An Outline of Economic Impacts of Management Options for Šumava National Park

Final Report

December 2013

eftec
73-75 Mortimer Street
London W1W 7SQ
tel: 44(0)2075805383
fax: 44(0)2075805385
eftec@eftec.co.uk www.eftec.co.uk

THE BRITISH ASSESSMENT BUREAU
ISO9001

This report has been prepared by

Authors:
Ian Dickie, Guy Whiteley (eftec)

Contributors:
Professor Pavel Kindlmann
Dr Zdenka Křenová
Dr Jaromir Bláha
Shannon Anderson, Angela Doku, Simon Fowell (eftec)
Miloš Picek, Vladimir Silovsky (Šumava Regional Development Agency)
Toby Aykroyd (Wild Europe initiative)
Neil Birnie (Founder of Wilderness Scotland/Wilderness Journeys (Adventure Travel Company) & Chief Executive of Conservation Capital)

Reviewers:
Lucy Emerton (Chief Economist, Environment Management Group)
Marianne Kettunen (Senior Policy Analyst, Biodiversity and Nature Conservation Programme, Institute for European Environmental Policy (IEEP))

The contents of this document and any errors it may contain are the responsibility of the authors.

ABOUT THE AUTHORS:
Economics for the environment consultancy ltd (eftec) is a specialist environmental economics consultancy based in the UK. It works to provide economic analysis for sound, effective and sustainable environmental policy and management. Since being founded in 1992, it has worked for public and private sectors in the UK and Europe, including evaluations of the Natura 2000 network and individual sites within it. The manager of the study, Ian Dickie, was an individual expert member of the European Commission's biodiversity no net loss working group and has 14 years experience of nature conservation economics in the EU.

eftec offsets its carbon emissions through a biodiversity-friendly voluntary offset purchased from the World Land Trust (www.carbonbalanced.org) and only prints on 100% recycled paper.

Table of Contents

Executive Summary and Conclusions 1
1 Introduction 4
Box 1: Bark Beetle Management 5
2 Scenarios 6
2.1 Definition of the scenarios 6
2.1.1 Current Status 6
2.1.2 Draft Bill Adoption 9
2.1.3 Increase of the non-intervention area ('pro wilderness') 11
2.2 Categories of Assessment 16
3 Current Status 18
3.1 Tourism 18
3.2 Regulating Ecosystem Services 18
3.3 Non-use and Existence Values, and Reputation 19
3.4 Local Economic Activity and Employment 20
3.5 Financial Viability 21
4 Draft Bill Adoption 22
4.1 Tourism 22
4.1.1 Ski-lift Development 22
4.2 Regulating Ecosystem Services 24
4.3 Non-use and Existence Values, and Reputation 24
4.4 Local Economic Activity and Employment 25
4.5 Financial Viability 26
5 Pro-Wilderness Development 27
5.1 Tourism 27
Box 2: Evidence from German NPs 28
5.1.1 Nature-based Tourism 28
5.1.2 Strong Šumava Brand 30
5.1.3 Higher Value Services 30
5.1.4 Research and Education 31
5.1.5 Hunting 32
5.2 Regulating Ecosystem Services 32
5.3 Non-use and Existence Values, and Reputation 32
5.4 Local Economic Activity and Employment 33
5.5 Financial Viability 34
References 36
Annex 1 – Šumava Ecosystem Services Valuation 41
Methodology [provided by study author David Vačkář] 41
Interpretation (eftec) 42
Annex 2 – Evidence for Existence Values 44
Annex 3 – Benefits of NPs and Wilderness Areas 45
Annex 4 – Ecotourism Industry Trends 48

Executive Summary and Conclusions

This analysis briefly compares the economic impacts of three potential future management scenarios for Šumava National Park (NP) in the Czech Republic:

1. Continuation of current management (current status).
2. The adoption of draft Bills that would declassify protected areas and enable developments (e.g. ski lift development) within some of the Park's most valuable habitats for wildlife (Bill adoption).
3. The adoption of proposals to expand the wilderness area in the Park's core with associated tourism opportunities (pro-wilderness development).

Currently, there exists a significant amount of nature-based tourism in and around the national park, connected to its large wilderness core. The 2 million visitors to Šumava NP each year bring an estimated €68 million of spending to the local area, where unemployment is below the national average. Key sources of employment are in nature-based tourism and forestry. The high imported element of forestry labour means that nature-based tourism activity is likely to result in a greater proportion of income remaining within the local economy, and as a result higher tax revenues to local Government.

The proposals in the draft Bills have the potential to generate employment through ski lift development, but much of this activity will use imported labour and/or be short-term (e.g. associated with construction work). The financial viability of this development is uncertain for a number of reasons, including:

- likely requirements to compensate for damage to protected habitats;
- reduced future snow cover due to climate change, and
- competition to attract sufficient visitors to use the ski lift.

The economic impacts of the adoption of the draft Bills (and, to a lesser extent, of continuing with current management) would also include negative effects on current nature tourism activity and on its long term potential to expand. Currently, and certainly if the proposed plans in the draft Bill are adopted, the value of the NP as an area of wilderness and high-quality ecosystems will be reduced. This would weaken one of its key selling points as a tourism and recreation destination. The opportunity for international branding of the national park based on these ecosystems would be diminished. This damage to ecosystems would go against the views of the 75% of the Czech population who agree that it is important to halt the loss of biodiversity because we have a moral obligation to look after nature.

Pro-wilderness development offers an alternative scenario. It would allow economic opportunities to be pursued to promote nature-based tourism at new locations and activities around an expanded non-intervention zone, while not undermining the ecological integrity of the NP. The Šumava NP is a unique area which supports a wide variety of habitats and species and has the potential to form one of the largest areas of natural forest and wetland habitat in Central Europe. This tourism offer is in keeping with visitor's preferences (identified in a 2010 survey), and can exploit global growth in ecotourism activity. The best access points to the Šumava NP's wilderness are currently regarded as being 'full' in that further increases in visitors would damage the wilderness experience which draws visitors. Therefore, there is perceived to be demand for a larger number of carefully managed access points to a larger wilderness area.

To maximise the local economic benefits of this tourism development around the park, appropriate training for the local workforce is required. Local benefits could be enhanced through nature-based tourism development that is spread throughout the communities in and around the park. This would not conflict with the park's wild image that attracts visitors, and this visitor market could grow with support from expanded marketing activity. The potential local economic benefits from the pro-wilderness development option include:

- maintaining and expanding employment in management of the National Park's habitats, visitor facilities and access points;
- increased nature-based tourism trade in the villages within and surrounding the Park;
- increased opportunities to attract financing for local economic development (e.g. training and SME support for nature-based tourism), and for the Park's management, both internationally (e.g. from EU funding sources), and locally (e.g. through fees for visitors using specific facilities);
- a greater proportion of value-added in the tourism offer being generated within the local community, meaning more income can be retained locally and support greater indirect economic activity, and
- maintaining forestry employment.

Key aspects of this analysis are the way in which tourism potential at the Park is developed, and the extent of logging as a measure to manage bark beetle. Šumava NP borders the Bayerischer Wald NP in Germany, which has developed a successful nature-based tourism industry. This offers a proven model to pursue sustainable economic development under the pro-wilderness development scenario, and a unique opportunity for complementary promotion of the two parks branded as the 'Wild Heart of Europe'.

More specific predictions of economic and employment impacts will require a full economic study. However, this initial analysis indicates that the pro-wilderness scenario offers a more economically and environmentally sustainable development plan for Šumava NP than either the current situation or the plans proposed in draft Bills. It is recommended that proposals in draft Bills should not be pursued at least until a fuller economic evaluation of options has been undertaken.

Recommendations for further work are shown in the Box below. The main differences between the pro-wilderness and Bill Adoption scenarios in the categories of assessment used are shown in Table ES1 below.

Recommendations for further work

This preliminary analysis shows that a more detailed economic assessment is required of the Šumava NP, which includes:

- Changes to ecosystem services under the different scenarios.
- Opportunities for sustainable local economic development connected with conservation of the Park's wilderness, for example:
    - Tourism promotion and events, based around individual communities and one or more visitor centres, could be developed and expanded without damaging the area's natural assets (ecology and landscape).
    - The tourism offer could also be enhanced through closer links (e.g. in marketing) with the adjoining Bayerischer Wald National Park, which has a core wilderness area and attracts high numbers of visitors.
    - There is a Šumava Region product range, but it does not appear to be marketed in connection with the existence of the national park.
- The financial viability of the ski run enabled by the drafted Bills proposals should consider vulnerability to climate change, risks of not achieving sufficient visitors, and the costs of compensatory habitat in relation to the areas of the park it would damage.

A fuller assessment of the potential costs and benefits of pro-wilderness development would allow the benefits the NP's unique image of wild natural ecosystems provides, which are currently overlooked in project and policy assessments, to be recognized. This will lead to a more informed choice on sustainable economic development for Šumava NP.

Table ES1: Main Impacts in Categories of Assessment Compared to Current Management		
	Bill Adoption	**Pro-wilderness Development**
Tourism	Increased winter tourism from a single major ski lift development, if financially viable. Damage to nature-based tourism offer.	Increase in nature-based tourism opportunities (including outside the peak season), based on expanded wilderness area; low level expansion of cross-country skiing. Opportunities for associated visitor events.
Regulating Ecosystem Services	Reduction in climate-regulating services. Risk of damaging significant water regulation services.	Increased climate and water regulating services.
Non-Use & Existence and Reputation	Decrease in existence value of Park to Czech and EU populations. Damage to 'natural' image of national park.	Increase in existence value of Park to Czech and EU populations. Enhanced 'natural' image based on expanded wilderness area.
Local Economic Impact and Employment	Potential increase in employment concentrated on ski lift development. Damage to nature-based tourism and associated employment opportunities in and around park. Continuation of forestry employment.	Increase in tourism employment in nature-based tourism and associated services. Potential for higher value-added services to retain income in local economy. Continuation of forestry employment.
Financial Viability	Viability of ski lift development appears vulnerable to not achieving visitor forecasts, and having to pay for compensation for damage to protected habitats.	Use of existing tourism infrastructure and low-level investments spread throughout villages in and around the park. Increased opportunities for international funding, and for the National Park to gather fees based on visitor services (e.g. viewing platform).

1 Introduction

Šumava National Park (NP) was established in 1991. Its status as an area of high conservation importance is reflected in several international designations: Šumava's peat bogs are designated Ramsar sites (which are wetlands of international importance); and the Šumava NP is part of the EU's Natura 2000 network due to both Special Protected Area and Special Area of Conservation designations (under the Birds and Habitats Directives respectively).

Šumava harbours important populations of many species including capercaillie (*Tetrao urogallus*), Ural owl (*Strix uralensis*), three-toed woodpecker (*Picoides tridactylus*), lynx (*Lynx lynx*), moose (*Alces alces*), peregrine falcon (*Falco peregrinus*) and freshwater pearl mussel (*Margaritifera margaritifera)* (Bláha et al., 2013).

The management of Šumava NP is a politically sensitive issue, attempting to strike a balance between promoting local economic wellbeing and protecting the area's ecological importance. Reflecting the political uncertainties and complexities of the management of the area, Šumava NP has had nine directors in its 22 year history, in contrast to the Bavarian Forest NP (in the region adjacent to Šumava on the German side) which has had 3 directors in its 43 years[1]. Recent debate surrounding the management of the NP, in which the international scientific community and NGOs discussed the future of the Šumava NP with the current NP director, local politicians, and developers, has attracted significant media interest in the Czech Republic. The NP has also attracted international attention criticising current management practices and plans for the future.

The Park's management is based on management zones with different levels of access and resource use, and allowing interventions against bark beetle (see Box 1). It is apparent that the scientific community support non-interventionist management of bark beetle[2]. However, intervention management practises bring revenue for the NP Authority in the form of timber, and create employment. These direct market returns can mean that intervention management practises are favoured by decision-makers. This view does not take into account the wider economic benefits that biodiversity can bring through indirect support for market activity (e.g. tourism), and non-market benefits (i.e. the value people place on maintaining a healthy ecosystem within the National Park).

The purpose of this report is to briefly compare the economic impacts value arising from three management scenarios for the Šumava NP: firstly if the current status of the park continues; secondly if the Bill drafted for the Czech parliament earlier this year is adopted, enabling declassification and development of areas of the Park; and thirdly if the management of the NP adopted a 'Pro-Wilderness' approach (see Section 2.1 for details).

The park is currently split into three zones: Zone I is the most valuable and strictly protected part of the NP (which should be equivalent to the core zone under Czech legislation), Zone II includes the natural ecosystems that in the past were variously influenced by human activities, and Zone III has areas which allow a wide variety of activities on them. More details on the zonation and intervention strategies in the NP are contained in the sections below. The issue of the management of the NP is currently under discussion due to the drafting, earlier this year, of a Bill to the Czech Parliament that has proposed a change to the zonation of the NP. This is intended to promote interventionist bark beetle management and encourage economic development, but is seen by many conservation organisations as a threat to the habitats within it (see Section 4.2).

This report does not undertake primary assessment of the ecological damage or benefits that will occur under any of the three scenarios. It instead relies on existing scientific and economic evidence from Šumava itself, evidence from a fact finding trip in July 2013 and comparable regions

[1] Křenová pers comms July 2013

[2] e.g as in the view of the Policy Committee of the Society for Conservation Biology, Europe Section, 2012, see also Box 1.

including the Bavarian Forest in Germany which borders the NP, to assess the economic potential of different development options.

Box 1: Bark Beetle Management

Bark beetle (*Ips typographus*) is the main pest species in commercial forests of spruce trees. Bark beetles attack mature trees and infestation results in the death of the tree. Bark beetle outbreaks are a natural feature of Šumava, and the Park has experienced significant outbreaks of bark beetle in the recent past. This makes it a key issue in the management of the NP, and leading to a debate about the appropriate management of bark beetle. Spruce trees are an important habitat in the Park, supporting red list species.

The three scenarios considered in this study differ in their approaches to bark beetle management. This is a major reason why they involve different sizes and locations of non-intervention areas, and therefore of 'core' conservation areas (described in Section 2.1 below). Broadly two management approaches are suggested in the management of bark beetle:

- **Intervention** - includes trap trees, insecticides and salvage cutting (Grodzki et al., 2006) This is practiced on the majority of Šumava NP, with appropriate intervention in perimeter areas.
- **Non-intervention** - no management intervention on forests affected by bark beetle. Practiced in non-intervention areas of Šumava NP (also with appropriate intervention in perimeter areas).

It is beyond the scope of this report to offer an in-depth assessment of these management practices, but key issues are that:

- Management 'interventions' do not always appear to be effective – Grodzki et al (2006) found no significant differences between tree mortality in intervention and non-intervention management areas and the outbreaks in both intervention and non-intervention areas ceased approximately at the same time.
- Bark beetle outbreaks are a natural phenomenon, but they have been exacerbated by the spruce monocultures that currently exist in the Park[3].
- Non-intervention management results in a more varied vegetation structure and therefore has significant benefits for biodiversity and greater resilience in the longer term (Müller et al, 2008; Kindlmann et al., 2012; Bláha et al., 2013).
- Proponents of intervention may argue for 'one-off' felling to achieve bark beetle management, but in practice this would be a regular cycle of intervention equating to a managed forest environment.

It is worth noting recent developments on bark beetle management in Austria, where a recent paper provides guidance on how to deal with bark beetles outbreaks in Austrian national parks and wilderness areas (National Parks Austria, 2013). The proposed management approach will not compromise the non-intervention philosophy in the core zone of these areas, while at the same time providing sufficient protection to surrounding landowners and their managed forests. It is based on a zonation model, which foresees a bark beetle control zone of varying width around the non-intervention zones of the protected areas. It now enjoys the broad support of Austrian conservationists and forest management authorities alike (WWF Austria, pers coms, Nov 2013).

[3] Marie Fischborn, IUCN Global Protected Areas Programme Marie Fischborn, IUCN Global Protected Areas Programme, accessed 12/8/13: https://portals.iucn.org/blog/2012/08/09/Šumava-national-park-to-beetle-or-not-to-beetle/

2 Scenarios

This section outlines the alternative scenarios for management of Šumava NP, and the categories of economic impact that each one is subsequently assessed against.

2.1 Definition of the scenarios

The three alternative future scenarios look at the short-medium term economic consequences (i.e. roughly up to 10 years ahead) of:

1. What is happening now and the prognosis for the park under current trends (current status).
2. If the Bills drafted for Parliament earlier this year were to pass and be implemented (Bill adoption).
3. If proposals supported by the scientific community were accepted and the area of non-intervention increased (pro-wilderness).

2.1.1 Current Status

This scenario assumes that current management approaches continue without significant change into the future. The current areas of zones, shown in Figure 2.1, are maintained. As described in Section 1, Šumava NP has several designations as it is of international conservation importance for several species and habitats. However, the most ecologically valuable areas of habitat are highly fragmented: there are 135 Zone I segments in the Park. These are shown in Figure 2.1.

Since the Šumava NP was established in 1991, zonation was used to define protection (Bláha et al, 2013). Zone I is the most strictly protected part of the national park. These are areas which are considered to be natural or semi-natural ecosystems of greatest conservation value. Zone II is managed actively to increase its ecological value, generally in preparation of some parts for inclusion in Zone I prior to 2030 (Křenová and Hruška, 2012). Zone III areas are villages and areas of significant human impact. After the windstorm Kyrill in 2007[4] the fragmented zonation was partly consolidated by NP management. The non-intervention regime was extended from Zone I to some parts of Zone II.

Under the current zoning, only 13% of land is classified as Zone I and the designation is split into 135 fragmented areas. This arrangement has been in place since 1995, when a change in leadership favoured active management of areas infested with bark beetle – an approach that has been criticised by a range of experts, including IUCN and the Ramsar Committee (Bláha et al., 2013). The current non-intervention area (Zone I plus part of Zone II with non-intervention against bark beetle from 2007) is much smaller than that proposed by scientists, based on GIS analyses of the actual extent of Natura 2000 habitats (52.2% for Zone I, out of which 49.8% should be non-intervention - Bláha et al., 2013).

As shown in Table 2.1, compared to other national parks in this region of Europe, non-intervention core areas of Šumava NP form a much smaller proportion of the NP and are much more highly fragmented[5].

[4] A strong windstorm in 2007 that felled approx. 700,000 trees in Šumava, and as a result initiated last massive bark-beetle outbreak.

[5] Fragmentation occurs where a contiguous habitat becomes broken up into smaller disconnected islands of the habitat.

Actual zoning of NP Šumava

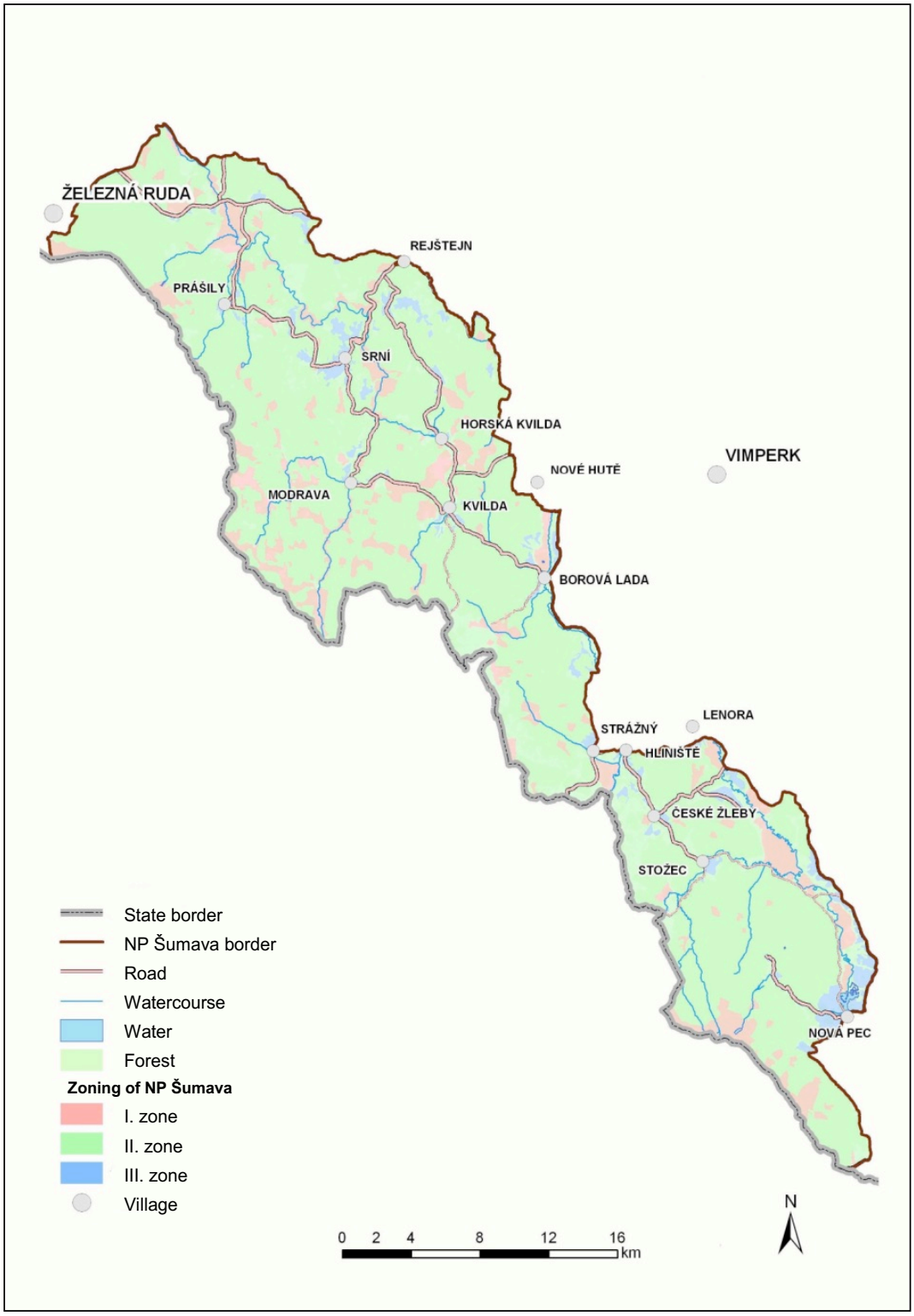


Figure 2.1: Current zoning of Šumava NP.

As stated in the UK's Lawton Review[6] on the management of sites designated for nature conservation, *"species confined to small, single, or only a few sites, are unlikely to be adequately protected"*. There is a wide evidence base which shows that small areas offer less effective protection for species[7]:

- small areas support small populations, with more limited gene pools, therefore species could naturally fluctuate into extinction;
- lower diversity in species due to low habitat diversity in smaller areas;
- edge effects – the edge of protected areas are often affected by external environment pressures (pollution, noise, human interference); the smaller the protected area, the greater chance these external impacts will penetrate all of the area, therefore no area free from impacts area in the protected Zone, and
- 'Allee effects' – which mean that species do not breed successfully at low densities.

Table 2.1 – National Parks in the region

Park	Country	Date established	Area (ha)	IUCN category	Non-intervention area	Number of parts of core zone
Bayerischer Wald	Germany	1970	24,217	II.	57,3%	7
Bialowieski	Poland	1947	10,517	II.	45%	1
Kalkalpen	Austria	1997	20,850	II.	89%	1
Donau-Auen	Austria	1996	9,300	II.	85%	1
Berchtesgaden	Germany	1978	20,800	II.	66,6%	3
Triglav	Slovenia	1961	88,000	II./V.	35,7%	2
Tatra	Poland	1954	21,164	II.	54%	1
Krkonošský	Czech Republic	1963	36,300	V.	12%	6
Podyjí	Czech Republic	1991	6,300	II.	35%	1
Šumava	Czech Republic	1991	69,030	II.	13%	135
Bieszczady	Poland	1973	29,202	II.	63%	2
Hohe Tauern	Austria	1981	185,600	II.	61,7%	5

Source: http://protectedplanet.net/, Křenová and Bláha, pers comms August 2013.

[6] Lawton et al. 2010 - An Independent Review of England's wildlife and ecological network commission by the government chaired by Professor John Lawton.

[7] Abensperg-Traun and Smith (1999), Berger (1990), Berger (1999), Bulman et al. (2007), Franking (1980), Gilpin (1986), Groom, Meffe and Carroll (2006), Harris and Pimm (2008), MacArthur and Wilson (1967), Pardini et al. (2005), Shaffer (1981), Trail, Bradshaw and Brook (2007), Willi, Van Buskirk and Hoffmann (2006).

The fragmentation of habitat within the management zones in Šumava NP reduces the nature conservation benefits of the most highly protected areas – with related implications for ecotourism potential. In response to the current status of the NP, the European Commission have been in contact with the Czech Government to raise concerns about the current management of the NP, and its impact on Natura 2000 sites[8]. There are also clear recommendations from IUCN and the European Council to change the zonation in the current management strategy and implement a clear and long term strategy for management of Šumava NP.

In a visit in 2010 to evaluate Šumava for a European Diploma (a protected areas award from the European Council), the Council's representative Pierre Gallant stated that: "*The Šumava NP forms with the neighbouring Bavarian Forest NP a unique forest Zone in the middle of Europe susceptible to host and demonstrate natural forest dynamics and ecosystem processes…. Recognizes however that the current local and national political climate in the ŠNP does not offer sufficient guarantee regarding the long term management and the preservation of the park and that some essential management instruments are missing*".

This evaluation for the European Council recommended postponing the awarding of the Diploma to the Šumava NP until the following conditions were to be fulfilled: a new zonation plan/system, a 10year management plan respecting recommendations of international experts (IUCN, Ramsar etc.), and guarantees of cooperation with the Bavarian Forest NP authority.

Under the current management regime Šumava National Park is not fulfilling its ecological potential.

2.1.2 Draft Bill Adoption

There are two drafts of the Bill recently developed for submission to the Czech Parliament: one by the Pilsen local government [9] and one by the government (prepared by the Ministry of Environment)[10].

The most advanced one in terms of preparation is the Bill drafted by the Ministry of Environment (the current director of the Šumava NP was substantially involved in its preparation) and therefore we will use it in the following assessment. However, as these two proposals do not differ substantially in matters analyzed here, so conclusions and recommendations hold also for the second proposal.

The plans in the Bills drafted for Parliament propose changes to the areas and definitions of the three types of Zone in the NP. Zone I is again comprised of those areas with significant biodiversity values. Zone II is comprised of those areas that have natural value, but are again compromised in some way by human activity. Zone II areas are split into Zone IIA and Zone IIB. Zone IIA areas are those that are suitable for ecological recovery within 15, 30 or 45 years, but logging will be allowed in them within these timescales. Zones IIB are those areas permanently designated as 'nature friendly management'. Zone III are those areas that are mainly used for business, tourism, sport and recreation, and are also potential areas for development.

Zone I designation prohibits all intervention management activities. But according to Annex 4, Part A of the Bill exceptions to these rules exist in certain territories in the NP. The Bills nominally propose increasing the Zone I area to 26.53%, but in practice it will comprise 22% non-intervention zones and 4% 'intervention zones' in which felling will be allowed (meaning it is not actually a non-intervention Zone). These proposals would increase the total size of Zone I areas and reduce

[8] Answer given by Mr Potočnik on behalf of the Commission (10 July 2012): http://www.europarl.europa.eu/sides/getAllAnswers.do?reference=E-2012-005294&language=SK
[9] http://www.psp.cz/sqw/historie.sqw?o=6&T=435
[10] http://www.psp.cz/sqw/historie.sqw?o=6&T=999

fragmentation of the core areas from 135 segments to 37. However, the current non-intervention area of the NP will actually be reduced. These zones are shown in Figure 2.2.

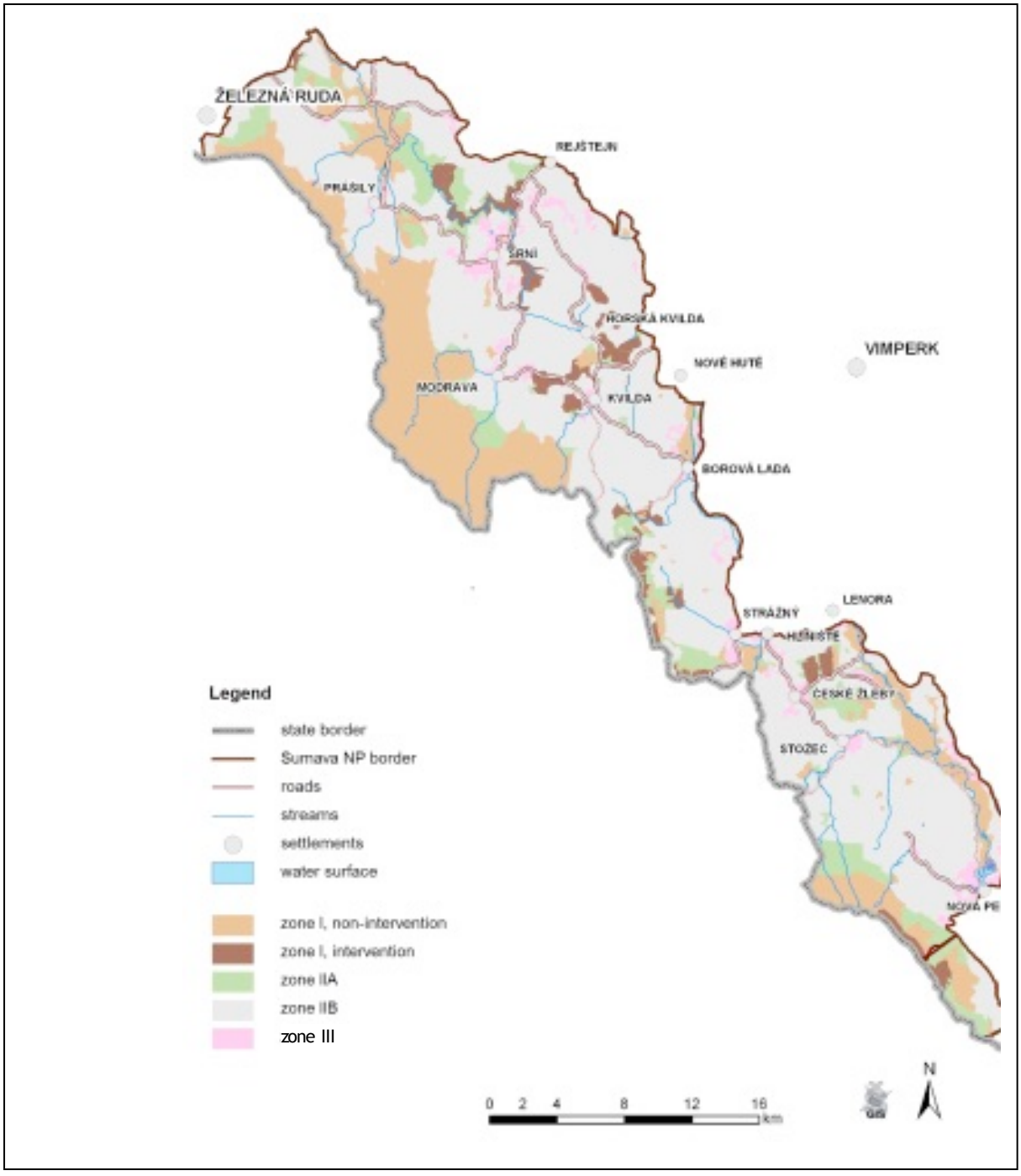


Figure 2.2: Zoning under draft Bill (Ministry of Environment) proposals.

A variety of management interventions are allowed in the in Zone II and Zone III areas. Zone IIB designation allows significant interventions on the land, including timber production for the local population, clearing of brushwood, establishing tourist infrastructure. Zone III allows timber management interventions and economic development opportunities. This includes a proposed ski lift and run. Zone IIA will be 8.49%, Zone IIB will be 59.87%, Zone III 5.12%.

Under drafts of the Bill, a significant part of the existing core areas will be de-classified from their present strictly protected status and logged, in many cases based on arguments for interventionist bark beetle management. Extensive areas of the Park would be opened up to a variety of high

impact activities, such as building and infrastructure development. These are proposed to include development of ski-lifts, and an expansion of the touristic road network, which may affect survival of some species (e.g. capercaillie).

It is concluded that under the drafted Bills habitats in Šumava NP will remain fragmented, although fragmentation will be reduced, and zone 1 areas will cover a lower proportion (only ~44%) of the highest-value habitats. Combined with increased development pressures, this means the ecological value of the NP will fall.

2.1.3 Increase of the non-intervention area ('pro wilderness')

The natural ecosystem (pro-wilderness) scenario is based on an ecological optimum size of Zone I, as defined in Bláha et al. (2013). This was calculated by defining a merged area using a GIS-based mapping of the most important features characterising the Natura 2000 status of the NP. The proposal is that 52.2% of the Šumava national park is defined as Zone I of which 49.8% is defined as non-intervention. These zones are shown in Figure 2.3.

This pro-wilderness scenario also involves investment in the promotion of nature-based tourism (with marketing based on the 'wilderness experience'), and in the local economy's ability and infrastructure for supplying these services for this market. There are numerous locations and opportunities to invest in small-scale infrastructure and low-impact access to Zone II areas. These developments would be based around current paths with the NP, as shown in Figures 2.4 a-c. They would not take place in locations where they would damage the ecological value of the NP (e.g. they would not increase fragmentation of habitats).

The zoning under this proposal, including the larger non-intervention area, is also intended to provide a more coherent large scale approach to bark beetle management. There would be a defined NP perimeter beyond which interventionist management, including felling to control the spread of bark beetle, could be employed.

It is concluded that under pro-wilderness proposals the ecological integrity of the NP will be assured and improved, with accompanying sustainable economic potential.

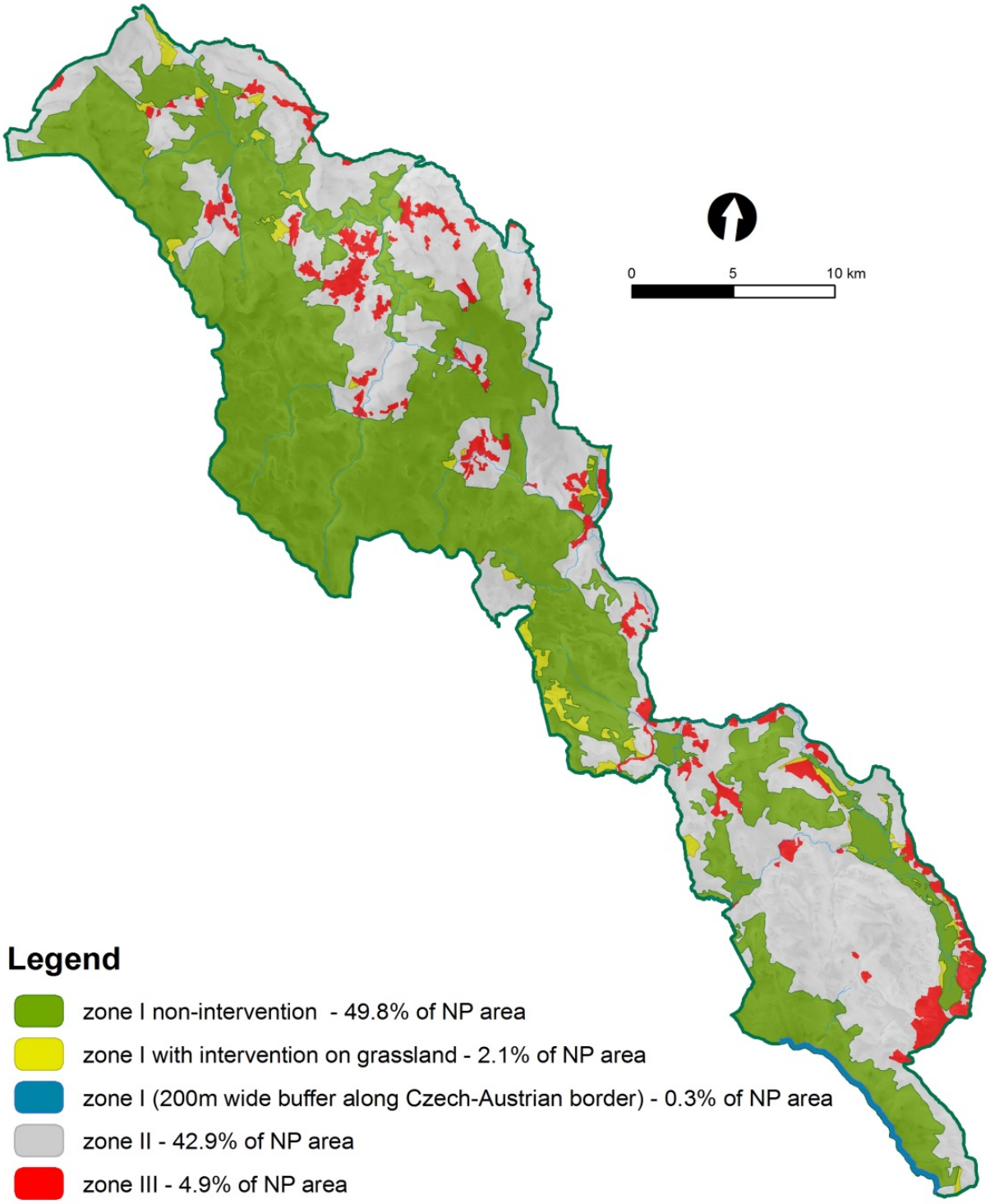


Figure 2.3: Zoning under increase in non-intervention area proposal.

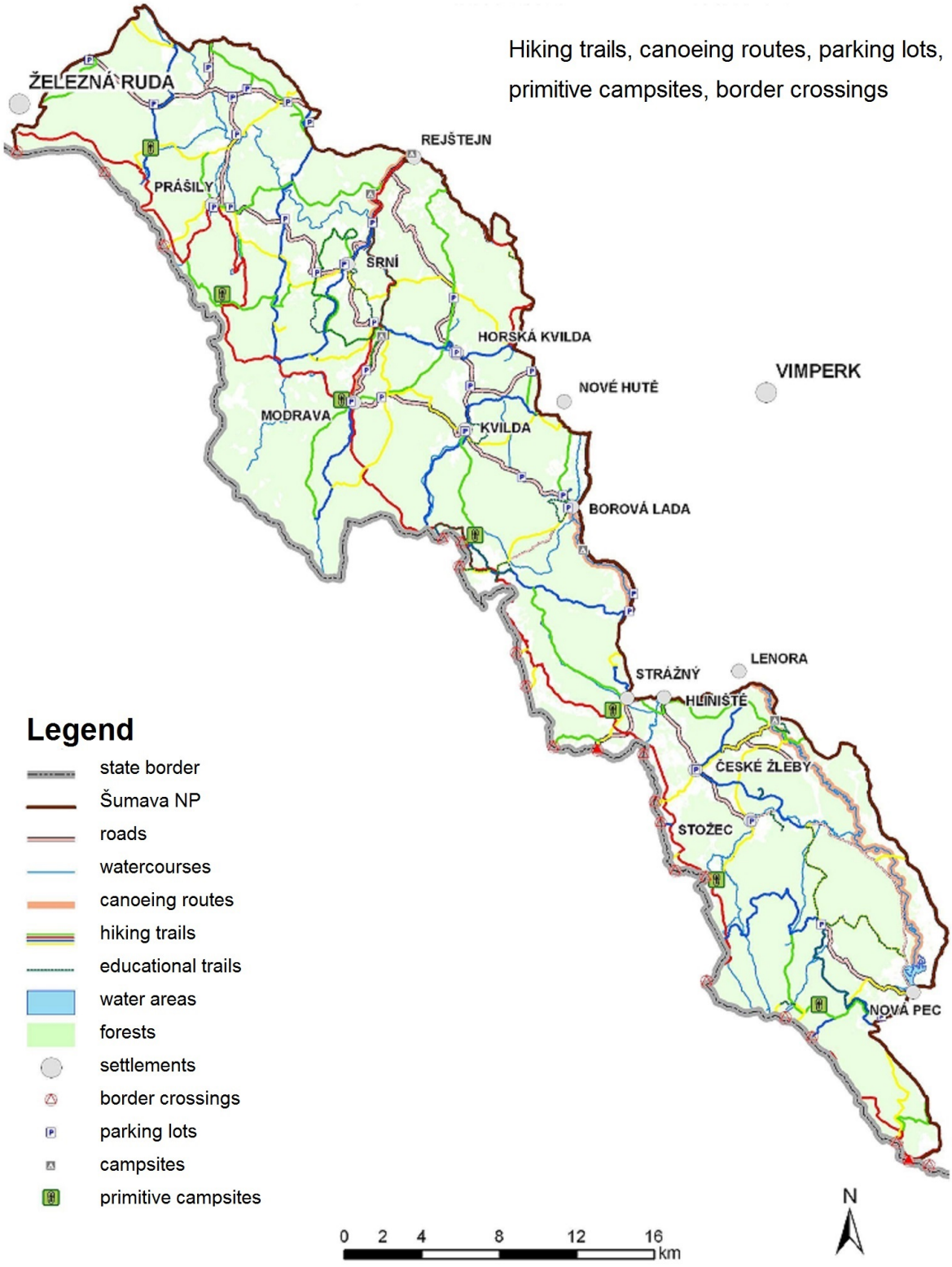


Figure 2.4a: Current hiking and canoeing routes in Šumava NP.

Figure 2.4b: Current cycling routes in Šumava NP.

Figure 2.4c: Current maintained cross country ski routes in Šumava NP.

Table 2.2 – Summary of Scenarios

Scenario	Non-intervention	Zone I	Zone II	Zone III	Additional
Current status	30% Long term goal: at least 50% by 2030	13%	82%	5%	High fragmentation
Draft Bill adoption	22% Phased adoption of non-intervention (over 15, 30 & 45 yrs), up to 35% after 45 yrs	27%	IIA: 8% IIB: 60%	5%	Declassification and logging of existing core areas. Particularly consolidation of fragmented areas, re-labelled as core. Increased development of infrastructure and building within the NP
Pro-natural ecosystem ('wilderness')	50%	52% (including buffer zone 0.3%)	42%	5%	Large un-fragmented non-intervention zones to support habitats and species within them, and provide large scale plan for bark beetle management. Expansion of nature tourism and related activities.

2.2 Categories of Assessment

The three management scenarios for the Šumava National Park will be assessed against the following categories, which are chosen to represent the main elements to the total economic value from future management:

- **Tourism** – The potential for the development of tourism activities in Šumava NP
- **Regulating Ecosystem Services** – Ecosystem services are those benefits that functioning ecosystems provide human populations. The key regulating services to be considered are water cycle regulation, including flood alleviation, and climate regulation through carbon stored in ecosystems.
- **Non-use and Existence Values and Reputation** – A national park and the species within in it are not only valued by tourists, locals, loggers or those who use the park directly. The general population also value and have an interest in nature *in situ*, even if they do not directly benefit from it in any tangible sense. These are known as 'non-use' values and include the values that people put on knowing that species exist ('existence values'). These non-use values can in part determine the reputation of the NP.
- **Local Economic Impacts and Employment** – The impacts on the extent and viability of economic activity in and around the national park, and the employment opportunities provided by the NP including those in forestry activities.
- **Financial Viability** – The level of revenue generation and the ability to generate and sustain sufficient funds to enable the NP to be managed effectively.

One assessment category looks specifically at regulating ecosystem services. It is recognised that ecosystem services are also part of other categories. These include revenues from provisioning services, and depending on the ecosystem services classification adopted, 'Tourism' and 'Non-use values' can be regarded as ecosystem services. However, the focus of this report is on economic impacts arising from management, and is not a full ecosystem services assessment of the NP.

Therefore these other (non-regulating) ecosystem services are not described using ecosystem services terms in this report.

Valuations of the ecosystem services from Šumava NP have been estimated by a team in the Czech Republic (Frelichová, Vačkář et al., 2013 – see Annex 1 for more details). In their study, the team took peer reviewed valuations of ecosystem types close to those occurring in the Czech Republic. These per hectare values were multiplied by area of ecosystems in Šumava and aggregated to give total values. The Šumava National Park was estimated to currently support values on average of €16,789/ha/yr with a total value of €1.6 billion/yr.

This is a preliminary result from the study and a number of limitations exist in the methods used. The total value it identifies can be considered to provide an approximate 'order of magnitude' estimate of the value of ecosystem services from Šumava NP. It suggests the value of these services is very significant. However, the methods involved, being based on transfers from similar areas rather than direct observations at the site, cannot generally be used to evaluate the changes in ecosystem services under the three scenarios.

3 Current Status

This scenario sets out the current economic circumstances of the NP.

3.1 Tourism

Approximately 2 million tourists visit the Šumava NP every year[11], the vast majority of which are from within the Czech Republic (Gorner and Čihař, 2013).

A range of nature and landscape based tourism activities occur in the NP. Mountain biking is the predominant activity undertaken by visitors. The paved roads, a relic of the military past and forest management of the area, result in particularly accessible cycling routes. The success of biking in the national park and the extensive network of paved roads has potentially come at the expense of visitors intending a 'wild' hiking experience. Paved roads have limited appeal to those hikers seeking wilderness and do not offer an attractive walking surface for wild hiking. Other activities that also take place here have developed to different extents; these include: cross-country skiing; hunting; fishing; wildlife watching; snow walking; canoeing; bivouacking.

The information available suggests that tourism is a vital contributor, albeit seasonal, to the local economy in and around the Šumava NP. A survey carried out by the local Regional Development Agency in 2007 found that tourism and related sectors are responsible for 30% to 50% of all jobs during the holiday season (Picek et al., 2007). Křenová and Kiener (2012) also report that tourism in the Šumava NP is important to the local economy.

Šumava NP is marketed as a tourism destination, but it is unclear as to the extent of that marketing material utilises the NP's characteristics, including its wilderness area, as a selling point. In 2009, 68% respondents to a visitor survey said that the existence of the NP designation was important to their decision to visit Šumava (Bláha, 2012).

The Regional Development Agency of Šumava recognises the region represents an area substantially untouched by development and that this is a large attraction for tourists. It is also stated that visitors come to Šumava because of hiking and sports, relaxation, *"nature and landscape beauties"* and *"clean environment and calm and quiet places"* (Picek et al., 2007).

Assuming it is reasonable to transfer visitor spending data from the Bavarian Forest NP study (Nationalparkverwaltung Bayerischer Wald, 2010)[12] to Šumava, the approximately 2 million visitors to Šumava NP each year bring an estimated **€67.6 million (2013 values)** of spending. Daily spending rates have been adjusted from Germany to the Czech Republic by the Purchasing Power Parity method for this calculation. The local impact of this spending will be reduced due to leakage for government taxes, but increased by local multiplier effects (which depend on the strength of supply chains in the local area).

3.2 Regulating Ecosystem Services

The habitats that Šumava NP supports provide a number of 'regulating' ecosystem services to the Czech public. Whilst a more in-depth valuation of the ecosystem services in Šumava NP has yet to be undertaken, it is possible to look at the benefits provided by Natura 2000 sites across Europe to estimate the ecosystem services potentially provided by the Šumava NP.

[11] http://www.Šumava.com/rec_park_about.php?l=en

[12] 46% visitors have a high national park affinity and spend €10.53 if a day trip (29% visitors) and €45.83 if staying overnight (71% visitors). 54% visitors have a low national park affinity and spend €8.60 if a day trip (37% visitors) and €45.82 if staying overnight (63% visitors). All values contained in report have been inflated to 2013 values and adjusted for Czech Purchasing Power Parity (PPP) which adjusts exchange rates for the relative costs of living in the countries concerned.

The Natura 2000 network was established under the 1992 Habitats Directive to recognise *Sites of Community Importance* (Bláha et al., 2013). Natura 2000 sites provide significant ecosystem services. Šumava NP is an important site in the Natura 2000 network due to its large size and significant number of features of conservation importance.

Results from a recent assessment from the overall Natura 2000 network in a recent study (European Commission, 2013), included:

- Carbon Storage – those benefits that come from storage of carbon in the Natura 2000 network is between €600 and €1,130 billion (stock value).
- Natural Hazards – Natura 2000 can provide mitigation benefits against natural hazards. At one site in Belgium the flood protection provided by a river landscape restoration range between €640,000 and €1,650,000 per annum.
- Water Provision – Nature provides water purification and provisioning services. The annual benefits from water purification is between €7 and €16 million per city and water provisioning is between €12 and €91 million per city.
- Cost benefit ratio – Benefits were seven times greater than costs across 300 Natura sites in Scotland, this finding was repeated in France. In Finland, a study of the benefits associated with protected areas found that €1 investment generated €20 of returns.

These data suggest that regulating ecosystem services from Šumava NP are of significant value. It is also noteworthy that in the study of Šumava by Vačkář et al. (op cit) the ecosystem service values generally, and for regulating services, were higher in the Park's non-intervention areas.

3.3 Non-use and Existence Values, and Reputation

Habitat and species conservation is an issue of global concern and where biodiversity is threatened, there is evidence that large numbers of people express their support for a positive outcomes for nature. In several recent petitions, a global audience have put their names to supporting conservation issues illustrating that millions of people hold existence values for conserving nature[13].

If these petitions have no impact on the petitioned action, then considerable numbers of people will have reduced welfare as a result of the decisions by the government/organisation who are responsible for managing that environment. It is sometimes possible to quantify the value that individuals give to the existence of habitats and species (existence values). Environmental valuation research using stated preference techniques has demonstrated that these values exist and can be significant. A number of examples from the economics and conservation academic literature are presented in Annex 2.

The high biodiversity value and unique landscape and wilderness attributes of Šumava NP means it is highly likely that the Czech population, citizens across Central Europe, and globally, hold significant values for its existence. This is supported by an opinion poll[14] that showed a majority of the Czech population disagreed with damaging developments within the NP (see Section 4.4).

Any damaging impacts on nature will be perceived negatively by this population and therefore damage the NP's reputation.

We can conclude from the existence of numerous petition websites and non-use valuation studies that is likely that significant international and national values are held for the **existence of Šumava**

[13] http://www.avaaz.org/en/index.php
[14] Factum Invenio 2011, available at: http://www.hnutiduha.cz/uploads/media/np_Šumava_verejne_mineni.pdf

NP as a site of conservation importance. The current condition and management of the park threatens this value[15].

We suggest that the continuation of current management would result in **reputational damage for the National Park and safeguarding of the Czech natural heritage generally**. This could result in loss of investment, and of nature- and landscape-based tourism.

3.4 Local Economic Activity and Employment

Approximately 950 people live in six villages inside the NP (Gorner et al., 2012). A further 1,180 people live in three villages on the border of NP. Altogether 2,130 people live in these villages in or on the border of the NP. In the area surrounding the Park there are 16 villages whose administrative boundaries partly overlap with the Park; they have approximately 15,000 residents. The population density of the area is three times lower than the national average (Picek et al., 2007). It has not been possible to conduct a detailed study on the local economy of the Šumava region due to limited information. For this reason we focus on job availability to those who live within the NP's borders.

In 2012 the national park employed 267 people (Šumava NP Yearly Report[16]). About 180 of these are employed in the department of ecosystem management of which 120 are foresters (Křenová, pers comms July 2013). Unemployment rates inside the villages in the national park have ranged from 7.5% in June 2011, to 11.6% in December 2011[17]. In absolute terms this amounts to 40 people in June and 62 in December. The unemployed are categorised to be former forest workers, who are generally older and have lower levels of education (Guy Whiteley, pers comms, July 2013).

Aside from the seasonality of the work and the low educational levels within the work force, a key driver of job losses and unemployment in the region is the public procurement processes of the national park (P. Kindlmann, pers comms, July 2013). The NP opens up forest management contracts to formal tenders[18] on a national and international basis. This has resulted in non-local foresters undertaking work in the national park, while local foresters are unemployed (P. Kindlmann pers comms, July 2013). As well as underemployment of the local workforce, there is evidence of capacity in guest houses, hotels and other accommodation not being fully utilised (G. Whiteley pers com, July 2013). This means that greater numbers of visitors could be accommodated in the local area within current facilities.

While employment is a concern for the local area, the unemployment rate is relatively **low, and the rate of unemployment in the region, and in the NP, is below the national average**. This is attributed to the employment opportunities offered by nature-based tourism and management of the Park.

Comparing the key activities of forestry and nature-based tourism, the high imported element of forestry labour means that tourism activity related to the pro-wilderness alternative is likely to have greater value-added within the local economy. This will result in a greater proportion of income remaining within the local economy, and as a result higher tax revenues to local Government.

[15] Report on the Trip to Šumava NP, Czech Republic, Policy Committee of the Society for Conservation Biology, Europe Section (2012).
[16] http://www.npŠumavanpŠumava.cz/gallery/23/7186-vz12_blok.pdf
[17] http://portal.mpsv.cz/sz/stat/nz/uzem/
[18] http://www.npŠumavanpŠumava.cz/cz/1525/sekce/lesis---prihlaseni-minitendry/; http://www.npŠumavanpŠumava.cz/gallery/10/3118-sbornik4_lokalnirozvoj.pdf

3.5 Financial Viability

The NP authority is mainly financed through the Ministry of the Environment (approx. €9 million), and the selling of wood (€6 million gross revenue) (Šumava NP Annual Report 2012). It does not appear that European funding contributes a significant amount towards the management of the National Park. Funding of the NP supports the substantial nature-based tourism spending that occurs in the local area (see Section 3.1).

Czech law states that the forests in the NP are not to be used for profit (Act No. 114/1992 Coll.). Despite this trees in the National Park can be logged and sold for three reasons 1) bark beetle infestations (in Zone II and Zone III) 2) wind damages (extracting wind fallen timber) c) forest cultivation (Zones II and Zones III). The current scenario would maintain the current levels of funding (from timber) for the National Park, but would be likely to inhibit potential revenue from expanded nature-tourism activity.

4 Draft Bill Adoption

4.1 Tourism

Under this option, increased development of tourism infrastructure aims to encourage more people to the area of Šumava. A ski-lift in Nová Pec is a key aspect of the proposed plans. This is discussed below. An increased number of paved trails is also proposed that would increase the capacity for cyclists in the region. Whether this capacity will be filled depends on the nature of the demand. It is not clear if the demand exists in the Czech Republic to utilise the proposed infrastructure. There is a high risk that this development will undermine the reason visitors they come to Šumava: near pristine ecosystems.

As shown by the nature of the tourism offer and the attraction to visitors to NP status, tourism in Šumava is inexorably tied to the natural and wild landscape the national park provides. Preliminary assessments suggest that if the draft Bills proposals are adopted then habitats for crucial species will be damaged, as demonstrated in the letters of protests and opinion poll related to the drafted Bills. The survey[19] suggested that degradation of habitats and ecosystems are likely to undermine the appeal of the national park to visitors. So this damage would be expected to significantly reduce numbers of visitors attracted – and related local spending and economic activity - by nature-based activities.

A detailed assessment is required comparing the potential local economic benefits of the proposed development to the potential local economic losses through damage to current nature-based tourism activities.

4.1.1 Ski-lift Development

The ski lift proposals need to be profitable to attract investment and sustain the claimed socio-economic impacts, such as job creation, in Nová Pec (in or near the east part of NP). The proposals claim to be potentially profitable based on attracting 130,000 users of the lift each year, made up of all of the 70,000 Czech users of the Hochficht (ski area in Austria) who currently enter it by road, and 60,000 new users attracted by the lift. Each user would pay €35 per day to use the lift and the Austrian ski area. One key benefit of downhill ski tourism is that it supports economic activity in the winter season.

There are uncertainties in the financial viability of the proposed ski-lift. The following analysis is based on an outline budget which has been made available (P. Kindlmann, pers com, July 2013) with a project cost of CZK 250 million (€9.6m) and projected profits of CZK 17million (€0.66m). This is a relatively low rate of profit (7%), which makes the project's commercial viability sensitive to assumptions used in the business case or other factors:

- It is not obvious why all the 70,000 who currently access the Hochficht by car would use the Nová Pec lift. For a significant proportion of these visitors (depending on where they come from), driving to Austria could still be a more convenient option.
- A factor in the use of the Nová Pec lift is the influence of climate change. Being at a relatively low altitude, the season of operation of the lift is vulnerable to a reduction in the length of snow cover. Any reduction would reduce operating times, and therefore revenues and profits. Alternatively providing artificial snow would increase capital and operating costs.
- In trying to attract 60,000 new users per year, the site would be in competition with other ski locations. Other skiing resorts in the Czech Republic are available, and not believed to

[19] source: Šumava NP Visitors Questionnaire
http://www.hnutiduha.cz/sites/default/files/publikace/2013/vystupy_anketa_Šumava_2011.pdf
http://www.hnutiduha.cz/sites/default/files/publikace/typo3/Vystupy_anketa_Šumava_2010.pdf

be used at maximum capacity. If only 40,000 new visitors per year were attracted, the ski lift's operation would only approximately break-even, meaning it would be unlikely to attract investment.

- It is unclear if the project costs include the costs of financing the investment. Whilst this may be less relevant for private equity investors, there is an expectation that the investments would be supported by public money (e.g. EU grants). In this case, the costs of financing the project are relevant given the severe budget constraints in Europe. Alternatively they can be regarded as reflecting the opportunity costs of investing in the ski lift rather than alternative investments (e.g. in the environment or education). Assuming grants are made worth 50% of the total costs, and are repaid over 15 years at a 3% (public sector) interest rate, the interests costs are CZK 30 million (€1.1m). At higher commercial interest rates, the interest costs are higher.
- Finally, building the ski lift in a Natura 2000 site will mean compensation is required. If feasible, the potential costs of this are calculated (see below) at 20 million CZK per km^2, or 3 5million CZK (€1.35 million) in total.

It is clear from these issues that the financial viability of the ski lift proposal is uncertain, and requires detailed investigation and modelling. Allowing for the costs of financing the public grants for 50% of the project, or for the costs of habitat compensation, each give the project an expected loss of €0.5m. Including both of these factors and allowing for a slightly lower number of new visitors (of 50,000 per year) gives the project a loss of approximately €2m.

Compensation

The ski lift proposal would utilise land currently designated as a Natura 2000 site, and would negatively affect 50 protected species[20]. If a plan or project having a significant impact on a Natura 2000 site is authorised, compensatory measures are compulsory[21], and it would be illegal to de-designate the site for economic purposes. Therefore, if the ski lift went ahead it would be required to compensate for damage to biodiversity, in line with Habitats Directive legislation. It is uncertain whether suitable areas for compensation exist, as they would need to be outside the Natura 2000 designations (as areas designated should already be managed to maximise biodiversity values). Here we assume that compensation is feasible, and calculate the potential costs of this, which should be included in the project costs.

The proposed ski lift would be approximately 2.5 km long. Logging to create space for the lift, and disturbance from the lift to surrounding habitat, is estimated to impact an area approximately 600 m wide. The total area impacted is therefore 2.5 x 0.6 km = 1.5km^2. It is noted that under some proposals there is also a proposed ski run, and this could further increase the width of habitat impacted. Therefore, this area estimate is conservative.

Compensation for this impact would require creation of high biodiversity value undisturbed forest. The costs of this are estimated based on the following costs:

- land purchase cost of approximately 2.4 million CZK per km^2 (P. Kindlmann, pers comm, September 2013). Although land purchase may not be essential to undertake compensation, it is included in the costs to reflect the opportunity costs of the change in land use;
- approximately 7.76 million of CZK per km^2 for habitat creation of coniferous forest; and
- management costs estimated at 0.5 million CZK per km^2, which over 50 years discounted at 3% have a present value of approximately 13.25 million CZK per km^2.

This gives a cost of 20.25 million CZK per km^2. For the 1.5km^2 of total area impacted, the total costs are estimated at 35 million CZK, or €1.35 million.

[20] http://portal.mpsv.cz/sz/stat/nz/uzem/

[21] Source: page iv, DG Internal Policies (2009) http://www.europarl.europa.eu/document/activities/cont/200910/20091013ATT62399/20091013ATT62399EN.pdf

4.2 Regulating Ecosystem Services

As stated above, contiguity of habitats is essential for nature conservation and functioning ecosystems. With increased development and access breaking undisturbed habitats, ecosystems are likely to have reduced functionality and therefore ecosystem services are reduced.

The ecosystem dynamics of Šumava are complex and difficult to model. The damage to habitats and increased intervention management regime undertaken in the NP are likely to reduce the value of these services, compared to the current management scenario. For example, greater use of intervention forest management is likely to reduce carbon being stored into the soil, and reduce regulation of water runoff.

The significance of these changes cannot be quantified without detailed analysis and/or modelling of the Šumava landscape. The drafted Bills, by damaging the integrity of ecosystems in the NP, put at risk the significant value of the ecosystem services provided by the NP (€1.6 billion/yr, as described in Section 2.2 and Annex 1).

4.3 Non-use and Existence Values, and Reputation

In 2010 the Strategic Framework for Sustainable Development in the Czech Republic was issued (Ministry of the Environment of the Czech Republic, 2010[22]). Priority 4.1 of this framework refers to landscape conservation as a pre-requisite for biodiversity conservation. Objective 2 of this priority states:

> *"In order to achieve the objective, there will be measures aimed at promoting preferential construction within or with links to existing settlements (but not at the expense of green residential areas)….minimizing ecosystem fragmentation (especially in cases where the construction of infrastructure and settlements gradually results in the separation of entire landscape and orographic units)".*

Objective 3 states:

> *"The protection and improvement of the condition of biotopes should be pursued through strict protection of surviving sites with natural communities (peatbogs, wetlands, primeval forests, etc.) and sound land management and use that takes account of the needs of specially protected and endangered species and specific communities."*

The drafted Bills violate the spirit, if not also the wording, of this Sustainable Development framework, as it will result in deterioration in the condition of biotopes in the national park, and threaten the conservation of species. It is also suggested that the Bills violate the Habitats and Birds Directive [23] [24] by:

- downgrading important habitat from Zone I-II to Zone III to allow for construction work;
- reducing the core zones from their current size; and
- establishing roads which will harm species and habitats.

The legal outcomes of these breaches are uncertain, but the conflicts they reflect between the drafted Bills and sustainable development and biological objectives do not enhance Šumava NP's brand with national, European or global communities, including amongst potential tourist visitors.

[22] http://www.mzp.cz/en/czech_republic_strategy_sd
[23] 92/43/ EEC and 2009/147/EC
[24] Hnutí Duha – FoE Czech Republic Complaint to Commission

The current and future status of Šumava NP has already generated significant media interest and protests, demonstrating significant non-use values. The correspondence below has been directed at the government in response to the drafted Bills:

- In a letter to Ms Kateřina Sequensová, Czech Republic's ambassador to Switzerland, Nikita Lopoukhine Chair of the World Commission on Protected Areas (February 2012) expressed concern that the Bills will allow logging on two-thirds of the national park, and undermine the ecological processes and ecosystem services that park provides. The letter also states that non-intervention is the best management strategy for the park, and that the drafted Bills will go against the principles of the Convention on Biological Diversity.
- In a letter to Jiří Mánek, Director of Šumava NP, Andrej Sovinc, Regional Vice Chair for Pan Europe IUCN World Commission on Protected Areas and Hans Friederich, Regional Director IUCN Regional Office for Europe stated that Šumava NP would no longer be able to retain an IUCN Category II status under the management proposal contained in the Bills. Šumava would lose the ability to call itself a "NP" internationally.
- A Resolution concerning the preservation of Šumava NP from the Society of Conservation Biology, Europe Section, stated that the drafted Bills would "compromise the area's biodiversity".
- An open petition letter has been signed by directors of 72 conservation organisations, research institutes and national parks, states that the plans contained in the Bills would damage the ecology of Šumava and calls for previous plans for an expanded non-intervention core zone to be reinstated.
- The European Commission in August 2013 published guidelines on management of wild and wilderness areas in the Natura 2000 network, giving for the first time recognition to the status and thus importance of non-intervention as a concept of ecological value for implementation.[25]

If one of the Bills is passed, it is likely that media interest and protests will increase. It is worth noting that two of the petitions which are discussed in Section 3.3, which attracted in total 1.5 million signatories, relate to infrastructure being built across sensitive habitats. The Bills drafted for the Czech Parliament propose similar developments, albeit on a smaller scale.

Under the drafted Bills, developments would result in a reduction of non-use values due to damage to habitats are a result of ski infrastructure construction and increased intrusion to wilderness areas from mountain bikers. An opinion poll from 2011 found that 71% of Czechs do not agree with building of a new ski-lift and downhill skiing run in Šumava NP[26]. The Bills' proposals will result in significant loss of non-use value from Šumava NP, and reputational damage to Šumava region and the Czech Republic's record of natural heritage protection.

4.4 Local Economic Activity and Employment

Under the drafted Bills, job opportunities could increase in the NP through:

- construction work related to tourism and relaxed protections in the NP;
- increased forest management; and
- any increases in tourism as a result of developments.

Increased construction work as a result of reduced protection will bring a temporary increase in jobs. However, these jobs will be short term, and construction work is often taken by mobile labour from outside local areas.

[25] http://ec.europa.eu/environment/nature/natura2000/wilderness/index_en.htm

[26] Factum Invenio (2011) http://www.hnutiduha.cz/uploads/media/np_Šumava_verejne_mineni.pdf

With a reduction in non-intervention zones, increased active management of the NP will potentially result in more job opportunities in direct management. However, it is unclear if an increase in management will increase unemployment in the local population, because at present these jobs are not all taken by the local workforce. Furthermore, the damage to the park's condition and reputation could reduce local job opportunities, currently and in future, related to nature-based tourism – as outlined above, it is likely that developments arising from the Bills will undermine the international market image for Šumava among nature-based and general recreation visitors.

However, even if there is an increase in visitors – e.g. winter skiers – associated with the development activity and it is also expected that jobs in tourism may increase, the extent to which the economic benefits from any increase in tourism remains in the local area depends on the ownership and employment structure of the tourism industry. Increased tourism concentrated on a single activity and site (skiing), is more likely to require large scale facilities that are owned and controlled by people from outside the region. This increases the leakage of tourism revenues from the local area. Training is likely be required in the local unemployed workforce to access any opportunities that arise from increased development to overcome a skills shortage.

Comparing the key activities of forestry and nature-based tourism, the import of forestry labour means that it is likely to have lower value-added within the local economy compared to tourism activity. This will result in a lower proportion of income remaining within the local economy, and as a result lower tax revenues to local Government.

4.5 Financial Viability

Significant costs are associated with the adoption of the draft Bills. Constructing new trails, development of new tourist infrastructure and a ski lift require large capital investment. Public (national and European) and private financing is required. It is uncertain whether the investments required will be profitable enough to attract significant private financing. Using public funds to support the investments is questionable given that they will reduce the ecological value of the National Park. European Commission financing should not be provided for any project that damages a Natura 2000 site.

The new developments could potentially bring new revenues to the National Park, but as discussed under Tourism above, there is a risk of the ski lift proving non-viable, meaning this financial return is not achieved. The reduced ecological value of the site would make it harder to access European funding (e.g. LIFE funds to develop the nature conservation interest, or Structural Funds to develop nature-based tourism facilities).

5 Pro-Wilderness Development

5.1 Tourism

As shown by Těšitel et al. (2003), tourists visiting Šumava appreciate the pristine nature of the NP. In 2011, 45% of visitors surveyed support the idea of having 30-40% of the NP as non-intervention zones, 36% support more than 40%. Also 68% of respondents disliked clear cuts and 52% of visitors surveyed do not mind the sight of dead trees[27]. Leveraging this aspect of the Šumava NP is important for any development. This echoes what is found in the Bavarian Forest, where bark beetle is accepted as a natural process[28]. These findings suggests that large non-intervention areas would not repel tourists, but that visitors support an increase in the non-intervention Zone and therefore show affinity with 'wild' natural areas.

The best access points to the Šumava NP's wilderness are currently regarded as being 'full' in that further increases in visitors would damage the 'wilderness' experience which draws visitors. Therefore, there is perceived to be demand for a larger number of carefully managed access points to a larger wilderness area.

In line with this, and as recognised by the Šumava Regional Development Agency in 2007, an opportunity lies in marketing Šumava as a region of *"unique nature and scenery values"* and a risk to the landscape lies in *"…ill conceived investment activities"* (Picek et al., 2007). Increasing the size of the core Zone to 52.2% would provide Šumava with recognition as a protected area of international importance. The Šumava NP would be adopting a strategy which is supporting the economic benefits associated with wilderness. Wilderness areas are rare in central Europe, and the presence of a significant wilderness area in the region will provide a draw to visitors.

The current extent and size of the potential activity at the Šumava NP in nature tourism are demonstrated by recent analysis of the tourism benefits of Natura 2000 sites. It found that tourism expenditure in Natura 2000 sites was €50-€85 billion a year (European Union, 2013). This expenditure is estimated to support from 800,000 to 2 million FTE jobs. This activity is related to ecotourism, which has a large and growing global market (see Annex 4).

A number of actions could be undertaken to develop Šumava NP's share of this substantial nature tourism market. Firstly, securing its conservation status would provide greater certainty for visitors and those investing in services for this market, as would support by government. Secondly, specialist nature-tourism analysis of the visitor offer could be undertaken to identify the most effective enhancements to local infrastructure and services. Thirdly, the visitor offer could then be marketed, including through a formal linkage between Šumava and Bavarian Forest NP (see Box 2). Tourism information leaflets developed in the past by the NP on wilderness and mountain spruce regeneration are no longer available in NP information centers or local accommodation services. This indicates the potential to increase the marketing efforts based on the nature-based tourism offer in the Park.

Increasing nature-based tourism activity could be done, at least initially, by making greater use of existing tourism capacity. As well as underemployment of the local workforce, there is evidence of underutilised capacity in guest houses, hotels and other accommodation (G Whiteley, pers comms). More effective marketing to visitors to promote Šumava NP's natural wild heritage could firstly aim to increase use of existing accommodation, and secondly to expand facilities, including accommodation in existing villages, and provide visitor facilities around new points of carefully managed access to a larger wilderness area.

[27] source: Šumava NP Visitors Questionnaire
http://www.hnutiduha.cz/sites/default/files/publikace/2013/vystupy_anketa_Šumava_2011.pdf
http://www.hnutiduha.cz/sites/default/files/publikace/typo3/Vystupy_anketa_Šumava_2010.pdf
[28] For example http://www.dw.de/the-bavarian-forest-a-story-of-regeneration/a-1079118

One factor such a development package could target would be to expand the tourism season using existing tourism activities in local communities. For example by providing further cross country skiing opportunities with the nature-based or landscape-based selling point of the NP. A benefit of this cross-country skiing tourism is that it supports economic activity in the winter season.

Box 2: Evidence from German NPs

The Bavarian Forest (Bayerischerwald) NP has 53% wilderness area and supports a healthy tourism industry: based around the iconic value of the wilderness 'brand', the natural landscape, feeling of remoteness that goes with it – all key marketing elements.

The Bavarian Forest NP attracts around 750,000 visitors per year, which bring expenditure of €13.5 million per year. It directly employs 200 people and indirectly 939 from tourism, a total of 1,139 jobs. Every euro spent on the national park by the Bavarian Government is doubled by tourism spend in the park (Nationalparkverwaltung Bayerischer Wald, 2010).

It is demonstrated that in the Bavarian Forest that the opportunity costs[29] of the National Park are far exceeded by the benefits from nature-based tourism. This means that tourism compensates the region for lost income in the forestry and wood-processing sectors as a result of protections offered by the NP.

It is worth emphasizing that the logging income that does exist almost completely flows out of the region, because of remote ownership of the operations, while a higher proportion of tourism income stays in the region. These circumstances closely follow those experienced in Šumava NP, but the Bavarian Forest has made a choice to protect the nature and is seeing associated tourism benefits.

An important study in 2010 demonstrates the potential opportunities in NPs. Mayer et al. (2010) analyses the economic impact of tourism in six German national parks. It shows that the NP is a driver of development and substantial opportunities exist based on the protection and expansion of the non-intervention wilderness areas of high value nature in Šumava NP.

The key findings analysis of the German NPs were:

- Between 32% and 35% of income is retained in national parks; 16% is converted into indirect regional income.
- Encouraging visitors to stay overnight will increase the economic impact as will increasing the quality of service which will increase the prices of services.
- Bayerischer Wald NP is a strong tourist attraction, but it could be doing more to co-ordinate marketing and tourism businesses. For example promoting regional products will keep economic impact in the region.

The following tourism development opportunities have been identified for Šumava and lead on from the Mayer et al. (2010) study. Not all of these opportunities are inexorably linked to an increased non-intervention Zone, but it is difficult to imagine these ideas succeeding if the landscapes and nature of Šumava is not adequately protected.

5.1.1 Nature-based Tourism

With increases in protection for natural habitats, plus better low-level local infrastructure, services and marketing, those tourist activities which rely on nature can be increased. This applies to some extent to all activities in the NP, but is particularly relevant to activities which rely on interaction with nature (including bird watching, wildlife watching). These activities are currently

[29] Opportunity cost refers to the lost benefits from pursuing a certain course of action. For example an opportunity cost of national park designation is the net value of all the timber protected.

underdeveloped in Šumava NP – increased protection for habitats will support the development and marketing of these activities.

These activities can contribute a significant amount to tourism revenue: in the United States bird watchers contribute $85 billion annually in economic output, creating 863,405 jobs (Pullis La Rouche, 2006). The potential scale of the market of people interested in birds and nature conservation from which Šumava NP would be looking to attract nature-tourism visitors is indicated by NGO memberships. The BirdLife European and Central Asian Partnership consists of 45 conservation organisations with approximately 1.9 million members, the majority of which are in Europe, and BUND (Friends of the Earth Germany) have 0.5 million members. These people provide a potential market of tourists motivated by nature-watching, which can be grown by increased quantities of wildlife in the non-intervention Zone, and in areas outside the non-intervention Zone, where species should also increase due to spill over effects.

Key aspects of Šumava's nature-based tourism offer would be populations of iconic species (e.g. birds such as capercaillie, black grouse, birds of prey) as well as its overall richness of forest and wetland ecosystems together with their wildlife (e.g. orchids, many insects, including beetles and butterflies) and particularly the wild landscape.

An increase in nature-based tourism can be attracted to the Park by specific development of facilities such as:

- improvement of nature trails, including replacing asphalt roads with access walking routes more in keeping with access to a wilderness area;
- observation towers and visitor centre(s) that allow visitors to learn about and see, but not disturb the species/environment they wish to encounter;
- development of enclosures where people can view wildlife such as red deer during the winter season (e.g. at Velký Bor, Beranky and Jelení Vrchy) and potentially wolves (near Srní); and
- increased provision of guided walks into the Park; these are currently offered (e.g. at Křemelná, Vltavský luh, Trojmezná, Smrčina, Modravsko, Polom, Ždánidla, Kamenná) by the Park administration, but usually sell out within a few days of being announced; this suggests demand is not being met and greater numbers of trips could be organised at other locations (e.g. around peatbogs around Kvilda and Weitfallernske, in "succession forests" at Stodůlky, Skelná, Vysoké Lávky or Cetlova Hůrka) attracting more visitors to the area.

These can be supported through development of widespread low-level provision of facilities (e.g. accommodation, catering) in local communities close to the best areas for activities. It can generate income and employment through tour guiding, accommodation, restaurant, transport provision, craft marketing, and other retail. Such developments require some investments, but compared to the skiing developments under the proposed bills, these are significantly less expensive. Also, being spread across a number of locations, they can be developed over time and in a way that spreads risks away from a single location.

An expanded non-intervention area would increase the potential for nature-based tourism as described above. It would also enable alteration of current access points that disturb rare species (e.g. capercaillie breeding areas) through provision of alternative wilderness access points.

A beneficial aspect of nature-based tourism is that it often takes place outside the peak tourism season (Rayment and Dickie, 2001). For example, in 2000, the RSPB established Capercaillie viewing ("Caper-watch") at its Loch Garten reserve in the highlands of Scotland. It has since attracted over 10,000 visitors, who bring increased tourism trade, estimated at around £90,000 (approximately €100,000, in 2006 prices) each year, to the area outside the peak holiday season (Dickie et al 2006).

Low-level provision of nature tourism based on local communities can generate income and employment through tour guiding, accommodation, restaurants, transport provision, craft marketing, and low level retail. Under plans for expanding the non-intervention zone a more sustainable economic development model can be established – combining: 1) low level, local

development within the park based on nature tourism, etc; and 2) development and improved productivity of activities in adjacent areas outside the NP.

5.1.2 Strong Šumava Brand

Strengthening the brand or identity of Šumava, particularly in connection to wildness and the wilderness experience, will help attract national and international tourists to the region. Acting to protect a larger area of Šumava NP will enhance the region's nature credentials and therefore increase the attraction for tourists. From this the park can apply for international awards to be applied to the park, such as Pan Parks or IUCN category II, which currently the park is looking like it will lose.

At present there is limited promotion of the National Park by accommodation and tourist providers in the region and there are very limited tourism-orientated products. Despite the existence of a Šumava Region product range[30], it does not appear to tie into the existence of the national park. The product certification that exists at present is not unique to Šumava, and does not utilise the natural assets of Šumava. There is an opportunity to develop the marketing of local produce using a Šumava brand that links to the unique nature-based image for Šumava that would develop under this scenario. This in turn could enhance the visitor experience of Šumava NP.

A good example to follow could be the use of the Yorkshire Dales NP logo[31]. Local business and producers sign a licence agreement and pay £50 (€58) to use the logo. The reasons for using the logo are given as follows: *"The Yorkshire Dales NP logo - the well-known Swaledale ram's head[32] - provides a strong identity for this beautiful area. The logo promotes the location, provides a sense of place, and is a strong brand which is recognised nationally."*

A way to strengthen the brand of the Šumava NP is by restarting the 'Wild Heart of Europe' initiative. The Bavarian Forest, on the German side, is often cited as a model for management based on non-intervention, that could be applied in Šumava NP. They have adopted a successful tourism industry based on a wilderness-like experience (see Box 2). In the past there have been discussions on enhancing links between the two parks, which would allow their combined marketing as the 'Wild Heart of Europe'.

A previous attempt to market the two national parks in this way was restricted by differences in management approaches in the two countries. A pro-wilderness management plan in Šumava NP would have synergy with the management approach in the Bavarian Forest. This would enable coordination of management and development of low-impact facilities for visitors to Šumava with those in the Bavarian Forest. For example, networks of trails could be coordinated across the border. This could resume use of the Wild Heart of Europe brand, presenting a significant marketing opportunity for tourism and sharing of visitor management and enterprise experience.

5.1.3 Higher Value Services

With the development of a unique brand, location and experience, correspondingly higher value tourism services can be supported by the park. High value services result in each tourist spending more money on services during their visit. This must be based on offering a wider range of services with higher-valued-added to tourists. Such services need to be of higher quality to ensure increased revenues. Support would be required at a local level to enable this, for example through international standard accreditation for accommodation & services; training for staff; communications support to overcome language barriers for international marketing; and support for planning and funding local businesses.

The following ideas are examples of higher value tourism opportunities:

[30] http://www.regional-products.eu/en/brands/detail/375/Šumava-originalni-produkt
[31] http://www.yorkshiredales.org.uk/livinghere/whatwecandotohelpyou/logo
[32] This is the head of a type of sheep associated with farming in the area.

- high quality restaurants offering local produce;
- increased options for guided tours;
- high quality camping and caravan sites;
- high quality package tours – with many of the services provided locally to keep value added in the region, although experience of existing wilderness operators is valuable[33];
- kit transport services (e.g. for cyclists/walkers) to take their overnight bags to the hotel/ campsite that they cycle or walk to through the wilderness areas;
- new, better and more extensive visitor centres;
- opportunity for local crafts, retail sales;
- use of Wild Heart/wilderness brand for locally produced goods and services – including produce from areas adjacent to non-intervention Zone;
- promotional events linked to the characteristics of the NP (e.g. a 'wilderness festival') held in the communities in and around the NP, with a concentration of activities (e.g. for families) to attract new visitors to the area.

Neil Birnie, a nature-tourism expert[34], commented on the nature-tourism opportunity that: "*Šumava National Park is ideally positioned to capitalise upon positive trends within the wider global tourism industry, with travellers increasingly seeking experiences based upon wilderness and wild nature. The Park's geographical proximity to major centres of European population gives it a significant competitive advantage over other areas of wilderness character.*

The key elements required to capitalise upon this opportunity are:

- *Creative product development: building upon existing offerings (outdoor activities and local guesthouse style accommodation) and focusing upon products of higher value potential such as upmarket wilderness 'ecolodge' accommodations, imaginative family-focused experiences and wildlife tourism;*
- *Training and skills development in the core service skills of guiding and tourism facility management;*
- *Investment in international marketing efforts to promote Šumava as a destination, with such promotional efforts carefully coordinated so as to complement individual business marketing strategies*".

These nature-based tourism developments can be a source for project based (EU) investment to the region. For example, EU Structural Funds 2014-2020 will continue to provide support to tourism related SME development and capacity building etc., including cross-border developments (M. Kettunen, IEEP, pers coms, Nov 2013). A feasibility study is recommended to identify specific development opportunities and what support they would require.

5.1.4 Research and Education

Although not what is usually thought of as tourism, the creation of the large wilderness area would attract scientific researchers, whose requirements can be similar to nature-tourists in terms of accommodation and other services. These scientists can bring with them similar revenues to tourists. A research and training centre was proposed in Kvilda in the centre of the NP, looking to attract scientists and also offering a unique opportunity for interpretation of field science to the public (e.g. using recently developed technologies that allow online tracking through radio tags of individuals of charismatic species). With the change in park leadership the research centre project was shelved, but could be revived.

[33] Examples of tour operators http://www.panparks.org/what-we-do/partners/tour-operator-partners

[34] Mr Birnie is Founder of Wilderness Scotland/Wilderness Journeys, which was recently recognised as Europe's No 1 Adventure Travel Company by National Geographic and winner of the Best Green Tour Operator category at the World Travel Awards. He is Chief Executive of Conservation Capital which has structured transactions in excess of US$ 200 million in more than 20 countries across Africa and Europe.

A large wilderness area will also be attractive to schools and students, national and international, including through overnight stays on educational trips, and in environmentally-focused holiday camps.

5.1.5 Hunting

Hunting is currently of limited importance to the National Park. Due to the loss of large natural predators in the NP (bears and wolves), traditional prey species such as deer have no pressure from predation. This large population of deer causes problems for the environment of the national park. For this reason culling is considered good environmental management.

At present the local population employed in forest management are obliged to shoot 10 deer a year; 686 red deer were shot in 2011 (Křenová, pers comms, July 2013). This is a potential income stream that is not being exploited, as some of these deer could be shot by hunting-tourists. Hunting is offered in the Czech Republic with up to €600 charged to shoot a roe deer[35], excluding any additional services.

Although not directly tied to the size of the non-intervention area, marketing which leverages hunting in the 'Wild Heart of Europe' will be attractive. Hunting may not be suitable in the majority of the NP, as it would not be in line with 'non-intervention' management. However, given that some deer culling is already taking place, a carefully managed system of permitted hunting should be possible. Its management would need to balance the benefits of reduced deer populations to habitat management, the local revenue from hunting, and the detrimental impact on species viewing by non-hunting visitors (as hunting makes all large species more wary of humans).

5.2 Regulating Ecosystem Services

It is difficult to determine the exact impact on ecosystem services of a large non-intervention area without understanding the ecosystem services that flow from Šumava NP in considerable detail. Under the pro-wilderness scenario, the protection of ecosystems, and the reduced fragmentation of habitats and intervention management, are likely to increase the value of regulating services, compared to the current scenario. For example, less use of intervention forest management is likely to increase carbon being stored into the soil, and increase regulation of water runoff.

The significance of these changes cannot be quantified without detailed analysis and/or modelling of the Šumava landscape. However, there is an opportunity under this pro-wilderness scenario to restore and manage wetlands to enhance their regulating services values.

5.3 Non-use and Existence Values, and Reputation

As discussed in the Section 3.3, the public values conservation of wildlife, particularly in the areas of highest quality habitats and species (such as Šumava NP). The creation of a larger non-intervention area will increase the level of these values for Šumava NP. It could also improve the reputation of Šumava as a sustainably managed NP. This links to the tourism market opportunities described above.

75% of the Czech population agree that it is important to halt the loss of biodiversity because we have a moral obligation to look after nature[36].

[35] http://www.stanislavstur.cz/download/Hunting%20in%20the%20Czech%20Republic%20with%20Stanislavstur.pdf

[36] http://ec.europa.eu/public_opinion/flash/fl_379_fact_cz_en.pdf

5.4 Local Economic Activity and Employment

Concern exists that any substantial increase in size of the non-intervention area would result in job losses of local people in the NP area. This is considered unlikely for a number of reasons. Firstly, unemployment in Šumava NP has closely following national trends (although generally having lower rates of unemployment) irrespective of the management of the park over the last two decades (see Figure 5.1). This suggests that the main drivers of local employment are the performance of the national economy and the skills of the local workforce – not the mode of management employed.

Secondly, the prospects for losing employment in forestry activities are low. Forest management is not likely to decrease in the event of an increase in non-intervention area. The fear that forest management work would be reduced, if the non-intervention area was increased, rests on the assumption that the current area is fully utilising all opportunities for employment. However, this is not the case. Even though the non-intervention area will increase under this scenario, there will still remain substantial areas (estimated to be at least 160km^2) that will continue to support existing levels of activity by lumberjacks/foresters. The need for cyclical bark beetle management activity will also remain in some areas.

In addition, the work of foresters does not only include chopping trees down, but also replanting. An area of 951.52[37] ha remains to be forested, this work is a legal requirement and is required whatever the extent of non-intervention zones, so should provide a stable source of employment. Anecdotal evidence (Guy Whiteley, pers comm July 2013) from the local population suggests that the present management of the forest is undertaken by companies that employ a non-local workforce. Therefore, the impact of any reduction in forest management activity (if it did occur) will not all fall on the local population. Therefore, an increase in the non-intervention Zone will not necessarily have any impact on forestry employment, nor employment within local communities.

Thirdly, the scenario of natural ecosystem (wilderness) expansion brings a better opportunity for creating new local employment in and around Šumava NP. This opportunity is based on long term expansion of nature-based tourism based on opportunities and branding associated with a large transboundary wilderness zone (described in Section 5.1).

Finally, there is some perception that there are sufficient jobs in the national park for the majority of individuals who have the requisite skillset. What the area around the national park might be experiencing is structural unemployment, whereby the skills and education of the workforce do not match the demand for jobs[38]. Anecdotal evidence suggests this is the case in Šumava – suggesting a need to provide appropriate training to match the local workforce the job opportunities associated with expanded tourism activity.

In Annex 3 we present a number of studies that show the revenue generation and employment opportunities generated by NPs and wilderness.

[37] http://www.czso.cz/vykazy/vykazy.nsf/i/les_8_01_2012
[38] http://www.brookings.edu/research/papers/2011/09/09-skills-unemployment-rothwell-berube

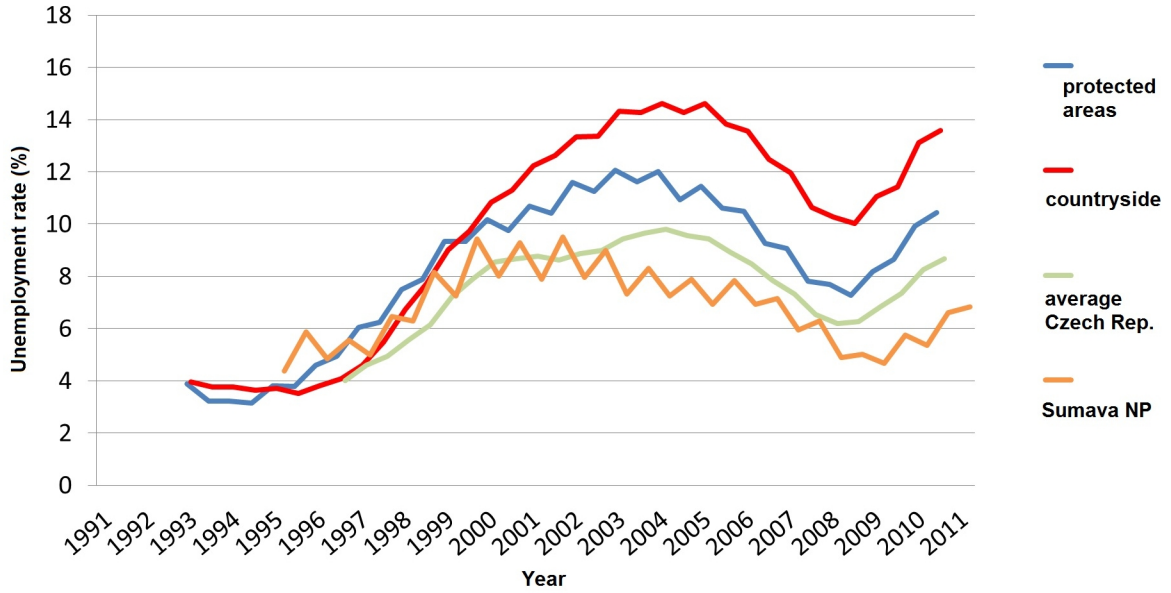


Figure 5.1: Employment trends in Šumava and related areas.

Overall pro-wilderness development is likely to have a positive impact on local employment. Forestry employment is likely to be maintained. Expansion and enhancement of the tourism offer can increase the employment opportunities it offers. Under this scenario it can also support activities which have a greater value added, and therefore result in more income and indirect activity supported, within the local economy.

5.5 Financial Viability

Leaving a substantial part of the national park to wilderness can be seen as a more cost-effective option. The land that has been designated as a non-intervention area would be left without ongoing habitat management (although visitor management could be required). It is unlikely that any intervention would be required in designated core areas, but there would still be other employment opportunities in conservation management: anti-poaching, information provision, guidance, research. Rangers would ensure borders are respected and tourist activities are not damaging habitats.

This scenario would provide local development opportunities that do not damage the ecological value of the Park. This would make it easier for the areas to access European funding (e.g. LIFE funds to develop the nature conservation interest, or Structural Funds to develop nature-based tourism facilities).

Under this scenario opportunities to generate revenue to enable the NP to be managed effectively could also increase through:

Entry fees

Entry fees could be charged for certain areas of the park, or access to specific new facilities or opportunities (e.g. canoeing routes). This would be a direct way to generate income to finance park activities, thus supporting jobs. Entry fees are not politically or practically possible across the whole of the national park. They may be possible on small areas of the park where a unique experience is provided, e.g. at the Polednik viewing tower; for canoeing on the upper Vltava River; entrance to red deer enclosures.

Payments for Ecosystem Services (PES)

New forms of financing and funding for nature are being considered across Europe[39]. These new funding streams could support jobs and management activities in the National Park.

One of these is PES, which refers to the beneficiaries of ecosystem services paying to ensure that these services continue or are enhanced. To assess the full potential for PES in the Šumava NP a full assessment of the ecosystem services provided and the beneficiaries would be required (building on the information in Annex 1). PES opportunities could also exist for a range of regulating ecosystem services including water quality, carbon sequestration and flood mitigation.

Voluntary donations to the running of the NP are also a form of PES. The key question is how to collect these donations. To maximise revenue it is best to collect donations at a bottleneck that most visitors flow through and it is beneficial to ask for a donation when customers are already spending money[40]. This could occur at either a centralised hotel booking site, or at check in/out at hotels who have signed up to be Šumava NP partners.

Excellent information materials have been produced by the National Park. These can be provided in hard copy or electronically to tourists who pay a voluntary donation to the park. A link to the donation page can be provided at hotels and tourists information points. This is of low or zero marginal cost to the national park authorities (no printing charges) and the documents already exist. It could form part of plans for improved marketing to underpin gains from nature-based tourism (see Section 5.1). It could form part of plans for improved marketing to underpin gains from alternative wilderness based tourism (see Section 5.1).

These are initial ideas and require further development. They illustrate that substantially increased revenue streams could be possible from the park.

[39] See http://www.prosperousparks.com/ or http://ec.europa.eu/environment/enveco/biodiversity/pdf/BD_Finance_summary-300312.pdf

[40] http://www.research-live.com/comment/tugging-on-the-behavioural-heartstrings/4007544.article

References

Abensperg-Traun, M., Smith, G. T., 1999. How small is too small for small animals? Four terrestrial arthropod species in different-sized remnant woodlands in agricultural Western Australia. *Biodiversity and Conservation* 8: 709–726.

Arcadis, eftec, ECNC, 2011. Recognizing Natura 2000 benefits and demonstrating benefits of conservation measures, Report for the DG Environment within the European Commission.

Berger, J., 1990. Persistence of different-sized populations: An empirical assessment of rapid extinctions in bighorn sheep. *Conservation Biology* 4: 91–98.

Berger, J., 1999. Intervention and persistence in small populations of bighorn sheep. *Conservation Biology* 13: 432–435.

BIO Intelligence Service, 2011. Estimating the economic value of the benefits provided by the tourism/recreation and Employment supported by Natura 2000, Final Report prepared for European Commission – DG Environment.

Bláha, J., 2012. Threats to wilderness in Šumava – how European Citizens can help wilderness, presentation. Available from: http://www.slideshare.net/panparks/jaromir-blaha-threats-to-wilderness-in-Šumava-how-european-citizens-can-help-wilderness [accessed 23.11.2013].

Bláha, J., Romportl, D., Křenová, Z., 2013. Can Natura 2000 mapping be used to Zone the Šumava National Park. *European Journal of Environmental Sciences* 3: 57–64.

Bulman, C. R. and 6 others, 2007. Minimum viable metapopulation size, extinction debt, and the conservation of a declining species. *Ecological Applications* 17: 1460–1473.

Cui, Y., Mahoney E., Herbowicz, T., 2011. Economic Benefits to Local Communities from National Park Visitation. Natural Resource Report NPS/NRSS/ARD/NRR–2013/632. Department of Community, Agriculture, Recreation and Resource Studies, Michigan State University.

Cumulus Consultants Ltd and ICF GHK, 2013. Valuing England's National Parks: Final Report for Natural Parks England. Available from: http://www.nationalparksengland.org.uk/__data/assets/pdf_file/0006/338361/Valuing-Englands-National-Parks-Final-Report-10-5-13.pdf [accessed on: 23.11.2013].

Defra, 2011. National Park Authorities: Assessment of Benefits – working paper. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69310/pb13533-national-park-authorities.pdf [accessed on: 23.11.2013].

Dickie, I., Hughes, J., Esteban, A., 2006. Watched Like Never Before. RSPB. Sandy. Available from: https://www.rspb.org.uk/Images/watchedlikeneverbefore_tcm9-133081.pdf [accessed on: 23.11. 2013].

eftec, Environmental Futures Ltd, 2006. Valuing our Natural Environment – Final Report, for the Department of Environment Food and Rural Affairs.

European Commission, 2013. Factsheet: The Economic Benefits of Natura 2000, European Union.

Font, X., Cochrane, J., Tapper, R., 2004. Tourism for Protected Area Financing: Understanding tourism revenues for effective management plans' WWF, World Wide Fund for Nature. Available from: http://www.panparks.org/sites/default/files/docs/publications-resources/pay_per_nature_view_-_understanding_tourism_revenues_for_effective_management_plans.pdf [accessed on: 23.11.2013].

Franklin, I. R., 1980. Evolutionary change in small populations. In M. E. Soulé and B. A. Wilcox (eds.), Conservation Biology: An Evolutionary-Ecological Perspective, pp. 135–149. Sinauer Associates, Sunderland, MA.

Frelichová, J., Vačkář, D., et al., 2013. Integrated assessment of ecosystem services in the Czech Republic. Global Change Research Centre AS CR, Brno.

Getzner, M., 2009. Economic and cultural values related to Protected Areas: Part A: A valuation of Ecosystems Services in Tatra (PL) and Slovenský ráj (SK) national parks. WWF, World Wide Fund for Nature. Available from: http://www.panparks.org/sites/default/files/docs/publications-resources/economic_and_cultural_values_related_to_protected_areas.pdf [accessed on: 23.11. 2013].

Gilpin, M. E., Soulé, M. E., 1986. Minimum viable populations: Processes of species extinction. In M. E. Soulé (ed.), Conservation Biology: The Science of Scarcity and Diversity, pp. 19–34. Sinauer Associates, Sunderland, MA.

Gorner, T.,Najmanová, K., Čihař, M., 2012. Changes in Local People's Perceptions of the Šumava National Park in the Czech Republic over a Ten Year Period (1998–2008). *Sustainability* 2012: 1354–1370; doi:10.3390/su4061354.

Gorner, T., Čihař, M., 2013. Local Attitudes on Protected Areas: Evidence from Šumava National Park and Šumava Protected Landscape Area. *Environment and Pollution* 2: 1–13.

Grodzki, W., Jakuš, R., Lajzová, E., Sitková, Z., Maczka, T., Škvarenina, J., 2006. Effects of intensive versus no management strategies during an outbreak of the bark beetle *Ips typographus* (L.) (Col.: Curculionidae, Scolytinae) in the Tatra Mts. in Poland and Slovakia, *Annals of Forest Science* 63: 55–61.

Groom, M. J., Meffe, G. K., Carroll, C. R. (eds.), 2006. *Principles of Conservation Biology*, 3rd ed. Sinauer Associates, Sunderland, MA.

Harris, G., Pimm, S. L., 2008. Range size and extinction risk in forest birds. *Conservation Biology* 22: 163–171.

Headwaters Economics, 2013. Summary Report: The Economic Costs and Benefits of a New National Park and Recreation Area for Penobscot and Piscataquis Counties, Maine. *Headwaters Economics*.

Headwaters Economics Website, 2013. Studies Show Economic Benefit of National Parks. Available from: http://headwaterseconomics.org/headwaters/economic-benefits-of-national-parks [accessed on: 23.11.2013].

Heurich, M., 2012. Lessons from 30 years of natural disturbances in the Bavarian Forest National Park [pdf]. *Nationalparkverwaltung Bayerischer Wald*, Prague.

Holmes, F.P., Hecox, W.E., 2004. 'Does wilderness impoverish rural regions? *International Journal of Wilderness*, 10(3): 34–39. Available from: http://www.wilderness.net/library/documents/IJWDec04_Holmes.pdf [accessed on: 23.11.2013].

Houdet, J., 2011. The Economics of Wilderness: Overcoming Challenges and Seizing Opportunities. Available from: http://www.panparks.org/sites/default/files/docs/publications-resources/the_economics_of_wilderness.pdf [accessed on: 23.11.2013].

IEEP, Brink, P., Badura, T., Bassi, S., Gantioler, S., Kettunen, M., 2011. Estimating the Overall Economic Value of the Benefits provided by the Natura 2000 Network [pdf]. *Institute for European Environmental Policy (IEEP)*.

Kindlmann, P., Matějka, K., Doležal, P., 2012. Lesy Šumavy, lýkožrout a ochrana přírody. [Forests of Šumava, bark beetle and nature protection. In Czech] Karolinum, Prague.

Křenová, Z., Hruška, J., 2012. Proper zonation – An essential tool for the future Conservation of the Šumava National Park. *European Journal of Environmental Sciences* 2(1): 62–72.

Křenová, Z., Kiener, H., 2012. Europe's Wild Heart – still beating? Experiences from a new transboundary wilderness area in the middle of the old continent. *European Journal of Environmental Sciences* 2 (2): 115–124.

Lake District National Park, 2011. Tourism, the economy and the local community. Available at: http://www.lakedistrict.gov.uk/learning/lakedistrictfacts/factstourism/factstourismeconomy [accessed on: 23.11.2013].

Lawton, J.H., Brotherton, P.N.M., Brown, V.K., Elphick, C., Fitter, A.H., Forshaw, J., Haddow, R.W., Hilborne, S., Leafe, R.N., Mace, G.M., Southgate, M.P., Sutherland, W.J., Tew, T.E., Varley, J., Wynne, G.R., 2010. Making Space for Nature: a review of England's wildlife sites and ecological network. Report to Defra.

MacArthur, R. H., Wilson, E. O., 1967. *The Theory of Island Biogeography*. Princeton University Press, Princeton, NJ.

Marshall, K., 2005. Capercaillie and Recreational Disturbance Study, For CNPA, FCS and SNH.

Mayer, M., Müller, M., Woltering, M., Arnegger, J., Job, H. 2010. The economic impact of tourism in six German national parks. *Landscape and Urban Planning* 97: 73–82.

Muller, J. B., Bußler, H., Goßner, H., 2008. The European spruce bark beetle *Ips typographus* in a national park: from pest to keystone species. *Biodiversity and Conservation* 17: 2979–3001.

National Park Services, 2011. Economic Benefits to Local Communities from National Park Visitation. *Natural resource report: NPS/NRSS/ARD/NRR-2013/632*. Available from: http://www.nature.nps.gov/socialscience/docs/NPSSystemEstimates2011.pdf [accessed on: 23.11. 2013].

Nationalparkverwaltung Bayerischer Wald, 2010. The regional economic impact of Bavarian Forest National Park [pdf].

Návrh zákona o Národním parku Šumava a o změně zákona č. 114/1992 Sb., o ochraně přírody a krajiny, ve znění pozdějších předpisů. Available from:
http://www.psp.cz/sqw/historie.sqw?o=6&T=435 ("Pilsener" proposal)
[accessed on: 23.11.2013],
or http://www.psp.cz/sqw/historie.sqw?o=6&T=999 ("Governmental" proposal).
[accessed on: 23.11.2013].

Pan Parks Website (undated) Initiatives supporting wilderness protection in Majella NP, Italy. Available from:
http://www.panparks.org/learn/case-studies/initiatives-supporting-wilderness-protection-in-majella-np-italy [accessed on: 23.11.2013].

Pardini, R., de Souza, S. M., Braga-Neto, R., Metzger, J. P., 2005. The role of forest structure, fragment size and corridors in maintaining small mammal abundance and diversity in an Atlantic forest landscape. *Biological Conservation* 12: 253–266.

Picek, M., Růžička, T., Silovský, V., Těšitel, J., Vlášková, K., 2007. Tourism in the Šumava mountains: Concept of sustainable tourism development. Action Programme. Issued by Regionální rozvojová agentura Šumava, o.p.s.

Policy Committee of the Society for Conservation Biology, Europe Section, 2012. Report on the Trip to Šumava NP, Czech Republic.

Potočnik, J., 2012. Letter to Mr. Tomáš Chalupa, Minister of the Environment of the Czech Republic.

Pullis La Rouche, G., 2006. Birding in the United States: a demographic and economic analysis. In Boere, G.C., Galbraith, C.A., Stroud, D.A. (eds.) Waterbirds around the world. The Stationery Office, Edinburgh, UK, pp. 841–846.

Rasker, R., 2013. A Comparative Analysis of the Economies of Peer Counties with National Parks and Recreation Areas to Penobscot and Piscataquis Counties, Maine. *Headwaters Economics*. Available from:
http://headwaterseconomics.org/land/reports/katahdin [accessed on: 23.11.2013].

Rayment, M., Dickie, I., 2001. Conservation Works. RSPB. Sandy.
http://www.rspb.org.uk/Images/conservationworks_tcm9-132933.pdf [accessed on: 23.11.2013].

Saniga, M., 2003. Ecology of the capercaillie (*Tetrao urogallus*) and forest management in relation to its protection in the West Carpathians. *Journal of Forest Science* 49: 229–239.

SCNP, APRS 2011. Benefits of National Parks: Joint report by the Scottish Campaign for National Parks and the Association for the Protection of Rural Scotland. *APRS Website*. Available from: http://btckstorage.blob.core.windows.net/site1061/Projects/Scottish%20National%20Parks/11.09%20Benefits%20of%20National%20Parks.pdf [accessed on: 23.11.2013].

Shaffer, M. L., 1981. Minimum population sizes for species conservation. *BioScience* 31: 131–134.

Summers, R., McFarlane, J., Pearce-Higgins, J., 2007. Measuring avoidance by capercaillies *Tetrao urogallus* of woodland close to tracks. *Wildlife Biology* 13: 19–27.

TEEB – The Economics of Ecosystems and Biodiversity for National and International Policy Makers 2009. Summary: Responding to the Value of Nature. Available from:
http://data.iucn.org/dbtw-wpd/edocs/2009-116.pdf [accessed on: 23.11.2013].

Těšitel, J., Kušová, D., Bartoš, M., (2003). Role of tourism in development of rural marginal areas (region of Šumava Mts. in Czech Republic), *European Rural Development Network Studies* 1:81–91.

Thiel, D., Jenni-Eiermann, S., Palme, R., Jenni, L., 2011. Winter tourism increases stress hormone levels in the Capercaillie *Tetrao urogallus*. *International Journal of Avian Science* 153: 122–133.

Thiel, D., Menoni, E., Brenot, J., Jenni, J., 2007. Effects of recreation and hunting on flushing distance of capercaillie. *Journal of Wildlife Management* 71(6): 1784–1792.

Thiel, D., Jenni-Eiermann, S., Braunisch, V., Palme, R., Jenni, L., 2008. Ski tourism affects habitat use and evokes a physiological stress response in capercaillie *Tetrao urogallus*: a new methodological approach. *Journal of Applied Ecology* 45: 845–853.

Traill L. W., Bradshaw, C., J. A., Brook, B. W., 2007. Minimum viable population size: A meta analysis of 30 years of published estimates. *Biological Conservation* 139: 159–166.

Třebický, V., Čihař. M., 2006. Analysis of Nature-Based Tourism in the Šumava National Park, Czech Republic: 1997-2004. Exploring the Nature of Management. Proceedings of the Third International Conference on Monitoring and Management of Visitor Flows in Recreational and Protected Areas. *University of Applied Sciences Rapperswil, Switzerland*, 13-17 September 2006. Rapperswil.

National Parks Austria (2013) Position Paper of the Expert Committee for Bark Beetle Management. Adopted unanimously at the 6th Meeting of the Advisory Board National Parks Austria, 10 April 2013.

Vimperk, 2000. Management Plan of the Šumava National Park for the period 2001–2010.

Walsh, R.G., Loomis, J.B., Gillman, R.A., 1984. Valuing Option, Existence, and Bequest Demands for Wilderness, *Land Economics*, 60: 14–29. Available from: http://www.jstor.org/discover/10.2307/3146089?uid=3738032&uid=2&uid=4&sid=21102514237951 [accessed on: 23.11.2013].

The Wilderness Society, 2004. The Economic Benefits of Wilderness: Focus on Property Value Enhancement. *Ecology and Economics Research Department* 2: 1–8. Available from: http://wilderness.org/sites/default/files/The-Economic-Benefits-of-Wilderness-With-a-Focus-on-Land-Value-Enhancement_low-res.pdf [accessed on: 23.11.2013].

Wilderness.net website, undated. Economic benefit of wilderness. Available online: http://www.wilderness.net/NWPS/valuesEconomical [accessed on: 23.11.2013].

Willi, Y., Van Buskirk, J., Hoffmann, A. A., 2006. Limits to the adaptive potential of small populations. *Annual Review of Ecology, Evolution and Systematics* 37: 433–458.

World Bank, 2012. The Benefits and Costs of Establishing a National Park in Madagascar. *ELAW*, Available from: http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTEEI/0,,contentMDK:20486381~menuPK:1187891~pagePK:210058~piPK:210062~theSitePK:408050~isCURL:Y,00.html [accessed on: 23.11.2013].

World Bank, 2004. How much is an Ecosystem worth? Assessing the economic value of conservation. Available from: http://data.iucn.org/dbtw-wpd/edocs/2004-050.pdf [accessed on: 23.11.2013].

Annex 1 – Šumava Ecosystem Services Valuation

The preliminary results from a study which estimates the ecosystem values of Šumava Region has been provided to us as part of this report. It provides an 'order of magnitude' estimate of the values coming from the park. The study has undertaken a value transfer exercise, which takes primary values from other studies on similar habitat types and applies them to Šumava. It finds that €1.1 billion a year worth of ecosystem services flow from the park every year.

Methodology [provided by study author David Vačkář]

Valuation of ecosystems of Šumava has been based on habitat accounting approach which takes into account specific natural habitat units occurring in the case study area. Benefit transfer was the key method applied to obtain values. A use of this method enabled us to derive values of the ecosystem examined based on data which have been previously carried out to value similar goods and services in similar context (Liu et al., 2010).

The initial step was literature review. To collect input data on biophysical and economical values we followed specific searching strategy within Web of Science (WoS) and Scopus. We have applied predefined chains of keywords, which included "Ecosystem service*", "valuation"," assessment" and ecosystem type. As a complementary data resource we extracted the Ecosystem Service Valuation Database (ESVD), which has been compiled by the Ecosystem Services Partnership (ESP) and the existing Czech studies and national reports.

We considered studies published between 2000 and 2012 only. Additionally, the studies were required to include information about habitat type, per hectare value, methodology and origin of data. To ensure comparability of transferred data with Czech environmental, social, economic and political conditions, we used studies related to European countries and geographical Zone in between 44° – 56° N. Findings in accordance with given criteria were included in the database of biophysical and economic values. In total, we were able to build a database of more than 200 records based on 58 source studies.

A diversified set of values in terms of economic and biophysical metrics has been attained from a literature review. Therefore, the values were converted into common metrics and, in case of monetary values, were standardized to euro per hectares per year using 2012 as the base year.

Once the values were standardized, we estimated average values of individual ecosystem services as well as a total value per hectare of selected ecosystems. A total value per hectare of ecosystem was counted as a sum of the means of available services values. Afterwards, we generated values of Czech ecosystems by an attribution of total values to a land use type based on the following formula:

$E_V = A_y * V_{ES}$,

where E_V is a value of assessed ecosystem, Ay is the area (in ha) of ecosystem/land use type and V_{ES} represents an assumed total value of given ecosystem/land use type per hectare (EUR 2012).

To be able to spatially reference the values, we created a map with proper distinction of habitats. Such a map was created in cooperation with the Nature Conservation Agency of the Czech Republic. The map was compiled based on all the major sources of land cover/land use data in the Czech Republic. The resulting consolidated layer comprises 40 categories of ecosystems, classified at four hierarchical levels.

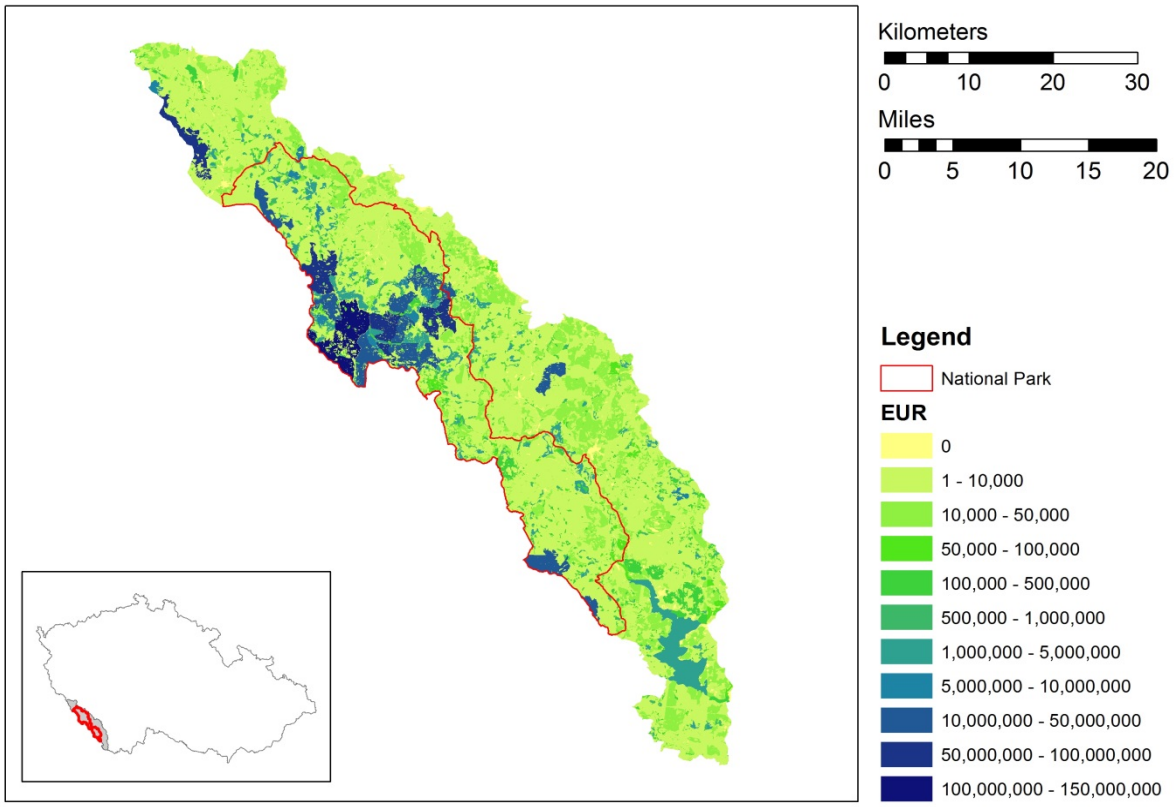
In the last step, we valued the ecosystems of Šumava and illustrated their value by the map. The overall value of the ecosystems, or ecosystem services, respectively, for the Šumava Mnt. is 1,690 million EUR per year. The value of ecosystems in the Šumava NP is estimated at 1,140 million EUR. Therefore, the average value per hectare for the whole Šumava area (NP and Protected Landscape

Area) is 10,078 EUR/ha/year. For the area of the NP, the average value per hectare is 16,749 EUR/ha/year (in 2012 prices).

Interpretation (eftec)

The method used gives an initial indication of the potential significance of ecosystem services from Šumava NP. For example, with 2m visitors/yr, cultural values could clearly be substantial. The method transfers values based on habitat types, but it has not been possible to adjust these for other variables (e.g. population, substitutes), so the results are uncertain. The results are an order of magnitude estimate of the potential size of the ES benefits.

Figure 1 – Estimate of value of ecosystem services from Šumava National Park



We have shown that the Šumava National Park is not only of importance for either the tourism it generates or the timber it provides, but also for the services it provides **local, national and international populations. less than they would be under and alternative management scenario.**

Ecosystem services valued:

Aesthetic value
Air quality regulation
Climate regulation
Disturbance regulation
Erosion regulation
Nutrient regulation
Pest control
Pollination
Provision biomass
Provision fish
Provision game

Provision non-timber
Provision timber
Provision water
Recreation
Water cycle regulation
Water quality regulation

Ecosystem categories mapped in Šumava Mt.

Alluvial forests
Alluvial meadows
Alpine grasslands
Anthropogenic water bodies
Anthropogenically influenced water courses
Arable land
Artificial rocks
Artificial urban green areas – parks, gardens, cemeteries
Artificial urban green areas – recreation and sport areas
Beech forests
Bog forests
Discontinuous urban fabric
Dry grasslands
Dry pine forests
Dump and construction units
Heaths
Industrial and commercial units
Intensive broad-leaved forests
Intensive coniferous forests
Intensive grasslands
Intensive mixed forests
Introduced *Pinus mugo* scrub
Introduced shrub vegetation
Macrophyte vegetation of water bodies
Mesic meadows
Natural *Pinus mugo* scrub
Natural rocks
Natural shrub vegetation
Natural water courses
Oak and oak-hornbeam forests
Orchards and gardens
Peatbogs and springs
Spruce forests
Swamps
Transport units
Wetlands and littoral vegetation

Reference

Liu, S., Costanza, R., Troy, A., Aagostino, J.D., Mates, W., 2010. Valuing New Jersey's Ecosystem Services and Natural Capital: A Spatially Explicit Benefit Transfer Approach. Environmental Management 45: 1271–1285.

Acknowledgement

Data and values has been provided within projects "Integrated Assessment of Ecosystem Services in the Czech Republic" and "Developing Long-term Social-ecological Research in the Czech Republic", funded by the Technology Agency of the Czech Republic and coordinated by the Global Change Research Centre, Academy of Sciences of the Czech Republic.

Annex 2 – Evidence for Existence Values

Table A.1 Evidence for Existence Values

Paper	Question	Value
Amirnejad, H., Khalilian, S., Assareh, M.H., Ahmadian, M., 2006. Estimating the Existence Value of North Forests of Iran by Using a Contingent Valuation Method. Ecological Economics 58(4).	Mean of willingness to pay (WTP) for existence value of these forests	US$2.51 household/month Or US$30.12 household/year
Christie, M., Hyde, T., Cooper, R., Fazey, I., Dennis, P., Warren, J., Colombo, S., Hanley, H., 2011. Economic valuation of the benefits of ecosystem services delivered by the UK Biodiversity Action Plan. Defra.	The aim of this study was estimate the value of changes in biodiversity and associated ecosystem services resulting directly from the delivery of the UK Biodiversity Action Plan (UK BAP).	Two scenarios were developed, one detailed the current benefits from UK BAP implementation scenario. The second detailed the benefits from increased spending on the UK BAP. The non-use benefits are as follows £million / year Sense of place – 131.3-167.4 Charismatic species – 253.7 -175.1 Non-Charismatic species – 83.3 - 41.74
Durand, S., Point, P., 2000. Approche Théorique Et Empirique De La Valeur D'Existence : Application Aux Espèces Animales Protégées. Chapitre 3 in: Méthode d'évaluation contingente et décision publique, pp. 58–94.	This study attempts at valuing existence value of three protected species (bear, mink and sturgeon)	Existence value: Sturgeon 73.27 per person Bear: 160.85 per person Mink 85.65 per person WTP in 1999 French Francs
Rollins, K., Gunning-Trant, C., Lyke, A., 1998. Estimating Existence Values For Four Proposed Park Sites In The Northwest Territories: Bluenose Lake And Melville Hills, East Arm Of Great Slave Lake, North Baffin And Bylott Island And Wager Bay. Parks Canada	The mean WTP for the creation of one, two and four more national parks.	Based on the data collected from the mail survey, the mean WTP for the creation of one more national park was assessed at $105.45, at $161.85 for two parks, at $191.57 for four parks, and $261.51 for ten parks (Canadian Dollars, CAD, 1995). The mean WTP from the mixed-mode survey was assessed at $250.69 for the creation of four parks and $282.87 for the creation of ten parks (CAD, 1996).

Annex 3 – Benefits of NPs and Wilderness Areas

Reference	Comment	Revenue	Jobs
Defra (2011) NP Authorities	Looks at the added value of NPs, longer term funding mechanisms and Defra/Government priorities.	Yorkshire and Humber: £1.8 bn of sales. £576 mn Gross Value Added (GVA). The Broads: Total annual value: £124 mn Dartmoor NP (annual): Over £100 mn	Yorkshire and Humber: 34,000 jobs The Broads: 2,529 jobs Exmoor: 2000 jobs Dartmoor NP: 2000 full-time jobs. Government Scheme: Grants created 132 new jobs; contributed to the maintenance of 1,543 jobs.
Cumulus Consultants for Natural Parks England (2013) Valuing England's national Parks	Assesses the contribution of NPs to economic prosperity and well-being. Identifies future opportunities for NPAs to support rural economies in partnership with local communities, business and local governments.	£10.4 bn (Business turnover) GVA £4.1 – 6.3 bn (2012)	157,000 jobs 2% lower than national average Businesses – 14,000 jobs
Headwaters Economics (2013)	Studies conducted by Headwaters Economics. No individual reports.	No mention	NPs and recreation could produce more than 1,000 jobs over time.
SCNP and APRS (2011) Benefits of NPs	Report to promote a strategy for developing a comprehensive network of NPs across Scotland. The study looks at the benefits to this strategy.	Spin-off effects of the impact of NPs – income	NPA's employ additional staff both directly and indirectly. NP status can increase tourism-related employment and sustain businesses.
NP Service (2011) Economic	Contribution of visitors,	Visitor spending:	Visitor spending:

benefits to local communities from NP visitation	spending, and jobs from the NP to the economy. Local economic impacts estimated. (US)	$9.34 bn (labour income) $16.50 bn (value added) Local Impacts: $4.58bn (labour income) $8.15bn (value added)	251,000 jobs. Local Impacts: 162,400 jobs
Lake District NP	Tourism, the economy and the local community. Addresses the benefits, challenges, and future of tourism	£944 mn (income, visitors spend)	11,903 jobs (FTEs)
The Economics of Ecosystems and Biodiversity (TEEB, 2009)	TEEB draws together experience, knowledge and expertise from all regions of the world in the fields of science, economics and policy. Its aim is to guide practical policy responses to the growing evidence of the impacts of ongoing losses of biodiversity and ecosystem services.	NZ conservation: US$221 mn Nature based recreation in US: $122bn (just under 1% US GDP).	NZ conservation: + 1,814 jobs Bolivia protected tourism: +20,000 jobs SA Ecosystem restoration: + 91 jobs. Europe: 1 out of 6 European jobs is dependent on the environment. 1 out of 40 of those working in Europe are directly employed in jobs linked to the environment.
Getzner, M. (2009) Economic and cultural values related to Protected areas	The valuation of ecosystem services by the examples of NPs in Poland and Slovakia that shows that ecosystem services are of eminent importance to the local, regional and national economies.	Tatra NP: ES worth EUR 593 – 888 mn Slovenský ráj NP: EUR 155 – 342 mn	Only mentions jobs of respondents, not jobs created/sustained through NPs.
Font, X., Cochrane, J. and Tapper, R. (2004) Pay per nature view	The report describes the six survival essentials for protected areas, and uses these as a context for analysis of the role	The economic activity from travel and tourism will generate US$5,490,900,000	+73 mn jobs directly 3x this figure indirectly South Africa:

	and potential of tourism in protected areas.	South Africa: $35 – 53 mn (profits)	700-800 new jobs over the next 5 years as a result of Nine tourism concessions
Wilderness.net: 'Economic benefits of wilderness'	Discusses trade-offs between economic prosperity and environmental protection. Looks at the different benefits associated with wilderness areas.	Outdoor recreation: $80 billion (taxes) $646 million (spending) Monetary value of wilderness ES: $2 – 3.4 bn	Outdoor recreation: 6.1 million jobs
Holmes and Hecox (2004) Does Wilderness Impoverish Rural Regions?	Identifies a significant positive correlation between the percent of land in designated wilderness and population, income, and employment growth.	Nothing mentioned	Employment growth in % terms

Annex 4 – Ecotourism Industry Trends

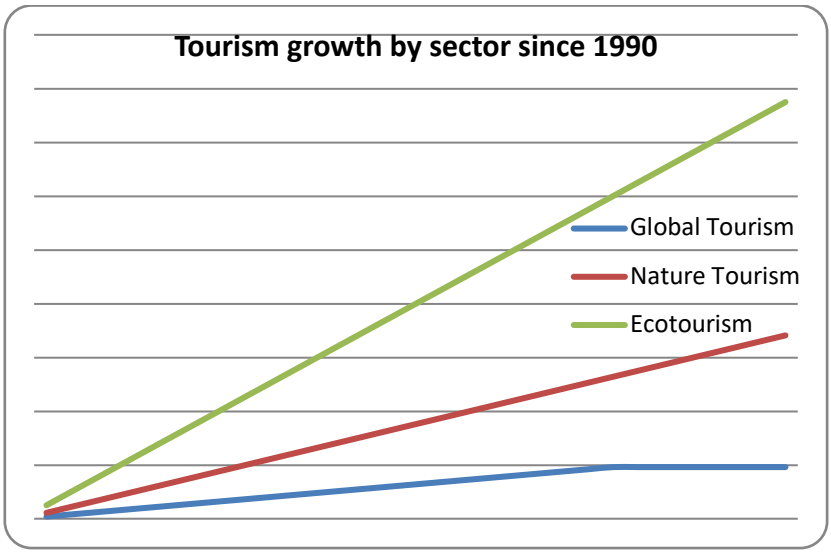
(Based on information gratefully received from Mr. Neil Birnie).

The International Ecotourism Society (www.ecotourism.org) says the following on the status of the *ecotourism* sector:

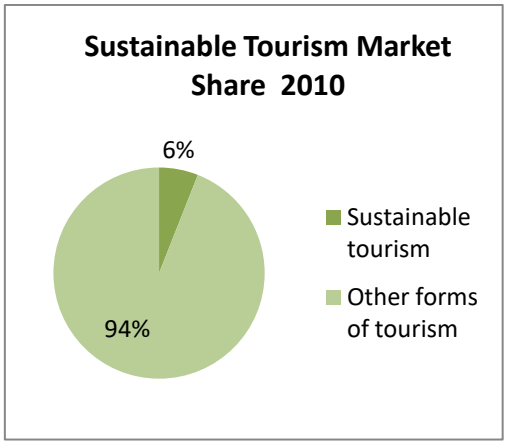
- The wider sector of *nature tourism* is growing globally at 10%-12% per annum;
- Since the 1990s, the sub-sector of *ecotourism* (which involves clear and positive linkages with the environment and benefits for local people) has been growing at a rate of 20% - 34% per year;
- *Nature tourism* is growing 3 times faster globally than the tourism industry as a whole (and therefore it could be said that *ecotourism* is growing at between 6 and 8 times the rate of normal tourism).

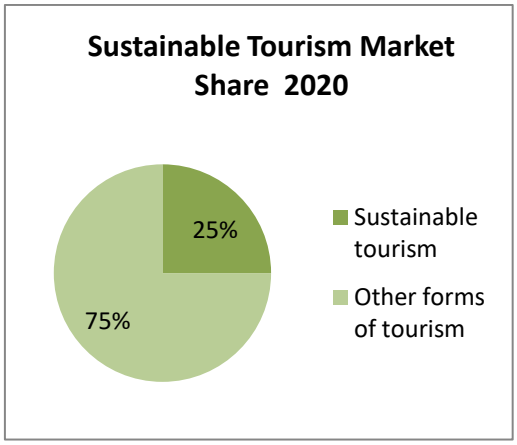
The International Ecotourism Society also makes the following general observations on the tourism sector as a whole:

- Resort tourism (sun and sand, ski resorts etc.) has now "matured as a market" and its growth is projected to remain flat. In contrast, 'experiential' tourism—which encompasses ecotourism, nature, heritage, cultural, and soft adventure tourism, as well as sub-sectors such as rural and community tourism—is among the sectors expected to grow most quickly over the next two decades.
- The United Nations Environment Programme (UNEP) and Conservation International have indicated that most tourism expansion is occurring in and around the world's remaining wild and natural areas.
- Analysts predict a growth in eco-resorts and hotels, and a boom in nature tourism — and suggest early converts to sustainable nature tourism will make market gains.



The International Ecotourism Society have also stated that *sustainable tourism* (which for the purposes of this report is believed to include all of *ecotourism* and most of *nature tourism (excluding mechanised development such as ski resorts)* could grow to 25% of the world's travel market within six years, taking the value of the sector to US$474 billion per year.





According to the UN's World Tourism Organisation (www.unwto.org), ecotourism and nature based tourism are among the fastest growing market segments worldwide. Research has shown that 8 % of all trips currently sold worldwide can be described as *ecotourism*, with a potential grow to 15%.

The growth in the ecotourism sector is also increasingly recognised beyond the tourism industry itself. Economy Watch (www.economywatch.com/world-industries) recently stated that:

"*The ecotourism industry is fast catching up with other flourishing industries of the world. Ecotourism is growing by leaps and bounds. The ecotourism market makes up 6% of the GDP all over the world. Ecotourism refers to the practice in which the place one visits is not harmed in any way, thereby maintaining the natural equilibrium of the place. This includes aspects related to maintaining the flora as well as the fauna of the place. Every effort is made to keep the place in its original form.*"