



USING A PARTICIPATORY ASSESSMENT OF ECOSYSTEM SERVICES IN THE DINARIC ARC OF EUROPE TO SUPPORT PROTECTED AREA MANAGEMENT

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ABSTRACT

Economic and non-economic benefits of protected areas were assessed in 58 national parks in the Dinaric Arc of Europe, involving over a thousand local people and identifying major economic benefits from tourism, rural development and water. The study used the Protected Area Benefits Assessment Tool in stakeholder workshops in all the parks studied. The results are being applied to improve protected area management and enhance collaboration with local stakeholders. The Dinaric Arc includes parts of eight countries in south-eastern Europe. While being one of the continent's most important areas for biodiversity conservation, it is under intense pressures from development and many of the region's protected areas are underfunded and undervalued. Understanding the full range of values and benefits of protected areas to stakeholders provides a good basis for developing management and policy responses and has proved popular with both governments and donor organizations. The results suggest that protected areas already provide significant economic benefits to local people in the region, often in places with few other options, and that further utilization of many ecosystem services is possible without undermining protected area objectives and effectiveness.

Key words: protected areas benefit assessment tool (PA-BAT), Dinaric Arc, socio-economic benefits, ecosystem services, tourism, policy, water

INTRODUCTION

The environment provides many resources that can be used to provide ecosystem services, subsistence resources, economic benefits and less tangible benefits such as spiritual peace or mental well-being. To help understand the interactions between humans and their environment, the United Nations Millennium Ecosystem Assessment (MEA) classified four categories, or services, relating to ecosystems that are of direct or indirect benefit to humans:

- Provisioning services which enable people to make a living (e.g., fisheries and forestry, both subsistence and commercial).
- Services which support human life (e.g., potable water and clean air).
- Services which regulate other important ecosystems (e.g., mangroves that act as a nursery for juvenile fish).

- Services of cultural significance or which provide opportunities for recreation (e.g., sacred sites and walking trails) (MEA, 2003).

The primary goal of any protected area is to maintain its natural values (Dudley, 2008). If carefully planned and well managed these same values can provide a range of ecosystem services capable of benefitting diverse stakeholders. Knowledge of values and benefits can lead to a better overall understanding of how protected areas contribute to local and national well-being and economies and enhance relationships between local people and protected area managers (Stolton & Dudley, 2010). Protected area assets can also, if properly managed and sustainably utilized, provide economic returns far above the level of investment needed to maintain them (Balmford et al., 2002). But to do this the benefits need to be understood and their contribution assessed.



Figure 1: Dinaric Arc region

Ecosystem valuation is the process of expressing a value for ecosystem goods or services (Farber et al., 2002). These values can be articulated in a variety of ways, from economic to intrinsic values and can be conducted at different spatial scales, from local (e.g., individual sites) to larger scale assessments (e.g., regions or biomes) (Kettunen & ten Brink, 2013). The Protected Areas Benefits Assessment Tool (PA-BAT) has been developed to help collate information on the full range of values from protected areas and the current and potential benefits (both economic and intrinsic) of individual protected areas from ecosystem services (Dudley & Stolton, 2009) using a participatory approach.

This paper discusses the implementation and results from using the PA-BAT in 58 protected areas across the Dinaric Arc region of south-eastern Europe; the largest use of this tool to date.

THE STUDY AREA

The Dinaric Arc includes parts of eight European countries: Albania, Bosnia and Herzegovina, Croatia, Kosovo¹, Former Yugoslav Republic Macedonia, Montenegro, Serbia and Slovenia (figure 1) in south-eastern Europe. Covering approximately 320,000 km², and with more than 6,000 km of coastline, the region includes the Dinaric Alps (after which the region is named) and the Adriatic Sea (the northernmost arm of the Mediterranean Sea).

The Dinaric Arc is particularly important for biodiversity conservation with high floristic diversity and endemism in landscapes which persist in few other areas of Europe. The region includes large areas of natural forest, preserved flood plains and free-flowing rivers, unique large-scale karst limestone landscapes with associated high diversity of cave fauna and large areas of traditional land uses and agricultural systems, with associated agrobiodiversity (Republic of Albania, 2014; Republic of Bosnia and Herzegovina, 2014; Republic of Croatia, 2014; Republic of Kosovo, 2011; Republic of Macedonia, 2014; Republic of Montenegro, 2014; Republic of Serbia, 2014; Republic of Slovenia, 2015). The region includes the most extended network of subterranean rivers and lakes in Europe, as well as wetlands of international importance. Important stopover and wintering sites for migrating birds include the Neretva delta (Bosnia and Herzegovina/Croatia) and Skadar/Shkodra Lake (Montenegro/Albania), which also has important nesting populations of endangered bird species, such as Dalmatian pelican (*Pelecanus crispus*). Inland, large carnivores (including wolf (*Canis lupus lupus*), lynx (*Lynx lynx*) and brown bear (*Ursus arctos arctos*)) use the Dinaric mountains as an ecological corridor between the Alps and the mountains of south-eastern Europe. The Eastern Adriatic coast has hundreds of islands and diverse coastal/marine ecosystems, which are feeding and breeding grounds for cetaceans, sea birds and marine turtles, and include unspoilt tracts with limited

BOX 1: THE PA-BAT STRUCTURE

The PA-BAT assesses the importance and values of all forms of **legal** resource use in a protected area (illegal resource use is usually identified in threat analyses and management actions are developed accordingly) and the benefits (both economic and non-economic) which accrue, or could potentially accrue, from these values. The assessment has two parts: an information sheet records basic details about the protected area and 24 datasheets record types of benefit; recipients of benefits; and qualitative information about their importance. The datasheets record the full range of protected area ecosystem services (de Groot et al., 2002) organized around nine main groups: nature conservation; protected area management; food; water; culture and spirit; health and recreation; knowledge; environmental benefits; and materials. Additional values can be added if they emerge from the discussion.

mass tourism development. Low-intensity farming practices have created semi-natural habitats which integrate forest, pasture and croplands and support a unique set of species (Glasnović et al., 2009).

Many of the most important natural areas in the Dinaric Arc are protected in national parks and nature parks. These cover nearly 20,000 km² of land and 750 km² of sea. Most also contain resident or nearby human populations, who derive direct benefits from the areas, and the ecosystem services also benefit more distant communities. However, an understanding of these values and associated benefits is low, even among protected area staff. Most protected areas are underfunded and their management approaches sometimes lag behind the professional standards in other countries (e.g., Glasnović et al., 2009), in particular concerning the role of local communities in site management.

The aim of the study was to provide locally sourced, credible information on the economic and non-economic importance of in-situ conservation in the region and the potential for increasing these benefits whilst ensuring effective biodiversity conservation. The objective was to use the results of this assessment to improve protected areas management and enhance collaboration with local stakeholders. Although, some site/country specific economic valuations have been published (e.g., WWF, 2011; Spurgeon et al., 2009; UNDP, 2011; Flores & Selimi, 2013; Flores & Ivicic, 2011; Emerton, 2009; UNEP, 2016; UNDP-GEF, 2015), no previous regional stakeholder analysis had been attempted and the results of existing assessment have had little practical impact in

the protected areas studied. Given that the Dinaric Arc is under intense pressures from development (e.g., Glasnović et al., 2009), the values and benefits of the region's protected areas urgently need to be understood and secured.

The Protected Area Benefit Assessment Tool (PA-BAT) was chosen as it is the only tool currently available which assesses stakeholder opinions of benefits. Its dialogue-driven approach was developed specifically to counteract the challenges many protected area managers face when data-driven approaches to assessment provide detailed cost and benefits analysis but little practical guidance on how to use this data. Once such a locally-driven process has been completed the need for more precise data can also be assessed and prioritized, thus ensuring any future assessments, such as detailed economic assessments (e.g., Kettunen & ten Brink, 2013), are precisely focused on the needs of the protected area.

METHODS

The PA-BAT methodology was implemented in 58 protected areas across the eight countries in the Dinaric Arc region between 2011 and 2014. The methodology was implemented in all the national parks in the region and in total implementation covered over 70 per cent of all the national and nature parks. Of the protected areas included in the study, 45 were in remote mountainous forest areas, six were marine protected areas (reflecting the terrestrial bias of protected areas in the region) with other sites in areas dominated by freshwater (floodplains, lakes and waterfalls).

Before implementation, the PA-BAT was adapted for use in the Dinaric Arc. Each question and stakeholder group was reviewed and adaptations were made to ensure that the tool was relevant to the region, e.g. indigenous peoples were removed as there are no indigenous peoples in this region, and two new groups, scientist/experts and civil society organizations (e.g. hunters, fishers and sports associations), were added according to the value assessed. (see figure 2). Information on ecosystem services was collected through facilitated, participatory workshops. The workshops were held locally to the protected area and notice of the meeting and/or invitations were distributed widely to ensure relevant participants were invited. During the workshop, participants were asked to assess the economic and non-economic value for a range of ecosystem services (see box 1) against a range of stakeholder groups (see figure 2). Assessments were selected from six possible values: 1) no importance; 2) minor or 3) major non-economic benefit (e.g. subsistence value, aesthetical value, cultural or



Health and recreation values

13. According to your opinion what is the importance of the area for supporting tourism and recreational activities?



Local people living inside the protected area	Local people living near the protected area	National population	Science/experts	Civil society organisations (user groups)	Business sector	Government/managers of protected areas	International community
	+	+	+	++	+	+P	+
	€€P		€	€€P	€P	€€P	

Key: + minor benefit, ++ major benefit, € minor economic benefit, €€ major economic benefit, P potential benefit, blank boxes relate to stakeholders not being relevant or the benefit being of no importance or potential.

Figure 2. An English translation of the PA-BAT assessment datasheet filled in during the workshop in Telašćica Nature Park for the assessment of recreation and tourism (question 13 in the PA-BAT). A detailed explanation of these results is provided in Box 2. The first row represents non-economic benefits (+ signs) while the second row represents economic values (€ signs).

BOX 2: CASE STUDY TELAŠĆICA NATURE PARK, CROATIA (INTERPRETATION OF FIGURE 2)

Telašćica Nature Park is situated in the central part of the eastern Adriatic coast on the southern side of the island of Dugi Otok. There are no inhabitants inside the protected area, thus there are no results for the first stakeholder group in figure 2. The local community living on the rest of the island represents locals living around the protected area. Locals have minor benefit from the recreational opportunities in the protected area while they have major economic benefit from the tourism activities (e.g. renting houses, working in the tourism sector, etc.) and they also see potential for further economic benefits from tourism.

The national population recognize Telašćica Nature Park as a touristic destination but it is not as important as some other Croatian national parks and it is not a major revenue earner in terms of GDP. Scientists and experts have conducted a few studies mainly regarding tourism in the protected area; and this has resulted in some income for them. Civil society organizations, in this case sports clubs (divers) and local cultural associations, receive major non-economic benefits from the protected areas as their work and cultural heritage can be presented to a wider audience. They also have major economic benefit from tourism related activities (e.g. renting sports equipment and services, selling local products) and they also see potential in gaining more income from marketing local products.

The business sector (e.g. local tourism agencies) sees some non-economic benefits from tourism and recreation on the island but their main focus is an economic one. At present, the local business sector has only a minor economic income because agencies from outside of the island run most enterprises and gain the majority of the tourism income.

Government (e.g. the tourist board/managers of the protected area, etc.) recognized tourism as a non-economic benefit although the main focus of protected area management is nature conservation; nonetheless, they see potential in improving current tourism practices. Managers of the protected areas receive major economic value from tourism related activities because they charge entrance fees mainly to nautical tourists, and this funding provides a major part of their budget. They also see potential in improving the tourism offer. The international community, mainly tourists from other European countries, recognize Telašćica Nature Park for its tourism and natural values, as Telašćica is on the majority of national touristic brochures and is represented at international tourism fairs, etc.

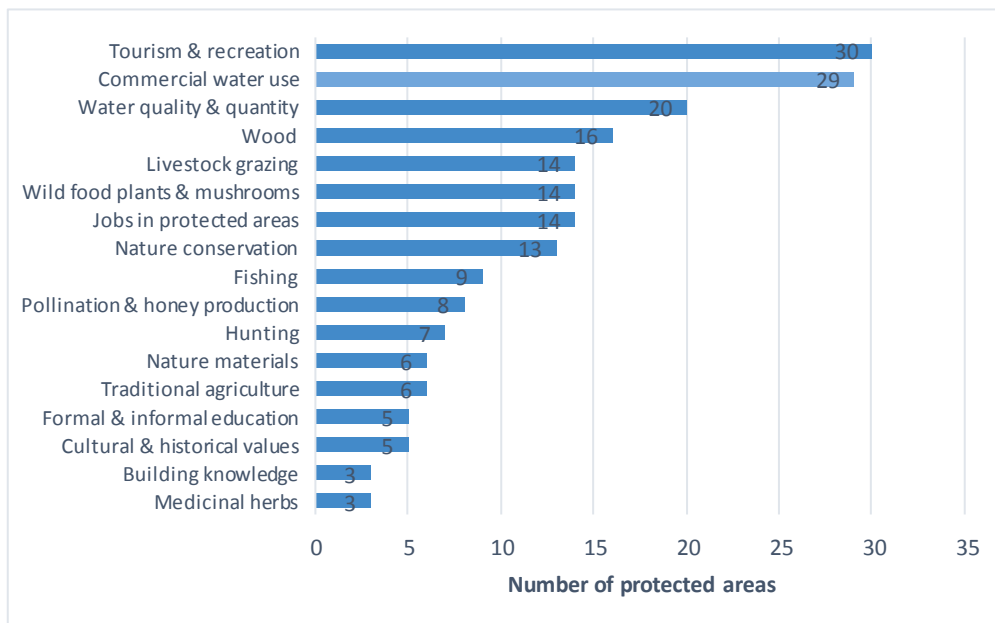


Figure 3. The assessment of major economic benefits in 58 protected areas in the Dinaric Arc.

religious value, etc.); 4) minor or 5) major economic benefit; and, if appropriate, 6) potential benefit (see figure 2). Symbols were used to record the group's final assessment decision, achieved through discussion and consensus. These decisions were then projected onto a screen to ensure the results are transparent and to encourage further participant involvement and debate (see figure 2). Detailed minutes of the discussion captured any additional information. Each participant was also given a short workshop assessment form to fill in at the end of the workshop, which asked what they thought of the workshop and how they could use the knowledge gained.

The PA-BAT was developed in part as a response to top-down, science-led transfer of knowledge. However, as Reed (2008) notes, local knowledge should not be accepted unquestioningly and a combination of local and scientific knowledge generally results in the most accurate result. The results from the workshop assessments were thus checked with expert input through a validation process. Any changes in the results were, however, kept to a minimum and recorded along with the justification for any revisions to ensure transparency.

As this was a regional implementation, volunteer national PA-BAT coordinators were recruited and trained to set up and implement the assessment in each country, and in each protected area a PA-BAT focal point was designated. In total the PA-BAT workshops involved 1,245 local people across the region. Following the workshops and data verification process, the results were entered into an Excel database. For each benefit and each beneficiary, indicators were entered using a three-point scale: 0 = no importance, 1 = minor importance and 2 =

major importance. Potential benefits were recorded separately. Over 22,000 items of data were inputted into the database. An online platform (using the Excel Dashboard programme) was developed so PA-BAT focal points and protected area staff could enter additional information and search, check and use the results. The estimated cost of implementation was €65,000 (approximately US\$83,000) over three years plus staff time (usually two people per workshop; one to facilitate the discussion and one to record the discussion). Over 30,000 km were travelled to implement the workshops.

RESULTS

This paper focuses on the results of the economic assessment of benefits only. Overall, the results showed a wide range of legal use of resources from protected areas which provide current (figure 3) and potential economic benefits (figure 4) to a wide range of stakeholders. Three findings are highlighted in more detail below. Firstly, although 95 per cent of stakeholders stated they already received some economic gain (i.e. both minor and major benefit) from tourism in protected areas, it was clear from the workshop discussions that there was potential to increase these benefits. Secondly, research highlighted the role of protected areas in a group of benefits, including local food production (agriculture, livestock, non-timber forest products, fishing, honey and in some cases hunting), employment, etc., which are broadly termed as local development, and were all seen as having major potential for increasing economic returns from the protected areas. Thirdly, commercial water use has a major economic value in 50 per cent of protected areas, linked to the widespread occurrence of karst landscapes in the region which have highly productive groundwater supplies (Veni et al., 2001), but there has been a very uneven distribution of the resulting benefits (figure 5).

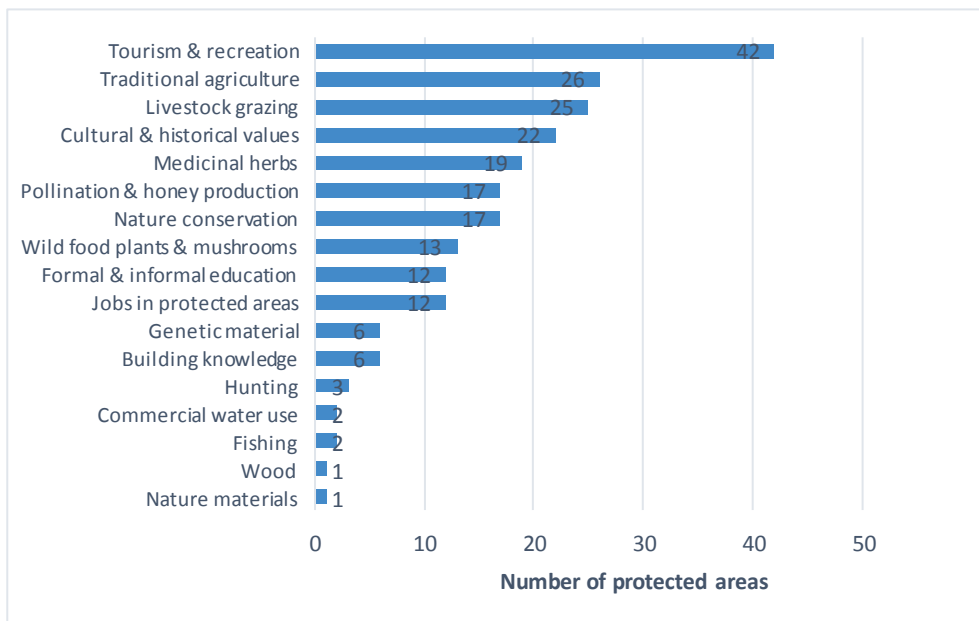


Figure 4. The assessment of economic benefits with potential recognized by the local community (locals in and around protected area) and civil associations in 58 protected areas in the Dinaric Arc.

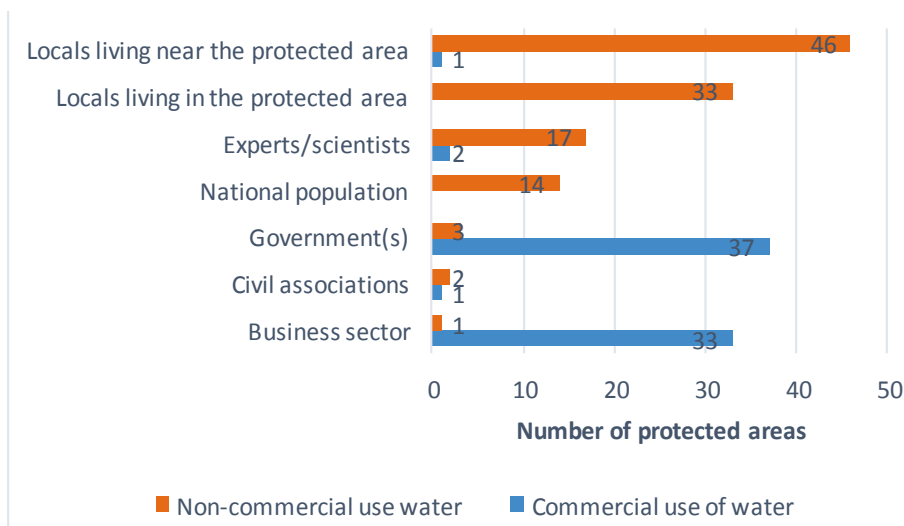


Figure 5. Comparison of flow of economic benefit from the non-commercial and commercial use of water to different stakeholder groups in 58 protected areas in the Dinaric Arc.

TOURISM

Tourism is both an important and potentially important benefit from protected areas in the region (figures 3 and 4). In 2014, the World Tourism Organization reported that south-eastern Europe (Albania, Bosnia-Herzegovina, Croatia, FYR Macedonia, Greece, Montenegro and Serbia) was the most buoyant area for growth in tourism in Europe (WTO, 2014). Although several protected areas in the Dinaric Arc receive high volumes of visitation, most tourist activity is focused on seasonal coastal and cultural tourism rather than year round nature-based tourism. In Croatia, for example, although the Plitvice Lakes World Heritage site has over one million visitors per year (IUCN, 2014), the vast majority of tourist bed nights (95 per cent) are in coastal areas (Demunter & Dimitrakopoulou, 2014) whereas most protected areas are inland. There is, therefore, considerable potential to develop higher value, locally beneficial, sustainable, nature-based tourism. Being

comparatively labour intensive, tourism provides multiple local employment benefits including: opportunities for women; relatively low barriers to entry (e.g. low educational requirements); and varied job opportunities, particularly important in areas with low agricultural activity (ODI, 2008). Projections for nature-based tourism suggest rapid growth for this sector. At the start of the 21st century ecotourism / nature-based tourism was growing three times faster globally than tourism as a whole (Coria & Calfucura, 2012). The PA-BAT assessment identified 42 protected areas (over 76 per cent of those assessed) which have some income from tourism and have the potential to bring in more economic gain to local people and business (figure 4). Assuming this tourism is developed in a way that supports protected area management, it could provide a major boost to protected area finances and involvement of local people in management without undermining conservation values (Spenceley et al., 2015).



Mljet National Park, Croatia © Equilibrium Research

LOCAL DEVELOPMENT

The Dinaric Arc region of Europe retains cultural traditions which encompass both landscape and livelihoods. However, as in many parts of the world, changes in global production networks and increasing urbanization are changing the character of rural areas. Nearly three-quarters of Europeans live in cities (European Environment Agency, 2014), leaving many rural areas with depleted populations and depressed economies; the cycle of declining jobs, migration, lack of demand for local services leads to many rural areas being virtually abandoned, local cultures disappearing and traditional land-use systems collapsing. It is accepted that in many areas the survival of local cultural will depend on tourism, niche manufacture and recreation as a replacement for resource extraction and agriculture as the dominant economic drivers (Moseley, 2003). All these values can, if carefully managed, be complimentary to protected area management.

In the Dinaric Arc study, the reinvigoration of traditional agriculture, including local production of medicinal herbs and honey, cultural and historical benefits and benefits specifically linked to protected area management (including nature conservation, education, knowledge building and jobs in protected areas) were all assessed as being more likely to provide increased economic gain in the future than the more 'traditional'

BOX 3: LOCAL PEOPLE'S RESPONSES TO THE PABAT EXERCISE

Miloje Blagojević, Beekeepers association, Đerdap National Park, Serbia:

"We have learned that in the same area honey is collected by a few other young honey makers who I can join so that together we can put our honey on the market."

Dragan Kovačević of the Republic Institute for Protection of Cultural-Historical and Nature Heritage, Bosnia and Herzegovina:

"For the first time, we have received data from the bottom-up, that is, from people who live in the protected areas. It is a simple tool for the assessment of resources and values of existing and proposed protected areas."

Miodrag Šikić, "Kurnatari" Association for the protection of the ownership rights and conservation of original Kornati archipelago values, Kornati National Park, Croatia:

"Kurnatari are owners of their land in the national park. After 30 years we have got the chance to say what we expect of the park and which values are important to us..."



Lonjsko Polje Nature Park, Croatia © Andrea Štefan

economic activities such as water and wood (e.g. timber harvesting and processing) which are currently providing benefits (figures 3 and 4). If achieved, such 'new' rural development could be an important tool for reversing the trend of depopulation and land abandonment (Terres et al., 2013).

A wide variety of local products come from protected areas in the region. However, there is no regional or international marketing of these products that highlights their links to conservation and local development, and there is often little coordination between producers even when they are working in the same area. During the PA-BAT workshop different producers met each other and stated that they will try to collaborate in the future.

A few examples of regional products from protected areas include the protection of rare and endangered birds in the salt-pans of Sečovlje Nature Park in Slovenia is coupled with producing top quality and traditionally gathered salt. The Croatian Lastovo Island Nature Park in Croatia has 9,000 trees of a species known locally as 'Piculja', an olive cultivar native to the country; almost all the 800 inhabitants of the island produce olive oil for their personal use and sale which, together with fishing, is the main source of income. Beekeepers from all over Serbia bring their hives to Đerdap National Park because of the clean air and linden trees, producing one-sixth of all linden honey produced in Serbia. Njeguši village in Lovćen National Park, Montenegro, produces a dry-cured ham recognized for its particular flavour and aroma resulting from the mixture of sea and mountain air and wood burned during the drying process. Over 100 drying facilities, supported by government incentives for the production of traditional products, employ many local people in and around the park. Ensuring that protected areas management plans include sustainable resource use for these important products will help build relationships with local people whilst protecting

biodiversity. National or even regional marketing can enhance both the market for local products and raise awareness about protected areas (Kremer, 2007).

Protected areas can also provide direct employment opportunities ranging from reserve management to resource-specific management (e.g. forestry operations), species protection, survey and monitoring, tourism/visitor services, retailing and cleaning operations. The PA-BAT assessments revealed that in 25 per cent of the protected areas jobs linked to conservation management were the only source of income and thus vital for the survival of local economies. The majority of these areas are in mountainous regions where no alternative employment exists; so without the opportunities presented by protected areas people would leave. Research in the UK supported the importance of conservation jobs in rural areas. In these areas one or two secure jobs can have a major impact on families and the local community; e.g. young families do not leave the area, thus supporting schools, business, local shops, etc. (Molloy et al., 2011).

COMMERCIAL WATER USE

The link between karst landscapes, water quality and economic benefit is clearly reflected in the assessment results (figure 3). There is a variety of commercial water use from protected areas in the region. Water sourced from protected areas is important for the national water supply. Two capital cities and their surrounding area, each with a population of more than a million, get their water from protected areas: Sarajevo in Bosnia and Herzegovina from Vrelo Bosne protected area and Tirana in Albania from Dajti National Park. In Croatia, Krka National Park and Papuk Nature Park supply two counties (Šibenik-Knin and Požega-Slavonia) with water, while Velebit Nature Park provides water locally and to three nearby offshore islands (Rab, Pag and Pašman).



The waterfalls at Krka National Park, Croatia which powered the first commercial HP plant in Europe (left) © Irina Zupan; bottled water from Durmitor National Park, Montenegro displaying the world heritage emblem (right) © Equilibrium Research

Hydroelectric Power (HP) is an important, well-established and often controversial source of power, often built in or close to protected areas. Krka National Park is home to the first commercial HP plant in Europe and second in the world (it began operation three days after the first plant in Canada in 1895). Although clearly an economic benefit to some sectors of society, plans to build major HP facilities in or very near protected areas throughout much of the region are likely to have serious detrimental impacts on the environment (see for example IUCN, 2012; Freyhof et al., 2015), perhaps a reason why water was not seen as having potential for further economic gain in the region by local stakeholders (figure 4). The fact that so many protected areas in the Dinaric Arc are in upland areas which include important water sources means that conflict around these issues is likely to remain for many years.

Another economic link between business and protected areas in terms of water is through the bottling of mineral water. The European bottled water market was worth over €39 billion in 2012 and market reports predict future growth of 6 per cent per year (Technavio, 2014). In some parts of Europe the benefits that ecosystems provide have for many years been recognized by

companies that depend on high-quality water; for example, the mineral water company Perrier-Vittel pays to restore forests in the catchment where it collects water in France (Johnson et al., 2002). In Croatia, more than 85 per cent of the population has access to high-quality water from the mains water supply system. Nevertheless, Croatia is ranked 12th in the world for per capita bottled water consumption partly due to high numbers of tourists during summer. Bottled water is a thousand times more expensive than tap water; and the largest producer of bottled water is one of the most profitable companies in Croatia (Zelena akcija, 2014).

Across the Dinaric Arc, however, there is little evidence that commercial enterprises consider the protection of their primary asset by supporting the management of the protected areas they rely on, despite using the perception of quality water from protected environments as part of their marketing strategy. Durmitor water, for example, sources its water from the 'Gusarevci' spring within the Durmitor National Park, Montenegro, as it notes on its website (Diva, 2017). Similarly, there are two bottling companies using water from Velebit National Park in Croatia; the natural spring water SANTA links the location with ensuring continued water quality (Santa,



Traditional woven products made by women (inset) in Una National Park, Bosnia-Herzegovina © Equilibrium Research

2017). Jazak spring water from Fruška Gora National Park, Serbia also links the quality of the water with its location in the national park (NIS, 2017) as does Qafshtama bottled water located close to two protected areas, Dajti and Qaf Shtama National Park, in Albania (Qafshtama, 2017).

Water use from protected areas in the Dinaric Arc provides a clear example of unequal distribution of benefits from the ecosystem services provided by parks and the benefits that accrue to local people. Although protected areas provide important non-economic water benefits (many water users living in protected areas do not pay for drinking water provision), the PA-BAT workshop participants identified the inequality of benefits distribution (figure 5). Only stakeholders in Shabenik Jabllanica National Park in Albania assessed economic gain from water ecosystems through locally organized irrigation associations. In contrast, Qafshtama, which has captured about 18-20 per cent of the national market for bottled water in Albania, provides limited local benefits (employment for around 20 local people and help with local road maintenance) and the local government does not receive any tax from the company as the water concession was given by central government.

Commercial uses of water from the protected areas of the Dinaric Arc Region present an important opportunity for protected areas and protected area authorities to build better relationships with the companies involved. Links could be as simple as providing better information about the protected area, its importance and management on marketing material about bottled water from the site, to cooperative agreements to share capacity and even funding to secure the water source such as Payment for Ecosystem Service (PES) schemes. Making such linkages provides a basis for building knowledge and developing projects that promote equitable and sustainable use of protected area resources.

There is an urgent need to establish these activities. At present the water bottling operations in the region are generally locally (or at least nationally) based businesses, however the global trend is for multinational food and beverage companies to acquire bottled water brands, reducing competition and local control over resources and profits, which may make cooperation between protected areas and bottled water companies harder to establish (Technavio, 2014).

DISCUSSION

One of the persistent challenges in securing protected area assets is that many of the services maintained by sustainable management or protection of ecosystems are diffuse, providing many people with benefits that are hard to measure, which although collectively are very important, are relatively small for each individual. On the other hand, unsustainable use often provides a few people with a lot of benefits, at the expense of the majority (Stolton et al., 2015). By collecting data from the majority of the protected areas in the Dinaric Arc, the results provide a region-wide picture of protected area benefits from which local, national and regional strategies can be developed. The data are being used for a wide range of applications including management planning, business planning, communication strategies, system-level policies, sector dialogues, detailed ecosystem services assessments, interpretation and education, rural development projects and to mobilize and generate funding. For each of the above-mentioned applications a guidance document has been developed to help protected areas use the results of the PA-BAT².

As noted above, the main objective of the assessment was to use the results to improve protected area management and enhance collaboration with local stakeholders. These objectives will be primarily accomplished by applying the PA-BAT results when protected area management plans and annual operational plans are developed or revised. To help facilitate this, each PA-BAT assessment is being made available on the evidence base web page (from March 2017) allowing all protected area staff easy access to the assessment results³. At the site level, the results have helped identify entrepreneurs to work with protected area staff and local/regional communities to create new sustainable initiatives which support conservation and rural development.

One of the main issues raised during the process of undertaking the PA-BAT assessment in the region is the lack of communication between the local community and protected area management. This highlighted challenges in protected area governance and has led WWF to develop recommendations for the improvement of governance, which are being presented to governments in national reports developed using the PA-BAT results (e.g. WWF, 2016). Strategic documents on sustainable use of resources (e.g. tourism, rural development) are also being developed for focused dialogue with different ministers, corporate entities (hydropower), EU delegations and the European Parliament.

Implementing the results of the PA-BAT has been aided by the assessment attracting donor agencies interested in funding projects on biodiversity and well-being, using the PA-BAT results as a baseline to develop a range of site-based projects. The analysis served as a basis for a new project, Protected Areas for Nature and People (PA4NP), to support the improvement of protected area systems in the region. Based on the PA-BAT findings, field projects in nine protected areas in Bosnia and Herzegovina, Serbia, Kosovo and Montenegro have been developed in order to present good practices and resolve conflicts. Regionally the results are informing two processes: the Dinaric Arc Big Win, a joint statement to coordinate efforts to deliver on the commitments made by countries in the region under the Convention on Biological Diversity and the establishment of the Dinaric Arc Parks Association.

CONCLUSIONS

The implementation of the PA-BAT in the Dinaric Arc resulted in a large amount of credible data sourced directly from hundreds of local people across the region. The site-based workshops proved an efficient and inexpensive process for gathering information from protected area stakeholders, often for the first time since the area was established. An expert review process ensured the data were checked for accuracy and that clean data were inputted into the database for analysis.

The results indicate that the Dinaric Arc is well placed to re-orientate rural planning and livelihoods in a way which brings rural development and biodiversity conservation together as partners working towards similar goals, rather than driving opposing strategies of intensification versus conservation.

ENDNOTES

¹ This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the IJC opinion on the Kosovo declaration of independence.

² See: croatia.panda.org/projekti/zatiena_podruja_za_prirodu_i_ljude/pa_bat_metodologija/

³ natureforpeople.org/protected_areas/

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ABOUT THE AUTHORS

Kasandra-Zorica Ivanić worked on the implementation and the analysis of the PA-BAT in eight countries of the Western Balkans. Now, as part of the WWF Adria team, she is working on gathering socio-economic benefits of protected areas and best practices in their management in the region.

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REFERENCES

- Balmford, A., Bruner, A., Cooper, P., Costanza, R., Farber, S., Green, R. E., Jenkins, M., Jefferiss, P., Jessamy, V., Madden, J., Munro, K., Myers, N., Naeem, S., Paavola, J., Rayment, M., Rosendo, S., Roughgarden, J., Trumper, K., and Turner, R. K. (2002). Economic reasons for conserving wild nature, *Science* **297**: 5583, 950–953. doi: 10.1126/science.1073947
- Coria, J. and Calfucura, E. (2012). Ecotourism and the development of indigenous communities: The good, the bad, and the ugly. *Ecological Economics* **73** (2012) 47–55. doi: 10.1016/j.ecolecon.2011.10.024
- de Groot, R.S., Wilson, M.A. and Boumans, R.M.J. (2002). A typology for the classification, description and valuation of ecosystem functions, goods and services, *Ecological Economics* **41**, 393–408. doi:10.1016/S0921-8009(02)00089-7
- Demunter, C. and Dimitrakopoulou, K. (2014). *Statistics in focus 2/2014*; Eurostat, European Commission.
- Div. (2017). *Quality is Crucial*. Savnik, Montenegro, www.vodadiva.com/quality.html (accessed February 2017).
- Dudley, N. (ed). (2008). *Guidelines for Applying Protected Area Management Categories*. Gland, Switzerland: IUCN. x + 86pp. WITH Stolton, S., Shadie, P., Dudley, N. 2013. *IUCN WCPA Best Practice Guidance on Recognising Protected Areas and Assigning Management Categories and Governance Types*, Best Practice Protected Area Guidelines Series No. 21. Gland, Switzerland: IUCN.
- Dudley, N. and Stolton, S. (2009). *The Protected Areas Benefits Assessment Tool: A methodology*. Gland, Switzerland: WWF.
- Emerton, L. (2009). *Economic valuation of protected areas: Options for Macedonia*. Skopje, FYR Macedonia: UNDP-GEF/ Ministry of Environment and Physical Planning, Republic of Macedonia.
- European Environment Agency. (2014). *Assessment of global megatrends — an update*. *Global megatrend 2: Towards a more urban world*. Copenhagen, Denmark: European Environment Agency.
- Farber, S. C., Costanza, R. and Wilson, M.A. (2002). Economic and ecological concepts for valuing ecosystem services. *Ecological Economics* **41**: 375–392. doi:10.1016/S0921-8009(02)00088-5
- Flores, M. and Ivicic, I. (2011). *Valuation of the contribution of the ecosystems of Northern Velebit National Park and Velebit Nature Park to economic growth and human wellbeing*. Croatia: WWF.
- Flores, M. and Selimi, E. (2013). *The economic contribution of ecosystems in and around Sharr Mountains National Park to the economy in Kosovo*, UNDP.
- Freyhof, J. Weiss, S. Adrović, A. Čaleta, M. Duplić, A. Hrašovec, B. Kalamujić, B.
- Marčić, Z. Milošević, D. Mrakovčić, M. Mrdak, D. Piria, M. Schwarz, U. Simonović, P.
- Šljuka, S. Tomljanović, T. and Zabrc, D. (2015). *The Huchen Hucho hucho in the Balkan region: Distribution and future impacts by hydropower development*. RiverWatch & EuroNatur.
- Glasnović, P., Krystufek, B., Sovinc, A., Bojović, B. and Porej, P. (2009). *Protected Area Gap Analysis*. Science and Research Centre of Koper, University of Primorska, Slovenia.
- IUCN. (2012). *Protecting Mavrovo National Park Macedonia (FYR)*. WCC 2012 Rec 150 EN. Gland, Switzerland: IUCN.

- Available from portals.iucn.org/docs/iucnpolicy/2012-recommendations/en/WCC-2012-Rec-150-EN%20Protecting%20Mavrovo%20National%20Park%20Macedonia%20%28FYR%29.pdf (accessed February 2016).
- IUCN. (2014). *World Heritage Outlook: Plitvice Lakes National Park*. Gland, Switzerland: IUCN. Available from http://www.worldheritageoutlook.iucn.org/search-sites/-/wdpaid/en/2016?p_p_auth=H6WB5Yju (accessed February 2016).
- Johnson, N., White, A. and Perrot-Maître, D. (2002). *Developing markets for water services from forests: Issues and lessons for innovators*. USA: Forest Trends.
- Kettunen, M. and ten Brink, P. (eds) (2013). *Social and Economic Benefits of Protected Areas: An Assessment Guide*. UK: Routledge.
- Kosovo Institute for Nature Protection. (2014). *Report on the State of Nature in Kosovo*, Kosovo.
- Kremer, M. (2007). Marketing Local Produce in the Rhön Biosphere Reserve, *UNESCO Today*, 2/2007, German Commission for UNESCO.
- MEA. (2003). *Ecosystems and Human Wellbeing: A framework for assessment, Millennium Ecosystem Assessment*. Covelo, California and New York: Island Press.
- Molloy, D., Thomas, S. and Morling, P. (2011). *RSPB Reserves and Local Economies*. Sandy, UK: RSPB.
- Moseley, M. J. (2003). *Rural development: principles and practice*. London, UK: Sage.
- NIS. (2017). *Jazak water, Belgrade, Serbia*. Available from: www.nis.eu/en/products-and-services/jazak-water (accessed February 2017).
- ODI. (2008). *The contribution of services to development and the role of trade liberalisation and regulation*, ODI Briefing Notes. UK: DFID.
- Qafshatama. (2017). Our location, www.qafshatama.com/en/texts/our-location.html (accessed February 2017).
- Reed, M.S. (2008). Stakeholder participation for environmental management: A literature review, *Biological Conservation* **141**: 2417–2431. doi:10.1016/j.biocon.2008.07.014
- Republic of Albania. (2014). *Fifth National Report to the Convention on Biological Diversity*, Ministry of Environmental and Nature Protection, Ministry of the Environment of Albania.
- Republic of Bosnia and Herzegovina. (2014). *Fifth National Report to the United Nations Convention on Biological Diversity of Bosnia and Herzegovina*. Bosnia and Herzegovina: Federal Ministry of Environment and Tourism.
- Republic of Croatia. (2014). *Fifth National Report of the Republic of Croatia to the Convention on Biological Diversity*. Croatia: Ministry of Environmental and Nature Protection.
- Republic of Kosovo. (2011). *Strategy and Action Plan for Biodiversity of Republic of Kosovo 2011 – 2020*. Kosovo: Ministry of Environment and Spatial Planning.
- Republic of Macedonia (2014). *Fifth National Report to the Convention on Biological Diversity of the Republic of Macedonia*. Ministry of Environment and Physical Planning.
- Republic of Montenegro. (2014). *The Fifth National Report to the United Nations Convention on Biological Diversity*. Montenegro: Ministry of Sustainable Development and Tourism.
- Republic of Serbia. (2014). *Fifth National Report to the Convention on Biological Diversity*. Serbia: Ministry of Environmental and Nature Protection, Ministry of Agriculture and Environmental Protection.
- Republic of Slovenia. (2015). *Fifth National Report to the Convention on Biological Diversity – Executive Summary*. Slovenia: Ministry of the Environment and Spatial Planning.
- Santa. (2017). Santa. Available from www.santa.hr/content/naslovna (accessed February 2017).
- Spenceley, A., Kohl, J., McArthur, S., Myles, P., Notarianni, M., Paleczny, D., Pickering, C. and Worboys, G. L. (2015). 'Visitor management', in G. L. Worboys, M. Lockwood, A. Kothari, S. Feary and I. Pulsford (eds) *Protected Area Governance and Management*, pp. 715–750, Canberra: ANU Press.
- Spurgeon, J., Marchesi, N., Mesic, Z. and Thomas, L. (2009). *Sustainable Financing Review for Croatia Protected Areas*. London, UK: Environmental Resources Management.
- Stolton, S. and Dudley, D. (2010). *Arguments for Protected Areas: Multiple Benefits for Conservation and Use*. London: Earthscan.
- Stolton, S., Dudley, N., Avcioglu Çokçalışkan, B., Hunter, D., Ivanić, K.-Z., Kanga, E., Kettunen, M., Kumagai, Y., Macted, N., Senior, J., Wong, M., Keenleyside, K., Mulrooney, D. and Waithaka, J. (2015). 'Values and benefits of protected areas', in G. L. Worboys, M. Lockwood, A. Kothari, S. Feary and I. Pulsford (eds) *Protected Area Governance and Management*, pp. 145–168, Canberra, Australia: ANU Press.
- Technavio. (2014). *Global Bottled Water Market 2014-2018*. Portland, USA: Infiniti Research Limited.
- Terres, J.M., Nisini, L. and Anguiano, E. (2013). *Assessing the risk of farmland abandonment in the EU*. Ispra, Italy: European Commission, Joint Research Centre, Institute for Environment and Sustainability.
- UNDP. (2011). *The economic value of protected areas in Montenegro*. Podgorica, Montenegro: UNDP, GEF and ISSP.
- UNDP-GEF. (2015). *Economic valuation of ecosystem services of special nature reserve "Koviljsko-Petrovaradinski rit"*. Novi Sad, Serbia: UNDP-GEF-Institution for nature conservation of Vojvodina province.
- UNEP. (2016). *Economic Transferability Study from Plitvice Lakes in Croatia to Una National Park in Bosnia and Hercegovina*. Sarajevo, Bosnia and Herzegovina: UNEP.
- Veni, G., DuChene, H., Crawford, N.C., Groves, C.G., Huppert, G.N., Kastning, E.H., Olson, R. and Wheeler, B.J. (2001). *Living with Karst: A Fragile Foundation*. Alexandria, VA, USA: American Geological Institute.
- World Tourism Organization. (2014). *Working Together in Europe – A Shared Leadership*. Madrid, Spain: UNWTO.
- WWF. (2011). *Ecosystem Services Evaluation in the Škocjan Caves Regional Park*. Rome, Italy: WWF.
- WWF. (2016). Protected Area Benefit Assessment Tool (PA-BAT) Bosnia and Herzegovina. Adria, Zagreb, Croatia: WWF. awsassets.panda.org/downloads/bih_bat_report_2016_eng_web__3_.pdf
- Zelena akcija. (2014). *Naša voda, Analiza upravljanja vodnim uslugama u Hrvatskoj*. Zagreb

RESUMEN

Los beneficios económicos y no económicos de las áreas protegidas fueron evaluados en 58 parques nacionales del arco dinárico de Europa, con la participación de más de mil personas locales, y se identificaron importantes beneficios económicos derivados del turismo, el desarrollo rural y el agua. El estudio utilizó la “Herramienta de evaluación de beneficios en áreas protegidas” en talleres para los interesados directos de todos los parques estudiados. Los resultados se están aplicando para mejorar la gestión en las áreas protegidas y aumentar la colaboración con los actores locales. El arco dinárico incluye partes de ocho países del sudeste de Europa. Si bien es una de las áreas más importantes del continente para la conservación de la biodiversidad, se encuentra sometida a las intensas presiones del desarrollo y muchas de las áreas protegidas de la región están subfinanciadas e infravaloradas. La comprensión acerca de la amplia gama de valores y beneficios de las áreas protegidas para las partes interesadas ofrece una buena base para desarrollar respuestas a nivel de gestión y políticas y ha tenido buena acogida entre los gobiernos y las organizaciones donantes. Los resultados sugieren que las áreas protegidas ya proveen beneficios económicos significativos a la población local de la región, a menudo en lugares con pocas opciones, y que es posible un mayor aprovechamiento de muchos servicios ecosistémicos sin socavar los objetivos y la eficacia de las áreas protegidas.

RÉSUMÉ

Une évaluation des avantages économiques et non-économiques des aires protégées a été effectuée dans 58 parcs nationaux de l'Arc Dinarique d'Europe, en coopération avec plus de mille représentants des communautés locales, et a permis d'identifier les principaux avantages économiques du tourisme, du développement rural et de l'eau. Des groupes de travail ont été rassemblés dans chacun des parcs étudiés, et se sont servis de l'Outil d'évaluation des Prestations dans les aires protégées (PA-BAT) dans le but d'améliorer la gestion et d'encourager la collaboration. L'Arc Dinarique s'étend sur huit pays en Europe du sud-est. Bien que ce soit l'un des plus importants domaines de conservation de la biodiversité du continent, la région est soumise à de fortes pressions liées aux développements économiques et de nombreuses aires protégées sont sous-financées et sous-évaluées. La sensibilisation des parties-prenantes locales aux multiples avantages des aires protégées constitue une base solide pour élaborer des solutions d'administration concrètes, ce qui s'avère être une stratégie populaire auprès des gouvernements et des mécènes. Les résultats suggèrent que les aires protégées fournissent déjà d'importantes retombées économiques à la population locale, souvent dans des endroits où il n'existe que peu d'autres options, et qu'il est possible d'utiliser davantage de services écosystémiques sans compromettre les objectifs et l'efficacité des aires protégées.