

Economic and Cultural Values Related to Protected Areas

Part 1: Valuation of Ecosystem Services in Tatra (PL) and Slovensky Raj (SK) national parks

Abstract

The valuation of ecosystem services by the examples of Tatra national park (Poland) and Slovensky Raj national park (Slovakia) shows that ecosystem services are of eminent importance to the local, regional and national economies.

In total, Tatra national park (PL) provides ecosystem services annually worth EUR 742m (potential range from EUR 593m to 888m), while Slovensky Raj national park (PL) provides around EUR 232m of ecosystem benefits (range from EUR 155m to 342m per year). The differences are due to the different ecosystem services provided, but also to the different size of the relevant economies and stakeholder groups.

For both national parks, recreation benefits are most significant. The national parks considered in this study can be labeled “national natural heritage” in terms of the perception of the national societies, and are therefore visited by hundreds of thousands of tourists every year. About two thirds of benefits stem from recreation benefits.

Biodiversity conservation is the second most important ecosystem service. The non-use values in terms of existence, option and bequest values account for about one third of benefits.

Other ecosystem services are especially significant to the local communities. The national parks provide water, erosion control, and a number of other forest ecosystem benefits.

Taking the values together, the establishment of the national parks is clearly efficient from an economic point of view. The costs of establishing and managing the parks are insignificant compared to the benefits provided, especially regarding those benefits that are specific to national parks. Further improvements, for instance, according to international IUCN and EU standards, and visitor management,

are advisable to conserve biodiversity while still securing the societal benefits in the long term.

1. Introduction, problem setting and methodological approach

1.1 Introduction

Protected areas – “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” (IUCN, 1994) – play a major role in conserving biodiversity in terms of genetic, species, ecosystem (habitat) and landscape diversity. Currently, about 25% of European Union’s territorial area is protected under the FFH- (Flora-Fauna-Habitat) or Birds-Directive. At the same time, WWF’s (2008) living planet index exhibits a dramatic decrease from 1970 to 2008 in terms of conservation of species and ecosystems.

Conserving biodiversity is a major inter- and trans-disciplinary task. It involves not only conservation from the viewpoint of ecology, but includes the notion that conservation efforts are important goals of the whole society. Therefore, economic as well as social issues have especially to be dealt with in the management of protected areas. The Convention on Biological Diversity (1992) emphasizes a number of issues that include

- benefit sharing of biodiversity conservation,
- integration of environmental and equity issues,
- participation of stakeholders and in particular empowerment of marginal social groups, and

- in general, sustainable development integrating ecological, economic, and social dimensions.

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 values. For instance, the willingness of a society to set aside major parts of its land to conserve biodiversity is an expression of such values.

In times of scarce resources (scarce public and private funds), it is especially important for biodiversity conservation to highlight the values associated with conserving biodiversity in protected areas. Such valuation has to include, in principle, all dimensions (benefits, costs) of establishing and managing ecosystem services. This is of particular importance regarding the long-term commitment of a society. Biodiversity conservation is a long-term objective, and the benefits as well become apparent only in a long-term perspective.

However, protected areas are in constant need to justify their existence, and to prove the benefits to society in order to receive sufficient funds for the management of the area. The different categories of protected areas need, of course, different amounts of resources in order to be managed appropriately. Landscape conservation areas, for instance, often are equipped with fewer financial resources than other categories such as national parks, biosphere reserves or nature parks.

National parks according to category II of IUCN's classification system in particular involve four different objectives:

- Conservation of biodiversity, especially in terms of allowing natural processes;
- Education and information for visitors and the general public;
- Recreation of visitors; and
- Scientific research.

In order to fulfill such broad range of objectives, national parks at least have to be implemented according to national law, managed by a specialized national park administration, and acknowledged and monitored by international bodies. Such fulfillment of obligations consumes substantial funds (costs).

The current study explores the benefits of biodiversity conservation in two national parks in Central Europe, the Slovensky Raj national park in Slovakia,

and the Tatra national park in Poland. 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 parks, and to draw conclusions on a PES (payment for ecosystem services) scheme harmonizing conservation and economic issues.

The study has therefore the following objectives:

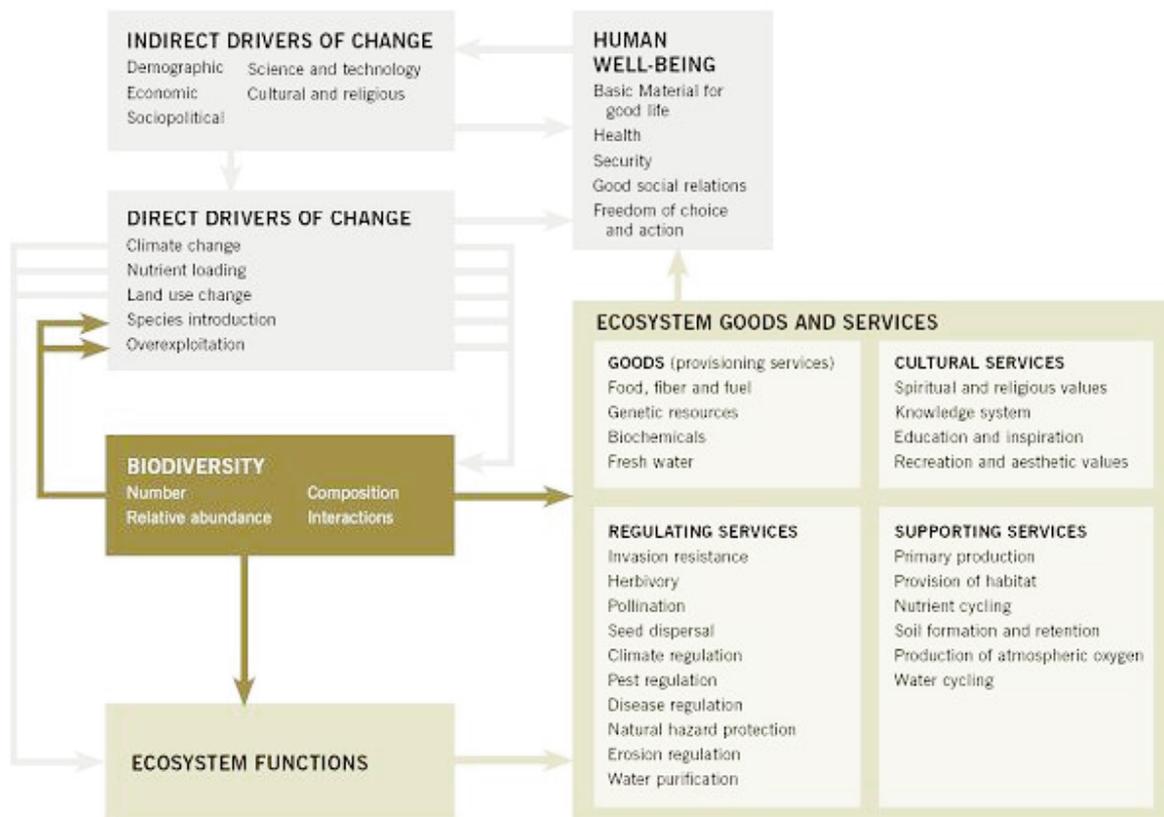
1. Indication of the Total Economic Value (TEV) associated with the economic and cultural services that the protected areas provide to the PA and the surrounding region.
2. Composition of a proposal containing two or more scenarios on Payments for Ecosystem Services (PES) which will serve as a base for follow-up activities (entry into discussions with stakeholders, and identification of a PES concept).

In addition to the national parks of Slovensky Raj and Tatra, a PES scheme for the Maramures national park (Romania), for which a valuation of ecosystem services already exists, will be drafted.

The basic notion of the current study is the acknowledgement of the importance of ecosystem services for development, and v.v. the drivers of ecosystem services based on development. Figure 1 presents this basic conception of the linkages between biodiversity, ecosystem functions, and the drivers for change.

Based on this concept, the next section provides an overview of the method, the work flow and the activities of the study.

Figure 1: Biodiversity, ecosystem functioning, ecosystem services, and drivers of change



Biodiversity is affected by drivers of change and also is a factor modifying ecosystem function. It contributes directly and indirectly to the provision of ecosystem goods and services. These are divided into four main categories by the Millennium Ecosystem Assessment: goods (provisioning services) are the products obtained from ecosystems; and cultural services represent non-material benefits delivered by ecosystems. Both of these are directly related to human well-being. Regulating services are the benefits obtained from regulating ecosystem processes. Supporting services are those necessary for the production of all other ecosystem services.

Source: CBD (2006, 14).

1.2 Working steps and methodology

The first step of the current project consists of a collection and interpretation of the re-levant ecological data on ecosystem services of the two national parks, and on a geo-graphical assignment of the relevant national park region.

In order to collect the relevant data, a data information sheet, several personal commu-nications and two workshops were held to specify the available data, and to collect and interpret information from the two national parks. In a first approach, the data was col-lected based on information already available.

For the two national parks, not all data was available in sufficient detail. Table 1 presents the first-best outline of information requirements; in the respective subsequent chapters, the available and relevant data is discussed more thoroughly. The selected ecosystem services are assumed to mirror the most important ones,

while some of the ecosystem functions presented above in Figure 1 (CBD, 2006) are not included for the current case studies.

Table 1: Overview of ecosystem services and information requirements

	Description of ecosystem services <i>in situ</i>	Quantity		Prices**
		before*	after*	EUR/unit
1. Ecosystem services				
1.1 <i>Forest products</i>				
1.1.1 Timber				
1.1.2 Non-timber products				
1.1.3 Water provision, supply				
1.1.4 Water retention / flood protection				
1.1.5 Carbon sink, climate regulation, CO2 sequestration				
1.1.6 Erosion control				
1.1.7 Medicinal resources				
1.2 <i>Agricultural products</i>				
1.2.1 Cattle, grazing				
1.2.2 Grains, food production				
1.3 <i>Fishing</i>				
1.4 <i>Hunting</i>				
1.5 <i>Recreation</i>				
1.5.1 Tourists for a day / no., expenditure, origin, motive to stay				
1.5.2 Overnight stays / no., expenditure, origin, motive to stay				
1.6 <i>Recreation opportunities (national park policies)</i>				
1.6.1 Education, information				
1.6.2 Hiking				
1.6.3 Climbing				
1.6.4 Others (e.g. rafting, mountain biking)				
1.7 <i>Biodiversity conservation values</i>				
1.7.1 Habitats, ecosystems, species, landscapes				
1.7.2 Existence values				
1.7.3 Option / quasi-option values				
1.7.4 Bequest values				
1.8 <i>Cultural values</i>				
1.8.1 Traditions, traditional landscapes				
1.8.2 Culture, artistic benefits				
2. Other information				
2.1 Land cover / land use				
2.2 Economic structure of the region				
2.3 Development concepts / strategies				
2.4 PA management plan				
2.5 PA Management strategies / frameworks				
2.6 PA budget, decision autonomy (including all transactions)				
2.7 PA Networks with the region				
2.8 Stakeholder(s) (involvement)				
2.9 Socio-economic development of the region:				
2.9.1 Municipalities, residents, age/education, jobs, unemployment				

Source: own draft.

The table lists all relevant ecosystem services provided by the national parks, 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 for the national parks; on the other hand, much data is not readily available. Regarding existence, option and bequest values, no reliable study exists in Poland nor Slovakia on which a valuation could be based on.

After collection of the available data, the second step consists of linking the quantitative information to prices.¹⁾ As no primary research – except for visitors’ values based on a survey – will be done in the current study, prices will be derived from the relevant inter-national (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 two national parks:

1 Benefits transfer

Based on existing valuation studies and data bases on values for ecosystem services, the values and benefits in money terms will be adapted to local/national circumstances (income, GDP, other information regard-

ding preferences or socio-demographics if necessary and feasible). These adapted values will be applied to the existing ecological data; the result will be 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.

2 Primary data collection

In each of the national parks, a visitor survey will collect 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) will be addressed. The results will show the potential range of values of the park for visitors and the general public.

Finally, the individual values will be 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 eco-system services provided by the national park.

The third work package includes a draft of PES (Payment for ecosystem services) schemes in three national parks, based on the valuation study. Taking the economic valuation of ecosystem services, the last working package of the project will include a discussion of potential payments for ecosystem services by the beneficiaries of these services. Stakeholder involvement in the form of discussion groups and workshops will ensure that a reasonable proposal for payments will be drafted. For instance, visitors (tourist) benefit from the services in terms of habitat and species conservation. The question arises to what extent tourists contribute to the parks' budgets.

The current report only includes the valuation of ecosystem services in the Tatra national park (Poland) and the Slovensky Raj national park (Slovakia). The Maramures Nature Park, as well as the implications for payments of ecosystem services (PES) schemes and the local/regional economy, will be dealt with in a separate report (see Part 2 in this volume).

2 Valuation of ecosystem services in Tatra national park (Poland)

2.1 Short description of the study site

The Tatra national park (Tatrzański Park Narodowy) was founded in 1954, and is located in the Southern part of Poland along the border to Slovakia (on the Slovakian side, a national park was also established), about 100 km south of Cracow (all data and information compiled from presentations of the Tatra national park administration, 2009). Early efforts for conservation date back to the late 19th century with joint formal commitments of Poland and Slovakia to conserve the area as a protected area in 1925. In 1993, the national park was also designated as a UNESCO world heritage site, and as a biosphere reserve. With Poland's (and Slovakia's) accession to the European Union, the area was also designated as a Natura 2000 site according to the Habitats and Birds Directives.

The national park is established on an area of 21,164 hectares of which 82% are publicly owned land. Forest ecosystems account for 72% of the area of which about 58% are natural or semi-natural forests. The core zone of the park is maintained on about 60% of the total land, the other parts include a buffer and a transition zone. While 92% of the forest area now consists of spruce, silver fir and beech are expected to increase their share of land to 20% and 13%, respectively, pushing back spruce areas, according to forest management plans. Many prominent (charismatic, "flagship") animal species populate the national park such as chamois, marmot, brown bear, lynx, wolf, otter, eagle, and falcon. Parts of the area are alpine areas, with many meadows and traditional forms of pasture. The national park is an important tourist attraction; currently, the national park annually counts about 2m visitors who have to purchase tickets for access to the park. The national park administration implements and monitors a rather strict regime regarding visitor management. Access to the park is restricted to certain areas and routes with temporal and spatial bans, including rules for hiking, climbing, mountain biking, skiing, and accessing the many caves in the area. Sports competitions and paragliding are prohibited.

2.2 Ecosystem services and money values

2.2.1 Forest products and ecosystem services

In the following, the different forest products and ecosystem services will be briefly de-scribed, and – where possible – valued in money units. In addition, the sections include a discussion of uncertainties, and the possible range of money values.

Timber

Starting with timber as one of the main services in many ecosystems (1.1.1, timber, see Table 1, page 5), the Tatra national park was formerly known as a major source of timber, in particular used as an input to the mining industry in the 18th and 19th century. However, according to the Tatra national park administration (2009), there is nowadays no commercial use and harvesting (logging) of timber. Under the control of the national park administration, and only based on ecological necessities, selective logging takes place in the event of windfall, spreading of bark beetle, or avalanches outside the core zone. At some occasions, the selective logging is done together with the aim to change the composition of tree species according to the ecological forest management plan. However, such logging is only a minor national park policy; mainly, the change of species composition is left to natural processes. Logging only takes place in the buffer zones of the park; no measures are done in the core zone. As the forests do not provide any substantial timber for commercial use, the ecosystem service of providing timber is negligible.²⁾

Non-timber forest products

Non-timber forest products (1.1.2), such as berries and mushrooms, are collected in some few areas of the park only for private purposes (no commercial use), and only in the landscape conservation zone (picking non-timber forest products is prohibited in the core zone). There are currently no statistics available on such non-timber forest products; however, it is assumed that such harvesting is of very limited importance. A few hundreds of tree seeds are harvested annually by the national park administration and sold to locals. Taking all together, non-timber forest products do not play a significant role in valuing ecosystem services of the Tatra national park.

Water provision, water supply

The Tatra national park is rich in water sources, both regarding run-off as well as many springs (1.1.3). Within the national park boundaries, 52 springs are located. On average, they provide annually about 7m cubic meters (m³) of fresh water, of which 5.5m m³ are used for the local water supply of the town of Zakopane and other adjacent communities (while the town of Zakopane has less than 30,000 residents, resident numbers can go up to 2-300,000 during the tourist season with peaks close to 500,000 tourists). The water sources of the national park therefore provide crucial “inputs” to the population of the town, as well as to the tourism industry. The price of one m³ of drinking water ranges in Poland from PLN 1.95 to 3.99 for households (EUR 0.47 to 0.96), with a mean of PLN 2.81 (EUR 0.68) (all figures in 2005 prices; Bartczak et al., 2007). Valued by actual water tariffs (prices), the value of fresh water actually used comes up to EUR 3.7m per year; if we assume that the springs would fully be used for drinking water purposes, the value of water provision of the Tatra national park ecosystems would amount to EUR 4.76m per year. Given the current water use of 5.5m m³ per year, the lower bound amounts to EUR 2.585m (water price EUR 0.47 per m³), the upper bound would be EUR 5.28m (water price of EUR 0.96 per m³).

Additional to water supply, water is used in four small hydro-electric power plants inside the national park. Actual production figures are currently not available, but production is very limited and only for local purposes.

Water retention, flood protection

The ecosystems of Tatra national park are important for retaining water runoff from the area (1.1.4). Regular annual floods occur while no flood protection infrastructure is current in place. Since there is no primary data on the value of water retention and flood protection available, the current study has to rely on valuation studies concentrating on public expenditure for flood protection that can be saved by a functioning forest ecosystem (abatement costs saved). Other possible methods include

- the quantitative calculation of water retained by the functioning forest ecosystem in comparison to a landscape with non-functioning forest ecosystems, or even no forest cover. This amount of water retained then may be valued with water prices.

- hedonic pricing for property values that would be changed if water is not retained in the ecosystem, and floods are more frequent.

As far as the Tatra national park is concerned, there are no primary studies neither on the potential water retention (measured in m³) nor on property values for the hypothetical scenario that forests would be decreased and therefore would not provide water retention and flood protection any more.

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.

As the forests of Tatra national park are fully functional regarding water retention and flood protection, it can be assumed that the value of EUR 90 per hectare is a reasonable approximate. Given that this amount is based on average EU income, and accounting for the income differential between the EU27 and the Polish economy (100:53), the value per hectare can be transferred to the policy site by approximating it by EUR 48 per hectare. The Tatra national park includes an area of 15,122 hectares of forest ecosystems. Valued by EUR 48 per hectare, the economic value of water retention, flood control and erosion control of the Tatra national park forest ecosystems may amount to EUR 725,856 per year. The lower bound, taking into account EUR 45 per hectare at EU27 price levels (transferred to Polish income levels, this would amount to EUR 24 per hectare), the value of water retention services (including erosion control) amounts to EUR 362,928 per year. The upper bound, assuming EUR 107 per hectare (transferred value of EUR 57), the annual value comes up to EUR 861,954.

Carbon sink, carbon sequestration

Regarding carbon sequestration (1.1.5), the valuation of forest ecosystems in the Tatra national park poses methodological problems in terms of the choice of the relevant base-line. It is straight forward to

assume a carbon sequestration effect of a newly planted (or naturally succeeded) forest of a formerly deforested area. However, the Tatra national park includes forest areas which might change in composition. The area (hectares) itself is not going to be changed in the future.

Nevertheless, the literature provides several value estimates regarding carbon sequestration (in EUR per hectare), in some studies depending on whether sustainable harvesting takes place. 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 of the Tatra national park, 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.

Regarding the valuation of carbon sequestration, there is a broad range of values available in the relevant literature. For instance, Stavins and Richard (2005) calculate the net present value per area unit, depending on the discount rate and the sequestration rates of a forest (e.g. newly planted vs. existing; periodic harvesting vs. sustainable/no harvesting). The forests in the Tatra national park are assumed not to be harvested in the future, only the composition of the tree species can be assumed to slowly approach the natural composition. Taking the lower bound of the discount rate (2.5%), no periodic harvesting of a mixed stand forest, the present value amounts to 227 EUR per hectare; per year, the equivalent value of carbon sequestration of the study by Stavins and Richard (2005) is EUR 5.7 per hectare. Van Kooten et al. (2004) calculate the value of carbon sequestra-

tion to amount to a range of EUR 90 to 596 per hectare (present value, discount rate between 3.5 and 5%), with an equivalent value per year of EUR 4 to 30 per hectare. Brainard et al. (2009) calculate with a “reasonable value” between EUR 200 and 250 per hectare (present value, discount rate 3.5-5%). This value translates to an annual value of EUR 7-12.5 per hectare. Chiabai et al. (2009) come up with a value of EUR 240-382 per hectare at a discount rate of 3%, equivalent to a value of EUR 7-12 per hectare and year.

For the Tatra national park, the marginal value of carbon sequestration is problematic since the forest already exists, and the mode of managing the forest has not been changed during recent years (and is not expected to be changed in the future). However, as mentioned above, it is reasonable to assume that the forest will slowly grow, will not be harvested and will therefore build some additional carbon storage (sink) in order to contribute to carbon emission reductions. Taking the middle range of values discussed above, at about EUR 12 per year and hectare, and assuming an income differential for Poland of 53% of the EU27 average, a valuation of the ecosystem service of storing carbon may end up with a value per hectare and year of EUR 6. Combined with the total forest area of the park (15,122 hectares), the carbon sequestration of the forests in Tatra national park can be valued annually at EUR 90,732. The lower bound of EUR 7 per hectare (transferred value: EUR 3.7 per hectare and year) leads to an annual value of EUR 56,102. The upper bound may lay at EUR 240,440 (taking the value of EUR 30 per hectare, transferred to EUR 16 per hectare for the Polish economy). The economic value of carbon sequestration is, as mentioned above, limited and will end when the forest will have reached its long-term equilibrium.

Erosion control

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

Medicinal resources

According to the Tatra national park regulations it is strictly prohibited to pick and collect plants in the national park. While the ecosystems of the park may be considered as a reservoir for potentially useful drugs, there is lack of data on such potential drugs, and there is also no current use of such herbs or simi-

lar plants. Due to these circumstances, plants for medicinal use may exist, but cannot be valued in the current study.

2.2.2 Agriculture and ecosystem services

Cattle, grazing

In general, there is no agricultural use of the areas inside the national park boundaries, but the national park administration allows for extensive sheep grazing for the meadows to keep these areas open from trees and bushes (ecosystem service 1.2.1). This grazing is basically done under the regulations of the national park administration and mainly for ecological management purposes. The sheep, however, produce milk which is used for some traditional cheese production. This cheese production is marginal since the traditional cheese is also produced (in significantly larger quantities) outside the park areas. There are some minor revenues of the cheese production included in the national park budget. And separate valuation – also due to lack of data – of ecosystem service provision is therefore not necessary.

Grains, food production

There is no food production (grains) allowed within the national park (1.2.2).

2.2.3 Fishing

There is no fishing (ecosystem service 1.3) allowed in the national park.

2.2.4 Hunting

There is no hunting (ecosystem service 1.4) allowed in the national park. Formerly, about 5 years ago, the national park administration stopped all hunting which was, anyway, done solely for the purpose of regulating game (all hunting rights are held by the national park). Nowadays, natural enemies such as wolf and lynx hunt game. Outside the national park, private land owners are fully compensated if predators hunt their animals (e.g. sheep).

2.3 Recreation and existence values of visitors

2.3.1 Introduction

The valuation of the ecosystem services referring to recreation and national park policies (1.5) as well as biodiversity values (e.g. existence value, 1.7) took place by means of a questionnaire addressed to visitors of the park. Therefore, primary data on these eco-system values were elicited and aggregated.

Annually, about 2m tourists visit the national park every year. Every visitor has to purchase a ticket (for a day or a week) at 16 entry points. Ticket prices vary according to season, regular tickets in the high season are sold for PLN 4.40, students and children pay less (PLN 2.20). Off-season tickets are sold for PLN 3.20 and 1.60, respectively. The national park earns about PLN 10m per year (ticket sales, other fees such as parking, cave visits, licenses, and other services) which are used for national park management.

Regarding cultural values, there are some ancient shepherd's cottages in the park, as well as three old monasteries which can be visited. Within the national park boundaries, there are one cable car and two ski lifts with two downhill slopes. These infrastructures were built prior to the establishment of the national park (IUCN category II). Cross-country skiing is allowed on signed tracks. The national park management pursues a "Zero tolerance policy" against visitors infringing national park regulations (such as skiing off track or ignoring temporal/spatial access bans).

2.3.2 General questions regarding environmental values and the national park visit

The questionnaire distributed during July and August 2009 in the Tatra national park – reprinted in the Appendix beginning at page 48 – first dealt with a block of questions regarding visitors' engagement and information on biodiversity in general, and national park aims and policies in particular. In total, 289 questionnaires were collected, of which 287 (99%) are from Poland.

93% (268) of the respondents stated that they are not members of conservation or environmental organizations. 7% (20) are regularly donating to such organizations with a mean of about EUR 62 per year (standard deviation EUR 103; only 12 respondents indicated their annual donations to environmental

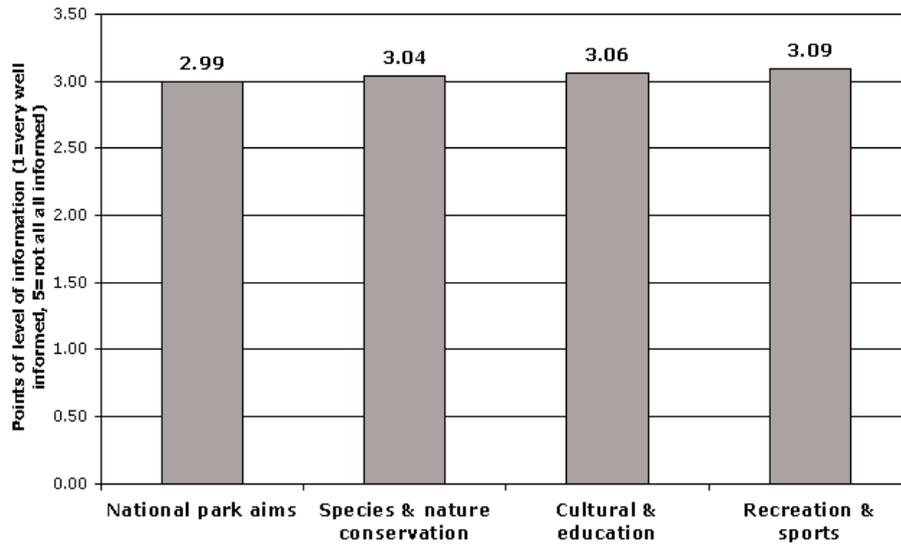
organizations). Regarding the information level, 19% of respondents (55 questionnaires) have heard of the biodiversity definition of the United Nations ("diversity of genes, species (animals, plants), ecosystems and landscapes") in detail before, while 55% have heard the definition but do not have detailed knowledge. For some 25% of respondents, the presented definition is new.

Respondents feel medium informed about different aspects of the national park. On average, respondents assess their information level about the national park aims with 2.99 points, about species and nature conservation programs at 3.02 points, recreation activities and possibilities at 3.06, and cultural and education offers of the national park at 3.09 points (Figure 2). This assessment of information level is a first hint towards environmental values, and suggests that information should be improved especially in the latter three fields. The differences, though, are not significant; overall, the information level does not seem to be very high. On average, respondents' information level is in the middle between "informed" and "not informed". National park aims are at least known to 45% of respondents. Otherwise, about 40 to 45% of respondents indicated that they are "not well" or "not at all" informed.

When valuing national park ecosystem services such as the conservation of biodiversity (e.g. existence and recreation values), it is of crucial importance that respondents have some basic knowledge about national park aims and objectives. Out of 12 items, respondents were asked to choose four items which they would consider to be the most important national park aims. According to IUCN category II criteria, the conservation of biodiversity and natural dynamics (processes), information and education, recreation, and scientific research, should gain the highest attention. Testing visitors also reveals whether the national park provides sufficient information, or whether the information is received and understood adequately by visitors. As Figure 3 suggests, some of the items considered to be most important are not specified in the IUCN national park aims. However, the four main aims of the national park are also named by respondents as the most important aims. Interestingly, some visitors would wish that the national park should concentrate on the construction of roads and sustainable forestry – aims that are fundamentally contradictory to these "official" aims. This result suggests that information policies of the national park could be sharpened in this respect. Nevertheless, it seems that visitors have a

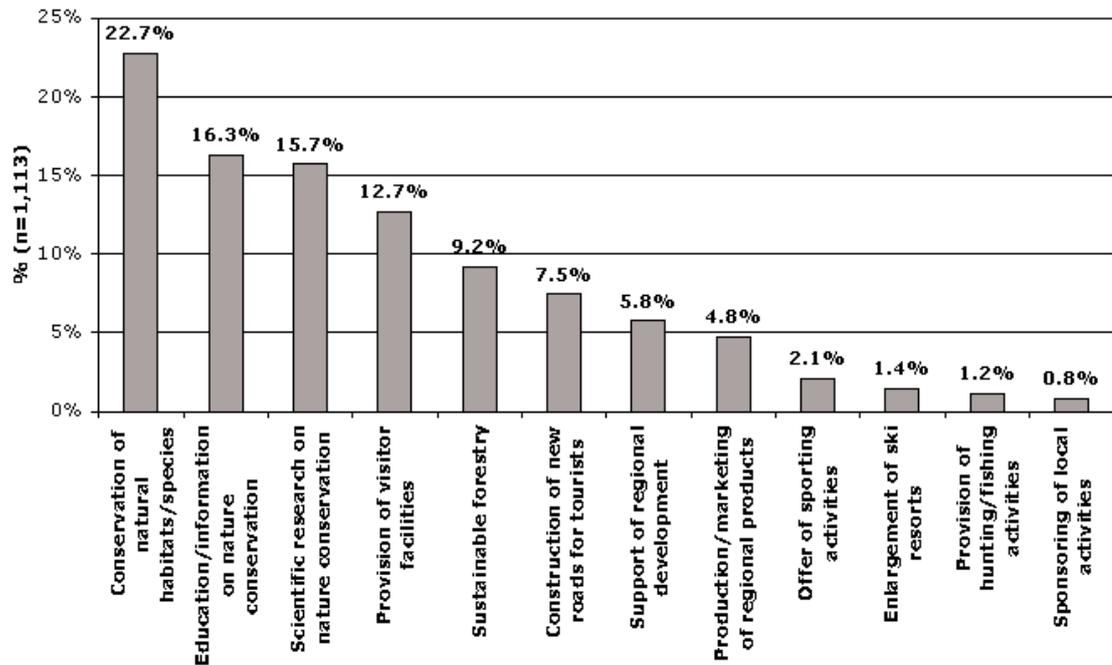
rather clear picture of national park aims. Their self-assessment mirrored above (see Figure 2) seems to be too pessimistic in terms of visitors' information level.

Figure 2: Self-assessed information level of respondents regarding national park policies and offers



Source: Visitors' survey in Tatra national park; own calculations.

Figure 3: National park aims considered most important

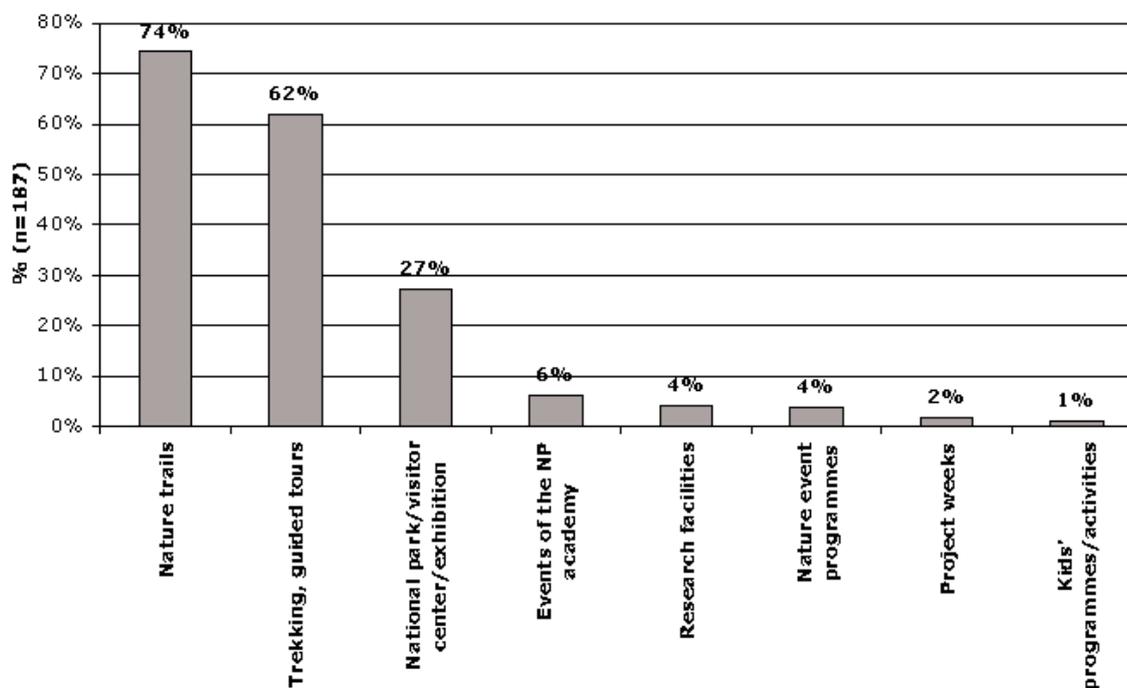


Source: Visitors' survey in Tatra national park; own calculations.

Regarding the actual (current) visit to the national park, the majority of visitors said that they have visited the national park more than four times (61%). Only a minority (6%) stated that the current visit would be the first one. The duration of the current stay is on average about 7.86 days (standard deviation 4.8 days).

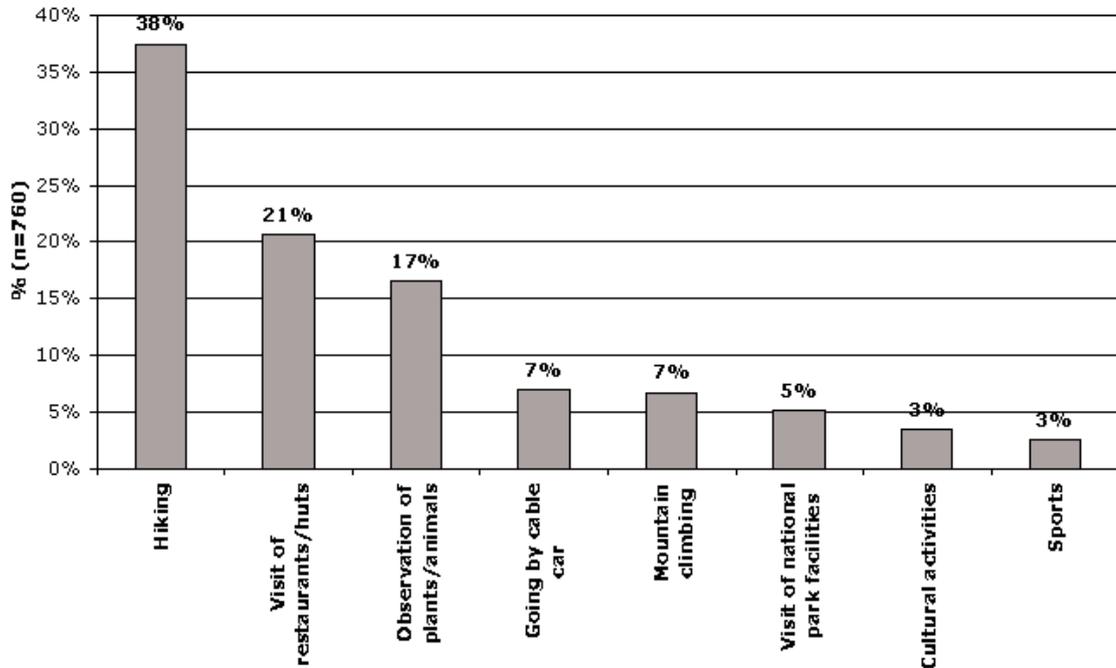
The national park offers a range of facilities for visitors. Most popular are nature trails and guided tours, while kids' activities are not experienced by many visitors (Figure 4). The main activities in the national park are certainly "typical" activities of visitors in national parks (hiking, mountain climbing, observation of plants/animals). However, some of these activities can also be done at other places and do not necessarily take place in protected areas (see Figure 5), for instance, for parts of hiking, using the cable car, and going to restaurants, there are certainly substitutes in other areas available.

Figure 4: National park facilities used by visitors



Source: Visitors' survey in Tatra national park; own calculations.

Figure 5: Main activities of visitors in the national park



Source: Visitors' survey in Tatra national park; own calculations.

2.3.3 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 in other motives, and therefore are only partially attributable to the recreation value of the national park.

Respondents in the current survey exhibited visiting motives that are rather closely connected to the establishment of the national park. 73% stated that they came solely for the purpose to see the national park, while another 11% came by based on 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 14%.

5.2% of visitors are travelling alone, while 32% are travelling with partners, family (33%) or friends (26%). Organized tours have only minor importance (4%). Groups include on average about 4 persons (standard deviation 9.6 persons). The most important transport mode is the private car (54%), compared to Western European national parks, a high percentage (33%) travelled by train, followed by bus (13%). On average, the journey to the national park took 7.89 hours (standard deviation 4.9 hours); the park is on average about 471 kilometers (standard deviation about 722 km) away from the home of the respondents.

Measuring travel costs was done in the questionnaire by asking visitors regarding their expenses per day for certain expenditure categories. In total, visitors spend on average about EUR 45.4 per day and person during their visit of the national park (standard deviation EUR 74.7, median value EUR 20.9). The 90% confidence interval lies between EUR 38.1

and EUR 52.6. Table 2 presents the details of expenditure categories suggesting that most money is spent on accommodation, sporting activities, and meals. Taking 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 or the other during “normal” life or in other tourist destinations –, visitor spending amounts to EUR 10.5 per day and visitor (standard deviation EUR 16.1; 90% confidence interval EUR 8.8 to EUR 12.2).

Table 2: Travel cost (expenditure categories) of visitors per day (in EUR)

Expenditure category	Mean	standard deviation
Accommodation	13.6	27.3
Sports	8.3	13.3
Others	5.5	6.9
Meals	5.3	8.0
Transport	4.7	10.0
Museums	3.7	3.9
Shopping	2.1	3.1
Entrance fee	2.0	2.2
Total	45.4	74.7

Source: Visitors’ survey in Tatra Raj national park; own calculations.

Total spending per visit and per person is computed based on mean travel costs (EUR 45.4 with a lower and upper bound according to the confidence interval; resp. EUR 10.5, see above), assuming that only those visitors who solely come for the purpose of visiting the national park, and staying on average 7.86 days in the region. Therefore, we can estimate total expenditure of an average amount of EUR 259.4 per person and stay (with a lower bound of EUR 217.4 and an upper bound of EUR 300.8).

For assessing the potential economic significance of the park for the region, a further question asked where visitors stay overnight. While only 5% of visitors only stayed for the day, the rest used accommodation close to the national park, in particular in the communities of Zakopane (48%), Koscielisko (9%), Kiry (6%) and Bukowina Tatrainska (2%).

Aggregating the travel costs elicited in the survey to the total number of visitors (about 2.0m per year) to the national park per year, given the daily expenditure, and the average number of days in the national park region, we end up with an estimate of total travel costs of about EUR 519m per year. This figure has to be considered as a rough estimate at the upper bound since visitors would bear a large part of these costs also in other holiday resorts, and would have spent money otherwise. Taking the lower and upper bound of the 90% confidence interval leads to range of possible recreation values of annually EUR 435m and EUR 601m. Taking the lower bound of only transport costs and fees, total recreation value amounts to EUR 21m per year (possible range between EUR 18m and EUR 24m).

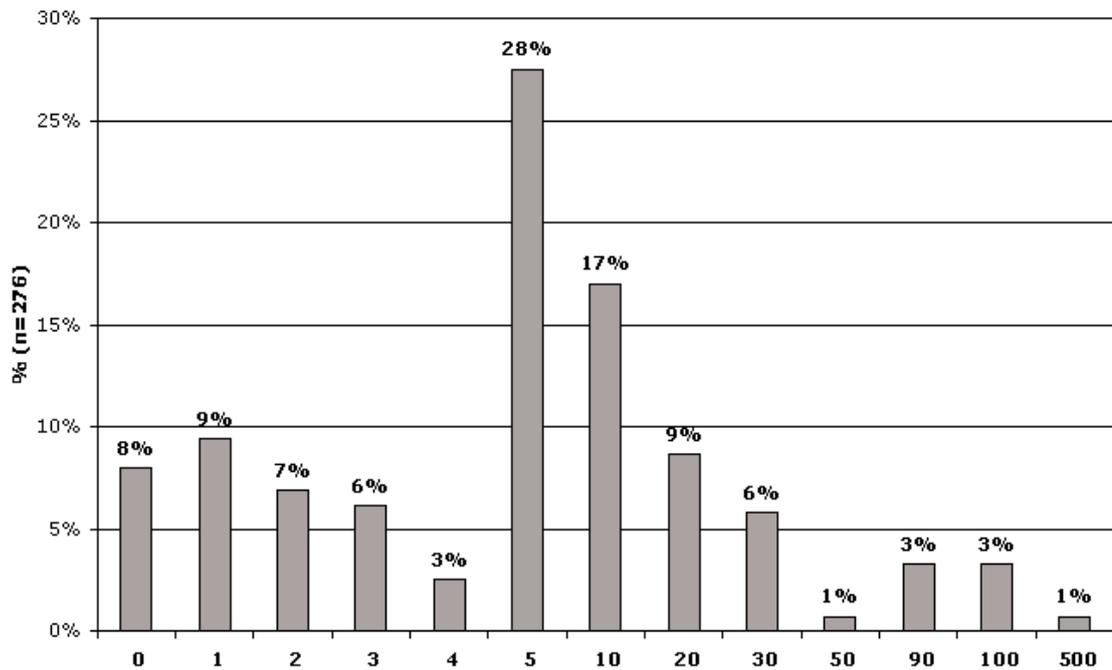
2.3.4 Willingness-to-pay for national park policies and environmental values

In order to derive an indication of potential values in terms of existence, (quasi-) option and bequest values of biodiversity conservation, and to facilitate the comparison between Tatra and Slovensky Raj national parks, the willingness-to-pay (WTP) question was formulated as concretely as possible while still being general enough to facilitate the comparison

between the two national parks (Tatra/Slovensky Raj national parks). The policy offered consisted of a sustaining of the species conservation programs of the park by an annual ear-marked payment elicited by a payment card. The question also explained that the funds provided by the government are unsecure, and that citizens had to pay directly for national park policies. Respondents were also warned that their stated WTP bids were on top of their expenses during the visit.

On average, respondents were willing to pay EUR 13.8 (standard deviation EUR 39.9) for securing the financing of national park programs, with a median value of EUR 4.4. The 90% confidence interval of the mean lies between EUR 9.8 and 17.6. Figure 6 shows the distribution of WTP bids elicited by the payment card with a range from “Nothing” to “EUR 500”.

Figure 6: Distribution of WTP bids of respondents



Source: Visitors' survey in Tatra national park; own calculations.

Regarding the motives for payments, and the financing of conservation activities in particular, the questionnaire included a range of statements which the respondent was asked to value on a 5-point scale (1="agree fully" to 5="reject completely").

The first debriefing question dealt with respondents who stated that they have no WTP for conservation policies, in order to find out whether the answer of Zero WTP involved preferences or was due to protest bids. Table 3 summarizes two questions of the questionnaire eliciting such preferences or perceptions.

The results presented in Table 3 highlight that most of respondents exhibit reasonable preferences regarding payments and financing, the rate of protest bids – respondents that reject the payments right away without deeper reasoning – is rather low. Mainly, respondents stated that their income would be too small to afford additional expenses, or that they would already pay too much tax.

Besides questions of financing, general preferences toward species conservation are very strong. For instance, strong agreement was indicated by respondents to the statement that nature and species conservation is important regardless the cost; however, respondents are generally not very familiar with valuation of environmental services.

When eliciting WTP from respondents, it is also important whether respondents thought of substitutes for their visit. If they perceive other areas to be adequate substitutes to Tatra national park, their WTP might be lower even if they hold strong preferences while they would just prefer to donate to nature conservation for other species or ecosystems. In general, respondents accept temporal or spatial restrictions necessary for conservation objectives, and would also visit the national park in the future. Only a minority of respondents would spend their holidays at other locations or even change their activities. Table 4 presents the respondents perception towards restrictions of access to (areas of) the national park necessary for conservation purposes.

Table 3: Statements regarding the payment for nature conservation programs

	Points (mean)
<i>Question 21</i>	
My income is too small for a contribution	2.91
Nature conservation should be financed publicly	3.05
I would like to await others' contributions	3.80
I already pay too much taxes	3.14
I would like to donate to other programs	3.74
Nature conservation is not that much worth to me	3.72
<i>Question 22</i>	
Nature conservation is important regardless the cost	2.14
I have not thought about my willingness-to-pay before	2.23
I would be willing to pay even if a majority would'nt	2.73
I talk much about nature conservation with friends/family	3.11

Source: Visitors' survey in Tatra national park; own calculations.

nal park is "the right to exist" (existence motive) with 33% of respondents; in order to conserve natu-

re for their children (bequest motive), 27% of respondents are WTP. The option value (personal benefit in the future) is the main motive of 18% of respondents. (For the rest of respondents' answers, no differentiation is available.)

Table 4: Preferences regarding temporal or spatial restrictions of access to the park, and substitutes for national park activities

	Points (mean)
I would visit the national park	2.75
I accept temporal/spatial restrictions	1.93
I would not visit the national park any more	4.12
I would choose another area for hiking	3.54
I would spend my holidays in another location	3.75
I would spend my holidays abroad	3.87

Source: Visitors' survey in Tatra national park; own calculations.

The individual WTP-figures elicited in the visitors' survey have to be aggregated to account for the wil-

The main motive for respondents to express a willingness-to-pay (WTP) for the financing of the natio-

lingness-to-pay for the existence, option and bequest values (non-use values) of the Tatra national park by the whole population of Poland. However, this is not an easy task since there are many uncertainties involved. In particular, an aggregation has to take into account the following aspects:

- Visiting the national park and/or willing to pay for conservation programs depends on available substitutes. If there are other protected areas in Poland, willingness to pay would be lower than if the Tatra national park is considered to be unique. In the current case of the Tatra national park, it is arguable that the Polish population considers this park as unique (highest mountain in Poland, alpine landscape otherwise non-existing).
- Usually, willingness to pay for non-use decreases with the distance to the park. Residents from areas more close to the park value the protected area higher than those living far away. In the current study, there is no significant correlation between the distance or travel time, and the willingness-to-pay of visitors.
- Average income of respondents in the survey was close to EUR 830 per month. This figure is rather close to the Polish average GDP of roughly EUR 1,030 per month (measured in PPP); in EUR, based on actual exchange rates, per-capita income is about EUR 600. The respondents of the survey therefore may have an income slightly above average. Adapted to the lower income level, WTP per respondent, based on the Polish average income, can be assumed to be about EUR 9.9 per person.

Based on these considerations, and given a Polish population (aged 14 or higher) of 21.9m, we may calculate the non-use values of Tatra national park for the Polish economy to amount 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, we can calculate a range 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.

Breaking down this number to the motives of visitors willing to pay, we arrive at 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.

2.3.5 Socio-economics of respondents

A final brief section of the questionnaire dealt with socio-economic characteristics of 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 for differences in socio-economic attributes, these data are crucial (this working step is beyond the scope of the current study). However, without describing in detail the group of respondents, Table 5 presents summary statistics of these attributes.

Table 5: Socio-economics of respondents (Tatra national park)

Gender	
Female	52%
Male	48%
Age of respondent (mean)	33.86
Number of persons in the household (mean)	3.18
Number of children in the household (mean)	1.05
Education	
Fundamental school	6%
High School	42%
University	52%
Profession	
Student	28%
Housewife/-man	3%
Looking for job	4%
Retired	7%
Manual worker	8%
White-collar worker	41%
Civil servant	2%
Self-employed	7%
Income	
Below 500EUR	23%
500-750EUR	32%
750-1000EUR	13%
1000-1250EUR	14%
1250-1500	5%
Over 1500EUR	13%

Source: Visitors' survey in Tatra national park; own calculations.

3 Valuation of ecosystem services in Slovensky Raj national park (Slovakia)

3.1 Short description of the study site

Slovensky Raj (Slovak Paradise) national park is located near the town of Poprad, in the central part of Slovakia, about 100 km from Kosice and about 340 km from the Slovak capital of Bratislava (all information and data from the Slovensky Raj national park management, 2009). The national park with an elevation above sea level from 500 to 1,700 meters is also rather close to the Tatra national park along the border between Poland and Slovakia. The national park comprises a total area of 19,753 hectares of core zone, and a buffer (conservation) zone of 13,011 hectares.

The area has a rather long history in terms of nature conservation. While named "Slovensky Raj" already in 1923, in 1931, forestry was limited on certain areas in the future park. In 1964, the area was conserved as a landscape conservation area, and in 1988, a national park was established. Currently (2009), authorities are discussing the possibilities for IUCN acknowledgment of the park according to category II. The area is also designated partially (with overlaps with the national park and other areas) as a Natura 2000 site (Habitat Directive).

One of the most important landscape elements in the Slovensky raj national parks are gorges and caves. The most significant is the Stratena jaskyna cave system with the longest cave of Slovakia (length of 18.5 kms), the Psie diery and the Dobsinska Ice Caves. In total, the park includes 177 caves. Moreover, many gorges such as Podlesok and Sucha Bela, attract visitors (up to 800,000 per year). The park is exceptionally rich in species (wolf, lynx, bear) and habitat diversity, which led to the inclusion in the Natura 2000 network as a Site of Community Interest.

About 50% of the land is owned by the state, 20% by municipalities/towns, 20% by the church, and the rest by other private land owners.

3.2 Ecosystem services and money values

3.2.1 Forest products and ecosystem services

The Slovensky Raj national park is not only rich in terms of biodiversity, but also provides a broad range of ecosystem services, mainly in terms of forestry, water provision, and recreation to visitors. In the following, the different ecosystem goods and services are discussed and valued accordingly. Basically, the unit money values presented above in section 2.2 for the Tatra national park will also be used in an adapted form to mirror specifics of the Slovensky Raj national park and the Slovak economy.

Timber

The production of timber (1.1.1, timber, see Table 1, page 5) is certainly a major eco-system service of Slovensky Raj national park. While according to IUCN category II, (commercial) forestry (even if sustainable) is allowed only for purposes of ecological management (e.g. change of composition of tree species), the Slovensky Raj national park produces timber for the state-owned forest company on an area of about 8,000 hectares. About 40% of timber extraction is due to windfall or prevention of bark beetle infection, the larger share of timber is commercially logged. The national park management (administration) does not receive any revenues out of timber production.

There are currently no official statistics about the harvesting of timber in the national park. However, the annual average increase of timber in forests in Central Europe can be assumed to amount to 4.3 up to 7.8 m³ per hectare, depending on the ecosystem, kind of forestry, and tree species. Harvesting is currently about 1.8 to 4.3 m³ per hectare. For Slovakia, these figures are comparable. Total annual harvesting of timber for round-wood production amounts to 5,312m m³ (2003) on a total forest area of 2,177 hectares; timber production therefore is likely around 2.44 m³ per hectare which seems to be a reasonable approximation (all data: World Resources Institute, 2009). Europe-wide, average harvesting is around 0.50 m³ per hectare. More recent data suggests that logging increased up to 10,214m m³ (2005), suggesting an average logging of 4.69m³ per hectare and year in Slovakia (Šulek, 2006). The harvesting of timber, of course, depends not only on tree growth, tree species, climate, etc., but also on harvesting costs as well as timber prices for the different wood products.

As an approximation, we can assume that average harvesting amounts to around 2.44 up to 4.69 m³ per hectare also in Slovensky Raj national park, with a mean value of 3.57 m³ per hectare. At the moment, international timber prices are at the minimum EUR 30 per m³, depending on quality and future use of timber, up to EUR 40 per m³ (Šulek, 2006). 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. Timber prices net of harvesting costs may amount to EUR 10 per m³ (Vysoky, 2009). However, due to recent thunder storms in Central Europe, and subsequent windfall, timber prices fell in 2008 and 2009.

Combining the forest area of about 8,000 hectares with the average harvest of timber in Slovakia, the annual timber harvest can be approximated by about 28,520 m³ per year. Given a conservative estimate (mean value of timber prices) of EUR 30 per m³, the annual revenue of timber production can be estimated to amount to roughly EUR 855,600 (lower bound: EUR 285,200 (EUR 10 per m³); upper bound EUR 1.426m (EUR 50 per m³)).

Non-timber forest products

Regarding non-timber forest products (1.1.2, mushrooms, berries), there are certainly some visitors who take out/collect such products. However, there are no statistical data to derive any order of magnitude how much visitors collect in Slovensky Raj national park. Anyway, personal experience of the national park administration staff suggests that the collection of non-timber forest products by visitors only plays a very minor role in the whole range of ecosystem services.

Water provision, water supply

Water protection and water provision (1.1.3) plays an important role in Slovensky Raj national park. Several large springs support the water supply of adjacent municipalities which, taken all together, include close to 75,000 residents. Specific water consumption per household is estimated at the minimum to amount to 80 liters per day and person (Kriš and Škultétyová, 2009; cf. also Tóthová and Mahríková, 2006). Given the total number of residents and assuming that the majority is – in one way or the other – depending on the securing of water supply in the Slovensky Raj national park, we end up with an annual specific water consumption of households

in the national park region of 2.19m³ at the lower bound (actual water consumption of households might be higher; water for agricultural or commercial uses are not counted here due to lack of data). However, water supply for the majority of residents in the area is not provided by Slovensky Raj national park, but by sources from Tatra national park (SK). If we therefore reasonably assume, that only 30% of residents are supplied by water from Slovensky Raj national park, the ecosystems of the park annually provide 0.657m³ of fresh water. Given a mean consumption of 160 liters per day and person, the park may provide up to 1.314m³ of fresh water per year.

Combining the annual water supply with actual water prices of EUR 0.95 per m³, the value of the ecosystem service of drinking water supply is – at the lower bound – about EUR 624,000 per year (upper bound EUR 1m given a water price of EUR 1.5 per m³).

The estimation made above can also be compared to a survey by the Slovensky Raj national park authority (2009). According to this survey, the ecosystem provides 1.094m³ from underground sources (springs) and 0.243m³ from ground sources (creeks), summing up to an amount that is close to the calculation of total water use given 160 liters per person and day. In 2008 the water price was EUR 1.10 per m³ in Spisska Nova Ves, and increased to EUR 1.129 per m³ in 2009.

All in all, we therefore arrive at a reasonable level of water provision services of Slovensky Raj national park of EUR 1.48m per year (assuming a relevant water consumption provided by the park of 1.314m³ and a price of EUR 1.1 per m³). The lower bound amounts to EUR 0.624m (water provision of 0.657m³; water price of EUR 0.95 per m³), the upper bound is EUR 1.971m (water provision of 1.314m³ and a water price of EUR 1.5 per m³).

Water retention, flood protection

The Slovensky Raj national park, though partially used for forestry, is an important area for retaining water runoff (1.1.4). In order to value the function of water retention and flood protection (together with erosion control), there are no primary studies for Slovensky Raj national park available that would quantify the amounts of water retained, or increased amounts of water running off if the national park would be managed in another way (such as clear-cutting).

The approach to the valuation of water retention in the national park is equal to the one presented above in section 2.2.1 for the Tatra national park. 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 by EUR 54 per hectare.

About half of the area of Slovensky Raj is used for forestry, while the other half constitutes the core zone of the national park (including the strict conservation zone). It is therefore reasonable to assume that the area of forestry only provides functions of water retention of 40% of untouched forests (Ceroni, 2007). About 8,000 hectares are valued by EUR 22 per hectare, while the rest of approximately 11,700 hectares in the national park can be valued by EUR 54 per hectare. Taking these figures together, the value of water retention (including erosion control) can be calculated to amount to EUR 807,800 per year. Given the lower EU27 value of EUR 45 per hectare (transferred to Slovak GDP levels: EUR 29 per hectare), the value of water retention services amounts to EUR 455,300 per year; the upper bound amounts to EUR 1.068m per year (basic EU27 value of EUR 107 per hectare, transferred to Slovak income levels: EUR 68 per hectare).

Carbon sink, carbon sequestration

Following the valuation approach described in section 2.2.1 for the Tatra national park, it is assumed that the carbon sequestration can also be based on respective values. However, in the case of Slovensky Raj national park, net carbon sequestration may only be relevant on areas where no forestry takes place. The harvesting on major parts of the national park (about 8,000 hectares) is presumably at the upper bound of sustainable forestry which would approach the regenerating capacity.³⁾ Therefore, carbon sequestration is considered as an important ecosystem service at the areas of the core and strict conservation zones, totaling 11,700 hectares.

Given the Slovak GDP differential, and again assuming a reasonable valuation of carbon sequestration of EUR 12 for Europe, the equivalent money value for Slovakia amounts to EUR 7.7 per hectare. For the whole area of 11,700 hectares, the value of the ecosystem service of carbon sequestration would come up to about EUR 90,090 per year. The lower bound with a transferred value of EUR 4.48 (EU27 value of EUR 7 per hectare) lies in the range of EUR

52,000 per year. The upper bound amounts to EUR 224,640 per year (EUR 30 per hectare and year, transferred value: EUR 19.2). The value of carbon sequestration would be increased if forestry was stopped completely in the national park.

Erosion control

Erosion control (1.1.6) was again included in the valuation of water retention and flood control above (ecosystem service 1.1.4).

Medicinal resources

The ecosystems in Slovensky Raj national park certainly include many rare species of plants and animals, which led to the declaration of a Natura 2000 site. However, due to the lack of data on medicinal resources (ecosystem service 1.1.7), there might exist some important medicinal resources but they cannot be valued in the current study.

3.2.2 Agriculture and ecosystem services

Cattle, grazing

Due to the large areas of forests with only very few pastures and meadows, there is no cattle grazing (1.2.1) in the national park that is worth noting.

Grains, food production

There is no food production (grains) located within the national park (1.2.2).

3.2.3 Fishing

In Slovensky Raj national park, fishing is based on few licenses that are handed to local fishermen (ecosystem service 1.3). About 150 licenses are issued every year. For fishing, fishermen have to become member to a fishing association with an enrolment fee of about EUR 3.30 and an annual fee of up to EUR 10; in addition, an official fishing ticket has to be purchased at a price of EUR 1. Summing up, fishermen pay in total about EUR 15 per fishing license and year (cf. Hensel, no year). While travel costs are unknown for fishermen, the price they pay for their annual license indicates the lower bound of value of recreational fishing; combined with the

number of annual licenses, recreational fishing can be valued at least by the fees paid for these licenses. Recreational fishing therefore can be valued at the minimum at EUR 2,250 per year and therefore plays only a very minor role given the other significant ecosystem benefits.

3.2.4 Hunting

In Slovensky Raj national park, hunting is allowed based on permit (ecosystem service 1.4). About 120 hunters are registered.

No information on the price of hunting licenses, the Slovak hunting tax or the trophy fees could be collected for Slovensky Raj national park. We therefore have to leave out the value of hunting services provided by the national park in the assessment.

3.3 Recreation and existence values of visitors

3.3.1 Introduction

As with the valuation of ecosystem services referring to recreation and national park policies (1.5) as well as biodiversity values (e.g. existence, 1.7) in Tatra national park (Poland), a visitor survey was carried out in Slovensky Raj national park in August 2009.

Annually, about 600,000 to 800,000 tourists visit the area per year (Slovensky Raj national park administration, 2009). In order to hike through the gorges, the land owner (state) provides marked trails, bridges and ladders. About 300,000 visitors use these facilities and pay a user fee that amounts to EUR 1.50 per person (for adults). In the last years, about EUR 250,000 were collected from use fees which are transferred to the local municipalities (the national park administration is not funded out of these user fees).

The main tourist attractions are Dobsinka Ice Cave, Podlesok and Such Bela gorges, and Cingov. The park has four main entry points (2 in the North, 2 in the South). There are a number of restaurants and accommodation around the park, with two restaurants in the central national park area.

Regarding cultural values, there is not that much to be seen in Slovensky Raj national park, there is one major ruin of an ancient monastery.

The total sample of the visitors' survey included 125 filled-in questionnaires from visitors from Slovakia (99), Poland (17), and other tourists (9).

3.3.2 General questions regarding environmental values and the national park visit

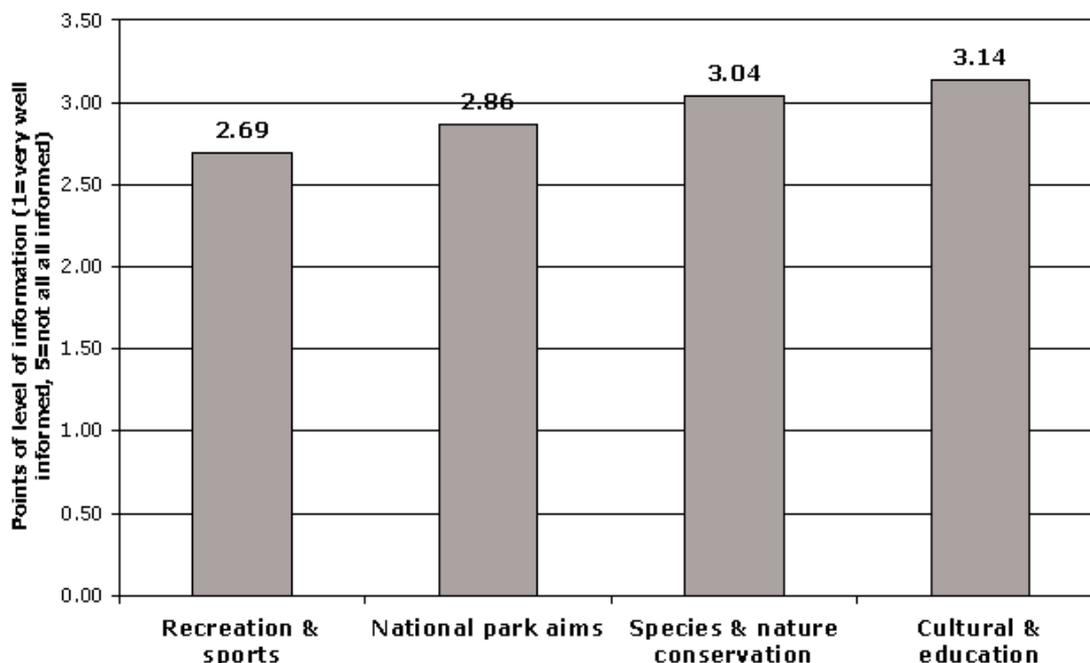
The questionnaire distributed during August 2009 in the Slovensky Raj national park – reprinted in the Appendix beginning at page 50 – first dealt with a block of questions regarding visitors' engagement and information on biodiversity in general, and national park aims and policies in particular, similar to the questionnaire distributed in Tatra national park.

A significant share of the respondents (17%, 21 questionnaires) stated to be members of conservation or environmental organizations. 14% (18) of respondents declared themselves as being regular donors to such organizations with a mean of about EUR 34 per year (standard deviation EUR 30.4; of the sample, 16 respondents answered this question regarding donations to environmental organizations). The information level of respondents regarding the definition of "biodiversity" seems to be comparatively high. 45% of respondents (56 questionnaires) have detailed knowledge about the biodiversity definition of the United Nations ("diversity of genes, species (animals, plants), ecosystems and landscapes"), while 30% have heard the definition without detailed knowledge. The presented definition is new to about 24% of respondents.

Furthermore, respondents also state quite high information levels regarding different aspects of the national park. On average, respondents indicate information levels about the national park of 2.86 points, about species and nature conservation programs of 3.04 points, recreation activities and possibilities of 2.69, and cultural and education offers of the national park of 3.14 points (Figure 7). These results indicate a major difference between the perception of the Slovensky Raj national park compared to the one in the Polish Tatra mountains. It seems as if the Slovensky Raj region is perceived as an area for recreation activities and sports to a larger extent; the Tatra national park therefore is considered more of a traditional national park. The assessed level of information suggests 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 aims are

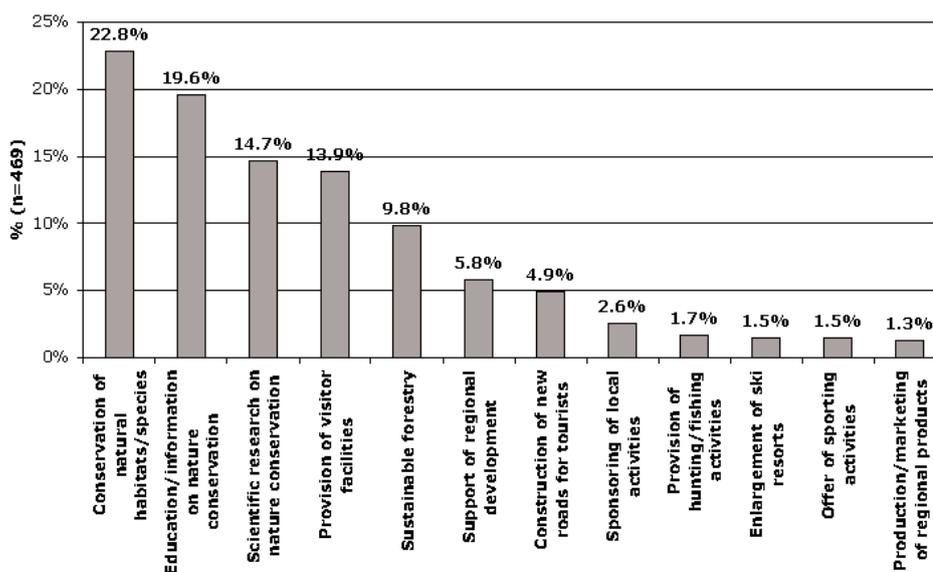
at least known to 40% of respondents. Otherwise, about 35% of respondents indicated that they are “not well” or “not at all” informed.

Figure 7: Self-assessed information level of respondents regarding national park policies and offers



Source: Visitors’ survey in Slovensky Raj national park; own calculations.

Figure 8: National park aims considered most important



Source: Visitors’ survey in Slovensky Raj national park; own calculations.

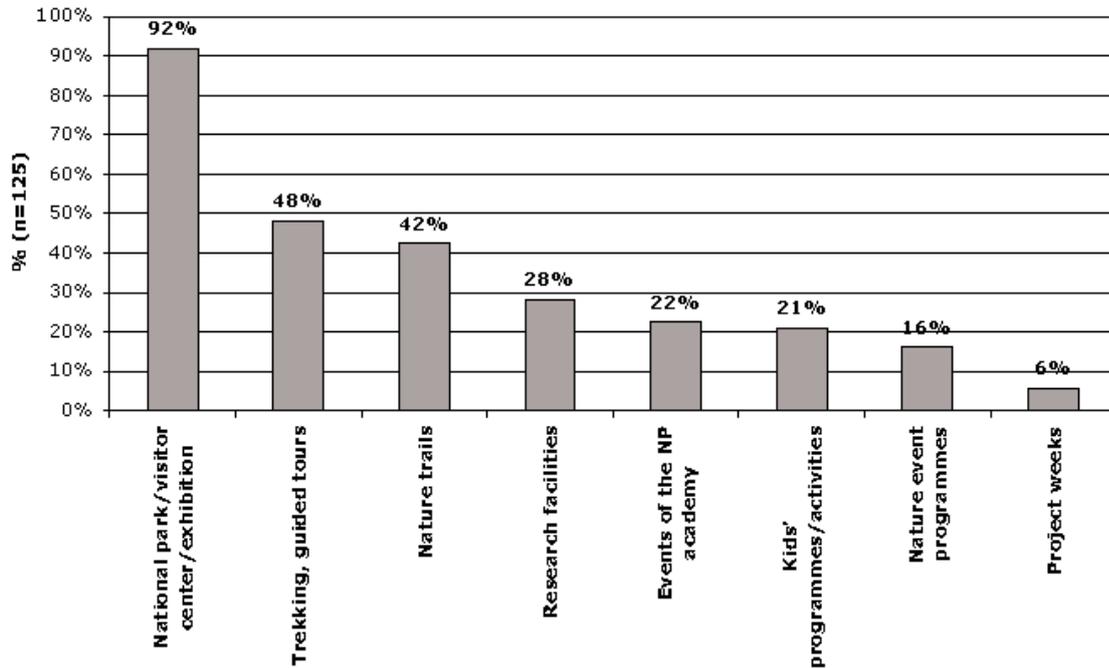
It is of crucial importance for the national park management that tourists (visitors) have some basic knowledge about national park aims and goals.

Respondents were therefore also asked to choose four items out of 12 of which they think that these would be the most important national park aims. As Figure 8 suggests, some of the items considered to be most important are not specified in the IUCN national park aims. However, the four main aims of the national park are also named by respondents as the most important aims. Interestingly, some visitors would wish that the national park should concentrate on the construction of roads and sustainable forestry – aims that are fundamentally contradictory to these “official” aims. This result suggests that information policies of the national park could be sharpened in this respect. Nevertheless, it seems that visitors have a rather clear picture of national park aims.

Regarding the actual (current) visit to the national park, the majority of visitors said that they have visited the national park more than four times (32%). Only a minority (24%) stated that the current visit would be the first one. The duration of the current stay is on average about 5.51 days (standard deviation 3.5 days).

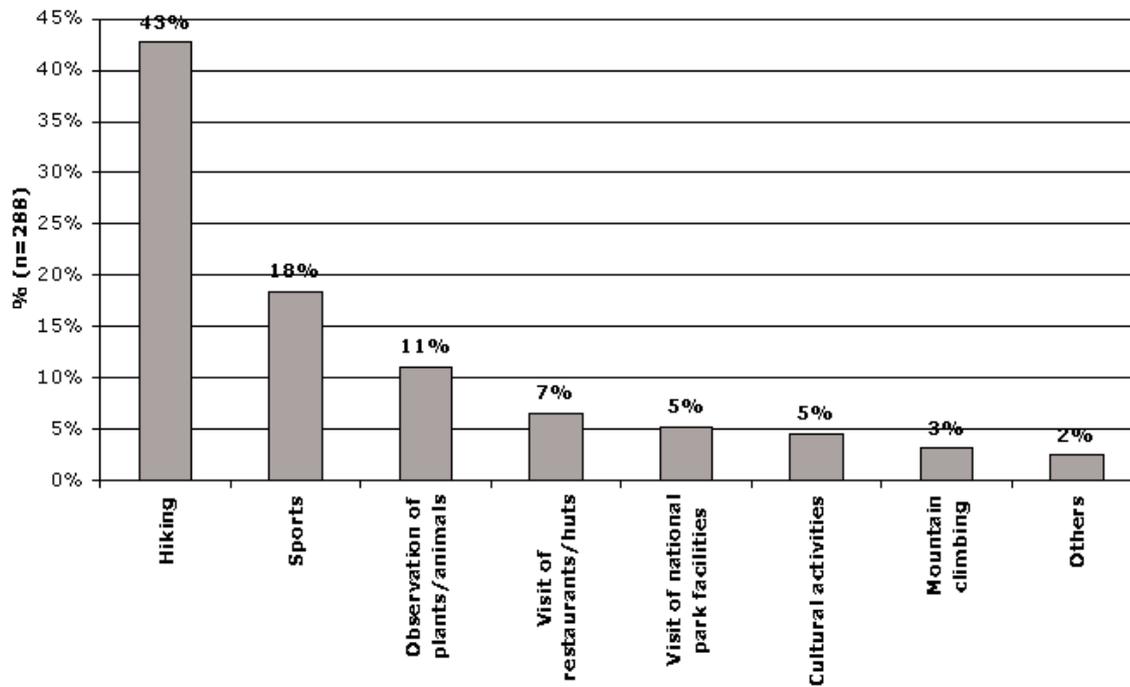
The national park offers a range of facilities for visitors. Most popular are the national park facilities (e.g. center, exhibition), nature trails and guided tours, while nature event programmes are not experienced by many visitors (Figure 9). The main activities in the national park are certainly “typical” activities of visitors in national parks such as hiking and the observation of plants/animals. All kinds of sports are major activities as well. However, some of these activities can also be done at other places and do not necessarily take place in protected areas (see Figure 10), for instance, for parts of hiking, and going to restaurants, there are certainly substitutes in other areas available.

Figure 9: National park facilities used by visitors



Source: Visitors' survey in Slovensky Raj national park; own calculations.

Figure 10: Main activities of visitors in the national park



Source: Visitors' survey in Slovensky Raj national park; own calculations.

3.3.3 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.

Respondents in the current survey exhibited visiting motives that are rather closely connected to the establishment of the national park. 73% stated that they came solely for the purpose to see the national park, while another 11% came by based on 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%.

7% of visitors are travelling alone, while 39% are travelling with partners, family (29%) or friends (24%). Organized tours have only minor importance. Groups include on average about 3.8 persons (standard deviation 3.8 persons). The most important transport mode is the private car (87%), 9% travelled by train, followed by bus (1%). On average, the journey to the national park took 5.48 hours (standard deviation 4.1 hours); the park is on average about 370 kilometers (standard deviation about 357 kms) away from the home of the respondents.

Measuring travel costs was done in the questionnaire by asking visitors regarding their expenses per day for certain expenditure categories. In total, visitors spend on average about EUR 54.1 per day and person during their visit of the national park (standard deviation EUR 81.6, median value EUR 28). The 90% confidence interval lies between EUR 41.2 and EUR 66.9. Table 6 presents the details of expenditure categories suggesting that most money is spent on accommodation, sporting activities, and meals (see above, section 3.3.2). Taking 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 or the other during “normal” life or in other tourist destinations –, visitor spending amounts to EUR 11 per day and visitor (standard deviation EUR 13; 90% confidence interval EUR 8.4 to EUR 13.6).

Table 6: Travel cost (expenditure categories) of visitors per day (in EUR)

Expenditure category	Mean	standard deviation
Accommodation	11.8	16.2
Sports	11.3	21.6
Others	8.6	11.2
Meals	8.3	12.8
Transport	4.6	6.6
Museums	3.4	2.6
Shopping	3.1	3.2
Entrance fee	3.0	3.7
Total	54.1	81.6

Source: Visitors' survey in Slovensky Raj national park; own calculations.

Total spending per visit and per person is computed based on mean travel costs (EUR 54.1 with a lower and upper bound according to the confidence interval; resp. EUR 11, see above), assuming that only those visitors who solely come for the purpose of visiting the national park, and staying on average 5.51 days in the region. Therefore, we can estimate total expenditure of an average amount of EUR 217.6 per person and stay (with a lower bound of EUR 165.2 and an upper bound of EUR 269.1).

For assessing the potential economic significance of the park for the region, a further question asked where visitors stay overnight. While only 13% of visitors only stayed for the day, the rest used accommodation close to the national park, in particular in the communities of Podlesok (23%), Hrabusice (18%), Dedinky (4%) and Congov (3%).

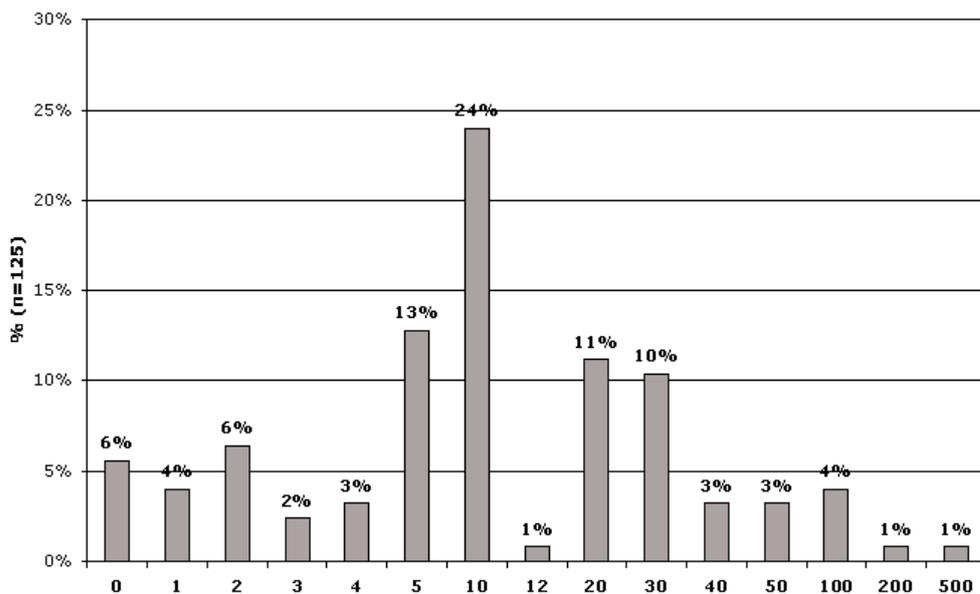
The total number of visitors in Slovensky Raj national park amounts to 600,000 to 800,000 visitors per year. In the following, we assume an average number of visitors per year of 700,000 to simplify the presentation of results, taking the lower and the upper number of visitors to mirror the lower and upper boundaries of recreation values of the national park.

The resulting total annual recreation values therefore amount to EUR 152m as a reasonable mean value, with a lower bound of EUR 99m and an upper bound of EUR 215m. Taking only transport costs, the reasonable mean value amounts to EUR 31m (lower bound: EUR 20m; upper bound: EUR 44m).

3.3.4 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, and to facilitate the comparison between Tatra and Slovensky Raj 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-marked payment. The question also explained that the funds provided by the government are unsecure, and that citizens had to pay directly for national park policies. Respondents were also warned that their stated WTP bids were on top of their expenses during the visit.

Figure 11: Distribution of WTP bids of respondents



Source: Visitors' survey in Slovensky Raj national park; own calculations.

On average, 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. Figure 11 shows the distribution of WTP bids elicited by the payment card (range from "Nothing" to "EUR 500").

Regarding the motives for payments, and the financing of conservation activities in particular, the questionnaire included a range of statements which the respondent was asked to value on a 5-point scale (1="agree fully" to 5="reject completely").

The first debriefing question dealt with respondents who stated that they have no WTP for conservation policies, in order to find out whether the answer of Zero WTP involved preferences or was due to protest bids. Table 7 summarizes two questions of the questionnaire eliciting such preferences or perceptions.

The results presented in Table 7 highlight that most of respondents exhibit reasonable preferences regarding payments and financing, the rate of protest bids – respondents that reject the payments right away without deeper reasoning – is rather low. Mainly, respondents stated that their income would be too small to afford additional expenses, or that they would already pay too much tax. The strongest sup-

port was stated for the statement that nature conservation should be financed publicly.

Besides questions of financing, general preferences toward species conservation are very strong. For

instance, strong agreement was indicated by respondents to the statement that nature and species conservation is important regardless the cost; however, respondents are generally not very familiar with valuation of environmental services but that they have thought about how much their willingness-to-pay would be.

Table 7: Statements regarding the payment for nature conservation programs

	Points (mean)
<i>Question 21</i>	
My income is too small for a contribution	3.15
Nature conservation should be financed publicly	2.21
I would like to await others' contributions	4.07
I already pay too much taxes	3.18
I would like to donate to other programs	3.72
Nature conservation is not that much worth to me	4.18
<i>Question 22</i>	
Nature conservation is important regardless the cost	2.26
I have not thought about my willingness-to-pay before	2.41
I would be willing to pay even if a majority would'nt	2.59
I talk much about nature conservation with friends/family	2.49

Source: Visitors' survey in Slovensky Raj national park; own calculations.

Table 8: Preferences regarding temporal or spatial restrictions of access to the park, and substitutes for national park activities

	Points (mean)
I would visit the national park	2.47
I accept temporal/spatial restrictions	1.79
I would not visit the national park any more	4.37
I would choose another area for hiking	3.45
I would spend my holi days in another location	4.24
I would spend my holi days abroad	3.97

Source: Visitors' survey in Slovensky Raj national park; own calculations.

When eliciting WTP from respondents, it is also important whether respondents thought of substitutes for their visit. If they perceive other areas to be adequate substitutes to Slovensky Raj national park, their WTP might be lower even if they hold strong preferences while they would just prefer to donate to nature conservation for other species or ecosystems. In general, respondents accept temporal or spatial restrictions necessary for conservation objectives, and would also visit the national park in the future. Only a minority of respondents would spend their holidays at other locations or even change their activities. Table 8 presents the respondents' perception towards restrictions of access to (areas of) the national park necessary for conservation purposes. It is interesting, though, that the acceptance of restriction of access is higher than in Tatra national park (PL), and that visitors perceive recreation in Slovensky Raj national park as being rather unique, without many substitutes of staying in another holiday resort.

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 18% of respondents; in order to conserve nature for their children (bequest motive), 59% 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 8% of respondents.

The individual WTP-figures elicited in the visitors' survey have to be aggregated to account for the willingness-to-pay for the existence, option and bequest values (non-use values) of the Slovensky Raj national park by the whole population of Slovakia. However, this is not an easy task since there are many uncertainties involved. In particular, an aggregation has to take into account the following aspects:

- * Visiting the national park and/or willing to pay for conservation programs depends on available substitutes. If there are other protected areas in Slovakia, willingness to pay would be lower than if the Slovensky Raj national park is considered to be unique. In the current case of the Slovensky Raj national park, it is arguable that the Slovakian population considers this park as unique (as the name suggests, "Slovak Paradise", the national park is considered to be unique at least in terms of recreation and biodiversity conservation).
- * Usually, willingness to pay for non-use decreases with the distance to the park. Residents from areas more close to the park value the protected

area higher than those living far away. In the current case, there was no significant correlation between distance and duration of travel, and the visitor's willingness-to-pay.

- * Average net income of respondents in the survey was EUR 923 per month. This figure is rather close to the Slovak average GDP per capita of roughly EUR 1,240 per month (measured in PPP); in EUR per-capita income is about EUR 690. The respondents of the survey therefore may have an income slightly above average, in particular taking into account that they stated net income. Adapted to the lower income level, WTP per respondent, based on the Slovak average income, can be assumed to be about EUR 17 per person.

Based on these considerations, and assuming a Slovak population (aged 14 or higher) of 4.5m, the reasonable mean non-use values of the Slovensky Raj national park can be approximated to amount to EUR 76.5m (lower bound: EUR 54m; upper bound: EUR 122m).

Breaking down this number to the motives of visitors willing to pay and taking the reasonable mean value, we arrive at 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.

3.3.5 Socio-economics of respondents

A final brief section of the questionnaire dealt with socio-economic characteristics of 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 for differences in socio-economic attributes, these data are crucial. However, without describing in detail the group of respondents, Table 9 presents summary statistics of these attributes.

Table 9: Socio-economics of respondents (Slovensky Raj national park)

inherently anthropocentric concept – and therefore includes values that are solely based on values attri-

Gender	
Female	51%
Male	49%
Age of respondent (mean)	36,88
Number of persons in the household (mean)	3,25
Number of children in the household (mean)	0,97
Education	
Fundamental school	4%
High School	36%
University	57%
Profession	
Student	19%
Housewife/-man	1%
Looking for job	2%
Retired	9%
Manual worker	15%
White-collar worker	32%
Civil servant	12%
Self-employed	2%
Income	
Below 500EUR	21%
500-750EUR	17%
750-1000EUR	19%
1000-1250EUR	11%
1250-1500	7%
Over 1500EUR	15%

Source: Visitors’ survey in Slovensky Raj national park; own calculations.

buted 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.

4 Summary, conclusions and recommendations: Total Economic Value of Tatra and Slovensky Raj national parks

This reasoning is also valid for the two national parks considered in the current study. Both provide important ecosystem services for the national economy, both in terms of use as well as non-use values. Interestingly, ecosystem services in the narrow sense (e.g. timber production, water provision, erosion control) are not important on a national level but, of course, provide important benefits for the local population.

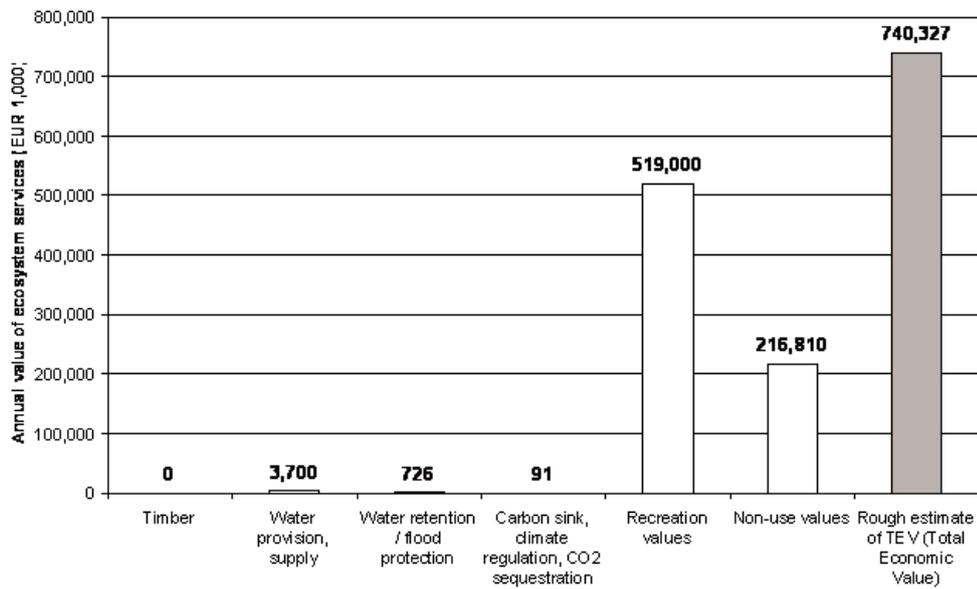
The economic valuation of ecosystem services (natural and cultural heritage) is based on the conceptual notion that a national park consists of natural capital that provides services to people. It is an

Table 10: Values for ecosystem services provided by Tatra (PL) and Slovensky Raj (SK) national parks

	Tatra national park (Poland)			Slovensky Raj national park (Slovakia)		
	Lower bound of value	Reasonable mean value (in tda, EUR, per year)	Upper bound of value	Lower bound of value	Reasonable mean value (in tda, EUR, per year)	Upper bound of value
1.1 Forest products						
1.1.1 Timber	0	0	0	285	856	1,426
1.1.2 Non-timber products	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1.1.3 Water provision, supply	2,585	3,700	5,280	624	1,480	1,971
1.1.4 Water retention / flood protection	363	726	862	455	808	1,068
1.1.5 Carbon sink, climate regulation, CO2 sequestration	56	91	240	52	90	224
1.1.6 Erosion control		see 1.1.4				
1.1.7 Medicinal resources	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
12 Agricultural products						
12.1 Cattle, grazing	0	0	0	0	0	0
12.2 Grains, food production	0	0	0	0	0	0
13 Fishing	0	0	0	2	2	n.a.
14 Hunting	0	0	0	n.a.	n.a.	n.a.
14 Recreation values	435,000	519,000	601,000	99,431	152,325	215,273
15 Recreation (Transport costs, entry fee, museum)	18,000	21,000	24,000	20,272	30,972	43,763
Rough estimate of use values	438,004	523,517	607,382	100,849	155,561	219,962
17 Biodiversity conservation values						
17.1 Existence values	65,971	92,100	119,410	11,250	15,938	25,417
17.2 Option / quasi-option values	35,027	48,900	63,400	5,000	7,083	11,296
17.3 Bequest values	54,302	75,810	98,290	37,750	53,479	85,287
18 Cultural values	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Non-use values	155,300	216,810	281,100	54,000	76,500	122,000
Rough estimate of TEV (Total Economic Value)	593,304	740,327	888,482	154,849	232,061	341,962

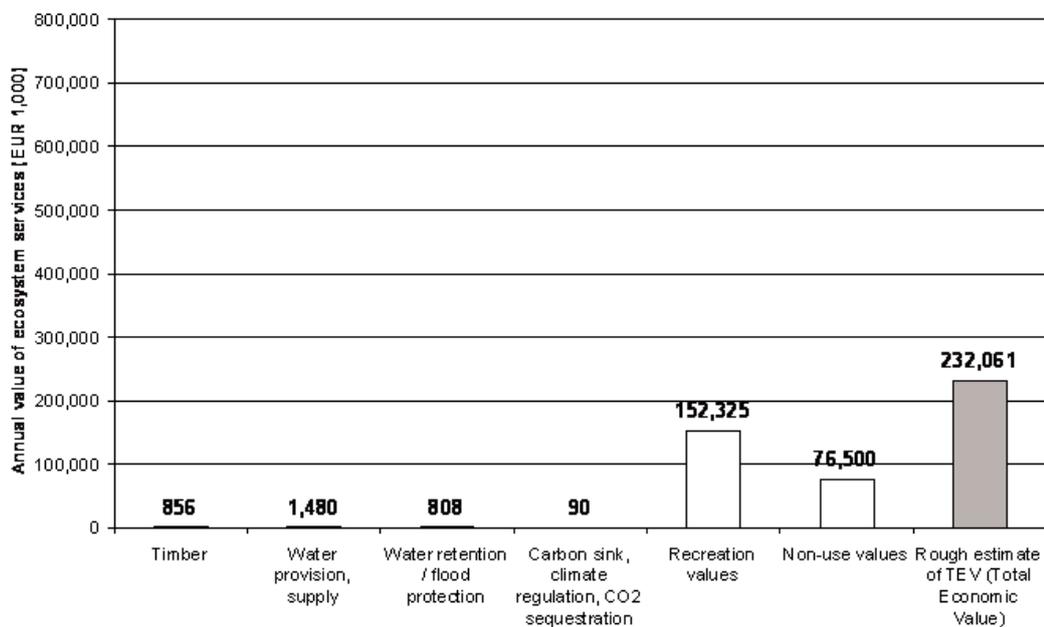
Source: own calculations.

Figure 12: Valuation of ecosystem services of Tatra national park (PL) (EUR 1,000, annual values)



Source: own calculations.

Figure 13: Valuation of ecosystem services of Slovensky Raj national park (SK) (EUR 1,000, annual values)



Source: own calculations.

Tatra national park (PL) provides in total around EUR 742m per year (potential range from EUR 593m to 888m). Most important are recreation benefits by about 2m visitors per year. Due to the long average stay of visitors in the region (over 7 days), visitors spend more than EUR 200 per person and stay. Recreation benefits amount to around EUR 523m (reasonable mean value), while non-use values are comparatively small with EUR 217m. This lower amount stems from the rather moderate willingness-to-pay of visitors of roughly EUR 9 per person an year for sustaining ecosystem benefits of the national park. However, while recreation benefits accrue to 2m visitors per year, non-use values benefit the whole population of Poland of over 26m people. Benefits to local residents are small and have a lower value compared to other aggregated benefits while they are, of course, vital to the adjacent municipalities (e.g. water provision, erosion control). Figure 12 presents a graphical overview of the importance of the different eco-system services in money terms.

Slovensky Raj national park (SK) provides somewhat smaller benefits to the Slovakian economy compared to the ones provided by Tatra national park (PL). The valuation of ecosystem service amounts to around EUR 232m (range from EUR 155m to 342m). This is due to the fact that the ecosystem services are different, but also because fewer people enjoy these benefits. For instance, while expenditure per day of visitors is in the same order of magnitude (around EUR 50), the number of days of stay and the number of visitors per year is significantly smaller. Again, willingness-to-pay ranges again around EUR 10 to 15, but the Slovak population is smaller compared to Poland's. On the other hand, Slovensky Raj provides more ecosystem services in the form of timber production, but less in terms of water provision, carbon retention and erosion control (cf. Figure 13).

All in all, the establishment of both national parks bears an eminent importance to the national economies. The results of the study show that the funds devoted to the administration and management of the parks are fully justified on economic grounds due to the manifold ecosystem services provided by the protected areas and which are specific to national parks.

- 1) There are numerous studies and paramount literature available regarding the valuation of ecosystem services, from single species to landscapes. It is not the task of the current study to review the literature as reviews are also published. For instance, Ninan (2009) presents a broad overview of valuing ecosystem services in the different contexts (see also, e.g., Markussen et al., 2003; Farber et al., 2002; Nunes et al., 2003).
- 2) This only refers to the timber products for commercial use. Water retention and purification, carbon sequestration, and the non-use values of providing habitats to important species, are dealt with in the sections below.
- 3) The net carbon sink of reducing or stopping forestry in the area also depends – at least in a time perspective – on the ways the harvests timber is used. For long-term use such as furniture or construction materials, the carbon emission is extended over a long period of time while using the timber for energy production certainly emits the carbon quickly.

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DISCLAIMER

This report was written based on good scientific conduct with the latest methodo-logical approaches available. All data sources have been indicated properly. However, the author cannot guarantee flawlessness of all data and results presented in here. Therefore, no claims can be accepted that may stem from the use of the results. The copyright of the report lies with the author, copying or using the report requires written approval by the author.

The conclusions and opinions presented in this report do not necessarily represent those of Klagenfurt University or WWF DCP.

Appendices to Part 1

(Due to software incompatibilities it was not possible to present all questionnaires in an identical layout. Publishers remark)

A1: Visitor questionnaire (English version)

Survey „Species and nature conservation in the Tatra National Park“

WWF (World Fund for Nature) and Tatra National Park 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 for nature conservation on a regular basis? Yes No
If yes: How much do you donate per year?
 Approx. _____ Zlt. 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 1 2 3 4 5
- ...Species and nature conservation programmes of the national park 1 2 3 4 5
- ...Recreation activities and possibilities 1 2 3 4 5
- ...Cultural and education offers of the national park 1 2 3 4 5
- 5 Which species or nature conservation activities of the Tatra National Park do you know?

- 6 The Tatra 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 activities such as museums
- 7 How often have you visited Tatra National Park (including today)?
 1x 2x 3x 4x more than 4 times
- 8 How long do you stay during your 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?
 National park (visitor) center and/or exhibitions, in _____
 Nature trails
 Nature event programme
 Kids' programmes and activities
 Project weeks
 Trekking, guided hiking tours
 Events of the NP academy
 Research facilities
 others: _____
- 10 What are your main activities in the national park? (**please tick 3 max.**)
- Hiking
 Observation of plants and animals
 Sports, such as mountain biking, jogging
 Visit of NP facilities and exhibitions
 Cultural activities
 Mountain climbing
 Going by cable car
 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?
 PL, please indicate your town and postal code: _____
 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 Which transport modes 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

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 central governments' budget, and out of revenues of entrance fees. However, governments may only provide extended financial support if the population 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 brown bear, wolf, lynx, and chamois), 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 in addition to all expenditure.*

- Nothing
- 4 ZI (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 to the following statements (**Value with 1= agree fully; 5=reject completely**):

- „My income is too small to be able to contribute“ ①②③④⑤
- „It is a public task to conserve nature, and should not be dependent on individual contributions“ ①②③④⑤
- „I would like to await others' contributions, and then decide“ ①②③④⑤
- „I already pay too many taxes“ ①②③④⑤
- „I would like to donate money for other programmes“ ①②③④⑤
- „Nature conservation programmes are not that much worth to me that I would be willing to pay“ ①②③④⑤

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

- „Nature and species conservation is important regardless the cost“ ①②③④⑤
- „I have not thought before this survey how much I would be willing to donate“ ①②③④⑤
- „I would also be willing to donate even if a majority of respondents would not be willing to support the programme“ ①②③④⑤
- „I talk much about nature conservation with my friends and family“ ①②③④⑤

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“ ①②③④⑤
- „I fully accept temporal/spatial restriction on access of habitats in order to conserve nature“ ①②③④⑤
- „I would not like to visit the national park any more“ ①②③④⑤
- „I would choose another area for hiking“ ①②③④⑤
- „I would generally abstain from hiking and would like to spend my holidays at another location in Poland“ ①②③④⑤
- „I would spend my vacation abroad“ ①②③④⑤

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??

- Fundamental 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 Tatra National Park**

A2: Visitor questionnaire at Slovensky Raj national park (Slovakia)

Prieskum "Ochrana prírody v Národnom parku Slovenský raj"

WWF (World Fund for Nature) a Národný park Slovenský raj robia prieskum ohľadom opatrení a programov pre ochranu prírody v národnom parku. Prosím venujte nám svoj čas a poskytnite nám svoj názor. Všetky údaje budú dôverné a použité iba na účely výskumu. Vyplnenie dotazníka zaberie iba asi 10 minút. ĎAKUJEME!

- 1 Ste členom organizácie, ktorá sa venuje ochrane prírody? Áno Nie
- 2 Prispievate pravidelne dobrovoľne finančne na ochranu prírody?
 Áno Nie
- Ak áno:** Koľko do roka?
Približne _____ EUR
- 3 Biodiverzita znamená – podľa definície OSN – rôznorodosť gènov, druhov (živočišných, rastliných), ekosystémov a krajiny. Počuli ste o tejto definícii predtým?
 Áno, poznám tu definíciu. Áno, počul som o niečom takom
 Nie, nepočul som o tom.
- 4 Ako dobre ste informovaný o...?
(Hodnotenie 1=veľmi dobre, 5=vôbec)
- ... cieľoch národného parku 1 2 3 4 5
- ... druhoch a programoch na ochranu prírody v národnom parku 1 2 3 4 5
- ... aktivitách a možnostiach v cestovnom ruchu 1 2 3 4 5
- ... kultúrnych a výchovných ponukách NP 1 2 3 4 5
- 5 Ktoré živočíchy, rastliny alebo aktivity na ochranu prírody v NP Slovenský raj poznáte?

- 6 NP Slovenský raj má podľa medzinárodnej definície národných parkov veľa cieľov. Prosím označte 4, ktoré považujete za najdôležitejšie.
- Vzdelávanie a informovanie o ochrane prírody
 - Ochrana prirodzených biotopov a druhov (voľne žijúcich živočíchov a rastlín)
 - Zväčšovanie lyžiarskych stredísk v NP
 - Vedecký výskum ohľadom ochrany prírody
 - Udržateľné lesníctvo
 - Podpora rozvoja miestnej ekonomiky (turizmu)
 - Budovanie nových ciest a chodníkov pre návštevníkov
 - Zabezpečenie zariadení pre návštevníkov (informačné centrá, turistické chodníky, informačné panely)
 - Produkcia a odbyt miestnych produktov
 - Ponuka športových aktivít
 - Zabezpečenie poľovníctva a/alebo rybárstva
 - Podpora miestnych aktivít ako napr. múzeá
- 7 Koľkokrát ste už boli v NP Slovenskom raji (vrátane dneška)?
 1x 2x 3x 4x viac než 4 krát
- 8 Ako dlho ostanete v NP počas terajšej návštevy?
_____ dní
- 9 Ktoré zariadenia ste už využili alebo plánujete využiť v rámci terajšieho pobytu?
- turistické chodníky
 - návšteva Dobšinskej Ľadovej Jaskyne
 - sprievodcovské služby
 - Aqua City Poprad
 - kúpalisko Vrbov
 - Spišský Hrad
 - Betliar, Krásna Hôrka
 - Levoča
 - iné: _____
- 10 Aké sú Vaše hlavné aktivity v NP? (prosím označte max 3)
- Turistika
 - návšteva Dobšinskej Ľadovej Jaskyne

- Pozorovanie rastlín a živočíchov
- Športy, ako bicyklovanie, beh...
- Návšteva zariadení a výstav NP
- Kultúrne aktivity
- Horolezectvo
- Návšteva reštaurácií a chát
- iné: _____

11 Prečo ste navštívili tento región?

- Prišiel/a som osobitne za účelom návštevy NP.
- Šiel/a som okolo (napr. okružný výlet) a tak som využil/a príležitosť vidieť park.
- Mal/a som iné dôvody návštevy tohto regiónu (priatelia, rodina, profesionálne dôvody) a tak som tiež navštívil/a NP. Iné motívy: _____

12 Odkiaľ ste?

- SK, prosím napíšte mesto a PSČ: _____
- 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 Bicykel Autobus Lietadlo
- Motorka Karavan Peši

16 Ako dlho trvala cesta? _____ hodín

17 Koľko km je NP vzdialený od Vášho domova? Približne _____ km

18 Koľko miniete denne peňazí počas Vášho pobytu?

Ubytovanie _____ EUR
 Strava _____ EUR
 Nákupy (miestne umel. predmety): _____ EUR
 Vstupný poplatok: _____ EUR
 Múzeá: _____ EUR
 Doprava (e.g. cable car): _____ EUR
 Športy: _____ EUR
 Iné výdavky: _____ EUR

19 Kde ste ubytovaný?

- Mesto/dedina: _____
- jednodenná návšteva bez nocovania

Aktivity národného parku sú financované hlavne zo štátneho rozpočtu. Vláda môže poskytnúť dodatočné peniaze iba ak si to miestne obyvateľstvo a návštevníci želajú. Preto je Váš názor na nasledujúce otázky veľmi dôležitý.

20 Predpokladajme žeby vláda znížila finančný príspevok na chod NP. Keby ste mohli tu a teraz prispieť vyčlenenou sumou na udržanie programov národného parku (ochrana prírody –vlk, rys), koľko by ste boli ochotný prispieť ročne? *Prosím myslíte aj na Vaše ďalšie náklady počas dovolenky, takže tento príspevok by bol fakticky príspevkom navyše ku všetkým 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 500 EUR nad 500 EUR

21 Prosíme vyjadrite svoj názor ku nasledujúcim vyjadreniam. **(Hodnotenie 1=plne súhlasím; 5=totálne odmietam):**

- „Môj príjem je príliš nízky aby som mohol/a prispievať“ ①②③④⑤
- „Ochrana prírody je verejný záujem a nemala by byť závislá na individuálnych príspevkoch.“ ①②③④⑤
- „Počkal/a by som ako by prispievali ostatní a potom by som sa rozhodol/a“ ①②③④⑤
- „Už teraz platím príliš vysoké dane.“ ①②③④⑤
- „Venoval/a by som peniaze na iné účely.“ ①②③④⑤
- „Programy na ochranu prírody nemajú pre mňa takú cenu aby som bol/a ochotný/a na to prispievať.“ ①②③④⑤

22 Súhlasíte s nasledujúcimi vyjadreniami? **(Hodnotenie 1=plne súhlasím; 5=totálne odmietam):**

- „Ochrana prírody je taká dôležitá, že na cene nezáleží“ ①②③④⑤
- „Nikdy pred týmto výskum som nerozmýšľal/a koľko by som bol/a ochotný/á venovať“ ①②③④⑤
- „Bol/a by som ochotný/a prispievať aj keď by väčšina respondentov nebola ochotná podporovať takýto program.“ ①②③④⑤
- „Veľa sa rozprávame o ochrane prírody s priateľmi a rodinou.“ ①②③④⑤

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

(Hodnotenie 1=plne súhlasím; 5=totálne odmietam):

- „V každom prípade by som navštívil/a národný park“ ①②③④⑤
- „Plne by som akceptoval/a časové/priestorové obmedzenia na vstup do biotopov ohľadom ochrany prírody.“ ①②③④⑤
- „Už by som viac nechcel/a navštíviť tento národný park“ ①②③④⑤
- „Vybrať/a by som si na turistiku inú oblasť“ ①②③④⑤
- „Úplne by som upustil/a od turistiky a vybral/a by som si na dovolenku iné miesto na Slovensku.“ ①②③④⑤
- „Strávil/a by som dovolenku v zahraničí“ ①②③④⑤

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

- Prispievam na ochranu rastlín a živočíchov pretože majú právo na existenciu.
- Rád by som prispel na ochranu rastlín a živočíchov pretože môžem mať z nich niekedy v budúcnosti os oh.
- Chcel by som odovzdať mojim deťom zdravú prírodu.

Prosím poskytnite nám ešte na záver krátke štatistické údaje:

25 Pohlavie: Žena Muž

26 Vek: _____

27 Koľko ľudí žije vo Vašej domácnosti? _____
z toho: _____ detí

28 Aké je Vaše najvyššie dosiahnuté vzdelanie?

- Základná škola Učňovská škola
- Stredná škola Vysoká škola

29 Aké máte zamestnanie?

- Študent Robotník
- žena/muž v domácnosti White-collar employee
- Nezamestnaný
- Dôchodca podnikateľ/živnostník

30 Prosím označte čistý 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 dôverné a budú anonymne a súhrne použité iba na účely výskumu

A3: Visitor questionnaire at Tatra national park (Poland)

Ankieta: „Ochrona gatunków i ekosystemów w Tatrzańskim Parku Narodowym”

WWF (World Fund for Nature) i Tatrzański Park Narodowy przeprowadzają ankietę na temat środków i programów ochrony przyrody na terenie parku narodowego. Zwracamy się z prośbą o wyrażenie osobistej opinii na poruszane tematy. Dane z ankiety będą wykorzystane wyłącznie w celach badawczych. Wypełnienie ankiety zajmuje ok. 10 minut. DZIĘKUJEMY!

1. Czy jesteś członkiem jakiejś organizacji zajmującej się ochroną przyrody?
 tak nie
2. Czy przekazujesz dotacje na ochronę przyrody?
 tak nie

jeżeli tak: to w jakiej wysokości w skali roku?

..... PLN alboEUR

3. *Bioróżnorodność oznacza – zgodnie z międzynarodowymi definicjami – różnorodność genów, gatunków (zwierząt, roślin), ekosystemów oraz krajobrazów.*

Czy słyszałeś wcześniej o bioróżnorodności?

- tak, znam tę definicję w szczególach
 tak, słyszałem o takim terminie
 nie, nie słyszałem nigdy o tym terminie

4. Jak dobrze czujesz się poinformowany o?

(Zaznacz w skali od 1=bardzo dobrze do 5=wcześnie)

- celach Parku Narodowego 1 2 3 4 5
 - programach ochrony gatunków i ekosystemów w TPN 1 2 3 4 5
 - możliwościach rekreacji na terenie Parku Narodowego 1 2 3 4 5
 - wartościach kulturowych i edukacyjnych Parku Narodowego 1 2 3 4 5

5. Jakie działania TPN w zakresie ochrony gatunków i ekosystemów są Ci znane?

.....

6. Tatrzański Park Narodowy ma szereg celów.**Zaznacz cztery z nich, które uważasz za najważniejsze:**

- informacja i edukacja w zakresie ochrony przyrody
 ochrona naturalnych siedlisk i gatunków (roślin, dzikich zwierząt)
 powiększanie terenów narciarskich
 badania naukowe w zakresie ochrony przyrody
 gospodarka leśna
 wspieranie rozwoju ekonomicznego regionu (poprzez turystykę)
 budowa nowych dróg i szlaków turystycznych
 zapewnienie infrastruktury turystycznej (muzea przyrodnicze, szlaki, tablice informacyjne)
 promocja produktów regionalnych
 możliwość uprawiania sportów na terenie parku
 sponsorowanie lokalnych przedsięwzięć takich jak np. muzea

7. Który raz odwiedzasz Tatrzański Park Narodowy (łącznie z dzisiejszą wizytą)?
 1x 2x 3 x 4x więcej niż czwarty
8. Na jak długo przyjechałeś w Tatry?

.....dni

9. Z czego skorzystałeś lub zamierzasz skorzystać podczas pobytu w TPN?

- muzeum przyrodniczego TPN
 ścieżek przyrodniczych
 programów przyrodniczych

- programów i zajęć dla dzieci
 wycieczek pieszych i z przewodnikami
 imprez organizowanych przez TPN
 możliwości prowadzenia badań
 inne

10. Jak głównie zamierzasz spędzić czas w TPN?

(zaznacz max 3 odpowiedzi)

- wycieczki piesze
 obserwacja roślin i zwierząt
 sport, taki jak bieganie, rower
 zwiedzanie muzeum i wystaw
 wycieczki kulturoznawcze
 wspinaczka
 kolejka linowa
 odwiedzanie schronisk górskich
 inne:.....

11. Co było motywem Twojej wizyty w rejonie Tatr?

- wyłącznie chęć odwiedzenia TPN
 przejazdem skorzystałem z możliwości odwiedzenia TPN
 inne powody aby odwiedzić region (przyjaciele, rodzina, sprawy służbowe itp.) i przy okazji zobaczyć TPN
 inne

12. Skąd przyjechałeś? PL, wpisz miasto i kod pocztowy:

.....

 SK CZ AT DE inny kraj:.....**13. Z kim podróżujesz?**

- sam z małżonkiem/partnerem z rodziną
 z przyjaciółmi z wycieczką zorganizowaną

14. Ile osób podróżuje z Tobą?

.....osób

15. Jakim środkiem lokomocji dostałeś się do TPN?

- samochodem pociągiem rowerem autobusem
 samolotem motorem kamperem

16. Jak długo trwała Twoja podróż? godz.**17. Jaka jest odległość Twojego miejsca zamieszkania od TPN? OK. km.**

18. Ile pieniędzy wydajesz podczas swojego pobytu w ciągu jednego dnia?

Zakwaterowanie: PLN
 Posiłki: PLN
 Zakupy: PLN
 Bilety wstępu: PLN
 Muzea: PLN
 Transport (np. kolejka linowa): PLN
 Sport: PLN
 Inne: PLN

19. W jakiej miejscowości nocujesz?

miasto/wieś
 przyjechałem na jeden dzień bez noclegu

Działalność Parku Narodowego jest w głównej mierze finansowana z budżetu centralnego, a także z pieniędzy uzyskanych za bilety wstępu.

20. Załóżmy, że rząd zredukował finansowanie parku narodowego. Jeżeli mógłbyś tu i teraz zapewnić dotację dla utrzymania programów parku (takich jak np. ochrona niedźwiedzia, wilka, rysia czy kozicy), jaką sumę byłbyś w stanie płacić w ciągu roku?

Pomyśl o pozostałych wydatkach jakie ponosisz w czasie swojego wyjazdu w Tatry, taka dotacja była by w zasadzie dodatkowym kosztem.

nic 4zł 8zł 12zł 16zł 20zł 40zł 80zł
 120zł 160zł 200zł 240zł 280zł 320zł 360zł
 400zł 600zł 800zł 2000zł ponad 2000zł

21. Wyraż swoją opinię na temat stwierdzeń: (w skali od 1=całkowicie się zgadzam do 5=kompletnie się nie zgadzam)

„moje dochody są zbyt małe, abym dotował parki” 1 2 3 4 5
 „ochrona przyrody jest zadaniem publicznym i nie powinna opierać się na indywidualnych dotacjach” 1 2 3 4 5
 „musiałbym poczekać i zobaczyć czy inni dotują i potem bym zdecydował” 1 2 3 4 5
 „już płacę zbyt wiele podatków” 1 2 3 4 5
 „wolałbym dotować inne programy” 1 2 3 4 5
 „programy ochrony przyrody nie są dla mnie tak ważne, zebym miał na nie płacić” 1 2 3 4 5

22. Czy zgadzasz się ze stwierdzeniami: (od 1=całkowicie do 5=całkowicie się nie zgadzam)

„ochrona gatunków i ekosystemów jest ważna niezależnie od kosztów” 1 2 3 4 5
 „nie zastanawiałem się wcześniej ile byłbym w stanie płacić na ochronę przyrody” 1 2 3 4 5
 „byłbym w stanie płacić nawet gdyby większość respondentów powiedziała, że nie chce płacić” 1 2 3 4 5
 „rozmawiam wiele o ochronie przyrody z rodziną i przyjaciółmi” 1 2 3 4 5

23. Ochrona gatunków i siedlisk wymaga stałego lub czasowych ograniczeń wstępu na niektóre tereny.

Co byś zrobił w takim przypadku?

(od 1=zgadzam się do 5=całkowicie się nie zgadzam)

„niezależnie od ograniczeń odwiedziłbym park narodowy” 1 2 3 4 5
 „całkowicie akceptuję stałe/czasowe ograniczenia wstępu ze względu na ochronę przyrody” 1 2 3 4 5
 „nie przyjechałbym już więcej” 1 2 3 4 5
 „wybrałbym inny region do turystyki pieszej” 1 2 3 4 5
 „zrezygnowałbym z turystyki pieszej i wybrałbym inne miejsce w Polsce do spędzenia urlopu” 1 2 3 4 5
 „spędziłbym wakacje za granicą” 1 2 3 4 5

24. Jeżeli byłbyś w stanie płacić na programy parku (pytanie 20), co byłoby głównym motywem dla Ciebie:

dotacje na ochronę zwierząt i roślin ponieważ mają prawo do istnienia
 chciałbym chronić zwierzęta i rośliny z uwagi na korzyści jakie mogą one dać w przyszłości
 chciałbym zapewnić moim dzieciom zdrowe środowisko

25. Płeć Mężczyzna Kobieta

26. Wiek:lat

27. Z ilu osób składa się Twoje gospodarstwo domowe?z tegodzieci

28. Jakie jest Twoje wykształcenie?

podstawowe średnie wyższe

29. Czym się zajmujesz?

uczeń pracownik fizyczny
 pani/pan domu pracownik umysłowy
 szukam pracy służba cywilna
 emeryt pracodawca
 inne

30. Zaznacz miesięczny dochód swojego gospodarstwa domowego:

mniej niż 2000zł 4000 – 5000zł
 2000 – 3000zł 5000 – 6000zł
 3000 – 4000zł powyżej 6000zł

Wszystkie odpowiedzi są traktowane w sposób poufny i wykorzystywane wyłącznie w sposób statystyczny i anonimowy

Dziękujemy za odpowiedzi, życzymy miłego pobytu w Tatrzańskim Parku Narodowym