed) or 2) other conservation measures (contractual, administrative and regulatory) identified in the Directive?

□ yes (*attach documentation to the questionnaire*)
□ no

If so,

1) The Management Plan is:

□ being drafted
□ drafted but not yet adopted
□ adopted by the Region (*specify the date of adoption*) _____

The questionnaire focuses on the regulatory frameworks and norms that guarantee conservation and/or management. These can be diverse, but it is assumed that an institution would have officially adopted them

□ approved by the Region (*specify the date of approval*) _____
□ integrated with other existing planning tools _____

2) The contractual, administrative and regulatory measures are the following:_____

Do conservation measures exist for the site (and/or any internal protection measures and/or overlapping with PAs)?

□ yes (□ **Conservation measures** □ **Protection measures)**
□ no

Does the Management plan or the Conservation measures plan for actions to maintain a satisfactory conservation status for habitats and species?

□ yes □ no

Do the Plans establish/budget costs for these actions?

□ yes □ no

Do the Plans budget for management costs?

□ yes □ no

15. What other plans and planning tools are in place for the area where the site is located?

□ Water protection plan
□ Hydrogeological plan
□ Forest management plan and/or Land use forest planning /Strategic forest plan
□ Territorial landscape plan
□ Plan for river basin management
□ Park plan
□ Park regulations
□ Other (*list*) _____

In-depth analysis of urban and planning instruments available, to understand which ones management needs to interact with and which ones are restrictions.

16. If present, which are the expected restrictions in the Regional Landscape Territorial Plan?

□ Woods
□ Archaeological
□ Other (*specify*) _____

17. Are there Pasture Plans approved or adopted?

□ yes
□ no

18. Does the site include Civic uses and/or Collective Rights?

□ yes
□ no
If so:

In-depth analysis on the rights and traditions of local communities: if present, whether they are recognised and how these interact with the management of the site.

Are these regulated?

□ yes □ no

Were these regulations approved by an administrative policy act (*Municipal Council Resolution, Council Resolution, others*)?

□ yes (specify administrative policy act) _____
□ no

What do the site regulations include?

□ Rights to wood harvesting from dried ground plant falls
□ Rights to wood harvesting from dry standing plants

□ Rights to wood harvesting from living and standing secondary species plants
□ Rights to pasture
□ Rights to hunting
□ Rights to cultivation
□ Pannage right

Is there a management body for collective rights (e.g., *Agrarian university, Commons or separate administration of civic goods*)?

□ yes □ no

Or, is management led by the municipality?

□ yes □ no

19. **Were research studies conducted in or of the site (scientific research, undergraduate, Masters, PhD thesis, others)?**

□ yes
□ no

If so, please complete the following table:

Title of the project/thesis/research study	***Discipline***	***Institution responsible for the research***	***Other institutions involved***	***Contacts***

Information on all previous research projects conducted in the area is collected and used to better understand the characteristics and the threats, environmental in primis*, of the area.*

Is it possible to access the information (databases, publications, reports, others)?

□ yes □ no

Was research carried out on the level of knowledge and monitoring of the species that led to the designation of the site?

□ yes (specify name of the project and species considered) _____
□ no

20. **Is data available on the hydrogeological risk of the territory?**

□ yes, on site (*attach documentation to the questionnaire*)
□ yes, from other institutional bodies (*indicate who could provide this information*)_____
□ no

C – ECONOMIC AND FINANCIAL OVERVIEW

21. Are there budgets and/or management reports including income and expenses for the site?

□ yes (*attach the budget balance sheet to the questionnaire*)
□ no
If not,
In the balance sheet of the Park Authority/Region, are there one or more expenditure items for the site?

□ yes (*attach the expenditure items for the last five years*)
□ no

22. What are the yearly funding resource available and what is the amount?

□ national ministry (€ _____)
□ regional (€ _____)
□ provincial (€ _____)
□ municipalities (€ _____)
□ other _____ (€ _____)

23. In the budget sheet of the last 5 years, what expenses were incurred for administration of the management of the site (excluding staff)?

20___ € _____
20___ € _____
20___ € _____
20___ € _____
20___ € _____

The economic and financial capacity of the Management Authority is assessed. Analysis of the origins of the funding and types of recurring costs is carried out to evaluate the activities of the Authority.

24. Complete the following table with percentage of time annually dedicated to the management of the site, including professional qualifications and roles (last five years)

Year	N°	Professional qualification	Role	% of time dedicated to the site according to contract or appointment (also informal)

Add other fields if necessary.

Analysis of human resources available to the Management Authority to understand level of competences and availability of time dedicated to the site.

25. Did the Management Authority participate in European projects in the last five years?

□ yes (*attach documentation to the questionnaire)*
□ no
If so,

Indicate the projects, specifying name and year of reference

□ LIFE _____
□ IPA Interreg _____
□ ENPI _____

Analysis on participation to international projects, which supported with additional funds, and are the outcome of capacity for project development, partnership building and networking.

□ 7FP/H2020 _____
□ EUROPEAID _____
□ Others (*list*)_____

Is it possible to access the list of the yearly project funds available to the site over the last five years?
□ yes (*attach documentation to the questionnaire*)
□ no (*why?*)_____

26. In the last five years, did the *Management Authority* participate in international, European, national and local projects (*regional, provincial and municipal*) different than the ones listed for question 25?

□ yes (*specify whether international, national, regional*) _____
□ no
If so,

Was funding received?
□ yes □ no
Is it possible to access the list of the yearly project funds available to the site over the last five years?
□ yes (*attach documentation to the questionnaire*)
□ no (*not available)*
□ no (*no funding was received)*

27. Did the projects listed in the questions 25 and 26 contribute to enhance the state of the ecosystems to conserve habitat and species of Community Interest)?

□ yes (*which ones?*) _____
□ no

If so,
Were habitat areas restored?
□ yes (*specify the type of habitat and surface area restored*) _____
□ no
Were animal or plant species safeguarded, increasing the distribution area, population density, n. of reproductive sites, trophic resources, or other parameters for assessing the state of conservation?
□ yes (*which ones*?) _____
□ no

Indicate the actions that enhanced the environment (ES; mowing of grasslands, wood harvesting, leaving litter and dead plant material on the ground).

_____

The analysis focuses on additional projects and funds which the Management Authority implemented at the national and level to reach conservation objectives.

D – ENVIRONMENTAL, ECONOMIC AND SOCIAL ASPECTS (*qualitative aspects*)

28. In the last National Report on progress with the implementation of the Habitat Directive and the conservation status of habitat and species sent by the Region to the Ministry of the Environment and Protection of Land and Sea (MATTM) for habitat and species (in the priority list) present in the site, which evidence or conservation threats emerged?

_____

29. In completing the *Prioritised Action Framework* as requested by the MATTM by November 2012, did the Region identify specific priorities for the site or for the habitat and priority species (and not) present in the site?

_____

30. Did land use of the area change over the past 10 years?

□ yes
□ no

If so,

What changed? For what area?

□ change in the utilised agricultural area (□ increase □ decrease: ha……..)
□ change in arable surface (□ increase □ decrease: ha……..)
□ change in area under permanent meadow and pastures (□ increase □ decrease; ha……..)
□ change in area under permanent crops (□ increase □ decrease: ha……..)
□ change in wood cover (□ increase □ decrease: ha……..)
□ other (specify):_____ (□ increase □ decrease: ha……..)

This section analyses environmental changes with social and economic impacts

31. Did the landscape significantly shift over the past 10 years?

□ yes
□ no

If so,

Did the landscape mosaic change?

□ yes *(how?)*_____
□ no

Did forest meadows decrease?

□ yes
□ no

Did hedges and shrub areas increase?

□ yes
□ no

Other *(specify)*_____

These questions first focus on compulsory documentation for Natura 2000 sites which offer a wealth of information. Variations in land cover and landscape indicate trends in the primary sector (land abandonment, intensification, and processes leading to more extensive land use). Further, more homogenous landscapes are less attractive.

32. Were the changes influenced by the establishment of the site?

□ yes
□ no

If so: How? Why? To what degree?

33. Were priority actions identified for the Natura 2000 Network locally and for the site specifically?

_____
_____

It is essential to understand which actions were identified and whether changes were influenced by the establishment of the site (both positively and negatively).

34. **Is there a database/list of agroforestry companies present in the site?**
□ yes
□ no
□ data not on site (*indicate the Institutions which provide this data*) _____
If so, **How many?** n. _____period of reference (*year*)_____

35. **Indicate in the following table the main economic activities present in the site of the area and within a 20 km buffer zone.**

Economic activities	Located in the site (number)	Located in the buffer zone (20 km) (number)	Size	Year of reference
Agriculture			Hectares per type	
Organic farming			Hectares per type	
Silviculture and other forestry activities			Number of enterprises, hectares	
Non forest wood products			Number of permits/licences - hectare	
Fishing, aquaculture and related service activities			Number of permits/licences	
Hunting			Number of licences	
Game hunting enterprises			Number of permits	
Livestock (tethering)			Number of animals per type	
Livestock (loose housing)			Number of animals per type	
Food processing			Number per type	
Electric power generation, transmission and distribution			Number per type	
Mining and quarrying			Number and surface area	
Industry (specify)			Number by sector	
Tourism			Number of visitors/ Nights spent	
Ecotourism			Number of visitors/ Nights spent	
Hotel			Number of facilities and beds	
B&B, other accommodation			Number of facilities and beds	
Agritourism enterprises			Number of facilities and seats	
Restaurant			Number of facilities and seats	
Travel agency and tourism			Number	

This data precisely delineates the economic activities in the area and their importance in terms of determining a PES scheme. It is also possible to indirectly address the most commonly used ES. Information should be provided as complete as possible.

Economic activities	Located in the site (number)	Located in the buffer zone (20 km) (number)	Size	Year of reference
/tour operator				
Travel/tour guide			Number of operators	
……..				
……..				

36. Is it possible to identify threats and critical factors within and outside the boundaries (pressure on the territory which may alter the conservation status of species and/or habitats and of the site in general)?

□ yes
□ no

If so, complete the following table

Threats	Within the boundaries of the site	Outside the boundaries of the site
Use of pesticides in agriculture;		
Agro-industrial mechanisation in agriculture;		
Monoculture		
Pasture		
Fires		
Poaching		
Illegal fishing		
Waste		
Urban expansion		
Road infrastructure		
Mining		
Industrial production		
Energy production		
Mass tourism		
Other (*specify*)		

This question provides information on threats to the conservation of the area in terms of new infrastructure development and loss of biodiversity, as well as on ES black markets, as the illegal use of ES.

37. **In the following table identify the stakeholders that need to be involved in defining actions for the management of the site, as well as their relative importance.**

Stakeholders	**Indicate level of importance**					
	Not important	Somewhat important	Moderately important	Important	Very important	N/A
Farmers						
Intensive livestock rearers						
Extensive livestock rearers						
Commercial fishers						
Non-commercial fishers						
Environmental guides						
Tourists						
Hikers						
Restaurant owners						
Hotel owners (B&B, others)						
Tour operators/guides						
Agritourism enterprises						
Forest contractors						
Commercial mushroom pickers						
Non-commercial mushroom pickers						
Commercial berry pickers						
Non-commercial berry pickers						
Mineral water producers (bottling)						
Surface water withdrawals						
Hydroelectric power plants managers						
Micro-hydroelectric power plants managers						
Hunter associations						
Sport fishing associations						
Environmental organisations						
Professional trade unions						
Members of civic uses						
Municipal owners						
Private owners						
……..						
……..						
……..						

With this table we ask the Management Authority to classify by order of importance the stakeholders, who, according to personal experience in the territory, may be more interested in its management, and could therefore be included in a possible agreement or a PES scheme.

This data provides information on the actual existence of a PES-like scheme. Agro-environmental schemes (CAP) recognise the role of farmers in supporting the conservation of ES by way a financial contribution per hectare. The present Manual includes Measures for the 2007/2013 programming period. Similar one are also found in the 2014/2020 programming period.

38. Is information available on how many payments for organic farming were implemented in the RDP?

□ yes (*approximate amount*) €_____
□ no
□ information not available (*indicate possible contact persons*) _____

If yes:
Which RDP measure?
□ Measure 132
□ Measure 133
□ Measure 214
□ Other Measure (*specify*)_____
How many in the last 5 years?
2012 n._____
2011 n._____
2010 n._____
2009 n._____
2008 n._____

39. Were they part of the Natura 2000 payments in the RDP?

□ yes (*approximate amount*) €_____
□ no
□ information not available (*indicate possible contact persons*) _____

40. Were service contracts for the maintenance of the territory and environmental conservation activated (e.g. DPR, Italian legislator decree 228/2001, others)?

□ yes
□ no
If so,
Complete the following table including the types of contract, regulations and expected benefits

Types of contracts signed	Subject of the contract	Brief description of the actions

The last set of questions analyses other types of agreements that according to the Italian legislation allow for contributions to farmers which maintain the territory and secure against it threats. These activities are generally regulated by contracts, which can be seen as self-financing mechanisms or saved costs.

E- ECOSYSTEM SERVICES (Qualitative aspects)

41. How important are the products and services provided by the site?

Ecosystem services		Indicate level of importance					
		Not important	Somewhat important	Moderate important	Important	Very important	N/A
Provisioning	Forage, pasture						
	Species for hunting and fishing						
	Raw material (wood, fibre,)						
	Mushrooms and berries						
	Medicinal plants						
	Genetic resources						
	Clean water						
Regulating	Caron sequestration						
	Local climate regulation / air purification						
	Water regulation (groundwater recharge)						
	Water purification						
	Erosion regulation (landslides, slope instability)						
	Protection from hydro-geological instability (floods, flooding)						
	Pollination						
	Pest regulation (harmful insects)						
	Biodiversity habitat						

This section specifically looks into the ES and PES to assess what has been done and what are the knowledge and competences of the Management Authority. Responses in this questionnaire are from the perspective of the manager but in the LIFE MGN, this table further identified the most important ES together with stakeholders. This table refers to the definitions provided in the Millennium Ecosystem Assessment because more immediate and comprehensible. Currently there are other ES classifications that can also be used (e.g. the Common International Classification of Ecosystem Services -

Cultural	Aesthetic value						
	Recreational value						
	Inspiration for culture, arts, educational and spiritual values, identity						

42. What are the three services that are considered a priority for the site and for what reason?

1. _____
2. _____
3. _____

43. How do stakeholders benefit from the services provided in the site?

Stakeholders	**Indicate level of importance**					
	Not important	Somewhat important	Moderately important	Important	Very important	N/A
Farmers						
Intensive livestock rearers						
Extensive livestock rearers						
Commercial fishers						
Non-commercial fishers						
Environmental guides						
Tourists						
Hikers						
Restaurant owners						
Hotel owners (B&B, others)						
Tour operators/guides						
Agritourism enterprises						
Forest contractors						
Commercial mushroom pickers						
Non-commercial mushroom pickers						
Commercial berry pickers						
Non-commercial berry pickers						
Mineral water producers (bottling)						
Surface water withdrawers						
Hydroelectric power plants managers						
Micro-hydroelectric power plants managers						
Hunter associations						
Sport fishing associations						
Environmental organisations						
Professional trade unions						
Members of civic uses						

With this table we ask the Management Authority to classify by order of importance the stakeholders, who, according to personal experience in the territory, may be more interested in its management, and could therefore be included in a possible agreement or a PES scheme.

This data provides information on the actual existence of a PES-like scheme. Agro-environmental schemes (CAP) recognise the role of farmers in supporting the conservation of ES by way a financial contribution per hectare. The present Manual includes Measures for the 2007/2013 programming period. Similar one are also found in the 2014/2020 programming period.

Stakeholders	Indicate level of importance					
	Not important	Somewhat important	Moderately important	Important	Very important	N/A
Municipal owners						
Private owners						
……						
……						
……						

44. Identify 1-2 species, amphibians, insects, birds, mammals, and reptiles, which are sensitive to ecological fragmentation and representative of the local fauna.

Amphibians
1. _____
2. _____
Insect
1. _____
2. _____
Birds
1. _____
2. _____
Mammals
1. _____
2. _____
Reptiles
1. _____
2. _____

Besides information on conservation, PES and other types of arrangements are analysed, including entry fees, amount, taxes, concessions and other financing instruments.

45. Were self-financing mechanisms activated to support the management of the site?

□ yes
□ no

46. Is there an entry fee?

□ yes (*cost of the ticket)* **€** _____
□ no

47. Is there a fee for guided tours?

□ yes (*cost of the guided tour)* **€** _____
□ no

48. Are fundraising activities connected to permits regulating mushroom picking?

□ yes
□ no

49. Are fundraising activities connected to the regulation of acquisition of state concessions?

□ yes
□ no

50. Are fundraising activities connected to the regulation of exemptions on payment of taxes and / or VAT?

□ yes, which ones? _____
□ no

51. Have payment schemes for some ecosystem services and function been activated?

□ yes
□ no
If so,
Which ones?
□ CO_2 sequestration and sale on the voluntary market
□ Imposition on billing for water consumption of a percentage for forest management
□ Withdrawal from state concession or fee applied per litre of bottled water
□ Other? (*specify*) _____

52. Does the Management Plan, or the Conservation Measures, expect to manage possible ecosystem services?

□ yes
□ no
If so,
Which are the functions provided by in a forest taken into account?
□ harvest of wood products
□ harvest of non-wood products (*mushrooms, truffles, berries, others*)?
□ touristic and recreational function
□ Protection from climate change (*CO_2 sequestration*)
□ Hydrogeological protection
□ Others (*specify*) _____

Required documentation to be attached to the questionnaire

A. *Check list* of the flora present in the site (*question 3*)
B. *Check list* of the fauna present in the site (*question 4*)
C. *Red list* of the flora present in the site (*question 5*)
D. *Red list* of the fauna present in the site (*question 6*)
E. Information on the of surface water and groundwater (*question 7*)
F. Management plan of the site or Conservation measures (*question 13*)
G. Budget balance sheet of the site (*question 20*) and/or expenditure items if the site is managed by a Park Agency or the Region
H. Summary of European funding in the last 5 years (*question 24*)
I. Summary of non-European funding in the last 5 years (*question 25*)

We thank you for taking the time to complete the questionnaire. Below is our contact information. Please do not hesitate to contact us for possible problems, concerns or doubts:

ATTACHMENT 3: QUESTIONNAIRE TO RESIDENTS

N. _____	**Place_____**	**Date _____**

A survey led by the LIFE+ Making Good Natura (LIFE11 ENV/IT/000168)

"Residents' perceptions in the Municipalities of the project"

Brief guidelines for completing the survey:

- Please respond spontaneously without seeking additional support.
- The survey will take about 5-10 minutes.
- Please respond to all the questions.

The survey is completely anonymous!

Information on the LIFE+ Making Good Natura project is available on the site: http://www.lifemgn-serviziecosistemici.eu

1. In which Municipality do you live? _____

2. Are you satisfied with living in your Municipality?

○ yes ○ no

3. Can you express your level of satisfaction with regard to the following services in your area?

	Very satisfied	Somewhat satisfied
Transport	○	○
Schools	○	○
Health services	○	○
Services to business	○	○
Communication networks	○	○
Environmental quality	○	○
Cultural activities	○	○

4. Habitat and species conservation provide many important services, which contribute to the well-being of the local and visiting population. What are, in your opinion, the most important services provided in the area where you live? (express your opinion for each of the options)

	Fundamental	Very important	Moderately important	Somewhat important	Not important
Source of food, water, and raw material for economic production (e.g. *timber, forage, water*)	○	○	○	○	○
Aesthetic, spiritual and recreational values; used by local residents and tourists (e.g. *tourism, landscape*, *hiking, local traditions*)	○	○	○	○	○
Natural regulating services in the environment (*contrast to soil erosion, carbon sequestration, water purification*)	○	○	○	○	○
Conservation of biodiversity and local resources for future generations	○	○	○	○	○

5. Are you aware on whether you live in a Municipality which includes a site protected by the Natura 2000 Network (SCI/SPA)?

○ yes ○ no (skip to questions A, B and C at the end of the survey. Thank you)

6. In your opinion, did the establishment of the site (SCI/SPA) enhance the quality of life and well-being for the local community?

○ yes ○ no

a) If so, from what perspective? (express your opinion for each of the options)

	Yes, a lot	Yes, Moderately	Yes, somewhat	Not at all
Locally, environmental protection has positively influenced on the quality of life of the population	○	○	○	○
New economic activities were created or traditional ones were revitalised	○	○	○	○
The local community developed a new sense of identity, also thanks to the flow of visitors	○	○	○	○

b) If not, can you please explain? _____

_____

7. In the past few years, have you participated in, or did you know of initiatives which aimed at promoting local development opportunities for the local community?

○ yes ○ no

8. Do you know of new economic activities that are directly connected to the presence of the site?

○ yes ○ no

If so, which ones? _____

_____

9. What is your overall level of satisfaction with the management of the site?

○ high ○ average ○ low

A. Age:	○ from 0 to 17
	○ from 18 to 30
	○ from 31 to 45
	○ from 46 to 60
	○ over 60
B. Gender:	○ male
	○ female
C. Qualification:	○ none
	○ primary school
	○ middle school
	○ upper secondary school
	○ university degree or above

Thank you for your cooperation!

ATTACHMENT 4: QUESTIONNAIRE FOR KEY STAKEHOLDERS

In the Project LIFE+ Environment Policy and Governance "*Making Good Natura - Making public goods provision the core business of Natura 2000*" - LIFE11 ENV/IT/000168, ERSAF, in collaboration with ETIFOR Srl (spin-off from the University of Padova), started a survey to collect information on visitors and recreational activities in the area.

The survey is divided into two parallel phases: the first collects information from visitors to the site, while the second collects information from "key respondents" identified by experts, and of whom you are part of.

The approach of the survey is the following: based on your technical knowledge and experience, we first ask you to respond in as detailed as possible to the following (mainly) open questions. A second questionnaire will be sent to you after responses to the first questionnaire have been analysed. The survey is much quicker as it relies on closed-ended questions. An interview may be carried out instead.

Given that we need to contact you later, the questionnaire will not be anonymous, but will be treated with the treated with the utmost confidentiality, according to the legislator decree 196/2003 (Data protection code).

Trusting in your participation in the initiative, aimed at enhancing the area ……, we thank you kindly.

Data of survey completion ___/___/_____ (DD/MM/YYYY)

Institution/ body/organisation/private

.....

1. What do you think are the main <u>points of strength</u> of the area in terms of favouring touristic and recreational functions?

.....

2. And what are the external factors that can provide <u>opportunities</u> to favour touristic and recreational functions?

.....

3. What do you think are the main <u>points of weakness</u> internal to the area that limit touristic and recreational functions?

.....

4. What are possible external threats or <u>limiting factors</u>?

.....

5. In order to increase the touristic and recreational functions of the area, what aspects should be <u>improved</u>? (list them by importance)

Which of the following are a <u>priority</u>? (order them by priority, with values from "1st" to "5th")

Aspects that need to be improved	Priority
a. ……..	
b. ……..	
c. ……..	

6. To develop concrete proposals that will improve the aspects listed above, which local actors (public and private) should be involved as a matter of priority?

.....

7. Did you ever hear about "ecosystem services"? yes ☐ no ☐

8. With the term "ecosystem service" we refer to "the multiple contributions of ecosystems to human well-being". Which ecosystem services do you think are more connected to the touristic and recreational functions of the site? Which relations predominate: synergies or conflicts?

.....

9. Do you think it would be possible to introduce a payment scheme to support management of the area and maintain its touristic and recreational functions? If so, in what form and to what degree?

.....

10. Do you think that current forest management practices maximise the touristic and recreational functions without contrasting with the overall conservation objectives of the area?

yes ☐ no ☐

If so: how? Which aspects have been more effective up to today?.....

.....

If not, which are the main constraints? Which aspects should be improved? .....

.....

11. Currently, do you think touristic and recreational uses are disjointed, or are their organised in well packaged? Which ones?

.....

12. Do you think that the establishment of the Natura 2000 site is having positive impacts in economic terms? yes ☐ no ☐

a. **If so, how?**

Quantitative impacts (e.g. increase in number of enterprises, increase in employment, increase in revenue):

_____

Qualitative (e.g. enhancement of productive processes, enhanced quality of new products):

_____

b. **If not, why?** (e.g. constraints, changes in land use, lack of funding)

_____

13. The presence of a Natura 2000 site involves costs but favours access to economic and financial benefits connected to environmental conservation (e.g., compensatory measures, development programs, services, others)**. Do you agree with the view? In your opinion, which were the most effective incentives up to now, provided there were any?**

_____

14. Indicate the most important economic hurdle which the Management Plan (or similar instrument) should address?

---

15. Who are the main types of visitors to the area?

Based on your experience, please indicate the types of visitors (sport-oriented, hikers, families, others) and provide an estimate of their approximate number on an average sunny week day or week-end day, by each of the four seasons.

(this is of course a personal estimate: please write an approximate number even if it does not correspond with the actual number of people)

We also ask you to indicate where the activities are principally carried out.

Activity	Main locality for activity	**Spring**		**Summer**		**Fall**		**Winter**	
		Week day	Week-end	Week day	Week-end	Week day	Week-end	Week day	Week-end
Hiking									
Mountaineering									
Climbing									
Mountain bike									
Cycling									
Canyoning									
Mushroom picking or other non-timber forest products									
Education									
Food and wine									
…….									
…….									

ATTACHMENT 5: QUESTIONNAIRE ON RECREATIONAL VALUE

Questionnaire for visitors of ……

Within LIFE+ Environment Policy and Governance Project "Making Good Natura - Making public goods provision the core business of Natura 2000" - LIFE11 ENV/IT/000168, ERSAF, in collaboration with ETIFOR Srl (Padova University spin-off), has launched a survey to gather information on people visiting this site and their recreational activities in the area. You can take the chance for giving inputs and comments to improve the management of the site.

You are kindly requested to fill-in the questionnaire in all its parts.

The questionnaire should be filled-in individually. In the case you were here with your family, questions and replies should be referred to your family.

The questionnaire is anonymous and information gathered will be treated confidentially according to legislator decree 196/2003 (i.e. Italian Privacy Law on Protection of Confidential Data)

Date ___/___/___ Place …… Weather conditions ……

The present questionnaire has been: □ self-filled □ presented and filled by an interviewer

1. What is the main activity you are here for today?

□ hiking

□ mountaineering or climbing

□ cycling

□ other sport activities (running, canyoning, horse riding, etc.)

□ mushroom, herb, chestnut, etc. picking

□ teaching

□ wine and food

□ other (please specify) _____

2. You came:

□ alone

□ with some friends → n° of friends |__|__|

□ with a group of people → n° of people |__|__|

□ with your family → n° family members |__|__| *(with reference to the next questions please make reference to all your family members)*

□ other (please specify) _____

3. Your visit to this site will last:

□ one day without accommodation → please move to question 7.

□ one or more days, with accommodation in the surroundings (<20km) → please reply also to questions 4, 5 and 6.

□ one or more days, with accommodation in a different place → please reply also to questions 4, 5 and 6.

4. *(in case of overnight staying)* **How many days are you staying? |__|__|__|**

5. *(in case of overnight staying)* **What is your accommodation?**

□ hotel

□ bed and breakfast

□ flat

□ mountain hut/refuge

□ camping

□ hosted by friends

□ other (please specify) _____

6. *(in case of overnight staying)* **The average daily disbursement for the accommodation is (please indicate your range):** □ 0 - 30 € □ 31 - 60 € □ 61 - 90 € □ more than 90 €

7. What has been the average disbursement per person you had today within this site (or in the surroundings) for…	**Average daily disbursement per person**
… food and drinks?	|__|__|__|__| € □ no disbursement
… purchasing of typical local products?	|__|__|__|__| € □ no disbursement
… renting/purchasing of technical equipment?	|__|__|__|__| € □ no disbursement
… parking?	|__|__|__|__| € □ no disbursement
… other (please specify) _____	|__|__|__|__| € □ no disbursement

8. How did you get to this site?

□ car

□ bicycle

□ camper

□ public transportation

□ motorbike

□ other (please specify) _____

9. How long did you travel to get to this site from the place where you normally live or the place you are staying during these days (n° of kilometres)? |__|__|__| km

10. Have you ever visited this site before? □ yes □ no → if no, please move to question 13

11. *(If you replied "yes" to question 10)* **When did you visit this site the first time? (year)** |__|__|__|__|

12. *(If you replied "yes" to question 10)* **With regard to the last year (2013) …**

… how often did you came for …	**… in spring …**	**…in summer…**	**… in autumn …**	**… in winter …**
…hiking?	|__|__| days	|__|__| days	|__|__| days	|__|__| days
… mountaineering /climbing?	|__|__| days	|__|__| days	|__|__| days	|__|__| days
…bicycling	|__|__| days	|__|__| days	|__|__| days	|__|__| days
… other sport activities?	|__|__| days	|__|__| days	|__|__| days	|__|__| days
… mushroom, herb, chestnut, etc. picking?	|__|__| days	|__|__| days	|__|__| days	|__|__| days
… teaching?	|__|__| days	|__|__| days	|__|__| days	|__|__| days
…wine and food?	|__|__| days	|__|__| days	|__|__| days	|__|__| days
… other purposes (please specify) _____	|__|__| days	|__|__| days	|__|__| days	|__|__| days

13. *(If you replied "yes" to question 10)* **have you participated in initiatives for the area fruition** (guided tours, courses, etc.) **organized by the owners of this site?** □ no □ yes

13.1 *(If replied "yes" to the previous question)* **Are you satisfied of the initiative?**

□ not at all □ very little □ somewhat □ to a great extent

14. This site is part of the Network of Protected areas called Natura 2000. Have you ever heard of Natura 2000 before?

□ yes, I know it very well □ yes, but I don't know details □ no, never

15. With reference to this site how would you define your level of satisfaction, on a scale from "Poorly satisfied" to "Very satisfied", with regard to the following aspects?

	Poorly satisfied	Partly satisfied	Satisfied	Very satisfied	I don't know
Accessibility	□	□	□	□	□
Silence	□	□	□	□	□
Tourism information (signs, etc.)	□	□	□	□	□
Parking availability	□	□	□	□	□
Additional services (benches, fountains, etc.)	□	□	□	□	□
Other (please specify) _____	□	□	□	□	□

16. Do you have any suggestion with reference to initiatives that might be implemented in order to improve the site?

……

17. In your opinion to what extent the following places contribute to the cultural value of this site?

	Very poorly	Poorly	Enough	Very much	I don't know
Le tre "Alpi"	○	○	○	○	○
Alpe alto e Alpetto	○	○	○	○	○
La chiesa di San Miro al monte	○	○	○	○	○
…….	○	○	○	○	○

18. The introduction of an entrance fee for the "*Sentiero dello spirito del bosco* (Forest spirit track)" is currently under debate. Would you pay an entrance fee knowing money paid would be only used for keeping and improving the site? yes □ no □

18.1. If you replied "yes" to question 18, what would be in your opinion a reasonable price you would be willing to pay? |__|__|__| €

18.2. In the case the entrance fee was introduced at the price you have indicated, would the number of your visits to the site change?

□ no, it would remain the same □ yes, it would decrease

□ yes, it would increase □ I don't know

18.3. What is the maximum price you would accept to pay to access the site? |__|__|__| €

A. Age: □ from 0 to 17 □ from 18 to 30 □ from 31 to 45 □ from 46 to 60 □ over 60

B. Gender: □ male

□ female

C. Level of education:

□ none □ middle school □ degree or post-degree

□ primary school □ high school

D. Place of residence:

□ Within the Province → Municipality of _____

□ Within Lombardy region

□ Within another Italian region (please specify) _____

□ Abroad (please specify) _____

E. Are you a member of any association?

Hiking/mountaineering association	(please specify) _____	yes □	no □
Sport association	(please specify) _____	yes □	no □
Environmental organisation	(please specify) _____	yes □	no □
Other	(please specify) _____	yes □	no □

ATTACHMENT 6: QUESTIONNAIRE ON AESTHETIC VALUE

N. _____	**Place** _____	**Date** _____

A survey led by the LIFE+ Making Good Natura Project (LIFE11 ENV/IT/000168)

"Valuation of ecosystem services: beauty and landscape values in Natura 2000 sites"

Brief guidelines for completing the survey:

- Please respond spontaneously without seeking additional support.
- The survey will take about 5-10 minutes.
- Please respond to all the questions

The survey is completely anonymous!

Information on the LIFE+ Making Good Natura project is available on the site:
http://www.lifemgn-serviziecosistemici.eu

How much do you like the individual pictures?
Please select an option for each picture.
Next to your favourite picture, specify the aesthetic element you like the most.

Picture 1

○ I don’t like it all
○ I like it a little
○ I like it enough
○ I like it
○ I like it very much

Aesthetic element:
_____

Picture 2

○ I don’t like it all
○ I like it a little
○ I like it enough
○ I like it
○ I like it very much

Aesthetic element:
_____

Picture 3

○ I don’t like it all
○ I like it a little
○ I like it enough
○ I like it
○ I like it very much

Aesthetic element:
_____

How much do you like the individual pictures?
Please select an option for each picture.
Next to your favourite picture, specify the aesthetic element you like the most.

Picture 4

○ I don’t like it all
○ I like it a little
○ I like it enough
○ I like it
○ I like it very much

Aesthetic element:
_____

Picture 5

○ I don’t like it all
○ I like it a little
○ I like it enough
○ I like it
○ I like it very much

Aesthetic element:
_____

Picture 6

○ I don’t like it all
○ I like it a little
○ I like it enough
○ I like it
○ I like it very much

Aesthetic element:
_____

In your personal opinion, how important is it to valorise the *grotta Carbone* and its archeological findings (picture 5)?

I don't know it	Not important	Somewhat important	Moderately important	Important	Very important
○	○	○	○	○	○

Reflecting on the cultural landscape of the area, in your opinion how important is the conservation of the ancient farm (picture 6)?

I don't know it	Not important	Somewhat important	Moderately	Important	Very important
○	○	○	○	○	○

Would you be willing to contribute to the maintenance of one or more the landscapes shown in the pictures above? By maintenance we refer to the conservation of the visible qualities, uses and current plant species.

○ yes ○ no

If so, which landscape would you be willing to support maintenance through an occasional donation? It is possible to choose one, more or none of the pictures above.

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6

How much would you be willing to pay?

○ 1 € ○ 5 € ○ 20 € ○ 50 € ○ 100 € ○ 1000 €

Finally, we would like to ask you some personal questions.

Gender	○ F	○ M
Are you here as a tourist?	○ Si	○ No
Do you live in an urban or rural centre?	○ City	○ Rural area
Municipality of residence	_____	
Nationality	_____	

Age
- ○ Less than 25 years old
- ○ Between 25 and 60 years old
- ○ Over 60 years old

Level of education
- ○ primary school
- ○ Middle school
- ○ High school
- ○ Degree
- ○ Post degree

Gross annual income
- ○ Up to 15.000 €
- ○ Between 15.000 and 30.000 €
- ○ Between 30.000 and 60.000 €
- ○ Over 60.000 €

Thank you for your kind cooperation!

ATTACHMENT 7: MEVAP, Evaluation of effectiveness in the Natura 2000 sites comprised in the LIFE MGN: table to calculate indices and indicators with classification and weight.

The acronyms T and M located in the macro-objective column refer to Territorial and Management components, as described in the Manual.

ENVIRONMENT						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
A1	**T** – Natural capital	**T** – Habitat conservation status -	10	Excellent (%) Good (%), Average/limited (%), no data (%)	1.Excellent (%), 2.Good (%), 3.Average/limited (%), 4. No data (%)	+2 → good + excellent >80% +1 → good + excellent 60-80% 0 → good + excellent 40-60% -1 → good + excellent 20-40% -2 → good + excellent <20%
A2	**T** –Natural capital	**T** – Species conservation status - T	10	Excellent (%) Good (%), Average/limited (%), no data (%)	1.Excellent (%), 2.Good (%), 3.Average/limited (%), 4. No data (%)	+2 → good + excellent >80% +1 → good + excellent 60-80% 0 → good + excellent 40-60% -1 → good + excellent 20-40% -2 → good + excellent <20%
A3	**T** – Level of resource use	**T** – Land use -	7	2.1 Arable land (km^2), 2.2 Permanent crops (km^2), 2.3 Pasture area (km^2), 2.4 Mixed farming areas (km^2), Total surface of the site (km^2) CORINE Land Cover [Data from the field, Management Plan, Questionnaires]	Δ % arable land Δ% permanent crops Δ % Pasture area Δ% Mixed farming areas Increase in hedges and shrubs (yes/no) Period of reference 2000-2006	+2 → Δ+ utilised agricultural area, area which contributes to the maintenance of a good conservation status for natural and semi-natural habitats and of species of community concern +1 → partial use of the utilised agricultural area, with opportunities for greater use for the maintenance of a good conservation status for natural and semi-natural habitats and of species of community concern 0 → partial use of the utilised agricultural area (few farms in the area), with opportunities for greater use for the maintenance of a good conservation status for natural and semi-natural habitats and of species of community concern -1→ slight decrease/increase of the utilised agricultural area, with shifts in the conservation status for natural and semi-natural habitats and of species of community concern -2→ decrease/increase of the utilised agricultural area, with significant shifts in the conservation status for natural and semi-natural habitats and of species of community concern

ENVIRONMENT						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
A4	**M** - Maintenance and management of resources	**M** – Management of forest resources	5	Total forest management area (ha), Total harvested area to the present day according the Forest Management Plan. Total forest cover 2006, 2000 CORINE Land Cover [Data from the field, Management Plan, Questionnaires]	Surfaces subject to timber harvest (yes/no) Interventions that improved the conservation status of habitat and anima and plant species i (presence/absence) Decrease in forest clearings (yes/no)	+ 2 → well managed forest areas, with interventions aimed at the maintenance of the conservation status for natural and semi-natural habitats and of species of community concern +1 → forest areas that need partial interventions to maintain a good conservation status for natural and semi-natural habitats and of species of community concern 0 → partial use of forest areas, with opportunities for interventions that will support a satisfactory conservation status for natural and semi-natural habitats and of species of community concern -1 → slight shifts in the conservation status for natural and semi-natural habitats and of species of community concern due to forest management -2 → significant shifts in the conservation status for natural and semi-natural habitats and of species of community concern due to forest management
A5	**M** - Maintenance and management of resources	**G** – Management of pasture areas	8	Pasture area; mowing/fodder area [MEVAP Sheets] Total pasture surface 2006, 2000 (CLC) [Data from the field, Management Plan, Questionnaires]	Pasture area (presence/absence, ha), Mowing/fodder area (presence/absence, ha), Δ % Pasture area (2006-2000)	+ 2 → Δ+ pasture area, or surface which contributes to the maintenance of a good conservation status for natural and semi-natural habitats and of species of community concern +1 → partial use of the pasture area, with opportunities for greater use for the maintenance of a good conservation status for natural and semi-natural habitats and of species of community concern, or absence of animals 0 → partial use of the pasture area (few animals in the area), with opportunities for greater use for the maintenance of a good conservation status for natural and semi-natural habitats and of species of community concern -1→ slight decrease/increase of the pasture area, with shifts in the conservation status for natural and semi-natural habitats and of species of community concern, presence of over grazing/illegal grazing/absence of animals -2→ decrease/increase of the pasture area, with significant shifts in the conservation status for natural and semi-natural habitats and of species of community concern

ECONOMY						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
E1	**T** – Pressure of the local socio-economic system	**T** – Impact of (urban) centres in the site area	7	1.1 Urbanisation km^2, 1.2 Industrial, commercial and transport areas km^2, 1.3 Mining, landfills and construction sites km^2, 1.4 Non agricultural, green areas, artificial km^2, Total surface of the site km^2 [CLC]	Impact of urban centres %, Impact of industrial sites and other economic activities %	+2 → no impact (no industrial activities or urban centres, or presence of small urban centre as compared to the site) +1 → no impact (presence of urban centres which cover <1% 0 → presence of urban centres and green, non agricultural areas which are not relevant in terms of surface cover -1→ environmental impacts with presence of economic activities and urban centres (surface covered is partially relevant) -2 → significant environmental impacts with presence of economic activities and urban centres (surface covered is quite relevant)
E2	**T** - Pressure of the local socio-economic system	**T** – Pressure from transport infrastructure	6	Construction (m), motorway (m), primary (m), primary link (m), raceway (m), residential (m), road (m), secondary (m), service (m), tertiary (m), unclassified (m), Total surface of the site km^2 [CLC]	Elements of landscape fragmentation (presence/absence) infrastructural density (metres/m^2)	+2 → absence elements of landscape fragmentation < 0,001 m/m^2 +1→ presence of infrastructure of limited dimensions >0,005m/m^2 0 → presence of elements of landscape fragmentation not relevant >0,01m/m^2 -1 → presence of elements of landscape fragmentation 0,05 m/m^2 -2 → presence of elements of landscape fragmentation 0,1 m/m^2
E3	**T** - Pressure of the local socio-economic system	**T** – Tourism pressure	7	visitors (n.), surface of the site (ha), [Data from the field, Management Plan, Questionnaires]	visitors (n.), visitors/ surface of the site (n° of tourists /ha)	+2 → density < 1 +1 → density between 1-10 0 → density between 10-50 -1 → density between 50-100 -2 → density >100

ECONOMY						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
E4	**T** - Pressure of the local socio-economic system	**T** – Forest fires	9	N° and hectares interested by fires (last five years - 2013-2009) [Questionnaires]	Forest fires (presence/absence), Annual surface covered by fire (ha) (2013-2009), Average surface covered by fire (ha) (2013-2009)	+2→ surface covered by fires = 0 ha +1→ impact of average surface covered by fire over total surface of the site 0- 5% 0 → impact of average surface covered by fire over total surface of the site 5-10% -1 → impact of average surface covered by fire over total surface of the site 10-15% -2 → impact of average surface covered by fire over total surface of the site >15%
E5	**T** - Pressure of the local socio-economic system	**T** – Degree of threats to the site	6	List of threats to the site [Questionnaires]	Threats: A- use of pesticides in agriculture; B- agro-industrial mechanisation in agriculture; C- mono-colture, D- pasture, E- fires, F-poaching, G- illegal fishing, H- waste, I- urban expansion, L-road infrastructure, M- mining, N- industrial production, O- energy production, P- mass tourism, Q- other (presence/absence), threat factor (n° threats for the site/total threats in the list)	+2 → threat factor =0 →absence of threat factors +1 → threat factor 0-0.25 0 → threat factor 0.26-0.50 -1→ threat factor 0.51-0.75 -2 → threat factor 0.75-1
E6	**T** – Green economy	**T** – Traditional/typical productions	7	List of products labelled Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), Traditional Specialty Guaranteed (TSG), products labelled PDO-PGI in the waiting list, products labelled PGDO-PDO-PGI (Protected and Guaranteed Designation of Origin, traditional products other sources (specify).	products labelled as PDO (n., %), products labelled as PGI (n., %), products labelled PDO-PGI in the waiting list (n., %), products labelled DOCG-PDO-PGI (n., %), traditional products (n., %), other sources (n., %)	+2 → capacity of the territory to promote typical and traditional products (presence of at least one product for each scheme), that is, promotion of all typical products of the territory +1 → capacity of the territory to promote typical and traditional products (presence of at least three products under a different scheme) 0 → presence of 2 products under different schemes, that is, absence of agricultural and agri-food productions connected to the characteristics / economy of the territory -1 → difficulty in promoting typical and traditional products (sites which are located within the area of the schemes and products are partially

ECONOMY						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
				[Questionnaires]		recognised) -2 → difficulty in promoting typical and traditional products (sites which are located within the area of the schemes but where no production is recognised), that is, lack of promotion of agricultural and agri-food productions in the territory
E7	**T** - Green economy	**T** – Organic farming and livestock farms	7	List of organic farms, list of farms under conversion, list of mixed farms [Questionnaires]	organic farms (presence/absence, n., types of production) farms under conversion (presence/absence, n., types of production) mixed farms (presence/absence, n., types of production)	+2→ organic farms > 50 % and positive trend in number of farms under conversion, that is, organic farms in the buffer zone using land areas within the boundaries of the site +1→ organic farms 25-50% and positive trend in number of farms under conversion, that is, organic farms in the buffer zone using land areas within the boundaries of the site 0→ organic farms 0-25% and positive trend in number of farms under conversion, in the buffer zone and within the boundaries of the site -1→ presence of mixed farms along in the site and in the buffer zone -2→ absence of organic farms /under conversion/mixed, in the site and in the buffer zone
E8	**T** - Green economy	**T** – Certified productions	5	List of short value chain, list of certified organic value chain, list of projects for the promotion of the territory [Questionnaires]	short value chain (presence/absence) and (type), certified organic value chain (presence/absence) and (type), projects for the promotion of the territory (presence/absence) and (type)	+2→ promotion of agricultural and agri-food products from the territory (presence 3/3) +1→ promotion of agricultural and agri-food products from the territory (presence 2/3) 0 → promotion of agricultural and agri-food products from the territory (presence 1/3), that is lack of agricultural and agri-food products from the territory -1 → definition of projects for the promotion of agricultural and agri-food products in the territory -2 → lack of promotion of agricultural and agri-food products in the territory

SOCIETY						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
S1	**T** – Human capital	**T** – Development and population density	6	population density, resident population 2003- 2014, surface of the site [ISTAT 2010]	Δ resident population (2003-2013), average density (n. inhabitants/km^2)	+2 → ↑ population > 10 % density < a 1 +1 → ↑ population 0-10% density between 1-10 0 → constant population density between 10-50 -1 → ↓ population 0-10% density between 50-100 -2 → ↓ population >10% density >100
S2	**T** – Services and participation in access to resources and benefits	**T** – Social - cultural activities	4	environmental associations (n.), hunting associations (n.), mushroom pickers (n.), sport fishers (n.), other (specify) [Questionnaires]	environmental associations (yes/no e n.), hunting associations (yes /no e n.) mushroom pickers (yes /no e n.) sport fishers (yes /no e n.) other (specify) (n)	+2 →presence of all associations/organisations in the list +1 → presence of at least 2 associations/organisations in the list 0 → absence of associations due to the environmental and socio-economic context -1 → presence of only one association/organisation -2 → absence of associations/organisations
S3	**T** - Services and participation in access to resources and benefits	**T** – Perception of economic actors on the economic and environmental benefits generated by the presence of the site	7	scores are attributed to multiple choice questions (n.) [Questionnaires]	points of strength (within the boundaries of the site) for tourism and recreation (list); points of weakness (within the boundaries of the site) for tourism and recreation (list); knowledge of ecosystem services [% of respondents over total n. of respondents who know the meaning the term]; level of support for payment for ecosystem services schemes [% of respondents who supported the feasibility in the implementation of a PES scheme in the site to favour tourism and recreation functions] level of awareness of the value attributed to the Natura 2000 site [% of respondents over total n. of respondents who identified benefits derived from the establishment of the site]	Level of awareness on the opportunities for the promotion of the site +2→ high +1→ medium - high 0→ medium -1→ medium - low -2→ low
S4	**T** - Services and participation in access to resources and	**T** - Perception of residents on the benefits	7	scores are attributed to multiple choice questions (n.) [Questionnaires]	level of overall resident satisfaction [% of respondents over total n. of respondents who expressed satisfaction]; level of satisfaction for the services	Level of satisfaction +2→ high +1→ medium - high 0→ medium

SOCIETY						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
	benefits	generated by the presence of the site			provided [% of respondents over total n. of respondents who are very satisfied]; level of satisfaction for quality of life and well-being [% of respondents over total n. of respondents who witnessed an improvement]; level of satisfaction for the management of the site [% of respondents over total n. of respondents who are very satisfied];	-1→ medium - low -2→ low
S5	**M** – Educational and scientific function	**M** – Level of user satisfaction	7	scores are attributed to multiple choice questions (n.) [Questionnaires]	level of overall satisfaction [% tourists over total number of respondents who are satisfied with the services offered in the site]	Level of satisfaction +2→ very satisfied +1→ satisfied 0→ moderately satisfied -1→ somewhat satisfied -2→ don't know
S6	**M** – Educational and scientific function	**M** – Trails and cycling network	6	Trails (n.), Extension of the trail network km, [MEVAP forms] bridleway (m), cycleway (m), footway (m), street (m) [Questionnaires]	trails (n.), extension of the trails network km, bridleway (m), cycleway (m), footway (m), street (m), density of the network (m/m^2)	+2 → presence of a diverse and well maintained trail network +1→ presence of a diverse trail network that needs partial restoration and maintenance 0 → presence of a trail network which can be potentially improved in terms of extension and/or maintenance →-1 the trail network is not adequate to the characteristics of the site, and has very little maintenance → -2 absence of a trail network, and no maintenance

SOCIETY						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
S7	**M** – Educational and scientific function	**M** – Scientific research	8	Scientific research projects, undergraduate/masters/doctoral (yes/no), scientific studies, undergraduate/masters/doctoral (yes/no) (n.) [Questionnaires]	Scientific research projects, undergraduate/masters/doctoral (yes/no)	+2 → presence of research activities and scientific studies on topics which respond to the needs of the protected area (completed and/or in progress) +1 → presence of interdisciplinary research activities and scientific studies which respond to the needs of the protected area (completed and/or in progress) 0 → presence of research activities and scientific studies which provide a context for the site -1→ research activities and scientific studies are insufficient to respond to the needs of the site -2 → no research activity or scientific study carried out

GOVERNANCE						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
G1	**M** – Management capacity of the Authority	**M** – Presence and use of planning tools	10	Management Plan / Conservation Measures / Protection Measures (absent/present, period of validity) Forest management plan (absent/present, period of validity) [Questionnaires]	Management Plan / Conservation Measures / Protection Measures (absent/present, period of validity) Forest management plan (absent/present, period of validity)	+2 → current planning tools in force +1 → planning tools being approved /updated 0 → planning tools being drafted -1 → planning tools present but not adopted -2 → no planning tools available
G2	**M** – Management capacity of the Authority	**M** – Level of completion of interventions	9	Interventions completed (refer to the Management Plan / Conservation Measures / Protection Measures /PAF) and expected interventions [Questionnaires]	Identification of interventions in the Plans/measures (yes/no), total n. of interventions completed over total expected n. of interventions (%)	+2 → interventions completed 100% +1 → interventions completed >75% 0 → interventions completed >50% or Management Plan recently approved -1 → interventions completed > 25% -2 → interventions completed <25%
G3	**M** – Management capacity of the Authority	**M** – Technical and thematic maps	8	habitat map, annex i of EEC Directive, species map, annex ii of EEC Directive, general map of species, land use map, geologic map, hydrogeological risk map, hydrogeological map, map of the hydrographic network, soils map, map of forest fires, vegetation map, map of forest cover or forest types, road map, orthophotos, DTM [Questionnaires]	Presence/absence: habitat map, annex i of EEC Directive, species map, annex ii of EEC Directive, general map of species, land use map, geologic map, hydrogeological risk map, hydrogeological map, map of the hydrographic network, soils map, map of forest fires, vegetation map, map of forest cover or forest types, road map, orthophotos, DTM	2 → 100% available technical and thematic maps +1 → >75% available technical and thematic maps 0 → >50% available technical and thematic maps -1 → > 25% available technical and thematic maps -2 → <25% available technical and thematic maps
G4	**M** – Management capacity of the Authority	**M** – Payments for Ecosystem Services (PES) in the territory	8	PES or PES like schemes (n.), concessions and other forms of self-financing mechanisms managed locally and of benefit to local people (n.) [Questionnaires]	PES or PES like schemes (presence/absence), concessions and other forms of self-financing mechanisms managed locally and of benefit to local people (presence/absence)	+2→ PES and/or PES-like schemes / other forms of self-financing mechanisms with positive impacts in terms of environmental benefits received +1 → PES and/or PES-like schemes / other forms of self-financing mechanisms currently adopted with partially positive impacts in terms of environmental benefits received 0 → PES and/or PES-like schemes / other forms of self-financing mechanisms under development

GOVERNANCE						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
						-1→ presence of PES and/or PES-like schemes / other forms of self-financing mechanisms, the environmental benefits of which are below expectations 2 →absence of PES and/or PES-like schemes / other forms of self-financing mechanisms, or ineffectiveness of the current existing ones
G5	**T** – Management capacity of the local institutions	**T** – Other mandatory plans	9	forest management plan (management /reorganisation) (presence/absence) and (n.), water protection plan (presence/absence hydrogeological plan (presence/absence), territorial landscape plan (presence/absence), plan for river basin management (presence/absence), other (specify) [Questionnaires]	forest management plan (management /reorganisation) (presence/absence) and (n.), water protection plan (presence/absence hydrogeological plan (presence/absence), territorial landscape plan (presence/absence), plan for river basin management (presence/absence), other (specify)	+2 → all plans are currently implemented +1 → plans are being adopted, that is, 2/3 plans can be currently implemented 0 → plans are being drafted /updated, that is, 50% of the plans are approved -1→ 1/3 of the plans can be implemented -2 → no plan is currently adopted
G6	**T** – Management capacity of the local institutions	**T** – Management of the territory	9	Natura 2000 payments activated - RDP- (yes/no) Activation of service contracts to maintain the territory, legislatory decree 228/ 2001 (yes/no, and n°) [Questionnaires]	Natura 2000 payments activated - RDP - (yes/no) Activation of service contracts to maintain the territory, legislatory decree 228/2001 (yes/no, and n°)	+2 → good management capacity (N2000 payments and service contracts activated) +1 → at least one activated 0→ data not available -1→ beginning of the process to activate the N2000 payments or the service contracts -2→ no activation process
G7	**T** – Management capacity of the local institutions	**T** - Payments for Ecosystem Services (PES) in the territory	8	PES or PES like schemes (n.), concessions and other forms of self-financing mechanisms managed locally and of benefit to local people (n.).) [Questionnaires]	PES or PES like schemes (presence/absence), concessions and other forms of self-financing mechanisms managed locally and of benefit to local people (presence/absence)	+2→ PES and/or PES-like schemes / other forms of self-financing mechanisms with positive impacts in terms of environmental benefits received +1 → PES and/or PES-like schemes / other forms of self-financing mechanisms currently adopted with partially positive impacts in terms of environmental benefits received 0 → PES and/or PES-like schemes / other forms of self-financing mechanisms under development

GOVERNANCE						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
						-1→ presence of PES and/or PES-like schemes / other forms of self-financing mechanisms, the environmental benefits of which are below expectations 2 →absence of PES and/or PES-like schemes / other forms of self-financing mechanisms, or ineffectiveness of the current existing ones
G8	**M** – Management and economic efficiency	**G** – Access to external funds derived from project development activities	8	Projects funded by the European Union (n., €), Local government (n., €), Ministry (n., €), cooperation activated (n., €), LIFE projects (n., €), Integrated territorial projects (n., €), others (n., €) (last 5 years) [Questionnaires]	Projects funded by the European Union (n., €), Local government (n., €), Ministry (n., €), cooperation activated (n., €), LIFE projects (n., €), Integrated territorial projects (n., €), others (n., €) Capacity to access funding: € funding /total revenue € funding/ordinary contribution Spending capacity of active funds: € spent/€ funded [data to be acquired]	+2 → capacity to participate in projects/national and international cooperation (that is, participation to all funded projects listed, with access and spending capacity > 80% in the last 5 years) +1 → capacity to participate in projects/national and international cooperation (that is, participation to at least half of the projects listed, with access and spending capacity 60-80% in the last 5 years) 0 → capacity to participate in projects/national and international cooperation (that is, participation to at least 2 projects listed, with access and spending capacity 40-60% in the last 5 years) -1 → limited capacity to participate in projects/national and international cooperation listed, with access and spending capacity 20-40% - 2 → no participation in projects/national and international cooperation that is, access and spending capacity <20% in the last 5 years)

GOVERNANCE						
COD	**MACRO-OBJECTIVE**	**INDEX WEIGHTING**	**INDE**	**DATA [source]**	**INDICATORS**	**RANGE OF EVALUATION CRITERIA**
G9	**M** – Management and economic efficiency	**G** – Management of revenue	10	Ordinary contribution (€) self-financing mechanism, PES and PES-like scheme (€), Total revenue of the site(€) [Questionnaires]	ordinary contribution/total revenue revenue from self-financing mechanisms/ordinary contribution revenue from implementation of PES and PES-like schemes/ordinary contribution	+2 → revenue from self-financing mechanism, PES and PES-like scheme >80% of the ordinary contribution +1 → revenue from self-financing mechanism, PES and PES-like scheme 60-80% of the ordinary contribution 0→ revenue from self-financing mechanism, PES and PES-like scheme 40-60% of the ordinary contribution -1 → revenue from self-financing mechanism, PES and PES-like scheme 20-40% of the ordinary contribution -2 → revenue from self-financing mechanism, PES and PES-like scheme <20% of the ordinary contribution
G10	**M** – Management and economic efficiency	**G** – Management of expenditures	10	Operating revenue (€), cash flow (€), committed amounts [Questionnaires]	Spending capacity (average over the last 5 years) (%), commitment capacity (average over the last 5 years) (%) payment capacity (average over the last 5 years) (%)	+2 → spending capacity, commitment capacity, payment capacity > 80% +1 → spending capacity, commitment capacity, payment capacity 60-80% 0 → spending capacity, commitment capacity, payment capacity 40< 60% -1 → spending capacity, commitment capacity, payment capacity 20-40% -2 → spending capacity, commitment capacity, payment capacity <20%

ATTACHMENT 8: VALUES OF ES BY CORINE LAND COVER CLASS

CODE	F1	F2	F3	F4	F5	F6	F7	F8	R1	R2	R3	R4	R5	R6	R7	R8	R9	C1	C2	C3
111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	0	1	2	2	1	1	0	1	1	1	1	2	0
142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
211	3	2	1	0	0	1	1	0	1	1	1	0	0	1	1	0	0	1	0	0
212	3	1	0	0	0	1	1	0	1	2	1	0	0	1	1	0	0	1	0	0
213	3	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	1	0	1
221	3	0	0	1	0	0	0	0	1	1	1	0	0	1	1	0	0	2	1	1
222	3	0	0	2	0	0	0	0	2	2	1	1	1	1	3	0	0	2	1	1
223	3	1	0	2	0	0	0	0	1	1	1	1	1	1	1	0	0	2	3	2
231	1	3	3	0	1	0	0	0	1	1	1	0	2	1	3	1	2	2	2	1
241	3	2	1	0	0	0	0	0	1	1	1	0	1	1	2	0	0	1	1	0
242	2	2	1	0	0	1	1	0	1	1	1	0	2	1	3	1	1	1	1	0
243	2	2	2	2	2	1	1	0	2	2	1	1	2	1	2	2	2	2	1	1
244	2	2	1	2	1	0	0	0	1	2	1	1	2	1	2	1	1	1	1	0
311	0	1	2	3	3	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3
312	0	1	2	3	3	2	2	1	3	3	3	3	3	2	3	3	3	3	3	3
313	0	1	3	3	3	3	3	1	3	3	3	3	3	3	3	3	3	3	3	3
321	0	3	3	0	2	3	3	0	2	1	2	3	3	1	3	2	3	3	3	3
322	0	1	3	1	1	1	1	0	2	2	2	3	2	2	2	1	3	2	3	1
323	0	1	1	1	1	2	2	0	1	1	1	1	2	1	2	2	3	2	1	1
324	0	1	2	1	1	2	2	0	1	1	1	1	2	2	2	2	3	2	1	2
331	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	0	1	3	3	2
332	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
333	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	1	0
334	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
335	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	3	2
411	0	1	1	1	0	0	0	0	1	1	3	3	0	1	1	1	2	2	1	1
412	0	0	0	0	0	1	1	0	3	3	3	3	0	2	1	1	2	1	1	1
421	0	0	1	0	0	0	0	0	1	2	0	1	0	1	0	0	2	1	1	1
422	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
423	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	1	2	2	1
511	0	0	2	0	0	0	0	3	0	1	3	2	0	1	0	0	3	3	3	2
512	0	0	2	0	0	0	0	3	1	1	3	1	0	2	0	0	3	3	3	3
521	0	0	3	0	0	0	0	0	1	1	0	0	0	1	0	0	3	3	3	3
522	0	0	3	0	0	0	0	0	1	0	0	1	0	2	0	0	2	3	2	2
523	0	0	3	0	0	0	0	0	2	2	0	0	0	0	0	0	2	3	3	2

In the tables above and below, the codes correspond to the following ES:

F1-Agriculture, F2-Pastures, F3-Animal resources, F4-Primary materials, F5-Mushrooms, F6-Medicinal plants, F7-Genetic resources, F8-Fresh water, R1-Carbon sequestration, R2-Air purification, R3-Water recharge, R4-Clean water, R5-Protection against erosion and landslides, R6-Protection from flooding, R7-Pollination, R8-Pest control, R9-Habitat for biodiversity, C1-Aesthetic value, C2-Recreational value, C3-Cultural value.

ATTACHMENT 9: VALUES OF ES BY HABITAT TYPE.

CODE	F1	F2	F3	F4	F5	F6	F7	F8	R1	R2	R3	R4	R5	R6	R7	R8	R9	C1	C2	C3
3130	0	0	1	0	0	0	1	2	1	1	2	2	0	2	0	1	3	3	2	2
3140	0	0	1	0	0	0	1	3	1	2	2	1	0	2	0	0	2	3	3	2
3150	0	0	2	0	0	0	1	3	1	2	2	2	0	2	0	1	3	3	3	2
3160	0	0	1	0	1	0	1	2	1	2	2	2	0	2	0	2	2	3	2	1
3170	0	0	0	0	0	0	1	1	1	1	2	2	0	2	0	2	1	1	1	1
3180	0	0	0	0	0	0	1	1	1	1	2	2	0	2	0	2	1	1	1	1
3220	0	3	2	0	0	1	1	3	1	1	1	1	0	1	0	0	1	3	1	2
3240	0	0	2	1	0	1	1	3	1	1	1	2	1	1	1	0	2	3	1	2
3260	0	0	3	0	0	0	0	3	1	2	2	1	0	1	0	2	3	3	3	2
3270	0	0	3	0	0	0	0	3	1	2	2	1	0	1	0	2	3	3	3	2
3290	0	0	3	1	0	1	1	3	1	2	2	2	1	1	1	1	2	3	3	2
4060	0	1	1	0	1	1	1	1	2	1	1	0	2	1	1	0	2	2	2	1
4070	0	1	3	0	2	2	1	0	2	1	1	0	3	2	1	0	3	2	2	1
4080	0	1	1	0	1	1	1	0	2	1	1	0	2	2	1	0	2	2	2	1
5130	0	1	1	1	1	1	1	0	1	1	1	1	1	1	2	2	2	2	1	1
5230	0	1	1	1	0	1	1	0	1	1	1	1	1	2	1	1	1	2	1	1
5330	0	1	1	1	0	1	1	0	0	0	0	0	1	2	1	1	1	1	1	1
6110	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1
6150	0	1	1	0	1	1	1	0	1	1	1	1	1	1	0	0	1	2	1	1
6170	0	1	1	0	1	1	1	0	1	1	1	1	1	1	0	0	1	2	1	1
6210	0	1	1	0	1	2	2	1	1	1	1	0	2	2	1	1	3	3	2	1
6220	0	1	1	0	1	1	2	1	1	1	1	0	1	2	1	1	3	2	1	1
6230	0	1	1	1	1	2	2	1	1	1	1	0	2	2	1	1	3	3	2	1
6310	0	2	2	2	1	1	1	0	2	0	1	0	1	1	1	1	1	2	1	1
6410	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1
6430	0	1	1	1	0	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1
6510	0	3	1	1	1	2	1	1	1	1	1	1	1	1	3	2	2	3	2	1
6520	0	2	1	1	2	2	1	1	1	1	1	1	2	1	3	2	2	3	2	1
7140	0	0	1	0	1	1	1	2	2	2	2	3	1	2	1	1	2	2	1	1
7160	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	3	1	2
7220	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	3	1	3
7230	0	0	0	0	0	1	1	2	2	2	2	3	1	2	1	1	2	2	1	1
8110	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
8130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8210	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8230	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
8240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
8310	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8340	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	3	2	2
9110	0	0	3	3	3	1	2	2	3	3	3	3	3	3	1	2	2	2	3	2
9150	0	0	3	3	3	1	2	2	3	3	3	3	3	3	1	2	2	3	3	2
9180	0	0	2	2	1	1	2	2	2	2	2	2	3	3	2	1	3	2	1	2
91B0	0	0	2	3	2	1	2	2	2	2	2	2	3	3	1	3	2	3	2	2
91D0	0	0	1	1	1	1	2	1	2	2	2	1	1	3	1	2	2	2	1	1
91E0	0	0	2	3	1	1	2	2	2	2	3	3	3	3	2	3	3	3	2	2
91F0	0	0	2	3	1	1	2	2	2	2	3	3	3	3	3	3	3	3	2	2
91K0	0	0	2	3	1	1	2	2	2	2	3	2	3	3	2	2	2	3	2	3
91L0	0	0	2	3	1	1	2	2	2	2	3	2	3	3	2	2	2	3	2	3
91M0	0	1	2	3	3	1	2	2	2	2	3	2	3	3	2	2	3	3	2	3
91AA	0	0	2	3	2	1	2	2	2	2	3	2	3	3	2	2	2	3	2	3
9210	0	0	2	3	2	1	2	2	2	2	3	2	3	3	2	2	3	3	3	2
9220	0	0	2	3	2	1	2	2	3	3	3	2	3	3	3	2	3	3	3	2
9260	0	0	2	3	3	1	2	2	3	3	3	2	3	3	3	2	2	3	3	3
92A0	0	0	2	3	1	1	2	3	2	2	3	3	3	3	2	3	2	3	2	3
9330	0	1	2	3	1	1	1	1	2	2	2	1	2	3	2	2	2	3	2	2
9340	0	0	3	3	1	1	2	1	2	2	2	1	3	3	2	2	2	2	2	2
9410	0	0	3	3	3	2	2	2	3	3	3	2	3	3	1	1	3	2	3	2
9420	0	0	3	3	2	2	2	2	3	3	3	2	3	3	1	1	3	3	3	3
95A0	0	0	3	3	3	2	2	2	3	3	3	1	3	3	1	1	3	3	3	3

ATTACHMENT 10: ENVIRONMENTAL SUITABILITY (1-3) AND POTENTIAL DENSITY (ANIMALS/KM^2) FOR CORINE LAND COVER LEVEL III.

	CORINE land cover level III	*Suitability for deer*	Density for deer	*Suitability for hare*	Density for hare	*Suitability for Chamois**	Density for Chamois*
211	Non-irrigated arable land	*1*	1	*2*	10		
212	Permanently irrigated land	*1*	1	*2*	10		
213	Rice fields			*1*	3		
221	Vineyards	*1*	3	*1*	1		
222	Fruit trees and berry plantations	*1*	3	*1*	1		
223	Olive groves	*1*	1	*1*	5		
231	Pastures	*1*	3	*2*	15	*1*	1
241	Annual crops associated with permanent crops	*2*	5	*2*	15		
242	Complex cultivation patterns	*2*	5	*3*	25	*1*	1
243	Land principally occupied by agriculture, with significant areas of natural vegetation	*3*	15	*3*	35	*1*	1
244	Agro-forestry areas	*2*	5	*2*	10	*1*	1
311	Broad-leaved forest	*3*	15	*1*	3	*2*	4
312	Coniferous forest	*2*	4	*1*	3	*2*	4
313	Mixed forest	*3*	10	*1*	3	*2*	4
321	Natural grasslands	*2*	8	*3*	25	*3*	8
322	Moors and heathland	*2*	5	*3*	20	*3*	8
323	Sclerophyllous vegetation	*2*	5	*2*	7	*1*	2
324	Transitional woodland-shrub	*2*	5	*2*	10	*3*	8
331	Beaches, dunes, sands			*1*	5		
332	Bare rocks					*1*	1
333	Sparsely vegetated areas			*1*	3	*2*	4
334	Burnt areas	*2*	5	*1*	5		

*Only for land cover under 600m of elevation and only on rocky sites under 1400m.

ATTACHMENT 11: ENVIRONMENTAL SUITABILITY (1-3) AND POTENTIAL DENSITY (ANIMALS/KM²) FOR CORINE LEVELS IV-V.

CORINE land cover levels IV-V		Deer		Hare		Chamois	
		Suitability	Density	Suitability	Density	Suitability*	Density*
2111	Intensive agriculture	*1*	0,5	*1*	3		
2112	Extensive agriculture	*1*	2	*2*	7		
212	Permanently irrigated land	*1*		*2*	7		
213	Rice fields			*1*	3		
221	Vineyards	*1*	2	*1*	3		
222	Fruit trees and berry plantations	*1*	2	*1*	3		
223	Olive groves	*1*	2	*1*	3		
231	Pastures	*1*	3	*2*	10	*1*	1
241	Annual crops associated with permanent crops	*2*	5	*3*	15	*1*	1
242	Complex cultivation patterns	*2*	5	*3*	25	*1*	1
243	Land principally occupied by agriculture, with significant areas of natural vegetation	*3*	10	*3*	35	*1*	1
244	Agro-forestry areas	*2*	5	*1*	3	*1*	1
3111	Forest with prevalence of holm oak and/or cork	*3*	10	*1*	3		
3112	Forest with prevalence of deciduous oaks	*3*	12	*1*	3		
3113	Forest with prevalence of deciduous mesophilic species (maple-ash, hornbeam)	*3*	12	*1*	3		
3114	Forest with prevalence of chestnut	*3*	8	*1*	3		
3115	Forest with prevalence of beech	*3*	14	*1*	3	*2*	3
3116	Forest with prevalence of hygrophilous species (mainly willow and/or poplar and/or alder)	*3*	8	*1*	5		
3117	Deciduous forest with a prevalence of non-native species (false acacia, eucalyptus, ailanthus, ...)	*2*	5	*1*	3		
3121	Forest with prevalence of Mediterranean pine trees (stone pine, maritime pine) and cypress groves	*2*	5	*1*	5		
3122	Forest with prevalence of mountain and/or oro-Mediterranean pines (black pine, larch, Scots pine, Bosnian pine)	*1*	3	*1*	3	*2*	4
3123	Forest with prevalence of silver fir and/or Norway spruce	*2*	5	*1*	3	*2*	4
3124	Forest with prevalence of larch and/or stone pine	*1*	3	*1*	3	*3*	6
3125	Forest with prevalence of non-native conifers (Douglas fir, Monterey pine, white pine)	*1*	2	*1*	3		
31311	Mixed coniferous and deciduous forest with prevalence of oak and/or cork	*3*	8	*1*	5		
31312	Mixed coniferous and deciduous forest dominated by deciduous oaks	*3*	10	*1*	5		
31313	Mixed coniferous and deciduous forest dominated by deciduous mesophilic and mesothermal species	*3*	10	*1*	5		
31314	Mixed coniferous and deciduous forest dominated by chestnut	*3*	6	*1*	5		

CORINE land cover levels IV-V		Deer		Hare		Chamois	
		Suitability	Density	Suitability	Density	Suitability *	Density *
31315	Mixed coniferous and deciduous forest dominated by beech	*3*	12	*1*	5	*2*	3
31316	Mixed coniferous and deciduous forest dominated by hygrophilous species	*3*	6	*1*	5		
31317	Mixed coniferous and deciduous forest dominated by non-native deciduous species	*2*	5	*1*	5		
31321	Mixed coniferous and deciduous forest dominated by Mediterranean pines	*2*	5	*1*	5		
31322	Mixed coniferous and deciduous forest dominated by mountain and/or oro-Mediterranean pines	*1*	3	*1*	3	*3*	6
31323	Mixed coniferous and deciduous forest dominated by silver fir and/or Norway spruce	*2*	5	*1*	5	*2*	4
31324	Mixed coniferous and deciduous forest dominated by larch and/or stone pine	*1*	3	*1*	3	*3*	8
31325	Mixed coniferous and deciduous forest dominated by non-native conifers	*1*	3	*1*	3		
3211	Continuous grasslands	*2*	8	*3*	25	*3*	8
3212	Discontinuous grasslands	*3*	10	*3*	35	*3*	10
322	Moors and heathland	*2*	5	*2*	15	*2*	4
3231	High bushes	*1*	3	*2*	15		
3232	Low scrublands	*1*	3	*3*	20		
324	Transitional woodland-shrub	*2*	5	*2*	10	*1*	1
331	Beaches, dunes, sands			*1*	3		
332	Bare rocks					*1*	1
333	Sparsely vegetated areas					*3*	4
334	Burnt areas	*1*	2	*1*	5		

*Only for land cover at elevations under 400m and only on rocky sites at elevation under 1600m.

ATTACHMENT 12: CORRESPONDENCE BETWEEN CORINE CLASSES LEVELS IV-V AND INFC CATEGORIES AND COEFFICIENTS USED (DATA DERIVED FROM INFC 2005)

	CORINE classes levels IV-V	INFC categories (2005)
3111	Forest with prevalence of holm oak and/or cork	• Oak groves • Cork groves
3112	Forest with prevalence of deciduous oaks	• Turkey oak woods, pedunculate, Macedonian and Valonia oak • Forests of sessile, downy and pedunculate oak
3113	Forest with prevalence of deciduous mesophilic species (maple-ash, hornbeam)	• European hop-hornbeam, hornbeam forest
3114	Forest with prevalence of chestnut	• Chestnut groves
3115	Forest with prevalence of beech	• Beech stands
3116	Forest with prevalence of hygrophilous species (mainly willow and/or poplar and/or alder)	• Hygrophilous forests
3117	Deciduous forest with a prevalence of non-native species (false acacia, eucalyptus, ailanthus, ...)	• Other deciduous forests
3121	Forest with prevalence of Mediterranean pine trees (stone pine, maritime pine) and cypress groves	• Groves of Mediterranean pines
3122	Forest with prevalence of mountain and/or oro-Mediterranean pines (black pine, larch, Scots pine, Bosnian pine)	• Stands of Scots pine and mountain pine • Stands of black pine, larch, and Bosnian pine
3123	Forest with prevalence of silver fir and/or Norway spruce	• Forests of Norway spruce • Forests of silver fir
3124	Forest with prevalence of larch and/or stone pine	• Forests of larch and stone pine
3125	Forest with prevalence of non-native conifers (Douglas fir, Monterey pine, white pine)	• Other coniferous forests, pure o mixed
31311	Mixed coniferous and deciduous forest with prevalence of oak and/or cork	• Other deciduous or evergreen forests • Other coniferous forests, pure or mixed
31312	Mixed coniferous and deciduous forest dominated by deciduous oaks	• Other coniferous forests, pure or mixed • Oak stands
31313	Mixed coniferous and deciduous forest dominated by deciduous mesophilic and mesothermal species	• Other coniferous forests, pure or mixed • European hop-hornbeam, hornbeam forest
31314	Mixed coniferous and deciduous forest dominated by chestnut	• Other coniferous forests, pure or mixed • Chestnut groves
31315	Mixed coniferous and deciduous forest dominated by beech	• Other coniferous forests, pure or mixed • Beech stands
31316	Mixed coniferous and deciduous forest dominated by hygrophilous species	• Other coniferous forests, pure or mixed • Hygrophilous forests
31317	Mixed coniferous and deciduous forest dominated by non-native deciduous species	• Other coniferous forests, pure or mixed • Other deciduous forests
31321	Mixed coniferous and deciduous forest dominated by Mediterranean pines	• Other coniferous forests, pure or mixed • Stands of Mediterranean pine
31322	Mixed coniferous and deciduous forest dominated by mountain and/or oro-Mediterranean pines	• Other coniferous forests, pure or mixed • Stands of Scots pine and mountain pine
31323	Mixed coniferous and deciduous forest dominated by silver fir and/or Norway spruce	• Other coniferous forests, pure or mixed • Forests of Norway spruce

		• Forests of silver fir
31324	Mixed coniferous and deciduous forest dominated by larch and/or stone pine	• Other coniferous forests, pure or mixed • Forests of larch and stone pine
31325	Mixed coniferous and deciduous forest dominated by non-native conifers	• Other coniferous forests, pure or mixed

ATTACHMENT 13: CORINE CLASSES, LEVEL IV CURRENT INCREMENT OF WOODY PHYTOMASS BY REGION (DATA FROM INFC 2005)

Values for unit area of current increment of phytomass for CORINE classes, levels IV-V (t/ha)	3111	3112	3113	3114	3115	3116	3117	3121	3122	3123	3124	3125	31311	31312	31313	31314	31315	31316	31317	31321	31322	31323	31324	31325
Piemonte	0,00	3,04	2,70	3,98	3,90	2,56	3,35	2,19	2,19	3,07	1,98	2,83	1,82	2,79	2,89	3,38	3,37	2,70	3,10	2,61	2,37	3,01	2,47	2,83
Valle d'Aosta	0,00	0,76	0,00	2,09	3,24	6,04	1,95	0,00	2,16	1,97	1,98	0,00	0,00	0,60	0,00	0,99	1,38	3,07	0,85	0,00	0,79	1,39	0,93	0,00
Lombardia	0,00	4,28	2,20	4,69	3,82	3,13	3,66	0,00	3,02	4,25	2,53	4,42	4,17	3,99	3,65	4,56	4,29	3,77	4,16	2,61	3,19	4,32	3,59	4,42
Alto Adige	0,00	1,14	4,06	4,50	3,73	4,05	4,91	0,00	1,85	3,75	2,53	0,65	0,42	1,30	2,13	2,48	1,99	2,38	2,52	0,38	1,73	2,84	1,54	0,65
Trentino	1,36	1,81	2,45	4,56	4,07	5,41	4,52	0,00	2,40	4,37	2,46	0,00	0,00	1,42	1,05	2,17	1,74	2,75	1,98	0,00	0,94	3,09	1,15	0,00
Veneto	1,93	3,43	3,63	4,50	5,31	2,79	3,74	5,68	1,92	3,92	2,32	0,00	0,00	1,71	1,55	2,14	2,27	1,42	1,64	2,44	1,00	2,77	1,09	0,00
Friuli V.G.	0,00	1,76	3,04	5,21	4,56	2,45	4,99	2,03	1,82	4,60	2,05	3,89	2,50	3,84	3,68	4,53	4,29	3,16	4,43	3,17	2,73	4,41	3,08	3,89
Liguria	1,41	3,09	2,79	4,17	4,48	2,85	3,27	2,84	3,22	4,37	1,78	6,72	4,32	5,22	5,31	5,53	5,96	4,75	5,32	5,19	4,40	5,09	4,49	6,72
Emilia Romagna	2,71	3,28	2,70	3,45	5,14	1,94	2,65	3,49	3,50	6,40	0,00	2,83	1,82	2,61	2,89	3,14	3,90	2,38	2,79	3,17	2,64	5,36	1,54	2,83
Toscana	2,40	2,28	3,21	4,17	6,72	2,62	3,35	3,41	5,96	6,40	0,00	4,59	3,75	3,61	4,19	4,41	5,64	3,59	4,12	4,18	5,01	5,89	2,50	4,59
Umbria	1,41	1,81	1,52	2,09	2,32	2,22	1,95	2,51	3,19	0,00	0,00	2,12	1,36	1,83	1,95	2,11	2,27	2,17	2,08	2,33	2,70	0,63	1,15	2,12
Marche	1,46	2,14	1,61	4,89	2,82	1,94	2,96	2,19	1,23	0,72	0,00	2,00	1,29	1,94	1,91	3,38	2,41	1,97	2,45	2,12	1,03	1,11	1,09	2,00
Lazio	2,09	2,19	1,86	4,30	2,90	1,88	2,10	2,76	1,89	5,05	0,00	4,89	3,56	3,65	3,79	4,63	4,19	3,36	3,75	4,07	2,52	5,02	2,66	4,89
Abruzzo	1,46	2,38	2,03	4,82	3,90	2,68	1,64	3,81	3,39	3,57	0,00	3,24	2,08	2,83	2,85	4,01	3,62	2,96	2,59	3,55	3,49	3,49	1,76	3,24
Molise	0,99	2,71	2,53	6,45	3,90	1,99	1,79	3,08	1,27	1,37	0,00	0,00	0,00	0,78	1,08	3,07	1,67	1,01	0,78	1,32	0,00	0,97	0,00	0,00
Campania	3,92	2,81	2,28	3,39	5,64	1,54	3,35	4,46	2,26	0,00	0,00	6,89	4,93	5,14	5,20	5,25	6,57	4,17	5,45	5,99	3,55	2,06	3,75	6,89
Puglia	1,04	2,66	2,37	2,54	4,65	3,53	3,04	2,27	2,23	0,00	0,00	3,89	2,92	3,61	3,39	3,26	4,33	3,71	3,58	3,27	2,00	1,16	2,12	3,89
Basilicata	0,94	1,95	2,03	3,65	4,31	1,77	2,18	1,70	0,86	1,12	0,00	4,18	2,96	3,17	3,43	3,94	4,37	2,96	3,37	3,20	2,16	2,05	2,28	4,18
Calabria	3,34	3,38	1,52	4,04	5,31	2,56	2,65	3,81	2,95	2,15	0,00	6,07	5,04	4,69	4,37	5,12	5,93	4,29	4,67	5,22	3,13	3,33	3,30	6,07
Sicilia	1,72	2,43	1,01	3,71	3,82	1,82	1,95	3,24	1,44	0,00	0,00	2,53	2,84	2,31	1,99	3,11	3,16	2,17	2,32	2,89	1,31	0,76	1,38	2,53
Sardegna	1,72	0,62	0,00	5,34	0,00	1,03	0,78	2,51	1,13	0,00	0,00	3,00	2,96	2,38	1,84	4,13	1,81	2,00	2,08	2,85	1,55	0,90	1,63	3,00

ATTACHMENT 14: VALUES PER UNIT AREA OF ABOVE GROUND ARBOREAL PHYTOMASS FOR TALL FOREST CATEGORIES (MG HA^{-1}) (DATA FROM INFC 2005).

	Forests of larch and rock pine	Forests of Norway spruce	Forests of silver fir	Stands of Scots pine and mountain pine	Stands of black pine, larch, and Bosnian pine	Groves of Mediterranean pines	Other coniferous foresets	Beech stands	Forests of sessile, downy and pedunculate oak	Turkey oak woods, pedunculate, Macedonian and Valonia oak	Chestnut groves	European hop-hornbeam, hornbeam forest	Hygophilous forests	Oher deciduous forests	Oak groves	Cork groves	Other deciduous or evergreen forests
Piemonte	94,8	194,3	195,6	109,5	83,2	34,4	97,3	138,4	79,7	91,7	126,5	67,7	86,5	74,4	0	0	0
Valle d'Aosta	90,3	110,3	132,9	89,2	61	0	0	112	47,9	0	76	0	132,5	49,1	0	0	0
Lombardia	118,9	176	235,7	86,8	109,6	0	214,8	137,8	83,1	107,3	137,1	65,6	95,1	88,1	0	0	47,1
Alto Adige	130	190,7	254,4	160,2	8,9	0	25,6	175	96	0	217,9	102,7	83,8	117	0	0	0
Trentino	110,8	225	251,8	98,9	125,2	0	0	138,9	94,2	0	122,1	79	99,8	87,9	63,3	0	0
Veneto	101,8	182,8	215,8	87,4	92,3	109,3	0	175,4	105,6	67,4	107,9	89,1	62,5	65,2	75,5	0	0
Friuli V.G.	82,4	207,7	326,7	94	113	48,7	160,8	196,7	88,2	0	181,1	80,7	40,4	106,1	0	0	0
Liguria	84,1	109,2	220,3	85,2	167,3	91,9	230,1	167,1	76,8	121,8	113,6	72,7	104,9	64,4	72,8	0	0
Emilia Romagna	0	141,2	333,9	66,5	137,9	82,3	84,3	166,9	59,4	109,2	109,3	73,3	54,4	62,4	157,4	0	0
Toscana	0	257,4	297,4	137	229,7	126,7	172,8	188,3	64,3	72	121,6	79,5	76,1	72,9	75,8	88,2	27,2
Umbria	0	0	0	74,2	75,5	70,9	97	140,5	45,7	73,8	62,2	52,3	62,8	62,5	91,8	0	0
Marche	0	61,1	0	0	99,6	107,3	57,4	120,3	53,1	87,8	122,4	54,3	80,2	62,4	92,9	0	0
Lazio	0	207,7	0	0	120,7	108	190,1	197,3	46,9	80,6	106,8	59,2	65,4	49	65,1	88,4	31,9
Abruzzo	0	144,5	231,4	174,1	71,1	64,4	98,6	183,4	63,9	98,1	91,6	59,6	59,5	47,7	57,1	0	0
Molise	0	0	154,9	0	78,1	55	0	207,6	53,9	94,3	79	82,7	52,2	53,5	66	0	0
Campania	0	0	0	0	105,7	89	82,2	232,7	43,6	70,9	70,6	63,1	40,3	58,9	62,4	106,8	22,9
Puglia	0	0	0	0	101,9	48,3	127,9	225,1	49,4	66,3	92,7	71,7	32,9	122,3	44	0	21,1
Basilicata	0	0	172	0	49,9	38,7	122,5	214,3	49,8	82,1	108,1	82	55,3	38	57,7	0	12,5
Calabria	0	0	158,8	0	147,9	92,1	161,6	233,4	82,6	131,3	85,3	77,6	93,4	69,2	112,7	75,4	40,7
Sicilia	0	0	0	0	61,4	69,4	70,9	138,6	56,4	93,7	94,3	29,4	45,4	36	71,9	28,8	51,7
Sardegna	0	0	0	0	42,8	41,7	55,2	0	40,8	0	83,9	0	22,9	15,9	60,8	47,7	40,6

ATTACHMENT 15: VALUES PER UNIT SURFACE AREA OF CURRENT INCREMENT OF VOLUME FOR TALL FOREST CATEGORIES (M^3 HA^{-1}) (DATA FROM INFC 2005).

	Forests of larch and rock pine	Forests of Norway spruce	Forests of silver fir	Stands of Scots pine and mountain pine	Stands of black pine, larch, and Bosnian pine	Groves of Mediterranean pines	Other coniferous foresets	Beech stands	Forests of sessile, downy and pedunculate oak	Turkey oak woods, pedunculate, Macedonian and Valonia oak	Chestnut groves	European hop-hornbeam, hornbeam forest	Hygophilous forests	Oher deciduous forests	Oak groves	Cork groves	Other deciduous or evergreen forests
Piemonte	2,9	6,9	5,4	3	3,4	2,7	4,8	4,7	2,7	3,7	6,1	3,2	4,5	4,3	0	0	0
Valle d'Aosta	2,9	4	3,9	2,6	3,7	0	0	3,9	1,6	0	3,2	0	10,6	2,5	0	0	0
Lombardia	3,7	7,4	9,6	3	5,8	0	7,5	4,6	3,2	5,8	7,2	2,6	5,5	4,7	0	0	3,5
Alto Adige	3,7	6,8	8,2	4,6	0,8	0	1,1	4,5	2,4	0	6,9	4,8	7,1	6,3	0	0	0
Trentino	3,6	9,3	8,2	3,1	3,9	0	0	4,9	3,8	0	7	2,9	9,5	5,8	2,6	0	0
Veneto	3,4	7,4	8,3	3,3	2,3	7	0	6,4	4,6	2,6	6,9	4,3	4,9	4,8	3,7	0	0
Friuli V.G.	3	9,8	8,6	2,4	2,9	2,5	6,6	5,5	3,7	0	8	3,6	4,3	6,4	0	0	0
Liguria	2,6	5,8	11,7	3,1	6,3	3,5	11,4	5,4	2,6	3,9	6,4	3,3	5	4,2	2,7	0	0
Emilia Romagna	0	13,2	12,4	3,9	6,3	4,3	4,8	6,2	2,2	4,7	5,3	3,2	3,4	3,4	5,2	0	0
Toscana	0	13,3	12,3	8,7	8,7	4,2	7,8	8,1	1,9	2,9	6,4	3,8	4,6	4,3	2,3	2,3	2,1
Umbria	0	0	0	5,3	4	3,1	3,6	2,8	1,3	2,5	3,2	1,8	3,9	2,5	2,7	0	0
Marche	0	2,9	0	0	3,6	2,7	3,4	3,4	1,8	2,7	7,5	1,9	3,4	3,8	2,8	0	0
Lazio	0	20,2	0	0	5,5	3,4	8,3	3,5	1,5	3,1	6,6	2,2	3,3	2,7	1,9	2,1	1,1
Abruzzo	0	5,6	8,7	6	3,9	4,7	5,5	4,7	2,1	2,9	7,4	2,4	4,7	2,1	2,8	0	0
Molise	0	0	5,5	0	3,7	3,8	0	4,7	2,1	3,6	9,9	3	3,5	2,3	1,9	0	0
Campania	0	0	0	0	6,6	5,5	11,7	6,8	2,1	3,8	5,2	2,7	2,7	4,3	3,1	4,4	1,3
Puglia	0	0	0	0	6,5	2,8	6,6	5,6	3,1	2,5	3,9	2,8	6,2	3,9	2	0	1,1
Basilicata	0	0	4,5	0	2,5	2,1	7,1	5,2	1,4	2,7	5,6	2,4	3,1	2,8	1,8	0	0,7
Calabria	0	0	8,6	0	8,6	4,7	10,3	6,4	2,3	4,8	6,2	1,8	4,5	3,4	3,7	2,7	3
Sicilia	0	0	0	0	4,2	4	4,3	4,6	1,9	3,2	5,7	1,2	3,2	2,5	2,5	0,8	3,2
Sardegna	0	0	0	0	3,3	3,1	5,1	0	1,3	0	8,2	0	1,8	1	2	1,3	2,7

ATTACHMENT 16: BASE COEFFICIENTS

INFC categories	Let	WBD	BEF	Rad
Forests of Norway spruce	y = 0,0659·x + 1,5045	0,38	1,29	0,29
Forests of silver fir	y = 0,0659·x + 1,5045	0,38	1,34	0,28
Stands of larch and rock pine	y = 0,0659·x + 1,5045	0,56	1,22	0,29
Stands of Scots pine and mountain pine	y = 0,0659·x + 1,5045	0,47	1,33	0,36
Groves of Mediterranean pines	y = 0,0659·x + 1,5045	0,53	1,53	0,33
Other coniferous forests, pure or mixed	y = 0,0659·x + 1,5045	0,43	1,37	0,29
Beech stands	y = -0,0299·x + 9,3665	0,61	1,36	0,2
Turkey oak woods, pedunculated, Macedonian and Valonia oak	y = -0,0299·x + 9,3665	0,69	1,45	0,24
Chestnut groves	y = -0,0299·x + 9,3665	0,49	1,33	0,28
European hop-hornbeam, hornbeam forest (-)	y = -0,0299·x + 9,3665	0,66	1,28	0,26
Forests of sessile, downy and pedunculate oak	y = -0,0299·x + 9,3665	0,65	1,39	0,2
Oak groves	y = -0,0299·x + 9,3665	0,72	1,45	1
Cork groves	y = -0,0299·x + 9,3665	0,72	1,45	1
Other deciduous forests	y = -0,0299·x + 9,3665	0,53	1,47	0,24
Stands of black pine, larch, and Bosnian pine	y = -0,0165·x + 7,3285	0,52	1,44	0,42
Hygrophilous forests	y = -0,0299·x + 9,3665	0,41	1,39	0,23
Other deciduous or evergreen forests	y = -0,0299·x + 9,3665	0,63	1,49	0,62

ATTACHMENT 17: CORRESPONDENCE BETWEEN CORINE LEVELS IV-V AND INFC CATEGORIES (WHERE MULTIPLE INFC CATEGORIES EXIST, WE USE THE AVERAGE OF DIFFERENT VALUES AND COEFFICIENTS)

CORINE levels IV-V	CORINE class	INFC class	INFC categories	Rad	Let	WBD	BEF
Forest with prevalence of holm oak and/or cork	3111	lecc	Oak groves	1	y = -0,0299·x + 9,3665	0,72	1,45
		sugh	Cork groves				
Forest with prevalence of deciduous oaks	3112	cerr	Turkey oak woods, pedunculate, Macedonian and Valonia oak	0,22	y = -0,0299·x + 9,3665	0,67	1,42
		quer	Forests of sessile, downy and pedunculate oak				
Forest with prevalence of deciduous mesophilic species (maple-ash, hornbeam)	3113	ostr	European hop-hornbeam, hornbeam forests	0,26	y = -0,0299·x + 9,3665	0,66	1,28
Forest with prevalence of chestnut	3114	cast	Chestnut groves	0,28	y = -0,0299·x + 9,3665	0,49	1,33
Forest with prevalence of beech	3115	fagg	Beech stands	0,2	y = -0,0299·x + 9,3665	0,61	1,36
Forest with prevalence of hygrophilous species (mainly willow and/or poplar and/or alder)	3116	igro	Hygrophilous forests	0,23	y = -0,0299·x + 9,3665	0,41	1,39
Deciduous forest with a prevalence of non-native species (false acacia, eucalyptus, ailanthus, ...)	3117	acad	Other deciduous forests	0,24	y = -0,0299·x + 9,3665	0,53	1,47
Forest with prevalence of Mediterranean pine trees (stone pine, maritime pine) and cypress groves	3121	pmed	Groves of Mediterranean pines	0,33	y = 0,0659·x + 1,5045	0,53	1,53
Forest with prevalence of mountain and/or oromediterranean pines (black pine, larch, Scots pine, Bosnian pine)	3122	psilv	Stands of Scots pine and mountain pine	0,39	y = 0,0659·x + 1,5045	0,495	1,385
		pner	Stands of black pine, larch, and Bosnian pine				
Forest with prevalence of silver fir and/or Norway spruce	3123	aros	Forests of Norway spruce	0,285	y = 0,0659·x + 1,5045	0,38	1,315
		abia	Forests of silver fir				
Forest with prevalence of larch and/or stone pine	3124	lari	Forests of larch and stone pine	0,29	y = 0,0659·x + 1,5045	0,56	1,22
Forest with prevalence of non-native conifers (Douglas fir, Monterey pine, white pine)	3125	aconi	Other coniferous forests, pure o mixed	0,29	y = 0,0659·x + 1,5045	0,43	1,37
Mixed coniferous and deciduous forest with prevalence of oak and/or cork	31311	latvr	Other deciduous or evergreen forests	0,455	y = -0,0299·x + 9,3665	0,53	1,43
		aconi	Other coniferous forests, pure or mixed				
Mixed coniferous and deciduous forest dominated by deciduous oaks	31312	aconi	Other coniferous forests, pure or mixed	0,245	y = -0,0299·x + 9,3665	0,54	1,38
		quer	Forests of sessile, downy and pedunculate oak				
Mixed coniferous and deciduous forest dominated by deciduous mesophilic and mesothermal species	31313	aconi	Other coniferous forests, pure or mixed	0,275	y = -0,0299·x + 9,3665	0,545	1,325
		ostr	European hop-hornbeam, hornbeam forest				
Mixed coniferous and deciduous forest dominated by chestnut	31314	aconi	Other coniferous forests, pure or mixed	0,285	y = -0,0299·x + 9,3665	0,46	1,35
		cast	Oak groves				
Mixed coniferous and deciduous forest	31315	aconi	Other coniferous forests, pure or mixed	0,245	y = -0,0299·x + 9,3665	0,52	1,365

CORINE levels IV-V	CORINE class	INFC class	INFC categories	Rad	Let	WBD	BEF
dominated by beech		fagg	Beech stands				
Mixed coniferous and deciduous forest	31316	aconi	Other coniferous forests, pure or mixed	0,26	y = -0,0299·x + 9,3665	0,42	1,38
dominated by hygrophilous species		igro	Hygrophilous forests				
Mixed coniferous and deciduous forest	31317	aconi	Other coniferous forests, pure or mixed	0,265	y = -0,0299·x + 9,3665	0,48	1,42
dominated by non-native deciduous species		acad	Other deciduous forests				
Mixed coniferous and deciduous forest	31321	aconi	Other coniferous forests, pure or mixed	0,31	y = 0,0659·x + 1,5045	0,48	1,45
dominated by Mediterranean pines		pmed	Groves of Mediterranean pines				
Mixed coniferous and deciduous forest	31322	aconi	Other coniferous forests, pure or mixed	0,325	y = 0,0659·x + 1,5045	0,45	1,35
dominated by mountain and/or oromediterranean pines		psilv	Stands of Scots pine and mountain pine				
Mixed coniferous and deciduous forest	31323	aconi	Other coniferous forests, pure or mixed	0,28666	y = 0,0659·x + 1,5045	0,397	1,33
dominated by silver fir and/or Norway spruce		abia	Forests of silver fir				
		aros	Forests of Norway spruce				
Mixed coniferous and deciduous forest	31324	aconi	Other coniferous forests, pure or mixed	0,29	y = 0,0659·x + 1,5045	0,495	1,295
dominated by larch and/or stone pine		lari	Forests of larch and stone pine				
Mixed coniferous and deciduous forest	31325	aconi	Other coniferous forests, pure or mixed	0,29	y = 0,0659·x + 1,5045	0,43	1,37
dominated by non-native conifers							

ATTACHMENT 18: CORRESPONDENCES AND COEFFICIENTS FOR CALCULATIONS BASED ON NATURA 2000 HABITAT DATA

Habitat	Class	INFC class	Rad	Let	WBD	BEF
Luzulo-Fagetum beech forests	9110	fagg	0,2	y = -0,0299·x + 9,3665	0.61	1.36
Medio-European limestone beech forests of the *Cephalanthero-Fagion*	9150	fagg	0,2	y = -0,0299·x + 9,3665	0.61	1.36
** Tilio-Acerion* forests of slopes, screes and ravines	9180	acad	0,24	y = -0,0299·x + 9,3665	0.53	1.47
Thermophilous *Fraxinus angustifolia* woods	91B0	acad	0,24	y = -0,0299·x + 9,3665	0.53	1.47
* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)	91E0	igro	0,23	y = -0,0299·x + 9,3665	0.41	1.39
Riparian mixed forests of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*)	91F0	igro	0,23	y = -0,0299·x + 9,3665	0.41	1.39
Illyrian Fagus sylvatica forests (*Aremonio-Fagion*)	91K0	fagg	0,2	y = -0,0299·x + 9,3665	0.61	1.36
Illyrian oak-hornbeam forests (*Erythronio-Carpinion*)	91L0	ostr	0,26	y = -0,0299·x + 9,3665	0.66	1.28
Pannonian-Balkanic turkey oak –sessile oak forests	91M0	cerr	0,24	y = -0,0299·x + 9,3665	0.69	1.45
* Eastern white oak woods	91AA	quer	0,2	y = -0,0299·x + 9,3665	0.65	1.39
* Apeninne beech forests with *Taxus* and *Ilex*	9210	latvr	0,62	y = -0,0299·x + 9,3665	0.63	1.49
* Apennine beech forests with *Abies alba* and beech forests with *Abies nebrodensis*	9220	aconi	0,29	y = 0,0659·x + 1,5045	0.43	1.37
Castanea sativa woods	9260	cast	0,28	y = -0,0299·x + 9,3665	0.49	1.33
Salix alba and *Populus alba* galleries	92A0	igro	0,23	y = -0,0299·x + 9,3665	0.41	1.39
Quercus suber forests	9330	sugh	1	y = -0,0299·x + 9,3665	0.72	1.45
Quercus ilex and *Quercus rotundifolia* forests	9340	lecc	1	y = -0,0299·x + 9,3665	0.72	1.45
Acidophilous Picea forests of the montane to alpine levels (*Vaccinio-Piceetea*)	9410	aros	0,29	y = 0,0659·x + 1,5045	0.38	1.29
Alpine *Larix decidua* and/or *Pinus cembra* forests	9420	lari	0,29	y = 0,0659·x + 1,5045	0.56	1.22
High oro-Mediterranean pine forests	95A0	pner	0,42	y = -0,0165·x + 7,3285	0.52	1.44

ATTACHMENT 19. INVITATION LETTER FOR STAKEHOLDERS

INVITATION TO THE MEETING

The …… (local partner) is implementing in partnership with …….., and other partners at the national level, the project ……, funded by ……., dedicated to the valuation and valorisation of the natural heritage present in the _____ (enter the name of the site), and included in the European network Natura 2000/in the Protected Area/in the geographical context of ……

OBJECTIVES OF THE PROJECT

The project aims at enhancing the management of the site by identifying sustainable development approaches with participation from local communities. Specifically, the objectives of the project are to:

- Identify and economically quantify the benefits to local and regional communities that are derived from the protection and management of the natural heritage present in the protected areas and/or Natura 2000 and/or area of high biodiversity value;
- Enhance the management of natural protected areas by identifying and activating public and private funding mechanisms from the valuation of the natural heritage present in the territories;
- Engage local social and economic actors interested in the management or use of the natural heritage, in order to identify best approaches for its enhancement.

WHY IS YOUR PARTICIPATION IMPORTANT?

Participation of actors who are involved in an economic activity connected to the management or use of the territory and its natural heritage, or beneficiaries of the services provided by the natural system is considered today essential to define shared and effective management approaches. Conservation of landscapes, forests, pastures and water resources requires the presence of many people who maintain this natural heritage or who benefit from it (clean water, food production, tourism, reduction of the hydrogeological risk, others).

The project calls for meetings with the social and economic actors who are interested in the management and use of the site. The objectives are to identify and share sustainable approaches to the valorisation of these landscapes, including through the creation of voluntary agreements among different actors. The agreements are meant to economically recognise the role of those who work for the conservation of the natural heritage, while guaranteeing access to its benefits.

HOW TO PARTICIPATE:

The project calls for the organisation of up to three meetings over the course of the year, with all interested social and economic actors. Each meeting lasts few hours and a few questionnaires are given to participants.

The first meeting will be held on the day …… at ……. and will take place in ……. at the following address ……

In the next few days the project secretariat will contact you to ask for a confirmation and provide further information.

Your contribution can significantly help raise challenges and opportunities connected to the management and valorisation of our natural heritage. We can work together to ensure the well-being of local communities and future generations.

Information on the LIFE+ Making Good Natura project is available on the site:
http://www.lifemgn-serviziecosistemici.eu

We thank you for your interest and look forward to meeting you soon.

Best regards.

Place, date

Signature

ATTACHMENT 20. PARTICIPANT REGISTRATION FORM

PROJECT
LIFE + MAKING GOOD NATURA

PARTICIPANTS TO THE MEETING HELD_____

Project sites: _____

name	surname	institution – category	e-mail	phone	signature

ATTACHMENT 21. MEETING AGENDA

MEETING AGENDA FOR _____

Project site: _____

1st PART OF THE MEETING:

- ⇨ **REGISTRATION AND COMPLETION OF QUESTIONNAIRE N° 1**
- ⇨ **WELCOME AND PRESENTATION OF PARTICIPANTS** (Short introduction of all participants, place of origin, role/organisation, expectations from the meeting)
- ⇨ **COMPLETION OF QUESTIONNAIRE N°2** (Key participants, Action C.2)
- ⇨ **PRESENTATION OF THE PROJECT AND OBJECTIVES OF THE MEETING** (Powerpoint presentation)
- ⇨ **PRESENTATION OF ECOSYSTEM SERVICES SELECTED FOR THE SITE** (Powerpoint presentation – Characteristics, economic valuation, potential providers and users)

2nd PART OF THE MEETING: PLENARY DISCUSSION

- ⇨ In your opinion, what does the ecosystem service need to be maintained, and under which conditions would you commit to guarantee its maintenance?
- ⇨ Under which conditions would you be willing to pay to guarantee the ecosystem service, of which you are a beneficiary?
- ⇨ What could be done to valorise the ecosystem service and guarantee its maintenance over time?

- ⇨ **EVALUATION OF THE MEETING** (Complete the evaluation sheet)

_____

ATTACHMENT 22. QUESTIONNAIRE FOR STAKEHOLDER MEETINGS (1)

N. _____	Place _____	Date _____

Brief guidelines for completing the survey:

- Please respond spontaneously without seeking additional support.
- The survey will take about 5-10 minutes.
- Please respond to all the questions**.**

The survey is completely anonymous!
Information on the LIFE+ Making Good Natura project is available on the site:
http://www.lifemgn-serviziecosistemici.eu

Thank you for your kind cooperation!

1. **The Natura 2000 Network is:**
   - ☐ The European Union funding program for the conservation of biodiversity;
   - ☐ The digital terrestrial channel dedicated to nature in Europe;
   - ☐ The system of protected natural areas in the implementation of EU directives on biodiversity;
   - ☐ The consortium of companies for the management of land and conservation of biodiversity.

2. **Do you know if your Municipality is involved in the Natura 2000 Network?**
   - ☐ YES
   - ☐ NO

3. **In your opinion, did the Natura 2000 Network enhance the quality of life and well-being for the local community?**
   - ☐ YES
   - ☐ NO

4. **If so, from what perspective? (express your opinion for each of the responses)**

	Yes, a lot	Yes, Moderately	Yes, somewhat	Not at all
Locally, environmental protection has positively influenced on the quality of life of the population	○	○	○	○
New economic activities were created or traditional ones were revitalised	○	○	○	○
The local community developed a new sense of identity, also thanks to the flow of visitors	○	○	○	○

5. If not, can you please explain?

_____

6. Do you know any new economic activities locally, directly connected to the presence of the site?

- ☐ YES
- ☐ NO

If so, which ones? _____

7. What is your level of overall satisfaction with the management of the Natura 2000?

○ high ○ average ○ low

8. Have you heard about ecosystem services?

- ☐ YES
- ☐ NO

9. Indicate your level of knowledge on ecosystem services:

Low 1 2 3 4 5 High

10. Ecosystem services are:

- ☐ Activities conducted by firms and enterprises for land maintenance and enhancement of biodiversity;
- ☐ Actions by Government and Regions to conserve and enhance biodiversity;
- ☐ Benefits provided by natural systems to economic and human social systems;
- ☐ The set of natural cycles that allow the maintenance of life on the planet.

11. Have you heard about payment for ecosystem services?

- ☐ YES
- ☐ NO

12. Indicate your level of knowledge on payments for ecosystem services:

Low 1 2 3 4 5 High

13. Payments for ecosystem services are:

- ☐ compensation for the activities of companies and society for land maintenance and enhancement of biodiversity;
- ☐ Public contributions for the conservation and enhancement of biodiversity;
- ☐ A tax on environmental services included in the drinking water supply bills and waste disposal;
- ☐ Voluntary agreements between public and private operators and users to economically compensate the maintenance of ecosystem services.

14. Would you be willing to voluntary pay a contribution to support a more efficient management of ecosystem services in your territory?

- ☐ YES, provided I know who and how contributions will be used;
- ☐ YES, provided contributions are tax deductible;
- ☐ NO, because I already pay for the provision of ecosystem services through my taxes;
- ☐ NO, because I should be compensated for the maintenance of ecosystem services.

15. Indicate your level of knowledge of the area

Low 1 2 3 4 5 High

16. Based on your knowledge, indicate the main ecosystem services present in the area

(Indicate no more than 3 types of services)

Provisioning services:

- ☐ Forage and pasture
- ☐ Wild species (hunting and fishing)
- ☐ Raw material (wood, fibre…)
- ☐ Mushrooms and berries, non timber wood products
- ☐ Genetic resources
- ☐ Clean water

Regulating services:

- ☐ Carbon sequestration
- ☐ Water regulation (groundwater recharge)
- ☐ Erosion regulation (landslides, slope instability)
- ☐ protection from hydrogeological instability (floods, flooding)

Cultural/educational services:

- ☐ Aesthetic value
- ☐ Recreational value (ecotourism, sport activities, others)

Inspiration for culture, arts, educational and spiritual values, identity

17. Habitat and species conservation provide many important services, which contribute to the well-being of the local and visiting population. What are, in your opinion, the most important services provided in the area where you live? (express your opinion for each of the responses)

	Fundamental	Very important	Moderately important	Somewhat important	Not important
Source of food, water, and raw material for economic production (e.g. *timber, forage, water*)	○	○	○	○	○
Aesthetic, spiritual and recreational values; used by local residents and tourists (e.g. *tourism, landscape*, *hiking, local traditions*)	○	○	○	○	○
Natural regulating services in the environment (*contrast to soil erosion, carbon sequestration, water purification*)	○	○	○	○	○
Conservation of biodiversity and local resources for future generations	○	○	○	○	○

Indicate your professional affiliation (not compulsory), e.g. farmer, staff from public administration, NGO representative, trade union representative, other)

_____

A. Age:

- ○ from 0 to 17
- ○ from 18 to 30
- ○ from 31 to 45
- ○ from 46 to 60
- ○ over 60

B. Gender:

- ○ male
- ○ female

C. Qualifications:

- ○ none
- ○ primary school
- ○ middle school
- ○ upper secondary school
- ○ degree or above

ATTACHMENT 23. ASSESSMENT OF THE MEETING

ASSESSEMENT OF THE MEETING HELD ON _____

Project site: _____

1. **Overall was the meeting:**

Confusing	1	2	3	4	5	Clear
Boring	1	2	3	4	5	Interesting
Useless	1	2	3	4	5	Useful
Abstract	1	2	3	4	5	Concrete
Easy	1	2	3	4	5	Difficult
I didn't learn anything	1	2	3	4	5	I learnt a great deal

2. **How do you evaluate the following aspects:**

Clarity of presentations:						
Not clear	1	2	3	4	5	Very clear
Management:						
Inadequate	1	2	3	4	5	Adequate
Respect for timing:						
Scarse	1	2	3	4	5	Suitable

Other (specify) _____

3. **What is your assessment of the *methodologies* used?**

Presentations:						
Negative	1	2	3	4	5	Positive
Participatory session:						
Negative	1	2	3	4	5	Positive

Other _____

4 Do you think that the *organisation* of the meeting was overall:

Scarce	1	2	3	4	5	Optimum

5. Are you interested in participating to the next project meetings?

- ☐ **YES**, because: _____
- ☐ **NO**, because: _____

6. In the next meriting, will you feel that you are engaged as:

- ☐ A provider of an ecosystem service and interested in defining a voluntary PES agreement
- ☐ A user of an ecosystem service and interested in defining a voluntary PES agreement
- ☐ An external participant interested in knowing about the outcomes of the project

7. Other comments that you feel should be added:

_____

Indicate your professional affiliation (not compulsory), e.g. farmer, staff from public administration, NGO representative, trade union representative, other) _____

ATTACHMENT 24. ENVIRONMENTAL BALANCE SHEET

SECTION *B1* OF THE ENVIRONMENTAL BALANCE

1) Specify the total amount of funding destined to the Natura 2000 site during the period of reference					
Sources of funding	*2013*	*2012*	*2011*	*2010*	*2009*
National funds					
Regional funds					
European Union funds					
Compensatory measures for the Natura 2000 Network					
Revenue from agro-environmental schemes					
Other (specify)……					

SECTION *B2* OF THE ENVIRONMENTAL BALANCE

2) Based on the Management Plan/Prioritised Action framework, list the economic activities which received funding as part of the interventions in the site and indicate the amount of funding received	
ECONOMIC ACTIVITIES	€
Agriculture	
Organic farming	
Silviculture and other forestry activities	
Non forest wood products	
Fishing, aquaculture and related service activities	
Hunting	
Game hunting enterprises	
Livestock (tethering)	
Livestock (loose housing)	
Food processing	
Electric power generation, transmission and distribution	
Mining and quarrying	
Industry (specify)	
Tourism	
Ecotourism	
Hotels	
Other (specify)	
……..	

SECTION *C2 b "indirect costs"* OF THE ENVIRONMENTAL BALANCE

3) Based on bans and restrictions currently applied on the territory of the Natura 2000 site (e.g. grazing, cutting and hunting ban) report compensation to the different enterprises.						
Enterprise	***Ban***	***Compensation (€) 2013***	***Compensation (€) 2012***	***Compensation (€) 2011***	***Compensation (€) 2010***	***Compensation (€) 2009***
Forest contractor	(e.g. cutting ban)	(e.g. compensation for loss of revenue from tree cutting)				
Farm						
Livestock farm						
Other (specify)						
……						
……						

SECTION *C2 "administrative costs"* OF THE ENVIRONMENTAL BALANCE

4) Indicate the role, qualification and % of staff time dedicated to the Natura 2000 site. Report salaries.				
YEAR	***Qualifications***	***Role***	***% staff time (dedicated to the site)***	***Salaries***
2013				
2012				
2011				
2010				
2009				

SECTION *C2 "administrative costs"* OF THE ENVIRONMENTAL BALANCE

5) Indicate the number of other staff specifically dedicated to the management of the site and yearly payments.		
YEAR	***Number of staff***	***€***
2014		
2013		
2012		
2011		
2010		
2009		

SECTION *C1 "one off costs"* OF THE ENVIRONMENTAL BALANCE

6) Complete the following table with the requested data	***€***
Costs incurred to for finalising the sites (e.g. research studies, others)	
Costs incurred for management planning (e.g. costs for drafting the implementation of the management plans/conservation measures, others)	

SECTION *C2 b "expenses to protect/maintain/prevent damage to the site"* OF THE ENVIRONMENTAL BALANCE

7) **Complete the following table with the requested data for the Natura 2000 site over the period of reference**				
YEAR	***Compensation costs for damage caused by wildlife***	***Expenses incurred for the maintenance of environmental resources (e.g. maintenance of water courses)***	***Expenses for damage prevention (e.g. fires, erosion, landslides) of environmental resources***	***Expenses incurred for the restoration of environmental resources (e.g. restore areas subjected to forest fires)***
2013				
2012				
2011				
2010				
2009				

ATTACHMENT 25. REFERENCE TO LEGISLATION SUPPORTING PUBLIC-PRIVATE ARRANGEMENTS

Articles 14 and 15 of Legislative Decree n. 228 of May 18, 2001 state the following:

Art. 14 - Contracts of collaboration with public administrations

1. The public authorities may conclude cooperation agreements, also pursuant to Article 119 of Legislative Decree 18 August 2000, n. 267, with farmers, also at the request of farmers' organizations most representative at national level, for the promotion of production from the territory and protection of quality products and local food traditions.

2. Cooperation agreements are designed to ensure support to local agricultural development and entrepreneurship, including through the enhancement of the peculiarities of typical products, organic and of quality, as well as by taking into account agro-food, rural and fishing districts.

3. In order to ensure adequate information to the consumer and provide knowledge on the origin of the raw material and the peculiarities of the production as referred to in paragraphs 1 and 2, the public administrations, in line with Community Guidelines on State aid to agriculture, may conclude contracts for promotion, with farmers who commit to the exercise of the enterprise by ensuring the protection of natural resources, biodiversity, cultural heritage and the agrarian and forest landscape.

Art. 15. - Agreements with public administrations

1. In order to assist in the conduct of activities that are functional to the restoration and maintenance of the territory, protection of the agricultural and forest landscape, care and maintenance of the hydrogeological system, and to promote benefits for the protection of production from the territory, governments can enter into agreements with farmers.

2. The agreements referred to in paragraph 1 shall state the performance of public administrations that may consist, in compliance with the Community Guidelines on State aid to agriculture even in terms of funding, administrative concessions, tariff cuts or public works. For the above purposes, public administrations, in derogation from the law, may enter into contracts with farmers for an annual amount of up to 50 million liras in the case of individual entrepreneurs, and 300 million liras in the case of associated entrepreneurs.

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