The Economics of Hunting in Europe

Towards a Conceptual Framework

Final Report

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Author:
Angus Middleton (FACE)

Co-authors:
Vincenzo Salerno (Office of Véronique Mathieu Houillon, MEP 1999-2014)
Nils Bunnefeld (University of Stirling)

Contributors:
Mirko Moro (University of Stirling)
David Scallan (National Association of Regional Game Councils - Ireland)
Charlotte Simon (FACE)

1. INTRODUCTION

Biodiversity depletion is a global concern and it is also at the forefront of the European Union's (EU) conservation agenda. The loss of our natural resources principally due to unsustainable management undermines economic and social development as well as our well-being.

Recently, there has been an increasing trend in showing the immense value of nature to society in order to raise awareness about the consequences of biodiversity loss and better inform policy makers. These studies include the Stern Review[1], the Millennium Ecosystem Assessment[2] and The Economics of Ecosystems and Biodiversity (TEEB)[3]. The TEEB's recommendation to incorporate economic value of ecosystem services into decision-making forms part of the key actions of EU's 2020 Biodiversity Strategy to halt biodiversity decline.

The value of biodiversity, however, encompasses various uses, traditions, practises as well as cultural and social values. From a policy perspective, the significance of biodiversity use is reflected in the Convention on Biological Diversity (CBD), which has sustainable use as its second objective and refers to it in 13 of 19 substantive Articles. Hunting, in its many forms, is one of the uses of our natural resources and hunters are key players in diversifying the values of nature, socially, ecologically and economically.

In Europe, hunting has a long history and has developed to include heterogeneity of cultures and traditions. Whilst hunting may be controversial in some circles, it should suffice to say that it is, in one form or another, a legal pursuit in all European countries and regardless of the motivation, constitutes a use of wild living natural resources which, because the social and economic benefits derived from such use, provide incentives for people to conserve them[4].

Currently, there are over 7 million hunters in Europe, making it the world's second largest formally organised hunting population after the United States of America. The numbers and densities of hunters vary from country to country and even from region to region, which often reflects local hunting cultures, traditions, land uses and political circumstances. Consequently, hunters and their affiliates form a diversified group from different spatial, social and cultural backgrounds and bring together a plurality of perceptions and values.

This socio-diversity is echoed in their values for hunting and biodiversity. In their diversity, hunters are united by a common passion for nature and their attachment to a traditional rural pastime. Further values of hunting include conviviality, heritage, and in a European context, the most important value is arguably, well-being. The term well-being is of course debated in particular between Utilitarians and Aristotelians but, in this instance, it is worth using the definition put forward by the New Economics Foundation in which well-being is equated to a dynamic state between both happiness and fulfilment[5]. Moreover, hunters' well-being related to physical exercise when going in the field could be added to the definition.

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[1] Stern, N. (2007) The Economics of Climate Change: The Stern Review. Cambridge University Press. Available at: http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/stern_review_report.htm

[2] Millennium Ecosystem Assessment (2005) Ecosystems and Human Well-being: Opportunities and Challenges for Business and Industry. World Resources Institute, Washington, DC.

[3] TEEB (2009) The Economics of Ecosystems and Biodiversity for National and International Policy Makers. Summary: Responding to the Value of Nature

[4] IUCN (2000) The IUCN Policy Statement on Sustainable Use of Wild Living Resources. Adopted at the IUCN World Conservation Congress, Amman, Jordan, October 2000. Available at: http://intranet.iucn.org/webfiles/doc/SSC/SSCwebsite/Policy_statements/The_IUCN_Policy_Statement_on_Sustainable_Use_of_Wild_Living_Resources.pdf

[5] New Economics Foundation (2011) Human Well-being and Priorities for Economic Policy Makers. Available at: http://www.neweconomics.org/publications/entry/human-well-being-and-priorities-for-economic-policy-makers

It is this passion for nature and hunting that, as a rule, motivates hunters and hunting societies to take a proactive approach to conservation and they contribute to the management of over 65 percent of EU's countryside[6].
This is done in collaboration with landowners, farmers, foresters and other stakeholders, thus bringing together a wide social network into a landscape level coherence for nature management.

To date, no framework is known to exist with which to assess the values of hunting and how they can best be managed for positive outcomes. The purpose of this report is therefore to present a first step towards the potential development of a conceptual framework through which to aggregate and analyse the economic values associated with hunting. This could serve to enhance management and policy decisions related to hunting and biodiversity conservation.

[6] A. Middleton pers. comm.

2. HUNTING IN EUROPE

Hunting is a term that encompasses a wide range of motivations and harvest strategies. In order to better understand and frame the wide range of values, both positive and negative, associated with hunting, it is worth briefly attempting to distinguish between the various motivations for hunting. In this regard, hunting can be considered a function of four interacting motivations. These can be described as livelihood, recreational, management and commercial.

With regards to livelihoods, it can be argued that there is no longer any pure subsistence hunting of any significant impact and that a more appropriate term is livelihood hunting. In this motivation, hunting fits in with other survival options but may also be a part of an aspiration for a better quality of life by e.g. consuming healthier and cheaper products within the private/family circle. This is an aspect that is very much reflected in the current bush-meat debate.

Commercial hunting, on the other hand, assumes a basic or secure livelihood-level[7] is attained and that the motivation for hunting is largely for profit. This involves extracting direct monetary values from hunting and hunting-related activities. These can be in the form of products or the act of hunting but is most often a combination of both.

Management hunting is largely about using hunting as a tool to help balance out competing social, ecological and economic interests with the objective of maintaining wildlife populations and or habitats.

Finally, recreational hunting is about hunting on the basis of individual principles and preferences in which well-being is the most important factor.

In most cases, hunting is a deeply personal pursuit that incorporates a number of motivations but will most often be driven by a principle motivation. Understanding hunting as a function of these motivations is an important prerequisite to better conceptualise the values of hunting and how they interact.

A brief overview of the values of hunting in Europe

Regardless of the motivation, the values of hunting are rather complex. Broadly speaking, hunters contribute to all the main sectors of the economy, both directly and indirectly.
For example, they compensate farmers for crop damages in the primary sector, purchase equipment from the secondary sector and pay for tourism services in the tertiary sector.
As a result of these values being generated and in order to sustain hunting, a certain amount of money and other resources are also reinvested in the conservation and restoration of habitats and wildlife populations.

Within the EU, in 2008 it was estimated that hunting is worth about €16 billion annually[8]. However, this figure was estimated by scaling up individual hunter expenditures from various EU countries. Much more work has been done at country levels, although the methodologies vary in relation to the diversity of hunting methods from country to country.

[7] Scoones, I. (1998). Sustainable Rural Livelihoods: A Framework for Analysis (Vol. 72). Brighton: Institute of Development Studies. Available at: http://www.ids.ac.uk/files/dmfile/Wp72.pdf
[8] Kenward, R. & Sharp, R. (2008) Use Nationally of Wildlife Resources Across Europe, 117-132.: in Manos, P. & Papathanasiou, J. [eds.] (2008) GEM-CON-BIO: Governance & Ecosystems Management for the Conservation of Biodiversity. Thessaloniki

In France, the economic flux associated with hunting in 1992 was estimated to be close to that of the film industry contributing €1.95 billion and 23,000 jobs[9].
Research in Ireland shows that hunters contributed €111.6 million to the Irish economy in 2007 of which 80-90 percent of this figure was spent within rural areas[10]. Whilst in 20014 in the UK, hunters and target shooters spent an estimated £2.5 billion on goods and services. Furthermore, the total gross value added related to sport shooting is estimated at £2 billion (€2.6 billion circa). This is given by employment costs plus profits. It is further estimated that out of a total of 74,000 full time equivalent (FTE) jobs, 35,000 are directly dependent on sport shooting. Accommodation and food are the industries where the highest proportion of these jobs concentrates[11].
In Italy, the annual total costs incurred by 850,000 official hunters is estimated at €3.26 billion[12] and hunting and shooting further create a little less than 43,000 jobs in total. These country level studies may suggest that the EU level estimate of the direct monetary value of hunting being worth €16 billion annually is likely an underestimation.

Typically, the bulk of such estimates reflect direct hunting expenditures (i.e. expenditures on hunting equipment, trips, maintaining hunting animals, licenses, taxes and trophies etc). As a result, they typically fail to capture a wider set of impacts embedded in hunting activities. These include the economic, environmental and cultural impacts linked to species conservation and management, habitat restoration and land management provided by hunters. Much of these costs would have to be incurred by taxpayers to finance habitat/species restoration and management, or to compensate landowners for damages caused by wildlife in the absence of hunting.

In the UK, nearly £250 million (€295 million circa) is spent on conservation activities by shooting providers each year. Such activities are labour-intensive accounting around 3.9 million conservation work days, equivalent to 16,000 FTE jobs[13]. In Finland, 40,000 hunters took part in voluntary hunting activities in 2008, which ranged from game monitoring and other conservation activities to assisting with traffic accidents involving wildlife. The value of these activities is estimated at €7.1 million. In Greece, a proportion of the hunters' annual contributions directly finance the activities of 400 Game Guards in environmental management and the tackling of illegal activities estimated at €7 million annually[14].

In addition, those who accompany the hunter in the hunting experiences (non-hunters) further contribute to the economy through the purchase of miscellaneous items in the place of hunting, including craft, on site food and accommodation. In the UK, for example, it is estimated that additionally to those who shoot, the efforts of those who flush wild game and/or retrieve dead or wounded animals amounted to the equivalent of 14,000 full time jobs. Furthermore in addition, on average up to 10 non-guns take part in the shooting day[15].

Other types of positive impacts by hunters and hunters' communities (including hunters' family, friends, etc.) include the promotion of culture, heritage, tourism, local economy, well-being and

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[9] Pinet J.M. (1993). Les chasseurs de France : organisation, typologie, économie, horizon 2000. Union nationale des Fédérations départementales de chasseurs. In: Chardonnet, Ph., des Clers, B., (1), Fischer, J., Gerhold., R., Jori, F., and Lamarque, F. (2002) The Value of Wildlife. *Rev. Sci. Tech. Off. Int. Epiz.,* 21 (1), 15-51.
[10] Scallan, D. (2013) *A Socioeconomic Assessment of Hunting in the Republic of Ireland.* Report for the Federation of Field Sports of Ireland and the National Association of Regional Game Councils. February 2013.
[11] Public and Corporate Economic Consultants (PACEC) (2014). The Economic, Environmental and Social Contribution of Shooting Sport in UK. Available at http://www.shootingfacts.co.uk/pdf/The-Value-of-Shooting-2014.pdf
[12] Università degli Studi di Urbino "Carlo Bo" (2011) La produzione di armi e munizioni per uso civile, sportivo e venatorio in Italia. Imprese produttrici, consumi per caccia e tiro, effetto economico e occupazionale.
[13] Public and Corporate Economic Consultants (PACEC) (2014). The Economic, Environmental and Social Contribution of Shooting Sport in UK. Available at http://www.shootingfacts.co.uk/pdf/The-Value-of-Shooting-2014.pdf
[14] Papadodimas, N. (2011) How do Hunting Organizations in Greece contribute in law enforcement mechanisms. European Conference: Illegal Killing of Birds Cyprus, Larnaka, 6 – 8 July 2011.
[15] Public and Corporate Economic Consultants (PACEC) (2014). The Economic, Environmental and Social Contribution of Shooting Sport in UK. Available at http://www.shootingfacts.co.uk/pdf/The-Value-of-Shooting-2014.pdf

volunteering in both habitat and wildlife management activities within rural and urban areas. Some of these activities are difficult to measure.

However, it should also be recognised that in a spatially and socially crowded landscape positive values for one sector of society (hunters) may imply negative values for other sectors, such as moral or ethical considerations, but also restrictions on access rights, sometimes during certain (hunting) periods of the year. This perspective is of course proportionally applicable for all human and recreational activities.

It is beyond the scope of this document to assess the values and motivations for those who oppose hunting and balance these against the principles of a European pluralist society. So whilst it may suffice to say that hunting, in one form or another, is a legitimate activity in all EU countries, the positive and negative values associated with the extent, intensity and management of hunting should also be recognised.

3. HUNTING VALUES AND ECOSYSTEMS

The previous section shows that hunting generates values in a variety of ways. There is no doubt that this contribution needs to be recognised. However, what may be of value for wider society are services provided by ecosystems, say for example wildlife or intrinsic beauty.

Figure 1 shows the types of benefits that are provided by the ecosystem categorised in use and non-use values. Direct use values are values that can be estimated more easily because they relate to market or commercial activities, like recreational fishing or hunting.
The amount of expenses that hunters sustain to practice hunting provides an estimate of use values, i.e., the use value of land managed for hunting purposes is at least equal to the pecuniary sum spent on principle, auxiliary equipment, trips, licenses, etc. But it is reasonable to assume that this does not really capture all the aspects that make hunting worthwhile.

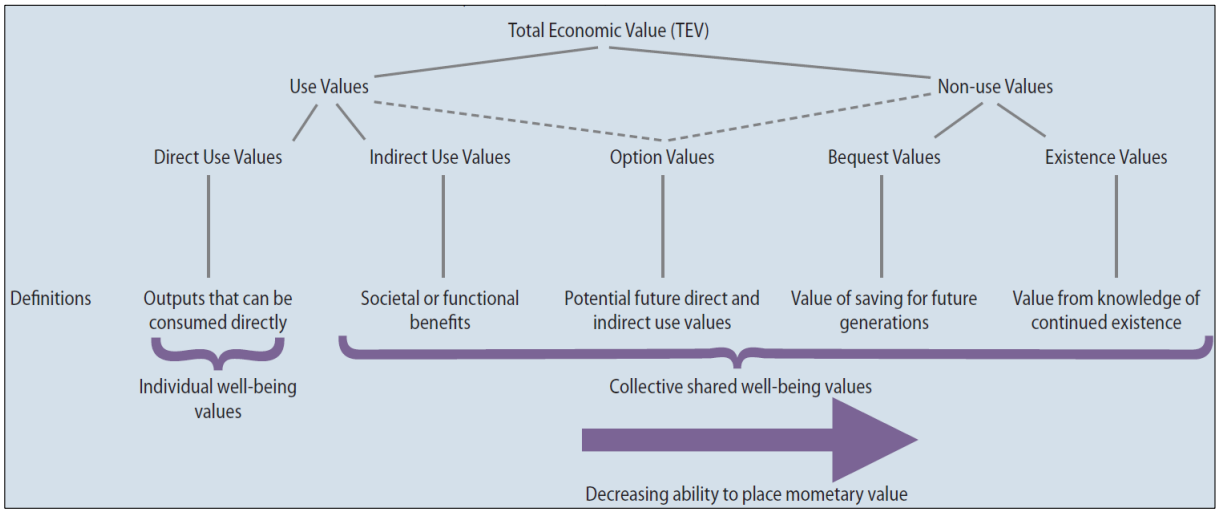

Figure 1. Total Economic Value of ecosystem services, from the UK National Ecosystem Assessment (UK NEA, 2011)[16]

Figure 2 shows the conceptual framework which links management practice to ecosystems changes and social welfare. Clearly, hunting and the motivations for hunting are influenced by the 'Drivers of Change', which in turn are influenced by the flow of values.

Hunting and in particular its organisation and management in Europe has long recognised the importance of investing in ecosystems in order to reap a dividend in the form of wildlife to hunt and nature to enjoy and this is, in itself, an active driver of change in determining and supporting ecosystem services.

[16] UK National Ecosystem Assessment (2011). http://uknea.unep-wcmc.org/Resources/tabid/82/Default.aspx

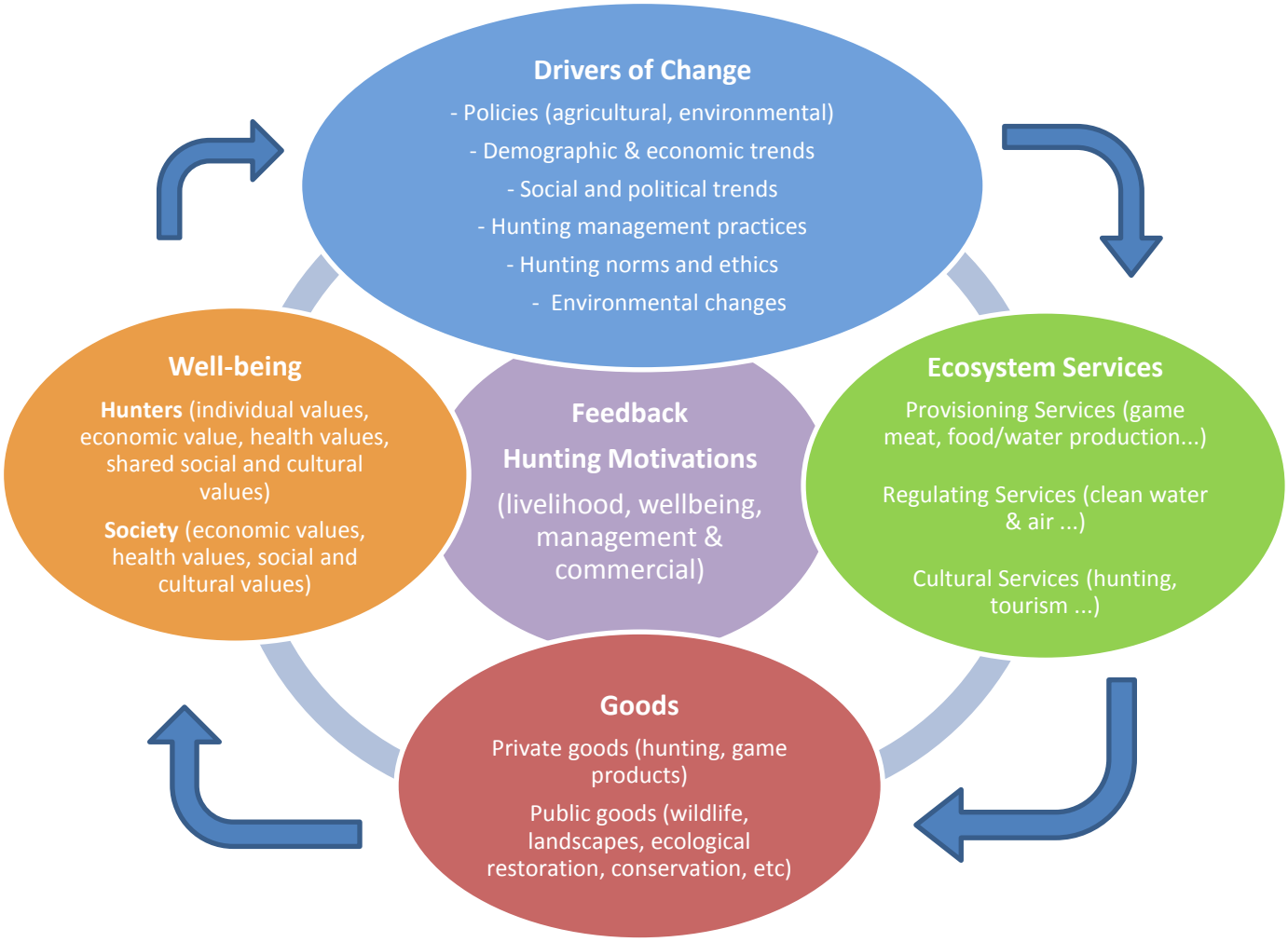

Figure 2. Economic Value of Hunting and Ecosystem services, adapted from the UK National Ecosystem Assessment (UK NEA, 2011)[17]

This makes it rather complicated to calculate the values of hunting in relation to ecosystem services as in some cases the investment value in ecosystems (e.g. well-being hunting) may provide a truer reflection of the value being derived (which one should assume is greater than the sum of the investments) whilst in the case of commercial hunting the extraction value should be greater (otherwise the business is not profitable). This does not even take into account temporal parameters.

Given this extreme complexity, it is perhaps more useful to understand the groups of values that are associated with hunting and then to put their evaluation into context using a wider framework of values that are aggregated into groups. This makes it much easier to engage with the drivers (or barriers) of change and adapt measures accordingly in order to maximise the values and overall ecosystem integrity.

[17] Emmett, B.A., Hails, R. and Maskell, L.C. (2011). UK National Ecosystem Assessment: Technical Report. UNEP-WCMC.

4. MANAGING THE DRIVERS OF CHANGE

Change in hunting systems is driven by interlinked natural and human factors such as climate, population dynamics of the hunted species, and economic, social and cultural aspects of the people involved. At the core of managing the drivers of change is a general understanding of the system components and their links. Furthermore, monitoring the system in an iterative process by targeting both, the human and natural drivers, is crucial for sustainability.

In the assessment of valid parameters allowing for a realistic estimation of the economics of hunting, the incidence of the human dimension with its subjective drivers, poses a great challenge. Elements such as behavior, motivation, passion are difficult to integrate into an economic model.

Because people's behavior often depends strongly on economic, social and cultural incentives, possible uncertainties within the recreational hunting system may arise.
For example, unregulated or unreported hunting (i.e. poaching and illegal killing) could become a possible uncertainty within the recreational hunting system[18]. Although, in some cases, population trends may bring a good overview, the unlawful and clandestine nature of illegal killing induces difficulties for measuring how deeply this affects ecosystem services.

Furthermore, it could lead to uncertainty and incomplete knowledge in the estimates of off-take and population size. Consequently, the identification of the drivers of change and their relative roles in, for example, population fluctuations may become difficult, bringing uncertainty when assessing the flows of values linked to hunting and ecosystem services.

Society today requires a high degree of accountability from citizens, governance, interest groups, and businesses. Hunting, as an activity carried out by a minority of people, needs to be justified on the principle of sustainable use of renewable resources.
However, the management of hunting and its traditional practices also depend on policies that vary from country to country and also from region to region and impact on society as well as on ecosystems services in varying and different ways.

For example, in certain countries the legal framework allows owners to grant hunting rights to a relatively small number of users (e.g. private land and estate owners in Europe, or safari companies in Africa). In such cases, a mismatch may occur as some users face barriers on resource use or land accessibility, while others are able to visit these same areas and/or use similar resources.
The challenges of conflicts between different resource users have been well documented in fisheries, with illegal catch being widespread. When facing this kind of conflict, hunting also may not always be monitored, or hunting quotas could remain unfilled or over- and under-reported.

Another driver can emanate from the resulting actions of public authorities when facing poaching issues, with straight enforcement actions for some representative/endangered species, while the illegal killing of more common species is taken less seriously.
In either situation, hunting activities can directly contribute to law enforcement mechanisms against poaching and illegal killing. For example, in 1969, the Hellenic Hunters Confederation and regional hunting associations from Greece created the Game Guard Body, which is completely financed from hunters' fees. The Game Guards have the same police rights as a civil

18 http://news.sciencemag.org/plants-animals/2011/08/hidden-poaching-takes-toll-scandinavian-wolves
Liberg & al. (2012): Shoot, shovel and shut up: cryptic poaching slows restoration of a large carnivore in Europe; Proc. R. Soc. B 2012 279, first published online 17 August 2011

servant of the Forest Service, by being in charge of wildlife monitoring and management as well as controlling illegal activities.

Through the different examples, it appears that the socio-economic aspects need to be taken into account and that the complete picture needs to be understood in order to manage systems in a sustainable way (e.g. law enforcement activities would also be a variable to be taken into consideration).

On the whole, however, hunting in Europe is considered to be well regulated by law and practiced in respect of sustainability and high ethical principles[19]. In many cases, additional standards are frequently set by local, regional and national hunters' associations with regard to sustainable hunting.

In most wildlife management and conservation systems, more than one objective exists. For example, conservation stakeholders may prioritize the conservation of the wider ecosystem; wildlife managers, the sustainable management of the quarry species; commercial hunters, the economic income, and recreational hunters, their experience and access to ecological quality meat.

Thus, traditional strategies optimizing against the objectives of a single stakeholder are unlikely to produce consensus on management approaches. Recently there have been proposals to extend the framework to include more realistic trade-offs between socio-economic and ecological sustainability through the explicit incorporation of resource user decision-making with understandings of the ecological dynamics of the system.

This suggests that a crucial next step in wildlife management is to collect data on the various social and ecological drivers of hunting systems. This information can then be used in adaptive management plans in order to promote sustainable wildlife management through monitoring of the economic, social and ecological indicators of change. This enables managers to update decisions to make hunting systems both socio-economically and ecologically sustainable.

[19] See for example reports on hunting and the European Charter on Hunting and Biodiversity to the Standing Committee of the Convention on Conservation of European Wildlife and Natural Habitats. Available at : http://www.coe.int/t/dg4/cultureheritage/nature/bern/default_en.asp

5. MAPPING AND ASSESSMENT OF ECOSYSTEM SERVICES

As part of its commitment to the Aichi Targets and under Action 5 of the EU Biodiversity Strategy to 2020, Member States are called upon to map and assess the state of their ecosystems and their services.

In this regard, the European Commission has established a working group on Mapping and Assessing Ecosystem Services (MAES), which has produced "*An analytical framework for ecosystem assessments under Action 5 of the EU Biodiversity Strategy to 2020*"[20]. This discussion paper outlines a framework for undertaking the assessment of various ecosystems, in line with international standards and methodologies being pursued under other similar processes. This work forms an integral part of setting a baseline for targeting and ensuring actions to fulfil Target 2 but also links strongly to other Targets.

As part of this the MAES working group will focus on six aspects. These include a focus on how the reporting under the Nature Directives (Art 12 & 17) can serve to assess ecosystem condition. In addition, a general pilot will explore the possibility of valuing natural capital. However, a key focus will be on four pilot studies to map four ecosystems (Agricultural, Forest, Freshwater & Marine) and their services.

Hunting is of course an aspect that cuts across a number of ecosystems and by definition derives both cultural and provisioning services from the ecosystems in which it is carried out. With over 7 million hunters in Europe, not to mention the multitude of hunt supporters, these values are likely to be quite significant, thus warranting examination.

However, it is also important to recognise that hunting is one of the most regulated recreational activities in Europe (formally and informally) and part of this requires ecosystem management actions to be undertaken. Furthermore, there is a significant additional voluntary investment by hunters into ecosystems because hunters have long recognised the need for stewardship. This investment in ecosystems is important to map not only because it helps to generate a more accurate value of the service but also because it can help in meeting other Targets and Actions under the EU Biodiversity Strategy to 2020.

In order to make some input towards the MAES process it will be necessary to aggregate and allocate values associated with hunting into the appropriate categories. These will then need to be divided across the various ecosystems under review. For this appropriate methodologies will have to be agreed upon.

[20] European Commission (2013) Mapping and Assessment of Ecosystems and their Services. An analytical framework for ecosystem assessments under Action 5 of the EU Biodiversity Strategy to 2020. Technical Report: 2013 – 067. Available at: http://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/pdf/MAESWorkingPaper2013.pdf

6. AGGREGATING THE VALUES ASSOCIATED WITH HUNTING

Hunting generates a large set of values in all sectors of the economy through both direct and indirect effects. These are broadly captured in Figure 3 which groups the values associated with hunting as broadly as possible. In general, services from any number of defined ecosystems (Agricultural, Forest, Freshwater, Marine etc.) give rise to hunting in one form or another. For this to occur, a varying degree of direct expenditure must be undertaken in order to allow hunting to take place, giving rise to hunting products, hunting revenues (to commercial operators) and well-being. The well-being includes a degree of public goods and services (orange arrow) that arise from hunting and hunting management. Hunting revenues are accrued to the hunting outfitter but are also spent by the individual hunter and care should therefore be taken to avoid double counting this financial flow.

As previously stated, in order to ensure that services can be extracted, it is common for hunters and hunting outfitters to undertake ecosystem investments, in addition to the direct expenditures that they make. Care needs to be taken regarding the nature of these investments and any elements that may be captured under direct expenditures.
Finally, the size, quality, availability and accessibility of ecosystems to hunters are determined by the various drivers of change.

These values can also be broadly divided into upstream values (i.e. creating/enabling hunting activities) and downstream values (i.e. which come out of hunting activities) and either set can be used to assess the value of the ecosystem services. It is important to note that public goods and services should be added to both upstream and downstream values. The choice of calculation will depend on the motivation for hunting and of course the available data.
However, in the case of recreational hunting, as is the case in Europe, and for the purpose of this conceptual framework it is useful to consider the primary motivation as well-being.
In this context and in relation to Figure 3, it should be considered that the sum of the downstream values is equal to or greater than the sum of the upstream values, or else hunters would not be motivated to hunt. This assumption is of course depending on the respective situations knowing that, in some countries, hunting models may be more associative than commercial. As consequence, the direct expenditures or revenues, being less competitive, could potentially lead to an underestimation of the upstream values such as the well-being.

The term well-being is of course debated but, in this instance, it is worth using the definition put forward by the New Economics Foundation in which well-being is equated to a dynamic state between both happiness and fulfilment[21]: "This is a dynamic state, in which the individual is able to develop their potential, work productively and creatively, build strong and positive relationships with others, and contribute to their community. It is enhanced when an individual is able to fulfil their personal and social goals and achieve a sense of purpose in society".

It is important to recognise the role of well-being in hunting activities, particularly in the context of hunting in Europe. Through this pursuit, hunters derive multiple benefits driven largely by their immersion in nature and their interactions with wildlife and other hunters. The well-being gains experienced by hunters ensure that as a whole hunters reinvest in nature in a variety of ways. They contribute to the different sectors and reinvest time, effort and money in conservation activities (such as monitoring, population/habitat management) not just for the sustainability of hunting, but to maintain Europe's natural heritage. From this perspective, well-

[21] New Economics Foundation (2011) Human Well-being and Priorities for Economic Policy Makers. Available at: http://www.neweconomics.org/publications/entry/human-well-being-and-priorities-for-economic-policy-makers

being can be considered as a cornerstone and the key driver when assessing all of the values linked to the economics of hunting.

Furthermore, recognising "well-being" as a primary motivation for hunting in Europe is in line with the EU Commission's MAES process and the more global TEEB process, which are attempting to evaluate the significance of ecosystem services such as the cultural aspect, including the physical, intellectual, spiritual and symbolic interactions with biota, ecosystems, and lands[22].

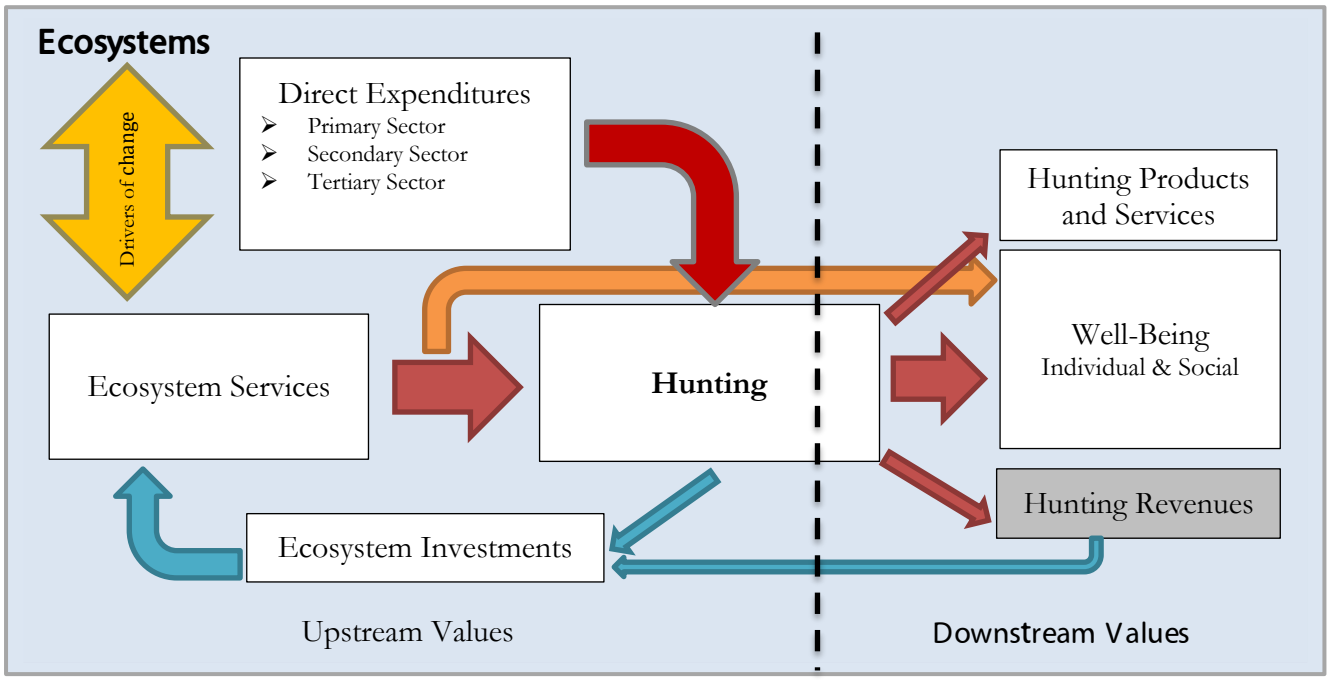

Figure 3. Aggregated Values Associated with Hunting

Notwithstanding the broad division between upstream and downstream values, it may be that, in a European setting and for economic estimates based on upstream values, the by-products arising from the use of the hunted animals, principally game meat, could arguably be viewed as additional values. In this context, the majority of the benefits from hunting by-products, in most cases, do not accrue to the hunter/operator, but rather to dealers and downstream consumers. Therefore, in some cases, the values extracted by the hunter/operator will be used for cost off-setting and it may be reasonable to consider these downstream values as being additional to the upstream values.

[22] MAES Technical Report: http://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/pdf/MAESWorkingPaper2013.pdf

7. TOWARDS AN ANALYTICAL FRAMEWORK FOR THE ECONOMICS OF HUNTING

In the medium term it is of interest to evaluate the upstream and downstream values associated with hunting in order to provide input towards the *Mapping and Evaluation of Ecosystem Services* and also the servicing of ecosystems. This can probably best be achieved by eliciting hunter preferences and using existing studies and data to establish and extrapolate the values.

However, in the longer term, the use values arising from hunting would need to be compared with use values arising from competing activities. This implies identifying whether the market is capturing all the value associated with different activities. In the case of hunting, this means estimating utility functions of hunters which include the willingness to pay for less tangible aspects such as conviviality, tradition, etc. These are indirect use values of the land subject to valuation.

Different land management practices affect non-use values of ecosystem services, for example, the level of biodiversity and the intrinsic value of ecosystems. The changes in the level of biodiversity associated with different land management need to be surveyed and then valued.

A multi-disciplinary framework to study the contribution of hunting to the total economic value of ecosystems would require:

(a) to establish how ecosystem services affect hunting? (What tools help?)

(b) to establish how hunting supports and depends on ecosystems services?

(c) estimates of the changes in use values of land subject to different management practices, including indirect use values that might not be captured by market transactions;

(d) estimates of the changes in biodiversity and scenic beauty brought about by hunting, agriculture, forestry and conservation.

(e) comparisons between hunting and other land management practices in Europe: agriculture, forestry and conservation;

(f) to establish the knowledge constraints about the contribution of hunting to ecosystem services, which affect decision-making;

8. END NOTE

This Report is not intended to be authoritative but rather it is designed as an initial framework to stimulate discussion and serve as a starting point from which new ideas and methodologies can be developed and refined.