

PARKS

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Developing capacity for a protected planet

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Editing and layout by: Sue Stolton and Nigel Dudley, www.equilibriumresearch.com

Produced by: Sue Stolton and Nigel Dudley, www.equilibriumresearch.com

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Global Programme on Protected Areas
Rue Mauverney 28
1196 Gland
Switzerland
Tel +41 22 999 0000
Fax +41 22 999 0002
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IUCN PROTECTED AREA DEFINITION, MANAGEMENT CATEGORIES AND GOVERNANCE TYPES

IUCN DEFINES A PROTECTED AREA AS:

A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.

The definition is expanded by six management categories (one with a sub-division), summarized below.

Ia Strict nature reserve: Strictly protected for biodiversity and also possibly geological/ geomorphological features, where human visitation, use and impacts are controlled and limited to ensure protection of the conservation values.

Ib Wilderness area: Usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, protected and managed to preserve their natural condition.

II National park: Large natural or near-natural areas protecting large-scale ecological processes with characteristic species and ecosystems, which also have environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.

III Natural monument or feature: Areas set aside to protect a specific natural monument, which can be a landform, sea mount, marine cavern, geological feature such as a cave, or a living feature such as an ancient grove.

IV Habitat/species management area: Areas to protect particular species or habitats, where management reflects this priority. Many will need regular, active interventions to meet the needs of particular species or habitats, but this is not a requirement of the category.

V Protected landscape or seascape: Where the interaction of people and nature over time has produced a distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.

VI Protected areas with sustainable use of natural resources: Areas which conserve ecosystems, together with associated cultural values and traditional natural resource management systems. Generally large, mainly in a natural condition, with a proportion under sustainable natural resource management and where low-level non-industrial natural resource use compatible with nature conservation is seen as one of the main aims.

The category should be based around the primary management objective(s), which should apply to at least three-quarters of the protected area – the 75 per cent rule.

The management categories are applied with a typology of governance types – a description of who holds authority and responsibility for the protected area.

IUCN defines four governance types.

Governance by government: Federal or national ministry/ agency in charge; sub-national ministry/agency in charge; government-delegated management (e.g. to NGO)

Shared governance: Collaborative management (various degrees of influence); joint management (pluralist management board; transboundary management (various levels across international borders)

Private governance: By individual owner; by non-profit organisations (NGOs, universities, cooperatives); by for-profit organisations (individuals or corporate)

Governance by indigenous peoples and local communities: Indigenous peoples' conserved areas and territories; community conserved areas – declared and run by local communities

For more information on the IUCN definition, categories and governance type see the 2008 *Guidelines for applying protected area management categories* which can be downloaded at: www.iucn.org/pa_categories

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IUCN-WCPA's Best Practice Protected Area Guidelines are the world's authoritative resource for protected area managers. Involving collaboration among specialist practitioners dedicated to supporting better implementation in the field, they distil learning and advice drawn from across IUCN. Applied in the field, they are building institutional and individual capacity to manage protected area systems effectively, equitably and sustainably, and to cope with the myriad of challenges faced in practice. They also assist national governments, protected area agencies, nongovernmental organisations, communities and private sector partners to meet their commitments and goals, and especially the Convention on Biological Diversity's Programme of Work on Protected Areas.

A full set of guidelines is available at: www.iucn.org/pa_guidelines

Complementary resources are available at: www.cbd.int/protected/tools/



PARKS: THE INTERNATIONAL JOURNAL OF PROTECTED AREAS AND CONSERVATION

Edited by Sue Stolton and Nigel Dudley, Equilibrium Research and IUCN
WCPA

sue@equilibriumresearch.com, nigel@equilibriumresearch.com
Rock House, Derwenlas, Machynlleth, Powys, SY20 8TN, Wales

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PARKS is published to strengthen international collaboration in protected area development and management by:

- exchanging information on practical management issues, especially learning from case studies of applied ideas;
- serving as a global forum for discussing new and emerging issues that relate to protected areas;
- promoting understanding of the values and benefits derived from protected areas to communities, visitors, business etc;
- ensuring that protected areas fulfill their primary role in nature conservation while addressing critical issues such as ecologically sustainable development, social justice and climate change adaptation and mitigation;
- changing and improving protected area support and behaviour through use of information provided in the journal; and
- promoting IUCN's work on protected areas.

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EDITORIAL: PROTECTED AREAS AS NATURAL SOLUTIONS TO CLIMATE CHANGE

Julia Miranda Londono^{1,*}, Francisco Jose Prieto Albuja², Pedro Gamboa³, Julia Gorricho⁴, Analiz Vergara⁵, Leigh Welling⁶, Carina Wyborn⁷ and Nigel Dudley^{8,9}

* Corresponding Author: jmiranda@parquesnacionales.gov.co

¹ Parques Nacionales, Colombia

² Ministerio del Ambiente, Ecuador

³ Servicio Nacional de Áreas Naturales Protegidas, Perú

⁴ WWF Living Amazon Initiative

⁵ WWF Living Amazon Initiative

⁶ World Commission on Protected Areas, Switzerland

⁷ Luc Hoffmann Institute, Switzerland

⁸ Equilibrium Research, UK

⁹ University of Queensland, Australia

Over the past decade, climate change has developed from being the minor concern of a few protected area specialists to a headline issue influencing decision making across entire protected area agencies and networks. As an example, at the fifth World Parks Congress at Durban in 2003 there was a single workshop discussing management under climate change (Hansen et al., 2003), while by the time of the sixth Congress in Sydney in late 2014 an entire stream was devoted to the issue, with dozens of presentations and hundreds of people involved. The ‘Promise of Sydney’ that emerged from the Congress includes a recognition of the need to: ‘INVEST... in nature’s solutions, supported by public policy, incentives, tools and safeguards that help to halt biodiversity loss, mitigate and respond to climate change’ (IUCN, 2014).

Anyone concerned with protected areas is likely to feel pulled in different directions when dealing with the issue of climate change. On the one hand it poses a potentially vast and complex challenge that questions the view of protected areas as static entities, maintained in perpetuity to preserve biodiversity and ecosystem services (e.g., Dunlop & Brown, 2008). A great deal of time and effort has been put into modelling likely impacts in this regard (e.g., Hannah et al., 2007; Kharouba & Kerr, 2010), and to identify the best options for what has become known as ‘climate smart’ approaches (Stein et al., 2014) to the protection of habitats and ecosystems against the additional pressures from climate change (McLeod et al., 2009; Gross et al., forthcoming). We now see that climate change is not just a concern for alpine or coastal protected areas or iconic



Signature of REDPARQUES Declaration, 13 August 2015, Lima, Perú © SERNANP, Perú



Salto Augusto Falls, Amazon, Brazil © Adriano Gambarini/ WWF Living Amazon Initiative / WWF-Brazil

species; protected areas the world over face the prospect of significant change (IPCC, 2014; Juffe-Bignoli et al., 2014). We must respond by developing climate smart strategies that maintain the diverse values that society holds for protected areas (Hopkins et al. 2015; Dunlop et al. 2013; Stein et al. 2014). But the truth is that we will only know for sure what is happening once it occurs. Protected area managers are learning – or more accurately will have to start learning – to manage for change.

Conversely, it has gradually been recognized that protected areas themselves have an active role in climate change response, in that they contain some of the elements that we need to both mitigate and adapt to

rapid climate change (Dudley et al., 2009). Protected areas provide one of the best mechanisms for maintaining natural vegetation, in keeping the soil underneath in good condition, and thus, protecting carbon locked up in vegetation, humus and peat (MacKinnon et al., 2012). A conservative estimate is that 15 per cent of the world's carbon is already maintained within the protected area system (Campbell et al., 2008), which includes state-run protected areas, many indigenous protected areas and also privately protected areas. At the same time, healthy ecosystem services are one of the prerequisites for humanity to adapt to life under a changing and uncertain climate future, for food and water security, disaster risk reduction and for the genetic material needed to help further crop adaptation,

new medicines and other products. In heavily modified areas, protected areas are some of the few remaining, or even the only remaining, natural habitats to supply these needs. Protected areas are also important in building the resilience of biomes that underpin global climate stability and support livelihoods in a climate change context, such as the Amazon.

Individual protected area managers, and in some cases national protected area agencies, are starting to recognize these values. Canada was an early starter, with an economic evaluation of potential carbon sequestration in its national parks system at the turn of the century (Kulshreshtha et al., 2000). In the context of creating a new national park structure to address management of multiple categories of protected areas for public welfare outcomes, the Peoples' Republic of China is considering the carbon sequestration benefits of protected areas (Yi et al., 2014). Institutions such as The World Bank (World Bank, 2009) and Convention on Biological Diversity (Janishevski & Gidda, undated) have started to recognize the potential mitigation benefits of protected areas.

This movement took a decisive step forward in August 2015, when 18 Latin American countries signed the *Declaration on Protected Areas and Climate Change* during the Council meeting of REDPARQUES, the Latin American Technical Cooperation Network on Protected Areas. The declaration highlighted the role of protected areas in climate change mitigation and adaptation and proposed integrating protected areas in climate planning and financing strategies. The call was repeated on a global stage at the 21st Conference of Parties of the UN Framework Convention on Climate Change (UNFCCC) in Paris in December 2015 (where the agreement to strengthen the global response to the threat of climate change was approved by 196 countries and will enter into after ratification by at least 55 countries that account for 55 per cent global emissions).

Key elements of the *Declaration on Protected Areas and Climate Change* are commitments to:

- Promote recognition of national protected areas systems as one the most effective strategies to avoid deforestation and ecosystem degradation and therefore contribute to the stabilization of greenhouse gases concentration in the atmosphere;
- Strengthen protected areas in the actions of the United Nations Framework Convention on Climate Change;
- Include national protected areas systems in the national adaptation strategies, including in the

National Adaptation Programs of Action (NAPAs) and National Adaptation Plans (NAPs), and other programmatic documents;

- Promote national recognition of the role of protected areas as mitigation strategies to absorb, store and reduce greenhouse gas emissions, as well as their benefits beyond carbon capture;
- Monitor and report on the contribution of protected areas and other effective conservation measures for climate change adaptation and mitigation;
- Promote participatory management of biodiversity and working with local communities, indigenous peoples and traditional populations.

In Paris, Latin American countries organized a series of events on the role of protected areas as nature-based solutions for mitigating and adapting to climate change; for the first time, protected areas were fully a part of a worldwide debate about addressing climate change. By creating a common platform, the RedParques declaration has also helped to further integrate the protected area agencies of the 18 countries involved and the initiative should also strengthen and influence other protected area agencies around the world.

This initiative leaves WCPA with a clear mandate for moving forward. Two tasks lie ahead. First, the initiative taken by Latin American countries, through their protected area agencies, needs to be spread much further, initially through other national and regional commitments and then simultaneously by working together collaboratively to ensure that the fine words are put into action. There is a long history of cross-border cooperation between protected area agencies, often continuing during periods of international tension or even conflict. Climate change is a global problem that requires local, national and regional collaborative efforts to address impacts that cross sectors, land tenures and national boundaries. The Protected Areas and Climate Change declaration provides an ideal framework for collective action. By highlighting the strong scientific evidence for the role of protected areas in addressing climate change, it should also encourage the protected areas community to work more closely with the UNFCCC in the future.

Secondly, WCPA and its partners need to build up a body of expertise to help protected area agencies, managers and staff to address these lofty goals. A first step in this direction was the creation of a Protected Areas Climate Change Specialist Group following the sixth World Parks Congress in Sydney. While further work is required to



Native trees nurseries are important for conservation of endangered species and for the restoration of degraded areas. Alto Quindío, Central Andes, Colombia © Diego M. Garces / WWF

model local impacts, we must not let the search for ever more precise information hold up action. We know enough about the broad trajectories of climate change to develop adaptation strategies, and should direct our attention towards identifying and then addressing the barriers to adaptation. A growing portfolio of experience gained by practitioners working on the ground can be harvested to document lessons learned and develop clear advice for future work (e.g., Gross et al., forthcoming). Initiatives like the IUCN PANORAMA programme, which is collecting case studies of successful use of protected areas in delivering benefits, can help provide an emerging library of experience. One critical step is for protected area agencies to interact closely with climate change agencies and thus contribute to climate policy-making processes at the national level.

But addressing climate change also involves learning and building capacity about the more subtle and intrinsic aspects of adaptation. It means changing the perceptions and expectations of protected area staff so that they have time to think about climate change alongside the myriad other daily challenges of managing their sites. This is not just a set of practical skills, but also means learning to live with and make decisions in the context of uncertainty and in many cases making trade-offs

between a range of different possibilities and management priorities. Protected area management needs to move beyond simply reacting to immediate threats and start comprehending and planning for long-term changes. This will require managers to take steps now in current policy and planning that are targeted at addressing the implications of changes that will take effect long into the future. This involves building capacity to accept and manage within the reality of rapid environmental change, where ecosystems may change and cherished components move away and disappear, to be replaced by incomers, new ecological interactions and perhaps the emergence of novel ecosystems (Hobbs et al., 2009).

In other words, responses must be on many different levels: acceptance at a global level, interaction at national levels between countries, at the level of park management and much more fundamentally within the heads of individuals managing, involved in and even just visiting individual protected areas. There are also different levels of influence and action from governments and civil society that need to complement one another, working with decision-makers to undertake multidisciplinary research that is connected to policy and practice while drawing on the best available scientific, local and traditional knowledge and across sectors – no

good comes from single sector policies; climate, energy, transport, food and health sectors need to have a more homogeneous scientific basis. WCPA has an exceptional role to facilitate *examples of practice* so governments can better lead positions in regional and global fora, and ultimately be able to make legal and institutional changes.

Other knowledge-based systems (i.e. traditional knowledge of indigenous peoples and local communities) are growing in potential to do this as the Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services (IPBES) is helping governments to build the bridge, but there is still a lot of work to do.

Adaptive management and governance have been discussed in theory, yet we still struggle to implement them in practice (Wyborn, 2015). Now, more than ever, protected area management must draw on the best available knowledge of social and ecological values to support inclusive decision making that anticipates, learns from and responds to change, helping reinforce protected areas systems themselves in an attempt to build larger social-ecological resilience (Berkes & Folke, 1998 Berkes et al., 2003). Protected areas need to be integrated into countries' strategies for a transition to climate resilient and low carbon development, as a stage in the implementation of the Paris agreement. The potential is high, but the risks of failure are also great. This stream of work will be a central facet of WCPA's mission for many years to come.

ABOUT THE AUTHORS

Julia Miranda Londono is a lawyer and director of Parques Nacionales, the protected area agency in Colombia, and deputy chair of the IUCN World Commission on Protected Areas.

Francisco Jose Prieto Albuja is the National Biodiversity Director and Head of the National Protected Areas System at the Ministry of Environment of Ecuador.

Pedro Gamboa is Head of the National Service of Natural Protected Areas of Peru (SERNANP) and Coordinator of the Latin American Technical Cooperation Network on Protected Areas (REDPARQUES).

Julia Gorricho is a Colombian national and is Amazon Conservation Vision coordinator for WWF's Living Amazon Initiative

Analiz Vergara, Ecuadorian, works on climate change and protected areas policies at WWF's Living Amazon Initiative, including involvement in the development of the REDPARQUES Declaration.

Leigh Welling is the Alaska Regional Chief Scientist for the US National Park Service and is co-chair of the IUCN WCPA Climate Specialist Group.

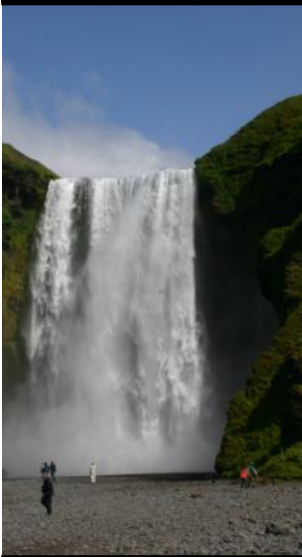
Carina Wyborn is Australian and works as a lead researcher at the Luc Hoffmann Institute, affiliated to WWF based in Gland, Switzerland.

Nigel Dudley is from the UK and is chair of the IUCN WCPA Natural Solutions specialist group and a consultant.

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DEVELOPING ICELAND'S PROTECTED AREAS: TAKING STOCK AND LOOKING AHEAD

Jon Geir Petursson^{1,2*}, Gudridur Thorvardardottir¹ and Roger Crofts³

* Corresponding author: jon.geir.petursson@uar.is; jgp@hi.is

¹ Ministry for the Environment and Natural Resources. Skuggasund 1, 150 Reykjavik, Iceland

² University of Iceland, Environment and Natural Resources. Sæmundargata 1, 101 Reykjavik, Iceland

³ WCPA Emeritus and WCPA Regional Vice-Chair Europe 2000-08, Edinburgh, Scotland

ABSTRACT

With about 20 per cent of Iceland's land area protected under formal mechanisms, this paper outlines the current position and discusses some factors in the transition from traditional to current approaches. It reviews elements of the development of Iceland's protected areas over recent decades, specifically large-scale, landscape connectivity approaches, innovative governance structures to engage local stakeholders, and new mechanisms of conflict resolution between protection and development. Some important challenges for the future are identified, comprising the need for a systematic review of nature as a basis for developing the protected areas network, dealing with increasing visitor numbers, developing new mechanisms for financing protected areas and improving inter-organizational collaboration in the management and governance of protected areas.

Key words: Iceland, protected areas, co-management, conflict resolution, connectivity.

ICELAND'S PROTECTED AREA ESTATE

Iceland is a 103,000 km² volcanic island located in the North Atlantic Ocean. It is endowed with a spectacular range of natural assets and unique geophysical features related to its location on the Mid-Atlantic Ridge where the Eurasian and the North American tectonic plates divide. Its population density is the lowest of any country in Europe, but is highly urbanized, with around 2/3 of its 330,000 inhabitants living in the Reykjavik capital area. Iceland's economy is largely natural resources based, with around 80 per cent of export income from three main natural resource based sectors: fishing, energy and export-related heavy industries, and nature-based tourism.

With around 20 per cent of the terrestrial land area formally protected in 113 individual units, Iceland has one of the highest areal coverages of land under formal protection of any OECD country (OECD, 2014) (Figure 1). The protected area estate has been gradually evolving since the designation of the first area, Þingvellir¹ National Park in 1930. The protected areas are widely distributed, with a relatively higher proportion in the uninhabited central highlands and in the south west (Figure 2).

Iceland has two main pathways to formally establish protected areas. Firstly, and most commonly, protected areas are designated according to the Nature Conservation Act. The original act of 1956 has been repeatedly updated and a major revision was recently passed by the parliament and entered into force in November 2015². The former Act allowed for five different categories of protected areas, in addition to the protection of individual species: national parks, nature reserves, natural monuments, country parks and habitat protection areas. The Government's Environment Agency (I: *Umhverfisstofnun*) carries out the preparation for declaring an area protected, drafts the terms of protection and defines the site boundaries. This is followed by a period of consultation with landowners, local authorities, and other relevant interested parties. Once the parties have agreed to the terms, the proposal is submitted to the Minister for the Environment and Natural Resources. Protection comes into force on the Minister's confirmation and then is advertised in the Legal Gazette.

Secondly, some protected areas have been established under site-specific legislation. This approach is rarely used, but significantly includes some of the larger areas

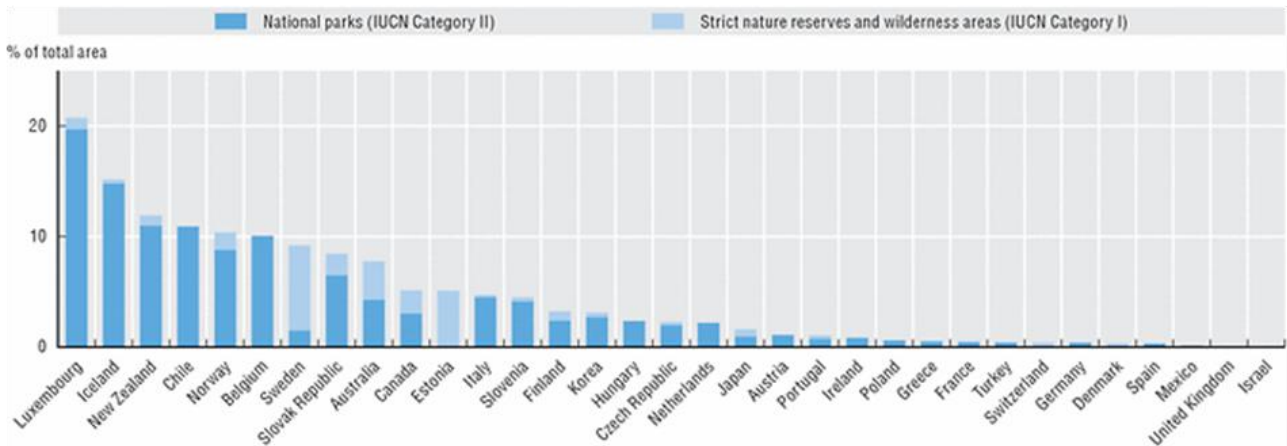


Figure 1. Strict protected areas (IUCN category I and II) coverage in different OECD countries. Source: OECD, 2014

Land area	103,000 km ²
Population	330,000
Demographic	About 2/3 live in the capital area
Land area under formal protected area regime	Around 20,000 km ² or ca. 20% of the terrestrial area
Number of protected areas	113 units
National Parks (3)	Þingvellir National Park Vatnajökull National Park Snæfellsjökull National Park
Ramsar Sites (6)	Mývatn-Laxá – site-specific legislation Þjórsárver – nature reserve Grunnafjörður – nature reserve Guðlaugstungur – nature reserve Snæfell and Eyjabakkar – wetland within Vatnajökull National Park Andakill – habitat protection area
World Heritage Sites (2)	Surtsey Nature Reserve Þingvellir National Park

Table 1. Some key facts about Iceland and its protected areas

like Þingvellir National Park, Vatnajökull National Park, Mývatn-Laxá Nature Conservation Area and Breiðafjörður Conservation Area. This usually allows for a more tailor-made approach to governance of the respective area. In addition, some of the Icelandic protected areas have international recognition; there are six wetland areas designated as Ramsar Sites and two areas protected as World Heritage Sites (Table 1).

In addition to formal protection, there are also other statutory and non-statutory types of land-based protection. These relate specifically to implementation of national policy to halt vegetation loss, forest and land degradation and promote soil conservation, through a combination of sand stabilization, soil conservation, afforestation, forest protection and ecological restoration (Blöndal and Gunnarsson, 1999; Crofts, 2011). Further, there are areas subject to softer conservation mechanisms according to the Nature Conservation Act, rather than formal protected areas, Special protection (I: *Sérstök vernd*) and Nature Conservation Register (I: *Náttúruminjaskrá*). Finally, there is other land owned by national or local government or privately which is often

set aside for recreation or water protection, and areas held under site-specific local municipal spatial planning protection (I: *Hverfisvernd*), that might qualify as protected areas. These other areas have, however, not yet been tested for conformity with the IUCN definition of a protected area (Dudley, 2008). These are not the subject of this paper, but are important tools in the nation’s conservation and restoration effort.

SITE PROTECTION IN TRANSITION

In recent decades, many factors have contributed to a transition in the approach to protected area management and governance in Iceland. This partly resembles similar evolution in many other countries and has certainly influenced the Icelandic debate (e.g. Child, 2014; Dudley et al., 2014; Watson et al., 2014). A number of key societal factors have contributed to this transition and have been, both directly and indirectly, influential in determining the current approaches and responses in protected area policy and practice.

The interest in protected areas in Iceland was for a long time vague, and most decision and policy makers

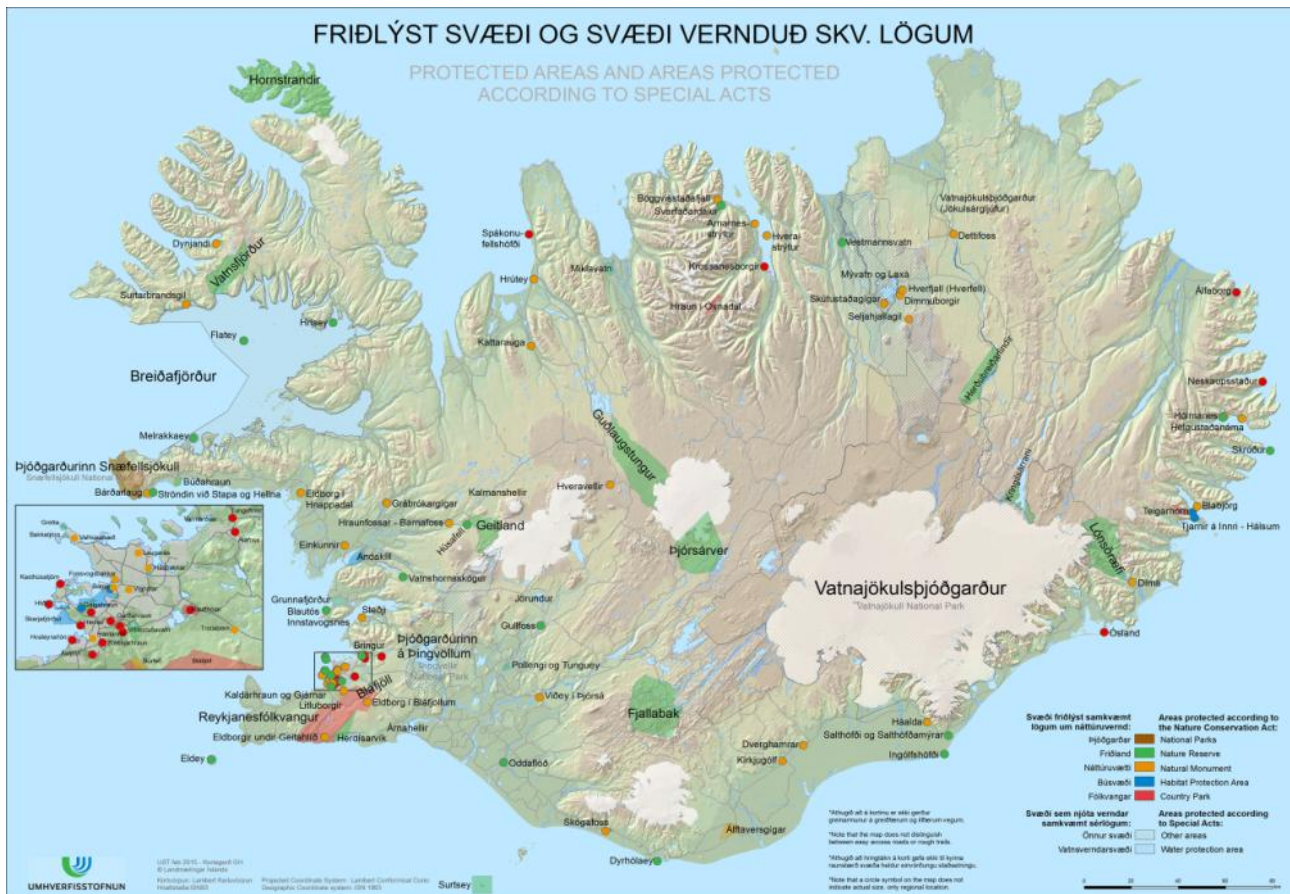


Figure 2. Protected areas in Iceland. Source: Environmental Agency

generally regarded them as ‘economic black holes’ (Child, 2014), hence unproductive areas in the otherwise productive landscapes, and the rationale behind their existence was mainly defined by conservationists and philanthropists. The first protected area, the 50 km² Þingvellir National Park, was established in 1930 when the founding legislation passed in 1928 came into force. By 1970, the number had only increased to seven formally protected areas covering some 555 km². However, by 1996 the number of protected areas had increased to ca. 80 units and their area to 9,807 km² (Statistics Iceland). This was largely the result of the implementation of the revised Nature Conservation Act of 1971 which put much more emphasis – and gave conservation actors more leverage – on the establishment of protected areas. This legislation also led to increased funding, the establishment of a permanent conservation office, implementation of an effective structure of a Nature Conservation Council, and recruitment of conservation staff who became instrumental in advancing site-based conservation.

The nature conservation debate in Iceland in recent decades has centred largely on the interplay with site-based energy development proposals, mainly hydro-electricity for heavy industry, which has become a major element in the diversification of the Icelandic economy

from a very high dependence on the export of sea fish. There has been a sequence of cases that have caused major societal debate and conflicts. Three cases illustrate these conflicts. On the river Laxá í Aðaldalur, in north Iceland, a group of local people used dynamite to blow away a dam in 1970 built to convert Lake Mývatn partly into a reservoir. This resulted in the protection of Lake Mývatn and the river Laxá by special legislation in 1974. This case is regarded as a major trigger for the development of the nature conservation movement in Iceland (Karlsdóttir, 2010). The second case is in the central highlands, Þjórsárver (an extensive wetland ecosystem) where step-wise hydro-electricity development on the river Þjórsá was predicted to cause irrevocable damage to the ecosystems and the wilderness quality of the area (Crofts, 2004). Part of the Þjórsárver wetland area was protected as a nature reserve, under the 1981 Nature Conservation Act, but extensions to fully protect the ecosystem are still being discussed. The third case was the heavily debated construction of the Kárahnjúkar hydropower plant in the heart of the wilderness area north-east of the Vatnajökull ice cap in east Iceland (Karlsdóttir, 2010). The cumulative effect of these cases contributed to a widespread call for improved decision making on energy development and greater integration with nature conservation (Thorhallsdóttir, 2007a; 2007b; Björnsson et al., 2012).



Figure 3. Annual number of foreign visitors to Iceland from 1949-2014, arriving by air and ship.
Source: Icelandic Tourist Board.

Another dimension of the transition relates to competing land use strategies. Sheep grazing was the dominant land use in the Icelandic highlands with legal privileges, based on 1,000 year-old institutional structures, and a long cultural tradition (Eggertsson, 1992). The sheep stock expanded to around 1 million winterfed ewes in the 1970s with a very substantial ecological impact, but was reduced by half following major agricultural reforms after 1980 mainly because of overproduction of lamb (Crofts, 2011). Although many protected areas allow sustainable sheep grazing, the diminishing sheep stock not only reduced pressure on the land but also reduced competition over land and opened up alternative land use strategies and the opportunity for major ecological restoration programmes (Crofts, 2011). At the same time, land availability has changed due to a rural exodus to urban areas, so that around 95 per cent of the population lives in urban settings.

Another important factor of the recent transition in site protection relates to property rights in the central highlands. Property rights to most land in that area have not been clear. Historically, the central highlands have traditionally been used primarily as summer pastures for sheep on a common shared basis within communities. It was unclear if the farmers had only a *usufruct* right to graze the summer pastures (i.e. no ownership title) or if their rights entailed real ownership of the land. This uncertain tenure created multiple conflicts over rights and responsibilities, encompassing about half of Iceland. In order to settle this and clarify property rights to those lands, new legislation entered into force in 1998 placing a duty on the Committee of the Interior (I: *Óbyggðanefnd*) to establish a legal land reform process to resolve land ownership disputes in the highlands. This is an ongoing process, but has to date addressed and resolved the ownership of around three-quarters of the highlands with a substantial area declared as 'public land' (I: *þjóðlenda*), meaning that the state is the owner but

governance is subject to collaboration with local government and with the farmers maintaining some *usufruct* rights, especially to sheep grazing in the traditional highland pasture areas assigned to their community. The land reform process has been subject to major debates, but the outcome has been clarification of the tenure rights and responsibilities, and as a result, has removed a constraint from the designation of new protected areas.

One of the most recent factors impacting on protected areas transitions in Iceland is the very rapidly growing numbers of tourists, specifically nature-based tourism (Saethorsdottir, 2013). The number of tourists in 2015 was about four times the Icelandic population: around 1.2 million (Figure 3). Icelandic nature, in its many and various guises, is the key magnet, with more than 80 per cent of visitors claiming that nature is the key reason for visiting the country.

Calculated by export income, tourism is now the single biggest economic sector, exceeding the long domination of the fisheries sector. This has a significant effect on protected areas as their previous management had only a marginal economic dimension. Protected areas in Iceland are no longer regarded as the 'economic black holes' in the landscape, but as a major natural resource base for tourism, and currently a key driver of the Icelandic economy. This has the effect of bringing more attention and resources to their governance, while simultaneously the impact and scale of tourism poses a great challenge to the integrity, values and quality of the protected areas.

NEW APPROACHES IN PROTECTED AREA POLICY AND PRACTICE

It is not only in Iceland that management and governance of protected areas have been in transition; it is a world-wide trend (Child, 2014), as demonstrated in



Mývatn Conservation Area the mecca for all types of ducks and crossing ground between North American and European species and important Atlantic salmon rivers. Diatomite extraction has now ceased improving the feeding grounds for the birds. Gas eruption pseudo-craters surround the lake © Jóhann Óli Hilmarsson

the recent outcomes from the 6th IUCN World Parks Congress in Sydney in 2014. Iceland has not been immune to changes in protected area policies and practice and there are some aspects where Iceland can provide informative cases that may contribute to the relevant global policy and practice debates. We highlight three particular approaches: landscape connectivity and large-scale protected areas, the diversity of governance models, and mechanisms to resolve conflicts between development and conservation.

- **Landscape connectivity and large-scale protected areas**

The biggest protected area development in Iceland was the establishment of Vatnajökull National Park in 2007 from a series of unconnected protected areas and unprotected land. The park encompasses the entire Vatnajökull ice cap, outlet glaciers, nunataks, some recently and historically deglaciated areas adjacent to the glacier and many of its surrounding landscapes. It includes the former national parks in Skaftafell, established in 1967, and Jökulsárgljúfur, established in 1973, as well as the natural monument Lakagígar, established in 1975. To achieve the creation of the larger and connected protected area required a long process, with significant work by many pioneers, that formally began in 1999 with a parliamentary resolution on its establishment (Gunnarsson, 2010; Guttormsson, 2011) and instigating a formal process of consultation with all interests, especially local communities with traditional rights, and concluding with specific legislation in 2007 creating the park.

Since its establishment, the national park has gradually been expanded to its current size of approximately 14,000 km²; this constitutes around 14 per cent of Iceland's total land area. There are ongoing consultations on further extensions to the park. It is the second largest national park in Europe, slightly smaller than the Yugyd Va National Park in European Russia. The establishment of Vatnajökull National Park was a continuation of the major national environmental movement that began in the 1990s to conserve the Icelandic highlands as one of Europe's largest wilderness areas. This was further promoted as a strategy to achieve a landscape-scale approach in protected area management, moving from disconnected and small units to larger interconnected units. Four objectives of the park have been defined: to protect nature, to allow public access and enjoyment, to provide an educational and research resource, and to strengthen communities and stimulate business activity. The park is further seen as a vehicle to promote rural development, as manifested in its objectives, especially nature-based tourism.

- **Innovative governance structures**

Iceland has been pursuing alternative governance structures for protected areas, seeking more local legitimacy and acceptance by the neighbouring communities and local governments. For example, the innovative governance structure of the Vatnajökull National Park is quite different from its more centrally governed predecessors. The park has formal status as an independent governmental authority directly reporting to the Ministry for the Environment and Natural



Kerlingarfjöll rhyolite mountains and small hanging glaciers, currently being considered for protection © Roger Crofts

Resources and was established by special legislation enacted in 2008. The park has a co-management governance system giving local government and civil society a formal role in its governance, decision making and executive action alongside the state. The park is divided into four administrative regions, representing different geographical areas, each with its own regional committee with representatives of local governments, environmental, recreational and tourism organizations and a national park manager, with joint responsibility for the management of the respective units. The park as a whole is governed by a park board, comprising a chairman and vice chair appointed by the minister, representatives from the four regions appointed by the local government authorities adjacent to the park, and representatives of environmental organizations. Funding is provided mainly from central government, supplemented by income generated by the park itself. The co-management regime has been subject to a thorough review after its first five years of operation. The preliminary results indicate that the regime is perceived as legitimate, has generally been effective and the local actors accountable for the power that has been devolved from central to local level (Petursson & Kristofersson, 2014). It is clear that the decentralized co-management model was one of the key factors in local government and local stakeholders accepting the establishment of such a large protected area. Even though the protected area in uninhabited, the local communities and local government authorities have historical rights and current responsibilities respectively for the land and its management, and without their support the enlarged park would not have been possible.

It is important to continue the development of the co-management approach in Iceland, both in the Vatnajökull National Park and in other areas. It is becoming a widespread practice that the best structure for effective protected areas comprises a combination of top-down and bottom-up approaches; engagement of key stakeholders at all stages in the process of identification, designation and management; and recognition of the different levels of authority in devolved systems of administration of nature protection (Phillips, 2003; Lockwood et al., 2006). The experience from Iceland concurs with this approach.

- **Mechanisms to resolve conflicts between development and conservation**

The third approach is an innovative mechanism to resolve conflicts between nature conservation and natural resource utilization for energy development that have, as outlined earlier, caused heated debate in Iceland for decades. The key instrument is the Master Plan for Conservation of Nature and Utilization of Energy (I: *Rammaáætlun*³). The initiative for the plan originates from the debate sparked by the Laxá conflict in 1970. The initial work towards such an evaluation was undertaken by a committee of specialists from the Ministry of Industry, the National Power Company, the National Energy Authority and the Nature Conservation Council and was active during the 1970s to the 1990s (Bjornsson et al., 2012). The work of this collaborative committee, many discussions and various proposals led to the formal start of work under the auspices of the Master Plan in 1999. The initial objectives of the plan are outlined by

Thórhallsdóttir (2007a): 'i) to evaluate potential energy sources in hydropower and geothermal energy, ii) to classify them according to their attractiveness regarding energy capacity, economic gains, regional and social consequences, as well as the impact on the natural environment, cultural heritage, recreation and other land use, and iii) to rank them taking all these considerations into account'.

The work on the plan progressed in two subsequent phases with the outcome coming into full legal force in 2013 with a parliamentary resolution on the classification of a set of potential energy sites into either: 'utilization category', 'hold category' or 'conserve category'. Under the Master Plan legislation, an independent scientific body is established with the responsibility to conduct a rigorous scientific assessment and examination of the various trade-offs for the individual proposed energy sites (Bjornsson et al., 2012). A significant element is that any development of proposed energy utilization of more than 10 MW is not permitted until it has been assessed under the Master Plan process. Development cannot proceed until after the land use of the site has been classified into the 'utilization' category according to the Master Plan protocols and approval by the Icelandic Parliament, which has the final decision-making power. Development of the sites in the 'utilization' category is then subject to a formal environmental impact assessment. Areas that fall within the 'conserve' category shall be protected from energy utilization under the Nature Conservation Act and within the government's formal protected area regime. The work on the Master Plan is now in its third phase and there is ongoing work to assess a large number of proposed areas for energy utilization that could be, according to the legislation, assigned to any of the three categories. The Master Plan has been a seminal conflict resolution instrument in order to resolve the challenging debates between nature conservation and energy development.

SOME IMPORTANT CHALLENGES FOR THE FUTURE

There are many challenges for the future, especially in relation to governance and expansion of protected areas, with the competing interests of tourism and the energy sector creating many tensions. In this paper, we highlight and present four different types of pertinent administrative and social/economic challenges. Obviously, this is not an exclusive list of challenges to the protected area estate of Iceland, which include those related to climate change, invasive alien species like *Lupinus nootkatensis* Donn ex Sims and *Anthriscus*

sylvestris (L.) Hoffm. (Wasowicz et al., 2013), and pollution of some important protected lakes (Ramsar, 2013). Although the protected area challenges we discuss are specific to Iceland, these are likely to have resonance in other countries.

• Advancing a systematic review of nature as a basis for developing the protected area network

There is a need to advance knowledge about the representativeness of the Icelandic protected area estate, in relation to the whole range of natural features and processes. Although the overall terrestrial protected area cover in Iceland is comparably large, quantity does not necessarily equal quality of biodiversity and geodiversity conservation.

An important attempt to address representation of the protected areas has been made through the Nature Conservation Strategy (I: *Náttúruverndaráætlun*), manifested in the 1999 Nature Conservation Act. The strategy aims to establish a network of protected areas to assure the long-term survival of the most vulnerable and threatened species and habitats. The strategy has run in two phases from 2004 with a range of locations proposed as protected areas for conservation of important biotic, as well as abiotic, nature. The implementation has, however, been slow, especially as agreement with stakeholders has not been achieved on many of the proposed sites. The newly enacted Nature Conservation Act (November 2015) aims to restructure and strengthen the Nature Conservation Strategy, especially its means of implementation and the scientific arguments to support the conservation value.

The need to advance knowledge becomes even more apparent for the marine environments where there has been much less emphasis on site protection compared with the terrestrial areas. Iceland has relatively few marine protected areas compared to the natural assets known on its continental shelf, with the Breiðafjörður Conservation Area by far the largest.

Being a relatively large country with few inhabitants, Iceland has in general been struggling to allocate enough resources to provide detailed description and systematic review of its nature. This relates not only to mapping and assessing nature for conservation purposes, but also to most land use in general. The situation is slowly improving as information accumulates, but there is still a long way to go. An important initiative is the ongoing work to map species, habitat types and ecosystems in the country in accordance with common European frameworks. The Natura Ísland project, run by the

Icelandic Institute of Natural History (I: *Náttúrufræðistofnun Íslands*) has started to give new and greatly improved understanding of Icelandic nature in general and contributes to better understanding of its conservation value. However, a systematic approach to the inventory and evaluation of the geoheritage is currently lacking; this is needed given the outstanding geodiversity of Iceland, as highlighted in the 2015 ProGEO conference held in Reykjavik⁴.

- **Dealing effectively with increasing visitor numbers**

As indicated earlier in this paper, nature-based tourism has been growing rapidly in Iceland. It is predicted to rise to 1.4 million in 2016 with a sharp seasonal peak during the summer months. This increase and its potential impacts are a major challenge to the protected area estate and the maintenance of Iceland's natural assets. Many protected areas and popular tourist destinations are now under serious threat of degradation and there is a further risk that the quality of the visitors' experience and enjoyment will diminish. An important factor for visitors' enjoyment is tranquillity, and this is bound to lessen with increased numbers of visitors at the same time in an area. Some of the sites might already be overwhelmed during peak days with individual visitors and package tours. However, if effectively planned, visitor management might create a great opportunity as experience of a protected area is now becoming a significant component of visitors' experience. This calls for far greater coordinated action by conservation and tourism interests. Emphasis needs to be on strengthening the institutional frameworks, organizational capacity, technical expertise and financial resources.

It is obvious that Iceland can draw lessons in this field from many other parts of the world, such as regulation of numbers, increased professional ranger presence, limiting and regulating visitor access in the most fragile parts, and improved footpath strategy and management. These are all issues that need urgent attention in order to halt degradation of protected areas conservation values.

- **Providing new mechanisms for financing protected areas**

Protected area management has been confronted with financial difficulties, not least related to rapidly growing visitor numbers. The bulk of the finance has come from the government, but there is increasing income from visitors, such as camping site fees and retail sales in visitor centres. The exponential growth in tourism has, however, created a major financial gap, especially for

visitor infrastructure, such as footpaths and for development of ranger services. The government has partly met this with substantial additional funding, especially in 2015, but more is needed.

New ways to generate revenues to meet the gap in funding of protected areas are being considered. Since 2011, Iceland has applied a relatively low accommodation tax, with 40 per cent of the income going directly to protected areas but the remaining 60 per cent subject to competitive bidding, and the protected areas may not always be successful. There has also been an ongoing political debate on different measures to generate revenues for infrastructure and ranger services, such as increasing the accommodation tax, introducing site specific access fees, parking fees, concession fees, and also debate about introducing a general nature pass and entry/exit taxes for those visiting Iceland. Whatever mechanism is favoured, it is urgent to ensure early resolution and implementation, and to ensure that the resources raised are not siphoned off for other activities.

All of these challenges require, ultimately, public support to raise awareness of the need for progress to be made to ensure that the environmental value of the protected areas, the popular tourist destinations, will not diminish.

- **Organizational structures and coordination for effective protected areas management**

There are three government organizations that are mandated to govern protected areas. The general rule is that protected areas established according to the Nature Conservation Act, together with the Mývatn-Laxá area, are governed by the Environment Agency. The two national parks, established by specific law – Þingvellir National Park and Vatnajökull National Park, and the Breiðafjörður Conservation Area, have their own governance structures, independent from the Environment Agency. The reporting arrangements are also different. The Environment Agency and Vatnajökull National Park report to the Ministry for the Environment and Natural Resources, while Þingvellir National Park reports to the Prime Minister's office as the park is administered by a parliamentary committee. In addition, two other governmental organizations are mandated to govern land for specific purposes – the Soil Conservation Service and the Forest Service.

This relatively complex organizational structure brings challenges (Crofts, 2009). It creates a coordination challenge and a risk that knowledge of and capacity for conservation management becomes scattered. On the other hand, it also creates governance diversity, a topic much discussed at the World Parks Congress in Sydney



Pingvellir National Park and World Heritage Site for rifts associated with the separation of the North American and Eurasian tectonic plates and site of first democratic parliament denoted by the flagpole in the photograph © Roger Crofts

in 2014, being important as the protected area estate expands and its governance needs to cope with multiple stakeholders and different interests. One size cannot necessarily fit all.

The transformation brought about by expansion of nature-based tourism, as outlined in previous sections, calls for increased organizational capacity and a more integrated and coordinated approach to protected area governance. It is, therefore, likely that the organizational structure for effective management of protected areas in Iceland will evolve in the coming years.

CONCLUSIONS

This paper does not provide an exhaustive list of all challenges related to the protected area estate in Iceland. There remain a number of major challenges which need to be addressed to secure conservation values in the existing areas and to ensure that new ones are systematically added.

Our aim is to give a brief overview into some of Iceland's extensive work on protected area establishment, management and governance. Iceland is endowed with spectacular natural assets: features, processes and whole landscapes. It has built up a substantial protected area

estate, starting with the first area in 1930, taking small steps after the Nature Conservation Act came into force in 1956, but not taking off until after 1970. Iceland now has around 20 per cent of its terrestrial area under formal protected area regimes. There are further plans to expand the area, especially under the new Nature Conservation Act and with a basis in the Master Plan for Conservation of Nature and Utilization of Energy. In addition to formal protection, there are also other statutory and non-statutory types of land based protection that have not yet been checked for conformity with the IUCN protected area definition, but might provide valuable additions.

Some of the societal challenges and transformations of recent decades discussed aid understanding of the development of the protected areas estate. The scale of nature in Iceland and the increase in popular public interest in the formal protection of nature brought about a significant change in approach from the later 1980s. Site protection has not been immune to the debate about the social impacts of conservation and a call for more socially inclusive approaches. There has been a demand for greater engagement by other stakeholders who felt excluded from the land they had rights to or lived next to by centralized approaches to nature protection.



Skógafoss Natural Monument: a classic Icelandic waterfall and an important tourist destination in south Iceland
© Roger Crofts

Iceland has many interesting and innovative cases for policymakers and practitioners in protected area governance elsewhere. Of particular importance are the large scale conservation approach and co-management structures in Vatnajökull National Park and the establishment and logic behind the Master Plan for Conservation of Nature and Utilization of Energy. We argue that such structures can provide policymakers elsewhere with ideas on how to address conflicts and seek reconciliation of the different trade-offs between energy development and conservation.

The expansion of tourism is not only a key driver of the Icelandic national economy and provider of rural employment, it is imposing challenges and driving changes in park management and protected area governance in Iceland. This concurrently causes challenges to the protected area estate; how to effectively and sustainably manage this growing number, and how to tap successfully into the financial flows of the tourism sector for funding the much needed nature conservation investments to prohibit degradation of the fragile nature.

ENDNOTES

¹ We use Icelandic spelling for the individual site names. Further, we provide Icelandic translation for some of the terms used.

² The new nature conservation legislation entered into force while this paper was under revision. The new act allows for the designation of more categories of protected areas than the previous act, and aims partly to reflect the IUCN categories of protected areas.

³ www.ramma.is

⁴ www.progeo.com

ABOUT THE AUTHORS

Jon Geir Petursson is a Director General for the Department of Land and Natural Heritage at the Icelandic Ministry for the Environment and Natural Resources. He is affiliated as an assistant professor (part time) in environmental governance at the University of Iceland. He has been engaged in research on protected area governance with the main focus on institutional aspects and their multiple social interconnections. Beyond Iceland, his work on protected areas has been in East Africa, primarily in Uganda and Kenya.

Gudridur Thorvardardottir is a Head of Division at the Department of Land and Natural Heritage at the Icelandic Ministry for the Environment and Natural



Þjórsárver Nature Reserve (Ramsar Site): key site for breeding of Pinked-footed geese (*Anser brachyrhynchus*) and surging Múlajökull glacier © Roger Crofts

Resources. She studied Geography at the University of Iceland and University of Waterloo, Ontario. She has worked in the field of nature conservation since 1989 and in the Ministry since 2011. She has participated in Nordic workshops under the Nordic Council of Ministers on projects with an emphasis on nature conservation, recreation and access.

Roger Crofts is an environmental policy and strategy adviser specializing in protected areas and geoconservation around Europe. He has visited Iceland over 20 times and produced many papers and given many talks in the hope of stimulating more effective conservation of nature. He was awarded the Knight's Cross of the Icelandic Order of the Falcon by the President of Iceland for his environmental work in 2014 and the Icelandic Soil Conservation Medal for his work on soil and land restoration in 2011. He was WCPA Regional Vice-Chair Europe 2000-08 and is now a WCPA Emeritus. www.rogercrofts.net

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RESUMEN

Con un 20 por ciento de la superficie terrestre de Islandia protegida por mecanismos formales, en este estudio describimos la posición actual y analizamos algunos factores en la transición de los enfoques tradicionales a los actuales. Examinamos, asimismo, los elementos del desarrollo de las áreas protegidas de Islandia en las últimas décadas, especialmente los enfoques de conectividad en gran escala basados en el paisaje, estructuras de gobernanza innovadoras para involucrar a los actores locales, y nuevos mecanismos de resolución de conflictos entre la protección y el desarrollo. Se identifican algunos retos importantes para el futuro, incluyendo la necesidad de una revisión sistemática de la naturaleza como base para el desarrollo de la red de áreas protegidas, en relación con el número creciente de visitantes, el desarrollo de nuevos mecanismos para la financiación de las áreas protegidas y la mejora de la colaboración entre organizaciones en la gestión y gobernanza de las áreas protegidas.

RÉSUMÉ

Environ 20 % de la superficie de l'Islande fait partie d'un système d'aires protégées officielles. Le présent document examine la situation actuelle et certains facteurs liés à la transition entre l'approche traditionnelle et l'approche récente. Nous passons en revue le développement des aires protégées de l'Islande au cours de ces dernières décennies, en particulier les projets de connectivité de paysage à grande échelle, les structures innovantes de gouvernance qui engagent les parties prenantes locales, et les nouveaux mécanismes de règlement des conflits d'intérêts entre le développement économique et la protection de l'environnement. Des défis importants pour l'avenir sont identifiés, tels la nécessité d'un examen systématique de la nature comme base de développement du réseau d'aires protégées, le traitement du nombre grandissant de visiteurs, le développement de nouveaux mécanismes de financement des aires protégées et l'amélioration de la collaboration inter-organisationnelle dans la gestion et la gouvernance des aires protégées.



MONITORING NATURE-BASED TOURISM TRENDS IN JAPAN'S NATIONAL PARKS: MIXED MESSAGES FROM DOMESTIC AND INBOUND VISITORS

Thomas Jones^{1*} and Takafumi Ohsawa²

*Corresponding author: tjones@meiji.ac.jp

¹Graduate School of Governance Studies, Meiji University, Japan

²Nature Conservation Bureau, Ministry of the Environment, Japan

ABSTRACT

Nature-based tourism (NBT), including visits to protected areas such as national parks, is said to rank among the tourism sector's fastest growing segments. However, protected area visitation statistics can be inaccurate or unreliable, leading to mixed messages when trends are extrapolated to national level. This paper examines one such case using empirical evidence to investigate the reported decline in visits to Japan's national parks. First, trends in domestic and international visitors are examined at the national level. Next, the case study of Kamikochi in the Japan Alps is introduced to assess challenges in monitoring emerging NBT segments, epitomized here by inbound visitors. Findings suggest that current monitoring methods are not yet sufficient to track visitor diversification, resulting in underreported segments such as inbound visitors whose profiles and behaviour differs from conventional domestic NBT. However, the Ministry of Environment, which administers Japan's national parks, is aware of the increasingly heterogeneous visitor spectrum, and taking steps to track the evolving range of variables that shape visitation by examining domestic and international visitors at national and local levels. This study's twin-segment approach uses multiple-scale case studies to revisit the debate over improved visitation data. Lessons learned from visit trends in Japan's national parks underline the importance of targeted monitoring of segments due to changes in NBT demand.

Key words: nature-based tourism, monitoring, domestic, international, Japan

INTRODUCTION

Nature-based tourism (NBT) has expanded from a niche role to rank among tourism's fastest growing market segments (Nyaupane et al., 2004; Tisdell & Wilson, 2012). Considerable research efforts have thus been devoted to monitoring the increasing volumes of visits in order to manage their associated environmental, economic and social impacts (Manning et al., 1999; Eagles, 2002). Monitoring NBT visitation in this way should be fundamental to effective management of protected areas, directing limited budgets towards mitigation of high priority impacts or particular flashpoints, such as those related to trails, trash and congestion (Newsome et al, 2012). However, in reality few protected area managers have the luxury of sophisticated monitoring systems such as that of Yosemite National Park, where data is collected not only on visitor use levels but also on the associated impacts via monitoring of soundscapes, use of formal and informal trails and spatial distribution of visitors (Eagles,

2014). Many are conversely forced to function without proper data on visitation, as statistics from individual sites are not systematic and can be inaccurate or out-of-date (Cope et al., 2000; Cessford & Muhar, 2003; Buckley (2009b). When local trends are scaled up to national level this can lead to mixed messages – or even confusion over the direction of growth – as this paper aims to demonstrate using empirical evidence from Japan.

Japan's national park visitation provides a convenience sample of visit data that stretches back to 1950. Despite this longitudinal consistency, the Japanese case typifies the challenges common to monitoring many protected areas given the lack of an entrance fee system that precludes the utilization of admission receipts. Instead, data is collected at local level and scaled up to create national trend indices. Interestingly, aggregated visitation to Japan's national parks has demonstrated negative growth since 1991, seemingly bucking the



Kappabashi Bridge, over the River Azusa and with the Hodaka Range in the background © Matsumoto City Tourism Dept.

forementioned trend of universal NBT growth. The data has thus attracted the attention of international researchers, with one comparative study contending that national park visitation had peaked and entered a state of per capita reduction in the USA¹ and absolute decline in Japan (Pergams & Zaradic, 2007). However, the validity of the Japanese data was not discussed in detail, and there have been no follow-up studies to date, so this paper employs empirical evidence to firstly investigate Japan's monitoring methods and then reassess the reported decline in visitation. Trends in domestic visits to Japan's national parks are compared with those of international tourists, an emerging segment. To contextualize the aggregated visitation data, a case study is introduced to demonstrate how mixed messages might emerge from monitoring domestic and international visitor trends at local and national levels.

MONITORING VISITOR TRENDS

This section defines some of the key terminology and reviews the literature on visitation data collection. Visitation can be defined as 'the sum of visits during a period of time' (Hornback & Eagles, 1999: 8). Visits are thus the basic measurement unit, while higher-level systems use more precise stay-time data to calculate visitor hours and days. Visits are made by visitors who should be distinguished from protected area residents and workers, as visitors receive no monetary reward but instead are motivated primarily by the opportunity to participate in NBT. Based on operational definitions such

as visits to national parks, NBT is said to rank among the fastest growing segments of the tourism sector (Higgins, 1996; Nyaupane et al., 2004; Tisdell & Wilson, 2012). It is an umbrella term that can be specifically defined in terms of visitors' choice of destination (e.g. national parks: see Boo, 1990) or activity (e.g. adventure or wildlife tourism: see Sung, Morrison & O'Leary, 2000). NBT can be sub-classified into segments based on scales of volume, difficulty and price. A variety of precise criteria could in theory be used to distinguish bona fide NBT from the kind of mass tourism that often occurs at 'natural' destinations. However, the case study approach employed herein sacrifices a more precise definition of NBT for the sake of macro-level analysis of a contemporary phenomenon – national park visit trends – within its real-life context (Yin, 2009).

Although achieving academic consensus over a strict definition of NBT remains elusive, there is widespread agreement among existing research on the need for a better understanding of NBT trends (Cope et al., 2000). Aside from keeping track of social, environmental and economic impacts, monitoring is vital in order to justify limited management budgets and allocate visitor facilities, services and staff. Accurate visitation data is also fundamental to troubleshoot problematic 'hotspots' and minimize conflicts between visitor segments (Cessford & Muhar, 2003; Eagles, 2014). Efforts to monitor NBT often focus on protected areas such as national parks for a number of reasons. As flagship

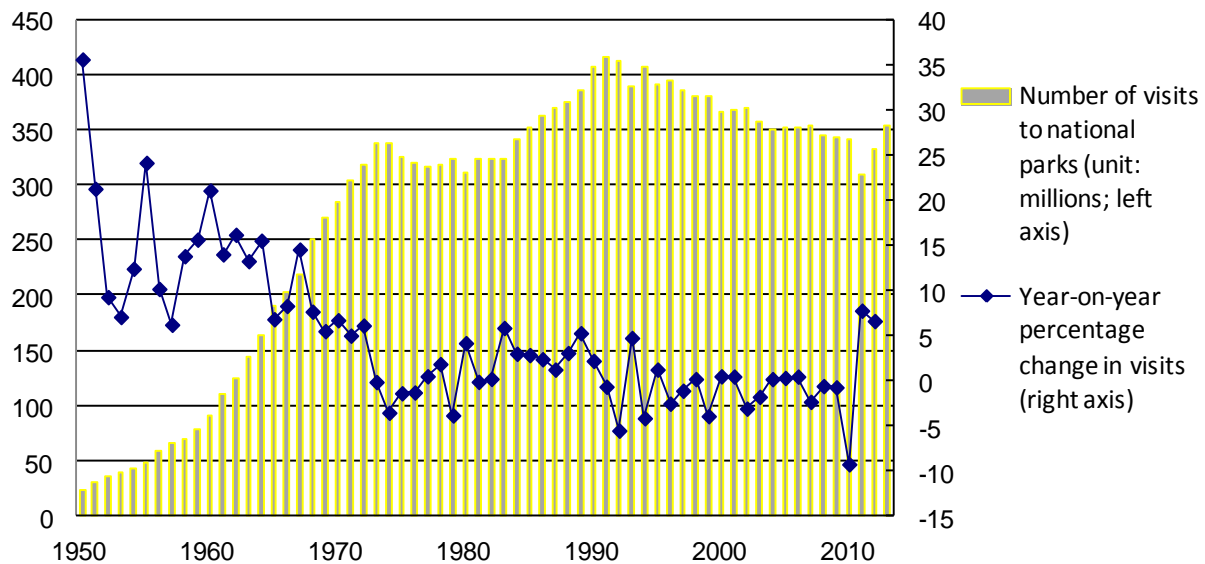


Figure 1. Annual aggregated visitations to Japan's national parks 1950-2013 (MOE, 2015)

conservation mechanisms, national parks dominate the small proportion of national government's fiscal and human resources allocated to protected area management. Consequently, the relatively high priority placed on management and marketing of such destinations ensures that managerial approaches and philosophy pioneered at a few iconic destinations areas often monopolize the debate over national policy-making (Buckley, 2012; Eagles, 2014).

Nonetheless, accurate reporting of visitation trends remains sporadic. A number of practical shortfalls in monitoring methods have been observed related to:

- lack of multi-year time series since count methods, and even management agencies themselves, are subject to change (Hornback & Eagles, 1999; Liu et al., 2012);
- multiple access roads or the presence of non-tourist traffic (Buckley, 2009b);
- cost of continuous staff or automated counters (Cessford & Muhar, 2003; Buckley, 2009b);
- sample days not representative – significant fluctuations in visitor numbers due to weather or public holidays, etc. (Cessford & Muhar, 2003).

There is also a widespread tendency toward under-reporting due to 'low levels of staffing, too many entrances for proper coverage, or other priorities of management' (Hornback & Eagles, 1999: 14). Even where data does exist, it often consists of 'guesstimates' based on the perceptions of staff or local volunteers, or anecdotal evidence (Cope et al., 2000). Despite conceding some of these limitations, Japan's national park database provides a rare longitudinal benchmark of

NBT trends stretching back to 1950 whose validity can be strengthened using representative case study examples such as Kamikochi, discussed below.

DOMESTIC VISITOR TRENDS

Collecting and reporting a central visitation database is one way that national park management can provide insights into long-term NBT trends. In Japan, records of the annual numbers of visits to national parks stretch back to 1950. The data is compiled by the Ministry of Environment (MOE) based on the four indicators below and updated annually in print and electronic form with a reporting lag of two years.

1. Individual national park: sourced from sample days and tourism surveys
2. Core facilities zone: sample days and tourism surveys
3. Visitor centres: infrared counters (and annual estimates)
4. Long-distance trail: sample days and traffic counts

As in certain British examples investigated by Cope et al. (2000), national level data is amalgamated from a variety of local government sources. This multi-agency approach poses challenges of reliability and consistency among record-keepers². More specific methodological shortcomings include the lack of consideration for repeat visitors, or those motivated by highly specific or non-park related factors. However, although the data relies on an eclectic mix of sources, the estimates do provide a benchmark of macro trends in visitation. Despite conceding considerable horizontal unreliability, the dataset has the advantage of longitudinal consistency, which enables analysis of the post-war visitation trends in order to examine the current downturn of 20 per cent in 2012 compared to the peak in 1991 (Fig. 1).

The promotion of international tourism was one important designation criteria for Japan's original National Parks Act that was passed in 1931 (Murakushi, 2006). However, the initial batch of 12 parks, designated from 1934-6, and the subsequent post-war additions developed almost exclusively as domestic visitor destinations (Jones, 2014). As a result, the data shown in Figure 1 includes very few international visitors, as will become apparent in the later discussion of Kamikochi.

Japan's designated national parks increased gradually to 17 in 1950 and 19 by 1960, before leaping to 27 by 1974. As the number of parks grew, annual visitation also rose rapidly to exceed 50 million in 1950. Between 1960 and 1963 visits increased from 90 to 145 million, and by 1971 surpassed 300 million (Fig. 1). This was an era in which GDP grew steadily at an annualized average of 11 per cent from 1955 to 1973. Rapid economic growth and urbanization brought construction of new bullet-trains, highways and other access infrastructure in tandem with increasing disposable income, leisure time and car ownership (Oyadomari, 1989). After a cool-off period in the 1970s, including the first year-on-year decline in 1975, visits rose again to a peak of almost 416 million in 1991. Thereafter came the extended decrease wherein the aggregate total fell 20 per cent to 333 million in 2012.

The cause of this decline has not been established, but partially reflects a 'normalization' process in reversal of the post-war correlation between increased visitation and the total number of parks designated. Another factor is Japan's population which increased from 82 million (1950) to a peak of 128 million (2010) but is now in decline. Rural regions face particular demographic challenges due to shrinking, ageing populations (Matanle, 2006; Muramatsu & Akiyama, 2011), and the post-1991 downturn in visitation also coincides with the economic stagnation which followed the bursting of the real estate bubble, epitomized by the 1987 Resort Law plan to convert nearly 40,000 km² (11 per cent of Japan's total landmass) into purpose-built rural resorts (Havens, 2011). By 1992, '39 per cent of the 77 designated infrastructure hubs and 83.8 per cent of the planned 2,046 special facilities were incomplete or abandoned' (Oura, 2008). Aside from such macro demographic and socio-economic trends, NBT dynamics have also been transformed by radical change in domestic demand due to:

- 'substitution' of international destinations for domestic ones linked to an increase in overseas travel (Balmford et al., 2009). Outbound Japanese tourists doubled from 5 million in 1986 to exceed 10 million in 1989 before peaking at 18.5 million in 2012 (JTBF, 2014).

Table 1. Estimated inbound visits to Japan's national parks (MOE, 2015)

	National Park ⁶	2012	2013	% change
1	Fuji-Hakone-Izu	838,000	1,007,000	20%
2	Shikotsu-Toya	240,000	317,000	32%
3	Chubu Sangaku	134,000	314,000	134%
4	Aso-Kuju	259,000	278,000	7%
5	Nikko	104,000	139,000	34%
6	Joshinetsu Kogen	107,000	108,000	1%
7	Seto Naikai	63,000	79,000	25%
8	Daisetsuzan	64,000	56,000	-13%
9	Kirishima Kinkowan	24,000	53,000	121%
10	Akan	46,000	51,000	11%
11	Saikai	32,000	43,000	34%
12	Ise-Shima	19,000	24,000	26%
13	Shiretoko	24,000	17,000	-29%
14	Sanin Kaigan	10,000	16,000	60%
15	Kushiro Shitsugen	13,000	16,000	23%
16	Unzen Amakusa	5,000	15,000	200%
	TOTAL	1,982,000	2,533,000	28%

- reduced demand for winter sports. For example the number of skiers and skaters in mountainous Nagano Prefecture declined from a peak of 22 million in 1990 to under 8 million in 2006, echoing a similarly drastic decline at the national level (Kureha, 2008).
- diversification in travel style away from the predominant package tour profile (Jang et al., 2001) in favour of smaller groups of independent travellers. Access underpins national park visitation (Yamaki, 1997), so diversification in travel modes could drive down demand for purpose-built package tour facilities, causing the closure of some large-scale hotels.

INBOUND VISITOR TRENDS

Could monitoring methods also be playing a contributory role in the reported decline? The next section of the paper examines changes afoot in international tourism to Japan which has shown significant growth since a renewed policy-focus on 'inbounds³' from 1996 (Soshiroda, 2005). After hosting the FIFA Soccer World Cup (2002), the subsequent Visit Japan Campaign launched in 2003 encouraged international arrivals to increase from 3.8 million to 8.3 million in 2008, when the Japan Tourism Agency (JTA) was established to promote international tourism (Jones, 2014). However, the timing coincided with a global dip in tourism arrivals,

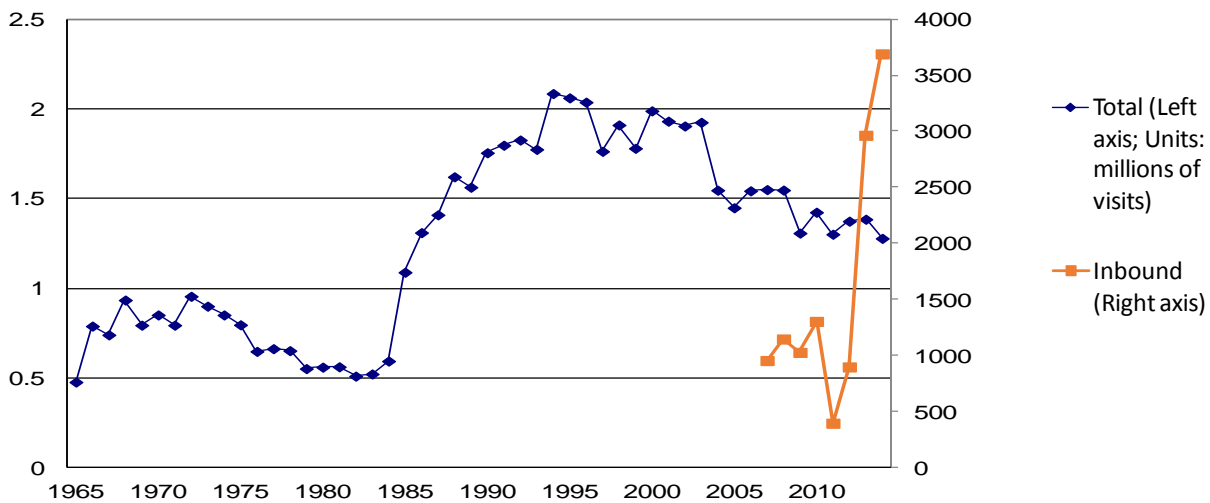


Figure 2. Annual visits to Kamikochi 1965-2014 (MCTD, 2015)

and the JTA's initial target of 10 million arrivals by 2010 was not achieved until 2013, when the awarding of the 2020 Olympic Games to Tokyo inspired a revised target of 20 million arrivals by 2020. Visitors from nearby Taiwan, the Republic of Korea and across East Asia comprise the bulk of inbound travellers, with selective deregulation of visa requirements also encouraging more visitors from countries such as Thailand and Malaysia (Fukunaga, 2013). Beyond broadening the number and range of inbound tourists' nationalities, the additional promotion has encouraged visitors to diversify geographically away from the urban hubs to national parks and NBT destinations such as Mt. Fuji and Kamikochi (Jones, 2014).

However, growth in inbound demand is relatively recent, and monitoring of inbound NBT largely undocumented, so this paper now turns to exploratory efforts to track inbound NBT. Since 2010, expenditure surveys have been commissioned by the JTA at 11 major international airports across Japan to intercept inbound tourists on their way home. The sample⁴ includes a total of 38,840 annual responses collected in 12 different languages (JTA, 2015). Based on these JTA findings, the MOE has begun to estimate the number of inbound visits to national parks since 2012, filtering self-reported destinations visited to match those located within the boundaries of national parks. This enables the generation of a per park multiplier which can then be applied to the total number of inbound arrivals to calculate visitation (MOE, 2014). Results show positive growth at fourteen out of the sixteen parks listed. Visitation more than doubled at three parks for an overall annualized increase of 28 per cent in 2013 (Table 1). Although the total 2.5 million visits still represents just 0.6 per cent of aggregated park visitation, this rapid growth rate seems likely to be underreported since it is based on an exit survey which asks visitors to report the destinations

visited during their trip, so despite the substantial sample size, results face a recall bias exacerbated by 'unfamiliarity with [Japanese] place names' (Funk, 2013). Nonetheless, the most visited park for inbounds, Fuji-Hakone-Izu, was consistent with domestic visitors, although the second and third ranked parks were different (respectively Shikotsu-Toya in Hokkaido and the Chubu Sangaku), suggesting that inbound visitation still tends to cluster around such urban hubs as Kanto and Sapporo⁵. In short, inbound NBT remains underreported, and the market at an embryonic stage with spill-over into rural destinations such as national parks likely to increase further along with the predicted growth in total arrivals.

CASE STUDY – KAMIKOCHI

Having analyzed the diverging trends in domestic and international visitors, the case study of Kamikochi is now introduced to provide context at the local level and assess some of the challenges associated with monitoring emerging NBT segments. Kamikochi is a valley 1,500m above sea level containing the headwater of the Azusa River flanked by steep mountains that rise to peaks of 3,000m. This is the southern gateway to the Chubu Sangaku, a mountainous national park at the heart of Japan's main island of Honshu. More commonly known as the Northern Japan Alps, the park ranked third in the 2013 data, as international visits increased by an annualized 134 per cent to exceed 300,000 (Table 1). The Chubu Sangaku also ranked among the ten most visited national parks overall in 2012, which in turn accounted for 81 per cent of all annual visitation (MOE, 2014).

Kamikochi thus offers useful insights to investigate converging trends in domestic and inbound segments. Moreover, the single paved road that allows access in and out of the Kamikochi valley has enabled long-term and systematic visitor monitoring, with the number of

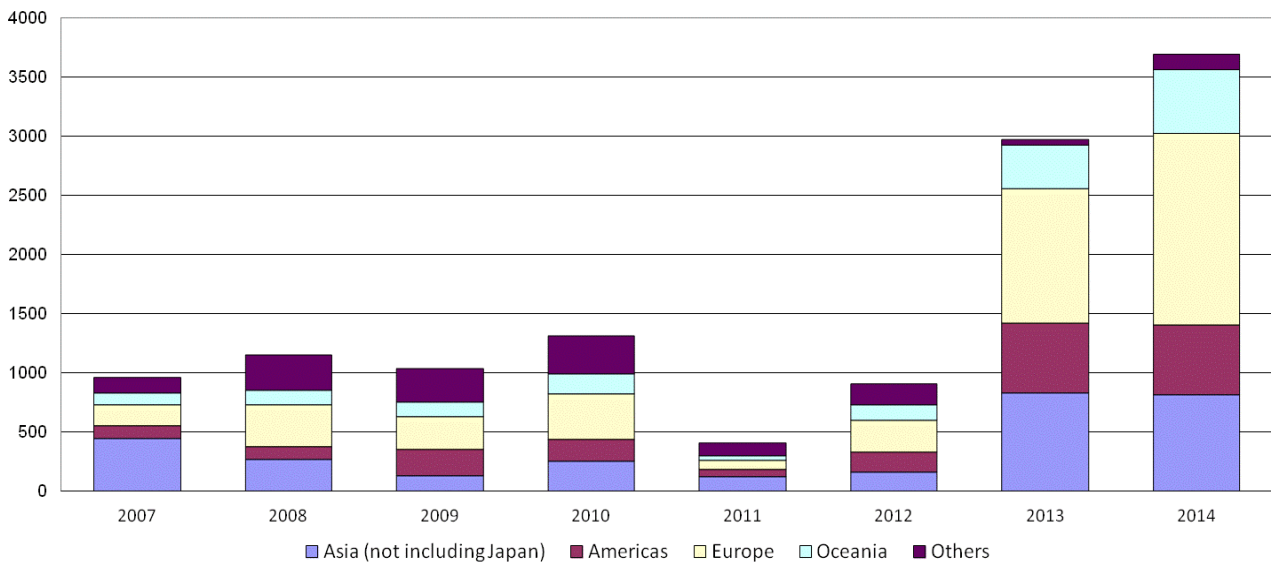


Figure 3. Number of inbound overnight stays at Hotel N 2007-2014

vehicles passing the Kama Tunnel recorded at the gate and multiplied by an average number of passengers⁷. The extreme topography once acted as a proxy cap on visitation to Kamikochi (Murakushi, 2006). However, the destination was transformed by post-war demand for NBT, with annual visits approaching 1 million in 1968 before a cool-off period in the 1970s coinciding with the oil crisis and economic stagnation. Thereafter, a ban on private cars begun in 1975 pre-empted the introduction of a park-and-ride system which inadvertently facilitated a fourfold increase in visits during the 1980s 'bubble economy' (Fig. 2). However, like the national trends, Kamikochi visitation peaked in 1991 before declining 38 per cent over the next two decades (Fig. 2). Tellingly, a 59 per cent decline was also reported in overnight stays from 320,000 in 1988 to 130,000 in 2011 (MCTD, 2015).

If Kamikochi's aggregate visitation mirrors national trends, it also reflects the recent rise in inbounds as one of the most iconic destinations in Nagano Prefecture, host to the 1998 Winter Olympics. The number of overnight stays by international visitors to Nagano increased ten-fold from 47,000 in 1999 to 465,000 in 2014 (NPTD, 2015). International tourism marketing connects national policies, such as the Visit Japan Campaign, with local positioning, emphasizing Kamikochi's proximity to the the Alpen route's 'wall of snow' which traverses the northern section of the national park. As at other national park destinations, the number of international visitors has not been counted directly since there is no entrance fee or registration system, and no way to capture visitors' profile in a systematic but cost-effective manner. However, interviews with local staff confirm that Kamikochi's inbound market has been increasing rapidly in line with the MOE's data (Table 1). For example, at 'Hotel N' the

total number of international guests increased 3.9 times between 2007 and 2014 (Fig. 3). The number of European visitors to Hotel N increased almost ten-fold during the same period, while (non-Japanese) Asian visitors also posted a three-fold increase from 2008 to 2014 and seem likely to increase again in the future. The Hotel N data also hints at the various socio-economic push and pull factors shaping the inbound market, such as the sharp dip following the 2011 disaster and anxiety over the nuclear radiation (Murakami et al., 2013). Findings from Hotel N are important since the 2014 total of 3,690 overnight stays accounts for 55 per cent of all international stays recorded that year in the valley. Local government data has begun to monitor inbound stays since 2013, and the international proportion of all overnight stays at Kamikochi was found to have increased from 2.5 per cent in 2013 to 4.5 per cent in 2014 (MCTD, 2015).

Although Table 1 suggests a particularly rapid increase in inbounds at the Chubu Sangaku, Kamikochi's case is not anomalous since similar trends have also been observed in other NBT destinations. For example, Hakuba in Nagano and Niseko in Hokkaido, two premier ski resorts located respectively in national or quasi-national parks, have both experienced a recent recovery in visitation mainly due to an increase of inbounds (Aoyama, 2015). Such findings all underline the rapid growth trend in inbound NBT and suggest a significantly larger share than the 0.6 per cent estimated by the MOE.

DISCUSSION

Despite consensus on the need for a better understanding of NBT trends to mitigate impacts and prioritize management strategies, protected area



A traditional Irori fireplace inside Kamonji Goya, the oldest hut in the Kamikochi valley © Shinnosuke Hiramatsu

visitation data remains inconsistent or unreliable (Hornback & Eagles, 1999; Eagles, 2014). Such methodological shortfalls encourage expectations of under-reporting or 'guesstimates' that undermine the validity of monitoring efforts and could even jeopardize NBT's claim to rank among the fastest growing tourism segments. This paper has demonstrated how mixed messages may emerge from monitoring domestic and international visitor trends at national and local levels.

Japan's national park visitation was selected as a multi-agency dataset which, although conceding some horizontal unreliability, has shown longitudinal consistency from 1950 to 2013. Aggregated data is drawn from four sources (Table 1) and updated annually by the MOE. National park trends show a 20 per cent decline in 2012 visitation compared to the 1991 peak (Fig. 1). The root cause remains uncertain, but is linked to a complex combination of socio-economic and demographic factors somewhat akin to the USA, where per capita NBT participation is said to be in decline due to structural change in socio-demographics (Ghimire et al., 2014; Stevens et al. 2014). Prior research used Japan's national park data to support such claims from the USA that NBT has peaked and entered a state of decline (Pergams & Zaradic, 2007). This was attributed to shifting trends in recreational demands and the emergence of 'videophilia'⁸

which has in turn been used to corroborate speculation of a 'nature-deficit disorder' whereby young people's connection with nature is being eroded (Louv, 2005). However, several articles refuted the alleged decline using thematically or geographically expanded visitor datasets, including one drawn from 280 protected areas in 20 countries worldwide (Jacobs & Manfredi, 2008; Buckley, 2009a; Balmford et al., 2009). In Japan, NBT demand has been transformed by changes in domestic travel patterns, and there is some evidence for reduced demand due to 'substitution' of international destinations for domestic ones, and a decline in winter sports. However, the findings of this paper echo those of Cordell (2008) in providing contextual evidence of a diversification in Japanese NBT rather than mere shrinkage.

Within this increasingly heterogeneous visitor spectrum, the reversal in fortunes of the international segment symbolizes that diversification, with a renewed policy-focus on 'inbounds' since 1996 (Soshiroda, 2005). The number of international arrivals to Japan increased from 3.8 million (2003) to 8.3 million (2008), then 13.4 million (2014), in line with the national policy emphasis on promotion of inbound tourism in the run-up to the 2020 Olympics. The current increase also reflects macro-economic factors such as the weak yen-dollar exchange

rate, effectively at its lowest level since 1973, making Japanese goods and services comparatively cheaper (Fukao, 2014). Aside from an absolute increase in the number and breadth of nationalities, inbounds are diversifying geographically away from urban hubs to visit more NBT destinations such as national parks. Utilizing JTA data, the MOE began to estimate inbound visits to national parks in 2012, and 2013 results reveal an annualized increase of 28 per cent (Table 1). Although this represents just 0.6 per cent of aggregated park visitation, our case study from the Japan Alps suggests that inbounds may in reality account for a significantly larger share. The number of international guests staying at Hotel N in Kamikochi increased 3.9 times between 2007 and 2014, and the share of international overnight stays in the valley increased from 2.5 per cent in 2013 to 4.5 per cent in 2014 (MCTD, 2015). These findings provide contextual evidence of the rapid diversification process, underlining the rapid growth in inbound NBT that could help offset the 38 per cent decline in overall visitation and 59 per cent decline in overnight stays reported at Kamikochi during the past two decades.

Keeping track of such changes in visitor demand is fundamental to effective protected area management, and these results justify recent initiatives by national and local government agencies to monitor inbounds, one of the principal – but underreported – growth segments for Japanese NBT. However, forecasting future inbound trends remains problematic due to hurdles that range from geo-political spats and faltering international relations to macro-economic conditions and natural disasters. For example in 2011, the numbers of inbounds declined rapidly following the tsunami and subsequent fears of radiation, with a year-on-year drop of 70 per cent at Hotel N. One way to improve forecasting and longitudinal validity of inbound data could be to increase the scope of monitoring. For example, MOE's opportunistic use of tourism data collected by JTA could be expanded further to report the economic impact of inbound NBT segments, which include potentially desirable niche markets such as wealthy, repeater 'ecotourists' from neighbouring countries. Such economic impact data could assist budget justification in the current climate of market-oriented conservation (Pascual & Perrings, 2007), and as JTA survey data already contains socio-economic variables such as nationality, gender, age, more detailed analysis of inbound NBT should be feasible. The current dearth of economic impact monitoring in national parks in Japan (and elsewhere) stands in stark contrast to the concerted efforts that have been made to develop internationally-recognised tourism satellite accounting procedures (Eagles, 2014).

Park planning could also be improved if quantitative data was backed up with qualitative insights into visitor experience and attitudes. In the USA, the National Survey on Recreation and the Environment (NSRE) has been monitoring recreational activities, environmental attitudes and values since the 1980s to provide a more holistic portrayal of NBT (Cordell, 2008). An equivalent profiling system in Japan could form the basis of a NBT marketing strategy, as there are currently few holistic attempts to promote the parks to an international audience (Jones, 2014). A better understanding of inbounds would also assist targeted management interventions, such as multilingual trail signs. Service provision could be tailored to meet the needs of inbounds, whose younger average age, coupled with different underlying beliefs, expectations, and values results in behavioural patterns that differ significantly from those of their domestic counterparts (McDonald & McAvoy, 1997). Language and cultural barriers make multilingual explanations of local customs and rules invaluable. Monitoring is thus a step on the way to mitigating constraints to inbound NBT, such as those 'related to personal safety, language, money, time and transport' (Ghimire et al., 2014). Cross-cutting data could also pave the way for more holistic management. Via more opportunistic use of inbound visitation data, such as the method pioneered by the MOE, new growth segments could be used to revitalize stagnant or shrinking markets. For example, the winter sports sector has already begun to benefit from an influx of international skiers and snowboarders to help offset the post-bubble domestic decline (Kureha, 2008; Aoyama, 2015). Inbounds may also visit parks during off-peak seasons, helping reduce the chronic spatial and temporal congestion of domestic visitors (Jones, 2014). These results hint at the potential of inbounds to contribute to the revitalization of NBT, by countering the current downturn in visitation and encouraging park planning based on long term trend records (Cope et al., 2000).

Finally, this paper acknowledges certain methodological limitations, including the two year lag between data collection and reporting. The time gap reflects the multi-agency composition of the monitoring system, which may represent its greatest challenge due to discrepancies in collection methods that undermine the validity of intra-site comparison and makes it difficult to break down the aggregated totals. Scaling up local trends to generate total visitation in this way can lead to mixed messages and create confusion over the direction of growth trends, as this paper has demonstrated using empirical evidence from Kamikochi. Despite this limitation, and the lack of a more stringent exclusion criteria for NBT, Japan's park data offers a 65 year snapshot of trends that offers a



A trail sign points the way to Mt. Yari (3,180 m) at the head of the Kamikochi valley © Thomas Jones

useful benchmark. It could be incrementally supplemented with targeted indicators that gauge trends in emerging segments such as inbound visitors. In fact, monitoring of inbounds has already begun at the national level since 2012, and the local level (in Kamikochi) since 2013, but it remains to be seen how the new data collected by separate agencies could be integrated and incorporated into aggregated visit data to improve the overall validity.

In conclusion, this paper utilized long-term visit data from Japan's national parks to contribute the debate over improved visitor monitoring. A twin-segment, multiple-scale case study demonstrated how the decline in Japanese NBT is being overstated by current methods of monitoring. Managers are aware of the increasingly heterogeneous visitor spectrum, and taking steps to track diversifying visit trends. Findings underline the importance of targeted monitoring of segments due to changes in NBT demand. Future research will seek to provide practical, site-specific examples of visitor monitoring that can slip between the cracks of academic and applied research since it 'is regarded as something of a luxury and is a lower priority than many other [park management] functions' (Cope et al., 2000). Efforts will also be made to investigate the effects of interrelated socio-economic variables, such as fluctuations in population and economic growth, on the aggregated number of national park visits.

ENDNOTES

¹ Also other US land tenures such as National Forest visits since 1990 (Buckley, 2009b).

² Reliability is questionable because the count method varies from prefecture to prefecture, with some using multipliers and others extrapolating from entrance figures to core facilities such as Visitor Centres (Interview with MOE on 20 May 2014).

³ However, the proportion of inbound travellers is disputed – for example in 2010, of 8.7 million international visitors to the country only 6.5 million were estimated to be tourists (Uzama, 2012).

⁴ The sample excludes transit visitors, tour guides and long-term visitors staying for a year or more.

⁵ Kanto includes seven prefectures around the Greater Tokyo Area. Sapporo is the capital city of Hokkaido, the northernmost of Japan's four main islands.

⁶ National parks which recorded <10,000 inbound visitors in FY2013 were excluded.

⁷ Counted as 45 visits per bus; 35 per shuttle bus; 3 per taxi. However, Hagiwara et al. (2001) claim that this figure inflates the actual number of visits by approximately 30 per cent based on independent testing of official data using video stills.

⁸ Pergams and Zaradic (2006) define videophilia as 'a preference for virtual reality over nature.'

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ABOUT THE AUTHORS

Tom E. Jones is Associate Professor at Meiji University's Graduate School of Governance Studies in Tokyo, where he lectures on environmental policy. Originally from the UK, Jones completed a PhD in Forest Science at Tokyo University in 2010 before working as a Researcher for a regional NGO in Matsumoto at the foot of the Japan Alps. His research interests include nature-based tourism, place branding and regional revitalization. Field Work experience includes stakeholder interviews and visitor surveys, particularly in and around the Japan Alps and Mt Fuji regions.

Takafumi Ohsawa majored in forest ecology and genetics in the undergraduate and graduate programmes at the University of Tokyo. Subsequently, he joined the Japanese Ministry of the Environment and mainly engaged in the issues of nature conservation. For instance, he worked as a park ranger at Daisetsuzan National Park in Hokkaido. Between 2013 and 2015, he was dispatched from the Ministry to Dalhousie University to study issues of climate change mitigation and adaptation. Currently, he works for the Ministry again, being involved in several global issues of nature conservation including the Convention on Biological Diversity.

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RESUMEN

Se dice que el turismo basado en la naturaleza (NBT), incluyendo la afluencia de visitantes a las áreas protegidas como los parques nacionales, se encuentra entre los segmentos del sector turístico de más rápido crecimiento. Sin embargo, las estadísticas sobre las visitas a las áreas protegidas pueden ser inexactas o poco fiables, dando lugar a mensajes mixtos cuando se extrapolan las tendencias a nivel nacional. Este artículo examina uno de esos casos en el que se utiliza evidencia empírica para investigar la disminución reportada en las visitas a los parques nacionales de Japón. En primer lugar, las tendencias en términos de visitantes nacionales e internacionales se examinan a nivel nacional. Luego, se introduce el estudio de caso de Kamikochi en los Alpes de Japón para evaluar las dificultades para realizar un seguimiento de los nuevos segmentos del NBT, caracterizados aquí por los flujos de entrada de visitantes. Los resultados sugieren que los métodos de seguimiento actuales son insuficientes para evaluar la diversificación de los visitantes, lo que

resulta en segmentos reportados de menos, tales como los flujos de entrada de visitantes, cuyos perfiles y comportamiento difieren del NBT interno convencional. Sin embargo, el Ministerio de Medio Ambiente, que administra los parques nacionales de Japón, es consciente del espectro de visitantes cada vez más heterogéneo, y está tomando medidas para evaluar la evolución de la diversa gama de variables que configuran la afluencia de visitantes mediante el análisis de los visitantes nacionales e internacionales a nivel nacional y local. Este planteamiento basado en dos segmentos utiliza estudios de casos de múltiples escalas para revisar el debate sobre la mejora de los datos de visita. Las lecciones aprendidas en torno a las tendencias de la visita a los parques nacionales de Japón subrayan la importancia del seguimiento preciso de los segmentos debido a cambios en la demanda de NBT.

RÉSUMÉ

Le tourisme basé sur la nature, y compris les visites des aires protégées tels les parcs nationaux, compte parmi les secteurs les plus dynamiques de l'économie touristique. Cependant les statistiques de fréquentation des aires protégées sont souvent inexactes ou peu réalistes, créant ainsi des confusions lors de l'extrapolation des tendances à l'échelle nationale. Le présent article examine l'un de ces cas à la lumière de preuves empiriques, en analysant la chute du nombre de visites des parcs nationaux du Japon. Tout d'abord, les tendances de fréquentation nationale et internationale sont étudiées à l'échelle du pays. Ensuite est présentée l'étude du cas de Kamikochi dans les Alpes japonaises afin d'évaluer les défis posés par l'émergence du tourisme basé sur la nature, en particulier par les visites en provenance de l'étranger. Nous constatons ainsi que les méthodes actuelles de recensement ne sont pas encore suffisantes pour appréhender la diversité des visiteurs, entraînant ainsi une sous-évaluation de certains segments tels les visiteurs étrangers, dont le profil et le comportement diffèrent de ceux présentés par le tourisme basé sur la nature national et conventionnel. Cependant, le Ministère de l'Environnement qui régit les parcs nationaux au Japon et est conscient de l'éventail de visiteurs de plus en plus hétérogène, met en place des mesures de suivi des différents types de fréquentation à l'échelle nationale et locale à l'échelle nationale et locale, via l'analyse de la provenance des visiteurs (nationale ou internationale). Cette étude bi-segmentaire se réfère à des études de cas multiples afin de réévaluer le débat portant sur l'amélioration de l'évaluation des visites. Les leçons tirées de l'analyse des visites des parcs nationaux japonais soulignent l'importance d'un suivi ciblé, en phase avec les évolutions du marché du tourisme basé sur la nature.



INDICATORS FOR ASSESSING GOOD GOVERNANCE OF PROTECTED AREAS: INSIGHTS FROM PARK MANAGERS IN WESTERN AUSTRALIA

Brooke P. Shields^{1*}, Susan A. Moore^{1*} and Paul F.J. Eagles^{1,2}

* Corresponding author: S.Moore@murdoch.edu.au, also brooke.shields3@bigpond.com

¹ Environmental and Conservation Sciences, School of Veterinary and Life Sciences, Murdoch University, South Street, Murdoch, WA 6150, Australia

² Department of Recreation and Leisure Studies, University of Waterloo, 200 University Avenue West, Ontario, N2L 3G1, Canada

ABSTRACT

Effective management of protected areas relies on good governance. An assessment was undertaken using the standards provided by the United Nations Development Programme's characteristics of good governance for sustainable development as a starting point. Being able to assess governance based on indicators is essential for ongoing effective management through improving practice. Although indicators and evaluation frameworks are available, they do not offer protected area managers a quick, comprehensive measure of governance. We used a three-round Delphi method with a cohort of 33 managers and researchers from government and non-government organizations, and universities. This participatory research process established a set of 20 indicators addressing public participation, consensus orientation, strategic vision, responsiveness, effectiveness, efficiency, accountability, transparency, equity, and rule of law. Accompanying output measures were provided by management plans, annual reports, audits, and stakeholder engagement. The findings emphasize the contributions of management plans and annual reports in establishing evaluation requirements and providing a place where results are publicly available. Further participatory research to refine these indicators and apply them in a diversity of contexts is advocated.

Key words: Delphi method, indicators, governance principles, output measures, protected area governance, protected area managers, standards

INTRODUCTION

As the amount of land and waters in protected areas continues to grow, it is important that such areas are managed effectively and sustainably, particularly as they often have insufficient financial and other resource inputs (Oli et al., 2014). As a result, good governance becomes a fundamental requirement to their success, as limited resources can only be effectively used if they are allocated wisely based on careful evaluation of past performance and prediction of future needs. Good governance has equity and including all stakeholders as particular concerns.

Protected areas are 'clearly defined geographical space (s), recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values' (IUCN, 2008). They have

economic as well as intrinsic importance, given their provision of ecosystem services that benefit humans, such as recreation, shelter, food and medicines, as well as benefits beyond human needs (Costanza et al., 1997; Dudley, 2008; Eagles et al., 2002; Gurung, 2010; Hoekstra et al., 2005; Moore et al., 2009). Good governance of such protected areas is essential for sustainable development underpinned by functional ecosystem services.

Good governance is essential for the successful management of all the planet's protected areas. Today, it is no longer solely a government responsibility and is often a process undertaken by a number of parties (Borrini-Feyerabend & Hill, 2015; Graham et al., 2003). Being able to identify and strive for good governance is an essential feature in successfully managing protected areas. Over the last couple of decades there has been an

Table 1: United Nations Development Programme characteristics of good governance and their descriptions (Source: UNDP, 1997)

UNDP Characteristic*	Description/Standard
1. Participation (<i>Legitimacy and voice</i>)	All men and women should have a voice in decision-making, either directly or through legitimate intermediate institutions that represent their interests. Such broad participation is built on freedom of association and speech, as well as capacities to participate constructively.
2. Consensus orientation (<i>Legitimacy and voice</i>)	Good governance mediates differing interests to reach a broad consensus on what is in the best interests of the group and, where possible, on policies and procedures.
3. Strategic vision (<i>Direction</i>)	Leaders and the public have a broad and long-term perspective on good governance and human development, along with a sense of what is needed for such development. There is also an understanding of the historical, cultural and social complexities in which that perspective is grounded.
4. Responsiveness (<i>Performance</i>)	Institutions and processes try to serve all stakeholders.
5. Effectiveness and efficiency (<i>Performance</i>)	Processes and institutions produce results that meet needs while making the best use of resources.
6. Accountability (<i>Accountability</i>)	Decision-makers in government, the private sector and civil society organizations are accountable to the public, as well as to institutional stakeholders. This accountability differs depending on the organization and whether the decision is internal or external to an organization.
7. Transparency (<i>Accountability</i>)	Transparency is built on the free flow of information. Processes, institutions and information are directly accessible to those concerned with them, and enough information is provided to understand and monitor them.
8. Equity (<i>Fairness</i>)	All men and women have opportunities to improve or maintain their well-being.
9. Rule of law (<i>Fairness</i>)	Legal frameworks should be fair and enforced impartially, particularly the laws on human rights.

* Governance principles for protected areas from Graham et al. (2003) are given in brackets in this column.

increasing focus on evaluating the effectiveness of protected areas (Borrini-Feyerabend, 2007; Borrini-Feyerabend & Hill, 2015; Hockings et al., 2004; Hockings et al., 2006), making it timely to extend such evaluations to explicitly consider and measure governance.

Several extensive sets of indicators for measuring governance have been proposed but determination of a small number of broadly applicable indicators has remained elusive (Abrams et al., 2003; Borrini-Feyerabend et al., 2013). Coad et al. (2013) noted that governance aspects of protected area management are in urgent need of more detailed and systematic assessments. This is supported by Leverington et al. (2010) who reiterate the importance of evaluation as a vital component of governance. This paper aims to contribute to governance evaluation efforts through developing a small set of indicators that can be readily understood and applied by protected area managers in Australia and elsewhere. Having this set of indicators will have a number of benefits including providing protected area managers with the ability to identify strengths and weaknesses within their governance arrangements, and facilitating comparisons between similar areas within and among countries, thus potentially enabling the sharing between countries of more specific information, strategies and resources for protected areas facing similar issues.

• Principles of good governance

Good governance for protected areas has been summarized as a set of principles: legitimacy and voice, direction, performance, accountability, and fairness and rights (Borrini-Feyerabend & Hill, 2015). These principles have a particularly strong focus on including all stakeholders and a concern for equity. They were first explicitly articulated by Graham et al. (2003), for consideration at the World Parks Congress in Durban 2003, and are based on the United Nations Development Programme's (UNDP) list of the characteristics of good governance (UNDP, 1997). The principles from Durban are now widely accepted and appear in IUCN publications on governance (e.g. Borrini-Feyerabend et al., 2013) and most recently in the IUCN book *Protected Area Governance and Management* (Worboys et al., 2015). The principles are provided as a basis for assessing the quality of governance (Borrini-Feyerabend et al., 2013; Borrini-Feyerabend & Hill, 2015).

The UNDP's list of characteristics of good governance and the associated descriptions were selected as the basis for analysis in this research (Table 1), rather than the IUCN principles for three reasons. First, the UNDP list provides more specifically named characteristics than is the case with the IUCN principles (UNDP, 1997 *cf.* Borrini-Feyerabend & Hill, 2015). Second, the description of each UNDP good governance characteristic provides a simple 'standard' against which



Snorkelling tour at Coral Bay, Ningaloo Marine Park © Tourism Western Australia

performance can be evaluated. Third, each characteristic can then be described by a small number of measurable indicators (as per the Results section of this paper) further assisting in, and being a central element of, this performance evaluation.

- **Finding indicators for good governance of protected areas**

An extensive list of suggested evaluation indicators was provided by Abrams et al. (2003) in their handbook for field testing focused on evaluating the governance of a protected area, as a participatory process. The authors recommend drawing from the ideas in this comprehensive list of qualitative and quantitative indicators, to develop indicators that best suit the assessment needs. Borrini-Feyerabend et al. (2013), in Annex 2 to their *IUCN Governance of Protected Areas Best Practice Guidelines*, provide an adapted version of Abrams et al.'s (2003) indicators. They also emphasize the importance of taking a participatory approach. In both publications, these indicators, over 100 in total, are presented according to Graham et al.'s (2003) five principles (i.e. legitimacy and voice, direction, performance, accountability, fairness). In this study, rather than potentially overwhelming managers with this list, we used a participatory approach with managers as stakeholders selecting a small number of indicators they regarded as applicable to their protected areas.

The research presented in this paper involved inviting 33 middle- to senior-level protected area managers and researchers to a workshop to identify indicators for good governance, using the UNDP characteristics of good governance as a starting point (Table 1). *The aim was to identify a small number of broadly-applicable indicators and ways of determining their achievement that protected area managers could use, which would provide a comprehensive, quick and effective assessment of the governance of their protected areas explicitly addressing accepted standards* (as per Table 1, column 2). The indicators also needed to highlight potential areas of concern, as well as enabling governance processes to be revised, re-implemented and re-assessed, if required (i.e. adaptive management; Pomeroy et al. (2004)). Such indicators would be applicable to individual protected areas, through to protected area systems.

- **Relationship between effectiveness evaluations for protected areas and evaluating good governance**

Over the last two decades robust means of evaluating the management of protected areas have been developed (Hockings, 1998; Hockings et al., 2006), however, the evaluation of governance has lagged behind (Leverington et al., 2010). These protected area evaluations, abbreviated as PAME (Protected Area Management

Effectiveness), provide an overall framework or way of assessing how a protected area or system is performing. The majority of evaluations are based upon the IUCN World Commission on Protected Areas Framework (Hockings et al., 2006; Leverington et al., 2008; Nolte et al., 2010). This framework has six components: context, planning, inputs, process, outputs and outcomes (Hockings et al., 2006). Governance appears as only one of 34 headline indicators servicing PAME evaluations, as the process indicator of 'Effectiveness of governance and leadership' (Leverington et al., 2010).

Lockwood (2010) provides one of the few published efforts to integrate evaluation of protected area governance with PAME evaluations. He suggests placing good governance principles 'above' the evaluation components of context, planning, inputs, process, outputs, and outcomes, while alerting us to the need to consider governance in all six components. Under his schema, the governance indicators being developed in this paper would most likely contribute to evaluating the principles of good governance. Here we extend and operationalize Lockwood's (2010) work by providing indicators for measuring achievement of these principles.

An overview of the methods we used to obtain and record managers' views regarding indicators for protected area governance and the subsequent results follow. The discussion addresses the importance of including stakeholders and publicly reporting on park performance, and the central place of management plans, annual reports, and audits in this process. We also discuss the importance of including financial considerations in future governance analyses. The conclusion emphasizes the need to undertake governance assessments over time and space, rather than being 'one-off' events.

METHODS

• **Introducing the Delphi process and workshop participants from protected areas in Western Australia**

A Delphi process was used to access and explore workshop participants' knowledge. Delphi surveys rely on experts commenting on a set of questions or statements, and have often been used in researching complex issues. The Delphi method also provides the opportunity for an expert group to consolidate a number of responses (Hess & King, 2002; Moore et al., 2009).

To develop the indicators of good governance, the process began with a workshop including 33 middle- to senior-level staff from protected area agencies in Western Australia (WA)¹ including the WA Department

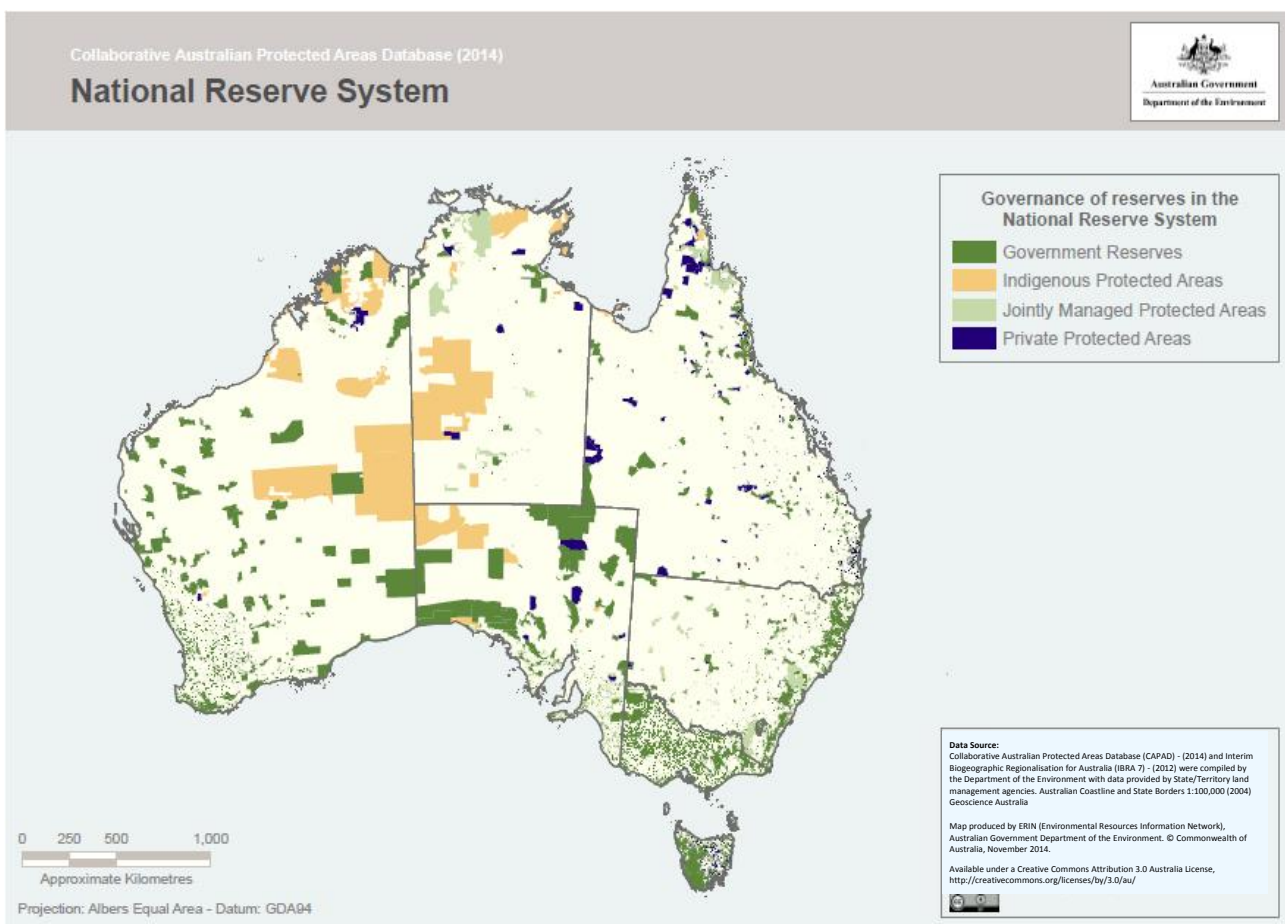
of Parks and Wildlife (WA DPW),² WA Conservation Commission, the Kings Park and Botanic Gardens Authority, and staff from non-government organizations involved in protected area management (Parks Forum, Leave No Trace – Australia), plus environmental science and tourism researchers from two universities (Murdoch University, Edith Cowan University). Over half the participants were from the WA DPW, the Department with responsibility for managing parks, marine parks, and reserves across Western Australia. Almost all the WA DPW staff were from the Parks and Visitor Services Division.

The WA DPW is responsible for managing 100 national parks, 13 marine parks and numerous other conservation reserves (WA DPW, 2016), in a state that is twelve times bigger than the United Kingdom and about three times larger than Texas (Virtual Australia, 2016) (Map 1). These areas receive 16 million visits per annum (WA DPW, 2016). They range from tall eucalypt forests in the southwest to the tropical coastlines of the north. Peri-urban parks experience high visitor numbers, while the more remote Purnululu National Park in northern Australia provides for much lower numbers of visitors, and largely only in the dry season. Spectacular marine parks with displays of tropical corals, such as the World Heritage listed Ningaloo Reef, attract both international and Australian visitors. In recent years indigenous protected areas (IPAs) have increasingly become an important part of Australia's National Reserve System (Map 1). As such, the research reported here is equally as relevant to these IPAs as it is for other types of protected areas.

• **The content and processes of the three rounds of the Delphi survey**

The workshop and follow-up correspondence were treated as a three-round Delphi:

- The workshop was **Round 1**. Participants were briefed as a single group on the 9 UNDP characteristics of good governance and given a copy of Table 1. The group was then divided into 10 smaller groups (Characteristic 5. 'Effectiveness and efficiency' was split and allocated to two groups), with participants pre-allocated to groups of 2-4 people to ensure a mix of managers and researchers within the smaller groups. Each group was given one UNDP good governance characteristic (e.g. equity). They were asked to discuss and agree on two managerial actions (also described as indicators) that would enable measurement of 'their' characteristic. They were also asked to discuss and agree on how achievement of the indicator would be determined and the results from its measurement made publicly



Map 1. Location of government-managed parks and reserves in the state of Western Australia (western third of the Australian continent) (see map for data sources and attributions)

available (i.e. 'output measure'). These written responses were then collected and typed up as a memo for distribution to all participants, as Round 2.

- For **Round 2**, the typed memo of the workshop deliberations was emailed to all participants. Respondents were asked to read the document, confirm (or otherwise) that the information from their small group deliberations and those of the other small groups were correct, and recommend any changes. They were thus asked to comment on the deliberations of all groups, and therefore on the indicators and output measures for all 9 UNDP characteristics.
- **Round 3** involved collating the memo and Round 2 responses into a table, which was sent to all workshop participants. For Round 3 the authors of this paper divided and re-organized the managerial actions into 20 'indicators as questions' that could be asked of protected area governance with each indicator accompanied by output measures. Participants were asked to review this table and provide comments or changes. These comments were then incorporated in a final table.

In all rounds, respondents were asked to reply, even if they had no comment. They were contacted and re-contacted by email, phone and in person (if possible) until they replied.

RESULTS

The response rates were 100 per cent from Rounds 1 and 2, and 79 per cent from Round 3. The lower response rate in Round 3 was due to staff moving or retiring and no longer being contactable or engaged in protected area management.

In the **Round 1** workshop numerous managerial actions were listed by participants including: identifying opportunities to be involved in and developing a framework for decision making; publishing legal and policy directives, and publishing annual reviews on the progress in implementing management plans; identifying, measuring and publishing key performance indicators; and publishing annual reports (App. 1). The changes recommended in response to the typed memo of managerial actions (i.e. **Round 2** of the Delphi) were minor (e.g. changes in grammar, correcting the names of those in the small groups). The changes in response to the table providing the foundation for **Round 3**

Table 2: Indicators for good governance of protected areas compiled through Delphi process with protected area managers

UNDP Characteristic ⁺	Indicator	Output measure					
		Management plan	Annual report		Stakeholder engagement	Audits	Other
			Park-specific*	State /Province			
1. Public participation	a) Are there opportunities for the public to be involved in decision-making including management plans (e.g. Conservation and Land Management Act 1984 (WA) says minimum 2 months for terrestrial, 3 months for marine)?	x *			x		
	b) Is there an advisory committee for the park consisting of key stakeholder groups (including local government, landholders, tourism operators, researchers, conservation/ 'friends of' groups etc.)?				x		
2. Consensus orientation	a) Has a framework been developed for decision making that incorporates stakeholder engagement and/or comment and do they have the right of appeal?	x			x		
	b) Have stakeholder groups been identified for key engagement requirements (e.g. management plans) and are they advised of any decisions/outcomes (e.g. email, annual report etc.)?	x *			x		
3. Strategic vision	a) Is there a publicly available plan/ strategic direction in place for the protected area based on current 'best practice' protected area management guidelines (including stakeholder engagement)? Does this plan outline/ cover any legal and/or other requirements?	x					
	b) Is adaptive management part of the process of this strategic direction/ plan (i.e. measure, review, evaluate, respond), including publishing the results (e.g. annual report)?	x	x				
4. Responsiveness	a) Does the protected area management/strategic plan follow the adaptive management process (i.e. measure, review, re-evaluate, report)?	x					
	b) Is there a report on the process/progress of management/strategic plan (e.g. annual report)?		x	x			
	c) Is there an asset management system* to assist with infrastructure/capital works planning, insurance etc.?						x
5. Effectiveness	a) Is there an annual report that highlights the level of achievement of proposed strategic targets (e.g. KPIs), including biodiversity conservation, visitor experiences/expectations etc.?		x	x			
	b) Are there internal and external auditing processes in place to reveal the degree and success of implementation of strategic/management plans?					x	
6. Efficiency	a) Are protected areas managed under one authority or agency?						x
	b) Does the protected area have internal and external auditing processes in place to identify areas where efficiencies can be made?					x	
	c) Are there opportunities for work to be conducted using partnerships with stakeholders (e.g. traditional owners, volunteers groups, schools etc.)?				x		
7. Accountability	a) Is there an annual report published that reports on managerial activities and accountability (including financial management, strategic goals/targets, external audit results etc.)?		x	x			
	b) Does the protected area operate within a well-developed framework that is available to the public e.g. management plan that identifies policy, review, systems, KPIs etc.?	x					
	c) Are there opportunities for stakeholders and/or the public to participate in protected area management and/or provide feedback?				x		
8. Transparency	Does the protected area publish an annual report including finances, staff numbers, visitor numbers, management plan/KPI achievements, stakeholder consultation/ engagement etc.?		x	x			
9. Equity	Does the protected area employ and develop the park in accordance with local legal requirements concerning equity (including employment within the protected area, access to interpretation etc.)?						x
10. Rule of law	Does the protected area outline the local/ state/ federal/ international legislation it is governed by and include in its annual report its compliance with these (including any fines/charges within the park)?	x	x	x			

⁺10 UNDP categories presented here, rather than the 9 as per Table 1, to retain the split from the Delphi process into efficiency and effectiveness as two separate characteristics.

* Used to show a change as suggested by two or more respondents in Delphi Round 3.



Couple at The Pinnacles, located in Nambung National Park © Tourism Western Australia

responses (i.e. 20 'indicators as questions' and accompanying output measures for good governance) were also minor. These minor comments related to adding, removing or changing the indicators, and clarifying and changing the output measures. Over half of the respondents were happy with the Round 3 table and had no further comments.

Table 2 presents the final results of the Delphi process, that is, it includes the changes recommended through the process. An asterisk (*) in this table indicates where changes were the result of Round 3 deliberations. An example of a change to an indicator was adding park-specific reporting to annual reporting in addition to state/provincewide reporting (Table 2, column 4). An example of a minor change is where the wording from the original Round 3 document, where Indicator 4c mentioned the existence of an 'asset management database', was changed to an 'asset management system'.

Regarding comments about the outputs, half of the respondents suggested that the relevant indicator should be included in a management plan, with the UNDP characteristics of public participation and consensus orientation receiving the most attention. Management plans ultimately, in these results, provided an output measure for almost half of the indicators (8 of the 20).

Additional output measures were suggested and have been included in Table 2 for asset management systems; a single governing authority/agency; and compliance with local legal requirements regarding equity.

DISCUSSION

• The importance of including stakeholders and publicly reporting on park performance

This participatory research produced 20 indicators, in the form of questions, as well as accompanying output measures (i.e. places where the requirements for the indicator would be detailed and the results from its measurement made publicly available). The output measures were management plans, annual reports, stakeholder engagement, and audits (Table 2). Collectively, these results emphasize the importance placed by managers on including stakeholders in protected area governance and management, and having publicly available reporting of the performance of protected areas. The deep interest in stakeholders illustrates the trend over the last two or three decades where protected area governance has become a more multi-level system, empowering and engaging a wider variety of participants (Lockwood, 2010). Having publicly available reporting of performance shows a deep concern with accountability and transparency through public disclosure.



Helicopter flying over the Bungle Bungle Range, Purnululu National Park © Tourism Western Australia

The interest in stakeholders is reflected in stakeholder engagement as an output measure. Such engagement was identified as an output measure for public participation, consensus orientation, efficiency and accountability (Table 2, column 6). This inclusivity underpins all of the IUCN activities associated with good governance (e.g. Borrini-Feyerabend et al., 2013) and is being increasingly emphasized as essential for successful PAME evaluations (Moore & Hockings, 2013).

A deep concern in having publicly available reporting of the performance of protected areas appears in Table 2 as an interest in management plans and annual reports, where these are publicly available documents. For over half of the UNDP characteristics, a management plan was the identified output measure, except for the characteristics of effectiveness and efficiency where an audit was the identified output measure. The other exceptions were the UNDP characteristic of transparency where annual reports were the output measure, and the characteristic of equity where the measure was compliance with local equity requirements. In some countries accountability of financial management and a basic rule of law may be lacking with respect to protected areas, however, this does not negate the importance of publicly available reporting.

- **The importance of management plans**

Importantly, management plans provide a mechanism for specifying a particular indicator, prescribing its measurement, and as a means of reporting periodically and publicly, at a minimum when the plan is revised, on its achievement. Given the importance of these plans, the concerns raised by Eagles et al. (2014) regarding plan quality are worrying. These authors undertook content analysis of 11 published management plans for protected areas within the Ontario provincial parks system. This analysis focused on the question ‘What is the level of policy detail on visitor and tourism policy occurring within this sample of management plans?’. They found that the level of policy detail in management plans was low, with a number of provincial-level policies mentioned on the agency website, but not in management plans. This lack of detail could impede determination of whether the standards of good governance have been achieved or not.

- **Other ways of reporting publicly on governance performance: annual reports and audits**

Annual reports were also an identified output measure for over half of the UNDP characteristics including strategic vision, responsiveness, effectiveness, efficiency, transparency, and rule of law (Table 2). The use of park-

specific annual reports was also highlighted. Such reports are not currently undertaken in Western Australia. The WA Department of Parks and Wildlife is required, however, by its Parliament to report annually on the performance of the system of parks and reserves it manages. Delphi respondents also expressed an interest in park-specific annual reports, especially as a place to report on the implementation and outcomes of adaptive management. Such reporting allows managers to determine whether they are achieving their desired outcomes in an efficient manner (Moore et al., 2003).

Audits were the identified output measure for the UNDP characteristics of effectiveness and efficiency. For the WA Department of Parks and Wildlife, results of an annual audit conducted by the Office of the Auditor General are published in the Department's annual report, a publicly available document. Auditing by an external party assists in accountability to stakeholders and building trust (Dando & Swift, 2003).

- **Protected area management effectiveness (PAME) evaluation and indicators of good governance**

The indicators and measures from this study provide a starting point for measuring good governance as part of PAME efforts. They specifically enable reporting against the UNDP characteristics and standards (Table 1), which enables their use as a reporting mechanism for the achievement of principles, an important point for evaluation, as suggested by Lockwood (2010). Importantly, the attention to output measures also opens up the possibility of using measures such as management plans to report on the 'outputs' of good governance, where outputs are one of the six widely recognized components of PAME evaluations.

- **Budget planning and forecasting as an important indicator**

Arguably, one key element missing from the proposed indicators is budget planning and forecasting. There is potential for this indicator to be included under the UNDP characteristic of strategic vision (Table 2). Although reporting on financial performance is specified under transparency, budget planning and forecasting are not. An important addition to Table 2 therefore is a question focused on budget planning and forecasting, to assist in reporting on achievement of strategic vision.

The WA Department of Parks and Wildlife already report, through their annual report, on expenditure, however forecasting is not included. Such a requirement could be problematic, however, as the majority of their

funding comes from the State government, whose priorities can change rapidly as political circumstances change. This makes budget forecasting very difficult, and highlights that although some practices may be desirable to enhance good governance they may not be politically possible. Traditionally, government-funded protected areas must compete with other public sectors for funding, such as health, education and military, and are increasingly being given lower priority (Eagles, 2013). This is evident in Western Australia; where the Department of Parks and Wildlife had its State-financed budget cut by almost 7 per cent from 2013-14 to 2015-16 (GoWA, 2015).

CONCLUSION

The governance indicators and measures presented in this paper enable protected area managers and other stakeholders to quickly and effectively evaluate the governance of a protected area or areas, in accordance with international best practice, that is, against the standards provided by the UNDP (1997). Together, these indicators and measures provide a simple, quick means of assessing governance for an individual protected area through to a system of such areas. They comprehensively address the good governance principles articulated by Graham et al. (2003)³ that underpin today's approaches to good governance of protected areas (e.g. Borrini-Feyerabend et al., 2013; Borrini-Feyerabend & Hill, 2015). The results from applying the indicators can assist in reviewing and adjusting management, with particular attention to adaptive management (see Responsiveness, Table 2).

Such evaluations do not need to be laborious, as illustrated by the indicators and measures outlined in Table 2. They can be efficient and effective, and through the use of a handful of measures including management plans, annual reports, audits, and stakeholder engagement, managers can relatively easily measure and then evaluate their performance against international standards (i.e. UNDP, 1997). These results are, however, based on only one state, with heavy involvement by a single protected area government management agency. Next important steps to extend this exploratory research include: further refining these indicators and measures with other stakeholders (Newsome et al., 2013); implementing the indicator set and accompanying measures across a range of case studies (including countries where good governance characteristics such as accountability of financial management and a rule of law may be lacking) to determine their functionality and applicability; and continuing the analysis beyond identification of indicators to their inclusion in wider



Aerial view of Lucky Bay, located in the Cape Le Grand National Park © Tourism Western Australia

PAME efforts (Leverington et al., 2010; Lockwood, 2010). Critical to these future efforts is such research being undertaken by a wide range of protected area managers, beyond government-managed entities. This expanded range includes indigenous and private arrangements, plus numerous combinations (Eagles, 2009). The Delphi process underpinning this study provides an effective means for undertaking future research.

For governance evaluations to succeed, protected area managers and their stakeholders need the resources and capacity to undertake the design and implementation of such systems. Building capacity requires a commitment to identifying the competencies needed and developing delivery mechanisms (Eagles, 2014). Agencies also need the resources and commitment to make change based on evaluation results. Institutionalization of a culture of evaluation, and especially support from an agency's executive are fundamental to success (Moore & Hockings, 2013). Also essential for success is a culture of engaging, including, and consulting with the public. The indicators and output measures developed in this paper provide a promising way forward that can be followed given existing capacities. Additional capacity will only enhance our opportunities for good governance into the future.

ENDNOTES

¹ In Australia protected area management is largely a state rather than national government responsibility.

² At the time this research was conducted the Department was named the WA Department of Environment and Conservation; for currency and convenience its current name is used in this paper.

³ Graham et al.'s (2003) good governance principles for protected areas map directly onto the UNDP (1997) characteristics of good governance and were derived from them.

ABOUT THE AUTHORS

Brooke Shields works as a Research Assistant with the Nature Based Tourism Research Group at Murdoch University, Western Australia. She graduated with First Class Honours in Environmental Science in 2013, with her thesis examining governance of Western Australian protected areas. Since graduating, she has also worked with Western Australia's Department of Parks and Wildlife Visitor Research Unit. She has research interests and expertise in protected area governance, wildlife tourism and conservation, and wilderness in marine landscapes.

Susan Moore leads the Nature Based Tourism Research Group at Murdoch University, Western Australia. Her expertise is natural area tourism, protected area management and biodiversity conservation policy. She has 190 publications including journal articles, books and reports and has led more than 30 research projects delivering outputs to industry, government and non-government organizations. Her jointly authored book *Natural Area Tourism: Ecology, Impacts and Management* is a best seller and can be found in 471 libraries globally. Professor Moore has undertaken research and provided advice on protected area management in Taiwan, South Africa, Finland, Iceland and Indonesia, and in all states and territories of Australia. She is a member of the IUCN World Commission on Protected Areas.

Paul F. J. Eagles is an Emeritus Professor at the University of Waterloo and a Walter Murdoch Adjunct Professor at Murdoch University. He specializes in environmental, recreation and tourism planning, with 40 years of planning experience. He has undertaken planning and research in this field in over 25 countries and has 360 publications. He was Chair of the Global Task Force on Tourism and Parks for the World Commission on Protected Areas of the IUCN from 1996 to 2008. He has been a consultant on tourism for numerous agencies in Canada, World Bank, World Tourism Organization, United Nations Development Programme, United Nations Environment Programme, Forestry and Agricultural Organization of the United Nations, and nature conservation agencies of Sweden and Finland.

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Perth Coastal Plain, Yanchep National Park © Russell Barton

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APPENDIX 1

Summary of managerial actions and output measures as collated from the Delphi Round 1 workshop and subsequently distributed to participants as the basis for Round 2 input.

PUBLIC PARTICIPATION. Public participation means all people should have a voice in decision making, either directly or through legitimate intermediate institutions that represent their interests.

Managerial activity 1.1: Identify annually the spectrum and number of opportunities for people to be involved in decision making, for example through submissions to management plans, community forums, volunteering opportunities.

Managerial activity 1.2: Identify key stakeholder groups and conduct an annual forum for representatives of those key stakeholders.

CONSENSUS ORIENTATION. Consensus-oriented decision making is the ability to mediate differing interests to reach broad consensus on what is in the best interest of the group.

Managerial activity 2.1: Develop a framework for decision making that requires the outcome of any process

to be achieved through the consensus views of the stakeholders involved. Publishing an annual report that reveals the outcomes of decision making as achieved through consensus was noted as an important output measure.

Managerial activity 2.2: Utilize a reporting and auditing framework that ensures that a consensus approach was taken and the framework's guidelines were followed.

STRATEGIC VISION. Strategic vision refers to a broad and long-term perspective on good governance including an understanding of the historical, cultural and social complexities in which that perspective is grounded.

Managerial activity 3.1: Outline law and policy directives that outline the strategic plan for the park. Having a management plan was assumed for this indicator.

Managerial activity 3.2: Publish the legal and policy directives that guide the strategic plan for the park. Reviewing, measuring and evaluating are important here.

RESPONSIVENESS. Responsiveness occurs when institutions and processes try to serve all stakeholders using a proactive manner regarding complaints and public criticisms.

Managerial activity 4.1: Identify once every five years the efficient and effective planning processes used for the management plan/strategic plan/project/programme plans. Connected to corporate goals, legislation and policy. Includes policy implementation, review and revision and embraces adaptive management.

Managerial activity 4.2: Publish an annual review of policy and plan implementation based on an independent annual audit process and an annual report per park and group of parks.

Managerial activity 4.3: Create an asset management database.

EFFECTIVENESS. Effectiveness refers to the capacity to realize organizational objectives.

Managerial activity 5.1: Publish annually the level of achievement of stated management objectives including KPIs that are measurable.

Managerial activity 5.2: Implement measures, such as review and audits, that reveal the degree of implementation of KPIs.

EFFICIENCY. Efficiency refers to making the best use of resources. It is the capability of acting or producing effectively with a minimum amount or quantity of waste, expense or unnecessary effort.

Managerial activity 6.1: Create a unified, single authority for the management of parks.

Managerial activity 6.2: Identify KPIs, to be audited by an external body, such as the Auditor General's Office.

Managerial activity 6.3: Identify the level of conservation achieved through partnerships with stakeholder groups.

ACCOUNTABILITY. Accountability is the requirement that officials answer to stakeholders on the disposal of their powers and duties, act on criticisms or requirements made of them and accept responsibility for failure, incompetence or deceit.

Managerial activity 7.1: Publish an annual report that reveals managerial activities in sufficient detail as to reveal accountability.

Managerial activity 7.2: Develop a framework to operate within (e.g. management plan), which identifies policy, review, systems and KPIs. This must be accompanied by independent audit, accompanied by action, communication and review.

TRANSPARENCY. Transparency is the sharing of information and acting in an open manner.

Managerial activity 8.1: Publication of an annual report reporting on KPIs such as staff numbers, budget, visitor numbers, management plan implementation; stakeholder consultation information; transparency on ownership, management and income sources.

Managerial activity 8.2: Engage in ongoing visitor monitoring of overall use, as well as specific facilities, programmes and activities.

EQUITY. Equity is just treatment, requiring that similar cases are treated in similar ways.

Managerial activity 9.1: Ensure equity in employment.

Managerial activity 9.2: Ensure equity in access including disability, foreigners, complaint handling and fees (social class and affordability).

RULE OF LAW. Application of the rule of law refers to legal frameworks being fair and enforced impartially.

Managerial activity 10.1: Annually publish compliance reports against the management plan and its user base using SMART KPIs.

Managerial activity 10.2: Report on comparable practice or reference best practice in reporting rule of law activities.

RESUMEN

La gestión eficaz de las áreas protegidas se basa en una buena gobernanza. Se hizo una evaluación utilizando como punto de partida las características normativas de la buena gobernanza para el desarrollo sostenible establecidas por el Programa de las Naciones Unidas para el Desarrollo. La evaluación de la gobernanza basada en indicadores es esencial para una gestión eficaz a través del mejoramiento de la práctica. Aunque existen indicadores y marcos de evaluación, estos no ofrecen a los administradores de áreas protegidas una medida rápida y completa de la gobernanza. Utilizamos un método Delphi de tres rondas con una dotación de 33 gestores e investigadores de organizaciones gubernamentales y no gubernamentales, y universidades. Este proceso participativo de investigación estableció un conjunto de 20 indicadores relativos a la participación del público, orientación de consenso, visión estratégica, capacidad de respuesta, eficacia, eficiencia, rendición de cuentas, transparencia, equidad, y estado de derecho. Las medidas de resultados se apoyaron también en planes de gestión, informes anuales, auditorías y grupos de interés. Las conclusiones ponen de relieve la contribución de los planes de gestión y los informes anuales en el establecimiento de los requisitos de evaluación y en la provisión de un lugar donde los resultados puedan estar disponibles al público. Se recomienda una mayor investigación participativa para perfeccionar estos indicadores y aplicarlos en una diversidad de contextos.

RÉSUMÉ

La bonne gouvernance est cruciale pour garantir l'administration efficace des aires protégées. Une évaluation s'appuyant sur les principes de bonne gouvernance du Programme des Nations Unies pour le Développement a été mise en place. Pour assurer une gestion durable, efficace et en perpétuelle amélioration, il est essentiel de pouvoir s'appuyer sur un éventail d'indicateurs précis. Bien que les indicateurs et les outils de mesure soient disponibles, ils ne permettent pas aux gestionnaires d'aires protégées d'obtenir une évaluation rapide et exhaustive de la gouvernance. Nous avons utilisé la méthode Delphi en trois étapes et engagé un groupe de 33 managers et chercheurs en provenance d'organisations gouvernementales, non-gouvernementales, et d'universités. Cet exercice collectif a établi un ensemble de 20 indicateurs portant sur la participation du public, la recherche de consensus, la vision stratégique, la réactivité, l'efficacité, le rendement, la responsabilisation, la transparence, l'équité et la primauté de droit. L'évaluation des résultats a été rendue possible grâce à des plans de gestion, des rapports annuels, des audits et l'engagement des parties prenantes. Les conclusions démontrent l'importance des plans de gestion et des rapports annuels pour permettre la juste évaluation et l'archivage des résultats afin qu'ils soient consultables. Davantage de recherche participative est préconisée pour affiner ces indicateurs et les appliquer dans une diversité de contextes.



NATURAL ICONS AND THREATS: AN APPROACH TO LANDSCAPE CONSERVATION PLANNING

Brendan Mackey^{1*}, Peter Jacobs², Luciana Porfirio³ and Sonia Hugh⁴

* Corresponding author: b.mackey@griffith.edu.au

¹Griffith Climate Change Response Program, Griffith University, Queensland, Australia

²People in Nature

³CSIRO Oceans & Atmosphere, The Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia

⁴The Fenner School of Environment and Society, The Australian National University, Canberra, Australia

ABSTRACT

Park management in complex landscapes spanning jurisdictions is often limited by the lack of shared management priorities and a common spatial information system. Furthermore, current approaches may lead to a reductionist approach by focusing on a narrow range of park features in isolation from their landscape context. The natural icons and threats framework is proposed as a complementary approach that can provide a more holistic perspective to managing biodiversity and nature conservation features and their threats across large and multi-jurisdictional natural landscapes. The first step is to engage managers and stakeholders in helping define natural icons, that is, widely recognized, significant and characteristic natural landscape features, and to identify threats to their condition. A GIS database of the icons and threats is developed that can be interrogated by park managers to identify conservation management priorities utilizing a decision support system. The 1.6 million hectare Australian Alps national parks network, comprising 11 protected areas spanning three States, was selected as a case study. The Multi-Criteria Analysis Shell for Spatial Decision Support tool was used to visualize and interrogate the spatial information. Critical and high priority areas for management intervention were identified and compared to current protected area agency programmes.

Key words: park management, multi-jurisdictions, decision support, whole-of-landscape planning

INTRODUCTION

The major focus of systematic conservation planning is biological conservation or biodiversity. For planning purposes, biodiversity is typically defined in terms of a selection of native species and broadly defined ecosystems, often using vegetation types as a surrogate, for which data are available (Felton et al., 2009). Increasingly, conservation planning is paying attention to ecological and evolutionary processes that sustain these elements of biodiversity including biological dispersal, habitat connectivity, wilderness quality and refugia (Klein et al., 2009). Furthermore, conservation policies now recognize the need for planners and managers to explicitly address threatening processes (Carwardine et al., 2012).

While systematic conservation planning has made a welcomed contribution to more cost-effective allocation of limited conservation resources, current approaches

are limited. Most, if not all, approaches to systematic conservation planning are inevitably reductionist. Data limitations mean that the majority of the species, communities, and processes that comprise biodiversity cannot be factored into the optimization algorithms (Bottrill et al., 2011). A corollary is that current approaches are strongly positivist in that only those things that can be measured are considered to hold value. Not everything that society values about nature conservation, however, can be measured and subjected to optimization algorithms.

The computational reductionism and positivism imposed by systematic conservation planning also tends to alienate the public who relate more to landscape features. This is a practical problem as the public's political support is needed for conservation investments to be forthcoming and sustained over time. Current approaches can also alienate land managers whose

management units are defined at the landscape level and who must deal with conservation assets and threats in an integrated way (Worboys & Mackey, 2013). Finally, in a world of rapid global environmental change, including climate change and increasing land use pressures, conservation planners need to consider the fate of the common, abundant and characteristic biodiversity and natural features, in addition to the rare and threatened.

In response to these limitations, we propose here an approach to conservation planning based on a 'natural icons and threats framework'. This framework promotes a landscape level focus that can complement established systematic conservation planning approaches. We test our new framework with a case study of the multi-jurisdictional Australian Alps National Parks Network (Australian Alps, 2012), hereafter called the Alps Network. We compare the framework with the current approaches to landscape scale biodiversity decision-making used by the various government agencies responsible for managing this common landscape that spans three State jurisdictions.

THE NATURAL ICONS AND THREATS FRAMEWORK

The natural icons and threats framework facilitates a landscape-level strategic assessment of the values, threats and condition of a protected area. The framework facilitates stakeholder engagement in the planning and management process by focusing on the natural values of widely recognized landscape features and addressing their key threats. The framework promotes a more holistic appreciation of the conservation values of protected areas as the identified icons will integrate many elements of biodiversity and natural values that are more typically considered in isolation and often out of their landscape and geomorphological context. The approach also provides a way of identifying decision making around priority actions and resource allocation in a way that is transparent to stakeholders and practitioners alike. Applying the framework involves the following three steps.

- **Step One – Natural icons**

Identify a set of key stakeholders who have a direct and sustained interest in the natural values of the protected area and their long-term conservation. Stakeholders can include park managers, researchers, eco-tourism operators, environmental NGOs, and neighbouring residents. The stakeholders are interviewed to help identify the protected area's natural icons: significant natural landscape-level features that are widely recognized and that symbolize, epitomize, characterize or define the protected area. These natural icons are intended to be defined broadly and can include, for

example, dominant vegetation communities or landforms. Each iconic feature will contain a diversity of component elements (species, communities, land units) each of which can independently possess their own conservation value.

The stakeholder-defined icons can be cross-validated with published information about the conservation values of the protected area. Typically however, while tourist and public educational materials may speak to iconic landscape features, formal research and management reports and literature may only focus on the component elements and particularly on listed threatened species and communities. Often, iconic landscape features may not be currently threatened but may be at risk from future threats such as climate change.

- **Step Two – Threats**

The second step is to identify the key threats to the nominated iconic landscape features. Examples of threatening processes include invasive plant and animal species, recreation and tourism activities, infrastructure development, climate change, and altered fire regimes. The threat is evaluated by its level of impact on the integrity (i.e. ecological condition) of the landscape feature. Threats to natural icons can be identified through a combination of literature review and stakeholder surveys. The latter is important because many protected areas lack the necessary monitoring systems to identify current threats at specific locations.

- **Step Three – Decision support**

The third step requires developing spatial data layers that represent the geographic distribution of each of the iconic landscape features and the threats. For large protected areas that cross jurisdictions, this approach catalyses the development of common Geographic Information System (GIS) spatial data-packs. A GIS-based decision support tool is then used to map the icons and threats and explore their geographic overlap. This spatial information provides a basis for engaging with stakeholders and decision makers about management priorities.

We use the Multi-Criteria Analysis Shell for Spatial Decision Support (MCAS-S), (ABARES, 2014, Lesslie et al., 2008) to visualize and analyse the spatial data layers of the icons and threats. Usually, these spatial data layers will have to be first generated using a computationally sophisticated GIS such as Arc GIS (ESRI, 2011), drawing upon available data. MCAS-S is a decision support tool designed specifically for non-GIS users to easily explore spatial data and apply them to natural resource

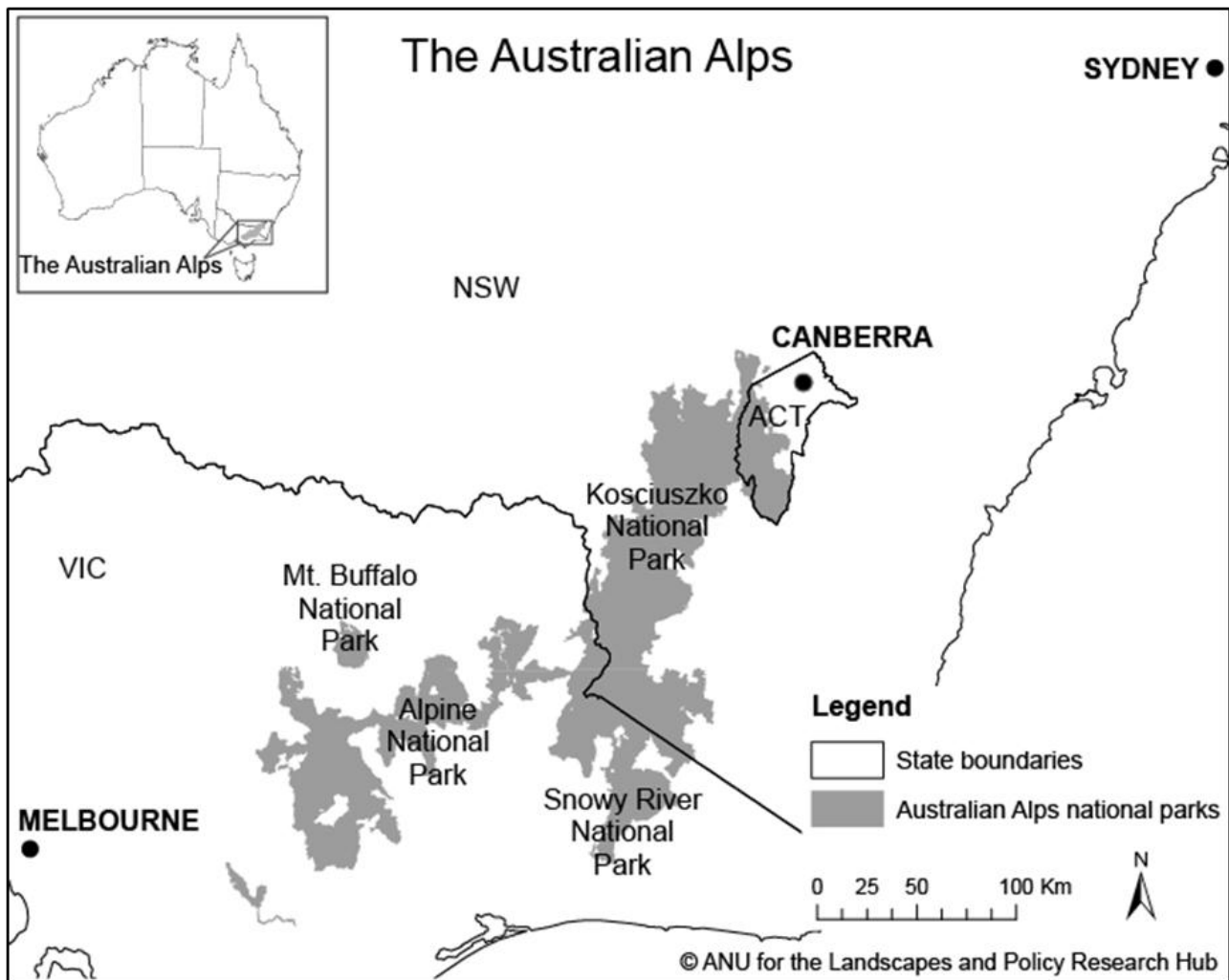


Figure 1: The national parks that comprise the Australian Alps Network

management and planning problems. MCAS-S has an intuitive and user-friendly interface that enables managers with a minimum of training to interrogate data layers and pose management questions for the landscape of interest. Using MCAS-S on laptop or desktop computers, managers and stakeholders can readily combine maps of the landscape icons and their threats with existing datasets to inform their coordinated, landscape-wide decisions.

CASE STUDY: AUSTRALIAN ALPS PROTECTED AREA NETWORK

The Alps Network was chosen as a case study to investigate the application of the icons and threats framework and explore the benefits of establishing a shared information base and common decision support system for, among other things, identifying whole-of-Alps Network management priorities. The study enabled us to test the utility of the framework in providing a pathway to a shared understanding of natural values and threats between the management agencies and supporting coordinated decision making in the complex Alps Network landscape. We addressed two questions

that are relevant to park managers responsible for determining the critical and high priority areas for invasive species programmes across the Alps Network:

1. Which natural icons are currently free from invasive species threats and where, i.e., the refugia locations, arguably most important to protect from future invasions; and
2. Which natural icons are under threat from invasive species and where?

• Alps Network overview

The Alps Network comprises 11 protected areas spanning 1.6 million hectares across the States of Victoria and New South Wales and the Australian Capital Territory (Figure 1 & Appendix 1 of the supplementary material available online ¹). Each of the three State/Territory government agencies respectively manages the park areas within its jurisdiction, in accordance with State based legislation. Interagency cooperation is promoted through the Australian Alps Co-operative Management Program (Australian Alps, 2012). There is, however, no whole-of-Alps Network management plan, central warehouse for environmental information and records or decision

Table 1: Brief description of the natural icons of the Australian Alps Network

Natural Icon	Brief Description
Alpine Peaks	The Alpine Peaks are the distinctive lofty treeless peaks and high ridges prominent in the landscape, characterized by steep slopes positioned above the tree line.
Treeless High Plains and Frost Hollows	The high plains are expansive and treeless flat to undulating features at higher elevations, snow covered in winter and spring. The undulating nature of the topography leads to associated frost hollows where cold air drains, leading to conditions too cold for tree growth.
Alpine Wetlands	The Alpine Wetlands describe the bogs and Peatlands that occur in high altitude wetlands and waterways at the tops of the extensive water catchments.
Snow Gum Woodlands	Snow Gums cover extensive areas at the highest elevations that trees can grow and embody much of what people recognize as typifying the Alps landscape.
Tall Wet Forests	The Tall Wet Forests are dominated by Alpine Ash (<i>Eucalyptus delegatensis</i>) and Mountain Ash (<i>E. regnans</i>) canopy species
Rainshadow Woodlands	The Rainshadow Woodlands are a distinctive landscape feature occurring in the upper Snowy River Valley
Heritage Rivers	The mighty river systems draining to both sides of the Great Dividing Range. The best known is the Snowy River, rich in folklore as it feeds water from the summit of Mount Kosciuszko to the ocean.

support system. Strategic assessment of values and threats is limited by the three different environmental management systems and datasets. Management plans for the individual parks take a varied approach to identifying and categorizing values and there is no strategic assessment of focal values.

• Identifying the Natural Icons

The Alps Network contains hundreds of listed communities, species and notable features dispersed across the landscape and recognized in several pieces of State and Commonwealth legislation. There are also important values held highly by the community that may not be found on formal lists. The Australian Alps National Landscape Destination Management Plan identifies additional social values, many related to legends and the human spirit and their relationship with the dramatic topography and snow of the high mountain landscape, its unique flora and fauna adapted to the harsh conditions, its Snow Gums (*Eucalyptus pauciflora*), wildflowers and mighty rivers (AANL, 2010). The task of identifying the key natural icon values therefore combined landscape ecology with community-held values.

We compiled a preliminary list of natural icon values, drawing upon expert knowledge of the landscape. A survey was designed and implemented on the online survey facility 'SurveyMonkey.com' (Massat et al., 2009). The survey group of 46 were mostly Alps Network protected area agency staff with a smaller number of Alps specialists from outside of the protected area agencies, selected for a variety of expertise to provide a wide range of knowledge.

The survey questions asked them to (1) consider whether they agreed or not with each of the preliminary listed natural icon features, (2) rank their importance and (3) record features they saw as icons but were absent from the preliminary list.

We obtained 27 responses, 10 from ecologists/scientists, nine from park managers/rangers, two from recreational users, one consultant and five others. Based on the responses, the following seven natural iconic features were chosen to characterize the Alps Network: (1) Alpine Peaks; (2) Treeless High Plains and Frost Hollows; (3) Alpine Wetlands; (4) Snow Gum Woodlands; (5) Tall Wet Forests; (6) Rainshadow Woodlands and (7) Heritage Rivers (see Table 1 & Appendix 2 (a) of the supplementary material available online ⁴).

The preliminary list of natural icons was largely endorsed with the highest agreement being around the Alpine Peaks, Treeless High Plains and Frost Hollows, and Alpine Wetlands. The single species, Mountain Pygmy Possum (*Burramys* spp.) and Corroboree Frog (*Pseudophryne* spp.) were less supported and were therefore not included here, enabling a focus on the endorsed landscape scale features. Geographic features such as glacial lakes, karst areas and boulder fields, and vegetation communities of snow patch, feldmark and old growth forest were also identified as icons by some survey respondents. While these biological and geographic features are of documented conservation significance for the Alps Network, for the purposes of this study they are encompassed by the identified broader landscape scale natural icons and can be incorporated as components in their descriptions.



Alpine Peaks icon, Mt Kosciuszko Main Range, Kosciuszko National Park © K McCallum

• Identifying the Threats

The Alps Network has been and continues to be subjected to a range of pressures and threats to the good health and condition of its biodiversity and ecosystems. The Alps Network in toto is sufficiently large to absorb small scale perturbations without serious impacts. However, there are emerging threats which operate, or threaten to operate, at larger scales with the potential for significant negative impacts for biodiversity. Notable large-scale threats include feral horse impacts on wetlands (Nimmo & Miller, 2007) and changed fire regimes from climate change (DEWHA, 2009). Furthermore, the natural resilience of ecosystems can be enhanced by reducing the impact of manageable threats so ecosystems are able to absorb and recover from these threats (Parks Victoria, 2014a).

We decided to focus on identifying the most important threats in the Alps Network associated with invasive species as these are the key threat abatement works currently under the control of and being carried out by managers. As with the natural icons, a list of the key threatening invasive species was derived based on a qualitative survey of selected stakeholders using the online survey facility 'SurveyMonkey.com' (Massat et al., 2009).

We compiled a preliminary list of key (threatening) invasive species based on expert knowledge and current protected area agency programmes. The survey was sent to a similar stakeholder group as for the natural icons survey. In the survey they were asked to consider whether they agreed or not with the preliminary list of key invasive species as key threats, to prioritize their importance, and identify important unlisted invasive species. The survey responses were benchmarked against the Parks Victoria State of the Parks Report (Parks Victoria, 2014b) that sought similar information.

Based on the 28 survey responses received, and confirmed through the benchmarking, the following nine invasive species were considered the most significant threat to the biodiversity of the Alps Network, generally in order of importance: (1) Feral Horses; (2) Hawkweeds; (3) Brooms; (4) Deer; (5) Oxeye Daisy; (6) Blackberries; (7) Willows; (8) Pigs; and (9) Foxes; (see Appendices 2 (b) & 3 of supplementary material available online ¹).

The preliminary list of invasive species threats was largely endorsed in the survey results with a strong view that feral horses and hawkweeds are the most important threats to key values. Other invasive species identified by survey respondents as threats are all locally important



Feral Horses are a key threat to several natural icons © James Shannon

but were not considered to be of landscape-scale impact. However, they may be added to the list of key threats in the future.

- **Developing the spatial data layers**

Having identified the set of icons and threats, the next step required development of spatial data layers that represent their distribution across the Alps Network.

As there is no GIS database held in common across the three jurisdictions, component data had to be first accessed from various sources for each icon and threat, and combined to provide a whole-of-Alps Network coverage. These spatial analyses were undertaken in ARC GIS and R software (R Core Team, 2012) and output layers prepared in MCAS-S format. Other ancillary datasets were also developed and incorporated into the MCAS-S data-pack. The most significant of these new datasets was a map of the vegetation cover. The data sources for each of the natural icons and invasive species are summarized in Appendices 4 and 5 of the supplementary material available online ¹.

- **Supporting data**

Vegetation map: A fundamental dataset for biodiversity conservation relevant to many of the icons and threats is a map of native vegetation cover showing the composition and structure of major plant communities for the Alps Network. While vegetation maps and reports that capture the bioregion's distinctive plant communities have been produced by jurisdictions, no common vegetation classification system or map existed at that scale for the Alps Network. The national-scale native vegetation layer generalizes community types to

the point where Alps-specific categories are not recognized (NVIS, 2007). To fill this gap, a common vegetation classification was developed to generate a new digital vegetation map for the Alps Network utilizing existing mapped data and other sources of published information from the three jurisdictions. Data sources, methods and the details of the common classification and map are provided in Mackey et al. (2015).

Catchment Condition: A catchment condition index and map (Worboys & Good, 2011) was used to provide a dataset that described the degree to which water sub-catchments have been ecologically degraded by contemporary land use impacts including fire and invasive species and likely trends in these conditions.

Other: A range of other datasets for standard geographic mapping features and information were also included in the data-pack. These included place names, populated places, primary roads, ski resorts, State boundaries, walking tracks and water-bodies (Geoscience Australia, 2014).

- **Presenting and integrating the data**

Analyses were undertaken to address the two questions posed above by using MCAS-S to combine selected spatial data layers using a computationally simple raster map calculation whereby each pixel was flagged as having a threat or icon present if that pixel was so identified in each primary data layer. The grid resolution of the MCAS-S data layers was 250m. Map algebra was then used to overlay the combined data layers to calculate the area of the Alps Network that was an 'icon free from threats' and the area that was an 'icon under threat'.

Table 2: Spatial statistics from MCAS-S analysis of natural icons and threats for the Alps Network

Natural Icon	Total area (Km ²)	% Area under threat from one or more invasive species *	% Area not under threat from invasive species
Alpine Peaks	153	45	55
Treeless High Plains and Frost Hollows	1,190	82	18
Alpine Wetlands	96	89	11
Snow Gum Woodlands	1,687	99	1
Tall Wet Forests	1,598	68	32
Rainshadow Woodlands	1,210	69	31
Heritage Rivers	336	71	29
Whole Alps Network	16,573		

* Subject to variable accuracy and confidence levels of available agency data. Some data represent treatment records and others presence, some polygonal and others buffered point data.

• Comparison with current park management programmes

We also undertook a qualitative comparison of current approaches to invasive management in the Alps Network with the priorities identified by the MCAS-S analysis based upon the natural icons and threats framework approach. For this comparison we drew upon publicly available documents, focusing on the Alpine National Park in Victoria for a more detailed comparison.

RESULTS

Spatial statistics are detailed in Table 2 of the MCAS-S analysis undertaken to reveal natural icon areas free from or subject to threats. The data layers used in this analysis and the map overlay calculations are illustrated in Appendix 6 of the supplementary material available online ¹.

• Identification of management priorities for invasive species programmes

Priorities for invasive species management intervention were identified by using the stakeholder interviews to weight those icons under single or multiple threats from invasive species. This analysis identified geographic areas that should be given special consideration by managers when determining conservation management plans and resource allocations for programme implementation.

We proposed that areas of natural icons currently not under threat from invasive species should be considered a 'critical priority' for protection to ensure they maintain the integrity of their natural values (Figure 2). These areas require on-going surveillance and early intervention to prevent new threats from becoming established.

We also proposed that the next priority for management intervention ('high priority') should be those icons under

the most serious threat. The Alpine Peaks, Alpine Wetlands and Treeless High Plains and Frost Hollows natural icons were considered by the stakeholders surveyed to be the highest priorities for biodiversity and this is somewhat supported by the protected area management plans. The worst threats to these icons were identified as feral horses, hawkweeds, willows and Oxeye daisy. Analysis of these multiple priority icons and multiple threats using MCAS-S identified high priority areas for management intervention (Figure 2,overleaf).

• Comparison with current approaches

The three management plans that cover most of the Alps Network present different approaches to the identification and prioritization of landscape features and focal targets, and therefore the outcomes vary considerably. The approaches taken by the Alps Network park agencies are summarized in Appendix 7 of the supplementary material available online ¹.

In Victoria, the entire area is classified into five broad 'natural ecosystems' (Parks Victoria, 2014a). While the condition, values and threats to those natural ecosystems are identified, the features are not given any focus in terms of their role in contributing to the characteristic and significant natural values of the landscape. For example, the 'Alps' natural ecosystem encompasses most of the highly valued natural features of the alpine landscape in one category.

In New South Wales, the characteristic natural values of the Alps are identified through description of seven key elements, a number of vegetation features of international and regional significance and identification of three areas of 'Outstanding Natural and Cultural Significance' (Department of Environment and Conservation, 2006). The relationship between these features is unclear in terms of identifying priority landscape focal features.

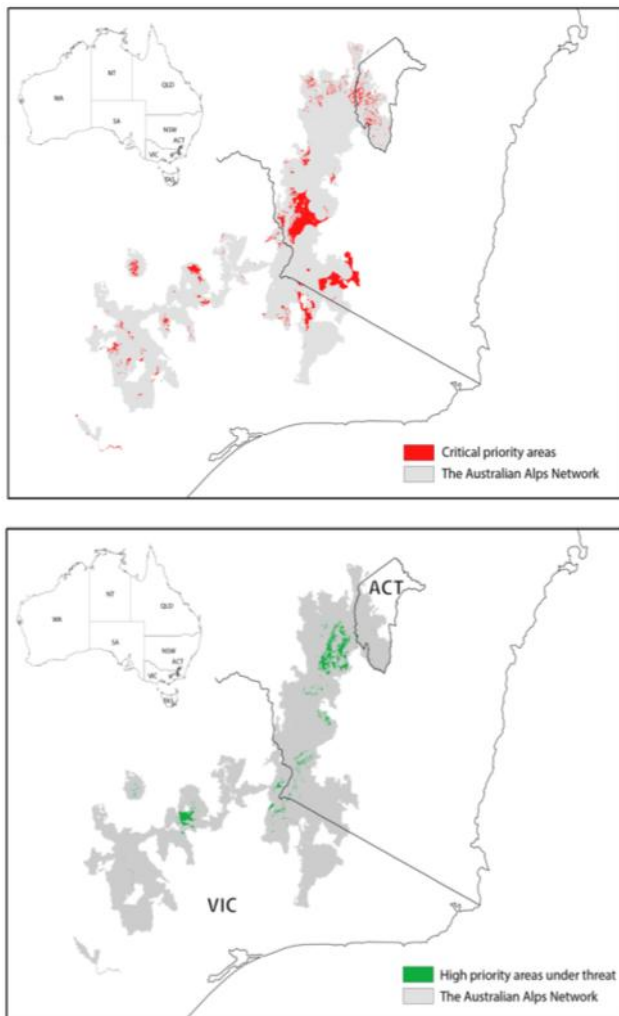


Figure 2: Top – critical priority areas, i.e., areas of natural icons currently not under threat from invasive species in the Alps Network; Bottom – high priority areas, i.e., areas of natural icons under the most serious threat from invasive species in the Alps Network

In the ACT, three vegetation features in Namadgi National Park have been identified as requiring special protection and management, and particular threats are identified (ACT Government, 2010).

It is difficult to find a shared position amongst the Alps Network agencies to identifying vegetation, landscape features or focus areas across the Alps Network. The three jurisdictions determine invasive species priorities through the development of various weed and pest strategies and invasive species programmes. However, the approach to the identification of natural assets in those strategies varies somewhat and the regional strategies are in the context of State and regional priorities rather than the perspective of protected area landscapes across the Alps Network. The outcome, however, in terms of the target invasive species across the Alps Network is generally common, with feral horses, pigs, deer, rabbits, foxes, goats, willows, hawkweed,

Oxeye daisy, blackberry and Scotch broom consistently being priority target species, among others on a local scale.

To compare the results from the MCAS-S analysis, based on the natural icons and threats framework, with a current invasive species management programme in the Alps Network, we focused on Victoria's Alpine National Park Intensive Management Program (AIM) as it is a recent invasive species strategic initiative with data readily available (Parks Victoria, 2015).

The current foci of the AIM Program are: (a) weed control in alpine peatlands; (b) feral horse control in the Alpine Wetlands and Treeless High Plains and Frost Hollows and Snow Gum Woodlands of the Bogong High Plains and Eastern Alps; (c) riparian weed control on Heritage and other rivers; (d) willow and hawkweed control in the Alpine wetlands and Treeless High Plains and Frost Hollows of the Bogong High Plains; (e) feral goat eradication in the Rainshadow Woodlands; (f) deer control trials in the Bogong and Wonnangatta areas; (g) English and Cape broom in the Mitta and Wonnangatta Valleys; and (h) gorse eradication in small infestations. We compared these foci with our analysis that identified 'critical' and 'high' priority areas (Figure 2) and the results are shown in Figure 3.

The comparison indicates that:

1. The AIM Program has an emphasis on the high priority areas and identifies protection of Alpine Wetlands and Treeless High Plains and Frost Hollows from the impacts of feral horses, willows, hawkweeds and Oxeye daisy;
2. The AIM Program has no apparent emphasis on the critical priority areas, i.e., the Alpine peaks, Alpine Wetlands and Treeless High Plains and Frost Hollows that are currently free from threats; and
3. The AIM Program emphasizes areas not determined as high or critical priority areas but that do generally align with the protection of other natural icons including riparian weed control, feral goat eradication in Rainshadow Woodlands, English broom control in riparian and lower forest areas, along with deer control trials and localized gorse eradication.

DISCUSSION AND CONCLUSION

The Alps Network is a complex of 11 protected areas, managed by three protected area agencies with co-operative management facilitated through the Australian Alps national parks Co-operative Management Program. We found that while this programme seeks to manage the area as one park with complimentary plans, there is

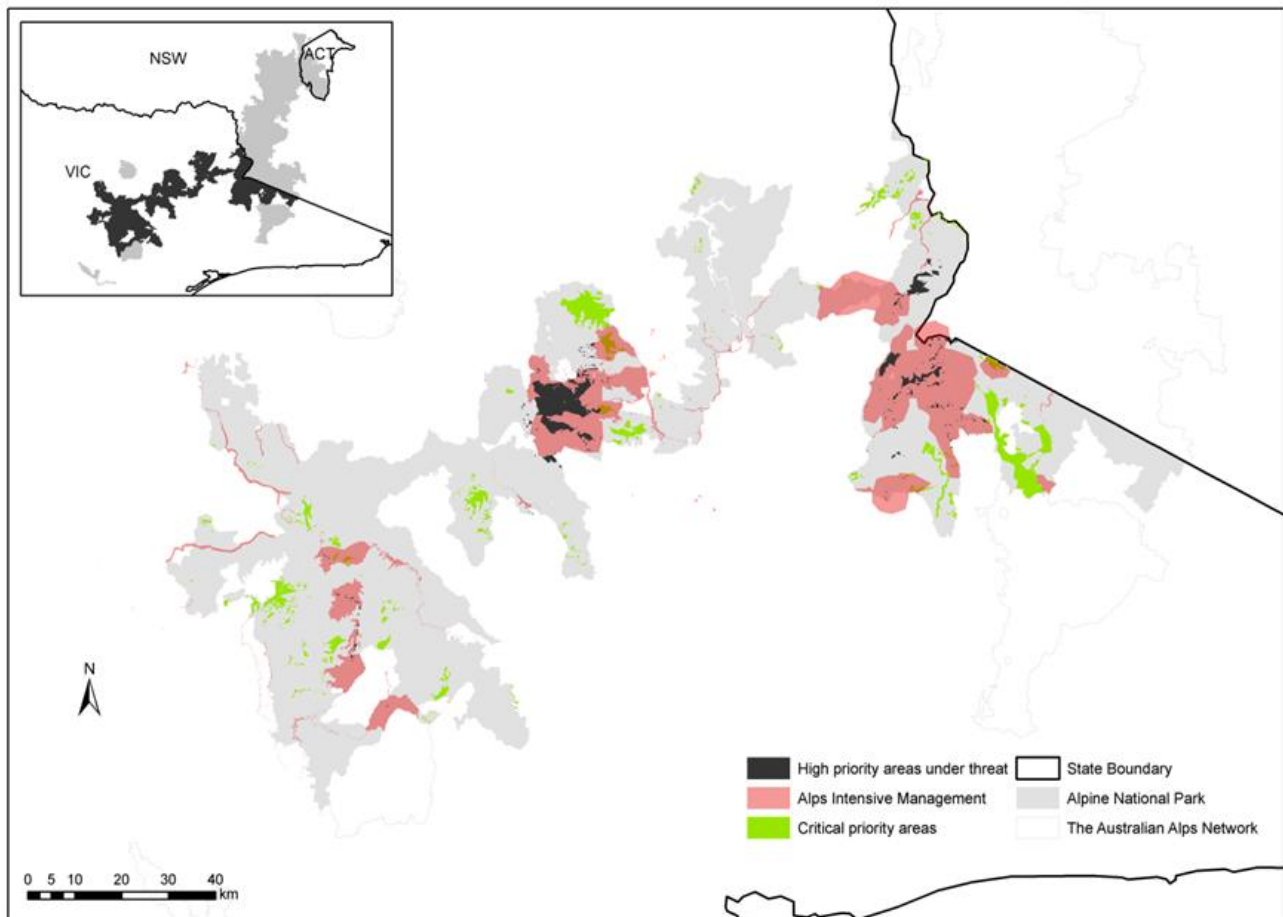


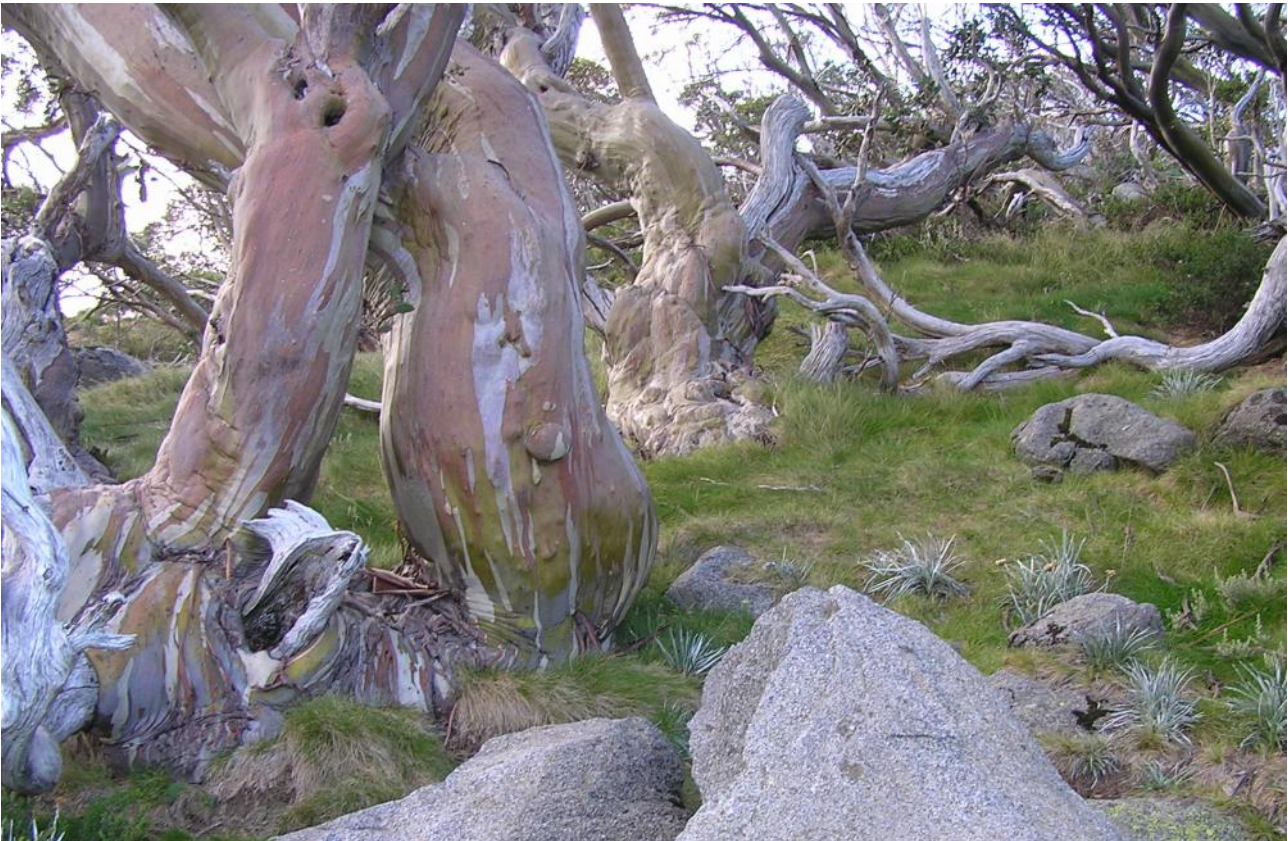
Figure 3: Comparison of the current principal invasive species programme in Victoria's Alpine National Park (Alps Intensive Management) with areas of natural icons and threats modelled as being of critical and high priority

no common multi-jurisdictional approach to identifying landscape scale conservation and heritage values, and threats to those values, and no central repository for environmental data.

We developed a new framework that provides a consistent approach to classifying and displaying landscape-level features and threats across the Australian Alps landscape, addressing the limitations of the separate management arrangements by promoting more effective cross-jurisdictional management arrangements. Using available data and the results of qualitative surveys of stakeholders, seven natural icons and nine major threats to these iconic features were identified in the Alps Network. These data were analyzed using the decision-support tool MCAS-S (Multi-Criteria Analysis Shell for Spatial Decision Support) to determine priority areas for resource allocation. Additional information was collated into an Alps-wide data-pack that can be used for further analysis including an Alps-wide vegetation classification and map. Classifying the Alps Network into seven natural icons and nine key threats common to all jurisdictions provided a significant improvement to the current situation where

management authorities used different methods to strategically identify and describe values and threats across the landscape. The natural icons identified here were shown to incorporate the range and variation of values described by the multiple agencies.

To compare the outputs and priorities of this decision support framework with a current invasive species programme, we used the AIM invasive species Program in the Alpine National Park in Victoria for a more detailed evaluation. We found that the high priority areas we identified were also emphasized in the AIM Program. This alignment suggests that the natural icons and threats framework effectively encompasses significant features at a smaller scale, such as threatened species. The AIM Program also addressed key threats to other natural icons albeit of a lower priority. The key limitation identified was the lack of emphasis in the AIM Program on what we identified as critical priority areas, which recognize the importance of maintaining the integrity of threat-free natural icons and the role they serve as potential refugia into the future. Our comparison suggests that the natural icons and threats framework and MCAS-S analysis are aligned with current Alps



Snow Gum Woodlands icon, Kosciuszko National Park © Gillian Anderson

Network agency management priorities while helping to identify otherwise overlooked important whole-of-landscape characteristics.

The qualitative approach used here for identifying icons and threats opens up the potential to engage with a wide range of stakeholders and practitioners to identify and share understanding of natural values, condition and threats across a bioregional landscape. We showed that it is relatively easy to use existing datasets from various sources and develop a common set of spatial datasets that span jurisdictions.

We stress that our aim is not to replace current systematic conservation planning approaches. For example, this approach may be particularly useful in identifying focal targets and threats for application of the Conservation Action Planning methodology (TNC, 2007). The concept of natural icons is complementary to the necessary attention given to endangered species, providing a focus on landscape features that is readily grasped by the public and decision makers. Furthermore, natural values and threats know no borders and a landscape-wide, cross-jurisdictional approach to their management is required. The framework implemented in MCAS-S provides a readily operational decision support tool that provides land managers with a common platform for strategic analysis and planning.

The natural icons and threats framework provides a pathway for identifying cross-jurisdictional park management decision-making around priority actions and resource allocation. The framework promotes an understanding of shared conservation values and harmonization of management strategies and tactics in a way that is transparent to stakeholders and practitioners alike.

FOOTNOTE

¹ To access the supplementary material, go to <<https://terranova.org.au/>> and search for <alps icons and threats>

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ABOUT THE AUTHORS

Brendan Mackey is Director of the Griffith Climate Change Response Program at Griffith University, Queensland, Australia. His research is currently focused on the interactions between climate change, biodiversity and land use, and approaches to helping improve environment and conservation regulatory and management frameworks.

Peter Jacobs worked for nearly 40 years with Parks Victoria and previous park management agencies in Victoria, finishing his public service in 2013 as Chief Ranger for the Alps in Victoria, Australia. Peter is now working with People in Nature as a Protected Area specialist consultant. His work is focused on Protected Area planning, knowledge management and project management.

Luciana Porfirio is currently an OCE postdoctoral fellow with CSIRO Oceans and Atmosphere. She is designing, developing, and testing land use change models. Prior to CSIRO, Luciana was a postdoctoral fellow in the Landscapes and Policy hub, as part of the National Environmental Research Program based at the Australian National University.

Sonia Hugh is a GIS analyst with extensive experience in spatial and temporal ecological modelling at multiple-scales from continent to catchment. Sonia worked for the Landscape and Policy Hub's Bioregional Futures team applying a range of tools and techniques to study characteristics of landscape ecosystems and the patterns of diversity under scenarios of natural and human induced change.

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RESUMEN

La gestión de parques que abarcan varias jurisdicciones a menudo se ve limitada por la falta de prioridades en materia de gestión compartida y un sistema de información espacial común. Por otra parte, las técnicas actuales de manejo de parques pueden llevar a un enfoque reduccionista, centrándose en las características específicas de los parques sin tener en cuenta su contexto regional. El marco de íconos y amenazas naturales se propone como un enfoque complementario que puede proporcionar una perspectiva más integral para el manejo de los componentes de conservación de la biodiversidad y sus amenazas. El método propuesto en este estudio facilita el manejo de parques a escala regional y ofrece herramientas para el manejo de parques ubicados en múltiples jurisdicciones. El primer paso consiste en involucrar a administradores e interesados directos en la definición de los íconos naturales, es decir, las características ampliamente reconocidas y significativas del paisaje natural. Así también a la identificación de las amenazas a los íconos. Con este fin, se desarrolla una base de datos, en formato de sistema de información geográfico (SIG), de los íconos y las amenazas. La base de datos SIG puede ser consultada por los administradores de los parques para identificar las prioridades en la gestión de la conservación. Como caso de estudio se seleccionó la red de parques nacionales de 1,6 millones de hectáreas de los Alpes australianos, que comprende 11 áreas protegidas y que abarca tres estados. Se utilizó un software llamado MCASS para el análisis de la base de datos SIG y como herramienta de apoyo a las decisiones espaciales. Se identificaron áreas de gran prioridad para la intervención administrativa y se compararon con los programas actuales de las agencias responsables de las áreas protegidas.

RÉSUMÉ

La gestion de parcs qui s'étendent sur plusieurs juridictions est souvent limitée par le manque d'alignement dans les priorités et par l'absence de système d'informations partagé. En outre, les méthodes actuelles peuvent mener à une approche réductrice en mettant l'accent sur un petit nombre de caractéristiques n'englobant pas la totalité du contexte paysager. Une approche complémentaire est proposée, basée sur les ressources emblématiques et les menaces naturelles, afin de fournir une perspective plus holistique, tant de la gestion de la biodiversité et de la conservation de la nature, que des menaces auxquelles sont confrontés les grands paysages naturels pluri-juridictionnels. La première étape consiste à demander aux gestionnaires et aux partie-prenantes de déterminer les ressources naturelles emblématiques du paysage, c'est-à-dire celles qui sont largement reconnues, importantes et caractéristiques, puis d'identifier les menaces qui pèsent sur elles. Ensuite une base de données (SIG) est générée, recensant ces ressources emblématiques et menaces potentielles, consultable par les gestionnaires de parc pour identifier leurs priorités de gestion grâce à un outil d'aide à la décision. Nous avons sélectionné pour une étude de cas, le réseau de parcs nationaux des Alpes australiennes, avec ses 1.6 millions d'hectares comprenant 11 aires protégées s'étendant sur trois états. Un système d'analyse multicritères d'aide à la prise de décisions spatiales a été utilisé pour visualiser et interroger les données spatiales. Les domaines d'intervention critiques pour action prioritaire ont ainsi été identifiés et comparés aux programmes actuels des agences des aires protégées.



CHRISTIAN MONASTIC LANDS AS PROTECTED LANDSCAPES AND COMMUNITY CONSERVED AREAS: AN OVERVIEW

Josep-Maria Mallarach^{1*}, Josep Corcó² and Thymio Papayannis³

*Corresponding author: mallarach@silene.es

¹ Silene Association, C/ Alfons Vè, 7, 1r, 1a 17800 Olot, Catalonia, Spain

² Universitat Internacional de Catalunya. C/ Immaculada, 22 08017 Barcelona, Spain

³ Mediterranean Institute for Nature and Anthropos. 23 Voucourestiou Street, 106 71 Athens, Greece

ABSTRACT

Using a literature review, diverse types of research and empirical evidence, this paper explores whether the essential features of the Indigenous peoples' and community conserved territories and areas (ICCAs) and the criteria of the Protected Landscape Approach are met in Christian monastic territories. Inspired by spiritual principles and applying traditional ecological knowledge, monastic communities developed distinctive natural resource management models, resulting in beautiful, harmonious and diverse landscapes for many centuries. In many countries, modern protected areas have been established on the sites of existing or former monastic lands, thereby creating positive synergies but also new challenges both for conservation and for the monastic communities. This paper shows that monastic communities are one of the oldest self-organized communities with a continuous written record in conservation management. Most Christian monastic conserved lands should be considered community conserved areas usually Category V – Protected Landscapes. The paper also argues that monastic communities' experiences in adapting to and overcoming environmental and economic crises is relevant to both managers and policy-makers involved in protected and high biodiversity areas, especially in regions where the protected landscape approach may be more effective.

Key words: Christianity, Community Conserved Area, conservation, landscape, integrated management, monastic community.

INTRODUCTION AND PURPOSE

The purpose of this paper is to explore whether the essential features of the Indigenous peoples and community conserved territories and areas (ICCAs) governance type and the protected areas management criteria of the Protected Landscape Approach (Dudley, 2008) are met in Christian monastic territories. Thus, it begins by presenting a brief overview of the historical origins of these local communities, and then moves to analyse the essential features of protected monastic landscapes, in order to evaluate the consistency with these approaches, and finally to suggest some conclusions.

Following economic crises, and an increased concern for social justice and conservation effectiveness, a growing interest has arisen in types of protected areas that differ from those created by public administrations via legal mechanisms. The 2008 IUCN *Guidelines for Applying*

Protected Area Management Categories consider the entire spectrum of governance types and management approaches and a new definition of protected areas was adopted (Dudley, 2008). The 'other effective means' of the IUCN protected area definition include a wide variety of types of governance, including governance by ICCAs, shared and private governance. In some regions these three broad categories together have an enormous social and ecological potential and cover a greater surface area of protected land and water than the protected areas established by legal means (Borrini-Feyerabend et al., 2013). In 2007, an IUCN conference concerning the revision of the protected areas definition made clear that sacred natural sites, the oldest known type of protected areas, are found in all categories of modern protected areas (Verschuuren et al., 2008). The 2008 protected area guidelines (Dudley, 2008) and the IUCN guidelines on sacred natural sites (Wild & McLeod, 2008) also acknowledge the significance that both religious and

spiritual values continue to have to protected areas and, more broadly, to nature conservation.

This paper argues that all Christian monastic territories should be considered 'sacred natural sites' (Wild & McLeod, 2008). Whilst in the Eastern monastic organizations the adjective 'sacred' is normally used, Catholic monastic organizations usually prefer 'holy'. In any case, both concepts apply to the lands and waters that protect and sustain these monastic communities.

In terms of protected area management objectives and governance types as defined in the IUCN guidelines (Dudley, 2008) Christian monastic territories have clear affiliations. A close association between long lasting local communities and specific landscapes is often the basis of monastic organizations, when combined with effective governance and nature conservation, such areas meet the ICCA governance type. Three characteristics are considered essential to define protected area management Category V, Protected Landscapes, the most significant category for Christian monastic communities. These are: (i) landscape and/or coastal and island seascapes of high and/or distinct scenic quality, with significant associated habitats, flora and fauna, and related cultural features; (ii) a balanced interaction between people and nature whose integrity has endured over time, or where there is a reasonable perspective of restoring any lost integrity; (iii) unique and traditional land-use patterns such as in sustainable agricultural and forestry systems and human settlements that have evolved in equilibrium with their landscapes (Dudley, 2008).

The living dimension of protected landscapes has been thoroughly discussed in the Protected Landscape Approach (Brown et al., 2005) concluding that it depends on the following seven criteria: the landscape in question should (i) be bioregional in scale and represent a mosaic of designations and land uses; (ii) embrace the interrelationship of nature and culture; (iii) recognize the relationship between tangible and intangible values, and the value of both; (iv) be community-based, inclusive and participatory; (v) be based on cross-sectorial partnerships; (vi) be founded on planning and legal frameworks that have created an environment of engagement through equity and governance for a diverse set of stakeholders; and (vii) contribute to a sustainable society.

Finally, let us recall that Target 11 of the CBD Strategic Plan for Biodiversity 2011-2020 states that 'by 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of

particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes' (UNEP, 2010). As we will discuss, Christian monastic conserved areas can also make a contribution to attain this ambitious goal.

This paper will use the criteria defining the management of Category V protected areas, together with the basic features of the ICCA governance type, to illustrate how they are met in areas managed by Christian monastic communities. Before that, however, an overview of the historical origins of these local communities and their fundamental values is presented.

ORIGIN OF CHRISTIAN MONASTIC LANDSCAPES

The origin of Christian monasticism goes back some seventeen centuries to the deserts of Egypt, Palestine and Syria, when these regions were provinces of the Roman Empire. Founded in the fourth century AD, the oldest thriving Christian Coptic monasteries are still located in the Egyptian deserts, e.g. St Antony the Great and St Macarius. These monasteries provide evidence that monasticism has been able to develop in harsh desert landscapes by managing very scarce resources in an efficient and resilient manner.

From the earliest times, the ideal of monastic life was closely linked to the aspiration of a return to a terrestrial Paradise, a desire that was associated with more or less complete solitude in the wilderness. It sought to enable aspirants to progress spiritually, attain holiness, and develop a deep harmony with nature. Numerous accounts talk of religious hermits who befriended wild animals and who in some cases were even fed by them (Macaire, 1991). In the words of contemporary Christian hermits, this cosmic experience of communion with nature is very inspirational and provides the impetus for the duty of caring (Mouizon, 2001).

Two main types of lifestyles developed from the beginning of monasticism, community life in monasteries and isolated life in hermitages or natural shelters. Both types have remained almost unchanged up to the present day and are usually regarded as complementary paths corresponding to different vocations or to different stages in the spiritual life of monks and nuns. The study of the economy and livelihoods of the earliest monasteries in the Middle East has revealed that models related to the adaptations to specific natural and social surroundings never went beyond the limitations of each community's ascetic



The Santa Creu hermitage at the Holy Mountain of Montserrat, Catalonia, Spain was inhabited by hermits for 14 centuries; today it is a Nature Reserve within the Montserrat Natural Park © J-M Mallarach

religious principles (Heiska, 2003). However, no systematic research has ever been conducted into the diverse reasons that explain why certain monastic communities failed and vanished, whilst others in similar environments have survived for so many centuries.

The expansion of successful monastic settlements created distinctive landscapes responding to a variety of historical, cultural and geographical patterns. By the end of the twelfth century, several thousand monasteries were thriving in Europe, North and East Africa and the Middle East, including many located in remote and isolated areas. Despite the fact that many monastic communities developed 'best practices' in the face of harsh conditions and have remained stable over many centuries, the resilient landscapes created by them have received little attention from conservationists and managers of natural resources (Mallarach, 2012).

Monastic communities have created numerous resilient monastic landscapes across ecosystems as diverse as the frozen taiga of northern Russia, the African or Middle Eastern deserts, the slopes and valleys of the Alps, Apennines, Carpathians and Pyrenees, the steppes of Eastern Europe and the coastal areas, islands and wetlands of the Mediterranean and the Black Sea.

Subsequently, the spread of Christianity into the Americas, Central and Eastern Asia, Central and Southern Africa and Oceania over the past five centuries has resulted in the development of monastic settlements in additional biomes, such as savannahs and tropical forests.

By following a lifestyle that seeks wholeness, most Christian monastic communities have been able to develop efficient, self-sufficient strategies, respectful to the values of natural surroundings. Most hermitic domains have also made significant contributions to nature conservation. Hermits, in their quest for peace and quiet in pristine areas, have respected and contributed to conserve the integrity of these environments. In terms of landscape ecology, the inclusion of areas devoted to hermits in monastic properties normally engendered a balanced landscape pattern, which in many cases has survived to this day. Thus, monastic landscapes may include monasteries of different sizes, usually surrounded by some agricultural lands and managed forests, with assorted hermitages and monks' cells located in well protected natural areas.

Thanks to the alms and donations as well as the careful management they practised, monastic communities often

Table 1. Sample of representative thriving Christian monastic settlements in different landscapes found in the main biomes of the world. References for most of them are found in Mallarach, Corcó & Papayannis (2015).

Biome	Landscape	Region / Country	Monasteries
Alpine	Alpine valley	Bulgaria	Rila
	Alpine valley	Alps, France	Grande Chartreuse
Chaparral	Agro-forest mosaic	Catalonia, Spain	Poblet
	Rolling hills	Crete, Greece	Chrysopigi
	Rocky cliff	Catalonia, Spain	Montserrat
Deciduous forest	Mountain valleys	Romania	Secu, Ramet, Tismana, ...
	Mountain valley	Kosovo	Visoki Dečani
	Rocky Pillars	Meteora, Greece	Aghia Triada, Rousanou,Varlaam,..
	Forested mountain	Lazio, Italy	Santa Scolastica
	Mountain slope	Rioja, Spain	Suso and Yuso
Desert	Rocky cliff	Palestine	Saint George
	Sandy desert	Wadi Natrum, Egypt	Abu Makar
Desert-scrub	Mountain valley	Arizona, USA	Christ in the Desert
	Rocky mountain	Syria	Deir Mar Mousa
Wetland	Islands within lakes	Montenegro	Beška, Kom, Moracnik
	Island in lake Ladoga	Arkhangelsk, Russia	Valaam
Marine	Small coastal islands	Normandy, France	Mont St Michel, Lérins
Rainforest	Forested rolling hills	Colombia	Santa María
	Marine Island	Philippines	Our Lady of the Philippines
Steppe	Plain grassland	Ukraine	Nativity of Mary in Olexandrivka
	Fluvial island	Ukraine	St Michael in Pelaheyivskiyi
Taiga	Lake island	Karelia, Finland	New Valamo
	Lake peninsula	Arkhangelsk, Russia	Kozheozersky
	Plains	Kola peninsula, Russia	Pechenga
Tundra	Arctic archipelago	Russia	Solovestky

ended up managing large tracts of land and waters, covering tens or even hundreds of square kilometres. In several European and Middle Eastern countries, it has been estimated that at their peak Christian monastic communities were responsible for managing up to 35 per cent of all productive landscapes (Mallarach et al., 2015). The maximum expansion of monastic landscapes depended on the region and the period of time. In the Middle East, North Africa and Ireland, they reached their peak in the fifth and sixth century, in Byzantium this was from the tenth to thirteenth century, while the high point in many Western and Central European countries was not attained until the eleventh to fourteenth century and in Russia until the fifteenth-sixteenth centuries. A single Latin monastic order, the Benedictine, is reported to have built over 14,000 monasteries in Europe before the Renaissance (Birt, 1907). Thus, during their long history, Christian monastic communities have created and established a high diversity of landscapes, where both wild biodiversity and agro-biodiversity were actually conserved, either consciously or as a by-product of the supreme goal of a perfect life.

ESSENTIAL FEATURES OF PROTECTED MONASTIC LANDSCAPES

Most monastic facilities are carefully integrated into the natural environment that surrounds them. This is probably due to a combination of factors such as the special relationship between Christian monasticism and nature viewed as an essential part of divine Creation, the contemplative attitude regarding natural creatures, i.e. viewing Creation in general and all its creatures as divine manifestations, and the search for harmony and perfection. Asceticism, frugality and moderation have also played a major role in the harmonious incorporation of monastic facilities into natural landscapes. This topic is analyzed more fully below following the criteria of IUCN's management category V – protected landscapes.

• High scenic quality and significant associated habitats, flora and fauna, and cultural features

Numerous monastic communities and hermits have settled in and adapted to some of the world's most beautiful and astonishing landscapes (Table 1). The reasons for selecting these amazing sites may be diverse,

Table 2. Sample of Christian monastic lands with more than six centuries of records on nature conservation included in legally established protected areas (Mallarach, Corcó & Papayannis, 2015).

Monastic community	Centuries of monastic management	Protected Area name	IUCN category	Country
St Catherine Greek Orthodox (male)	16	Saint Catherine Natural Protectorate	V	Egypt
Qashida Ouadi Maronite and Orthodox (male and female)	15	Ouadi Qashida - Cedars of God World Heritage Site	IV	Lebanon
Lérins, Cistercians since 1859 (male)	15	Marine Protected Area and Nature Reserve Lérins Islands	IV + III	France
Caldey – Currently Trappist (male)	14	Pembrokeshire National Park	V	Wales, UK
Mount Athos Pan-Orthodox hundreds of monastic settlements (male)	11	Mount Athos Natural and Cultural World Heritage Site and Natura 2000	V + IV	Athos, Greece
Montserrat, Benedictine (male and female)	10	Natural Park Muntanya de Montserrat	II + V	Spain
Serbian Orthodox monasteries (male and female)	9	Skadar Lake National Park and Ramsar site	V	Montenegro
Grande Chartreuse Carthusians (male)	9	Chartreuse Natural Regional Park	V	France
Rila Bulgaria Orthodox (male)	9	National and Natural Parks of Rila	II + V	Bulgaria
Maria Laach Benedictine (male)	9	Eifel National Park	II	Germany
Sacro Eremo Camaldoli Camaldolese (male)	8	National Park Casentino Forests	II	Italy
Mileseva Serbian Orthodox (male in the past and female since 2002)	7	Special Nature Reserve Milesevka	IV	Serbia
Desert of San José de las Batuecas – Carmelite (male)	6	Natural Park las Batuecas-Sierra de Francia	V	Spain
Neamt, Secu, Agapia, and other Romanian Orthodox (male and female)	6	Vanatori Neamt Natural Park	V	Romania
Solovetsky Russian Orthodox (male)	6	Solovetsky Islands World heritage Site	IV	Russia

including beauty, remoteness or security, etc. However, according to traditional sources, the main reasons are often related to spiritual inspiration (Kinder, 2002).

After eleven centuries of uninterrupted governance by a coalition of Christian monasteries organized in self-sufficient communities, the peninsula of Mt. Athos, the only self-ruled monastic territory in the world, has managed to conserve a rich biodiversity, including 22 plant species endemic to Greece, 14 of which are local endemics, and 41 species of mammals, six of which are carnivores (Philippou & Kontos, 2009). In 1988 the entire Athonite peninsula was listed as a mixed natural and cultural World Heritage Site (Papayannis, 2008).

A number of old-growth forests hosting a very rich biodiversity have been preserved by monastic communities. An example is the Sainte Baume (Holy Cave) of Saint Marie Madeleine in Provence (France), a hermitic site dating from the fifth century, considered to be one of the highest quality forest sites in the Western Mediterranean (Rossi et al., 2013). Another example is the Sacro Eremo delle Carceri (Italy), the forested

mountain area to which St Francis of Assisi retreated in the twelfth century, which conserves some of the finest forestlands in the whole of Italy (Pungetti et al., 2012).

The cultural heritage of monastic communities is both tangible and intangible and often very rich and diverse. Their tangible heritage includes monastic buildings or facilities, and numerous objects such as old books and manuscripts, while their intangible heritage relates to liturgy, music, icon painting, wood carving, philosophy, science, traditional ecological knowledge and so forth, along with all other forms of religious art. Unlike the natural heritage, the cultural heritage of these communities has been the object of extensive research, as described, for example, in the synthesis by Krüger and Tomas (2007).

• **An enduring and balanced interaction between people and nature**

Numerous examples of balanced and resilient interaction between monastic communities' settlements and natural areas can be found throughout the world – Table 2



Panorthodox Aghia Anna Skete. Monastic settlements and garden terraces on steep slopes within the off-road area of the Athonite Peninsula, Greece. All transportation, including solar panels, is done with mules © J-M Mallarach

provides a representative sample and a few outstanding examples are discussed below.

St Catherine's, one of the first Christian monasteries, was founded in 337 AD in the desert near the site of the Biblical burning bush at the foot of Mount Sinai, and has been active uninterruptedly ever since, with the help of Muslim Bedouins. In 2002 monastic lands were included in the St Catherine Protectorate, one of the largest protected natural areas in Egypt, part of which is a cultural World Heritage Site (Grainger & Gilbert, 2008). The monastery of St Anthony the Great, founded in 356 AD, on the mountain of Al-Qalzam (Egypt), has been occupied continuously since then, managing the territory around it, and today consists of a self-contained monastic village with gardens, a mill, a bakery and five churches, hosting a large monastic community.

The Ouadi Qashida (the Holy Valley) in Lebanon, despite the wars and conflicts the region has suffered, still conserves some of the best remnants of the native cedar forests at Horsh Arz el-Rab (Cedars of the Lord). Three Maronite monastic communities share the custodianship of this holy natural site, offering natural caves for retreats. The site was declared a cultural World Heritage Site in 1998 and an interpretation centre has been built

to stress the importance of preserving the cedar forest remnants (Higgins-Zogib, 2005). The Carthusian Order often choose wild rugged countryside, surrounded by large forests that were left untouched to create a buffer of solitude and silence. Perhaps the best example is the first mother-monastery of Grand Chartreuse, built nine centuries ago in a secluded forested valley in the Savoy Alps (France), still managed by the Carthusian community, and nowadays included in the Regional Natural Park of la Grande Chartreuse.

Christian monastic gardens gave birth to botanical and pharmaceutical gardens in numerous post-medieval towns of Europe and the Middle East (MacDougall, 1986). In fact, some monasteries continue to keep pharmaceutical gardens, such as Pannonhalma (Hungary) and Vatopedi in Mt. Athos (Greece).

- **Unique and traditional land-use patterns in harmony with the landscape**

Many Christian monastic territories have developed over time a balanced landscape mosaic that includes farm land – with vegetable and medicinal gardens, olive groves and orchards – and partially managed forests, although some also boast pastures and wetlands (rivers, lakes, etc.) and areas that are left without extractive uses.

Organic farming is commonly practised in monastic territories. In some monasteries traditional practices have never ceased, as in the Romanian monasteries of Neamt, Secu, Agapia or Varatec, where local plant varieties and local breeds are preserved using traditional methods and provide foodstuffs for self-consumption (Catanoiu, pers. com., 2012). Some monasteries such as Duprava (Serbia) have a mission to conserve local domestic varieties and breeds (Pesic, pers. com., 2014). In recent years, a number of monastic communities have moved from agrochemical to organic farming. Examples include the communities of Pierre-qui-Vire, Saint-Benoît-sur-Loire and Boulaur (France), Hosios Lukas, Chrysopigi and Agia Triada (Greece), Santa Croce in Gerusalemme and Casamari (Italy), Plankstetten (Germany) and Miura (Japan). In some cases, organic agriculture represents a significant part of the monastic community's identity, e.g. the monastery of Solan (France) (Delahaye, 2011). It is significant that some of the finest agricultural products of this part of the world are produced organically by monastic communities, from wines, beers (e.g. Belgian Trappists) and liquors (e.g. Chartreuse), to cheese, cakes, jellies and many other delicacies.

Best practices in animal husbandry have been developed in a number of monasteries such as those of Frauenthal



The Orthodox Monastery of Pechenga Russian Federation is thriving in the extreme conditions of the Kola peninsula

Source: https://upload.wikimedia.org/wikipedia/commons/3/34/Pechenga_Monastery_Petsamon_luostari_01.jpg

and Hauterive (Switzerland), Cystersów (Poland) and many more in Romania. A number of monastic communities such as Randol, Chambarand and Lérins (France) that raise cattle or sheep, produce organic cheese for self-consumption and/or for sale.

- **Forest management**

Wise and prudent management has been the guiding rule in most forests managed by monastic communities. On the Italian Peninsula, the Camaldulensian monks condensed about eight centuries of continuous experience of forest management of their forests into the Forestry Code of Camaldoli. This formed the basis for the first Forestry Code of Italy (Frigerio, 1991). On the Athonite peninsula (Greece), development of sustainable forestry practices such as restoring coppiced oak and chestnut trees in tall forests and the combining of sustained yields with biodiversity and aesthetic concerns have been developed in the forests of Simonopetra Monastery and have influenced other forested lands within the monastic autonomous territory as well as in Greece (Kakouros, 2009). In Spain there are well documented cases where monastic communities like that of Poblet and St Jeroni de la Murtra went through many

efforts to stop or minimize external threats to their forests (Estruch, 2001). Sound management practices have been developed involving native or mixed tree species, such as in the monastery of Stift Heiligenkreuz (Austria), known as the ‘mystical heart of the Vienna Woods’.

Although monastic forest practices have acquired a justifiable reputation for sustainability, not all such practices are identical. In Italy, for instance, experts can identify the forest structure of forests managed by Benedictine, Cistercian and Camaldolesian communities. Wise forest practices developed by the Camaldolesian monks in the Apennines allowed the establishment of the Casentino Forests National Park in Italy (Pungetti et al., 2012). The careful management of smaller forests around monasteries occurs in numerous monastic areas such as Notre-Dame de Randol (France), Chrysopigi on Crete (Greece) and Wavreumont (Belgium).

In many arid regions of the Middle East and Africa, Christian monastic lands host the only surviving but generally severely over-exploited and ecologically deteriorated forest patches and extremely valuable

biodiversity. This is the case of numerous monastic forests and forests used by hermits in Ethiopia. These are normally grouped together into ca. 35,000 'church' forests that are conserved in the country (Dudley, et al., 2005; Bekele et al., 2001). Finally, in other arid regions, certain monasteries such as those of Koubri (Burkina Faso) and Dzobegan (Togo) have planted well-adapted tree species and have succeeded in creating the only forests for many kilometres around also creating a milder climate in the monastic buildings themselves (Yawo, 2003).

CRITERIA OF THE PROTECTED LANDSCAPE

APPROACH

This section evaluates how six out of seven criteria of the Protected Landscape Approach, as defined by Brown et al. (2005), are met by Christian monastic protected landscapes. Given that these communities place a strong emphasis on self-sufficiency, the only criterion that is rarely fulfilled is the existence of cross-sectorial partnerships.

- **Representing a mosaic of designations and land uses at bioregional scale**

Hundreds of present-day natural protected areas with diverse designations (national parks, natural parks, natural monuments, nature reserves, etc.) have been established in ancient or present monastic lands that retain their beauty, harmony and biodiversity. Most of these natural areas are managed as Category V protected areas, which account for over half of the protected areas of Europe (Gambino et al., 2008). For instance, the island of Caldey (Wales), inhabited by Christian monks since the sixth century, is now part of the Pembrokeshire National Park; the lands of the Abbey of Maria Laach (Germany) are within the Eifel National Park, and the Abbey of Lérins (France), founded in the fourth century, stands on the small archipelago of the same name, where both the land and sea are natural protected areas (see Table 1).

In other cases, certain contemporary natural protected areas have been promoted by monastic communities, either as protection against urban encroachment – for example, Montserrat Natural Park and its Nature Reserve and the Poblet Site of National Interest, both in Catalonia (Spain) – or as a means of conservation, the case of Rila Natural Park (Bulgaria) created by the Orthodox Church, surrounded by a National Park. In these few cases, monastic authorities are represented on the boards of the protected areas, which is not generally the case when the protected area is promoted and managed by public agencies.

This overlap with different types of protected areas may create challenges and opportunities depending on each particular case. A quite sensible challenge is tranquillity. Many protected areas foster public use, whilst for monastic communities silence and quiet is very important. On the other hand, many monastic communities do not have the ability or the means to resist external pressures, and they are grateful of the support they can get from protected area managers.

As the examples discussed above demonstrate, the ideal self-sufficient monastic settlement implies the development – inasmuch as it is feasible – of diverse land uses, including forests, grasslands and croplands, the encouragement of practices such as fishing in ponds, lakes, rivers or in coastal waters, and the promotion of renewable energy sources, such as hydropower, photovoltaic, wind etc. Given the bioregional scope that monastic territories have had over time, the type and extension of all these land uses are closely related to the specific ecosystems and biomes in which monastic settlements have taken root. For instance, monasteries in rugged forested mountains slopes have agricultural lands reduced to well-managed terraces, like those of Aghia Anna Skete, on the eastern shore of Mount Athos, Greece. Conversely, monasteries located on fertile plains, like Boulaur, France, retain a mosaic of land uses, devoting a higher proportion to agriculture and pasturelands.

- **Embracing the interrelationship between nature and culture and tangible and intangible values**

The relationship between natural, cultural and spiritual dimensions lies at the very heart of the lands and waters managed by Christian monastic communities: their mission is spiritual, their means are cultural and their physical support is natural. Monastic communities are not oriented towards the creation of material profit but rather towards spiritual benefit, striving for perfection and excellence in both spiritual and material domains. The monks of the Coptic monastery of Abu Makar in Wadi Natrum (Egypt) say, *'We never divide the material and spiritual. Our whole life, even in its most material details, must contribute towards the spiritual progress of each monk and the whole community towards the worship of God, (...) It is our deep conviction that we attain our heavenly vocation through the carrying out of these commonplace tasks on Earth'* (Monastery web site, 2015).

Monastic communities consider the relationship between natural Creation and Nature to be a manifestation of God that deserves deep respect, whence the common use of



New Skete of Sihla, Moldavia, Romania, is a good example of the new orthodox monastic settlements in the Carpathians, within the Natural Park of Vanatori Neamt © J-M Mallarach

the terms 'holy' or 'sacred' to refer to their territories. As these communities normally intend 'to endure for ever' in the same place, natural resources are carefully safeguarded not just for the present generation, but to be bestowed on future generations of monks or nuns. Among the most cherished values stemming from this philosophy are silence, solitude, harmony and beauty, which they consider as prerequisites for experiencing a sacred atmosphere (Mallarach & Papayannis, 2007). Here one finds all the criteria suggested by E. F. Schumacher to ensure the conservation of the intrinsic value of the land, namely health, beauty and permanence (Schumacher, 1997).

- **Community-based, inclusive and participatory governance**

Monastic communities are among the oldest self-organized communities to have kept continuous written records on natural resource management and governance, often over many centuries, showing that conservation of ecological integrity and diversity of their lands was the norm, not the exception. One can find

records on all the activities the monasteries have been engaged in (such as agriculture, forestry, livestock, fishing, mills, etc.), although very few of them have been analyzed from an environmental point of view, and due to wars, fires, looting, sackings, etc. in a number of cases these extremely interesting records have been lost. This significant but often overlooked historical circumstance is in part due to the fact that monastic communities are based on principles that coincide closely with those of environmental sustainability: stability, discipline, asceticism or sobriety, vegetarianism, communal property, and acknowledging that they are custodians or stewards, never owners. Private property is usually not allowed, with rare exceptions, whilst communal property is always the norm.

Although the governance of monastic communities varies greatly according to the tradition or lineage they belong to, all tend to stress the family bonds of the community, with the abbot or abbess seen as the father or mother figure of the monastic family. Although the authority of the head of the monastery and his or her close associates

is undisputed, most monastic communities do follow certain democratic procedures when, for instance, electing the abbot or abbess or accepting new candidates.

Most Christian monastic orders allow each monastic settlement a large degree of autonomy. Autarchy is usually regarded as an ideal way of life since it maximizes freedom from worldly pressures, being recommended by the monastic rules that have been in place for over fifteen centuries. For instance, the Rule of St Benedict (480-550) recommends placing the monastery in an area that can provide for all the monks' material needs (Rule of Benedict 66, 6) and states that monks should take care of all the possessions of the monastery 'as if they were sacred vessels of the altar' (Rule of Benedict 31, 10). 'All the possessions of the monastery' include the fields, the vegetable gardens, the forests, springs, and wells, as well as all the other elements that ease the life of the monastic community. The ideal is summed up by the famous motto '*ora et labora*', along with the principle that 'they will be truly monks if they work with their hands' (Rule of Benedict 28, 8). Similarly, the rule St Basil drew up for the community he founded around 356 AD in Cappadocia stressed the virtues of poverty, obedience, renunciation and self-abnegation. Celtic monastic rules were similar as well (O Maidín, 1996). The logical consequences of the guiding principles of these rules are the rooting of monastic communities in the land, a growth in creative efforts aimed at developing wise and prudent management systems striving for perfection, the avoidance of any kind of commercial mentality, and care for those such as the poor, old, sick, weak and pilgrims who are most in need (Neyt, 2003).

- **Founded on planning and legal frameworks with a diverse set of stakeholders**

Christian monastic landscapes exist under diverse legal frameworks, ownerships and governance systems and styles. In many cases they are not included in legally established protected areas and are therefore community conserved areas. The inclusion of monastic landscapes as part of formal protected areas implies in most countries the existence of governing boards, planning and management regulations, public-use requirements and so forth. In fact, in most countries monastic communities are not allowed to participate in the governing boards of protected areas, a prohibition that has created difficulties when attempting to make the objectives of protected areas compatible (especially in the sphere of public use) with the requirements of monastic life. The case of Mt. Athos is a global exception, as it is one of the world's largest mixed natural and cultural World Heritage sites whose heritage is managed by a Holy Community representing 20 sovereign monasteries.

The UNESCO Initiative of World Heritage Sites of Religious Interest¹, launched in 2010, is seeking to address these challenges in the context of the World Heritage Convention, in particular the management of World Heritage sites by religious communities.

- **Contributing to a sustainable society**

Over their long histories, Christian monastic communities have often made significant contributions to peace and stability in the regions in which they are established. In addition to their often successful economic stability, they also ensure social security by providing food and basic supplies to the local population in times of need and famine, as has occurred, for example, in several monasteries in Catalonia (Gort, 2008; Altisent, 1974). A well-documented example of ecological sustainability is that of the Cistercians. In addition to the common domestic and liturgical uses of water, this community was known for developing creative and efficient systems for using water for productive purposes such as flour, oil- and paper-milling, efficient irrigation techniques, fish aquaculture methods and purification and depuration systems. These monastic communities, numbering several thousands, had a significant positive impact – to date only partially researched – in Western Europe before the Industrial Revolution (Kinder, 2002). The sophisticated agricultural systems and devices for harnessing renewable water energy that were developed by Cistercians were a source of inspiration for farming techniques in large regions of Europe for several centuries (Leroux-Dhuys, 1999).

However, the history of Christian monasticism is not one of steady evolution. Aside from the occasional disruptions caused by wars or pillage, the worst setbacks suffered by monastic communities in Europe came with the Reformation, which suppressed monasticism in northern Europe and parts of central Europe and the British Isles. Later on, the French Revolution and its aftermath in the nineteenth and twentieth centuries prompted several European governments – liberal and communist alike – to ban religious houses and monastic organizations, or to enforce severe limitations on their activities, which usually involved the confiscation of monastic properties and lands for political, ideological or economic reasons (Besse, 1911).

As a result, many monasteries were abandoned, sacked or destroyed, which had severe repercussions not only for monasticism and its associated cultural and spiritual heritage – as has been well studied – but also for landscape conservation and sustainability in general, a consequence that has not yet been thoroughly analyzed.



Santa Maria de Poblet, a Cistercian monastery, Catalonia, Spain. Within the walls, vegetable gardens and orchards for the community. Around, vineyards, olive and almond groves. At the background, forested slopes managed by the monks for seven centuries © Arxiu PNIN Poblet

In just a few decades, many monastic forests that had been carefully managed for centuries were cut down or seriously damaged (Urteaga, 1989). Numerous traditional varieties of fruit and vegetables were lost and a great deal of traditional ecological knowledge, including many of the best practices that had been gradually developed over centuries by monastic orders in Europe, was rapidly forgotten. Later, when political situations changed and a certain level of tolerance re-emerged, a monastic resurgence occurred in many European countries, which led to the partial recovery of what had been lost, including natural resources and quality landscape management.

For a number of reasons, both spiritual and material, and including the conscious goal of permanence and asceticism that monasteries uphold, Christian monasticism has usually gone hand-in-hand with ecological sustainability. Monastic management practices were – and still are – usually sustainable, sophisticated and well-adapted to the conditions of each particular site. As in other protected areas of the same category, however, in some monastic conserved lands conflicts may develop, either within, or in relation with surrounding lands or waters, especially in areas including fragile or declining habitats or species. In those cases, as it has been suggested, active management interventions are needed, and careful monitoring is

essential to check if contemporary management practices support or damage biodiversity (Dudley & Stolton, 2015).

• **Community Conserved Areas**

Monastic communities are a particular type of local community sharing a territory and involved in different but related aspects of livelihoods – such as managing natural resources held as ‘commons’, developing productive technologies and practices, and producing knowledge and culture. They share a common daily life and are permanently settled. Moreover, they have a strong sense of identity, share a rich cultural and spiritual legacy and are well self-identified. Therefore, monastic communities completely fit into the definition of ‘local community’ in relation to Community Conserved Areas (Borrini-Feyerabend & Hill, 2015).

The main defining characteristics of ICCAs have been summarized as follows: i) a people or community is closely identified with a well-defined territory, area or species; ii) the community is the major player in decision-making (governance) and implementation of the management of the territory, area or species, and so a community institution has the capacity to develop and enforce regulations; and iii) the community management decisions and efforts lead to the conservation of the territory, area or species and associated cultural values (Borrini-Feyerabend et al., 2004).



Solovetsky fortified monastery located on the Solovetsky Islands in the White Sea in northern Russia © Fr Maxim Massalitin Source²

Our research has shown that these three features fully apply to most territories managed by Christian monastic communities. As in most ICCAs, the objectives of management of Christian monastic communities are related to a series of factors such as (i) a bond of livelihood, health, identity, autonomy, culture and freedom; (ii) a tie between generations of monks and nuns that guarantees the preservation of their memories and their projection in the future; (iii) the ground where these communities live, learn, work and connect with the soul as well as the material and spiritual realms; and (iv) a bond with sacredness in the form of a) saintly ancestors who may have founded or inspired the settlement, b) with sites sanctified by the lives and deeds of holy people, or c) with the responsibility to care for a holy legacy. The latter includes natural areas and natural resources as part of the monastery, since it is traditionally understood as a living organism.

CONCLUSIONS

We believe that the long and generally successful ability of many Christian monastic communities to adapt to the most diverse ecosystems for many hundreds of years deserves more attention from the viewpoint of nature conservation in general and of protected landscapes in particular. Managers of protected areas, especially those that are equivalent to Category V Protected Landscape,

would benefit greatly from the best practices developed by monastic communities as managers of forests, pastures and croplands, as well as their use of renewable energy sources, in many different ecosystems, from the Arctic tundra and taiga to the arid plains of the Middle East and deserts of North Africa. There are solid evidences that landscapes managed by these monastic communities have been more carefully conserved than those managed by lay organizations thriving around them, in the same regions over the centuries.

Although conserved areas managed by Christian communities are usually equivalent to IUCN Category V, quite frequently these territories include areas of stricter protection. The domains of hermits are usually equivalent to nature reserves or strict nature reserves (Categories I or III).

Following the conclusions of the Santa Fe Accord on historical ecology (Crumley, 1994), we contend that the analysis of the criteria applied for the creation and maintenance of conserved areas by Christian monastic communities in diverse ecosystems throughout history is of interest for nature conservation and landscape management. Such an analysis has the potential to provide an array of well-documented examples of effectively managed community conserved areas that

have created and maintained for centuries a diversity of aesthetically pleasing, harmonious and biodiverse landscapes, spread over a large variety of ecosystems.

We suggest that most Christian monastic territories should be considered as part of the global network of ICCAs as well as protected landscapes. Since they can provide inspiring solutions for many other types of protected landscapes they deserve respect and careful attention, whether or not they are included in legally established protected areas. Moreover, their values, management principles and governance systems can inspire criteria for community well-being in healthy conserved landscapes. Since most focal areas for prioritizing biodiversity conservation have been identified and are situated in countries dominated by Christianity (Mikusinski et al., 2013), the conservation experience of Christian monastic communities can inspire both conservationists and policy makers. What is needed is to better analyse and distil the best practices developed by Christian monastic communities, giving priority to those located in hotspots of biodiversity.

Most of the threats and challenges that Christian monastic communities are currently facing in their attempts to maintain or restore the integrity of their territories are similar to other sacred natural sites, community conserved areas and protected landscapes. Therefore, the majority of the recommendations included in the Protected Landscape Approach (Brown et al., 2005), the best practice guidelines for sacred natural sites (Wild & McLeod, 2008) and the governance of protected areas (Borrini-Feyerabend et al., 2013) would be useful for Christian monastic conserved areas.

The renewed interest in environmental coherence found in Christian monasteries around the world is a promising trend. Their message, grounded in spiritual principles and traditional ecological knowledge, provides a living example of resilient sustainability that other local communities are attempting to follow.

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ENDNOTES

¹ whc.unesco.org/en/religious-sacred-heritage

² <https://www.flickr.com/photos/massalim/2150517110/in/photolist-4h2XPd-dMa4GS-f8SbjJ-5peaKY-5p9U3Z-f8SaCj-9k1aef-f8BPtR-gNnAwk-f8BEmz-f8BMSx-dM4KSX-f8BMcZ-gNnCAa-f8BDQP-dMajSJ-f8BQ8V-dM4Lfk-dM4LaX-dMa4JJ-4hPv5t-4hP19M-dM4vFa-dM4Lm4-dMajmf-dMa4Vq-dMajqU-dMa5Fm-dMajTY-dMajC-dMajAs-f8TgbQ-dMa4LJ-dMajS-dMa5fo-dM4vj8-dM4vt6-dM4v46-dMa5zY-dM4L8z-dM4vLP-dMa5sJ-dM4KUF-dM4vBe-dM4vzM-4gXUmc-dM4v8t-4h35mS-dMa59b-dMaj6b>

ABOUT THE AUTHORS

Josep-Maria Mallarach, PhD and MSc Environmental Sciences and BD in Geology, is working as independent environmental consultant. He has been involved in planning, management and evaluation of protected areas in both Europe and North America for a quarter century. With Thymio, he is the co-ordinator of The Delos Initiative, and member of the Steering Committee of the IUCN WCPA, Specialist Group on Cultural and Spiritual Values of Protected Areas. Josep-Maria is representing IUCN at the expert group of the UNESCO Initiative of World Heritage Sites of Religious Interest. Email: mallarach@silene.es

Josep Corcó, graduated in Philosophy and obtained his PhD at the Universidad de Navarra, with a dissertation about Karl Popper's cosmovision. Since 1997 he has taught philosophy at Universitat Internacional de Catalunya, Barcelona, Spain. He is the Director of the Chair on Culture, Science and Religion, Faculty of Humanities and his current research is focused on the relationship between science, society and religion. Email: jcorco@uic.es

Thymio Papayannis, Architect, Planner and Environmentalist, received an honorary doctorate from Athens Agricultural University for his contribution to the environmental sector. He is co-ordinator of The Delos Initiative and member of the Steering Committee of the IUCN WCPA, Specialist Group on Cultural and Spiritual Values of Protected Areas. He has founded and coordinated the Mediterranean Wetlands Initiative of the Ramsar Convention; has founded and chaired WWF Greece and the Society for the Protection of Prespa, as well as Med-INA for over ten years, and has also been involved with the ecological work of the Ecumenical Patriarchate and the Holy Community of Mount Athos. At present he is Senior Advisor on Culture and Wetlands of the Ramsar Convention. Email: thymiop@med-ina.org



Partial view of the Rila monastery, Bulgaria, surrounded by magnificent forests. The community has kept the 'holy unity' with nature that the founder, St Ivan Rilski, wished eight centuries ago. © J-M Mallarach

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APPENDIX 1

Web sites on some monastic orders and monasteries cited in the article (last accessed 3.02. 2016)

- *Abbey of Santa Maria de Poblet*: www.poblet.cat
- *Stanbrook Abbey*: www.stanbrookabbeyfriends.org/Sustainability; www.guardian.co.uk/environment/2009/oct/30/stanbrook-abbey-eco-friendly-nuns
- *Abbey of Christ in the Desert*: christdesert.org/About_Us/Strawbilt/History/
- *Bulletin Alliance of International Monasticism, Num: 78/79*: www.aimintl.org/index.php?option=com_content&view=article&id=304&Itemid=326&lang=en
- *Carthusians*: www.chartreux.org
- *Franciscan Custody of the Holy Land*: <http://198.62.75.4/opt/xampp/custodia/01cust.php>
- *Monastery of Camaldoli*: www.camaldoli.it
- *Monastery of Miura*: www.pcusa.org/news/2012/8/16/japanese-catholic-monastery-practices-ecological-w/
- *Monastery of Saint Macarius the Great, Egypt*: www.stmacariusmonastery.org/eabout.htm
- *Monastery of Cantauque*: www.monastere-cantauque.com/english/index.html
- *Monastery of Saint Anthony, Egypt*: stanthonymonastery.org/NewHome.htm
- *Monastery of Mar Musa, Syria*: www.deirmarmusa.org/index1.html
- *Monastic Inter-religious Dialogue on the Environment, 2008*: monasticdialog.com/conference.php?id=117
- *Monastic Orders and Monasteries*: www.religiousworlds.com/mystic/orders.html
- *Muensterschwarzach*: www.abtei-muensterschwarzach.de/ams/kloster/konvent/index.html
- *Orthodox Monasteries Directory*: www.orthodox-monasteries.com

RESUMEN

A partir de una revisión bibliográfica, diversos tipos de investigaciones y evidencias empíricas, este trabajo examina si los territorios monásticos cristianos cumplen las características esenciales de los Territorios Indígenas de Conservación y otras Áreas Conservadas por Pueblos Indígenas y Comunidades y los criterios del enfoque basado en el paisaje protegido. Inspiradas en principios espirituales y aplicando conocimientos ecológicos tradicionales, las comunidades monásticas han desarrollado modelos propios de gestión de los recursos naturales, creando y manteniendo paisajes hermosos, armoniosos y diversos durante siglos. En muchos países, las áreas protegidas modernas se han establecido en territorios monásticos existentes o antiguos, creando así sinergias positivas pero también nuevos retos tanto para la conservación como para las comunidades monásticas. Este artículo plantea que las comunidades monásticas auto organizadas están entre las comunidades más antiguas que disponen de registro escrito continuo en la gestión conservacionista y que la mayoría de los territorios de comunidades cristianas monásticas deberían ser considerados áreas de conservación comunitarias, correspondiendo por lo general a la Categoría V – Paisajes Protegidos. Plantea asimismo que las experiencias de dichas comunidades para adaptarse y superar crisis ambientales y económicas son relevantes para los responsables políticos y los administradores de las áreas naturales protegidas, especialmente en las regiones con una gran biodiversidad, donde el enfoque basado en paisajes protegidos puede ser más eficaz.

RÉSUMÉ

A partir d'une revue littéraire, empirique et académique, le présent rapport cherche à démontrer si les territoires monastiques chrétiens respectent les lignes directrices établies pour les Aires du patrimoine autochtone et communautaire (APAC) et les critères de l'Approche des paysages protégés. Inspirés par des principes spirituels et par l'application des connaissances écologiques traditionnelles, les communautés monastiques ont développé des modèles distinctifs de gestion des ressources naturelles, préservant des paysages admirables, harmonieux et variés pendant de nombreux siècles. Dans plusieurs pays, les aires protégées modernes ont été établies sur des terrains monastiques anciens ou existants, créant ainsi des synergies positives, mais aussi de nouveaux défis à la fois pour la conservation et pour les communautés monastiques elles-mêmes. Cet article montre que les communautés monastiques sont l'une des plus anciennes communautés auto-organisées qui ont laissé une trace écrite et continue de gestion de la conservation. La plupart des territoires des communautés monastiques chrétiennes devrait être considérées Aires de patrimoine autochtone et communautaire, correspondant, en général, à la Catégorie V – Paysages protégés'. Le document met également en avant que l'expérience des communautés monastiques, qui ont su s'adapter et surmonter les crises environnementales et économiques, est valable pour les décideurs et les gestionnaires des aires protégées à biodiversité élevée, en particulier dans les régions où l'application des critères de l'approche des paysages protégés pourrait se révéler particulièrement efficace.



UNDERSTANDING THE LINK BETWEEN BENEFITS FROM PROTECTED AREAS AND THEIR RELATIONSHIP WITH SURROUNDING COMMUNITIES: AN EXPLORATION IN COSTA RICA

Sergio A. Molina-Murillo^{1,2,*}, Mauricio Fernández Otárola³ and Kelly N. Shreeve⁴

*Corresponding author: sergiomolina@una.cr

¹ Department of Environmental Sciences, National University of Costa Rica (UNA), Heredia, Costa Rica

² Forest Research Unit (ReForesta), University of Costa Rica, San Jose Costa Rica

³ Department of Biology, University of Costa Rica, San Jose, Costa Rica

⁴ Department of Sociology, Colorado State University, USA

ABSTRACT

Protected areas are an essential strategy in preserving natural resources. A central aspect of protected area management is to maintain and improve their relationship with surrounding communities given that local conflicts often occur over the existence or expansion of protected areas due to land-use restrictions. This study seeks to understand the link between perceived socioeconomic and environmental benefits from protected areas and the perceived strength of the relationship between 12 of these communities and their corresponding protected areas in Costa Rica. In total, 365 door-to-door interviews were conducted to collect data, and a logistic model and correlations were used to analyse the results. We found there is a significant link between the strength of the relationship between the community and protected area and the number of perceived socioeconomic benefits from the protected area; however, such a link does not exist with environmental benefits. This finding suggests that policy makers and protected area managers need to better develop and explain, in a participatory and integrated fashion, socioeconomic benefits from protected areas to communities since the successful long-term management and survival of protected areas hinges on these relationships. In this way, the desired goals of preserving habitats and biodiversity can be supported.

Key words: communities, Costa Rica, ecosystem services, environmental benefits, protected areas, socioeconomic benefits

INTRODUCTION

Significant efforts since the beginning of the 19th century have helped increase exponentially the number of protected areas to become a central component of biodiversity conservation across the world (Chape et al., 2008); covering 15.4 per cent of the planet's terrestrial and inland water areas by 2014 (Deguignet et al., 2014, p.12). However biodiversity is still threatened. A key underlying cause of biodiversity loss is the lack of awareness of its value as conceptualized in the Aichi Biodiversity Strategic Goal A (Convention on Biological Diversity Aichi 2020 Biodiversity Targets, n.d.), The Economics of Ecosystems and Biodiversity Initiative (TEEB, 2010), and the recently adopted Sustainable Development Goal 15 to halt biodiversity loss (United Nations Sustainable Development Goals, 2015).

Protected areas are vital in addressing climate change (e.g., UNFCCC, 2007), are effective implements for

conserving biodiversity (Bruner et al., 2001; Secretariat of the Convention on Biological Diversity, 2010), and contribute to local communities by providing ecosystem services and sustaining cultural values as well (IUCN, 2012; Marshall & Simpson 2008; Muhamad et al., 2014; Naughton-Treves et al., 2005; Olomí-Solà et al., 2012). However, even when the valuation of biodiversity conservation might help local communities reduce their direct pressures on natural resources, as noted in Aichi Biodiversity Strategic Goal B (Convention on Biological Diversity Aichi 2020 Biodiversity Targets, n.d.), many protected areas struggle in maintaining and improving their relationship with communities given resource and land-use restrictions, unequal benefit sharing, and equivocal governance approaches (e.g., McCool et al., 2012; Nana & Tchamadeu, 2014; Snyman, 2012).

Understanding the relationship between protected areas and their surrounding communities is critical for

successful long-term management and conservation of natural ecosystems (Andam et al., 2010; Khan & Bhagwat, 2010; Timko & Satterfield, 2008). For a community to maximize potential benefits provided by the protected area and for the protected areas management to work effectively with the community on conservation outcomes, there must be a thorough understanding from both entities of the current status of relationships, how this can be mutually beneficial, and options for improving affiliations. Although it is commonly conceived that the only purpose of protected areas is to conserve the natural landscape and its biodiversity, today the importance that protected areas have in promoting public understanding and fostering the socioeconomic wellbeing of their respective local communities is recognized (Marshall & Simpson, 2008; Muhamad et al., 2014; Naughton-Treves et al., 2005). Achana and O'Leary (2000) argue that in addition to an ecological relationship between protected areas and neighbouring human communities, strong social relationships have proven to be mutually beneficial. If local people benefit from the existence of a protected area, they will support the protected area and the continued conservation of the area (Mackenzie, 2012; Nyirenda & Nkhata, 2013). This, in turn, may lead to the progress of a community and supports the protection of biodiversity (Chandra & Idrisova, 2011).

Some studies have found negative implications of protected areas on surrounding communities, leading to negative community-protected area relationships. Factors such as management strategies, community organization, and distribution of benefits can advance these negative relationships (Feng, 2008; Raboanarielina, 2012). However, other studies have found that protected areas have positive effects on nearby communities, and these positive impacts appear to be related to strengthened relationships with the respective protected areas (e.g., Mackenzie, 2012; Tessema et al., 2010). Additional studies have pointed to community members who perceive benefits from wildlife (Karanth & Nepal, 2012) and/or tourism, have more positive attitudes toward conservation (Sirakaya et al., 2002; Snyman, 2012).

In Costa Rica there are over 60 protected areas covering approximately 26 per cent of inland territory, created to conserve the area for its natural, cultural, or socioeconomic value (SINAC, n.d.). This study aimed to analyse communities' perceptions of *environmental* and *socioeconomic* benefits (values) provided directly or indirectly by nearby protected areas in order to suggest ways in which to strengthen the relationship. The study assessed the link between perceived benefits of protected

areas by community members and the strength of the community-protected area relationship.

METHODOLOGY

The project centred on assessing the perceptions of locals about ecosystem services and their relation with their surrounding protected area. Since the way individuals see the world is inherent to their behaviour in social systems (Veenhoven, 2002), measuring perceptions of locals is relevant to understanding the relationship between communities and protected areas. There is an important body of literature that examines actual objective characteristics with perceptions (e.g. Flynn et al., 2006; Li et al., 2011; Marsh & Tilley, 2010). Such studies indicate that measures of perceptions inform policy in ways that solely objective measures cannot, since the way individuals see the world – as opposed to the way the world actually is – is itself primary to the behaviour of social systems.

• Study site

The focus was on the four most visited protected areas in the Central Volcanic Conservation Area of Costa Rica: Poas Volcano National Park (Poas), Braulio Carrillo National Park (Braulio Carrillo), Irazu Volcano National Park (Irazu), and Guayabo National Monument (Guayabo). In terms of total number of visitors, official data for the year 2012 report Poas as the most visited area studied with 299,102 visitors, Irazu was second with 173,702 visitors, Guayabo with 27,100, and Braulio Carrillo received the fewest with 14,305¹. Three gateway communities were selected for each of the four protected areas based on their proximity to one of its public entrances (Figure 1). These communities are characterized by being rural, relying mostly on agriculture, forestry and cattle ranching for their key economic activities and, given their proximity to the protected area, also taking advantage of tourism opportunities.

• Data collection and analysis

In total, 365 interviews were conducted in these communities between November 2011 and April 2013 (see Table 1). After a pilot test, the twelve chosen communities were sampled using a door-to-door systematic sampling procedure within spatial strata in which a pair of interviewers approached every other house in each community. Interviews were conducted with an adult of the household. All interviews were collected in a voluntary and confidential manner in order to preserve the internal validity of our findings considering the small number of households in each community; with a resultant sampling error for each of them smaller than twenty per cent.

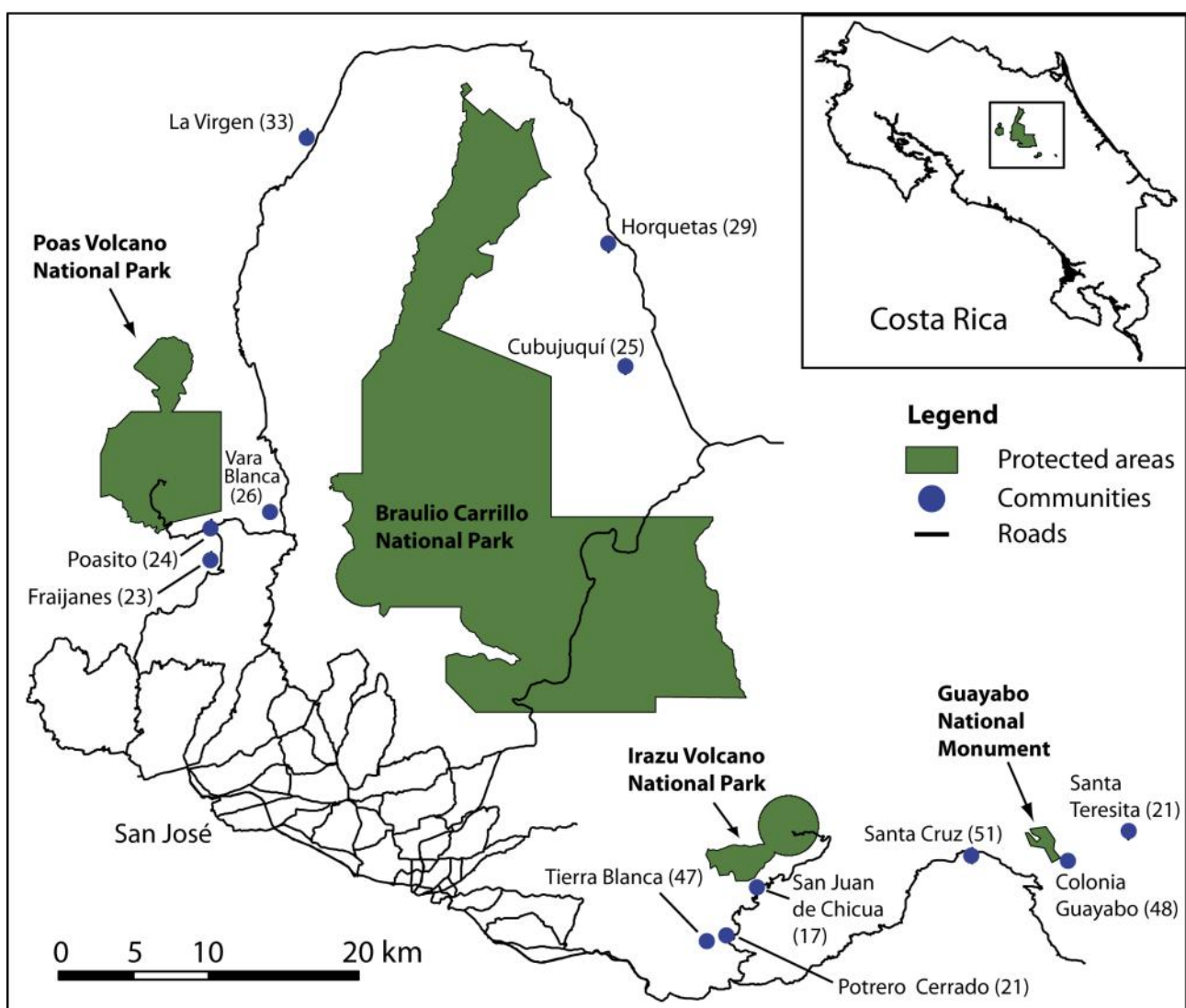


Figure 1. Location of protected areas and communities assessed (in parentheses the number of interviews conducted per community)

Respondents were asked to consider 13 possible benefits (see Table 3) obtained from their respective protected area and respond 'yes' or 'no' to whether they perceived that their community receives each benefit. Included in the list were five possible environmental benefits (i.e., those legally recognized in Costa Rica to receive payments for ecosystem services) and eight socioeconomic benefits – based on feedback from park officials and on previous studies (e.g., ACCVC/UNA-IDESP, 2011; Gutierrez & Siles, 2008). In subsequent analyses the number of *environmental* and *socioeconomic* benefits were compared; however, since the number of benefits on each category varies, we weighted the number of responses to control for this initial difference. Respondents were also asked to rate the perceived strength of the relationship between the community and their respective protected area. This was assessed with a three-point ordinal scale from one being 'Weak' to three being 'Strong'; and those respondents who chose the option 'two' were excluded from the

analyses since they do not have any attitude in either direction. Logistic models were used to assess the probability for *environmental* and *socioeconomic* benefits to be identified by local inhabitants when considering the perceived strength of the relationship between the protected area and the community. In order to account for the effects of the communities in our logistic model, we nested each of the three communities into each of their corresponding protected area. Statistical analyses were carried out using JMP 10 (SAS Institute, 2012).

RESULTS

• Sample profile

Of those interviewed, there was a similar sample size of community members interviewed across the four protected areas and across their place of origin in or outside the respective community (Figure 1 and Table 2). Since most interviews were conducted during the day, over a third of interviewees were housewives. Most

Table 1. General description of the studied communities and sampling effort, a total of 365 houses across twelve communities

Community	Protected Area	Number of Houses	Number of Interviews	Interviewing Period
Fraijanes	Poas	393	23	November 2011
Poasito		366	24	
Vara Blanca		160	26	
La Virgen	Braulio Carrillo	718	33	April 2012
Horquetas		616	29	
Cubujuqui		354	25	
Tierra Blanca	Irazu	667	47	November 2012
Potrero Cerrado		146	21	
San Juan de Chicua		83	17	
Santa Cruz	Guayabo	253	51	April 2013
Santa Teresita		156	21	
Colonia Guayabo		138	48	

Table 2. Demographic description of sampled respondents (n=365)

Variable	Category level	n (%)
Protected Area	Poas Volcano National Park	73 (20)
	Irazu Volcano National Park	85 (23.3)
	Guayabo National Monument	120 (32.9)
	Braulio Carrillo National Park	87 (23.8)
Origin	Born in the area	184 (50.4)
	Came from outside	181 (49.6)
Gender	Female	231 (63.3)
	Male	134 (36.7)
Age	<20	16 (4.4)
	21-40	124 (34)
	41-60	161 (44.1)
	61-80	58 (15.9)
	>80	6 (1.6)
Education	Elementary incomplete	52 (14.3)
	Elementary complete	159 (43.7)
	High school incomplete	41 (11.3)
	High school complete	48 (13.2)
	University incomplete	22 (6)
	University complete	42 (11.5)
Occupation	Housewife	142 (39.4)
	Primary sector (e.g., agriculture, dairy)	37 (10.3)
	Secondary sector (e.g., construction, industry)	12 (3.3)
	Tertiary sector (e.g., services, tourism)	106 (29.4)
	Other (e.g., student, retired, unemployed)	63 (17.5)

respondents (94 per cent) were between 21-60 years old, and only about 15 per cent did not complete primary

- **Environmental and socioeconomic benefits**

On average, locals perceive more *environmental* benefits (76.92 per cent) than *socioeconomic* benefits (54.28 per cent) from their respective protected areas (Wilcoxon $Z = -10.17$, $df = 1$, $P = 0.001$). *Increases in overall landscape*

beauty and the *protection of biodiversity* are recognized by more than 80 per cent of locals as key environmental benefits provided by their surrounding protected area. Under the socioeconomic dimension, the two most recognized benefits provided by protected areas are that they provide *surrounding properties with higher value* and they *help increase economic opportunities through tourism*. As shown in Table 3, even these top

Table 3. Percentage of respondents who perceive *environmental* and *socioeconomic* benefits are provided by their surrounding protected area

List of perceived benefits	Percentage
Environmental	
Increases overall landscape beauty	89.04
Protects plants and animals in general (biodiversity)	83.84
Protects soil from erosion	72.05
Helps purify the air and sequester carbon	71.23
Generates and protects water	67.95
<i>Environmental average</i>	76.82
Socioeconomic	
Gives higher value to surrounding properties	68.77
Increases economic opportunities due to tourism	62.19
Provides spaces for recreation	57.81
Park rangers provide surveillance and alerts in case of emergencies	56.99
Park administration supports development of infrastructure	52.60
Generates sources of employment	51.23
Collaborates in community development activities	46.30
Helps community improve public services	38.36
<i>Socioeconomic average</i>	54.28

Table 4. Logistic model explaining individuals' perceived relationship with the protected area

Independent variables *	DF	χ^2	P
Environmental benefits	1	0.165	0.685
Socioeconomic benefits	1	38.08	<0.001
Protected area	3	13.08	0.004
Community (within its protected area)	8	16.42	0.037
Model $\chi^2 = 80.53$, $P < 0.001$ $R^2 (U) = 0.235$, $N = 247$			

* The dependent variable is the relationship perceived by each individual with the protected area, coded 0 = weak and 1 = strong

socioeconomic benefits lag behind when compared with environmental ones.

There is a positive link between the perception of *socioeconomic* benefits and the perceived strength of the community–protected area relationship; however, such relationship is not present for *environmental* benefits (Table 4). As shown in Figure 2 (overleaf), those who consider there is a weak relationship between the community and the protected area perceive on average 73 per cent of the potential *environmental* benefits, but these same individuals only perceive receiving around 40 per cent of the potential *socioeconomic* benefits. Note that at 95 per cent confidence level, the percentage of *environmental* benefits identified does not significantly change for those respondents who perceive a stronger relationship with the protected area; whereas, the percentage of *socioeconomic* benefits increases from 39.7 to 67.1 with a stronger community–protected area relationship.

The community–protected area relationship is also influenced according to the protected area and the communities associated with the protected areas (Table 4). A clear pattern indicates that *environmental* benefits significantly surpass the perceived *socioeconomic* benefits within each of the protected areas (Figure 3). However, the most visited protected areas (i.e., Irazu and Poas) are the ones where the smallest gap exists between *environmental* and *socioeconomic* benefits. Braulio Carrillo is the protected area where *environmental* benefits are perceived to be the highest, significantly different from Guayabo and Poas, although it is also the area with the largest gap between these and *socioeconomic* benefits.

In the case of Irazu and Braulio Carrillo, almost twice as many nationals as foreigners visited the protected areas. In contrast, Poas was visited evenly by foreigners and nationals. Since the protected areas do not keep records of adjacent visitors, we asked the locals about their

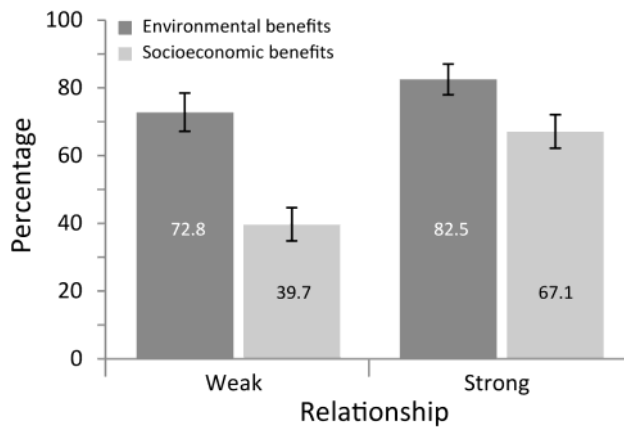


Figure 2. Percentage of respondents who perceive environmental and socioeconomic benefits across the perceived relationship with the protected area (Error bars indicate 95 per cent confidence interval)

visitation to the nearby protected areas and found that those around Poas tend to visit the most frequently (93.1 per cent). Irazu was the second most visited protected area by 85.7 per cent, Guayabo closely follows with 82.5 per cent, and Braulio Carrillo had very low visitation by their neighbours with only 29.8 per cent. We found no correlation between these visitation patterns and a community–protected area relationship (Spearman $\rho = -0.058$, $P = 0.272$). The effects assessed in this study across other variables such as gender, education, origin, or age did not present significant differences.

DISCUSSION

Our results show evidence for a link between the number of perceived *socioeconomic* benefits a community receives and the perceived strength of the relationship between that community and the respective protected area. This concurs with the results found by Allendorf et al. (2012), Baker et al. (2012), and Pearson and Muchunguzi (2011). As presented in Figure 2, it seems that *environmental* benefits are a necessary condition in the community–protected area relationship due to their reliance on natural resources for their living or employment. Despite the general awareness of the *environmental* benefits provided by their surrounding protected areas, it appears that locals may be unaware of how these benefits directly benefit them. Therefore, they do not see higher environmental benefits as relating to a stronger relationship. *Socioeconomic* benefits, or lack thereof, may more directly affect individuals, thus, one could argue that it is easier for people to draw these connections. This idea is supported by the fact that people do not truly understand or value *environmental* services until they have been purposefully taught about them. According to Stern et al. (2008), people's value of *environmental* services increases after having received some environmental education; however, once the

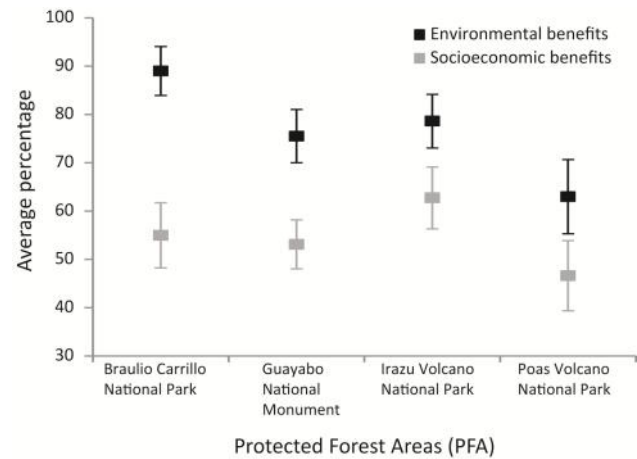


Figure 3. Percentage of respondents who perceive environmental and socioeconomic benefits across protected areas. Error bars indicate 95 per cent confidence interval.

education stops, their perceptions return to how they were before.

When results are analyzed for *environmental* and *socioeconomic* benefits across each protected area, the patterns remained similar with a higher average of *environmental* benefits identified (Figure 3). These along with other results from studies in Asia and Africa (Allendorf et al., 2012; Allendorf & Yang, 2013; Pearson & Muchunguzi, 2011) lead us to believe that this pattern on the perception of benefits is not an isolated case but holds across regions.

Despite being the most visited protected area, respondents at Poas indicated the lowest average percentage of both *environmental* and *socioeconomic* benefits. Here, and in Irazu, the two most visited protected areas by tourists, is also where the gap between *environmental* and *socioeconomic* benefits is the smallest. The focus on tourism might be limiting the awareness and understanding of additional benefits provided by the nearby protected area; furthermore, in these highly visited protected areas tour-operators or out-of-town accommodation owners often are the ones controlling – or at least mediating – most tourism activities. On the contrary, an area such as Braulio Carrillo with little visitation is still highly perceived – contrary to the other protected areas – as an important source of both *environmental* and *socioeconomic* benefits by locals.

West et al. (2006) argue that conservation efforts change how people see themselves in relation to their surroundings. Considering this, a current discussion in the scientific community questions whether or not protected areas have an effect on surrounding communities. On one hand, the preservation of land may



The protection of vast pristine forests at Braulio Carrillo National Park is paramount to provide potable water to an increasing urban population in the capital city of San Jose © Sergio A. Molina-Murillo

reduce the use of natural resources and limit agricultural expansion, but on the other hand, protected areas present opportunities to preserve ecosystem services and boost tourism revenue (Andam et al., 2010; Otuokon et al., 2012; Park et al., 2012). If local governance is lacking, and by extension community participation, then residents may lose the opportunity to reap the *socioeconomic* benefits that a relationship with the protected area can offer (Aigner et al., 2001; Molina-Murillo & Clifton, 2014). Other factors such as organizational structure, leadership, and political participation are also important to realize these benefits (Adams & Hutton, 2007; Laverack, 2001). Therefore, better organized communities are more inclined to work together and take advantage of the benefits provided by their surrounding protected areas (Bodin & Crona, 2008; Rydin & Pennington, 2000). The reason is simple: they have the necessary leadership and connectedness to successfully do so (Bodin & Crona, 2008). In addition, better organized communities are also at greater advantage for protecting and developing their natural capital (Pretty, 2003; Pretty & Ward, 2001). This is because communities that are characterized with high social capital facilitate better sharing of ideas, skills, and beliefs (Pretty & Ward, 2001) as well as a greater sense of working together to achieve common goals such as conservation and development.

Certainly the establishment of the Costa Rican network of protected areas along with the growth of the tourism economy have altered the lifestyles, demographics, and sources of income in communities around the country (Schelhas & Pfeffer, 2005). Although substantially poorer than other communities in the country, there is evidence

that protected areas in Costa Rica seem to alleviate poverty for their surrounding communities (Andam et al., 2010). Therefore, a close evaluation of these developments must be performed on a continual basis, so that protected areas and their surrounding communities are managed as integrated units for conservation and development.

CONCLUSIONS

Despite the increasing awareness that local people living around protected areas might have about the benefits provided by these ecosystems, having and maintaining a close relationship between communities and the protected area is central to this perception and consequentially, to the long-term existence and effectiveness of the latter. Residents are more aware overall of *environmental* benefits from the protected area, which could be explained by the close connection of these benefits to their living and employment needs, and the lack of socioeconomic and political organization in many of the communities. While sharing socioeconomic benefits is vitally important to maintaining a healthy relationship between locals and protected areas, these benefits must be earned and distributed in an integrated way. Thus, the effective development of community benefits from protected areas must be dynamic and participatory, and community leaders must be legitimately empowered to participate in the management process.

ENDNOTES

¹ Jiménez, G. (2013). Marketing Department of the Central Conservation Area. (Personal Communication).



Protecting the red-eyed tree frog (*Agalychnis sp.*) also serves tourism purposes on the lowland forests at Braulio Carrillo National Park © Sergio A. Molina-Murillo

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ABOUT THE AUTHORS

Sergio A. Molina-Murillo is associate professor at the National University of Costa Rica (UNA) and research associate at the University of Costa Rica (UCR). His passion and expertise revolves around forestry, socioeconomics, and sustainability. He is the Director and Editor of the *Tropical Journal of Environmental Sciences*, and member of the CITES national Scientific Committee. He is a forest engineer with a Master and Doctorate from the University of Minnesota, the latter in management of natural resources and economics.

Mauricio Fernández Otárola is assistant professor and researcher at the Department of Biology in the University of Costa Rica, San José, Costa Rica. He is a biologist interested in tropical forest ecology and plant reproduction, especially the interactions between animals and plants. He studies the effect of environmental factors on these interactions, and the importance of these interactions in the maintenance of biodiversity and the restoration of degraded land.

Kelly Shreeve completed a bachelor's degree in environmental sociology and is currently a master's student studying sociology at Colorado State University. She participated in field research in Costa Rica and has studied people–environment relationships extensively. Currently, she is living in Fort Collins, Colorado and developing a thesis on food systems.

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RESUMEN

Las áreas protegidas son una estrategia esencial en la preservación de los recursos naturales. En la actualidad, un aspecto central del manejo de las áreas protegidas es mantener y mejorar su relación con las comunidades circundantes dado el frecuente conflicto por la existencia y expansión de áreas protegidas debido a restricciones en el uso de la tierra. En este estudio, buscamos entender la conexión entre los beneficios socioeconómicos y ambientales percibidos por las comunidades sobre las áreas protegidas y la fortaleza de la relación percibida entre 12 de estas comunidades y sus correspondientes áreas protegidas en Costa Rica. En total, se realizaron 365 entrevistas casa a casa para recolectar los datos, y se utilizó un modelo logístico y correlaciones para analizar los resultados. Encontramos que existe una conexión significativa entre el nivel de percepción de la relación comunidad-área protegida y el número de beneficios socioeconómicos percibidos del área protegida; sin embargo, dicha conexión no se mantiene para los beneficios ambientales. Este resultado sugiere que los responsables de la formulación de políticas y los administradores de áreas protegidas deberían desarrollar y explicar mejor, de una manera participativa e integradora, los beneficios socioeconómicos adicionales de las áreas protegidas hacia las comunidades, por cuanto la gestión a largo plazo y la supervivencia de las áreas protegidas dependen de la relación que tienen con sus comunidades circundantes. De esta manera se pueden apoyar los objetivos deseados de preservación de los hábitats y la biodiversidad.

RÉSUMÉ

Les aires protégées sont un élément clé pour la préservation des ressources naturelles. L'un des principes fondamentaux de la gestion des aires protégées est de maintenir et d'améliorer leurs relations avec les communautés locales, car l'existence ou l'expansion des aires protégées est souvent source de conflits, en raison des restrictions d'utilisation de ces terres. Cette étude vise à comprendre le lien entre la perception des avantages socio-économiques et environnementaux créés par aires protégées, et la qualité des relations entretenues par 12 communautés avec leurs aires protégées au Costa Rica. 365 entretiens en porte-à-porte ont été menés, puis analysés grâce à un modèle logistique basé sur des corrélations afin d'en déduire les résultats. Nous avons constaté que la qualité des relations entre la communauté et l'aire protégée influence la perception des avantages socio-économiques provenant de l'aire protégée; cependant ceci n'est pas le cas pour les avantages environnementaux. Ces résultats suggèrent que les décideurs et les gestionnaires d'aires protégées se doivent de mieux présenter et expliquer, de manière intégrée et participative, les avantages socio-économiques liés aux aires protégées, car la gestion à long terme et la survie des aires protégées repose sur leurs bonnes relations avec les communautés. La réalisation des objectifs attendus de la préservation des habitats et de la biodiversité sera ainsi favorisée.



NATURE PARKS AS INSTRUMENTS FOR SUSTAINABLE INTEGRATED REGIONAL DEVELOPMENT: REVIEW OF A SURVEY OF OPINIONS FROM STAKEHOLDERS IN LUXEMBOURG

Franklin Bahfon Feyeh

* Corresponding author: franklinfeyeh@outlook.com
Institute of Geography and Spatial Planning, University of Luxembourg

ABSTRACT

Today, protected areas have gained significant recognition in local development programmes, acting as instruments for sustainable integrated development. Whereas these goals have been achieved in some areas, in others, the idea remains contested and challenging. This paper focuses on strategies for integrating environmental conservation, economic prosperity, local wellbeing and resource governance, to probe the extent to which these are contributing to the appreciation of Nature Parks as instruments for sustainable development in Luxembourg. Two case studies indicate that adopting a multifunctional character, away from the traditional policy of pure conservation, is having important implications for rural development. Strategies for environmental education, innovative production and collaborative governance are setting a new standard of management and bringing forth new identities in rural areas. However, concrete social policies are lacking and local participation in Nature Parks' activities is insufficient. These limitations have most often been translated into questions such as, conservation for whom? It is, therefore, suggested that management strategies in Nature Parks be monitored routinely, using appropriate sustainability indicators, in order to ensure anticipated outcomes.

Keywords: Nature Parks, Luxembourg, Strategies, Instruments, Integrated development, Sustainability indicators.

INTRODUCTION

Protected areas span the globe, yet as their numbers increase so do concerns about whether these areas are able to maintain values and objectives (Frys -& Nienaber, 2011 Jungmeier et al, 2006; Mose, 2007; Nolte et al, 2010). IUCN defines protected areas as 'clearly defined geographical spaces, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values' (Dudley, 2008). Most of these areas are linked by the aim to conserve biodiversity and the ecosystem services they provide to help improve the lives of those living in or around the areas being protected. In Europe, Nature Parks are a form of protected area, covering about 25 per cent of land area in individual countries. Their objectives range from conserving nature, to connecting people with nature, improving sustainable tourism, to strengthening the knowledge capacity of rural areas. In Luxembourg, Nature Parks are the main type of protected spaces found in rural areas. The rural areas, however, are generally

'rurban' in nature, with increasing infrastructure development projects for housing and mobility. Nature Parks are, therefore, important tools to ensure that human activities do not impact natural resources in rural areas.

Defined by the law of 10 August 1993 as tools for integrated development in rural areas covering 5,000 hectares or more, Nature Parks in Luxembourg have double objectives: to enhance conservation and to promote socio-economic and cultural values within the framework of sustainable development. These objectives closely align with the management objectives of IUCN's category V protected area; that is 'protected areas that promote the interaction of people and nature over time, to produce an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values' (Dudley, 2008). Accordingly, such areas seek to

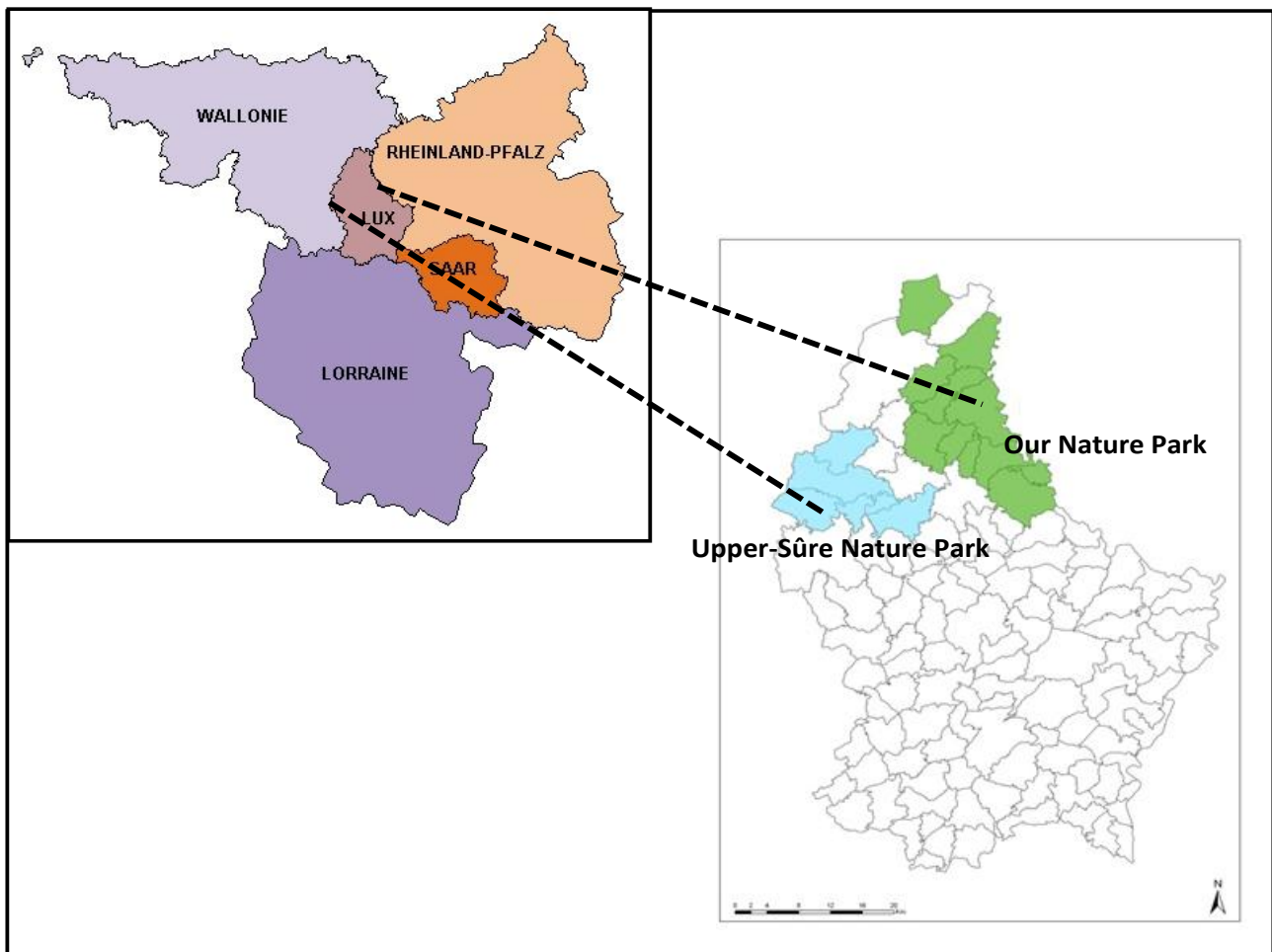


Figure 1: Location of Nature Parks in Luxembourg (Adapted from MDDI, Luxembourg)

restore historical management systems or maintain important landscape values while accommodating contemporary development and change. Nature Parks in Luxembourg balance traditional policies of conservation, which typically have authoritarian control at the centre, with present-day approaches that nurture a combination of preservation with other development functions (social, economic and governance). As such, there has been a growing expectation that Nature Parks contribute to or direct activities of regional development (Hammer, 2007b). Further, there is the need to regulate activities in Nature Parks in accordance with the varying objectives of sustainable development (Dudley, 2008). Consequently, areas of this kind are supposed to act as models of sustainability, so that lessons can be learnt for wider application (IUCN, 2012). Luxembourg's Nature Parks thus aim to mitigate resource depletion, while improving socio-economic prosperity and participatory regional processes, explicitly linked to development strategies.

Since the 1950s, Nature Parks in Europe have increasingly been managed to integrate conservation with development (Gamper et al., 2007). This has, amongst other things, improved knowledge on the importance of ecosystem services found in protected

areas. It has also led to high expectations, especially on the part of local communities, on the integrated benefits that parks would bring to rural areas. However, Mose (2007) argues that although integrated development is being widely used in many conservation projects in Europe, experience with the concept varies. In some countries, while new approaches to achieve sustainable development in protected areas have been the subject of continuous discussion and empirical testing, little change can be identified elsewhere (Mose, 2007).

These concerns are the reason for this study. Given that limited knowledge exists, the aim was to understand whether parks in Luxembourg are moving along the path of sustainable integrated development, as set out by the law guiding their creation. A lack of empirical evidence has made it difficult to reconcile Nature Parks with rural development. As such, the objectives of this study were to analyse the strategies for promoting sustainable integrated regional development in Nature Parks, the consequences of these for rural areas and the factors limiting the advancement of such regional initiatives. The outcomes are informing policy makers on how to modify and enhance the performance of Nature Parks, to make these areas 'real living landscapes' (Hammer, 2007a).



A view of the Esch-sur-Sûre River © Franklin Feyeh Bahfon

METHODOLOGY

• Study Areas

The study was conducted in two Nature Parks: Upper-Sûre and Our (Figure 1). These are picturesque landscapes offering a rich biodiversity with water sources sloping down the Ardennes region. Their gentle slanting interlocking spurs harbour forests and fauna while the plateaus are mainly used for agricultural purposes.

The aim of the study was to answer the question: to what extent are management strategies contributing to the appreciation of Nature Parks by local, regional and national stakeholders, as instruments for attaining sustainable integrated regional development in Luxembourg?

The Upper-Sûre Nature Park was created in 1998 and is located in the north-west of Luxembourg, near the Belgian border. It has an area of about 183.87 km² of which 50 per cent is forested and 42 per cent is agricultural land. Altogether, the area has a population of about 6,000 inhabitants (Upper-Sûre Nature Park, 2014), grouped into four municipalities. The park includes Luxembourg's only artificial lake that acts as a reservoir for supplying about one-quarter of the household drinking water in Luxembourg. This park is devoted to preserving rare and endangered species of plants and animals. Management is mainly carried out by a biological station located in the park, which functions

as a regional contact point for planning, implementing and monitoring schemes for biodiversity protection.

The park's governance brings together environmentalists, planners, local farmers, members of the tourism board and certain state ministries as well as the local population, to establish a strong participatory approach for regional development. Of importance, from the park's designation was the notion that those living and working in this part of the country are the ones responsible for bringing development to the region. A Nature Park is, therefore, a platform to assimilate essential concepts related to bottom-up development and is also a means to improve regional values. As such, the priorities of the Upper-Sûre Nature Park, in addition to those concerning biodiversity, are: to maintain the quality of drinking water from the Upper-Sûre River; boost value creation through the use of natural and cultural resources as well as improving the economic and social status of the region. Sustainable local production of food and non-food items is the main economic activity promoted in the park and it is intended to improve traditional production systems through eco-friendly production and marketing methods. The park also aims to attract small and medium-size enterprises to diversify traditional agricultural processes, which have been characterized by monocultures. The processed food and non-food products are derived from natural products (Field, 2008), and include products such as tea, cosmetics and household detergents.

The Our Nature Park was initiated by a local association (SIVOUR – Inter-communal Syndicate for the Our Valley) in 2005, as a means to represent the best interests of the region and beyond. The park covers about 306 km² with around 21,000 inhabitants and eight municipalities. It is an area rich in culture, with the castles of Vianden and Clervaux being some of the oldest preserved cultural artefacts in Europe.

Stakeholders of the park are working together to reconcile nature conservation and economic development of the region (Our Nature Park, 2014). As in Upper-Sûre park, the biological station in the Our park also coordinates regional projects for landscape and biodiversity protection. The park is renowned for conserving endangered species like the little owl (*Athene noctua*), various bats (*Antrozous*) and the European otter (*Lutra lutra*). It is also an important platform for promoting the cultivation and maintenance of deciduous and stem-fruit trees.

It is anticipated that the park will provide additional economic incentives, to improve the quality of life of the rural population whilst ensuring effective conservation. The production of foodstuffs and a few non-food items is at the centre of the park's economic activities.

• Data Collection

The qualitative technique of triangulation was used for data collection. Consequently, three main methods were used: fieldwork, literature review and semi-structured interviews.

Fieldwork helped in improving knowledge about ongoing projects, relevant reports, policy documents and literature related to the case study areas. It also helped to map out relevant institutions and stakeholders involved in regional strategies. The investigation was focused on local production units (farms, firms and marketplaces), with the aim of understanding the views of stakeholders about Nature Parks as regional tools for development.

Literature drawn from various sources was instrumental in linking the research results with the role of Nature Parks in influencing sustainable development. In this study, two distinct types of reviews were necessary; a review of peer reviewed literature and grey literature. The scope of peer reviewed literature was limited within the domain of environmental economic geography, to understand the interface between nature and economy in protected areas. Grey literature about Nature Parks was taken from policy and project files from public and Nature Park authorities, flyers, maps, seminars and conference papers, reports and other useful internet sites related to the Parks.

A total of nineteen semi-structured interviews were conducted from November 2012 to May 2013. Eight were with participants affected by the strategies of Nature Parks (i.e. owners of small businesses, agriculturalists, local producers and suppliers, and private individuals). Eleven were with stakeholders from government agencies (i.e. experts in the field of regional planning, environment, rural development and agriculture, including European projects on local development), local and Nature Park administration, researchers and NGOs. Criteria for selecting participants were guided by the reasoning that the study depends greatly on views and experiences. This was mainly directed by the research questions, which intended to understand the views of different actors about Nature Parks. As such, participants were either living in one of the Nature Parks or were experts with practical and/or theoretical in-depth knowledge about the patterns and processes of Nature Parks in Luxembourg. Ordinary citizens living in park areas were also important in relating Nature Parks with the local population. The MAXQDA 11.1 software for qualitative data analysis was used to organize and interpret the acquired data.

The interview process was guided by, but not exclusively limited to five groups of questions:

Environmental Domain

- What are the strategies for biodiversity protection in Nature Parks in Luxembourg?

Economic Domain

- How are Nature Parks through innovation and diversification, influencing local economic development, specifically in the production of food and non-food items?
- How can the processes for local production be described?

Social Domain

- How can the social dimension of the parks' policies be defined?
- What is the impact of Nature Parks' development on local employment?

Governance Domain

- What institutional relationship exists in Nature Parks?
- How would one describe the participatory process for Nature Parks' development?

Others

- What are the problems limiting efforts to encourage sustainable strategies in Nature Parks and how could these be improved?

Table 1. Summary of Nature Park strategies

Regional development strategies	Main characteristics
Environmental Protection	Environmental education
	Training on green skills
	Soil and water management
	Biodiversity management
	Environmental advice on local agricultural practices
	Eco-friendly agricultural methods
Economic Development	Small and medium size cooperatives (Eco-entrepreneurs)
	Sustainable production
	Regional marketing
Social Development	No social strategy for local employment
Participatory Governance	Inter-municipal cooperation

It is important to note that the ecotourism sector was not included in the analysis as sustainable tourism and regional development has been extensively researched (Cochrane, 2006; Driml & Common, 1995; EUROPARC Federation, 1993; Honey, 1999; Tapper & Cochrane, 2005). The economic analysis, therefore, concentrated on regional production of food and non-food items.

RESULTS AND DISCUSSION

The research highlighted the difficulty of describing how Nature Parks in Luxembourg have been influencing local development. This is because there are no organized data sources to indicate trends and monitor changes concerning activities in and around parks. However, from the interviews conducted, it is obvious that the two Nature Parks are having some effects beyond environmental protection, including aspects of economic development, participatory local governance and social wellbeing. A summary of the strategies is presented in Table 1 and discussed below.

• Environmental Protection

The strategies to prevent environmental degradation in Luxembourg's Nature Parks are linked to the ecosystem approach (Shepherd, 2008). The rationale is to strike a balance between policies of ecological preservation and economic development, to better involve and improve the quality of life of the rural population. This approach seeks to reconcile different actors' groups such as farmers, tourists, foresters and local producers, not excluding ordinary individuals, to a common agenda: sustainable use of available resources. Through schemes, such as education on sustainable development, viewpoints are shifting towards natural resource valuation and the promotion of skills required for sustainable production. Environmental education offers students of all ages a context for developing active citizenship and participation, embracing the complexity

of the interdependencies of ecological, societal, and economic systems (Swayze, 2010). Main themes for environmental education revolve around water management. In both parks, authorities are using games, excursions and experimental exercises, to provide instruction on how to make surface and groundwater cleaner. Most learning activities are framed within subjects relating to environmental economic relationships so as to promote responsible economic activities along important water sources in Nature Parks.

Protecting water sources from harmful agricultural inputs and animal wastes is an important thematic area in the process of biodiversity management in both parks. Brochures to improve awareness on water conservation and use of pesticides are distributed during outdoor events or sent directly to residents. Also, actions are being taken, for example, to delay grass cutting around open fields. This is known as 'Fauchage tardif', a process for improving biodiversity, given that delaying grass cutting will provide valuable habitat for endangered butterflies. Each year, the parks in collaboration with the Ministry for Sustainable Development promote a tree planting campaign in areas experiencing reduction due to construction or ageing. Trees are provided for free to interested local inhabitants and this is meant to maintain the tradition in which villages are surrounded by orchards. In addition, certain rare species of plants and animals are monitored regularly by the biological stations, to maintain or improve growth. Examples include the non-venomous smooth snake (*Coronella austriaca*) and pyramidal bugle (*Ajuga pyramidilis*).

Contracts promoting biodiversity conservation ensure environmental stewardship with the aim of reducing harmful agricultural practices. Contracts, in the form of incentives, are signed with local landowners for the protection of certain plant and animal species, as well as

soil, air and water. A number of farmers are given financial compensation for their efforts in managing the environment and for restraining from intensive production practices, especially along water courses. Others are provided with technical and professional support. In the Upper-Sûre Nature Park, for example, the river contract (Contrat de Rivière Haute-sûre) is the main form of biodiversity contract, signed between park authorities and local farmers. This initiative started in 2006 under a European Community Interreg III project for the preservation of the Upper Sûre catchment area. By 2008, around fifty farmers in the Upper Sûre Nature Park had signed the river contract (there is no data to determine what per cent of total farmers this represents). They collaborated with park authorities to construct fences, drinking troughs and small bridges along and over brooks in farm plots, to prevent cattle from trampling along or having direct access to these water sources.

Well-trained specialists are also employed on a full time basis in the two Nature Parks to give technical advice to farmers. They advise farmers on the types of farming practices that are compatible with the local ecosystems and also, on the importance of organic farming in Nature Parks. Through this approach, innovative methods of soil protection, such as direct drilling (ploughing topsoil to a depth of 5 cm in order to retain the humus layer) are being promoted. This has proved favourable in maintaining soil stability and increasing yields. Before the introduction of this technique, local farmers were usually engaged in a traditional ploughing system, rotating the entire topsoil at a depth of about 30 cm. This led to nutrient leaching and soil erosion, estimated at thousands of tonnes of topsoil per year, including related impacts such as lower crop yields and profits.

• Economic Development

The authorities in the Nature Parks are trying to encourage an economic approach that improves innovation and diversification in the production of local goods, bringing forth new strategies that blend traditional with modern agricultural practices. These have generated a strong identity for the rural areas concerned. Before the creation of Nature Parks, mono-production of basic raw materials with no further processing, mainly as animal feed was the main activity. The creation of Nature Parks has led to production activities being developed by local cooperatives. Accordingly: *'Today, more than 80 per cent of locally obtained raw materials are not exported as before but are being processed using guideline principles made available by park authorities'* (Remark from a local farmer).

This has led to the production of quality tea, beef and cereal products such as flour and pasta, as well as candies, a perfume, beer, soap, and body creams. These commodities are obtained from plants that are locally grown and they are contributing greatly in boosting the identity of park areas through the *VumSei* and *BEO* brands. Consequently, a local identity has now been established through park labels and this has been considered a great added value in marketing regional products. Today, these food and non-food items with eco-labels can be found in shops in and around the Nature Parks. *'Although there are generally no official statistics, we have been seeing an increase in sales of between 10-15 % yearly'* (a local producer).

For over twenty years, the two Nature Parks have been playing a significant role in promoting a new form of agriculture which aims to be compatible with the immediate surroundings and provides new opportunities to local producers. This 'third way of rural development' (Loloudis 1999, in Nastis & Papanagiotou, 2009) is an approach to economic diversification that focuses mainly on agriculture and agricultural enterprises in rural areas (Nemes, 2005). The first ever herbal tea production unit in Luxembourg, for example, is an initiative of local farmers in the Upper-Sûre Nature Park. Promoting tea production is an innovative process to stimulate eco-friendly activities in economically sensitive domains. That is, parks are encouraging economic actions that have little or no influence on nearby ecosystems. It is encouraging to see how an economic activity like this includes measures to both protect water sources and produce quality products. Tea products are mainly made from medicinal plants and other herbs, grown and processed in the Nature Park. The plants are cultivated without the use of fertilizers and pesticides in order to comply with strict regulations regarding nature conservation and environmental protection.

The production of mustard is another example of innovation and diversification. Farmers in Our Nature Park have been educated on how to process mustard seeds to produce six different mustard products. Before this initiative, much of the mustard consumed in Luxembourg was from Canada. Thus, this is also an example of how this park has been attempting to reduce trade flows between continents, for products which can be manufactured locally.

• Social Development

Social development is a major challenge in Nature Parks, with respect to employment. For a long time employment opportunities have been focused on the southern part of



Esch-sur-Sûre Village © Franklin Feyeh Bahfon

Luxembourg City, but with the regional initiatives associated with the Nature Parks, it is anticipated that parks will help to reverse this situation. However, to date the objectives for improving social wellbeing have been broadly defined and lacking implementation. The problem is that: *'In the legislation enacting the creation of Nature Parks in Luxembourg, specifications as to how parks would increase wellbeing or add value to the lives of those living in these areas are lacking'* (government administrator). Also, *'Most social objectives are only on paper and some of us on the ground know little about whether the objectives are attained or not'* (local inhabitant).

Youth employment programmes are lacking, although they could play a great role in this aspect of development. Consequently, doubts about social impact are often manifested. Such imbalance in social development should be corrected if Nature Parks are to be involved in regional development (UNRISD, 2012). This is because social policies can perform multiple functions in any economy, including those of protection and can help to test whether Nature Parks are making positive or negative contributions to the livelihoods of people living immediately adjacent or further away.

Many stakeholders have been expecting that Nature Parks, through various development oriented policies, would be able to improve local welfare especially in terms of job creation. Although some local cooperatives have been trying to boost local employment, it is argued that this is insignificant because labourers are mainly from within a single family. Therefore, it can be argued that:

'Nature Parks have done relatively little in the domain of local employment. In this sense, it can be concluded that social development is not as important as economic and environmental development...Similarly, Nature Park authorities most often forget about the local population who have otherwise contributed more to the image of Nature Parks than what they gain socially from parks, even though this is hard to prove' (local inhabitant).

This is certainly not a positive image for Nature Parks as the idea of combining environmental preservation with priorities of economic development has led to high expectations about the contributions parks will bring to the region (Mose, 2007). In future, if social and economic objectives are to be compatible with biodiversity conservation, attempts should be made to integrate these within planning and management (Rodríguez-Rodríguez, 2012).

• Participatory Governance

Generally, decisions regarding management of parks in Luxembourg are taken at three main levels. At the national level, the Ministries for Sustainable Development and Infrastructure, Agriculture, Rural Development and Forestry, are active in managing the activities of Nature Parks. These institutions are responsible for coordinating all spatially relevant policies within the Nature Parks and between parks and other administrative levels. They also evaluate the ecological potential of Nature Parks and define proposals for protection, restoration and management.



A local shop for Nature Parks' products, with insert tea products from Vum sei cooperative © Franklin Feyeh Bahfon

The municipalities in the areas of the two Nature Parks are represented together in a regional organization that runs the development processes in the parks. Management is divided into various sections (executive, park administration, mixed working groups and regional syndicates), each of which has a specific duty to ensure the smooth functioning of the parks. In general, these segments ensure that proper decisions are made with respect to the coordination of regional projects. This inter-municipal cooperation for sustainable development is one of the most important achievements of the Nature Parks and a significant contribution towards encouraging a win-win situation in resource management where both top-down and bottom-up objectives are simultaneously dealt with. The two parks thus each make up a sort of invisible region, in a country where decisions about spatial planning and development are managed only at the local and national level. Therefore, Nature Parks could be confirmed as regional instruments for resource governance. For example: *'The occasion to meet with actors from other municipalities and institutions to discuss aspects related to Nature Parks and regional development would not have been possible if there were no Nature Parks'* (local administrator).

Local level governance is composed of local business owners, and farmers' and producers' cooperatives, including tourism organizations. These are the main stakeholders influencing the production economy in the park areas. They have the greatest decision making on what and how to produce food and non-food stuffs.

Integrated decision-making processes are common in projects that are related to local production and water management. Synergies can be found among sectors and across scales. Even though there is evidence of conflict of interest especially between local producers and the administration of the different parks, a common language (Qalyoubi, 2012) to decide quality labels, to agree on certain farming and biodiversity management techniques, as well as the marketing of regional products has developed between the two Nature Parks. In this respect, the parks' strategies have gone a long way to promote collaborative governance in which stakeholders co-produce goals and strategies and share responsibilities (Althea & Rehema, 2012) on approaches, rules, practices and institutions that shape how humans interact with the environment (UNEP, 2010).

The governance system practised in Luxembourg's parks seeks to ensure that all actors are involved to better manage and develop local potentials and to promote cooperation on topics related to protected area development. However, local participation, which is supposed to be an important contribution to this process, is insufficient. In some cases, diverging ideas about the operational qualities of park development have led to governance structures falling apart. In Our Nature Park, for example, communication between some local producers and park authorities has ceased for about six years now. *'At the moment we (farmers' group) do not have any cooperation with them (park authorities) even though there was a sort of understanding in the*

beginning when the LEADER project started' (local producer).

Disagreements between actors are normally due to misconceptions on aspects related to development and protection; the power to control and how to finance projects; divisions over what aspect of economic activity needs to be encouraged or commercialized and the transparency approach for controlling quality products.

Furthermore, some local inhabitants defend their continuing failure to participate in parks activities with the opinion that projects in park areas are not destined to help those living around these areas. *'Even though there is a lack of a culture for public participation in the Our Nature Park, for example, people in this area cannot identify themselves with projects which they are not part of... One reason for the lack of engagement is because parks' projects are too vague, which at the end yield less fruit than expected, making it difficult for the local population to recognize any concrete achievements. Another reason might be that local projects are directed more towards visitors (tourists) rather than to the local population'* (local inhabitant).

Judging from this, a new realism is necessary for policy and practice to navigate conflicts and to make difficult choices. This will help to ensure that Nature Parks' governance indeed integrates the concerns of all stakeholders.

CHALLENGES AFFECTING NATURE PARKS'

STRATEGIES

- **Inadequate mechanisms to encourage organic production**

Notwithstanding the efforts made by Nature Parks' authorities to promote sustainable agriculture, there are still some gaps, especially regarding organic agriculture. Many farmers still practise conventional agriculture, which can have deleterious impacts on biodiversity. Although there are ongoing efforts by the Institute for Biological Agricultural Research (IBLA) to convert conventional farmers to organic producers, under the project; 'Organic Farmers in Nature Parks', most conventional producers are sceptical about the importance of such a transformation, thinking it will reduce profit. This is a barrier limiting conversion to organic agriculture in many countries (Smit et al., 2009). Reports from UNEP (2011) contradict this notion, insisting that profits from organic agriculture are good. This is because organic products can command higher prices, often a premium of about 20 per cent when compared to conventional agriculture (UNEP, 2011). In

this sense, farmers' incomes can remain generally high and the adoption of organic techniques can give a new life to rural communities. It is important to note that Luxembourg has the third highest per capita consumption of organic products in Europe (Helga & Lukas, 2012), but very few farmers are engaged in such a practice, let alone in Nature Parks. As such: *'If there is any place within Luxembourg where organic farming is to be encouraged, it should be in Nature Parks. This is because parks have the maximum potential to do so'* (agricultural specialist).

Much of what is currently being produced in the park areas (tea, cereals, edible oil, mustard and cosmetic products) are categorized as quality items. It is, therefore, difficult to distinguish Nature Parks from other areas, based on local production only. It has been argued that as Nature Parks are protected areas, production should only be carried out using organic means. However, because the success of agriculture in many European Union countries depends more on subsidies than on the quality of their products, there is a tendency to favour quantity and not quality. Faced with this situation: *'The question should be; is it better to use public money for quality products or is it for the local producers to decide?'* (organic producer).

- **Lack of transparency in local production**

Moreover, there are certain hidden practices that limit transparency in the entire production chain of goods from parks in Luxembourg. Some products made with raw materials obtained from areas outside the parks are being labelled as from Nature Parks. Bringing these raw materials into the parks entails negative externalities, for example, from long distance hauling. The situation is becoming serious in Our Nature Park where there are no generally agreed principles for local production. To attain a level of sustainability in regional production, production standards should not only be limited to quality criteria published by park authorities, they should also take into consideration the entire production lifecycle. This is particularly important in building consumer trust.

- **Inadequate knowledge about the concept of the Nature Park**

Another major obstacle is the lack of understanding about parks as tools for sustainable development. This is a result of insufficient knowledge and different stakeholders have different views about how parks can effectively contribute to regional development. Some think of parks as areas for conservation only, while others reflect on either the economic or social facet of



A brook joining the Esch-sur-Sûre River © Franklin Feyeh Bahfon

parks' development. Consequently, there are disagreements on which path to follow in order to promote sustainable outcomes. It is understood that this difficulty is a result of differences in goals and expectations among stakeholders involved in the development of parks in Luxembourg. Most public actors want to encourage ecological principles, thinking this is the most important aspect of protected area management. On the other hand, some local stakeholders would prefer aspects related to economic and social development, given that these would have direct or tangible consequences on local citizens. As such, the issue is about finding the right balance which should be guided by intensive awareness building on the conceptual and practical meaning of a Nature Park.

- **Disagreement over the size of existing parks**

There is confusion or uncertainty among stakeholders on whether existing parks are large enough to operate as separate entities for regional development. Some municipalities are interested in merging the two parks so as to have a wider region with greater comparative advantage and improved political powers over decisions on nature conservation. Others argue that this will slowly, but surely, erode the power of individual municipalities over decisions related to regional planning and development. Consequently, this has escalated

tensions. There is now conflict over concepts of local development and one municipality (Rambrouch) situated in the middle of the Upper-Sûre Nature Park withdrew its participation in all park activities.

RECOMMENDATIONS

This study was concerned with the practical understanding of Nature Parks as instruments for sustainable integrated regional development. It was observed that in Luxembourg, as in other European countries, strategies for integrated development highlight the notion of a paradigm shift in protected area management (Mose, 2007), where designated functions have moved far beyond biodiversity conservation to include other aspects, mainly economic, social and governance processes. Furthermore, the case of Luxembourg reflects the limitations which according to Nolte et al. (2010) and Dudley (2008) are often discussed in relation to protected area management effectiveness in Europe. The difficulties in implementing the objectives of social wellbeing and ensuring proper participatory processes in parks in Luxembourg are clearly impacting management effectiveness. Consequently, the following recommendations might help to design more practical strategies. They have relevance throughout Europe, where many protected landscapes (i.e. areas managed as category V protected areas) face the same challenges.

Table 2. Sustainability indicators to improve Nature Parks' performance

Domain	Main Indicators
Ecology	Number of farmers involved in organic farming within park areas
	Number of farms converting to organic agriculture
	Number of contact points for issues of environmental protection
	Monthly measurement of nitrate quantity in water sources
	Number of social learning activities related to biodiversity protection
Economic	Quantity of agricultural pesticides used per year in park areas
	The number of local producers engaged in organic production
	Agricultural area under organic farming
	The proportion of products with park labels in relation to total goods produced in park areas
Social	Yearly survey of local levels of satisfaction regarding Nature Park outcomes
	Number of new jobs directly linked to activities in Nature Parks
Governance	Number of meetings between stakeholders to improve regional network per year
	Number of partnerships per year within and beyond park areas to combine local and national strategies for regional development
	Number of regional/local actions per year to motivate local interest in participating in park activities

If parks in Luxembourg want to improve performance on economic development, an important consideration would be to design more practical strategies that would improve sustainable agriculture, particularly organic production. Sustainable agriculture is a philosophy based on human goals and on understanding the long-term impacts of our activities on the environment and other species (Robinson, 2008). The use of this approach guides the application of prior experience and latest scientific advances to create integrated, resource-conserving and equitable farming systems. This will help to distinguish park areas from other rural areas where initiatives are also taken to promote sustainable production, as well as providing biodiversity outcomes.

There is also a need to consider the merging of the Nature Parks, to improve regional economic performance. This does not reflect a physical extension beyond present boundaries. Rather, it represents a political process, to open new corridors for producers and consumers, including knowledge sharing and power over decisions creating a regional competitive advantage. It might also lead to the establishment of a specific label for both Nature Parks.

It is important to increase efforts towards motivating the local population to be pioneers of almost all initiatives organized in the park areas. This will go a long way to help local people identify themselves with park activities and increase local responsibilities on issues of regional governance and development. Stakeholder dialogue should be considered a priority, while awareness building or knowledge sharing on the value of local potentials

should be a recurrent theme in the project cycle management of park areas.

Strategies in Nature Parks should be monitored routinely, using appropriate sustainability indicators (see Table 2), in order to ensure anticipated outcomes within positive levels. Through this, less successful strategies could be redesigned to improve results and address certain challenges, especially those related to social development.

Finally, it is necessary for stakeholders to understand the vagueness and challenges of the concept of sustainable development. This will help eliminate poorly defined objectives and improve knowledge among the local population that a Nature Park is just an instrument among others, not a panacea for all regional problems.

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ABOUT THE AUTHOR

Franklin Bahfon Feyeh holds a PhD in Geography from the Institute of Geography and Spatial Planning, University of Luxembourg. He is interested in topics related to sustainability, regional development and governance, conservation and development as well as cross-border development.

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RESUMEN

Hoy en día, las áreas protegidas han cobrado un importante reconocimiento en los programas de desarrollo local, sirviendo como instrumentos para el desarrollo integral sostenible. Si bien en algunas áreas se han logrado estos objetivos, en otras, la idea sigue siendo polémica y desafiante. Este estudio se centra en las estrategias para la integración de la conservación ambiental, la prosperidad económica, el bienestar local y la gobernanza de los recursos, para investigar la medida en que estos elementos contribuyen a la apreciación de los parques naturales como instrumentos para el desarrollo sostenible en Luxemburgo. Dos estudios de caso indican que la adopción de un carácter multifuncional, apartado de la política tradicional de conservación pura, está teniendo consecuencias importantes para el desarrollo rural. Las estrategias para la educación ambiental, la producción innovadora y la gobernanza basada en la colaboración están dando lugar a una nueva norma de gestión y generando nuevas identidades en las zonas rurales. Sin embargo, se carece de políticas sociales concretas y la participación local en las actividades de los parques naturales es insuficiente. Estas limitaciones se han traducido con frecuencia en preguntas tales como, ¿conservación para quién? Por lo tanto, se sugiere un seguimiento rutinario de las estrategias de gestión de los parques naturales, mediante indicadores de sostenibilidad adecuados, con el fin de garantizar los resultados esperados.

RÉSUMÉ

Les aires protégées ont désormais acquis une importance bien reconnue dans les programmes de développement local, car elles agissent comme des instruments de développement durable et intégré. Alors que certaines régions atteignent cet objectif, pour d'autres l'idée reste contestée et complexe. Ce document traite des façons d'intégrer la conservation de l'environnement, la prospérité économique, le bien-être local et la gouvernance des ressources, afin d'examiner de quelle manière ceux-ci influencent la perception des parcs naturels en tant qu'instruments de développement durable au Luxembourg. Deux études de cas indiquent que le fait d'adopter un système multifonctionnel, loin de la politique traditionnelle de conservation pure, a des implications importantes pour le développement rural. Des stratégies visant l'éducation environnementale, l'innovation et la gouvernance collaborative créent de nouvelles normes et de nouvelles façons d'appréhender la gestion les zones rurales. Cependant, les politiques sociales concrètes font défaut et la participation locale dans les activités des parcs naturels est insuffisante. Ces limitations sont le plus souvent exprimées par des questions telles : la conservation pour qui? Il est donc proposé une surveillance systématique des stratégies de gestion des parcs naturels, utilisant des indicateurs de durabilité appropriés, afin d'assurer les résultats attendus.