

GEF/UNDP PIMS 4279: Catalyzing Financial Sustainability of Protected Areas in Montenegro

THE ECONOMIC VALUE OF PROTECTED AREAS IN MONTENEGRO September 2011



EXECUTIVE SUMMARY 10 reasons for public investment in Protected Areas

1. PAs generate considerable values

The value of tourism and recreational activities, other uses of PA lands and resources, water supply services and watershed/flood protection services is estimated at just under €68 million in 2010.

2. PAs play an appreciable role in the national economy and development

In 2010, the quantified value of PAs equated to some 2.2% of GDP, or economic benefits of €106 generated per capita of Montenegro's population.

3. PA values accrue to multiple sectors, at many different levels of scale

In 2010, just under a half of PA values accrued to the general public (worth more than €32 million), more than a third generated earnings and cost savings to businesses and industries (€25 million), and around 15% earned revenues for the government (€11 million). PA goods and services supported the output of many different sectors of the economy, including tourism, energy, water, agriculture, infrastructure and disaster risk reduction.

4. The values generated by PAs have a substantial multiplier effect across the economy

For example, PAs protect the source of existing and planned hydropower generation worth almost &80 million a year in public revenues. PAs generate total income, investment and spending for the tourist sector of &172 (or 5.7% of GDP), including gross visitor spending of more than &220 million and capital investment in excess of &60 million, as well as some 7,700 full-time job equivalents.

5. There is significant public under-investment in PAs

At ≤ 2 million a year in total or $\leq 1,800/\text{km}^2$, current funding to the PAS is insufficient to manage the PA network effectively. It is lower than in many other Central and Eastern European countries, and less than half of the actual financing needs for effective PA management in Montenegro.

6. Continuing to accorded PAs a low policy and investment priority will incur economic losses

Continuing to carry out "business as usual" may cost Montenegro's economy and population more than €30 million over the next 25 years.

7. Investing adequately in PAs will generate value-added to the economy

Choosing to "invest in natural capital" may create a steady, and increasing, value-added to Montenegro's economy and population over continuing "business as usual", generating incremental benefits worth more than €1.5 billion over the next 25 years.

8. There is a high economic return to public investment in PAs

Although choosing to "invest in natural capital" implies a considerably higher level of public investment than continuing "business as usual", these expenditures are far outweighed by the economic benefits generated. Net benefits will more than double over the next 25 years, and PAs will generate a total return of almost €29 per €1 of public funds invested.

9. PAs are not being managed to their full economic potential

The public income earned from PAs is currently less than €1 million a year. There is low cost recovery – this equates to only around 15% of projected funding needs. In many cases there are unmet consumer demands for sustainable PA products and services, and the bulk of PA goods and services are being provided at a low or zero price to users. Increased public investment and policy action can help to realise these economic opportunities.

10. There remain untapped opportunities to increase the levels of revenues generated from PAs

Tourists and recreational visitors are, for example, willing to contribute almost €19 million a year more than they are currently being charged as entry fees, and there is a potential market for PA authorities to provide hikes and guided tours which is worth up to €3 million a year in public earnings. Increased public investment and policy action is required to capture these potential revenue streams.

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List of acronyms

CPI	Consumer price index
GDP	Gross domestic product
GEF	Global Environment Facility
НРР	Hydropower plant
ISSP	Institute for Strategic Studies and Prognoses
MEA	Millennium Ecosystem Assessment
NBSAP	National Biodiversity Strategy and Action Plan
NPV	Net present value
PA	Protected Area
PAS	Protected Area system
PENP	Public Enterprise National Parks of Montenegro
PPP	Purchasing power parity
TEV	Total economic value
UNDP	United Nations Development Programme

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1. Introduction

Background to the study

The UNDP-GEF-Government of Montenegro project "Catalyzing financial sustainability of protected areas in Montenegro" aims to improve the financial sustainability of the national Protected Area System (PAS), through fostering a more enabling legal and policy environment, building institutional and individual capacity to improve the cost-effectiveness of protected areas (PAS), and securing new revenue streams.

One of the project's outputs is concerned specifically with generating information about the economic value of the national Protected Area System:

"an economic valuation of the PAS supports the case for sustained public investment in protected area establishment and management."

The intention is to provide data that can be used to convince public decision-makers of the economic rationale to investing in PAs. It is anticipated that this will help to improve the current situation, where there is little or no practical and policy-relevant information on the economic value of PAs, and PAs are accorded a low budgetary and economic policy priority.

Sources of data and information

Preliminary work on scoping out the economic valuation study was carried out during the Project Preparation Grant phase, focusing on five pilot PAs (Durmitor, Biogradska gora and Skadarsko jezero National Parks, Tivat Saltpan Nature Reserve, and the proposed Komovi National Park). Detailed studies were subsequently carried out by a team from the Institute for Strategic Studies and Prognoses (ISSP) to determine a monetary quantification of the ecosystem products and services in each PA. These are documented in a separate report "Economic Valuation of Montenegro's Protected Area System".

The current document relates the findings of the ISSP study to the entire national PAS. It assesses the public benefits and costs of establishing and managing PAs as an economically viable form of land use. The report focuses primarily (although not exclusively) on National Parks. These contribute the majority of the national PAS (around 80%), form by far the largest contiguous areas (with just four exceptions, all other PAs are below 10 km² in size: see Figure 1) and generate some of the most significant ecosystem services.



The analysis was carried out as a desk study, and did not involve any fieldwork. It is based on the results of the ISSP studies (ISSP 2011), supplemented by a review of literature on the economic value of PAs in Montenegro and elsewhere, and of key national development and economic statistics.

It should be noted at the outset that there are few or no available data on which to base an analysis of the economic value of PAs in Montenegro. The ISSP study was the first attempt to systematically collect and collate information on the economics of ecosystems and biodiversity across different PAs and types of values – and as such it was an extremely useful exercise, yielding important new information. The paucity of available data and statistical records however meant that it was simply not possible to quantify many economic values and benefits, aside from those for which records are routinely kept by PA authorities (mainly tourism receipts and revenues from other licences, charges and fees levied on the use of PA land and resources). In particular, it was impossible to generate any meaningful estimates of the value of supporting and regulating ecosystem services (indirect values) – even though these potentially comprise the most significant contribution made by PAs to the Montenegro economy.

For these reasons, the figures presented in the current report are not comprehensive, and depend on many assumptions. They omit consideration of several important PA values because there simply was not sufficient information to enable them to be calculated. The study also relies heavily on extrapolating the few data that are available for Montenegro, and of necessity employs "benefit transfer" techniques. Benefit transfer involves applying values estimates from studies which have been carried out elsewhere to the study site in question. There are many hazards in using such an approach, which are mainly to do with the credibility of applying data about a particular site or ecosystem to another context which might have very different biological, ecological and socio-economic characteristics.

Where benefit transfer techniques have been used, a conservative approach has been taken. The primary source of data is valuation studies that have been carried out in Central, South and Eastern European countries with similar economic, institutional and ecological conditions to Montenegro. All values have been adjusted to bring them to 2010 Montenegro price levels, applying a consumer price index (CPI) deflator to account for domestic inflation, and using appropriate Gross Domestic Product Purchasing Power Parity (GDP PPP) conversion rates to equalise differences between Montenegro and other countries.

The resulting analysis should therefore be seen as being very much a first attempt to assess the economic contribution of Montenegro's PAs, and to weigh up the public costs and benefits of investing in the PAS. The estimates presented remain highly speculative, and involve many assumptions and approximations. It is to be hoped that when new data become available, or as more detailed studies are undertaken, the figures presented in this report can be supplemented, improved and updated.

Content of the report

The report contains six chapters, in addition to this introductory section:

- <u>Chapter 2</u> provides an overview of the economic value of PAs, biodiversity and ecosystem services;
- <u>Chapter 3</u> describes the current value of PAs to Montenegro's economy;
- <u>Chapter 4</u> reviews recent trends in public spending on PAs;
- Chapter 5 models the public costs and benefits of PAs under different future scenarios;
- Chapter 6 summarises the main findings and conclusions from the study;
- Chapter 7 presents a full list of documents referred to in the report; and
- An <u>Annex</u> lists the detailed assumptions that have been made in modelling scenarios.

2. Understanding the economic footprint of Protected Areas

Although the primary goal of PAs is biodiversity and ecosystem conservation, they typically leave a substantial economic footprint: locally, nationally and globally (Figure 2).



Figure 2: the economic footprint of PAs

It is not the role of this document to provide a detailed overview of the economics of PAs, biodiversity and ecosystems, or to describe how ecosystem valuation techniques and tools should be applied. This can be found elsewhere: for example in work carried out under The Economics of Ecosystems and Biodiversity initiative (TEEB 2008, 2010) and the South East Europe Transnational Cooperation Programme (Ruzzier *et al* 2010), or by the Convention on Biological Diversity (SCBD 2008) and IUCN's World Commission on Protected Areas (Philips 1998).

Before presenting data on the value of Montenegro's PAs, it is however useful to summarise the economic thinking that underpins this study, and to present the broad framework within which the links between PAs and the economy should be understood.

Why PA under-valuation is a problem

As this document will describe, Montenegro's biodiversity and ecosystems generate substantial economic values, which accrue across many sectors and stakeholder groups. The national PAS is therefore an important and productive asset, because it provides a flow of economically valuable goods and services.

Unfortunately, decision-makers rarely perceive PAs in these terms. Very little attention has traditionally been paid to these values by either the economists who provide the figures which inform policy formulation and decision-making, the financial planners who calculate and allocate budgets, the businesses whose economic activities impact on PAs, or the environmental planners and policy-makers who are responsible for managing PAs as economically-viable conservation units.

One of the major reasons for PA under-valuation is that many biodiversity and ecosystem services are not priced and do not have a market. They therefore do not usually enter into the monetary calculations or profits and losses that determine how people choose to produce, consume, trade and invest. Because PAs are not seen as generating economic benefits, and because the costs and losses associated with PA degradation and loss remain largely unaccounted for, they tend to be allocated a low budgetary and policy priority as compared to those sectors which are considered "productive" in development terms. It is thus almost inevitable that PAs do not appear as an economically desirable or financially profitable use of land,

resources and funds when policies are formulated, investments and business opportunities analysed, or projects appraised.

It is hardly surprising that it has been difficult for conservation planners to justify PAs as an economically beneficial land use option, to advocate for higher budgets, or to optimise and capture the values that PAs generate. Perhaps more seriously, PA under-valuation has also meant that many potentially profitable development opportunities and business possibilities have been missed, and wide-ranging economic costs and losses have often been incurred.

Framing the links between ecosystem services and human wellbeing

The last few years have seen a shift in the way that PA goods and services are conceptualised. In particular, the publication of the Millennium Ecosystem Assessment (MEA) in 2005 stimulated a much greater awareness of the links between ecosystem services and the economy. The MEA provided a framework for

tracing the links between ecosystem services and human wellbeing, which is now widely-accepted in conservation and sustainable development planning.

Ecosystem services can be defined as "the benefits people obtain from ecosystems". According to the MEA framework (Millennium Ecosystem Assessment 2005), there are four basic categories ecosystem services: provisioning, regulating, cultural and supporting services (Figure 3). Understanding these linkages is an important first step in PA valuation.





Figure 3: PA ecosystem services and human wellbeing

Accounting for total economic value

Being able to express these economic linkages requires that PA goods and services can be adequately valued. As we have described above, this has traditionally posed something of a problem to economists. One important reason for undervaluation is that the economists who generate the statistics and calculations that inform decision-making have conventionally taken account only of those values for which there is a clear market and price. The problem is, many ecosystem services are not priced or marketed.

Over the last two decades, a suite of methods have however been developed for dealing with the economic value of biodiversity and ecosystems. Total Economic Value (TEV) has become the most commonly-used framework for identifying and categorising PA values. Importantly, it takes account of those values that have traditionally been omitted from economic and financial decision-making.

The TEV framework extends beyond just physical products and marketed commodities, and considers the full range of economically important ecosystem services associated with PAs, categorising them into direct, indirect, option and existence values. As shown in Figure 4, TEV also looks at their ecological functions, the possibilities of future as yet unknown uses, and the intrinsic values they hold for humans regardless of actual use. Assessing the total economic value of a PA involves considering its complete range of characteristics as an integrated system – resource stocks or assets, flows of environmental services, and the attributes of the ecosystem as a whole.



Figure 4: Total Economic Value of PA ecosystem services

Source: adapted from Emerton 2009b.

The process of economic valuation involves identifying the ecosystem services that a PA generates, tracing through the ways in which these impact on human and economic wellbeing, and demonstrating the value of these linkages in economic terms. What is of particular concern, from an economic standpoint, is the way in which these linkages are expressed in the economy.

The wellbeing outcomes that PA goods and service generate are manifested via a range of economic benefits and avoided costs. Key public economic outcomes include, for example, sustaining and enhancing GDP, employment, sectoral income, public revenues, exports and foreign exchange earnings – and the costs and losses that are avoided when productivity and output is eroded by the loss of economically valuable ecosystem services (Emerton 2009c). Key indicators for businesses include sustaining and enhancing profits through capturing and pricing new investments, markets, prices and products, and avoiding risks and losses through minimising expenditures, saving costs, reducing tax burdens and decreasing liabilities (Emerton 2009b).

Investing in PAs as economic assets

With this background in mind, the basic aim of PA valuation is to improve the quality and positive impact of decision-making – to allow PAs to be treated as economically valuable and productive assets when they are compared to other land, resource and investment options, and to also better recognise the opportunities and costs avoided that investing in PAs bring to the economy.

A key concern, in the context of this study (which has public decision-making as its primary concern) is to show how valuation information can shift the view that PAs are a luxury that governments cannot afford, to one where they are seen as a necessity that they cannot afford not to invest in.

The rationale is, essentially, that valuation can help to demonstrate that PAs form a key part of Montenegro's economic asset base, or stock of productive capital. It articulates the magnitude of the flows of economic goods and services, and the scale of the costs and losses avoided, that arise from PAs, and shows the ways in which they contribute to key economic and development indicators. Valuation shows that, if managed sustainably, PAs will continue to yield economically productive and beneficial flows of goods and services. If used and managed unsustainably, these economic benefits will progressively be lost.

3. What Protected Areas are worth to the economy

The contribution of PAs to key sectors

Tourism

Tourism is an important and rapidly-growing sector in Montenegro's economy, and one of the key development priorities (MTE 2008). In 2009 and 2010, around 1.2 million visitors were recorded, accounting for 7.6 million and 8.0 million bednights respectively; 85% were international arrivals (MONSTAT 2011). Both domestic and international tourism is concentrated in the coastal region (Olters 2008, Tarchiani 2011) – in 2010 coastal resorts accounted for around 90% of visitors and 96% of bednights (MONSTAT 2011).

Protected areas are also an important location for both domestic and international tourism. Visitor data are available for only six PAs: the four National Parks, Long beach Ulcinj Monument of Nature and Kotor-Risan Bay World Heritage Site. Almost 275,000 visits were made to these PAs in 2009, and more than 308,000 in 2010 (ISSP 2011). These numbers are equivalent to just under a quarter of all recorded domestic and international visitor arrivals in Montenegro in 2010 (MONSTAT 2011). In reality, the number of people visiting PAs is far higher than this, as these calculations are based only on those sites for which visitor records are kept. Other PAs are also important recreational and visitor destinations, for example beaches, caves and parks that are designated as Monuments of Nature, as well as Areas with Exceptional Natural Features. To account for this, the study makes a conservative estimate that half as many tourists again are visiting PAs for which visitor numbers are not recorded. This revised estimate account for just over one third of all domestic and international arrivals, according to MONSTAT figures.

While many of these visits are made as "side-trips", some holidays are motivated purely by the wish to visit a PA. A study on the attitudes of Europeans towards tourism for example states that, throughout the EU, more than 6% of respondents declared the prime motivation for their holiday to be nature; this is especially the case for tourists from Western Europe (Stolton 2009). This also holds true for visitors to Montenegro. A recent survey found that visits to scenic natural landscapes and National Parks are key determinants of both domestic and international tourists' trips. Durmitor and Biogradska gora National Parks are two of the top three destinations in northern Montenegro in terms of popularity and visits made, Skadar Lake is one of the most popular in the south, and National Parks received the second highest rating of national tourism assets and services, according to visitor surveys, (CSTI 2007).

One important source of economic impact is from the expenditures that are made by visitors. In 2010, National Parks generated direct revenues (from entry fees and other charges) of some \leq 415,857 (ISSP 2011). Visitors to PAs also spent money on hotels and restaurants. The Central Bank of Montenegro has calculated that average expenditures on food and accommodation is just under \leq 43 per guest day (MTE 2008). These estimates accord well with data collected at Durmitor National Park, which find a gross turnover of \leq 1.6 million for hotels and restaurants, translating into an average accommodation fee of \leq 12.6, plus typical spending on food, drinks and other services of \leq 46.0 per visitor day (ISSP 2011). They also appear to be consistent with data from nearby countries. In Tatra National Park in Poland visitors spend on about \leq 45 per day, and in Slovakia's Slovensky Raj National Park total visitor expenditure averages \leq 54 per person day (Getzner 2009)

Assuming that 75% of tourists are visiting PAs as part of longer stays or holidays, direct spending on hotels may therefore account for annual revenues of €14.9 million. This is a conservative estimate, as there is evidence that spending on hotels in areas with attractive natural landscapes tend to be greater than that in other places. Work carried out in Croatia by the Institute of Tourism has for example found that there is a

premium of as much as 24-32% attached to the price that visitors are willing to pay for hotels located in forest areas, and that landscape is a decisive factor in visitors' choice of hotels (Pagiola 1998). A portion of these revenues accrue to PA authorities, where camping or accommodation is offered within PAs. For example, Biogradska gora National Park authorities earned revenues of some €19,400 in 2010 from the sale of just over 1,000 bednights in Park bungalows and 700 nights of camping fees (ISSP 2011).

The total economic value of PA tourism is however greater than the amount of money that people spend. Expenditures on entry fees, hotels and restaurants, travel costs and other purchases only tell us the minimum amount that visitors are willing to pay to visit PAs. For most tourists, the total value they ascribe to their visit to PAs exceeds the market prices they pay. The net economic benefit or "consumer surplus" to PA visitors is their total willingness to pay for PA tourism less expenditures actually made on their trip. Although there is a relatively large body of literature on consumers' willingness to pay for PA tourism, no studies have as yet been carried out in Montenegro. In Romania, for example, a study carried out in 5 PAs finds an average consumer surplus per visitor of ≤ 42 , including an average willingness to pay for conservation of €15 (Dumitras 2008, DUmitras et al 2011). Visitors to seven National Parks in coastal areas of Croatia state an average willingness to pay for biodiversity and ecosystem conservation of between €13 (for domestic visitors) and €16 (for overseas visitors) per visit, in addition to actual expenditures made (Spurgeon and Gallagher 2010). In Tatra National Park in Poland visitors are willing to contribute an additional €14 to secure PA conservation activities, and for Slovakia's Slovensky Raj National Park average willingness to pay for conservation is €23 (Getzner 2009). In Maramures Mountains Natural Park just under 60% of visitors expressed their willingness to contribute between €18 (for the conservation of traditional landscapes) and €21 (for wildlife conservation programmes) to PA funding (Ceroni 2007).

Although the visitor profile of the people interviewed in these studies is similar to those visiting Montenegro, there is of course a large degree of variation in the characteristics of individual PAs. However, if we use the appropriate CPI and PPP conversions and apply these broad figures to Montenegro (a consumer surplus of \leq 42.6 per visit, including a willingness to contribute to conservation funding of \leq 12.2), this equates to a total consumer surplus of some \leq 19.7 million a year, including a willingness to contribute to conservation of \leq 5.7 million.

Table 1: summary of value of PA tourism						
Direct revenues and earnings	€15.3 million	Private				
Visitor consumer surplus	€19.7 million	sector 42.5%				
Total PA tourist value	€35.0 million		$\langle \rangle$			
Including (note: values not additive to total above):		PA author				
Revenues to PAs	€0.4 million	Non-		1.2%		
Revenues to hotels and restaurants	€14.8 million	commercial				
Visitor conservation values	€5.7 million	users/ beneficiaries				
Other uncaptured visitor benefits	€14.1 million	56.4%				

Other uses of PA lands and resources

Although extractive resources uses are, for obvious reasons, restricted in PAs, some limited activities are permitted. Many of these are closely associated with tourism. Fishing, boating, rafting, fishing, gravel and sand extraction are all carried out in National Parks (in addition to water extraction, dealt with in a separate section below).

<u>Fishing</u>

Licensed fishing is carried out in three PAs: Biogradska gora, Durmitor and Skadarsko jezero National Parks. Work carried out by WWF elaborates the economic impacts of sport fishing activities in Durmitor and Biogradska gora (Mrdak 2005), while detailed records are available from PA authorities on sport and commercial fishing in Lake Skadar (ISSP 2011):

- In <u>Biogradska gora National Park</u>, 229 sport fishing permits were issued in 2010 at a price of €20 each, generating revenues for the PA authorities of €4,580 (ISSP 2011).
- In <u>Durmitor National Park</u>, PA authorities generated €11,570 in revenues from the sale of sport fishing permits in 2010 (ISSP 2011). If these are costed at the same price as permits in Biogradska gora, this translates into approximately 580 anglers.
- Both sport and commercial fishing takes place in <u>Skadarsko jezero National Park</u>. In 2010, 500 sport fishing permits and 250 commercial fishing permits were issued, earning revenues of €85,702 for the PA authorities (ISSP 2011).

For commercial fishing, it is possible to estimate the market value of fish caught. There are 300 bleak (*Alburnus spp.*) fishers, each fishing for 95 days a year and landing an average of 16 kg per trip (translating into a total catch of 456 tonnes); the 100 carp fishers operate for 190 days a year, landing an average of 5 kg of carp per trip (translating into a total catch of 95 tonnes) (ISSP 2011). At a market price of €3/kg for bleak and €5/kg for carp, this equates to total income of some €1.8 million a year. Around 200 tonnes of bleak and 70 tonnes of carp are sold on to "Ribarstvo" in nearby Rijeka Crnojevica, which produces canned smoked fish. With a conversion factor of 0.5 kg carp and 0.18 kg bleak to produce 1 can, these sales are used to produce around 0.82 million cans of bleak using 147 tonnes, and 0.14 million cans of carp using 70 tonnes (MAFWM 2006). At a retail price of €4 for a can of carp and €1 for a can of bleak, the gross market value added from this production is in the region of €1.4 million a year.

- In addition to the revenues generated for PA authorities from the sale of permits and the market value of the catch, sport fishing generates a <u>range of other expenditures in the economy</u>. Work carried out by WWF suggests that domestic anglers make average expenditures of €6 per trip on food and other fishing-related expenses, while for foreign anglers the amount is up to €121 (from Mrdak 2005, updated to 2010 price levels). Sport-fishing in the three National Parks mentioned above may therefore generate an additional €14,500 a year in secondary economic impacts.
- As already described above in the section on tourism, PAs also generate economic values for recreational visitors over and above their direct expenditures. For sport fishers, this may equate to a total <u>consumer surplus</u> of €55,700, including gross <u>willingness to pay for conservation</u> of €16,000 a year.

Water sports

Biogradska gora, Durmitor and Skadarsko jezero National Parks are popular locations for water sports:

- In <u>Biogradska gora National Park</u>, various options for renting boats on Biogradsko Lake exist, with prices ranging between €5-8 per hour; in 2010, PA authorities earned revenues of €5,043 from boat rental, and additional revenues of €2,104 (presumably for the private sector) are also cited (ISSP 2011).
- <u>Durmitor National Park</u> is famous for white-water rafting. In 2010, more than 8,700 tourists went white-water rafting, generating revenues for the PA authorities of €150,074 from the fee that is levied for rafting through the region under their protection (ISSP 2011). Most of these are engaged in two to three day trips, priced at an average of €272 at 2010 levels, and about 80% are foreign tourists (Mrdak 2005). The total income generated is €2.4 million. Indirect economic impacts include income accruing to travel

agencies, spending on refreshments and other incidental expenditures, estimated at just under €55 per trip at 2010 levels, and totals just under €0.5 million (Mrdak 2005)

- Just over 40,000 cruise boat tourists visited <u>Skadarsko jezero National Park</u> in 2010 (ISSP 2011). Approximately 30 entrepreneurs operate up to 50 boats on the lake, offering trips to visitors. At a price charged of €10 per boat trip per person, the income generated to boat operators was €0.4 million.
- As above, PAs also generate economic values for recreational visitors over and above their direct expenditures. For visitors engaging in water sports, this may equate to a total <u>consumer surplus</u> of €2.2 million including <u>willingness to pay for conservation</u> of more than €630,000 a year.

Other economic activities and revenue sources

Various other economic uses of PA lands and resources are made, and generate revenues for both PA authorities and for users. These include (in addition to PA entry fees, which are already covered above):

- <u>Souvenirs and publications</u> are a source of revenues for PA authorities. In 2010, Skadarsko jezero National Park generated €9,756 in sales from its information centre, Biogradska gora National Park earned €12,101, and Durmitor National Park earned €13,692 (ISSP 2011).
- <u>Guided tours</u> include sales of 82 bird-watching tickets, which generated €328 for Skadarsko jezero National Park authorities in 2010 (ISSP 2011). For these visitors, consumer surplus may total just under €14,000, including €4,000 willingness to pay for conservation. There is however evidence that visitor interest in specialist guided tours is greater than those actually offered. Although no detailed information exists for Montenegro, recent surveys in Romania found that around 75% of visitors were willing to pay between €13-15 on guided tours (such as bird watching, nature hikes or cultural heritage trips) during their visit to Maramures Mountains Natural Park, and in Macin Mountains National Park around €1-2 (Ceroni 2007, Ceroni and Dragoi 2008). If we use the appropriate CPI and PPP conversions and apply these figures to Montenegro (an average willingness to pay for guided tours of €8.4 among 75% of visitors), this equates to a total uncaptured annual visitor benefit of some €2.9 million a year.
- <u>Wood harvesting</u> generated revenues for Durmitor National Park of €14,097 in 2010 through sales of fuelwood (ISSP 2011)
- <u>Collection of non-timber forest products</u> is recorded in Biogradska gora National Park, with an estimated total value to collectors of €1.1 million in 2010, composed of collections of wild berries, herbs and mushrooms (ISSP 2011). Around 150 honey producers maintain 7,500 hives in Skadarsko jezero National Park, generating production to a market value of €0.83 million a year (ISSP 2011).
- <u>Sand and gravel extraction</u> concession fees for sand and gravel earned an average of €69,404 a year in revenues for Skadarsko jezero National Park authorities between 2008-10, generating production with a direct sales price of €138,530 and a full market value of €346,326 for the concession holders (ISSP 2011).
- <u>Licence fees for filming</u> generated €4,274 in revenues for Skadarsko jezero National Park authorities in 2010 (ISSP 2011).
- Land rental from the wine producer "Plantaze" generated €61,878 in revenues for Skadarsko jezero National Park authorities in 2010 and yielded grapes and wine to a total market value of €350,000 for the producer (ISSP 2011). Revenues from the lease of land to a restaurant earned €10,382 for Biogradska gora National Park, and general revenues from rent and leases generate €78,306 for Durmitor National Park (ISSP 2011).

Table 2: summary of value of other uses of PA lands and resources					
Direct revenues and earnings	€8.9 million				
Uncaptured visitor willingness to pay	€5.1 million	Private			
Total value of other PA land and resource uses	€14.1 million	sector 46.1%			
Including (note: values not additive to total above):					
Revenues to PA authorities	€0.5 million			PA	
Gross primary production values	€4.6 million	Non		3.7%	
Gross earnings from sales of processed products	€2.1 million	commercial			
Gross earnings to service providers	€3.3 million	users/ beneficiaries			
Visitor conservation values	€0.6 million	50.2%			
Other uncaptured visitor benefits	€4.5 million				

Water supplies

The most important sources of water supplies located inside PAs are from Biogradska gora, Durmitor and Skadarsko jezero National Parks:

<u>Biogradska gora National Park</u> and the contiguous <u>Bjelasica Monument of Nature</u> has four springs which are used by commercial water bottling companies (ISSP 2011). The concession fees paid by existing water bottling concessions, which utilise about 15,000 m³ of water a year, generate almost €45,000 in revenues; in addition, there is considered to be the potential to tap an additional 18,700 m³ of water for bottling, with potential revenues from fees of more than €56,000 a year (ISSP 2011). Assuming a production ratio of raw to bottled water of 50% and an average retail price of €0.50/litre, current gross value added to these companies may be in the region of €3.7 million and potential earnings may add another €4.7 million.

All of the settlements within the PA (which contain about 500 people) except for Bjelojevići and Jelovica have constructed spring-fed gravitational water supply systems, and small installations have also been built to supply tourist facilities; overnight tourists can be assumed to consume water in line with the national average 150 litres per capita per day (UNECE 2007). The value that households are willing to pay for water are, however, far higher than existing charges, as water supplies are subsidised (UNECE *op. cit.*). Recent studies have estimated consumer willingness to pay for clean drinking water in Montenegro to be ≤ 110.5 per household per year (ten Brink *et al* 2007), worth some ≤ 125 at 2010 prices. Current water use by residents may therefore be worth $\leq 10,400$ when valued at tariff cost price and generate a consumer surplus of $\leq 14,500$.

- Water sources in <u>Durmitor National Park</u> supply about 1,600 households in Zabljak together consuming between 135 and 230 thousand m³ a year for which they pay €0.38/m³, as well as up to 500 households without water meters who pay €10 per month per household (ISSP 2011); in addition, almost 55,000 visitor days are spent each year by tourists staying inside the National Park. The revenues generated from water sales are something over €112,000, and the consumer surplus is €157,000 a year.
- <u>Skadarsko jezero National Park</u> provides wells and reservoirs for the estimated 1,500 people or 600 households that live inside the PA as well as for the tourists that spend approximately 42,000 visitor days there a year (ISSP 2011). Current water use may therefore be worth €31,000 when valued at tariff cost price and generate a consumer surplus of almost €44,000.

Although currently still under development, a major project is underway to supply water from Bolje sestre karstic spring on Skadar Lake to the coastal region. This is designed to overcome the water shortages which occur in the summer season, affecting both the tourism industry and the residents of Herceg Novi, Kotor, Budva, Tivat, Bar and Ulcinj (World Bank 2010). The affected resident population is

currently some 170,000 people (ITSC 2006) and the number of tourist nights spent is up to 7.6 million (MONSTAT 2011). Exact supply figures are not available, but it has been estimated that the annual summer water deficit in the six coastal municipalities is in the region of 24.5 million m³, projected to rise to 27.5 million m³ in 2020 and 38 million m³ in 2033; meanwhile the scheme is planned with a 1,500 l/sec or 47.3 million m³ a year maximum capacity (ITSC 2006). Assuming that the new water supply system will be sufficient to meet this deficit, this will translate into water values worth €9.3 million when valued at tariff cost price and generate a consumer surplus of €5.5 million a year.



Watershed protection

PAs secure water supplies for downstream users. Several PAs cover mountainous watershed areas, contain major rivers or water bodies, or comprise canyons and gorges through which important water courses flow. The protected status of PAs, and the good quality of the natural habitats they contain (such as forest, grasslands or wetlands), provide important watershed protection services, helping to safeguard downstream waterflow and quality. A large population relies on this water, including domestic and industrial consumers, hydropower and irrigated agriculture.

The most significant PAs as far as watershed protection are concerned are Durmitor and (to a lesser extent) Biogradska gora National Parks, as well as Tara River Man and Biosphere Reserve, which help to protect the upper reaches of the Tara River as well as lakes which recharge groundwater aquifers which feed the Piva River; Piva River Canyon and Komarnica River Canyon Monuments of Nature, which help to protect the Piva and Komarnica Rivers. The upper and middle catchment of the Morača River includes Platije Canyon, Mrtvica Canyon and Mala Rijeka Canyon Proposed Natural Monuments, Morača Catchment and Canyon Proposed Area of Special Natural Characteristics and Sinjajevina/Saranci Proposed Regional Park (which is contiguous with Durmitor National Park).

Unfortunately, little or no information is available for Montenegro on the economic value of watershed protection. It is only possible to make very approximate estimates, based on studies from nearby countries in sites with similar characteristics. As explained above, these figures must be treated with caution: the capacity of an ecosystem to retain sediments and prevent erosion depends on a series of specific characteristics, such as vegetation cover, soil erodibility, slope, weather conditions and management practices. Work carried out in Poland's Tatra National Park uses public expenditures saved due to the existence of functioning forest ecosystems are to estimate PA water retention, flood control and erosion control at €48/hectare; for Slovensky Raj national park in Slovakia, a figure of €54/hectare is given (Getzner 2009). In Maramures Mountains Natural Park, Romania, the value of erosion control in forested ecosystems was estimated from the costs for maintenance of infrastructure that are associated with each ton of soil

loss (set at €2/tonne); the figures used for average sediment loss per hectare were 10 tons for of non-vegetated and agricultural land, 0.25 tons for functional forest, and 0.07 tons for meadows (Ceroni 2007).

Unfortunately, comprehensive data are not available on forest cover in Durmitor and Biogradska gora National Parks, Tara River Man and Biosphere Reserve, Piva River Canyon and Komarnica River Canyon Monuments of Nature, or the proposed Platije Canyon, Mrtvica Canyon and Mala Rijeka Canyon Natural Monuments, Morača Catchment and Canyon Area of Special Natural Characteristics or Sinjajevina/Saranci Regional Park. Area figures are only available for Biogradska gora forest (1,600 ha), and for forests and canyons of the Tara and Susica in Durmitor National Park (9,637 ha). According to FAO's Global Forest Resource Assessment for 2010, Montenegro contains 543,000 ha of forest, of which 67,000 is under public ownership, 10,000 ha is designated for soil and water protection and 5,000 ha for the protection of biodiversity, and 13,000 is found within PAs (FAO 2010).

For the purposes of this study, we take a conservative estimate of 40,000 hectares as the area of functional forest in actual or proposed PAs that is performing a key watershed protection function. From studies carried out in surrounding countries, an average figure (at equivalent 2010 Montenegro prices) of \pounds 25.23 per ha can be applied, referring to expenditures avoided on the prevention and mitigation of erosion. This equates to an annual value of some \pounds 1 million a year.

It should however be noted that the total value of PA watershed protection is much greater than this, as siltation, sedimentation and loss of water regulation services results in substantial damages and costs to downstream producers and consumers, such as hydropower, household, industrial and agricultural water users in areas downstream of PAs. Unfortunately, no data are available.

Table 4: summary of value of other uses of PA watershed protection services			
Damage cos	ts/expenditures avoided	€1.0 million	
Total PA wa	ershed protection value	€1.0 million	

Flood prevention

Floods and landslides rank among the major natural hazards facing Montenegro (RMSI 2008). Natural ecosystems impact on the frequency and severity of these natural disasters. Flooding is particularly intense in mountainous areas and low-lying floodplains: the Skadar Lake area and upper catchments of the Lim and Tara Rivers are among the most vulnerable areas in the country (Tarchiani 2011). It is likely that the frequency and severity of these events will intensify in the future, both due to ongoing ecosystem degradation and because of climate change. The climate change scenario to 2100 which has been constructed for Montenegro suggests that a strong disturbance in the balance of water resources is expected: flood waves will become more common, and affect progressively larger areas, as a result of increased intensity of rainfall and because of sea level rise (Government of Montenegro 2010).

Farmland, housing, traffic and communication lines are endangered by flooding, while in the region of Skadarsko jezero, flooding also has detrimental effects on sanitary conditions for the local population (ten Brink *et al* 2007). Over recent years, there has been marked increases in losses from property damage and lost revenue due to business interruption caused by extreme weather events (Tarchiani 2011), and the best and most fertile agricultural land is also regularly flooded (RMSI 2008). Major flooding events were recorded in November and December 2007, 2009 and 2010, affecting 1,086, 450 and 6,350 people respectively, an average of just under 2,000 people a year (WHO 2011). Looking at the entire period 1900-

2011, 1,000 people were affected by each flash flood event and 2,300 people by each general flood event (PreventionWeb 2011).

Durmitor, Biogradska gora, and Skadarsko jezero National Parks all provide important floods control services. Unfortunately, no comprehensive national-level data are available on either the damage costs associated with floods and landslides, or of the expenditures that are made to prevent or mitigate them. Detailed studies have however been carried out around Skadarsko jezero National Park on the impacts of the November/December 2010 floods (ISSP 2011). Damage due to floods was reported by 839 households in Golubovci and Tuzi municipalities, 287 households in Cetinje and Bar and 136 households living inside the National Park: a total of some 3,200 people. The total compensation paid was ≤ 2.1 million, or an average of just under ≤ 1.9 million, and just over ≤ 0.4 million was paid in compensation from government funds.

We can see that the number of households affected by flooding around Skadarsko jezero National Park accounts for just under half of the total population impacted by the 2010 flood events in Montenegro. If it is assumed that a third of the remaining flood-affected population live in mountainous areas of the Tara, Piva, Komarnica and Morača basins, then existing or planned PAs may play an appreciable role in providing flood mitigation to just under two thirds of the people in Montenegro which are regularly affected by flooding. Extrapolating the historical data on the frequency and impact of flooding events, we can assume that a flash flood (affecting 1,000 people) occurs every year and a general flood event (affecting 2,300 people) every 3 years. If the upstream protection functions of PAs serve to minimise the affected population in these areas by just 25% below what it would have been in the absence of the protective functions of PAs, then the value of flood control in terms of damage costs avoided (projected on a *pro rata* basis from those recorded around Skadarsko jezero National Park in 2010) equates to for a flash flood event, an average of €0.5 million a year.

These figures refer to the expenditures which are made to deal with the effects of flooding events. It is also possible to look at the preventive expenditures which are saved. No data are available for Montenegro, but work carried out in Maramures Mountains Natural Park in Romania estimates the value of water regulation and flood control services provided by forested ecosystems from the public expenditures avoided, coming up with a figure of ≤ 150 /hectare – equivalent to ≤ 164 at 2010 Montenegro price levels (Ceroni 2007). It should be noted that this figure can only be applied to forested mountain PAs, not to the Lake Skadar region. If half of the PA forest area that has already been ascribed for the calculation of watershed protection benefits also serves an important flood mitigation function, then this translates into annual benefits of some ≤ 3.3 million a year.

Table 5: summary of value of PA flood prevention services			
Damage costs avoided	€0.5 million		
Preventive expenditures avoided	€3.3 million		
Total PA flood protection value	€0.5-3.3 million		

Summary of the distribution of PA values across the economy

The sections above have described in detail how Montenegro's PAs generate economic benefits for a wide range of groups and economic sectors. Taking out the benefits that are presented in more than one section (for example visitor consumer surplus is shown both under "tourism" and under sub-sections such as boating, rafting and guided tours) gives us a total estimated value of the PAS of €67.8 million

The bulk of this value is associated with tourism and recreation (some two thirds), followed by water supply services (Table 6). However, it should be reiterated that this is an extremely conservative, and incomplete, estimate of the value of PAs. It covers only those benefits that could actually be quantified on the basis of available data. Tourism earnings and income are undoubtedly a key value generated by Montenegro's PAs, and their importance should not be under-emphasised. At the same time, it is necessary to bear in mind that it is tourism-related activities for which there were the greatest amount of information available to this study (as well as being the main economic benefit for which records are kept and statistics gathered at the PA level) – and that they have therefore been able to be valued fairly comprehensively as compared to other PA benefits. It is therefore hardly surprising that the values calculated are so large, as compared to other PA goods and services (such as, for example, watershed and flood protection services, for which it has been impossible to fully value the wide range of economic impacts, contribution to income, and costs and losses avoided), for which much less information was available.

	Value (€ mill)	Lise of other PA	Water supply services 28.0%
Guided tours, hiking and land sports	2.9	land and resources	
Water sports and recreational fishing	5.7	5.2%	
Other PA tourist values and sales	35.2		
Use of other PA land and resources	3.5		
Water supply services	19.0		
Watershed/flood protection services	1.5	Other PA tourist	
Total quantified value	67.8	values and sales 51.9%	



Watershed/flood protection services 2.2% Guided tours, hiking and land sports 4.3% Water sports and recreational fishing 8.3%

In turn, these PA values contribute to production, output and income in many different sectors, and benefit a wide range of stakeholder groups. With similar caveats concerning the availability of information and focus of the valuation study to those mentioned above, we can see that a large share – almost half – of quantified PA values accrue to non-commercial users and beneficiaries: mainly local communities and PA visitors (Table 7). The private sector, ranging from small-scale entrepreneurs to larger companies and industries, is also a significant beneficiary of PA goods and services, which also make a substantial contribution to government revenues.



Table 7: distribution of PA values across beneficiary groups 2010

Measuring the broader economic impacts of PAs

Although a lack of data prevents any meaningful sectoral or macroeconomic-level analysis, it is important to underline that the economic footprint of PAs is wide-ranging (as has been explained in Chapter 2). The goods, services and activities that PAs generate in turn support and protect a large amount of production,

consumption and output off-site, and in other parts of the economy. It has not been possible to quantify in monetary terms the economic multipliers and secondary effects of PA goods and services in terms of the multipliers and induced spending and earnings that are generated in this study, although – as below – partial data can be presented, referring to hydropower and tourism sectors.

Hydropower

One example, that has been touched on above, is the watershed protection services that enable and protect activities in the hydropower, irrigated agriculture and domestic water supply sectors. Although it has only been possible in this study to provide partial estimates of their value, essentially of public damage costs/expenditures avoided, the watershed protection afforded by PAs also has substantial economic impacts via costs avoided and revenues sustained for the private sector, food and energy supplies for domestic consumers, national employment, investment flows, export earnings and GDP for the country as a whole. In reality, the figure of €1 million a year that is presented above is only the tip of the iceberg.

Durmitor and (to a lesser extent) Biogradska gora National Parks, as well as Tara River Man and Biosphere Reserve, Piva River Canyon and Komarnica River Canyon Monuments of Nature, Platije Canyon, Mrtvica Canyon and Mala Rijeka Canyon Proposed Natural Monuments, Morača Catchment and Canyon Proposed Area of Special Natural Characteristics and Sinjajevina/Saranci Proposed Regional Park all serve to protect the watersheds which feed existing or planned hydropower schemes.

Hydropower plants (HPP) that depend on watersheds protected by the PAs mentioned above include the existing Piva hydroelectric scheme as well as planned large-scale and small-scale hydropower plants (HPP) on the on the Morača River. The total hydropower potential in Montenegro is estimated to be 9,846 GWh, and a "moderate construction" scenario envisages the development of new hydropower facilities totalling just over 486 GWh up to 2025 (MED 2008a) – a total of 2,190 GWh, when existing schemes (867 GWh of large-scale hydropower and 836 GWh of small schemes) are included (EPCG 2009).

Piva HPP has an installed capacity of 342 MW (Government of Montenegro 2010). In 2010 it produced about 1,286 GWh of electricity, or 34.5% of Montenegro's total net electricity production (EPCG 2011). In 2008 (the latest year for which figures are available), direct consumers accounted for approximately 31% of gross electricity consumption, and distributive consumers 41%, paying average prices of 4.1¢/kWh and 9.6¢/kWh respectively (EPCG 2009). Applying these figures to the amount of electricity generated by Piva HPP in 2010, and adjusting for the proportion of generated power actually sold, suggests an annual value of some €56.2 million.

A cascade of four hydropower schemes has been proposed for the Morača River. These are anticipated to have a combined installed capacity of 238.4 MW and a generation of about 700 GWh/year; in addition, the eleven reservoirs that may be created in the upper catchment area (to intercept sediments and prevent siltation of the downstream dams) have potential for small-scale hydropower generation, with an installed capacity of 313 MW and an annual generating capacity of 520 GWh (NVE 2010). It should be noted that the main impact of PA watershed protection services will be on these small-scale hydropower facilities, as the reservoirs would effectively mitigate any further silt and sediment transport downstream. Applying the same assumptions as have been used for Piva HPP, this suggests that the potential gross sales value from small-scale HPP that are protected by PAs is something in the region of €22.7 million a year.

Tourism

One sector for which these secondary, induced and multiplier effects can be calculated is tourism. As is also the case with other sectors and PA goods and services, the total economic impact of PA tourism is far greater than just direct spending on entry fees, hotels and restaurants (MTE 2008).

The production and consumption associated with the tourism sector also includes visitor expenditures on secondary and support services (such as transport, travel agents and other purchases) and government spending on travel and tourism services linked directly to visitors. As well as its direct economic impact, the industry has significant indirect and induced impacts. These include capital inflows and investments on infrastructure and equipment, collective government spending (for example on tourism marketing and promotion, aviation, administration, security services, resort area security services and sanitation, etc.), and domestic purchases of goods and services by the sectors dealing directly with tourists (for example, food and cleaning services by hotels, fuel and catering services by airlines, and IT services by travel agents). Last, but not least, the induced contribution includes the income and jobs supported by the spending of those who are directly or indirectly employed by the travel and tourism industry.

The World Travel and Tourism Council has constructed a set of "tourism satellite accounts" for Montenegro, which measure these broader economic impacts (MTE 2008, WTTC 2011). These show that around 90% of visitor spending is on leisure travel. If we assume that these figures can be assigned on a *pro rata* basis to the estimated 463,000 PA visitors, then we can estimate that PA tourism made a total direct, indirect and induced contribution to GDP of some ≤ 172 million in 2010 (Table 8). This includes gross visitor spending of more than ≤ 220 million, public expenditures of almost ≤ 8 million and capital investment in excess of ≤ 60 million, as well as some 7,700 full-time job equivalents.

	All domestic and international tourism ^[1]	All leisure travel ^[2]	PA tourism ^[3]
Visitor exports (foreign visitor spending)	545.0	490.5	179.7
Domestic expenditure	127.5	114.8	42.0
Government individual spending	1.5	1.4	0.5
Purchases by tourism providers	-435.4	-391.9	-143.6
Direct contribution to GDP (€ million)	238.6	214.7	78.7
Domestic supply chain	78.3	70.5	25.8
Capital investment	187.9	169.1	62.0
Government collective spending	21.7	19.5	7.2
Imported goods from indirect spending	-96.0	-86.4	-31.7
Induced	92.5	83.3	30.5
Indirect and induced contribution to GDP (€ million)	284.4	256.0	93.8
Total contribution to GDP (€ million)	523.0	470.7	172.4
Direct employment	10.2	9.2	3.4
Indirect employment	13.1	11.8	4.3
Total employment ('000 jobs)	23.3	21.0	7.7

Table 8: travel and tourism economic impacts 2010

Source: [1] WTTC 2011, [2] imputed from WTTC figures for 2009 and 2010, [4] imputed on a pro rata basis based on MONSTAT and PA records of visitor arrivals and overnights.

4. Trends in Protected Area investment

The previous chapter described the substantial contribution that PA goods and services make to selected sectors and to key economic and development indicators. An important question that now arises is: if PAs are so valuable to the economy, and to so many groups in Montenegro, then how much is actually being invested in maintaining this important asset, and by whom?

Although they are by no means comprehensive, some data are available to enable us to answer this question. Funding to PAs comes from two main sources: the State budget, and the reinvestment of income generated from charges levied on the use of PA goods and services. However, as we shall see below, these investments are extremely small, when compared either to the level of benefits that PAs generate for the economy or to the basic requirements of the PAS.

Self-generated income

First, we can look at the revenues that are generated by PAs and reinvested in their management.

It is only National Parks that earn income. This averages around €0.9 million a year, although has been steadily falling over the last four years – from just over €1 million in 2007 and 2008 to some €800,000 in 2009 and 2010 (Figure 5).

About half of these revenues are earned from tourism. The remainder come from sales of publications, and other uses of PA lands and resources.



Figure 5: National Park revenues 2007-10

Public budget transfers

PAs are funded from the public budget, including donor contributions. Again, it is only National Parks that receive direct transfers from national government, channelled through Public Enterprise National Parks of Montenegro (PENP). This averages just over €0.4 million a year, although has fluctuated quite considerably over the last four years.

Various other public funding sources also contribute towards the maintenance of the PAs a whole (i.e. including other categories of PAs than National Parks), although these are relatively small in comparison, and do not comprise regular, direct allocations. They include spending made by the Nature Protection Institute, and recent occasional allocations to activities such as (to take examples from recent years) the development of secondary legislation for Nature Protection Law, establishment of a framework for Natura 2000, implementation of the Law on National Parks, development of MPAs, and the initiation of Eco-Fund, among others. Data are not available on the exact amount or composition of this funding.

Total funding to PAs

Adding together the income earned and direct transfers from national government shows that, in total, National Parks received average direct investments of just under ≤ 1.4 million a year, or $\leq 1,600/^{km^2}$ between 2007 and 2010.

Around one third of this is typically contributed through transfers from the national budget, and two thirds from revenues and other contributions from PENP.

Overall, funding has been falling over the last four years, and in 2010 total investments were worth only just over half of what they had been in 2008 (Figure 6).



Figure 6: public investment in National Parks 2007-10

Also taking into account indirect or occasional funding from the public budget (as outlined above), and considering all categories of PAs, increases this figure slightly. A financial scorecard analysis was carried out during the Project Preparation Grant phase of the project. This calculated total funding to all categories of PAs from all sources to be in the region of ≤ 2 million a year, or an average of $\leq 1,800/\text{km}^2$. Just under half of this came from public budgets, with the balance funded through reinvested revenues.

Comparing actual and required PA investment levels

PA investment figures for Montenegro (an average of €1,600/km² of direct funding to National Parks or a total of €1,800/km² across the entire PA system) do not compare particularly well with middle-income countries and economies in transition in the region. Data generated for other Central and Eastern European countries for example indicates that over recent years public funding to PAs averaged €4,170/km² in Hungary, €2,890/km² in the Czech Republic and €1,900/km² in Croatia (Mansourian and Dudley 2007).

Funding is also not sufficient to maintain the PA network. The on-the-ground reality is that the majority of PAs are operating on a budget that is effectively zero. Only National Parks are under active management and staffing – and even they face a pressing shortage of funds for essential conservation activities and investments. For other categories of PA, the situation is even more critical.

The financial scorecard analysis mentioned above looks at the actual financing needs for Montenegro's terrestrial PAs. These figures cover both the existing 1,089 km² national PA network and an estimated including 650 km² of new PAs. It recommends that a minimum of \leq 5.3 million a year is required for basic management of terrestrial PAs, and \leq 6.3 million is needed for improved management (\leq 3,000- \leq 3,600/km² averaged across the entire national PA network). This is up to twice the amount that is actually being invested.

5. Weighing up the public costs and benefits of Protected Areas

Modelling alternative PA investment and management futures

Chapter 3 described the value of PAs to Montenegro's economy in 2010, while Chapter 4 reviewed recent trends in public spending on PAs. These analyses provide a useful snapshot of the current situation as regards the economic costs and benefits of the PAS. Our concern is however now to look at the longer-term public costs and benefits of establishing and managing PAs as an economically viable form of land use.

In order to do this, the current chapter develops scenarios or alternative futures for PA management and investment (and, by implication of the status of biodiversity and ecosystem services). The aim is to give a broad indication of the economic costs and benefits associated with public policy and investment choices as regards Montenegro's PAS.

No comprehensive scenarios or projections for PAs, biodiversity and ecosystems in Montenegro exist, although various public policy documents (such as the National Biodiversity Strategy and Action Plan for 2010-15, Protection and Development Strategies for individual National Parks, Spatial Plan to 2020, Tourist Development Strategy to 2020 and National Strategy for Sustainable Development and Action Plan for 2007-12) present some predictions of likely future trends in selected parameters. The scenarios developed below have been informed by these, and other, documents on Montenegro (particularly those relating to EU accession and integration – for example see ten Brink *et al* 2007), as well as by the recent work carried out by ISSP on the economic value of pilot PAs and of course a review of actual statistical data. They have also been guided by recent work carried out under The Economics of Ecosystems and Biodiversity initiative (Braat and ten Brink 2008, TEEB 2008, 2010) which looked at models for assessing the costs of policy inaction as regards biodiversity and ecosystems, and by a recent European Commission study on "scenarios and models for exploring future trends of biodiversity and ecosystem services changes" (IEEP *et al* 2009).

For this reason, the scenarios that are modelled are highly speculative, and rely on many assumptions. The Annex to this document lists the detailed assumptions used. The figures presented in the current chapter should therefore be seen as a broad indication of what *might* occur under different alternative PA investment and management futures, rather than a definitive statement of what *will* happen.

Business as usual and investing in natural capital

We consider two basic scenarios for Montenegro's PAS: a baseline trend scenario (assuming that current trends in PA investment, management and use will continue), and an explorative scenario (forecasting the effect of improved PA investment and management effectiveness).

<u>Business as Usual – continuing under-investment in PAs</u>: This corresponds to a situation where current trends in PA investment, management and use continue. As a result, although the area of the PAS expands as planned, existing and new PAs suffer from a chronic lack of funding, and weak management effectiveness. The recreational use of PAs increases, as national tourism develops, at least initially, but over the longer-term stagnates as the quality of PAs and visitor experiences decline. Insufficient spending also translates into an inability to manage threats to biodiversity and ecosystems: while PAs continue to provide important ecosystem services (such as water supplies, watershed protection and flood control), the quality and impact of these services decreases progressively over time.

<u>Investing in Natural Capital – adequate investment in PA conservation and sustainable use</u>: This corresponds to a situation where PA investment is gradually increased and policy implementation is improved, eventually meeting the financing needs that are required for "optimal" (as defined in the financial scorecard) management. The recreational use of PAs continues to increase steadily, in line with development of the national tourism market, and visitor experience improves as the quality of both natural ecosystems and the facilities and services offered by PAs advances. Better management effectiveness means that the status and integrity of biodiversity and ecosystems in PAs and their broader landscapes is maintained and improved: the quality and impact of PA ecosystem services is sustained and in many cases grows.

Analysis is made of the public costs and benefits of these two alternative scenarios over the next 25 years (starting from a baseline year of 2010, and continuing up to 2035). The public costs and benefits of "business as usual" and "investing in natural capital" are compared, and the value-added by undertaking adequate investments in PA conservation and sustainable use is demonstrated.

As mentioned above, the scenario models are highly speculative, due to a lack of both biophysical and economic data. This also means that (as in Chapter 3) it is also not possible to include all of the economic benefits associated with PAs. An important omission on the cost side, which should be noted, is that the *opportunity costs* of PAs could not be calculated on the basis of available information. These comprise the production, income and other land and resource use/development benefits foregone by choosing to conserve and sustainably utilise land and resources in the PAS. These are likely to be substantial, and wide-ranging in their effects. In this case, the exclusion of opportunity costs is not however considered to have a major impact on the resulting figures, as both scenarios refer to the same land area in the PAS under the same basic management regime – it is conservation management *effectiveness* that varies between the two scenarios – and so will imply similar opportunity costs.

The economic implications of continuing business as usual

Continuing business as usual will result, initially, in an increase in PA values, as growth in biodiversity and ecosystem use outweighs the progressive decline in the quality and value of services generated. However, over time, values will start to decrease, as the ability of PAs to provide key goods and services is gradually eroded (Figure 7).

Under the business as usual scenario, the net present value (NPV) of the gross economic contribution of the PAS over the next 25 years is just over \notin 662 million. This compares to a total public investment of just under \notin 63 million (with a NPV of \notin 21 million).





The economic implications of investing in natural capital

Investing in natural capital will result in a progressive increase in PA values, as both levels of biodiversity and ecosystem and the quality and value of services generated improve. Although this increase will be sustained, the rate of growth will slow over time as ecosystem and biodiversity status is restored and as PA management effectiveness targets are reached (Figure 8).

Under the investing in natural capital scenario, the net present value (NPV) of the gross economic contribution of the PAS over the next 25 years is just under €958 million. This compares to a total public investment of just under €114 million (with a NPV of €35 million).



Figure 8: PA values - investing in natural capital

Winners and losers

We can differentiate four main groups that are economically impacted by PAs: PA authorities, other government agencies, the private sector, and non-commercial users. As explained above, in Chapter 2, these cover most sectors and population groups in the country; they include beneficiaries at local, regional and national levels.

Under both business as usual and investing in natural capital scenarios, the primary beneficiaries of PA values are non-commercial users, gaining from a share of around a half of the total values generated, followed by the private sector at around a third (Figure 9).



Although there is little change in the broad distribution of benefits between the two scenarios, investing in natural capital implies small gains in the relative share accruing at household and company levels, and a small decrease for public revenues (Figure 9). However, the absolute value of PA benefits generates substantial gains for all beneficiary groups, more than doubling the total values received by the private sector and non-commercial users over the 25 year period of analysis, and increasing public revenues by 15-30% (Figure 10).



The value-added by investing in natural capital

It is clear that investing in natural capital implies sustained, and increasing, PA economic values for all beneficiary groups, while continuing business as usual will result in the steady erosion of PA economic values. Although the value-added by investing in natural capital as compared to continuing business as usual is relatively small over the short-term, it progressively increases as the gap widens between the two scenarios (Figure 11).



Figure 11: annual value-added from investing in natural capital over business as usual

Investing in natural capital shows a steady, and increasing, value-added over continuing business as usual. After 25 years, the cumulative gain will be more than €1.5 billion (Figure 12), with a NPV of €296 million.



Meanwhile, choosing to continue business as usual does not just imply reduced values as compared to investing in natural capital. It also incurs long-term losses as compared to the current situation. Although initially values will increase, over time they will progressively reduce, as the capacity of PAs to generate economically valuable goods and services is eroded. These long-term losses outweigh the short-term gains. The cumulative costs of continuing business as usual after 25 years are some €30 million (Figure 13).



Figure 13: cumulative costs of business as usual

The returns from investing in natural capital

It is clear that there are substantial economic gains from investing in natural capital as compared to the persistent under-investment in PAs that takes place under business as usual. Public decision-making should be informed, at least in theory, by the desire to secure development and other gains for Montenegro's economy and population – the gross value-added should be sufficient reason to choose to invest in natural capital and to ensure that an adequate funding and policy priority is accorded to PAs.

However, we can see from the preceding analysis that investing in natural capital also implies a considerably higher level of public investment than continuing business as usual. From a government perspective, it would be reasonable to question whether this increased public funding is justified, in relation to the added benefits it generates to the economy.

Initially, the public return on investment (the value of benefits generated per € invested in the PAS) will be higher under business as usual than under investing in natural capital. Over the longer-term, as PA values are eroded under a situation of continuing under-investment, the returns per unit of public funding will however start to decline. This is as compared to an immediate decrease in return on investment under investing in natural capital (as the initial investments required to expand the PAS and improve PA management effectiveness) followed by a sustained increase in public returns (Figure 14).

After 25 years, PAs will have generated a total return on public investment of almost €29 per €1 of funding under the investing in natural capital scenario, as compared to €27.5 under business as usual. The total benefits generated over and above public funding invested shows a pronounced difference: €3.2 billion with a NPV of €923 million under investing in natural capital as compared to €1.7 billion with a NPV of €641 million under business as usual.



Figure 14: returns to PA investment from business as usual & investing in natural capital

6. Summary of findings and conclusions: the economic rationale for public investment in Protected Areas

This report has demonstrated that, even on the basis of only a very superficial and partial valuation exercise, the protected area system generates substantial values for Montenegro's economy. It has shown that:

- <u>PAs generate considerable values</u>. The value of tourism and recreational activities, other uses of PA lands and resources, water supply services and watershed/flood protection services is estimated at just under €68 million in 2010.
- <u>PAs play an appreciable role in the national economy and development</u>. In 2010, the quantified value of PAs equated to some 2.2% of GDP, or economic benefits of €106 generated per capita of Montenegro's population.
- PA values accrue to multiple sectors, at many different levels of scale. In 2010, just under a half of PA values accrued to the general public (worth more than €32 million), more than a third generated earnings and cost savings to businesses and industries (€25 million), and around 15% earned revenues for the government (€11 million). PA goods and services supported the output of many different sectors of the economy, including tourism, energy, water, agriculture, infrastructure and disaster risk reduction.
- The values generated by PAs have a substantial multiplier effect across the economy. For example, PAs protect the source of existing and planned hydropower generation worth almost €80 million a year in public revenues. PAs generate total income, investment and spending for the tourist sector of €172 (or 5.7% of GDP), including gross visitor spending of more than €220 million and capital investment in excess of €60 million, as well as some 7,700 full-time job equivalents.
- <u>There is significant public under-investment in PAs</u>. At €2 million a year in total or €1,800/km², current funding to the PAS is insufficient to manage the PA network effectively. It is lower than in many other Central and Eastern European countries, and less than half of the actual financing needs for effective PA management in Montenegro.
- Continuing to accorded PAs a low policy and investment priority will incur economic losses. Continuing to carry out "business as usual" may cost Montenegro's economy and population more than €30 million over the next 25 years.
- Investing adequately in PAs will generate value-added to the economy. Choosing to "invest in natural capital" may create a steady, and increasing, value-added to Montenegro's economy and population over continuing "business as usual", generating incremental benefits worth more than €1.5 billion over the next 25 years.
- <u>There is a high economic return to public investment in PAs</u>. Although choosing to "invest in natural capital" implies a considerably higher level of public investment than continuing "business as usual", these expenditures are far outweighed by the economic benefits generated. Net benefits will more than double over the next 25 years, and PAs will generate a total return of almost €29 per €1 of public funds invested.
- <u>PAs are not being managed to their full economic potential</u>. The public income earned from PAs is currently less than €1 million a year. There is low cost recovery this equates to only around 15% of projected funding needs. In many cases there are unmet consumer demands for sustainable PA products and services, and the bulk of PA goods and services are being provided at a low or zero price to users. Increased public investment and policy action can help to realise these economic opportunities.
- <u>There remain untapped opportunities to increase the levels of revenues generated from PAs</u>. Tourists and recreational visitors are, for example, willing to contribute almost €19 million a year more than they

are currently being charged as entry fees, and there is a potential market for PA authorities to provide hikes and guided tours which is worth up to €3 million a year in public earnings. Increased public investment and policy action is required to capture these potential revenue streams.

From a public perspective, we can therefore see that PAs help to sustain income, output and consumption across the economy, generate employment and earn the government fiscal revenues. Because of the important and economically valuable services that that it provides, maintaining the PAS is also a way of avoiding the losses that are associated with ecosystem and biodiversity degradation, and are manifested through reduced earnings, increased costs and expenditures and declining economic wellbeing. These economic benefits and costs avoided accrue to the government, the general public and to many different sectors of the economy, such as tourism, energy, water, agriculture, infrastructure and disaster risk reduction.

The overriding message is clear: using the PAS to conserve biodiversity and ecosystems is not just a biological or ecological issue, but is also a major economic concern. It generates immense values, costs saved and losses avoided in other parts of the economy. These range from the economic activities that underpin local economies, through the life support services that protect human settlements and enable production, the outputs and production of both small businesses and large-scale industries, the goods and services that are traded on national and export markets, and the key development indicators that underpin GDP and sustain and enhance the growth of Montenegro's economy.

The implication is that PAs should be treated, in public policy and investment terms, in the same way as any other component of productive infrastructure: as a stock of equipment, facilities and services that are required for Montenegro's economy and human population to function, prosper and grow. Just as the PAS should be seen as an economic asset, so there are tangible economic returns from investing in it. Conversely, running down this stock of natural capital imposes costs and losses on most sectors of the economy, and undermines economic growth. If managed sustainably, PAs can continue to yield economically productive and beneficial flows of goods and services. If used and managed unsustainably, these economic benefits will progressively be lost – to the cost of Montenegro's economy and population.

7. References

- Braat, L. and ten Brink, P. (eds.). 2008. The Cost of Policy Inaction: The case of not meeting the 2010 biodiversity target. study for the European Commission, DG Environment, Brussels.
- Ceroni, M. 2007. Ecosystem services and the local economy in Maramures Mountains Natural Park, Romania. Report submitted to United Nations Development Programme (UNDP), Bucharest.
- Ceroni, M. and M. Dragoi. 2008. Assessing and capturing ecosystem benefits in Macin Mountains National Park, Romania. Report submitted to United Nations Development Programme (UNDP), Bucharest.
- CSTI. 2007. The Experience of Tourists in Northern and Southern Montenegro. Centre for Sustainable Tourism Initiatives (CSTI) and the Center for Entrepreneurship and Economic Development (CEED), Podgorica.
- Dumitras, D. 2008 Comparing welfare estimates from travel cost and contingent valuation application to the recreation value of Romanian parks. Lucrari Stiintifice, Seria I, 10(4).
- Dumitras, D., Arion, F. and E. Merce. 2011. A Brief Economic Assessment on the Valuation of National and Natural Parks: the Case of Romania. Not. Bot. Hort. Agrobot. Cluj 39(1): 134-138.
- Emerton, L. 2009a. Corporate Ecosystem Valuation: A Scoping Study. World Business Council for Sustainable Development (WBCSD), Geneva.
- Emerton, L. 2009b. Economic Valuation of Protected Areas: Options for Macedonia. GEF/UNDP PIMS 3728: Strengthening the Ecological, Institutional and Financial sustainability of Macedonia's Protected Area System and Ministry of Environment and Physical Planning, Skopje.
- Emerton, L. 2009c. Making the Economic Case: A Primer on the Economic Arguments for Mainstreaming Poverty-Environment Linkages into Development Planning. Poverty-Environment Initiative, United Nations Development Programme (UNDP) and United Nations Environment Programme (UNEP), Nairobi.
- EPCG. 2009. Report on Business Operations of Elektroprivreda Crne Gore A.D. Nikšić for Year 2008. Elektroprivreda Crne Gore A.D. Nikšić (EPCG), Podgorica.
- EPCG. 2009. Electricity consumption. <u>http://www.epcg.co.me/en01_03_03.html</u>, accessed 22 August 2011.
- FAO. 2010. Global Forest Resources Assessment 2010. FAO Forestry Paper 163, Food and Agriculture Organisation of the United Nations (FAO), Rome.
- Getzner, M. 2009. Economic and cultural values related to Protected Areas Part A: Valuation of Ecosystem Services in Tatra (PL) and Slovensky Raj (SK) national parks. WWF World Wide Funds for Nature Danube Carpathian Programme (DCP), Vienna.
- Government of Montenegro. 2010. The Initial National Communication on Climate Change of Montenegro to the United Nations Framework Convention on Climate Change (UNFCCC). Ministry for Spatial Planning and Environment, Podgorica.
- IEEP, Alterra, Ecologic, PBL and UNEP-WCMC. 2009. Scenarios and models for exploring future trends of biodiversity and ecosystem services changes. Final report to the European Commission, DG Environment on Contract ENV.G.1/ETU/2008/0090r. Institute for European Environmental Policy, Alterra Wageningen UR, Ecologic, Netherlands Environmental Assessment Agency, United Nations Environment Programme World Conservation Monitoring Centre.
- ISSP. 2011. Economic Valuation of Montenegro's Protected Area System. Report prepared for "GEF/UNDP PIMS 4279: Catalyzing Financial Sustainability of the PA System" project, Institute for Strategic Studies and Prognoses (ISSP), Podgorica.

- ITSC.2006. Environmental Impact Assessment Study on Regional Water Supply System of Montenegrin Coast from Water Source Bolje Sestre. Report prepared for Government of Montenegro by ITSC Ltd, Podgorica.
- MAFWM. 2006. Montenegro's Fisheries Development Strategy and capacity building for implementation of EU Common Fisheries Policy Ministry of Agriculture, Forestry and Water Management, Podgorica.

Mansourian, S. and N. Dudley. 2008. Public Funds to Protected Areas. WWF International, Gland.

MED. 2008a. Investment Opportunities: Energy Sector of Montenegro. Ministry of Economic Development, Podgorica.

MED. 2008b. Spatial Plan Of Montenegro until 2020. Ministry of Economic Development, Podgorica.

- Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-being: Synthesis. Island Press, Washington DC.
- Mrdak, D. 2005. Economic valuation of Tara river (Montenegro). Annex 2 in WWF. The Northern Montengro Greedn Belt: Biodiversity Assessment Study on Durmitor-Tara-Prokletije Landscape. WorldWide Fund for Nature Mediterranean Programme, Rome.
- MONSTAT. 2008. Demografski trendovi u Crnoj Gori od sredine 20. Vijeka i perspektive do 2050. Godine. Statistical Office of Montenegro (MONSTAT), Podgorica.
- MONSTAT. 2011. Arrivals and overnight stays: monthly releases. Statistical Office of Montenegro. http://www.monstat.org/eng/page.php?id=44&pageid=44 Accessed September 1 2011.
- MTE. 2008. Montenegro Tourism Development Strategy to 2020. Ministry of Tourism and Environment, Podgorica.
- NVE. 2010. Strategic Environmental Impact Assessment for Detailed Spatial Plan for Hydro Power Projects (HPPs) on the Morača River. Norwegian Water Resources and Energy Directorate on behalf of Montenegro Ministry of Spatial Planning and Environment, Podgorica.
- Olters, J. 2008. The Restorative Power of Nature. Monitor 19(903): 32-33.
- Pagiola, S. 1996. Republic of Croatia Coastal Forest Reconstruction and Protection Project: Annex J. Economic Analysis. Staff Appraisal Report: Report: Republic of Croatia Coastal Forest Reconstruction and Protection Project, World Bank, Washington DC.
- Philips. A. (ed.) 1998. Economic Values of Protected Areas: Guidelines for Protected Area Managers. Task Force on Economic Benefits of Protected Areas of the World Commission on Protected Areas (WCPA), the Economics Service Unit of IUCN International Union for Conservation of Nature (IUCN), Gland.
- PreventionWeb. 2011. Montenegro Disaster Statistics: Data related to human and economic losses from disasters that have occurred between 1980 and 2010. http://www.preventionweb.net/english/countries/statistics/?cid=266 accessed 1 September 2011.
- RMSI. 2008. Risk Assessment for South Eastern Europe: Desk Study Review. South Eastern Europe Disaster Risk Mitigation and Adaptation Initiative. Report prepared by RMSI for the Global Facility for Disaster Reduction and Recovery (GFDRR), UN International Strategy for Disaster Risk Reduction (UN/ISDR), Geneva.
- Ruzzier, M., Žujo, J., Marinšek, M. and S. Sosič. 2010. Guidelines for economic evaluation of the natural assets of the PAs. South East Europe Transnational Cooperation Programme, Institute of the Republic of Slovenia for Nature Conservation, Ljubljana.
- SCBD. 2008. Protected Areas in Today's World: Their Values and Benefits for the Welfare of the Planet. Technical Series No. 36, Secretariat of the Convention on Biological Diversity, Montreal.

- Spurgeon, J. and D. Gallagher. 2010. Valuation of Tourism Benefits for Croatia's Protected Areas. Report prepared by Environmental Resources Management Ltd. for the Program on Forests (PROFOR), World Bank, Washington DC.
- Stolton, S. (ed.) 2009. Communicating values and benefits of protected areas in Europe. Results of a seminar organised by BfN and EUROPARC Federation at the International Academy for Nature Conservation, Isle of Vilm.
- Tarchiani, V. 2011. National Assessment Report of the national capacities, gaps and needs in flood and drought risk assessments: Montenegro. World Meteorological Organization (WMO), Regional Programme on Disaster Risk Reduction in the South East Europe.
- TEEB. 2008. The Economics of Ecosystems and Biodiversity. An Interim Report.
- TEEB. 2010. The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB.
- ten Brink, P., Avramovski, L., Vermoote, S., Bassi, S., Callebaut, K., Lust, A. and A. Hunt. 2007. Benefits for fYRoM and other countries of SEE of compliance with the environmental acquis. Final Report Part II: Country-specific report Montenegro. Report prepared for the European Commission – DG Environment, Arcadis ECOLAS N.V., Berchem and Institute of European Environmental Policy, Brussels.
- UNECE. 2007. Environmental performance reviews: Republic of Montenegro. Environmental Performance Reviews No. 25, United Nations Economic Commission for Europe, Geneva.
- WHO. 2011. EM-DAT International Disasters Database: Montenegro Country Profile. World Health Organization (WHO) Collaborating Centre for Research on the Epidemiology of Disasters Emergency Events Database EM-DAT, maintained by Université catholique de Louvain, Brussels.
 http://www.emdat.be/result-country-profile accessed 11 July 2011.
- World Bank. 2010. Report No: ICR00001484. Implementation Completion and Results Report (IDA-43220) on a Credit in the Amount of SDR6.6 million (US\$ 10.0 million equivalent) to Montenegro for a Montenegro Sustainable Tourism Development Project. Sustainable Development Department, South East Europe Country Unit, Europe and Central Asia Region, World Bank, Washington DC.
- WTTC. 2011. Travel and Tourism Impact 2011: Montenegro. World Travel & Tourism Council, London.

Annex: assumptions made in modelling scenarios

	Changes from the baseline 2011-35			
	Business as Usual scenario	Investing in Natural Capital scenario		
Public investment in PAs	Maintained at current levels (using figures from financial scorecard analysis).	Amount required for basic management phased in 2011-2015, amount required for optimal management phased in 216-2020 (using figures stated in financial scorecard analysis). Refers to terrestrial PAs only: funding needs for MPAs excluded.		
Size of PAs	Target 10% of territory (1,381 km ²) mentioned	d in Spatial Plan phased in 2011-2020		
National population growth	Projections provided in MONSTAT 2008 used.	· · ·		
All tourist visitor arrivals	Assigned pro rata from WTTC 2011 estimates 2021, and 5% per year thereafter	of increase in tourism economic impacts to		
All tourist visitor overnights	Projections provided in MTW 2008 used, and	2.5% thereafter		
PA visitors/overnights (and associated number of PA visitors participating in sport- fishing, boat trips, rafting, etc.)	Assume actual baseline of all PA visitors is 1.5 times the recorded number of NATIONAL PARK visitors. For BGNP, DNP and SJNP assume 15% the rate of increase of national visitor arrivals/overnights 2011- 15, 20% 2016-20, 5% 2021-25, stagnant from 2026. For other PAs assume same rates of increase, plus growth in PA area.	Assume actual baseline of all PA visitors is 1.5 times the recorded number of NATIONAL PARK visitors. For BGNP, DNP and SJNP assume 25% the rate of increase of national visitor arrivals/overnights 2011- 15, 50% thereafter. For other PAs assume same rates of increase, plus growth in PA area.		
PA entry fees	Maintained at current levels in BGNP, DNP and SJNP in real terms, increase gradually in other PAs to levels which are consistent with existing NPs.			
Average hotel expenditures per visitor day	No change 2011-15, but reduce by 10% a year 2016-20, 5% 2021-25, 2.5% 2026-30 as PA visitor experience declines.	No change 2011-15, but increase by 0.5% a year 2016-20, 0.75% 2021-25, 1% 2026-35 as PA visitor experience improves.		
Proportion of PA tourists making overnight trips	No change 2011-15, but reduce by 10% a year 2016-20, 5% 2021-25, 2.5% 2026-30 as PA visitor experience declines.	No change 2011-15, but increase by 0.33% a year 2016-30 as PA visitor experience improves.		
Visitor WTP conservation and consumer surplus	No change 2011-15, but reduce by 2.5% a year 2016-20, 5% 2021-25, 7.5% 2026-30, 10% 2031-35 as PA visitor experience declines.	No change 2011-15, but increase by 1% a year 2011-16, 1.5% 2021-25 as PA visitor experience improves.		
Price of fishing permits, non-PA expenditures made by sport fishers	No change in real terms			
Number of commercial fishers in SJNP, catch, price of fish and fish products	No change in real terms			
PA "tax" on rafters and price of rafting trip, non- PA expenditures made by rafters	No change in real terms			
Proportion of PA visitors willing to pay for guided tours	Increases 1% a year2011-20, but reduces by 5% a year 2021-35 as PA visitor experience declines.	Increases 1% a year2011-20, 1.25% 2021-30 as PA visitor experience improves.		
Average tour price, WTP for tours	No change in real terms	Increases 2.5% a year2011-30 as PA visitor experience improves.		
Proportion of visitors WTP for guided tours who actually go on tours	No change in real terms	Increases 1.5% a year2011-15 and 1% 2016- 30 as PA visitor experience improves.		
Per capita domestic water consumption	No change in real terms			

	Changes from the baseline 2011-35			
	Business as Usual scenario	Investing in Natural Capital scenario		
WTP for water	Decreases 5% a year2016-20, 7.5% 2021-25, 10% 2026-30 as ecosystem water services decline.	Decreases 1% a year2016-35 as ecosystem water services improves		
Domestic water consumers	Increase in line with population growth for pe with growth in visitor overnights	ermanent residents, for tourist increase in line		
Regional Water Project water supply	From projections given in ITSC 2006			
Bottled water concession fees and market prices	No change in real terms			
Bottled water extraction	No change in real terms	Identified existing potential water concessions are utilised by 2020		
Watershed forest area	Increases in line with expansion of PAs, but balanced by 1% decline a year to account for reduction in forest quality	Increases in line with expansion of PAs, and 1% increase a year to account for improvement in forest quality		
Value per hectare of watershed forest	Increases at the same rate as population growth plus a factor of 2 to account for increasing density of settlement and infrastructure	Increases at the same rate as population growth plus a factor of 2 to account for increasing density of settlement and infrastructure, and 0.5% a year 2011-15, 1% 2016-20, 1.5% 2026-35 due to improved service provision		
Number of people affected by floods	Increases at the same rate as population growth plus a factor of 2 to account for increasing density of settlement and infrastructure	Increases at the same rate as population growth plus a factor of 2 to account for increasing density of settlement and infrastructure, and 0.5% a year 2011-15, 1% 2016-20, 1.5% 2026-35 due to improved service provision		
Frequency of floods	Increases by 5% 2011-15, 10% 2016-20, 15% 2021-35 due to progressive ecosystem degradation.	Decreases by 1% 2011-15, 2.5% 2016-20, 5% 2021-35 due to progressive ecosystem improvements.		
Proportion of flood- affected population protected by PAs	Increases as PAs expands			
Proportion of flood- affected population which avoid damages due to PA protection services	Reduces by 25% 2011-15, 33% 2016-20, 50% 2021-25, 75% 2026-30, 85% 2031-35 due to progressive ecosystem degradation.	Increases by 1.5% 2011-15, 2% 2016-20, 2.5% 2021-35 due to progressive ecosystem improvement.		
Per capita costs and expenditures due to floods	Increases at the same rate as population growth plus a factor of 2 to account for increasing density of settlement and infrastructure			