M.Sc. Programme
“Management of Protected Areas”

Economic and Cultural Values Related to the Veľká Fatra National Park (Slovakia)

Author: Mgr. Radoslav Považan

Supervisor: Prof. Dr. Michael Getzner
Department of Public Finance and Infrastructure Policy
Vienna University of Technology
Resselgasse 5,
1040 Vienna
Tel.: +43/1/58801 26720
e-mail: michael.getzner@tuwien.ac.at

Carried out at: Department of Economics
University of Klagenfurt
Universitaetsstrasse 65-67
9020 Klagenfurt
Ph +43 (0) 463/ 27 00 4192
e-mail: mpa@uni-klu.ac.at

Klagenfurt, May 2011

DECLARATION OF HONOUR

I herewith declare that I am the sole author of the current master thesis according to art. 51 par. 2 no. 8 and art. 51 par. 2 no. 13 Universitätsgesetz 2002 (Austrian University Law) and that I have conducted all works connected with the master thesis on my own. Furthermore, I declare that I only used those resources that are referenced in the work. All formulations and concepts taken from printed, verbal or online sources – be they word-for-word quotations or corresponding in their meaning – are quoted according to the rules of good scientific conduct and are indicated by footnotes, in the text or other forms of detailed references.

Support during the work including significant supervision is indicated accordingly.

The master thesis has not been presented to any other examination authority. The work has been submitted in printed and electronic form. I herewith confirm that the electronic form is completely congruent with the printed version.

I am aware of legal consequences of a false declaration of honour.

Klagenfurt, 15 May 2011 Signature:
I would like to thank:

WWF – DCP for providing the tuition fee which enabled me to take the MPA course;

Ján Kadlecík, the colleague, for the invaluable advice and travel cost repayment through the project of which Jan is the mastermind;

Michael Getzner, the supervisor, for the professional guidance;

David Strobel from WWF for the provision of Manuscript of the PA ecosystem services guidelines;

Peter Vantara, the NP Veľká Fatra director, for the cooperation and NP Veľká Fatra data provision;

Tereza Thompson for the help with the grammar check and thesis finalisation;

Peter Sabo and Juraj Vysoký for their willingness to consult issues relating to the preparation of the thesis.
# Table of Contents

Declaration of Honour ........................................................................................................................................ 2

Acknowledgements .................................................................................................................................................. 3

1 Summary ............................................................................................................................................................ 5
  1.1 Summary ......................................................................................................................................................... 5

2 Introduction ...................................................................................................................................................... 6
  2.1 Preface ............................................................................................................................................................ 6
  2.2 Objectives and Purpose .............................................................................................................................. 8

3 Project Description .......................................................................................................................................... 9
  3.1 Background ................................................................................................................................................ 9
  3.2 Methods .................................................................................................................................................... 13

4 Results ............................................................................................................................................................ 17
  4.1 Short description of the study site ............................................................................................................ 17
  4.2 Ecosystem services and money values ................................................................................................. 21
    4.2.1 Forest products and ecosystem services ....................................................................................... 21
    4.2.2 Agriculture and ecosystem services ............................................................................................ 31
    4.2.3 Fishing ............................................................................................................................................... 31
    4.2.4 Hunting ........................................................................................................................................... 32
  4.3 Recreation and existence values of visitors ......................................................................................... 32
    4.3.1 Introduction ....................................................................................................................................... 32
    4.3.2 General questions regarding environmental values and the national park visit ....................... 33
    4.3.3 Motives for visiting the national park and travel costs of visitors ............................................. 42
    4.3.4 Willingness-to-pay for a national park policies and environmental values ................................ 46
    4.3.5 Socio-economics of respondents ................................................................................................. 52

5 Conclusion ...................................................................................................................................................... 54
  5.1 Summary, conclusions and recommendations: Total economic value of Veľká Fatra national park (Slovakia) ................................................................................................................... 54
  5.2 Recommendations .................................................................................................................................... 57

6 References ..................................................................................................................................................... 61
  6.1 Literature .................................................................................................................................................... 61
  6.2 Internet Resources ..................................................................................................................................... 64

List of Figures ...................................................................................................................................................... 65

List of Tables ..................................................................................................................................................... 66

List of Acronyms and Abbreviations .................................................................................................................. 67

Appendix ........................................................................................................................................................... 68
1 SUMMARY

1.1 Summary

The valuation of ecosystem services in protected areas is still in pioneering stadium in Slovakia and also in the Carpathian Ecoregion. Previous valuations were done in Central Europe in two national parks – Tatra national park (Poland) and Slovenský raj national park (Slovakia) by Getzner (2009, 2010). These studies showed that ecosystem services are of eminent importance to the local, regional and national economies (Strobel 2010).

In this paper another national park in Slovakia – Veľká Fatra is evaluated and values are compared to results from Tatra and Slovenský raj national parks. Valuations are based and elaborated applying state-of-the-art methodological approaches.

In total Veľká Fatra National Park provides **EUR 179,128,728** worth of ecosystem benefits per year. This value is lower compared to Tatra or Slovenský raj national parks. This is due to the fact that the ecosystem services provided are different, but mainly due to lower number of tourists (500,000), lower average number of length of stay (2.28 days) and lower national population in Slovakia compared to Poland.

The most important benefit of the Veľká Fatra national park is the biodiversity conservation represented by non-use values in terms of existence, option and bequest values (**EUR 117,000,000**). The second most important benefit is the recreation (**EUR 53,010,000**).

Other services such as forest products, agricultural products, fishing or hunting are less significant, however, compared to Tatra or Slovenský raj national parks, these services are more important. In this sense, Veľká Fatra national park, the service of timber production, water provision, water retention (flood protection) and carbon sequestration are of the highest value.

The results of the study clearly show that Veľká Fatra national park provides important ecosystem services for the national economy. The costs of establishing and managing the national park are non-significant compared to values of provided ecosystem services.

Finally, the study results are available to be used along with proposed recommendations for future valuations.
2 INTRODUCTION

2.1 Preface

Protected areas are defined by IUCN (1994) as "Land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means". They ensure conservation of biodiversity in terms of genetic, species, ecosystem (habitat) and landscape diversity. It is a paradox that globally, the total number and surface of protected areas have been raising continually while the WWF Index of Living planet is decreasing.

The conservation of biodiversity in general, as well as in situ in protected areas is based on the perception of ecological, economic and social goals and problems, and therefore on a range of societal values influencing and originating from individual ones. For instance, the willingness of a society to set aside major parts of its land to conserve biodiversity is an expression of such values and vice versa (Getzner 2010).

The functions of the nature (and protected areas) represent the ability of the ecosystem to provide the services through the products and ecological processes. (Sabo et al. 2011).

From anthropocentric point of view, the function of the ecosystem is characterised by the spectre of those beneficial characteristics, which are related to the potential of the ecosystem to fulfil particular human needs and enable particular human activities. The word ecosystem services describe the benefits, which humans gain from processes running in the ecosystem. These services are realised in such large ecosystems and biomes, that they cannot be replaced by any super modern technologies.

The valuation of ecosystems and their functions is significant for the following reasons (Sabo et al. 2011):

- it deepens the understanding of the relations and bonds between ecosystems and quality of life,
- demonstrates the ability of ecosystems to contribute to poverty diminution,
- evaluates the compatibility of the strategies aimed at their conservation and use
- integrates economic, environmental, social and culture efforts,
- integrates information of various scientific fields (e.g. nature, human, technical science)
finds out and valuates possible measures for ecosystem services sustainable management.

Today’s arguments of nature conservationists and decision makers such as occurrence of protected species and habitats are too weak to stop strong development within protected areas. The State Nature Conservancy of the Slovak Republic and its national parks administrations have not got strong enough arguments when discussing the plans for development activities within protected areas with the economy resort. Expressing the economic value of nature in numbers would give conservationists stronger arguments. It is obvious that nature conservancy needs to react to these economic pressures. Even though nature and wildlife cannot be boxed up and expressed in numbers only, there is a call to monetarize the nature in order to see its (economic) value.

The current challenge is to develop or refine indicators and the quantitative methods behind them. Ideally, this process leads to a generally accepted valuation scheme which incorporates all relevant services, while at the same time leaving flexibility to integrate area-specific variables (Strobel 2010).

The underlying case for the valuation of ecosystem services is that it will contribute towards better decision-making, by ensuring that policy appraisals fully take into account the costs and benefits to the natural environment and by highlighting much more clearly the implications for human wellbeing, while providing policy development with new insights (DEFRA 2007).

Many papers are devoted to evaluation of ecosystem services, esp. from the so called EU15 countries. However, the processes of evaluations are only starting in new EU member states (Slovakia including), although ecosystem services are not an unknown term. There were pilot evaluations of ecosystem services carried out in two national parks in central Europe (Getzner, 2009, 2010) – Tatra national park (Polish side) and Slovenský raj national park (Slovakia). This study’s intention is to contribute to this task and start ecosystem services evaluation in Veľká Fatra national park. It is considered necessary now the pressures on protected areas in Slovakia are increasing.

The study explores the benefits of biodiversity conservation in Veľká Fatra national park and compares the results with valuation in two national parks in Central Europe, the Slovenský Raj national park in Slovakia, and the Tatra national park in Poland. For the Veľká Fatra national park we used the same methodology in order to get as comparable results as possible. The main goal of the study is to assess and value the benefits of biodiversity conservation in terms of the ecosystem services provided by the national park.
2.2 Objectives and Purpose

For this study we have defined following research questions:

- What is the Total Economic Value (TEV) associated with the economic and cultural services that the Veľká Fatra national park provides?
- What is the relative importance of ecosystem services?
- What are the use- and non-use values of the Veľká Fatra national park?
- How does the Veľká Fatra national park compares to the Tatra national park (Poland) and Slovenský raj national park (Slovakia)?
3 PROJECT DESCRIPTION

3.1 Background

Whereas ecosystem services and their values are part of virtually any landscape, one of the most important challenges is to assess the quality and quantity of the services provided in key natural areas such as protected areas, since they are often the source area of an exceptionally high productivity of environmental services. The results obtained can help to draw deductions on how to adapt management in order to achieve a good and sustained services flow while at the same time not compromising values such as for example species richness and landscape beauty. While it is commonly acknowledged that no calculation scheme results in an exact value of ecosystems there is an equally common understanding that a range of valuation techniques, if properly applied, provide sound approximations. Therefore, in monetary terms, approximations constitute valid references e.g. for protected area administrations or landscape planners at regional councils, in order to argue for pursuing or dismissing specific management options, particularly where investments and revenues have to be weighed against the continuity of ecosystem functions and services flow (Strobel 2010).

Examples include (WWF guidelines 2010):

- Continuation of the management of species-diverse mosaic landscapes related to traditional (soft) agricultural techniques versus an entirely forested landscapes or intensive agriculture;

- Construction of hydropower-plants versus maintenance of valley landscapes which ensure flood protection and erosion prevention (e.g. when alternative energy options are available);

- Restrictive versus lax protected area policies, in particular in connection with tourism management

The discipline of environmental economics first emerged in the 1950s and 1960s, largely prompted by the introduction of new environmental regulations in the United States and later in Europe. For the first time, it became necessary to assess the environmental costs and benefits of (mainly government-instigated) large infrastructure projects, as well as to compare public policies and market-based interventions such as effluent charges and pollution fees. Environmental valuation grew in popularity as the “Limits to Growth” movement of the 1970s and the vision of sustainable development articulated in “Our Common Future” in 1987 took hold. The 1970s, in particular, saw a major shift from the use of solely scientific data to support environmental arguments to the inclusion of economic...
reasoning. Towards the end of the 1980s and into the 1990s, “green” issues associated with nature conservation became a major focus of valuation work. This was motivated in no small part by the UNCED “Earth Summit” of 1992 and the “Rio Conventions” on biodiversity, climate change and desertification that came out of it (Strobel 2010).

Overview of ecosystem services

Most famous and used classification of ecosystem goods and services comes from the Millennium Ecosystem Approach (2005). It shows the interdependencies among ecosystem goods and services, biodiversity, human well-being and drivers of change:

Fig. 1: Biodiversity, ecosystem functioning, ecosystem services, and drivers of change

Source: Systemic overview of ecosystem services (source: Millennium Ecosystem Assessment, 2005).

There are two basic categories of benefits of protected areas: Use- and non-use values. These kinds of values represent the environmental evaluation as a concept of Total economic value (TEV). TEV consists of (Millennium Ecosystem Assessment, 2005):

- Use values
Direct use values – These are values derived from the direct use of the protected area for activities such as recreation, sustainable harvesting, wildlife, fuel wood, grazing, agriculture, gene pool harvesting, education, research. They refer to ecosystem goods and services that are used directly by human beings. They include the value of consumptive uses such as harvesting of food products, timber for fuel or construction, medicinal products and hunting of animals for consumption; and the value of non-consumptive uses such as the enjoyment of recreational and cultural activities that do not require harvesting of products. Direct use values are most often enjoyed by people visiting or residing in the ecosystem itself.

Indirect use values – These are values linked mainly to the ecological function of protected areas (watershed protection, climate stabilisation, flood control, ecosystem protection, carbon sequestration). They are derived from ecosystem services that provide benefits outside the ecosystem itself. Examples include natural water filtration which often benefits people far downstream, the storm protection function of mangrove forests which benefits coastal properties and infrastructure, and carbon sequestration which benefits the entire global community by abating climate change.

Option values – These values derived from the option of using the protected area sometimes in the future; these values may be direct or indirect use values, and may include the future information provided by the protected area (future information, future use). They are derived from preserving the option to use in the future ecosystem goods and services that may not be used at present, either by oneself (option value) or by others/heirs (bequest value). Provisioning, regulating, and cultural services may all form part of option value to the extent that they are not used now but may be used in the future.

Non-use values – values that humans hold for a protected area but which are not linked to the use of the protected area; non-use values are hard to measure. They refer to the enjoyment people may experience simply by knowing that a resource exists even if they never expect to use that resource directly themselves. This kind of value is usually known as existence value (or, sometimes, passive use value).

Existence values – the benefit of knowing that the protected area exists (biodiversity, ritual values, culture, heritage, landscape)

Bequest values – relates to the benefit of knowing that others benefit or will benefit from the protected area (use and non-use values for legacy)
Valuation techniques

The common and most widely used valuation techniques are (WWF guidelines, Strobel 2010):

- Market prices: A simple and direct way of valuing protected area goods and services is to look at their market prices: what they cost to buy or what they are worth to sell. Typical examples for applying the market price method are the valuation of water, timber and non-timber products.

- Travel costs: Protected areas typically hold a high value as a recreational resource or destination. Although in many cases no charge is made to view or enjoy natural ecosystems and species, people still spend time and money to reach protected areas. This spending – for transport, food, equipment, accommodation, time, etc. – can be calculated, and visitation rates can be compared to expenditures. Travel costs reflect the value that people place on leisure and recreational aspects of tourism.

- Contingent valuation: This method, which consists of a survey, is predominantly applied for the valuation of non-use values. In the surveys, people provide their stated preference, for instance their willingness to pay, for certain management activities the protected area administration carries out in order to ensure the long-term conservation of the flora and fauna. In contrast, the revealed preference relates to the actual contributions of park visitors, or taxpayers. Contingent valuation is a widely accepted tool for assessing the non-use values of protected areas. These stem from the mere existence of protected areas and their landscape beauty. Usually they are subdivided into the existence value (value due to the existence of the PA), the bequest value (the value the PA has for future generations) and the option value (the value as a potential source of personal benefit in the future). Contingent valuation, however, can have shortcomings: for example if the statistical mass of respondents is low, the information provided may not be representative. Also, if possible, direct interviews should be preferred over anonymous distribution, in order to avoid or minimize misconceptions or deliberately wrong answers.

- Hedonic pricing: The method of hedonic pricing in the context of protected areas is used mainly for providing a value to environmental attributes by correlating them to housing and real estate prices within or close to protected areas. This method may be relevant in particular for protected areas of IUCN categories V and VI with considerable or substantial human activity within protected area borders. This method combines aspects from market pricing, the consideration of air and water quality, noise pollution, as well as aesthetic values.
Replace costs and avoided costs: Replacement costs refer to the amount necessary for the restoration of ecosystems and their services, or the amount necessary to generate substitute services. Avoided costs refer to the amount that would be saved, if activities which lead to the degradation or loss of ecosystem services would not be carried out. They reflect economic losses which can be forestalled by effective conservation. These methods can be applied particularly where reference values from past experiences (under comparable circumstances) exist.

There are some papers related to providing environmental valuation and cost-benefit analysis such as Hanley & Spash (1993), Kosz (1996), Getzner (2002), Getzner & Jungmeier (2002), Getzner (2003, 2009, 2010), WWF guidelines (Strobel 2010) and others. A literature review of papers on the economic, social and ecological value of ecosystem services we can find in Newcome et al. (2005). An introductory guide to valuing ecosystem services was done by DEFRA (2007).

3.2 Methods

Methodologically, the work follows the methodology which was used for valuating Tatra and Slovenský raj national parks (Getzner 2009, 2010). It also takes into account new guidelines developed by WWF (Strobel 2010 – Draft version); official version should be introduced in the late spring 2011. The guidelines are based on a case study (Getzner 2010) developed under the WWF Protected Areas for a Living Planet project funded by the MAVA Foundation. There is a call for the establishment of more harmonized valuation schemes. In order to obtain comparable results, this work follows the methodology already used for similar purposes instead of searching for a different one.

The first step of the current project consists of a collection and interpretation of the relevant ecological data on ecosystem services of the Veľká Fatra national park, and on a geographical assignment of the relevant national park region. The identification of relevant criteria was taken from previous studies in Tatra and Slovenský raj national parks and slightly adapted to area of Veľká Fatra national park in accordance with the information gained at the workshop which took place in the residence of national park administration in Vrútky with the protected area staff. In order to collect the relevant data, data information sheet was filled and additional personal communications were held to specify the available data, and to collect and interpret information from the Veľká Fatra national park. The data based on information already available were collected at first.

The principal information sources were:

- Data from the national park administration
DATA FROM NATIONAL OR EUROPEAN STATISTICS

DATA GATHERED FROM THE DISTRIBUTED QUESTIONNAIRE

INFORMATION OBTAINED FROM EXTERNAL PEOPLE WITH KNOWLEDGE ON THE PROTECTED AREA OR REGION

Certain aspects of information could not be accessed mainly due to the lack of resources at local or regional level, e.g. there was no proper access to regional data regarding energy or agriculture issues. Veľká Fatra national park does not have a management plan which usually contains many required information for valuation. For this reason it was even harder to acquire the data and many numbers had to be estimated (expert judgement) or taken from other studies.

Tab. 1 presents the first-best outline of information requirements; in the respective subsequent chapters, the available and relevant data is discussed more thoroughly.

Tab. 1: Overview of ecosystem services and information requirements

<table>
<thead>
<tr>
<th>Description of ecosystem services in situ</th>
<th>Quantity</th>
<th>Prices**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Ecosystem services</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Forest products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.1 Timber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.2 Non-timber products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.3 Water provision, supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.4 Water retention / flood protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.5 Carbon sink, climate regulation, CO2 sequestration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.6 Erosion control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.7 Medicinal resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1.2 Agricultural products</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2.1 Cattle, grazing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2.2 Grains, food production</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1.3 Fishing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1.4 Hunting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1.5 Recreation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5.1 Tourists for a day / no., expenditure, origin, motive to stay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5.2 Overnight stays / no., expenditure, origin, motive to stay</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1.6 Recreation opportunities (national park policies)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.6.1 Education, information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.6.2 Hiking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.6.3 Climbing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.6.4 Others (e.g. rafting, mountain biking)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1.7 Biodiversity conservation values</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.7.1 Habitats, ecosystems, species, landscapes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.7.2 Existence values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.7.3 Option / quasi-option values</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table lists all the relevant ecosystem services provided by the national park, and includes empty cells for providing more detailed information (description of regional/local specifics of ecosystem services), quantification of ecosystem services provision before and after the establishment of the national park, and a first indication of potential economic values attributable to these services. It turned out that some of the ecosystem services are not relevant to the national park; on the other hand, much data is not readily available. Regarding existence, option and bequest values, no reliable study exists in Slovakia on which a valuation could be based. After collection of the data available, the second step consists of linking the quantitative information to prices. As no primary research - except for visitors' values based on a survey - was done in the current study, prices were derived from the relevant international (context-specific scientific) literature and from environmental values databases such as EVRI (Environmental Valuation Reference Inventory), taking into account differences in price levels and income between the original study site and the policy sites in the Veľká Fatra national park (Getzner 2010):

1 Benefits transfer

Based on existing valuation studies and databases on values for ecosystem services, the values and benefits in monetary terms were adapted to local/national circumstances (income, GDP, other information regarding preferences or socio-demographics if necessary and feasible). These adapted values were applied to the existing ecological data; the result is a valuation of ecosystem services based on values of other studies; the valuation will be presented within a range of possible results, taking into account scenarios and sensitivity of results.
Primary data collection

In the national park, a visitor survey collected data on individual’s willingness-to-pay for specific ecosystem services. In particular, the recreation value and non-use values (existence values) of the park's services (species & habitat conservation) were addressed. The results show the potential range of values of the park for visitors and the general public.

Finally, the individual values were aggregated, e.g. by means of the annual number of visitors to the national park, to derive a broad indication of the potential value of ecosystem services provided by the national park.

The current study includes the valuation of ecosystem services in the Velká Fatra national park (Slovakia) and compares these results with Tatra national park (Poland) and Slovenský raj national park (Slovakia).
4 RESULTS

4.1 Short description of the study site


Veľká Fatra National Park was declared by Order No. 140/2002 Coll. on 1st of April 2002 as an upgrade of the Landscape Protected Area of the same name established in 1973 (28th December) to protect a mountain range with a high percentage of well-preserved Carpathian forests. The area of the national park is 40 371 ha and of the buffer zone 26 132 ha. State Nature Conservancy of the Slovak republic – Veľká Fatra National Park Administration is a state expert organisation, whose task is to insure professional work on the field of nature and land protection. The residence of the administration is at the moment in Vrútky, however the plan is to move it to Martin in 2011.

Veľká Fatra is a large mountain group belonging to the Outer Western Carpathians; it is 40 km long and 20 km wide. Nearly 90 % of the area is covered by forests. The main ridge shows on the map in an Y shape. South part of the main ridge includes the highest mountains of Veľká Fatra. On Ploská (1532 m) summit the main ridge splits into two long branches: eastern – Liptovská and western – Turčianská. There is Šubochnianska valley (27 km long) between them. Turčiansky Ridge is lower, and covered by woods. The highest point in this part is Kľak (1394 m). Grassy Liptovský Ridge is higher. The highest points are in his par represented by Rakytov (1567 m), Smrekovica (1530 m) and Čierny kameň (1479 m). Veľká Fatra is delimited by Turčianska Basin on the west, by Oravská Highlands on the north, by Chočské Mountains and Liptovská Basin on the north-east, by Nízke Tatry on the east and by Kremnické and Starohorské Mountains on the south.

The main subject of conservation is a mountain range with a high percentage of well-preserved Carpathian forests with prevailing European beech, which cover 90 % of the area in combination with ridge-top cattle pastures dating back to the 15th - 17th centuries, to the times of the so called Walachian colonization. In places there are also relict Scots pine forests and the Harmanec valley is notable as the richest Irish yew tree location in Central and probably the whole Europe. Veľká Fatra national park is also an important reservoir of fresh water thanks to high rainfalls and low evaporation in the area. More common are various slates creating gently modelled ridges and summits of the so called Hôlna Fatra and limestone and dolomite rocks creating a rough and picturesque
terrain of the so called Braliná Fatra. There are also many karst features, namely caves, Harmanec Cave being the only one open to the public.

The relief of Veľká Fatra is extremely rugged and has great differences in altitude. It is notable for its karst phenomena such as rocky walls, terraces, windows and small canyon-like valleys. The best-known valleys are Gaderská, Blatnická, Belianska and Bystrická; its best known caves (not accessible to the public) include Mažarná, Jelenecká, Horná and Dolná Túfna. Amongst its rarer plant species are remnants of relic pine growths on limestone rocks, for example Androsace villosa. The occurrence of crowfoot is typical for the park’s flora communities in alpine meadows while fauna is represented by mountainous species, amongst which there are 110 nesting bird species and 60 mammal species, large carnivores as lynx, bear and wolf including.

Fig. 2: Location of Veľká Fatra national park

Fig. 3: Overview map of Veľká Fatra national park

There were 5 Natura 2000 sites designated and approved in Veľká Fatra. All of them are proposed sites of Community Interest (pSCIs) under the Habitat Directive. Sites cover 437.56 sq. km, of which approximately 403.71 km is the area of the national park itself.

pSCI (SKUEV0147) Žarnovica

pSCI (SKUEV0164) Revúca

pSCI (SKUEV0238) Veľká Fatra

pSCI (SKUEV0381) Dielnice

pSCI (SKUEV0382) Turiec a Blatnický Potok

Since the 15th May 2010 there is a SPA (SKCHVÚ033) Veľká Fatra announced within the national park Veľká Fatra by the Order of the Ministry of Environment No. 194/2010 Coll.
4.2 Ecosystem services and money values

4.2.1 Forest products and ecosystem services

Protected areas are not important only in terms of biodiversity, but also in the terms of ecosystem services. The main ecosystem services are being considered the water supply, water provision, erosion control, services provided by forests (not only timber), carbon sequestration, food provision, as well as recreation to the visitors.

In the following chapters, the different products and ecosystem services will be briefly described and – where possible – valued in monetary terms for Veľká Fatra national park.

**Timber**

Valuation technique: market prices

**Variables and units:**

- Surface of timber-managed area within the protected area – $S$ (ha)
- Average harvest amount per year – $Ha$ ($m^3$/ha)
- Mean value of timber price based on national levels – $Pmt$ (EUR/$m^3$)

**Value of timber products in Veľká Fatra national park:**

$$VT = S \times Ha \times Pm = 14,158 \text{ ha} \times 3.57 \text{ m}^3/\text{ha} \times 34.26 \text{ EUR/m}^3 = \textbf{1,731,639 EUR (national park)}$$

$$VT = S \times Ha \times Pm = 9,689 \text{ ha} \times 3.57 \text{ m}^3/\text{ha} \times 34.26 \text{ EUR/m}^3 = \textbf{1,185,044 EUR (buffer zone)}$$

For this calculation, an average harvest amount and mean value of the national timber price was used for the lack of data available.

There are forest agencies and other organisations in Slovakia currently, which have been appointed to manage (parts of) protected areas and keep the accounts of all conducted activities. Nevertheless, these activities can be carried out only with the consent of the protected area leadership, which monitors the proceedings, is continuously and fully informed of everything that takes place, and has the right to intervene if planned activities compromise the main management objectives, according to IUCN management categories (Strobel 2010).

Due to harvesting activities in Veľká Fatra national park, the production of timber (1.1.1, timber, see Tab. 1, page 14) is one of major ecosystem services in this
protected area. Up to 88 % percents (35,719 ha) of the area of the national park is covered by forests (see Fig. 5).

Fig. 5: Area of forests in the Veľká Fatra national park (in hectares and percents)

Area of forests within the Veľká Fatra NP

Source: Based on data provided by the Veľká Fatra National Park Administration

In this case the Veľká Fatra national park acts against the guidelines appropriate to the IUCN category II, where commercial forestry is allowed only for purposes of ecological management. Veľká Fatra national park manages a commercial forest on the area of 14,158 hectares (plus 9,689 hectares in the buffer zone). The timber produced and revenue earned belongs mostly to the state-owned forest company, not to the administration of the park.

Other 17,498 hectares of forests are in the category “protective forests” and 3,357 hectares in the category “special purpose forests” (see Tab. 2).

Protective forests and special-purpose forests with prevailing non-production functions are being designated to provide protection of infrastructure and natural resources against injurious agents. The forest stands in the 7th and 8th vegetation zone and serves as a protection against avalanches. Along with the protection against avalanches it provides ecological functions as erosion control and water management as well. Important social functions are fulfilled by the forests in the protection zones of the water sources, natural curative springs and forests fulfilling primarily health functions (Moravčík et al., 2007).
Commercial forests have changed wood composition to a large extent, which corresponds with the unfavourable conservation status of these habitats. Other forest categories are more-or-less in a good conservation status.

As there is no information available on current figures of timber harvest in Slovakia, we look at the numbers from previous years. In Slovakia the sum of annual timber harvest for round-wood production was 5,312 m$^3$ in 2003 on a total forest area of 2,177 hectares; which is around 2.44 m$^3$ per hectare (all data: World Resources Institute, 2009). Logging increased to 10,214 m$^3$ in 2005, making it an average logging of 4.69 m$^3$ per hectare per year in Slovakia (Šulek, 2006).

As an approximation, we can assume that average harvesting amounts to around 2.44 up to 4.69 m$^3$ per hectare also in Velká Fatra national park, with a mean value of 3.57 m$^3$ per hectare. At the moment, international timber prices are at the minimum EUR 30 per m$^3$, depending on quality and future use of timber, up to EUR 40 per m$^3$ (Šulek, 2006). Current green report (2010) states the average price EUR 34.26 m$^3$ (coniferous + broadleaf trees). These figures are certainly conservative estimates since timber prices increased in 2007; on the other hand, these prices also include parts of the harvesting costs. However, due to recent thunder storms in Central Europe, and subsequent windfall, timber prices fell in 2008 and 2009, but they started to go up slightly afterwards. These data were taken also for Slovenský raj in previous study (Getzner, 2010) and will make easier comparison between these two parks in Slovakia.

Total commercial forest area is 14,158 hectares (plus 9,689 ha in buffer zone), the average harvest of timber in Slovakia is 3.57 m$^3$; the annual timber harvest can be approximated by about 50,544 m$^3$ per year (plus 34,590 m$^3$ in buffer zone). Using a conservative estimate (mean value of timber prices) of EUR 34.26 per m$^3$, the annual revenue of timber production can be estimated to amount to EUR 1,731,639 in the national park and EUR 1,185,044 in the
buffer zone (lower bound: EUR 505,440 + EUR 345,900 (EUR 10 per m$^3$); upper bound EUR 2.527m + 1.73m (EUR 50 per m$^3$)).

**Non-timber forest products**

Valuation technique: market prices – in respect of following facts non-timber products were not evaluated.

Typical products of this category are herbs, berries (bilberries, cranberries and raspberries), mushrooms and natural fibres (1.1.2). In Veľká Fatra national park as well as in all the other national parks in Slovakia (with the third level of protection) it is not allowed to collect plants (and mushrooms).

The Law on Nature and Landscape Protection (543/2002 Coll., § 14) says:

“(1) In the territory in which the third level of protection is valid following activities are prohibited

h) collecting plants including their fruits,”.

In Veľká Fatra national park the collection of berries and mushrooms for direct consumption, in the distance of 2 metres from the tourist (nature) trail is generally accepted (NP Veľká Fatra visiting rules). However, the experience of the national park administration staff suggests that the collection of non-timber forest products by visitors plays only a minor role in the whole range of ecosystem services.

**Water provision, water supply**

With regards to a high amount of waterfall in the NP Veľká Fatra (the average of the whole area is around 1,000 mm) and a low level of evaporation (approx. 480 mm), there is more than a half of the waterfall (520 mm) left to be soaked underground. This amount is very high compared to other parts of Slovakia. For this reason as well the NP Veľká Fatra was proclaimed the protected water management area. (Vestenický, K. & Vološčuk, I. 1986)

Valuation technique: market prices

**Variables and units:**

- Mean number of persons receiving water from the protected area - $Nm$
- Average water use per person per year - $Uaw$ (m$^3$)
- Mean regional water price - $Pmw$ (EUR/m$^3$)

**Value of water provision:**
\[ VWP = Nm \times Uaw \times Pmw = 150,000 \times 43.8 \text{ m}^3 \times 0.8675 \text{ EUR/m}^3 = 5,699,475 \text{ EUR} \]

Data sources: regional and national statistics

For the water use per person per year the respective national averages were taken as a reference. The water prices indicated in the calculation reflect the regional water price level of the district to which the protected areas belong, at the time of the research (2011).

Water protection and water provision (1.1.3) is one of the most important roles in the Veľká Fatra national park. Thanks to its rich fresh water resources, the Veľká Fatra was declared a protected water management area in 1987 in the area of 64 km\(^2\) with the potential fresh water supply up to 3,95 m\(^3\).s\(^{-1}\).

In Veľká Fatra national park approximately 10 relatively big springs support the water supply of municipalities within the Turiec region (Martin, Nečpaly, Blatnica, Turany, Sučany, etc.) and in Lower Liptov region (Ružomberok, Liptovské Revúce, Liptovská Osada, etc.). All in all, it includes more than 150,000 of residents.

In the Veľká Fatra region there is also a range of mineral and geothermal springs (Martin, Budiš, Dubové, Turčianske Teplice, etc.). The thermal water of the Turčianske Teplice spa has demonstrable healing effects on dysfunction of the locomotive organs and urinary, neural and gynecological problems.

The data on water supply in the Veľká Fatra region can only be calculated due to lack of available information. Specific water consumption per household is estimated at the minimum of 80 litres per day per person (Kriš and Škultětová, 2009; cf. also Tóthova and Mahríková, 2006). An annual specific water consumption of households in the national park region is 4,380,000 m\(^3\) at the lower bound (actual household water consumption could be higher; water for agricultural or commercial uses is not included for lack of data). Majority of inhabitants of the Turiec and Lower Liptov regions are depending on the securing of water supply in the Veľká Fatra national park. If the mean consumption is 160 litres per day per person, the park may provide up to 8,760,000 m\(^3\) of fresh water per year. Average value of water consumption is 120 l per person per day (43.8 m\(^3\)) per year.

Combining the annual water supply with actual water price of EUR 0.8675 (Turiec Water-Supply Company, 2011) per m\(^3\), the value of the ecosystem service of drinking water supply is EUR 5,699,475 per year (lower bound EUR 3,799,650 – given consumption 80 l per person and day) and (upper bound EUR 7,599,300 EUR – given a water consumption 160 l per person and day).
**Water retention, flood protection**

Valuation technique: reference values related to replacement/avoided costs

Variables and units:

- Protected area surface - A (ha)
- Mean value of water retention (for EU27; as for unmanaged forests – in Slovak Republic Protective + Special Purpose Forests) - Vmwr (EUR/ha)
- Income differential - ID

Value of water retention in Veľká Fatra national park:

\[
VWR = [A_{\text{unmanaged forests}} \times V_{\text{mwr unmanaged forests}} \times ID] + [A_{\text{managed forests}} \times V_{\text{mwr managed forests}} \times ID]
\]

\[
= [20,855 \text{ ha} \times 90 \text{ EUR/ha} \times 0.64] + [14,158 \text{ ha} \times 36 \text{ EUR/ha} \times 0.64] = 1,527,448 \text{ EUR (national park)}
\]

\[
= [6,686 \text{ ha} \times 90 \text{ EUR/ha} \times 0.64] + [9,689 \text{ ha} \times 36 \text{ EUR/ha} \times 0.64] = 608,348 \text{ EUR (buffer zone)}
\]

Data sources: data from the PA administrations, EU statistics

Most of the forests ensure functions related to regulating the water regime (water management) or preventing the soil erosion (soil protection function). In mountain areas (such as Veľká Fatra is) these functions play very important role. Their importance is highlighted in all relevant international documents concerning sustainable forest management. Flood protection measures to protect infrastructure in river basins are carried out through management of small watercourses. There is growing importance of the linear planting of trees, windbreaks, river bank vegetation, water reservoirs and protection forest zones in the areas of increased noise and dust (Moravčík et al. 2007). Wetlands have a significant importance in the field of flood protection. There is one Ramsar site in the surroundings of the Veľká Fatra national park along the River Turiec called The Wetlands of Turiec.

The size of the NP Veľká Fatra forest determines that the park does play an important role in retaining the water run-off (1.1.4). However, there have been no studies carried out to examine the water retention in the whole area of the park that would bring results suitable to quantify the value of this forest function.

Since Veľká Fatra national park has 14,158 ha of managed forest (+ 9,689 ha in the buffer zone), this share of surface has a lower mean value of water retention. The underlying assumption is that the retention value is 40% lower compared to unmanaged forests. Scientific site assessments on the water retention capacity
and corresponding values does not exist for Velká Fatra national park, therefore mean values had to be taken as a reference (in this case from the EU27 countries). These were then brought into the national context by multiplying them with the respective income differential for Slovakia. If, in this context, the cost is also taken into consideration, there might be differences in overall investment and maintenance costs, e.g. in cases where water is drained for consumption. This depends largely on the individual topographic conditions which determine the water flow regime and soil stability, and requires a separate analysis (Strobel 2010).

As Getzner (2010) says values for forest ecosystems’ function to water retention and flood protection in several international studies range from EUR 45 to 150 per hectare (Croitoru, 2008; cf. also IUCN/World Bank, 2004). Chiabai et al. (2009) estimate the marginal value of all provisioning services of forest ecosystems (type of biome: temperate mixed) to amount to EUR 107 per hectare (this value also includes erosion control). Krieger (2001) estimates the value of water regulation and erosion control to be around EUR 90 per hectare (current prices). Pearce (2001) assesses the value of flood control to amount to about EUR 45 per hectare. However, as income levels are different, the unit value (per hectare) of EUR 90 for water retention services has to be adapted. The average GDP for Slovakia is about 64 % of EU27 average; taking this relation as a basis for transferring the money value, we can approximate this value to EUR 54 per hectare.

In Velká Fatra national park, the area of the forest can be divided to three categories, depending on the function that the forest provides. 20,885 ha are covered by two categories – the special purpose forests and protective forests- within the national park (including the strict conservation zone) and additional 6,686 hectares of this forest category are within the buffer zone (see Tab. 2). The area of 14,158 ha is forested by forest used for commercial purposes within the park and 9,689 ha in the buffer zone of the park. In accordance with Ceroni (2007), we use the assumption, that the forest of commercial category fulfills its water retention function at only 40 % compared to the untouched forests. Therefore we calculate the value of 14,158 hectares (plus 9,689 ha) of commercial forest at EUR 23 per hectare and the value of 20,885 hectares (+ 6,686 ha) of special purpose forest and protective forest at EUR 57.6 per hectare. Summarised, the value of water retention (including erosion control) can be calculated at EUR 1,527,448 per year (plus EUR 608,348 per year in the buffer zone).
**Carbon sink, carbon sequestration**

Regarding carbon sequestration (1.1.5), the valuation of forest ecosystems in the national parks assumes that the carbon sequestration can also be based on respective values.

In the ideal case, primary studies are available providing a good set of data on the assessed site. Often however, firsthand data is lacking, making reference values or extrapolations from data of sites with comparable characteristics the best calculation option (Strobel 2010). In Veľká Fatra there are no primary studies in this aspect.

Other basic underlying questions which may have to be considered are (Strobel 2010):

(1) How much carbon is sequestered above-ground and how much below-ground, and

(2) What are the carbon release rates in relation to the carbon sequestration rates?

Frequently, only above-ground carbon sequestration is measured. Below-ground carbon sequestration is more difficult to determine, and therefore more rarely included in studies. Furthermore, the role of climate change and its effects on carbon sequestration has to be better analysed and included in future assessments, in particular with regard to how much carbon is sequestered/released considering on average higher temperatures, as well as locally and regionally changing climatic conditions. Forests and other ecosystem types store carbon, but there may be also either human-induced or natural carbon release. These carbon release rates have to be taken into consideration as well, if a comprehensive view on the matter is desired. The issue of relative importance of carbon release versus carbon storage is probably one of the most controversially discussed within the broader theme of carbon sequestration. Also in this case, primary studies may reveal a clearer picture on individual sites, however, there is still potential to develop more generally valid reference values for particular ecosystems. The lack of primary studies results in extrapolations, average values and different sets of assumptions (Strobel 2010).

**Variables and units:**

- Protected area surface - A (ha)
- Mean value of carbon sequestration (applicable to unmanaged forests) - Vmcs (EUR/ha) (12 EUR/ha)
- Income differential (taking the EU-27 as reference) - ID (0.64 for Slovakia)
Value of carbon sequestration in Veľká Fatra national park (considering only unmanaged forest areas):

\[ VCS = A \times Vmcs \times ID = 20,855 \text{ ha} \times 12 \text{ EUR/ha} \times 0.64 = 160,166 \text{ EUR (national park)} \]

\[ VCS = A \times Vmcs \times ID = 6,686 \text{ ha} \times 12 \text{ EUR/ha} \times 0.64 = 51,348 \text{ EUR (buffer zone)} \]

Data sources: data from the PA administrations, scientific reference data, EU statistics

As an alternative, a study of Chiabai et al. (2009) states average reference values of EUR 240 per hectare for cool coniferous forests and EUR 382 per hectare for temperate mixed forests. Taking these values as a reference, and considering the prices as independent from national income levels, the following values result ((240 + 382)/2 = 311 Eur/ha):

For Veľká Fatra national park (considering unmanaged and managed forest areas):

\[ VCS = A \times Vmcs \times ID = 35,716 \text{ ha} \times 311 \text{ EUR/ha} = 11,107,676 \text{ EUR (national park)} \]

\[ VCS = A \times Vmcs \times ID = 16,777 \text{ ha} \times 311 \text{ EUR/ha} = 5,217,647 \text{ EUR (national park)} \]

There are some discussions concerning the carbon storage amounts of old-growth forests compared to mature or young stands. In this context, Keeton et al. (2008) found that the study object, a spruce-fir old-growth forest in the Ukrainian Carpathians, stores on average 155 – 165 t/ha. This storage capacity is about 50 % higher than that of a comparable plot of regular mature spruce and fir stands (Strobel 2010).

Alternative forest report from Slovakia (Lesnicky účet [Forest Account] 2010) stated total carbon storage up to 226.9m ton for all forests in Slovakia in 2009. If we consider total area of forests of Slovakia (1,937.69 ha) the mean of carbon storage will be 117 ton per hectare. This number is very comparable to Keeton’s et al. study while it represents not only old-growth forests, but also younger stands.

The literature provides several value estimates regarding carbon sequestration e.g. van Kooten et al., 2004, Brainard et al., 2009, Stavins and Richards, 2005 (in EUR per hectare).

A simple but intriguing valuation approach in the current context consists of valuing the costs of forestation, and then connecting these costs to the carbon
sequestered in the new forest. If – as in the current case – a forest already exists, meeting a carbon reduction goal can be more easily achieved. The saving of the costs of carbon sequestration in a newly planted forest is therefore one possible approach to valuing this ecosystem service. Other approaches include the attempts to value the costs of climate change, then computing damage costs per ton of carbon, and linking these costs to carbon potentially sequestered in an existing or newly planted forest. For the latter approach, it is particularly important to consider the time perspective (life cycle) and the discount rates assumed to mirror time preferences for carbon emissions and climate change. In the current case, with a forest already existing, we can assume that the additional carbon bound in the forest is limited. The forest will grow since commercial forestry was stopped five years ago, and the changing composition of the forest might add some more potential for a carbon sink. However, when the forest has reached its long-term equilibrium, no more carbon will be stored. The small effect of carbon sequestration is therefore limited (Getzner, 2009).

Concerning Veľká Fatra national park, the carbon sequestration is an important ecosystem service in the areas with no commercial forest use (e.g. core and strict conservation zones), totaling 20,885 hectares (plus 6,686 in the buffer zone). In the rest of the area, (14,158 hectares + 9,689 ha in the buffer zone) the commercial use of the forest reaches the upper level of sustainable management and the net carbon sequestration is not relevant there.

Getzner's mean value of carbon sequestration results in EUR 12 per hectare per year. The carbon sequestration value includes also the national income differential as "adaptation ratio" to the respective country, based on the average from the EU-27 countries 64 % for Slovakia which means EUR 7.68 per hectare. For the whole area of 20,885 hectares (plus 6,686 in the buffer zone), the value of the ecosystem service of carbon sequestration would come up to EUR 161,166 per year (plus EUR 51,348 per year in the buffer zone). The lower bound with a transferred value of EUR 4.48 (EU27 value of EUR 7 per hectare) lies in the range of EUR 93,565 per year (plus EUR 29,953 per year in the buffer zone). The upper bound amounts to EUR 400,992 per year respectively EUR 128,371 per year (EUR 30 per hectare and year, transferred value: EUR 19.2).

Erosion control

Erosion control (1.1.6) is included in the valuation of water retention and flood control above (ecosystem service 1.1.4).
Medicinal resources

Similarly to non-timber forest products, it is not allowed to collect medicinal products e.g. plants (ecosystem service 1.1.7) within the national park, therefore they were not evaluated in this study in Veľká Fatra national park. Potentially, it is possible to collect (medicinal) plants in the buffer zone. The first botanic garden of medicinal plants within the central Europe was established nearby in 1578 (in Kláštor pod Znievom).

4.2.2 Agriculture and ecosystem services

For many protected areas this criterion is not relevant directly. In some protected areas (in particular category VI) however, agriculture may be part of the larger management concept. Products sourced can be cheese, wool, meat, cereals, fruits, etc. For example: A protected area harbours fruit tree meadows, as well as pastures where sheep herding takes place (Strobel 2010)

Cattle, grazing

There are some pastures and meadows with sheep and cattle grazing in the national park (1.2.1). Total area of grasslands in the Veľká Fatra national park is 4,007.8 hectares while total area of grasslands in the buffer zone is 6,716.9 hectares. There is no available evidence of cattle and grazing products in the park. Overall, 10 agricultural cooperatives (mountain farming) occur in the national park and 8 additional in the buffer zone. More detailed data referring to value of cattle/sheep products were not available.

Grains, food production

Food production (grains) within the Veľká Fatra national park is a marginal issue (1.2.2) – the area of arable land is only 18.3 hectares and of gardens/yards 6.9 hectares. In the buffer zone it is of course more – 1,265.2 hectares of arable land and 47.3 hectares of gardens/yards. The most popular crops are grains, potatoes and oil-seed rape. Benefits of food production are not relevant for the area of national park.

4.2.3 Fishing

According to Strobel (2010) the value of fishing and hunting VFH usually contains of two major components: the value of the sold product (determined by market prices) and the value of the license (determined by national or local price levels). Any fishing or hunting activity within protected areas (if allowed) should be conducted in a responsible way, i.e. according to criteria of sustainability, to
keeps species populations in a healthy balance among each other, as well as in relation to the overall space their ecosystem offers. Therefore, it is absolutely essential that any fishing / hunting is properly monitored, by the use of appropriate indicators which should be applied not only for ensuring the sustainability of activities, but also for demonstrating the additional value that sustainable harvests create for the protected area management as a whole. Furthermore, it should be analysed in how far sustainable fishing / hunting within protected areas compares – in terms of ecological and economic efficiency – to respective practices outside protected areas.

In Velká Fatra national park, fishing plays only a very minor role (ecosystem service 1.3). There are few fishing grounds (trout) Lubochnianka, Gaderský stream and Žarnovica which are administrated by Forests of the Slovak Republic, state enterprise and have negligible importance comparing to other benefits. Other fishing grounds are located in the buffer zone and managed by Slovak fishing association. The most important fishing ground outside of the national park is Turiec River, with the occurrence of endemic huchen.

4.2.4 Hunting

In Velká Fatra national park, hunting is allowed based on issue of permit (ecosystem service 1.4). About 56 hunting districts are registered in the Velká Fatra region (inside and outside the national park). No information on the price of hunting licenses, the Slovak hunting tax or the trophy fees could be collected for Velká Fatra national park. We therefore have to leave out the value of hunting services provided by the national park in the assessment.

4.3 Recreation and existence values of visitors

4.3.1 Introduction

A visitor survey was undergone in Velká Fatra national park in January – April 2011 in regards to the evaluation of ecosystem services regarding the recreation and national park policies (1.5) and biodiversity values (e.g. existence, 1.7).

Annually, about 500,000 tourists visit the area per year (Velká Fatra national park administration, rough estimation, 2011).

The main tourist attractions are Smrekovica, Borišov, Kráľova studňa, Havranovo (Malinô Brdo, Jasenská), main mountain ridge, etc. The biggest magnet of the national park is the diversity of its marked hiking trails. For less demanding hikers there is an ‘educational trail’ along the main ridge of the Velká Fatra with a length of 11 km. Equally popular is the central route,
Veľkofatranská magistrála, which has a total length of 49 km. In the vicinity of the national park there is a very popular destination - Harmanecká cave. Very important place for recreation is the Spa of Turčianske Teplice in the Turiec region and thermal bathing complex at Bešeňová in the Liptov region. There are numbers of restaurants and accommodation available close to the park, with few restaurants in the central national park area. The main ski resorts can be found in Malinô Brdo, Turecká, Jasenská valley and Žarnovická valley. There is a ski touring area on the Krížna Mountain. One educational trail through the Veľká Fatra mountain ridge “Hrebeňom Veľkej Fatry” has nine stops. There is no regular offer of guided tours. Occasionally, national park administration makes excursions for schools from the region and some lectures and trainings. Nevertheless, information centre or visitor centre is missing in the park. There is no entrance fee to the national park.

Regarding cultural values, there is one famous site – Vlkolínec – added to the List of the World’s Heritage of UNESCO in December 1993. It is remarkably undisturbed and well preserved mountain settlement that, judging from the integrity of its rows of houses, it is second to none within the Central-European region.

The total sample of the visitors' survey included 150 filled-in questionnaires from visitors from Slovakia (139), Czech Republic (8) and Poland (3).

**Willingness-to-pay for national park policies and environmental values**

In order to derive an indication of potential values in terms of existence, (quasi-) option and bequest values of biodiversity conservation, the willingness-to-pay (WTP) question is formulated as concretely as possible. The question also explains that the funds provided by the government are insecure, and that citizens had to pay directly for national park policies. Respondents are also warned that their stated WTP bids were on top of their expenses during the visit (Getzner 2010).

4.3.2 General questions regarding environmental values and the national park visit

The questionnaire was distributed during January – April 2011 in the Veľká Fatra national park (see in the Appendix). It first dealt with a block of questions regarding visitors' engagement and information on biodiversity in general, and national park aims and policies in particular, similar to the questionnaires distributed in the Slovenský raj national park and Tatra national park (PL) in 2009.
It was found out that only a small number of visitors (7 %, 11 questionnaires, Fig. 6) are members of conservation or environmental organizations.

Similar situation is in the Tatra national park (7 %). In the Slovenský raj national park the number of members is quite significant (17 %).

**Fig. 6: Membership in conservation organisations**

Are you a member of a nature conservation or environmental organisation?

- Yes: 7%
- No: 93%

Source: Visitors' survey in Veľká Fatra national park; own calculations

11 % (16) of respondents stated themselves as regular donators to ecological organisations with a mean of about EUR 34 per year (standard deviation EUR 31.8 – see Fig. 7).

This situation is very similar to the Slovenský raj national park (14 % of respondents with a mean of about EUR 34), but in Tatra national park the donations are quite higher (7 % of respondents, mean about EUR 62 per year).
Do you make donations to nature conservation on a regular basis?
If yes: How much do you donate per year? (roughly)

Source: Visitors’ survey in Veľká Fatra national park; own calculations

The information level of respondents regarding the definition of "biodiversity" seems to be comparatively high. 43 % of respondents (65 questionnaires) have detailed knowledge about the biodiversity definition of the United Nations; while 32 % have heard "something like this". This definition is new for one quarter (25 %) of the respondents (Fig. 8).

These results are comparable to the Slovenský raj national park (45 % of respondents have detailed knowledge; while 30 % have heard the definition without detailed knowledge; the definition is new to about 24 % of respondents). In Tatra national park, the information level is slightly lower (19 %; 55 %; 25 %).
**Fig. 8: Awareness of biodiversity definition**

Biodiversity means the diversity of genes, species (animals, plants), ecosystems and landscapes. Have you heard of this definition before?

- 43% Yes, I know this definition in detail
- 32% Yes, I have heard of such a definition
- 25% No, I haven’t heard of this concept

**Source:** Visitors’ survey in Veľká Fatra national park; own calculations

Moreover, visitors also state (worse) medium information levels concerning different aspects of the national park. At a discount the average, respondents indicate information levels about the national park at 3.59 points, about species and nature conservation programs at 3.73 points, recreation activities and possibilities at 3.22, and cultural and education offers of the national park at 3.70 points (Fig. 9).

These results indicate a major difference between the perceptions of the Veľká Fatra national park compared to the Slovenský raj (2.86; 3.04; 2.69; 3.14) and Tatra national parks (2.99; 3.04; 3.06; 3.09). It seems quite significant that the information level about Veľká Fatra as a national park is the lowest. One of the reasons why this is the reality could be that Veľká Fatra national park is rather young (established in 2002) and needs more time and effort to be perceived as a real national park. If the Slovenský Raj region is perceived as an area for recreation activities and sports to a larger extent; Tatra national park is considered more of a traditional national park. It seems that information efforts should be strengthened particularly regarding the aims and functions of a national park, less regarding the potential activities of visitors. National park Veľká Fatra aims are “known a little” to only 19% of respondents. On the other hand, about 54% of respondents indicated that they are “not well” or “not at all” informed. This is clearly worse than in Tatra (45% and 40 – 45%) and Slovenský raj national parks (40% and 35%).
Fig. 9: Self-assessed information level of respondents regarding national park policies and offers

How well do you feel informed about?

<table>
<thead>
<tr>
<th>Category</th>
<th>Points of level of information (1=very well informed, 5=not at all informed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aims of the national park</td>
<td>3.9</td>
</tr>
<tr>
<td>Species and nature conservation programmes</td>
<td>3.8</td>
</tr>
<tr>
<td>Recreation activities and possibilities</td>
<td>3.6</td>
</tr>
<tr>
<td>Cultural and education offers</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Source: Visitors’ survey in Veľká Fatra national park; own calculations

Fig. 10: National park aims considered most important

The Veľká Fatra National Park aims considered most important

<table>
<thead>
<tr>
<th>Aims of the national park</th>
<th>15.2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation of natural habitats and species</td>
<td>22.3%</td>
</tr>
<tr>
<td>Scientific research on nature conservation</td>
<td>11.6%</td>
</tr>
<tr>
<td>Sustainable forestry</td>
<td>10.9%</td>
</tr>
<tr>
<td>Support of regional economic development</td>
<td>7.8%</td>
</tr>
<tr>
<td>Construction of new roads for tourists</td>
<td>13.6%</td>
</tr>
<tr>
<td>Provision of visitor facilities</td>
<td>4.3%</td>
</tr>
<tr>
<td>Production and marketing of regional products</td>
<td>2.2%</td>
</tr>
<tr>
<td>Offer of sporting activities</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Source: Visitors’ survey in Veľká Fatra national park; own calculations

For a proper management of the protected area it is important to know that tourists are aware of national park aims and objectives at least on the basic level of knowledge.

Visitors were also asked to choose four out of 12 items, of which they think that these would be the most important national park aims. As we can see from the
RADOSLAV POVAŽAN

Fig. 10, some of the items considered to be most important are not specified in the official IUCN national park (category II) aims. Fortunately, the four main aims of the national park are mentioned by respondents as the most important aims. It is surprising that some visitors would wish that the national park should concentrate on the enlargement of ski resorts or construction of roads because this is the contrariety to these IUCN aims. Comparable results were achieved in Tatra and Slovenský raj national parks. All in all, it means that there is still a lack of knowledge of national parks. We suppose, this not only the case of Veľká Fatra national park, but protected areas in general in Slovakia. There is a need of better information policy not only on the side of national park administration, but also better environmental education in schools and cooperation with tourist business companies in common propagation of the national park. The huge comparative disadvantage of Slovak national parks comparing to western countries is a poor information service of protected areas administrations. Despite that, it seems that visitors have more-or-less a clear picture of national park aims.

Regarding the actual (current) visit to the national park, large majority of visitors said that they have visited the national park more than four times (70 %) – see Fig. 11. Only a minority (7 %) stated that the current visit would be the first one. Presented facts are different in Slovenský raj national park (32 % and 24 %), but similar to Tatra national park (61 % and 6 %). These differences can be explained by carrying the surveys in different season (survey in Veľká Fatra has been carried out in winter season and we assume that majority of „first-timers“ visits national parks in summer) or location of the park in the central Slovakia (for many people it is the closest national park and they use to make shorter, but more frequent trips there).
Fig. 11: Visitation of the Veľká Fatra national park

How often have you visited Veľká Fatra National Park (including today)?

- 7% 1x
- 9% 2x
- 7% 3x
- 7% 4x
- 70% more than 4 times

Source: Visitors’ survey in Veľká Fatra national park; own calculations

The duration of the current stay is about **2.28** days on average (standard deviation 2.54 days) – see Fig. 12. This is quite short comparing to 5.51 days (standard deviation 3.5 days) in Slovenský raj national park or Tatra national park (7.86 days, standard deviation 4.8 days). Considering that, it can be presumed that the Veľká Fatra national park is not a typical destination for longer holidays, but typical place for short-term stays (e.g. weekends) or one day trips. Probably, the length of stay would be higher in summer, but not significantly higher.

Fig. 12: Length of visitation of the Veľká Fatra national park

For how long do you plan to stay during current visit in the NP?

- 58% 1 day
- 16% 2 days
- 13% 3 days
- 4% 4 days
- 6% 5-7 days
- 3% more than 7 days

Source: Visitors’ survey in Veľká Fatra national park; own calculations
The national park offers several facilities to the visitors. In the Veľká Fatra national park the most popular are walking and nature trails (trekking), in the nearby area it is Harmanecká cave and Spa in Turčianske Teplice (Fig. 13). High popularity of Harmanecká cave (41% of all the visitors want to visit) is a little surprising because this is not a cave opened to the visitors all year round. Visitors would like to visit it during the winter season as well (currently, the cave is open from May only). On the other hand, national park facilities (e.g. centre, exhibition) are hardly popular. It is important to mention that the Veľká Fatra national park does not have a real visitor centre (there is a small so called information centre in Ružomberok, however, that I outside of the park) and the office of national park administration is situated in Vrútky (on the edge of the park). Not only in Veľká Fatra the visitors centres are missing, despite the fact that they are one of the most popular stops for tourists in the protected areas in western countries. There is also no offer of guided tours for tourists. In Slovenský raj and Tatra national parks visitors and information centres or guided tours belong to the most popular facilities for tourists. For better communication with visitors in Veľká Fatra it is necessary to deal with this topic.

Fig. 13: National park facilities used by visitors

![Diagram showing facilities used by visitors in Veľká Fatra national park](image)

Source: Visitors’ survey in Veľká Fatra national park; own calculations.
The main activities in the national park are certainly "typical" activities of visitors in national parks such as hiking and the observation of plants/animals (see Fig. 14). All kinds of sports belong to main activities as well. In Veľká Fatra region there are very good conditions for skiing and cross country skiing in winter. In the summer, mountain biking is very popular with some designated cycling roads (e.g. in Gaderská valley). Of course, some of these activities could be done at other places and do not necessarily take place in protected areas (e.g. hiking, or going to restaurants). In this case, the results from all three selected protected areas are very similar.

Fig. 14: Main activities of visitors in the national park

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiking</td>
<td>91%</td>
</tr>
<tr>
<td>Harmonie Cave</td>
<td>18%</td>
</tr>
<tr>
<td>Observation of plants, animals and habitats</td>
<td>25%</td>
</tr>
<tr>
<td>Sports, such as mountain biking, jogging</td>
<td>31%</td>
</tr>
<tr>
<td>Visit of NP facilities and exhibitions</td>
<td>8%</td>
</tr>
<tr>
<td>Cultural activities</td>
<td>9%</td>
</tr>
<tr>
<td>Mountain climbing</td>
<td>5%</td>
</tr>
<tr>
<td>Visiting restaurants and huts</td>
<td>28%</td>
</tr>
</tbody>
</table>

Source: Visitors’ survey in Veľká Fatra national park; own calculations.
4.3.3 Motives for visiting the national park and travel costs of visitors

For valuing the recreation value of visitors in a protected area, it is of crucial importance to differentiate between visitors who solely come to visit the national park, and those who had other motives of visiting the region and then just dropped by. In the first case, the journey to the region is closely connected to the national park's existence, while the latter includes motives other than the facilities and offers of the national park. Regarding recreation values, measuring travel costs is usually considered to be a reliable tool when the motive of visiting the area is closely connected to the national park. Otherwise, travel costs borne by the visitor are also founded on other motives, and therefore are only partially attributable to the recreation value of the national park (Getzner 2010).

Fig. 15: Motives for visiting the national park

As we can see from the Fig. 15 respondents in the current survey adduced visiting motives that are connected to the establishment of the national park. Almost two thirds of them (64 %) stated that they came solely for the purpose to see the national park, while another 15 % came with other motives (e.g. visit of friends, family) and took the chance to visit the park. Other motives to visit the regions were stated by 16 % and 5 % visit the park because they made another trip and made a stop there. The number of respondents who came solely for national park purpose in Slovenský raj and Tatra national parks was a little higher (73 %).
7 % of visitors are travelling alone, while 18 % are travelling with partners, family (27 %) or friends (48 %) – see Fig. 16. In the survey nobody selected “organized tours”, but we presume there were some groups of students from schools who chose the item “friends”. Especially in summer season we would say that there are also several organized one-day trips for visitors from Spa in Turčianske Teplice to the national park. Groups include on average about 4.3 persons (standard deviation 4.7 persons).

Similarly, travellers in Tatra and Slovenský raj are followed: alone 5 %, 7 %; traveling with partners 32 %, 39 %; with family 33 %, 29 % and friends 26 %, 24 %.

**Fig. 16: Who are visitors traveling with?**

![Pie chart showing travel companions](image)

*Source: Visitors’ survey in Veľká Fatra national park; own calculations.*

The most important transport mode is the private car (64 %), 15 % travelled by bus, followed by train (12 %); some respondents took a combination of train and bus (Fig. 17). There is a very interesting and significant group of people who came on foot (14 %) – those are people from the surroundings of the park and its buffer zone. In Tatra national park tourists prefer private cars (54 %) and train (33 %) and in Slovenský raj as many as 87 % visitors prefer private cars, followed by train (9 %).
On average, the journey to the national park took **2.52** hours (standard deviation 2.99 hours); the park is on average about **73** kilometres (standard deviation about 113 km) away from the home of the respondents. Previous surveys carried out in Tatra and Slovenský raj national parks indicate quite different results. For instance, in Tatra region, the journey to the national park took 7.89 hours and the park is on average about 471 kilometres away from the home of the respondents. In Slovenský raj it is 5.48 hours; the park is on average about 370 kilometres away from the home of the respondents. These disparities can be explained, Veľká Fatra national park is considered a place to stay mostly short-term. It is a very popular destination for people from surroundings, especially from Turiec region. Other two parks attract visitors also from further-out places.

Measuring travel costs was done in the questionnaire by asking visitors regarding their expenses per day for certain expenditure categories (Getzner 2010). In total, visitors spend average about EUR **46.5** per day and person during their stay in the national park (standard deviation EUR 64.6, median value EUR 27). Tab. 3 presents the details of expenditure categories suggesting that the most money is spent on meals, accommodation and other expenses. If we take only transport costs, entry fees and museums costs into account (expenditure which is directly connected to a national park visit, while other costs can be assumed to accrue in one way of the other during "normal" life or in other tourist destinations) visitor spending amounts to EUR **9.3** per day per visitor (Standard deviation EUR 3.5).
In Slovenský raj, visitors spend on average about EUR 54.1 per day per person during their visit of the national park; in Tatra national park EUR 45.4 per day. Taking only transport costs, entry fees and museums costs into account, visitors spending amounts to EUR 11 per day per visitor and in Tatra national park it is EUR 10.5 per day.

Tab. 3: Travel cost (expenditure categories) of visitors per day (in EUR)

<table>
<thead>
<tr>
<th>Expenditure category</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meals</td>
<td>13.6</td>
<td>16.4</td>
</tr>
<tr>
<td>Accommodation</td>
<td>8.7</td>
<td>15.8</td>
</tr>
<tr>
<td>Others</td>
<td>6.8</td>
<td>20.7</td>
</tr>
<tr>
<td>Transport</td>
<td>5.8</td>
<td>11.3</td>
</tr>
<tr>
<td>Shopping</td>
<td>4.4</td>
<td>15.3</td>
</tr>
<tr>
<td>Sports</td>
<td>4.3</td>
<td>15.3</td>
</tr>
<tr>
<td>Entrance fee</td>
<td>1.8</td>
<td>5.0</td>
</tr>
<tr>
<td>Museums</td>
<td>1.6</td>
<td>5.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46.5</strong></td>
<td><strong>64.6</strong></td>
</tr>
</tbody>
</table>

Source: Visitors’ survey in Veľká Fatra national park; own calculations.

Total spending per visit and per person is rated based on mean travel costs (EUR **46.5**; resp. EUR **9.3 per day**, see above), assuming that only those visitors who solely come for the purpose of visiting the national park, and staying on average 2.28 days in the region. Therefore, we can estimate total expenditure of an average amount of EUR **106 per person** and **stay**. Taking only transport costs, the expenditure of an average will be EUR **21.2** per person per stay.

For assessing the potential economic significance of the park for the region, a further question was asked about the place of overnight stay. While 58 % of visitors only stayed for the day, the rest used accommodation close to the national park, in particular in the places like Borišov (29 %), Hotel Kráľova studňa (16 %), and Smrekovica (14 %).

The total number of visitors in Veľká Fatra national park amounts to **500,000** visitors per year. Number of tourists in other two parks is higher: Tatra national park (2,000,000) and Slovenský raj national park (600,000 – 800,000).
Recreation value of the Veľká Fatra national park

Variables:

- Mean spending per person per day - Sm (EUR)
- Mean duration of stay per visitor - Dm
- Average number of visitors of the national park per year - Nv

Recreation/tourism value: \( VRT = Sm \times Dm \times N = 46.5 \times 2.28 \times 500,000 = 53,010,000 \text{ EUR} \)

Taking only transport costs, the reasonable mean value is followed:

Recreation/tourism value: \( VRT = Sm \times Dm \times N = 9.3 \times 2.28 \times 500,000 = 10,602,000 \text{ EUR} \)

These values are higher in Tatra and Slovenský raj national parks, because the number of tourists as well as the length of stay and expenditure is higher.

4.3.4 Willingness-to-pay for a national park policies and environmental values

In order to derive an indication of potential values in terms of existence, (quasi-) option and bequest values of biodiversity conservation, and to facilitate the comparison among other studies in national parks, the willingness-to-pay (WTP) question was formulated as concretely as possible. The policy offered consisted of a sustaining of the species conservation programs of the park by an annual ear-market payment. The question also explained that the funds provided by the government are insecure, and that citizens had to pay directly for national park policies. Respondents were also warned that their stated WTP bids on top of their expenses during the visit (Getzner 2010).
If you could here and now contribute an ear-marked payment for sustaining the national park programmes, how much would you be willing to pay per year?

<table>
<thead>
<tr>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nothing</td>
<td>15%</td>
</tr>
<tr>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td>8</td>
<td>3%</td>
</tr>
<tr>
<td>10</td>
<td>25%</td>
</tr>
<tr>
<td>15</td>
<td>25%</td>
</tr>
<tr>
<td>25</td>
<td>9%</td>
</tr>
<tr>
<td>30</td>
<td>4%</td>
</tr>
<tr>
<td>40</td>
<td>2%</td>
</tr>
<tr>
<td>50</td>
<td>4%</td>
</tr>
<tr>
<td>100</td>
<td>3%</td>
</tr>
<tr>
<td>Over 500</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: Visitors’ survey in Veľká Fatra national park; own calculations.

On average, respondents were willing to pay EUR 26 (standard deviation EUR 84.4, median EUR 10; for securing the financing of national park programs. Fig. 18 shows the distribution of willingness-to-pay of respondents (range from "Nothing" to "EUR 500").

Similarly, in Slovenský raj respondents were willing to pay EUR 23 (standard deviation EUR 52.4, median EUR 10; 95% confidence interval: EUR 13.4 to EUR 32.6) for securing the financing of national park programs. Fig. 11 shows the distribution of WTP bids elicited by the payment card (range from "Nothing" to "EUR 500"). In Tatra national park visitors are willing to pay EUR 13.8 (standard deviation EUR 39.9, median EUR 4.4; 90% confidence interval of the mean lies between EUR 9.8 and 17.6).

In the questionnaire asked about the motives for payments and the financing of conservation activities in particular. The questionnaire included a range of statements which visitors were asked to value on a 5-point scale (1 = "fully agree" to 5 = "reject completely").

One question was designed for respondents who stated that they have no WTP for conservation policies, in order to find out the reason of zero WTP. Tab. 4 shows two questions referring to WTP.

The results presented in Tab. 4 show that most of respondents exhibit medium preferences concerning payments and financing and the rate of protest bids (rejected payments right away without deeper reasoning) is rather low. Mainly, visitors adduced that their nature conservation should be a public task not
dependent on individual contributions – this is the strongest support. Moreover, they stated that they would already pay too much taxes or their income would be too small to afford additional expenses. Comparable results were achieved in previous studies in Tatra national park and Slovenský raj national park.

Tab. 4: Statements regarding the payment for nature conservation programs

<table>
<thead>
<tr>
<th>Points (mean)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Question 21 (Value with 1=agree fully; 5=reject completely)</strong></td>
<td></td>
</tr>
<tr>
<td>„My income is too small to be able to contribute.“</td>
<td>2.67</td>
</tr>
<tr>
<td>„It is a public task to conserve nature, and should not be dependent on individual contributions.“</td>
<td>1.99</td>
</tr>
<tr>
<td>„I would like to see others’ contributions, and then decide.“</td>
<td>4.02</td>
</tr>
<tr>
<td>„I already pay too much in taxes.“</td>
<td>2.60</td>
</tr>
<tr>
<td>„I would like to donate money for other programmes.“</td>
<td>3.33</td>
</tr>
<tr>
<td>„Nature conservation programmes are not that much worth to me that I would be willing to pay. “</td>
<td>3.75</td>
</tr>
<tr>
<td><strong>Question 22 (Value with 1=agree fully; 5=reject completely)</strong></td>
<td></td>
</tr>
<tr>
<td>„Nature and species conservation is important regardless of the cost.“</td>
<td>2.27</td>
</tr>
<tr>
<td>„I have not thought before this survey how much I would be willing to donate.“</td>
<td>1.86</td>
</tr>
<tr>
<td>„I would also be willing to donate even if a majority of respondents would not be willing to support the programme.“</td>
<td>2.90</td>
</tr>
<tr>
<td>„I speak much about nature conservation with my friends and family.“</td>
<td>2.76</td>
</tr>
</tbody>
</table>

Source: Visitors’ survey in Veľká Fatra national park, own calculations; Getzner 2010.

The questionnaire was also aimed at general preferences. They are rather strong regarding nature and species conservation and they indicate that nature and species conservation is important regardless the cost (2.27 points). On the other hand, they have not thought usually very much about how much their willingness-to-pay would be (1.86 points). Furthermore, respondents rather use to speak about nature conservation with their friends and families (2.76 points). Results from Tatra and Slovenský raj national park are more-or- less similar, but there is higher number of people who have thought about donations before.
Tab. 5: Preferences regarding temporal or spatial restrictions of access to the park, and substitutes for national park activities

<table>
<thead>
<tr>
<th>Question 23 (Value with 1=agree fully)</th>
<th>Points (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>„I would in any case visit the national park.“</td>
<td>2.42</td>
</tr>
<tr>
<td>„I fully accept temporal/spatial restriction on access of habitats in order to conserve nature.“</td>
<td>1.93</td>
</tr>
<tr>
<td>„I would not like to visit the national park any more.“</td>
<td>4.41</td>
</tr>
<tr>
<td>„I would choose another area for hiking. “</td>
<td>3.17</td>
</tr>
<tr>
<td>„I would generally abstain from hiking and would like to spend my holidays at another location in Slovakia. “</td>
<td>4.03</td>
</tr>
<tr>
<td>„I would spend my vacation abroad. “</td>
<td>3.74</td>
</tr>
</tbody>
</table>

Source: Visitors’ survey in Veľká Fatra national park, own calculations; Getzner 2010.

If we are talking about WTP of respondents, it is also important whether respondents though of substitutes for their visit. If they perceive other areas to be adequate substitutes to Veľká Fatra national park, their WTP might be lower. In general, respondents accept temporal or spatial restrictions necessary for conservation objectives, and would also visit the national park in the future (2.42 points). Only a minority of respondents would spend their holidays at other locations or even change their activities (3.74 – 4.41 points). Tab. 5 presents the respondents’ perception towards restrictions of access to the national park necessary for conservation purposes. It is interesting, that the acceptance of restriction of access is higher in Veľká Fatra (1.93 points) and Slovenský raj national parks than in Tatra national park (Poland). It can be interpreted that visitors of Slovak national parks are used to some restriction due to nature conservation and most of them usually accept this. It can be a heritage from the past when nature conservation was built on the systems of restrictions. We assume the situation is more-or-less comparable in all Slovak national parks. Visitors also perceive recreation in Veľká Fatra and Slovenský raj national park as being rather unique, without many substitutes of staying in another holiday resort.

In Veľká Fatra, a major motive for respondents to express a willingness-to-pay (WTP) for the financing of the national park is „the right to exist“ (existence motive) with 17 % of respondents; in order to conserve nature for their children (bequest motive), 76 % of respondents are WTP and therefore state that the
bequest motive is the strongest motive for their willingness-to-pay. The option value (personal benefit in the future) is the main motive of 7% of respondents. Conservation nature for children of respondents is the strongest motive also in Slovenský raj and Tatra national parks, but “right to exist” was almost not taken into account in Tatra national park.

**Fig. 19: Motives for WTP of respondents**

- 17%: Animals and plants have a right to exist
- 7%: I might like to benefit from plants and animals in the future
- 7%: I would like to hand my children a healthy environment

*Source: Visitors’ survey in Veľká Fatra national park; own calculations*

The individual WTP found out in the survey has to be aggregated to account for the willingness-to-pay for the existence, option and bequest values (non-use values) of the Veľká Fatra national park by the whole population of Slovakia.

**Existence value of the Veľká Fatra national park**

The existence value VE is calculated by means of contingent valuation.

**Variables:**
- National population number (typically considering persons >14 years) - $N_p$
- Mean willingness to pay per person - $WTP_m$
- Share of respondents indicating the existence motive as priority - $s_E$

*Data sources: national statistics, visitor questionnaire*
17% of respondents indicated the **existence motive** as priority, 76% the bequest motive and 7% the option motive. Consequentially, the share for the existence motive results in:

Existence value: \[ VE = N_p \times WTP_m \times s_E = 4,500,000 \times 26 \times 0.17 = 19,890,000 \text{ EUR} \]

**Bequest value of the Veľká Fatra national park**

The bequest value \( VB \) is calculated by means of contingent valuation.

*Variables:*
- National population number (considering persons >14 years) - \( N_p \)
- Mean willingness to pay (WTP) per person - \( WTP_m \)
- Share of respondents indicating the bequest motive as priority - \( s_B \)

Data sources: national statistics, visitor questionnaire

17% of respondents indicated the existence motive as priority, **76% the bequest motive** and 7% the option motive. Consequentially, the share for the existence motive results in:

Bequest value: \[ VB = N_p \times WTP_m \times s_B = 4,500,000 \times 26 \times 0.76 = 88,920,000 \text{ EUR} \]

**Option value of the Veľká Fatra national park**

The option value \( VO \) is calculated by means of contingent valuation.

*Variables:*
- National population number (considering persons >14 years) - \( N_p \)
- Mean willingness to pay per person - \( WTP_m \)
- Share of respondents indicating the option motive as priority - \( s_O \)

Data sources: national statistics, visitor questionnaire

17% of respondents indicated the existence motive as priority, 76% the bequest motive and **7% the option motive**. Consequentially, the share for the existence motive results in:

Option value: \[ VO = N_p \times WTP_m \times s_O = 4,500,000 \times 26 \times 0.07 = 8,190,000 \text{ EUR} \]
In Tatra national park, the non-use values were calculated to about EUR 216.8m per year. Accounting for the deviation around the mean WTP of EUR 9.9 per person and assuming a 90% confidence interval, the range will be between EUR 7.1 and EUR 12.8. This estimate gives a range of potential non-use values between EUR 155.3m and EUR 281.1m per year. In Slovenský raj, non-use values were approximated to amount to EUR 76.5m (lower bound: EUR 54m; upper bound: EUR 122m).

In Tatra national park it is approximately EUR 92.1m per year for the existence value, about EUR 75.8m for the bequest value, and roughly EUR 48.9m for the option value, while in Slovenský raj it is approximately EUR 15.9m per year for the existence value, about EUR 53.4m for the bequest value, and roughly EUR 7m for the option value.

Average net income of respondents in the survey was EUR 1,147 per month for a household (Fig. 20). It is higher than in Slovenský raj (EUR 923) and Tatra national park (EUR 830).

Fig. 20: Net income of households

![Income distribution](image)

Source: Visitors’ survey in Veľká Fatra national park; own calculations

4.3.5 Socio-economics of respondents

A final brief section of the questionnaire dealt with socio-economic characteristics of the respondents. Data collected in this section should, first, show that the survey is close to being representative to the total population; second, for subsequently estimating econometric models and controlling the differences in socio-economic attributes, these data are crucial. However, without describing in detail the group of respondents, Tab. 6 presents summary statistics of these attributes (Getzner 2010).
Tab. 6: Socio-economics of respondents (Veľká Fatra national park)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>47 %</td>
</tr>
<tr>
<td>Male</td>
<td>53 %</td>
</tr>
<tr>
<td><strong>Age of respondent (mean)</strong></td>
<td>35.71 %</td>
</tr>
<tr>
<td><strong>Number of persons in the household (mean)</strong></td>
<td>3.38 %</td>
</tr>
<tr>
<td><strong>Number of children in the household (mean)</strong></td>
<td>1.03 %</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
</tr>
<tr>
<td>Fundamental school</td>
<td>7 %</td>
</tr>
<tr>
<td>Professional education</td>
<td>3 %</td>
</tr>
<tr>
<td>High school</td>
<td>41 %</td>
</tr>
<tr>
<td>University</td>
<td>49 %</td>
</tr>
<tr>
<td><strong>Profession</strong></td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>19 %</td>
</tr>
<tr>
<td>Housewife/-man</td>
<td>0 %</td>
</tr>
<tr>
<td>Looking for job</td>
<td>1 %</td>
</tr>
<tr>
<td>Retired</td>
<td>7 %</td>
</tr>
<tr>
<td>Manual worker</td>
<td>17 %</td>
</tr>
<tr>
<td>White-collar worker</td>
<td>18 %</td>
</tr>
<tr>
<td>Civil servant</td>
<td>23 %</td>
</tr>
<tr>
<td>Self-employed</td>
<td>13 %</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
</tr>
<tr>
<td>Bellow 500 EUR</td>
<td>10 %</td>
</tr>
<tr>
<td>500 – 750 EUR</td>
<td>18 %</td>
</tr>
<tr>
<td>750 – 1,000 EUR</td>
<td>16 %</td>
</tr>
<tr>
<td>1,000 – 1,250 EUR</td>
<td>13 %</td>
</tr>
<tr>
<td>1,250 – 1,500 EUR</td>
<td>13 %</td>
</tr>
<tr>
<td>Over 1,500 EUR</td>
<td>29 %</td>
</tr>
</tbody>
</table>

_Source: Visitors’ survey in Veľká Fatra national park, own calculations; Getzner 2010._
5 CONCLUSION

5.1 Summary, conclusions and recommendations: Total economic value of Veľká Fatra national park (Slovakia)

The economic valuation of ecosystem services (natural and cultural heritage) is based on the conceptual notion that a national park consists of natural capital that provides services to people. It is an inherently anthropocentric concept - and therefore includes values that are solely based on values attributed to ecosystems services by people (visitors, tax payers). However, in many cases, it turns out that the "pure" anthropocentric valuation of ecosystem services provides a firm foundation for nature conservation as well as for extension of (public and private) funding for protected areas (Getzner 2010).

Currently, we are still pioneers in the valuation of ecosystem services in protected areas in Slovakia, but also in the Carpathians Ecoregion. This study was based on previous studies carried out in Slovenský raj and Tatra national park (Getzner 2009, 2010) and elaborated applying state-of-the-art methodological approaches.

The results of the study clearly show that Veľká Fatra national park provides important ecosystem services for the national economy. With its services the park generates values which contribute significantly to human well-being and the national economies. From the Tab. 7 as well as Fig. 21 we can see that the ecosystem services in the narrow sense (e.g. timber production, water provision, flood protection, erosion control) are not that important on a national level, but they provide important benefits for the local population (Turiec and Lower Liptov regions).
Tab. 7: Values for ecosystem services provided by Veľká Fatra national park; Tatra and Slovenský raj national parks

<table>
<thead>
<tr>
<th>Ecosystem services</th>
<th>Veľká Fatra NP (Slovakia)</th>
<th>Slovenský raj NP (Slovakia)</th>
<th>Tatra NP (Poland)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reasonable mean value (EUR per year) - NP</td>
<td>1,731,639</td>
<td>1,185,044</td>
<td>856,000</td>
</tr>
<tr>
<td>1.1 Forest products</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.1 Timber</td>
<td>1,731,639</td>
<td>1,185,044</td>
<td>856,000</td>
</tr>
<tr>
<td>1.1.2 Non-timber products</td>
<td>n. a.</td>
<td>n. a.</td>
<td>n. a.</td>
</tr>
<tr>
<td>1.1.3 Water provision, supply</td>
<td>5,699,475</td>
<td>-</td>
<td>1,480,000</td>
</tr>
<tr>
<td>1.1.4 Water retention / flood protection</td>
<td>1,527,448</td>
<td>608,348</td>
<td>808,000</td>
</tr>
<tr>
<td>1.1.5 Carbon sink, climate regulation, CO₂ sequestration</td>
<td>160,166</td>
<td>51,348</td>
<td>90,000</td>
</tr>
<tr>
<td>1.1.6 Medicinal resources</td>
<td>n. a.</td>
<td>n. a.</td>
<td>n. a.</td>
</tr>
<tr>
<td>1.2 Agricultural products</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2.1 Cattle, grazing</td>
<td>0</td>
<td>n. a.</td>
<td>0</td>
</tr>
<tr>
<td>1.2.2 Grains, food production</td>
<td>0</td>
<td>n. a.</td>
<td>0</td>
</tr>
<tr>
<td>1.3 Fishing</td>
<td>n. a.</td>
<td>n. a.</td>
<td>2,000</td>
</tr>
<tr>
<td>1.4 Hunting</td>
<td>n. a.</td>
<td>n. a.</td>
<td>n. a.</td>
</tr>
<tr>
<td>1.5 Recreation</td>
<td>53,010,000</td>
<td>-</td>
<td>152,325,000</td>
</tr>
<tr>
<td>1.6 Recreation opportunities (national park policies)</td>
<td>10,602,000</td>
<td>-</td>
<td>30,972,000</td>
</tr>
<tr>
<td>Rough estimate of use values</td>
<td>62,128,728</td>
<td>1,844,740</td>
<td>155,561,000</td>
</tr>
<tr>
<td>1.7 Biodiversity conservation values</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.7.1 Existence values</td>
<td>19,890,000</td>
<td>-</td>
<td>15,938,000</td>
</tr>
<tr>
<td>1.7.2 Option / quasi-option values</td>
<td>8,190,000</td>
<td>-</td>
<td>7,083,000</td>
</tr>
<tr>
<td>1.7.3 Bequest values</td>
<td>88,920,000</td>
<td>-</td>
<td>53,479,000</td>
</tr>
<tr>
<td>1.8 Cultural values</td>
<td>n. a.</td>
<td>n. a.</td>
<td>n. a.</td>
</tr>
<tr>
<td>Non-use values</td>
<td>117,000,000</td>
<td>-</td>
<td>76,500,000</td>
</tr>
<tr>
<td>Rough estimate of TEV (Total Economic Value)</td>
<td>179,128,728</td>
<td>1,844,740</td>
<td>232,061,000</td>
</tr>
</tbody>
</table>

Source: own calculation; Getzner 2010

The valuation of ecosystem services in Veľká Fatra national park amounts to around EUR 179m (+ 1.8m if we take into account the buffer zone). As we can
see (Tab. 7) total economic value of Veľká Fatra national park is the lowest compared to Tatra or Slovenský raj national park. This is due to the fact that the ecosystem services are different, but mainly due to the lower number of tourists (500,000) and to the lower average number of stay (2.28). Veľká Fatra national park is a typical destination for weekend holidays or one day trips while in Slovenský raj it is more (5.51) and in Tatra national park 7.86 days.

A part of the difference also stems from the extrapolation of the values related to the visitors’ willingness to pay – in connection with non-use values – to the national population, which is higher in Poland (Strobel 2010).

On the other hand, Veľká Fatra national park has the highest value of timber production, but this commercial harvesting should not be typical for the national park (if we are talking in terms of IUCN categories). Veľká Fatra is clearly dominant in aspects of water provision and water retention (flood protection) from all three valuated protected areas (Fig. 21). This is also a reason why Veľká Fatra was designated as a national park as well as protected water management area.

**Fig. 21: Valuation of ecosystem services of Veľká Fatra national park (EUR 1,000, annual values)**

<table>
<thead>
<tr>
<th>Ecosystem Services</th>
<th>Annual Value (EUR 1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber</td>
<td>1732</td>
</tr>
<tr>
<td>Water provision</td>
<td>5,699</td>
</tr>
<tr>
<td>Water supply</td>
<td>1527</td>
</tr>
<tr>
<td>Water retention</td>
<td>160</td>
</tr>
<tr>
<td>Carbon sink, climate regulation, CO2 sequestration</td>
<td>53,010</td>
</tr>
<tr>
<td>Recreation values</td>
<td>117,000</td>
</tr>
<tr>
<td>Non-use values</td>
<td>179,129</td>
</tr>
<tr>
<td>Rough estimate of TEV (Total Economic Value)</td>
<td>179,129</td>
</tr>
</tbody>
</table>

Source: own calculations

The result of the study shows that it is well worth for the state to invest in the nature conservation and management provided by the national park administration. The ecosystem services provided by the protected areas
overcome the investments in the long term. This significance of the ecosystem services should be kept in mind when developing management policies within the context of sustainable development.

5.2 Recommendations

Following recommendations are based on the WWF guidelines (Strobel 2010) and my own experience:

1. There is a need to develop a comprehensive methodology for economic valuation which is applicable to different ecosystems and different geographic scales. Such a methodology needs to be based on a common consensus by experts in terms of scientific validity as well as conclusiveness with respect to action proposals derived from its results. All possible relevant assessment criteria need to be included, but it should be open to the assessors of each individual area which is assessed to decide which criteria are relevant and which not, and which detail of calculations would be necessary to reflect a realistic value of criteria. The harmonization would be in particular necessary for calculating carbon sequestration, as well as non-use values. We assume that it is not possible to find universal criteria for the whole biosphere. It would be necessary to establish core (universal) criteria and then to add some specific criteria regarding the certain ecoregion.

2. Limitations related to first-hand site information or to research / statistical analysis: In a number of cases, e.g. quantitative information on soil erosion or water retention may be missing. Equally, not every country, state or district has sufficiently detailed information on certain values, e.g. from timber, non-timber or agricultural products. Information gaps are probably most related to non-productive ecosystem services. In Slovakia, information about number of visitors or number of people who are supplied by water from the protected area is very often missing. There also is a need for transparency of data acquisition, which should be verifiable. Research, monitoring and information are necessary.

3. Spatial limitation: A broader geographic scope beyond the protected area boundaries would be beneficial in view of including other services which also influence human well-being and the economic stability (e.g. the agriculture and energy sectors, as well as further details with regard to water provision).

4. Various scenario simulations and planning should be included in the assessment in order to show or forecast possible shifts in values of certain criteria or total economic value. These shifts might result due to changes
in extent and intensity of land use, ecosystem structure / composition, tourism visits frequency or other factors. Scenarios should explain, descriptively as well as visually, how changes in one field (criterion) affect changes in other fields (criteria), and should result in an "optimal management proposals/solution" referenced against the (protected) area's main priorities and objectives of nature protection.

5. The results and conclusions of the economic assessments of ecosystem services need to be communicated to local stakeholders, municipalities, entrepreneurs, NGOs, regional authorities, and other relevant bodies. It should be done in a way that, if necessary, adaptations in strategic planning concepts will be realized, which in turn provide a better frame for future management requirements. To sustain work with owners and visitors, communication and environmental (ecological) education is highly recommended.

Recommendations for national parks in Slovakia:

National parks in Slovakia face a number of problems which are also hindering local and regional development. Most importantly, our national parks are acknowledged only by national law; however they do not pass any assessment regarding the fulfilment of internationally recognised IUCN management criteria for protected areas of category II – national parks. The two most compromising factors in this context are:

1. The number of protected areas and their size is rather high, however, real nature conservation is more-or-less poor.

2. The primary problem of the national parks is an increasing dominance of commercial forest use. Due to its economic profit-driven background in particular, it is practically perpetually in conflict with national park priorities from the IUCN standards (internationally recognised) point of view. The next problem is that the ownership of the land within the parks is in private and corporation hands as well as private forest associations. Other problem is a very weak political support for real national park policy from the Ministry of Environment.

The root causes of this are in bad environmental policy after “velvet revolution” in 1989. In Slovakia, unlike other countries (e.g. Czech Republic), the land was restituted to private hands in national parks too. The better solution would have been to offer the land owners an adequate land out side of the national parks. This land would have been also better for their commercial purposes. Currently, the long term solution is only
step-by-step purchasing of the land in national parks by state or environmental NGOs. Small country, as Slovakia is, will never have enough money for compensation payments for all landowners within so large protected areas.

Whereas the Slovakian Nature Protection system has received adequate or nearly adequate national funding in the past (1990s and beginning of 2000s), the situation has worsened significantly and continuously from 2006 onwards, both in terms of reductions in national funding, as well as in a series of personnel changes, initiated by high political levels, which effected the replacement of experienced staff with persons who are not from the field or are inexperienced.

3. The park administrations do not have an appropriate authority within the park borders: although informative and counselling meetings with stakeholders are held, there are other key players who determine the management activities in several areas of the park (e.g. Forests of the Slovak Republic, especially private land owners and land users, co-operative farms or local farmers etc.).

4. Given this unsupportive political-institutional situation at national level, it is a big challenge for international nature conservation organisations to help to overcome the current deficiencies. This would only be possible in a joint effort with intensive national and international conservation and policy work. Parallel to this, protected area administrations in Slovakia should increase their access to non-state funds through European Union or international funding opportunities, and intensify their work with foreign partner organisations or through networks in order to compensate the drastic cuts in their budgets.

Moreover, the role of the forestry company active in the parks has to be defined in a new way. The most optimal option would be to compensate the private owners by changing their land inside protected areas for more productive land lying in other areas outside of the protected areas, another would be that the forestry companies are allowed to continue their activities, however under the strong supervision by the park administration, which should enforce substantially stricter rules for logging (e.g. only in the case of windfall events or threats to human life).

5. There is a need of better information policy not only on the side of national park administration, but also better environmental education in schools and cooperation with tourist business companies in common propagation of the national parks. The huge disadvantage of Slovak national parks comparing to western countries is a poor information service of protected areas administrations. The key challenge is to improve
communication with all the stakeholders, especially the land owners. Their support is a corner-stone of the functional national park system.

6. Environmental awareness is very low compared to western countries. Moral devastation of the society during 40-years of socialism has met with western consumer society. In that situation nature conservation plays only a very minor role. This is a deeper problem which will take years of daily work to be dealt with.
6 REFERENCES

6.1 Literature


IUCN (1994). Guidelines for Protected Area Management Categories. IUCN, Gland (Switzerland).


NP Veľká Fatra Administration – consultation (in verb., msc.)
Order No. 8/2005 Coll. of Regional Environment Authority, Žilina. On Veľká Fatra national park and its protective zone visiting rules


6.2 Internet Resources

Official web-site of the State Nature Conservancy of the Slovak Republic:

Vlkolínce UNESCO web-site: http://www.vlkolinec.sk/?theme=uk

Turiec Water-Supply Company, 2011 (Turčianska vodárenská spoločnosť):
List of Figures

Fig. 1: Biodiversity, ecosystem functioning, ecosystem services ......................10
Fig. 2: Location of Veľká Fatra national park ..............................................17
Fig. 3: Overview map of Veľká Fatra national park ......................................19
Fig. 4: Logo of Veľká Fatra national park ..................................................20
Fig. 5: Area of forests in the Veľká Fatra national park ................................22
Fig. 6: Membership in conservation organisations .........................................34
Fig. 7: Donations to nature conservation ....................................................35
Fig. 8: Awareness of biodiversity definition ................................................36
Fig. 9: Self-assessed information level of respondents ...................................37
Fig. 10: National park aims considered most important..................................37
Fig. 11: Visitation of the Veľká Fatra national park .....................................39
Fig. 12: Length of visitation of the Veľká Fatra national park..........................39
Fig. 13: National park facilities used by visitors .........................................40
Fig. 14: Main activities of visitors in the national park.................................41
Fig. 15: Motives for visiting the national park .............................................42
Fig. 16: Who are visitors traveling with? ....................................................43
Fig. 17: Type of transport used to get to the park .......................................44
Fig. 18: Distribution of WTP bids of respondents ........................................47
Fig. 19: Motives for WTP of respondents ...................................................50
Fig. 20: Net income of households ............................................................52
Fig. 21: Valuation of ecosystem services of Veľká Fatra national park ............56
**List of Tables**

Tab. 1: Overview of ecosystem services and information requirements............14  
Tab. 2: Area of forests in the Veľká Fatra national park................................23  
Tab. 3: Travel cost (expenditure categories) of visitors per day......................45  
Tab. 4: Statements regarding the payment for nature conservation...............48  
Tab. 5: Preferences regarding temporal or spatial restrictions.........................49  
Tab. 6: Socio-economics of respondents......................................................53  
Tab. 7: Values for ecosystem services provided by Veľká Fatra national park....55
List of Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>IUCN</td>
<td>International Union for Conservation of Nature</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
</tr>
<tr>
<td>NP</td>
<td>National park</td>
</tr>
<tr>
<td>SPA</td>
<td>Special Protected Area</td>
</tr>
<tr>
<td>TEEB</td>
<td>The Economics of Ecosystems and Biodiversity</td>
</tr>
<tr>
<td>TEV</td>
<td>Total Economic Value</td>
</tr>
<tr>
<td>UNCED</td>
<td>United Nations Conference on Environment and Development</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
</tr>
<tr>
<td>WTP</td>
<td>Willingness To Pay</td>
</tr>
<tr>
<td>WWF</td>
<td>World Wildlife Fund</td>
</tr>
</tbody>
</table>
Appendix

Appendix 1: Visitor questionnaire (English version + Slovak version)

Survey: “Species and nature conservation in the Veľká Fatra National Park”

State Nature Conservancy of the Slovak Republic and Veľká Fatra National Park Administration in cooperation with Klagenfurt University and WWF (World Fund for Nature) are carrying out a survey on measures and programmes for nature conservation in the national park. Please provide us with your personal opinion and your support. All data will be treated strictly confidential and used only for research purposes. Filling out the questionnaire takes only about 10 minutes. THANK YOU!
Current No. of questionnaire: __________

Survey
„Species and nature conservation in the Veľká Fatra National Park”

State Nature Conservancy of the Slovak Republic and Veľká Fatra National Park Administration in cooperation with Klagenfurt University and WWF (World Fund for Nature) are carrying out a survey on measures and programmes for nature conservation in the national park. Please provide us with your personal opinion and your support. All data will be treated strictly confidential and used only for research purposes. Filling out the questionnaire takes only about 10 minutes. THANK YOU!

1 Are you a member of a nature conservation or environmental organisation?  ☑ Yes ☐ No

2 Do you make donations to nature conservation on a regular basis?  ☑ Yes ☐ No

If yes: How much do you donate per year?  Approx. ___________ Zł or ___________ EUR

3 Biodiversity means – according to the United Nations definition – the diversity of genes, species (animals, plants), ecosystems and landscapes.

Have you heard of this definition before?  
☐ Yes, I know this definition in detail
☐ Yes, I have heard of such a definition
☐ No, I haven’t heard of this concept

4 How well do you feel informed about?  (Please value with 1=very well, 5=not at all)

...Aims of the national park
...Species and nature conservation programmes of the national park
...Recreation activities and possibilities
...Cultural and education offers of the national park

5 Which species or nature conservation activities of the Veľká Fatra National Park do you know?


6 The Veľká Fatra National Park has according to the international definition of national parks a number of aims. Please tick four aims that you consider most important for a national park:

☐ Education and information on nature conservation
☐ Conservation of natural habitats and species (wild plants, wild animals)
☐ Enlargement of ski resorts in the park
☐ Scientific research on nature conservation
☐ Sustainable forestry
☐ Support of regional economic development (tourism)
☐ Construction of new roads for tourists
☐ Provision of visitor facilities (visitor center, hiking trails, information panels)
☐ Production and marketing of regional products
☐ Offer of sporting activities
☐ Provision of hunting and/or fishing activities
☐ Sponsoring of local facilities such as museums

7 How often have you visited Veľká Fatra National Park (including today)?

☐ 1x ☐ 2x ☐ 3x ☐ 4x ☐ more than 4 times

8 For how long do you plan to stay during current visit in the NP?  __________ Day(s)

9 Which facilities have you used by now, or are going to use/see during your current stay?

☐ Trekking
☐ visit of Harmanceká Cave
☐ visit of NP Administration or NP Information Centre
☐ Ski resorts
☐ Spa in Turčianske Teplice
☐ Batrícia Castle
☐ Slováň Castle
☐ Vlkolinec
☐ others: ____________________________

10 What are your main activities in the national park? (please tick 3 max.)

☐ Hiking
☐ Observation of plants, animals and habitats
☐ Sports, such as mountain biking, jogging
☐ Visit of NP facilities and exhibitions
☐ Cultural activities
☐ Mountain climbing
☐ visit of Harmanceká Cave
☐ Visiting restaurants and huts
☐ others: ____________________________

11 What was your motivation for visiting the region?

☐ I came solely for the purpose to see the national park.
☐ I came by (e.g. during a round trip) and took the chance to visit the park.
☐ I had other motives to visit the region (friends, family, events, professional reasons) and also visited the national park.
☐ Other motives: ____________________________

12 Where do you come from?

☐ SK ☐ CZ ☐ AT ☐ DE
☐ Other Country: ____________________________

13 With whom are you travelling?

☐ Alone ☐ With spouse/partner ☐ With family
☐ With friends ☐ With an organized tour

14 How many people are travelling with you (in your group)?  ________ people

15 What transport did you use to travel from home to the national park?

☐ Car ☐ Train ☐ Bicycle ☐ Bus ☐ Air
☐ Motorcycle ☐ Camper/trailer

16 How long did your journey take?  ________ hours

17 How many kilometres is the national park away from your home? Approx. ________ km

PAGE 69
18 How much money do you spend during your stay per day?
Accommodation: __________ EUR
Meals: __________ EUR
Shopping (crafts): __________ EUR
Entrance fee: __________ EUR
Museums: __________ EUR
Transport (e.g. cable car): __________ EUR
Sports: __________ EUR
Other expenditure: __________ EUR

19 In which town do you stay overnight?
❖ Town/village: __________________
❖ Only visitor for the day, no overnight stay

The activities of the national park are mainly financed out of the control and regional governments’ budgets, and out of revenues of entrance fees. However, governments may only provide extended financial support if the locals and the visitors wish them to do so. Hence your opinion to the following issues is most important.

20 Assume that the government would reduce its contribution to the financing of the national park. If you could here and now contribute an ear-marked payment for sustaining the national park programmes (nature conservation such as wolf, lynx, golden eagle or cyclamen), how much would you be willing to pay per year? Please think of your other expenses during your holidays, so this contribution would in fact be an additional contribution to all the expenditure.

❖ Nothing
❖ 1 EUR ❖ 2 EUR ❖ 3 EUR ❖ 4 EUR ❖ 5 EUR
❖ 10 EUR ❖ 20 EUR ❖ 30 EUR ❖ 40 EUR ❖ 50 EUR
❖ 60 EUR ❖ 70 EUR ❖ 80 EUR ❖ 90 EUR ❖ 100 EUR
❖ 150 EUR ❖ 200 EUR ❖ 500 EUR ❖ over 500 EUR

21 Please tell us your opinion in the following statements (Value with 1=agree fully; 5=reject completely):

❖ "My income is too small to be able to contribute" 1 2 3 4 5
❖ "It is a public task to conserve nature, and should not be dependent on individual contributions" 1 2 3 4 5
❖ "I would like to see others’ contributions, and then decide" 1 2 3 4 5
❖ "I already pay too much in taxes" 1 2 3 4 5
❖ "I would like to donate money for other programmes" 1 2 3 4 5

Nature conservation programmes are not that much worth to me that I would be willing to pay * 1 2 3 4 5

22 Do you agree with the following statements (Value with 1=agree fully; 5=reject completely):

❖ "Nature and species conservation is important regardless of the cost" 1 2 3 4 5
❖ "I have not thought before this survey how much I would be willing to donate" 1 2 3 4 5
❖ "I would also be willing to donate even if a majority of respondents would not be willing to support the programme *" 1 2 3 4 5

❖ I speak much about nature conservation with my friends and family∗ 1 2 3 4 5

23 Protecting the species and habitats might need temporal or spatial restrictions regarding access to the area. What would you do in such a case? (Value with 1=agree fully; 5=reject completely)
❖ "I would in any case visit the national park" 1 2 3 4 5
❖ "I fully accept temporal/spatial restriction on access of habitats in order to conserve nature" 1 2 3 4 5
❖ "I would not like to visit the national park any more ∗" 1 2 3 4 5
❖ "I would choose another area for hiking" 1 2 3 4 5
❖ "I would generally abstain from hiking and would like to spend my holidays at another location in Slovakia∗" 1 2 3 4 5
❖ "I would spend my vacation abroad" 1 2 3 4 5

24 If you would like to pay for the national park programmes (question 20), which is a major motive for you (please tick only one):

❖ I donate to the conservation of animals and plants because they have a right to exist.
❖ I would like to conserve animals and plants because I might like to benefit from them in the future.
❖ I would like to hand my children a healthy environment.

Please provide us finally with some short statistical data:

25 Gender: ❖ Female ❖ Male

26 Age: __________

27 How many people live in your household in total? __________ of which: __________ children

28 What is your highest education??
❖ Basic school ❖ Professional education (trade)
❖ High school ❖ College/university

29 What profession do you currently have?
❖ Student ❖ Manual worker
❖ Housewife/man ❖ White-collar employee
❖ Looking for a job ❖ Civil servant
❖ Retired ❖ Self-employed

30 Please tick your class of your monthly household income (net of taxes & social security):
❖ less than 500 € ❖ from 1,000 to 1,250 €
❖ from 500 to 750 € ❖ from 1,250 to 1,500 €
❖ from 750 to 1,000 € ❖ above 1,500 €

All your answers and data are treated completely confidential, and are only used in aggregated and anonymous form!

Thank you very much for the interview, and we wish you all the best for your stay at Velká Fatra National Park.
Číslo dotazníka:

Dotazník “Ochrana přírody v Národním parku Veľká Fatra”

Státní ochranu přírody SR a Správu NP Veľká Fatra spoluprací s Univerzitou v Klagenfurte a WWF (World Fund for Nature – Svetový fond pre divočinu) vykonávajú prieskum ohľadom opatrení a programov pre ochranu přírody v národnom parku. Prosím, venujte nám svoj čas a poskytnite nám svoj názor. Všetky údaje budú doverne a použité iba na účely výskumu. Vyplnenie dotazníka zaberie asi iba 10 minút. DAKUJEME!

1 Ste členom organizácie, ktorá sa venuje ochrane prírody?
   ☐ Ano ☐Nie

2 Prispievate právadne dobrovoľne na ochranu prírody?
   ☐ Ano ☐Nie

Ak áno: Kolko eur do roka?
   ☐ Právadne________EUR

3 Biodiverzita znamená – podľa definície OSN – roznorodosť génov, druhov (živočích, rastlinných), ekosystémov a krajín. Počúli ste predtým o tejto definícii?
   ☐ Ano, počúli som o niečom takom
   ☐ Nie, nepočúl som o tom.

4 Ako dobre ste informovaný o…?
   (Hodnotenie 1=veľmi dobre, 5=občas)
   ☐ ☐ ☐ ☐ ☐...cieľoch národného parku
   ☐ ☐ ☐ ☐ ☐...druhoch a programoch na ochranu prírody v národnom parku
   ☐ ☐ ☐ ☐ ☐...aktivitych a možnostiach v cestovnom ruchu
   ☐ ☐ ☐ ☐ ☐...kultúrnych a výchovných ponúkach NP

5 Ktoré živočíchy, rastlín alebo aktivity na ochranu prírody v NP Veľká Fatra prispievajú?

6 NP Veľká Fatra má podľa medzinárodnej definície národných parkov veľa cieľov. Prosím označte 4., ktoré považujete za najdôležitejšie.
   ☐ Vzdelávanie a informovanie o ochranie prírody
   ☐ Ochraná prirodených biotopov a druhov (voľne žijúcich živočíchov a rastlín)
   ☐ Zvlášť chránené lyžiarskych stredisk v NP
   ☐ Vedecký výskum ohľadom ochrany prírody
   ☐ Udržateľné lesníctvo
   ☐ Podpora rozvoja miestnej ekonomiky (cestovný ruch)
   ☐ Budovanie nových ciest pre návštevníkov
   ☐ Zabezpečenie zariadení pre návštevníkov (príjmovný centrá, turistické chodníky, informačné panely)
   ☐ Produkcie a odbyt miestnych produktov
   ☐ Podpora športových aktívít
   ☐ Zabezpečenie polovníctva a/alebo rybárstva
   ☐ Podpora miestnych aktívít ako naprí. múzeá

7 Koľkokrát ste už boli v NP Veľká Fatra (vrátane dneška)?
   ☐ 1x ☐ 2x ☐ 3x ☐ 4x ☐ viac než 4krát

8 Ako dlho ostanete v NP počas terajšej návštevy?

9 Ktoré zariadenia ste už využili alebo plánujete využiť v rámci terajšejho pobytu?
   ☐ Turistické chodníky
   ☐ Návšteva Harmaneckej jaskyne
   ☐ Návšteva Správy NP alebo Informačného centra
   ☐ Lyžiarske stredisko
   ☐ Kúpele Turčianske Teplice
   ☐ Biatlníky ľad
   ☐ Skištajnorský hrad
   ☐ Víkolinec
   ☐ Iné:________________________

10 Aké sú Vaše hlavné aktivity v NP? (prosím označe max 3)
   ☐ Turistika
   ☐ Návšteva Harmaneckej jaskyne
   ☐ Pozorovanie rastlín, živočíchov a biotopov
   ☐ Športy, ako bicyklovanie, beh...
   ☐ Návšteva zariadení a výstav NP
   ☐ Kultúrne aktivity
   ☐ Horolezectvo
   ☐ Návšteva reštaurácií a chát
   ☐ Iné:________________________

11 Prečo ste navštívili tento región?
   ☐ Prišli/a som zámerne za účelom návštevy NP.
   ☐ Šiel/a som okolo a tak som využil/a príležitosť vidieť národný park.
   ☐ Mal/a som iné dôvody návštevy tohto regiónu (prietelia, rodina, profesionálne dávody) a tak som tiež navštívil/a NP.
   ☐ Iné moty:________________________

12 Odkiaľ ste?
   ☐ PL ☐ CZ ☐ AT ☐ DE ☐
   ☐ Iná krajina:________________________

13 S kým cestujete?
   ☐ Sám ☐ S manželkou/manželom/partnerom
   ☐ S rodinou ☐ S priateľmi ☐ So zájazdom

14 S koľkými ľuďmi cestujete (vo vašej skupine)?
   ☐ _____ ľudí

15 Akým dopravným prostriedkom ste prišli do NP?
   ☐ Auto ☐ Vlak ☐ Dicikel ☐ Autobus ☐ Lietadlo
   ☐ Motorka ☐ Karavan ☐ Pteli

16 Ako dlho trvala cesta? _____ hodín
17 Kořko km je NP vzdálený od Vášho domova?
Přibližně __________ km

18 Kořko peříži miemie denne počas Vášho pobytu?
Ubytování __________ EUR
Strava __________ EUR
Nákupu (miestne umel. predmety): __________ EUR
Vstupné poplatek: __________ EUR
Múzeá: __________ EUR
Doprava: __________ EUR
Športy: __________ EUR
Iné výdavky: __________ EUR

19 Kde ste ubytovaný?
☐ Mesto/obec: __________________________________________
☐ jednodňová návšteva bez nocovania

Aktivity nárocneho parku su financovane hlavne zo statneho rozpočtu. Vláda môže poskytnúť dodatočné peniaze iba ak si to miestne obyvateľstvo a návštevníci želajú. Preto je Váš názor na nasledujúce otázky velmi dôležitý.

20 Predpokladajme, že by vláda znižla finančný príspevok na čo? NP. Kedy ste mohli tu a teraz spievať vyčlenenou sumou na určenie programov národného parku (ochrana prírody – napr. oror skalné, vík, rys alebo cyklámen fatranský), koľko by ste boli ochotný príspevok ročne? Prosím mysliete na Vaše ďalšie náklady počas dovolenky, takže tento príspevok by bol takto príjemným navýšením ku višším výdavkom.

☐ Nič
☐ 1 EUR ☐ 2 EUR ☐ 3 EUR ☐ 4 EUR ☐ 5 EUR
☐ 10 EUR ☐ 20 EUR ☐ 30 EUR ☐ 40 EUR ☐ 50 EUR
☐ 60 EUR ☐ 70 EUR ☐ 80 EUR ☐ 90 EUR ☐ 100 EUR
☐ 150 EUR ☐ 200 EUR ☐ 300 EUR ☐ nad 500 EUR

21 Prosím vyjadrite svoj názor ku nasledujúcim vyjadreniam. *(Hodnotenie 1=úplne súhlasím; 5=zásadne odmietam):*

“Môj priem je príliš nízky aby som mohol/a prispevať” __________

“Ochrana prírody je verejné záujém a nemala by byť závislá na individuálnych príspevkoch.” __________

“Počkať/a by som ako by spispevali ostatní a potom by som sa rozhodol/a” __________

“Už teraz platím príliš vysoké dane.” __________

“Veniť/a by som peniaze na iné účely.” __________

“Programy na ochranu prírody nemajú pre mňa takú cenu aby som bola uchovávať/a ne k priem priem.” __________

22 Súhlasite s nasledujúcimi vyjadreniami? *(Hodnotenie 1=úplne súhlasím; 5=zásadne odmietam):*

“Ochrana prírody je taká dôležitá, že na cene nezáleží.” __________

“Pred týmto výskumom som nikdy nerozmyšľal/a, čo by som bol/a ochotný/a venovať” __________

Dátum a čas vypnenia dotazníka:
Miesto vypnenia dotazníka:

“Boľ/a by som ochotný/a prispevať aj keď by všichna respondentov nebola ochotná podporovať takéto program.” __________

„Věta sa rozpráváme o ochraně prírody s priateľmi a rodinou.” __________

23 Ochrana dvoch a biotopov si môže vyžadovať časové alebo priestorové obmedzenia čo sa týka prístupu do územia. Čo by ste robiли v takom prípade?

*(Hodnotenie 1=úplne súhlasím; 5=zásadne odmietam):*

“V každom prípade by som navštívil/a národný park” __________

„Píme by som akceptoval/a časové priestorové obmedzenia vstupu aby sa chránila príroda.” __________

„Už by som viedeš nechcel/a navštíviť tento národný park.” __________

„Vybral/a by som si na turistiku inú oblasť.” __________

„Úplne by som upustil/a od turistiky a vybral/a by som si na dovolenku iné miesto na Slovensku.” __________

„Strávil/a by som dovolenku v zahraničí.” __________

24 Ak by ste boli ochotný príspevka na programy národného parku (otázka 20), ktorý je Váš hlavný dôvod *(prosim označte iba jeden):*

☐ Prispievaem na ochranu rastlín a živočíchov pretože majú právo na existenciu.
☐ Rád by som prispel na ochranu rastlín a živočíchov pretože môžem mať z nich niektoré v budúcnosti osôb.
☐ Chcel by som odovzdať mojim defom zdravú prírodu.

Prosím poskytnite nám očko na záver krátko štatistickú údaj:

25 Pohlavie: ☐ Žena ☐ Muž

26 Vek: __________

27 Kořko žije vo Vašej domácnosti? __________ z toho: __________ detí

28 Aké je Vaše najvyššie dosiahnuté vzdialenie?
☐ Základná škola ☐ Učňovská škola
☐ Stredná škola ☐ Vysoká škola

29 Aké máte zamestnanie?
☐ študent ☐ robotník
☐ žena/muž v domácnosti ☐ súkromný zamestnanec
☐ nezamestnaný ☐ štátny zamestnanec
☐ dôchodca ☐ podnikateľ/živnostník

30 Prosím označte štát na mesačný príjem Vašej domácnosti?
☐ menej ako 500 € ☐ od 1,000 do 1,250 €
☐ od 500 do 750 € ☐ od 1,250 do 1,500 €
☐ od 750 do 1,000 € ☐ nad 1,500 €

Všetky údaje budú dôverne a budú anonymne a súhrne použité iba na účely výskumu.

Ďakujeme Vám za Váš čas, a želáme Vám prijemný pobyt vo Veľkej Fatre!