Management effectiveness evaluation in protected areas – a global study

Second edition – 2010

Fiona Leverington, Katia Lemos Costa, Jose Courrau, Helena Pavese, Christoph Nolte, Melitta Marr, Lauren Coad, Neil Burgess, Bastian Bomhard, Marc Hockings

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"The goal of parks and protected areas is to contribute as much as possible to the range of choices available to the children of the future. They cannot choose the impossible or dream the unimaginable'."
(Hales, 1989)

Citation

Fiona Leverington, Katia Lemos Costa, Jose Courrau, Helena Pavese, Christoph Nolte, Melitta Marr, Lauren Coad, Neil Burgess, Bastian Bomhard, Marc Hockings (2010)

Management effectiveness evaluation in protected areas – a global study. Second edition 2010.

The University of Queensland
Brisbane AUSTRALIA

The 2010 Biodiversity Indicators Partnership (www.twentyten.net) is a global GEF funded initiative to provide the best information on biodiversity trends and assess progress towards the CBD 2010 Target.

The *Management effectiveness evaluation in protected areas – a global study – second edition 2010* forms part of the 2010 Biodiversity Indicators Partnership (www.twentyten.net), a global initiative to communicate trends in biodiversity and assess progress towards the CBD 2010 target.

The 2010 Biodiversity Indicators Partnership (www.twentyten.net) is a CBD-mandated initiative bringing together a suite of biodiversity indicators, allowing for a more comprehensive and consistent monitoring and assessment of global biodiversity, with a view to measuring progress towards the CBD's target to reduce the rate of biodiversity loss by 2010.

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Preface by Nikita (Nik) Lopoukhine, Chair, IUCN World Commission on Protected Areas

Protected areas on land and sea are the cornerstones of international efforts to conserve biodiversity. These areas, including national parks, protected landscapes and countless other reserve types, are increasingly recognised for the numerous benefits they bring to communities. As I travel around the globe in my role as Chair of the World Commission on Protected Areas (WCPA), I am continually impressed at the efforts of protected area staff and supporters in all countries – from richest to poorest – to ensure that these areas can deliver benefits for conservation, and to local communities, to visitors from near and far, and to the broader society.

As the world faces some of its greatest challenges through climate change, protected areas' values are ascending. They help to mitigate the extent of climate change by storing carbon in forests and grasslands, soils and marine areas that would otherwise be emitted into or stored in the atmosphere. Protected areas also assist in adaptation to climate change: they are a source of fresh water and other environmental goods and services while also buffering the effects of natural disasters.

We are aware that these important roles can be compromised by inadequate management. The extreme is where protected areas are nothing more than 'paper parks' – existing on maps and country lists but no more protected from threats than surrounding areas. The community of protected area specialists, conservation groups, international agencies have responding to these concerns, and have striven to ensure that management is continually improving. As part of this effort, assessments of Protected Area Management Effectiveness (PAME) have now been conducted in more than 140 countries. These assessments have been included in the Protected Areas Program of Work and the associated targets developed by the Convention of Biological Diversity (CBD). They are conducted in many different ways and by many different groups, but have the common ultimate aim of improving protected area management and accountability.

Information from these assessments is vital as part of a cycle of management and of continuous improvement. Globally, this information provides an understanding of the state of protected areas, the major threats they face, and the priorities for action and to guide investments accordingly.

The Global Study of Management Effectiveness was initiated and supported by the WCPA, along with NGO and academic partners, to bring together the numerous and diverse sets of information collected at local level and to interpret the information to assist us at international level. This has been a big undertaking and has only been delivered with the cooperation of countless people from across the global protected area network.

The team that has put together this Study need to be recognized for their contribution to protected area management around the world. The findings of this study will assist me, the WCPA and our partners to determine future priorities to improve protected area management. I know that it will also help protected area managers and others working at local level to find and share information about management effectiveness.

Nik Lopoukhine
Chair, IUCN World Commission on Protected Areas

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Acknowledgements

This report has been compiled with the use of information and assistance given freely and generously by many sources, including country agencies, conservation organisations and individuals.

Financial support for the Global Study from 2005 -2008 was generously provided by WWF International, The Nature Conservancy (TNC) and the University of Queensland. From 2008-2010 financial support was given through the Biodiversity Indicator Partnership funded by the Global Environment Facility. Assistance and cooperation from IUCN World Commission on Protected Areas (WCPA), UNEP-World Conservation Monitoring Centre (WCMC) and the World Bank has been greatly appreciated.

Support from the InterAmerican Biodiversity Information Network (IABIN) enabled us to focus efforts on the more complicated management effectiveness evaluation scene in Latin America.

The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety through BfN helped to fund a study of European management effectiveness which was conducted jointly with the University of Griefswald and yielded much valuable information for that region.

Individual supporters of management effectiveness initiatives and the Global Study have included Jamie Ervin, Jason Spensley and Jef Parrish (TNC), Sue Stolton and Nigel Dudley (Equilibrium) Leonardo Lacerda (formerly WWF), Alexander Belokurov and Liza Higgins-Zogib (WWF), Geoffroy Mauvais (IUCN), Stuart Butchart (Birdlife International), Kathy MacKinnon and Tony Whitten (both formerly of the World Bank), Josep-Maria Mallarach and Charles Besancon (UNEP-WCMC). In the European study, there was major support from Suzanne Stoll-Kleeman (University of Griefswald) and Gisela Stolpe, among others .

Allan Lisle from University of Queensland has been responsible for the 'translation tool' and assistance in statistical analysis: his help has been very valuable.

For comparative information about methodologies, acknowledgement is given to:

- Marc Stern – for his comparative study of marine management effectiveness systems (2006)
- Stéphane Pauquet – comparative analysis of three methodologies applied in Bolivia (Pauquet 2005)
- Sue Stolton, for compiling a number of case studies presented in the revised version of the IUCN WCPA guidelines on management effectiveness (Hockings *et al.* 2006)
- PowerPoint presentations from the regional workshop on management effectiveness in the Andes (Cracco 2006) and all authors of the report comparing existing tools in the region (Cracco *et al.* 2006).
- Participants in workshops on management effectiveness held in Melbourne, Australia in February 2002, and in Durban at the Vth World Parks Congress, 2003.
- Anne Kettner for compilation of information on European methodologies.

Special thanks for input, assistance and review of individual methodologies and for provision of data and information about assessments are given to Jamie Ervin, Alexander Belokurov, Sue Stolton, Dan Salzer, Stéphane Pauquet, Sandra Valenzuela, Angela Martin, Helder de Faria, Maria Padovan, Arturo Ignacio Izurieta, Juan Chang, Bernard Pfleger, Dan Paleczny, Kathy Rettie, 'Wildtracks' of Belize, Ronaldo Weigand Jr, Vinod Mathur. Mark Zimsky, Kathy MacKinnon, Surin Suksuwan, Carmen María López, Hag Young Heo, Adriana Dinu, Alexia Wolodarsky, Jonathon Smith, Chris Dickenson, Rita Mabunda, Thomas Barano, Chris Mitchell, Peter Stathis, NSW Dept of Environment and Conservation, Natalia Flores, Hildegard Meyer Cristian-Remus Papp, David Butterworth, Dave Chambers, Mervi Heinonen, Gabriele Niclas, Nicole Schrader, Rauno Väisänen. Carlo Franzosini, Genti

Kromidha, Jill Matthews, Lucia Naviglio, Françoise Bauer, Gordana Beltram, Ian Burfield, Ramona Cherascu, Ioli Christopoulou, Lina Daugeliene, Abdulla Diku, Olivia Favre, Claudine Fenouillet, Lincoln Fishpool, Carlo Franzosini, Pierluca Gaglioppa, Laura García de la Fuente, Victor Manuel García Díaz, Ivana Grujicic, Viktoria Hasler, Mervi Heinonen, Erik Hellberg, Roelof Heringa, Andrea Hoffmann, Joëlle Huysecom, Jana Kus Veenvliet, Gilles Landrieu, , Mike McCabe, Hildegard Meyer, Marta Mugica de la Guerra, Charmaine Muscat, Bo Nilsson, Cliona O'Brien, Olaf Ostermann, Cristian-Remus Papp, Nevena Piscevic, Howard Platt, Martina Porzelt, Zeljka Rajkovic, Johan Rova, Christian Schlatter, Melle Schol, Nicole Schrader, Jesus Serrada, Andrej Sovinc, Daniela Talamo, Anabela Trindadi, Bart van Tooren, Katharina Vuksic and Andreas Weissen.

At the University of Queensland, international interns Sophie Vonk, Erika Díaz Pascacio and Greta Nielsen (also University of Griefswald) gave very valuable assistance especially in the analysis of reports. We are also grateful to UNEP-WCMC's Protected Area Programme, especially Charles Besançon, and Arianna Granziera, for assisting with matching of assessments with the WDPA.

All photos are by the authors unless otherwise acknowledged.

This study would not be possible without the people around the world who work to record management effectiveness in the field and kindly share their information.

Above: Recording protected area values, Expedition National Park, Australia

Executive summary

The Global Study into management effectiveness evaluation was conducted between late 2005 and 2010. In cooperation with many people across the world, we aimed to strengthen the management of protected areas by compiling the existing work on management effectiveness evaluation, reviewing methodologies, finding patterns and common themes in evaluation results, and investigating the most important factors leading to effective management. The project was supported by WWF International, the Nature Conservancy and the University of Queensland, and worked under the auspices of IUCN World Commission on Protected Areas. Objectives and findings of the Global Study included the following:

Objective 1: Record, collect and collate available information from assessment systems, individual park assessments and other evaluations of management effectiveness that have been undertaken in protected areas. Develop a system for integration of available management effectiveness information into the World Database on Protected Areas (WDPA).

The Global Study has recorded over 9000 assessments of protected area management effectiveness evaluation (PAME) from 140 countries. Original data was obtained and analysed for about half of these assessments, and in addition over 50 evaluation reports have been reviewed. We developed a database which is being linked to the WDPA. A website to enable viewing of the methodologies and study locations has been developed by the World Conservation Monitoring Centre in partnership with the Global Study.

While we are sure that there are some assessments that we did not locate and include in the Global Study database, we are reasonably confident that we have included the majority of assessments that have been completed and in the public arena. Given this, the gap between completed assessments and the 2010 target under the Convention on Biological Diversity Programme of Work on Protected Areas of assessing 30% of the world's protected areas is substantial. Assessments recorded in the Global Study represent just 6% of the more than 100,000 protected areas included in the WDPA although 35 countries have achieved at least the 30% target and 63 countries have assessed more than 15% of their protected areas. On an area basis, progress is even more impressive with 67 countries meeting the 30% target and 99 countries assessing more than 15% of the area under protection. This represents significant progress over the position of just a few years previously and there is evidence of many more countries commencing ambitious programs of evaluation of management effectiveness of their protected area systems in all regions of the world.

Objective 2: Gain an understanding of most appropriate methodologies for different situations and protected area systems.
Over 70PAME methodologies have been reviewed, and these are summarised in a supplementary report to the original version of this document (Leverington *et al.* 2008) and an overlapping report for Europe (Leverington *et al.* 2010a). The most widely used methodologies across the world are RAPPAM and the Tracking Tool, while other methodologies, including the Parks in Peril Site Consolidation Scorecard, PROARCA and ParksWatch Parks Profiles, have been applied extensively in Latin America and the Caribbean. Depending on the purpose, assessments are conducted at different scales and levels, from detailed site-level studies such as those using the Enhancing our Heritage methodology, to broad system-level assessments such as the study of Finnish protected areas. Guidelines and a checklist for choosing and adapting methodologies are presented in this report. People undertaking assessments are encouraged to use or modify existing published methodologies where possible, and to maintain maximum consistency over time.

Objective 3: Gain as wide a picture as possible of status of protected areas, key threats, factors influencing effectiveness of management and necessary changes to management strategies and approaches.
Protected areas have been assessed using many different methodologies. In order to gain an overall picture, we developed a 'common reporting format', defining headline indicators which represent the major themes and elements of the thousands of indicators used in the various assessment systems. Data was then 'translated' into the common reporting format, combined into one database and analysed.

Though the available data does not represent a random or representative sample of protected areas, and the method for translating the data inevitably loses some richness of information, interesting patterns can be seen. The average score of 4151 assessments (representing the most recent in each protected area using each methodology), was 0.53 on a zero to one scale. This indicates that management leaves much to be desired, with 13% of the assessed protected areas 'clearly inadequate' (scoring less than 0.33) 62% scoring between 0.33 and 0.67 – in the range we defined as 'basic management' and 24% in the 'sound management' range (over 0.67).

The average was seen to vary significantly according to the Human Development Index (HDI), with protected areas from the low-HDI countries scoring on average one-third lower than those from high HDI countries.

Scores for the overall average and for individual headline indicators increased over time for those protected areas where repeat assessments were conducted. This pattern was particularly clear where assessments were linked to programs to consolidate and strengthen protected area management, as in the Parks in Peril program.

There were clear patterns in the strengths and weaknesses of management, and these patterns were consistent across most methodologies and regions Many protected areas lack basic requirements to operate effectively, and do not have an effective management presence.

Self-assessed outcome indicators, relating to achievement of objectives, values conservation and effect on the community, also scored relatively well, indicating that even where 'inputs' and many 'processes' are weak, protected areas were still performing a valuable function for conservation and in the community. Where possible, these assessments need to be further verified with incorporation of other objective measures, backed by targeted monitoring, to increase their rigour.

Threats to protected areas are still numerous and serious. Threats discussed in assessment reports were classified according to the system developed by the Conservation Measures Partnership. The most commonly nominated threats in most regions are hunting, killing and collecting animals; logging and wood harvesting; gathering non-timber forest products; recreational activities; and the management of adjacent lands. These show some consistency across regions, though differences are seen in countries like Australia, where invasive species and fire management are more serious threats.

Objective 4: Analyse most useful and commonly used indicators for assessing management effectiveness of protected areas (i.e. what indicators are most reliable predictors of overall effectiveness).
We analysed the correlations between individual headline indicators and the average mean (with corrected item-total correlations). Overall management effectiveness was most strongly linked to adequate infrastructure, equipment and information; good administration; communication, adequacy of information, staff training and good management planning.

There was low correlation with the highest-scoring indicators (park gazettal and tenure security) and with outcome measures of both values and community impacts.

We also correlated all indicators with outcome measures. The condition of protected area resources were most strongly correlated with the support and constraint of the external environment (a measure of context), and with inputs and processes including research and monitoring, staff numbers and training, effectiveness of administration, natural resource management and communication. The effect of the protected area on the community was most strongly linked with communication, involvement of communities and programs of community benefits

The study shows that though an overall measure of effectiveness could be estimated quite successfully from just ten headline indicators, this measure would not be highly correlated with outcomes, which need to be assessed separately.

Above: Hat Noppharat Thara - Mu Ko Phi Phi National Park , Thailand.

We have drawn upon these findings to recommend that:

- Management agencies, partners and funders continue to cooperate to help protected areas achieve minimum basic standards. Protected areas in low HDI countries are most in need of assistance to improve management effectiveness.
- Provision and maintenance of adequate facilities, equipment and infrastructure needs to be improved, as these factors score poorly and are very strongly liked to effective management.
- Protected area establishment and design – the first building blocks of the systems – are relatively effective in most places, with serious problems recorded in a few. However, it is essential that national governments provide better policy support for tenure resolution where this remains an issue, and for appropriate development planning and control around protected areas across all regions.
- A greater effort should be put into communication, community involvement and programs of community benefit, as these factors show very strong links to effective management and outcomes.
- A boost to the specific program areas of resource management and research and monitoring is also required, especially to achieve conservation of protected area values.
- Visitor management stands out as another area of management which needs to be improved for those areas where tourism is a significant function of protected areas, as it scores poorly in most.
- Managers need to build better pro-active management capacity, linking management planning, actions, research and monitoring, and evaluation. All these factors scored poorly, are correlated with effective management overall, and were regularly mentioned in reports as needing attention.

The international cooperation and the sharing of information and experiences throughout this project have been greatly appreciated and it is hoped that this spirit will continue to contribute to better management and evaluation in the future

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Chapter 1 The Global Study into management effectiveness evaluation

1.1 Why the Global Study into management effectiveness evaluation was undertaken

The aim of the Global Study into protected area management effectiveness was to strengthen management of protected areas by pulling together the good work on this subject, helping the conservation community to share experiences and to find common themes in the study results. With the cooperation of numerous partners, we listed, and where possible assembled and analysed, all studies of management effectiveness that we could locate around the world, drawing on information from the conservation community, NGOs and park management agencies.

This aimed to help us understand more about what factors are essential to good management, and to recommend ways to maximize the benefits obtained from conducting evaluations of management. Sharing of experiences and lessons learned makes good sense. There can be much wasted effort if organisations start from the beginning in developing evaluation methodologies, ignoring the "lessons learned from a long history of efforts to develop useful and practical methods of monitoring and evaluation approaches in conservation and other fields" (Stem *et al.* 2005).

The stated objectives of the Global Study were to:
1. Record, collect and collate available information from assessment systems, individual park assessments and other evaluations of management effectiveness that have been undertaken in protected areas.
2. Gain an understanding of most appropriate methodologies for different situations and protected area systems.
3. Gain as wide a picture as possible of status of parks, key threats, factors influencing effectiveness of management and necessary changes to management strategies and approaches.
4. Analyse most useful and commonly used indicators for assessing management effectiveness of protected areas (i.e. what indicators are most reliable predictors of overall effectiveness).
5. Develop a system for integration of available management effectiveness information into the World Database on Protected Areas (WDPA).

1.2 Partners and relationships

The Global Study was co-funded by the University of Queensland, The Nature Conservancy (TNC) and World Wide Fund for Nature (WWF), under the auspices of the IUCN World Commission for Protected Areas (WCPA), and worked in close cooperation with other organisations including the World Bank, Global Environment Facility (GEF) and United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC). The second phase of the project, conducted with UNEP-WCMC, was part of the Biodiversity Indicator Partnership and funded by the Global Environment Facility. Additional information from Europe was obtained through a study funded by the German Government (BfN) and conducted in partnership with the University of Greifswald (Nolte *et al.* 2010)

The Global Study was developed in response to the World Parks Congress Recommendation 5.18; Durban Action Plan Targets 5-7; and the specific goals and activities outlined in the CBD Protected Areas Programme of Work.

PAME is a requirement of the CBD Program of Work on Protected Areas
In 2004, the CBD Conference of the Parties 'COP7' (Convention on Biological Diversity 2004) adopted a Programme of Work on Protected Areas in recognition of the fact that

> "… existing systems of protected areas are neither representative of the world's ecosystems, nor do they adequately address conservation of critical habitat types, biomes and threatened species… and (that) … insufficient financial sustainability and support, poor governance, ineffective management and insufficient participation pose fundamental barriers to achieving the protected areas objectives of the Convention on Biological Diversity."

The Programme established a specific goal (4.2) and related activities relating to PAME:

Goal 4.2 - To evaluate and improve the effectiveness of protected areas management

Target: By 2010, frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties.

Suggested activities of the Parties
4.2.1 Develop and adopt, by 2006, appropriate methods, standards, criteria and indicators for evaluating the effectiveness of protected area management and governance, and set up a related database, taking into account the IUCN-WCPA Framework for evaluating management effectiveness, and other relevant methodologies, which should be adapted to local conditions.

4.2.2 Implement management effectiveness evaluations of at least 30 percent of each Party's protected areas by 2010 and of national protected area systems and, as appropriate, ecological networks.

4.2.3 Include information resulting from evaluation of protected areas management effectiveness in national reports under the Convention on Biological Diversity.

4.2.4 Implement key recommendations arising from site- and system-level management effectiveness evaluations, as an integral part of adaptive management strategies

These are ambitious targets, and many countries are now striving to establish or increase their capacity to evaluate management effectiveness throughout their protected area systems. International initiatives, such as IABIN, are assisting in this effort by providing coordination and helping to share experiences and techniques across jurisdictions.

2010 Biodiversity Indicator Partnership includes PAME
The 2010 Biodiversity Indicator Partnership (2010BIP) is a global initiative to track progress towards the United Nations 2010 biodiversity target to significantly reduce the rate of biodiversity loss. Twenty-nine indicators have been selected to assess progress towards this target. Management effectiveness is one of three indicators relating to protected areas.

The PAME Global Study provides the mechanism for the 2010BIP to populate this indicator, and the data arising from this project has been incorporated into the United Nations Global Biodiversity Outlook 3 (GBO3) Report (Secretariat of the Convention on Biological Diversity 2010) (for details of the indicators see http://gbo3.cbd.int/)

1.3 Why we need management effectiveness evaluation

Since the second half of last century, protected areas across the world have increased dramatically in area and size (see Figure 1) as most countries have developed protected area systems as a core strategy to protect biodiversity and environment. The many values of protected areas for biodiversity conservation, protection of cultural heritage, maintenance of vital 'ecosystem services' and provision of a range of socio-economic benefits have been well recognised , and the roles of protected areas in mitigating and adapting to climate change are increasingly important (Dudley *et al.* 2010).

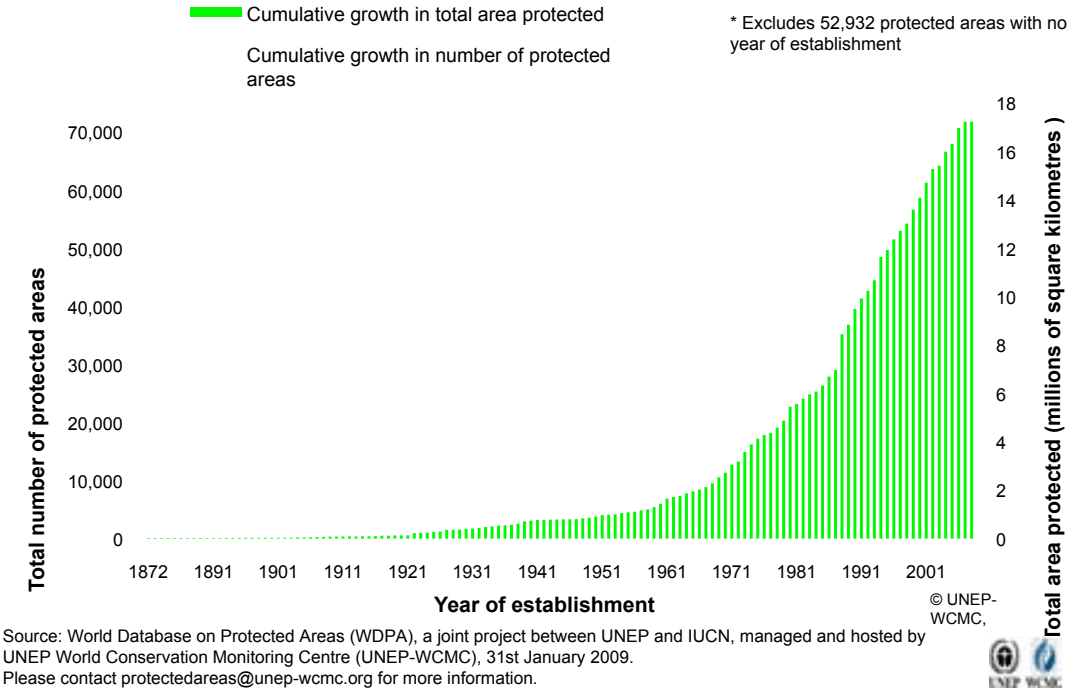


Figure 1: Growth of the world's protected areas

However, using protected areas as a key strategy for biodiversity conservation is reliant on the assumption that they can protect their values for the foreseeable future. Society is making investments of money, land, and human effort into protected area acquisition and management and into specific intervention projects. The community, people investing in protected areas, and protected area managers need to know if these investments are sound. Questions include:

- Are protected areas effectively conserving the values for which they exist?
- Is management of these areas effective and how can it be improved?
- Are specific projects, interventions and management activities achieving their objectives, and how can they be improved? (Leverington and Hockings 2004)

The need to evaluate protected area management effectiveness has become increasingly well recognised internationally over the past ten years, as we have seen in both developed and developing countries that declaration of protected areas does not always result in adequate protection (Ervin 2003a; Hockings and Phillips 1999; Hockings *et al.* 2000). As the total number of protected areas continues to increase, so too do calls for proper accountability, good business practices and transparency in reporting (Hockings *et al.* 2006). In addition, as other strategies for 'off-park' conservation and multi-use reserves have developed, and as concern for rural poor and Indigenous rights has increased, there has been more questioning about the role and effectiveness of protected areas (for example, see the records of the IVth

and Vth World Parks Congresses). This has led to a greater need to be able to demonstrate the usefulness of protected areas and the extent to which they contribute to or detract from community well-being (Southworth *et al.* 2006; Timko and Satterfield 2008).

This need for protected area effectiveness evaluation echoes calls to measure, evaluate and communicate the effectiveness of conservation strategies more generally (Saterson *et al.* 2004; Sutherland *et al.* 2004) (Ferraro and Pattanayak 2006)). It has been brought into a sharper focus by the increasing threats to protected areas through climate change, and debate about whether protected areas remain relevant in periods of rapid biophysical and social change (Dunlop and Brown 2008; Hannah *et al.* 2007; Shadie and Epps 2008).

Evaluation is also critical for adaptive management. We live in a world where we experience and can expect dramatic changes – in the biophysical world, the community, the economy and the way we govern ourselves. As global change accelerates, we need to be able to show to what extent protected areas are functioning as an effective strategy for conservation. Managers need to understand what works and what does not, so they can build on the best ideas and practices. Evaluation of management effectiveness is a vital component of this responsive, pro-active style of protected area management. Through evaluation, both positive and negative experiences can be used as opportunities for learning, and continual improvement can be combined with anticipation of future threats and opportunities.

Staff frequently do not find the time to reflect on management practices under the pressure of day to day operations. Management effectiveness evaluation workshops provide the opportunity for this information sharing and discussion and yield rapid improvements in management practices.

Above: Discussing management at Bwindi National Park, Uganda

As discussed above, there are many reasons why countries, non-government organisations, protected area managers, donors and others want to assess management effectiveness. These different purposes may require different assessment systems and varying degrees of detail. Broadly speaking, management effectiveness evaluation can:

- enable and support an adaptive approach to management of protected areas;
- assist in effective resource allocation between and within sites;
- promote accountability and transparency by reporting on effectiveness of management to interested stakeholders and the public;
- help involve the community, build constituency and promote protected area values. (Hockings *et al.* 2006; Leverington and Hockings 2004).

Assessments might contribute to all of these, but an evaluation that is useful for one purpose (e.g. accountability to a donor or treasury) may not be useful for another (e.g. on-ground management).

1.4 Current approaches to assessing effectiveness: PAME and other evaluation studies

Effectiveness of protected areas can be considered at four different, complementary levels.

First level: coverage of protected areas
At the first level, many studies have been conducted to evaluate the coverage of protected area systems (Chape S *et al.* 2005; Jenkins and Joppa 2009) and the extent to which biodiversity is represented within these systems (see, for example Rodrigues *et al.* (2004)). National and international targets for protected areas often relate to the proportion of land and sea within protected areas, and most countries track their progress towards such targets, but this does not consider how effective such coverage is in achieving conservation.

Second level: broadscale outcomes
At the second level, a number of meta-studies in recent years have investigated relationships between protected areas and large-scale environmental impacts such as forest clearing, primarily using remote sensing data on forest cover changes over time (Joppa *et al.* 2008; Nagendra 2008; Nagendra *et al.* 2004). Protected areas are considered to be an effective conservation strategy if there are no gross ecological changes or destruction of habitat, or if these changes are less in protected areas than in comparison sites.

These studies provide essential and objective information about conservation success at a broad level, but have significant limitations. They rely on a limited suite of indicators and may not detect other important changes, such as the loss of animal populations which lead to the "half-empty forest" syndrome (Redford and Feinsinger 2003; Stoner *et al.* 2007) Measuring gross changes through remote sensing is more difficult in non-forest environments such as grasslands or marine parks. Level two studies raise a number of questions: would the protected areas be likely candidates for clearing anyway? If forests are not cleared, to what extent is this due to good management? Has the protection of some areas led to more clearing in other places (Andam *et al.* 2008; Ewers and Rodrigues 2008)?

While this second level of assessment is important in countries where major large-scale threats operate, it is not particularly relevant in many more developed countries where it is unlikely that gross alienation or developments will take place within a protected area.

Third level: protected area management effectiveness assessments (PAME)
The third level, using a quite different approach, comprises the many thousands of assessments of protected area management effectiveness (often known as PAME) conducted by protected area agencies or conservation non-government organizations since the 1990s (Cifuentes *et al.* 2000; Hockings 2003; Rivero Blanco and Gabaldon 1992). These studies are directed to one or more of four basic purposes: improving protected area management, increasing accountability, communicating with the public, and assisting in prioritization of resourcing (Leverington and Hockings 2004). Over the past ten years, many countries have made significant efforts to develop and apply PAME methodologies to assess the effectiveness of their protected area sites and systems. Funding agencies including the World Bank, Global Environment Facility and Worldwide Fund for Nature (WWF) now require such evaluations for all project interventions that involve protected areas (Belokurov *et al.* 2009).

Management effectiveness evaluation (PAME) is defined as
"the assessment of how well the protected area is being managed – primarily the extent to which it is protecting values and achieving goals and objectives. The term management effectiveness reflects three main themes:
- *design issues relating to both individual sites and protected area systems;*
- *adequacy and appropriateness of management systems and processes; and*
- *delivery of protected area objectives including conservation of values."*

(Hockings *et al.* 2006).

PAME approaches and methodologies are discussed further below. They usually consist of a combination of measures including assessments of resourcing, planning, management processes and output. Outcome measures are often also included in these assessments, but they are often qualitative estimates by staff or other experts, and are sometimes challenged as subjective and lacking in evidence.

The information in this report is mostly derived from PAME (third level) studies.

Fourth level: detailed monitoring

The fourth level of assessment consists of detailed monitoring and reporting on the condition and trend of specific protected area values such as animal populations, forest condition, cultural values and socioeconomic impacts. Methodologies for directing, undertaking and reporting on such detailed studies in a systematic way to support adaptive management have been developed by groups such as the Nature Conservancy (Parrish *et al.* 2003) and park management agencies in Canada and South Africa (Timko and Innes 2009).

Where it is available, detailed monitoring gives more confidence to judgments about outcomes that are made in management effectiveness assessments.

Left: Recording birds in Virua National Park, Brazil

Ideally, such detailed information should underlie judgments about outcomes that are made in third-level PAME assessments. However, in many cases the information is not available and, expert opinion from protected area staff, local people or scientists is often used. Unfortunately, many monitoring and research projects on protected areas are not incorporated into adaptive management and do not provide useful feedback loops into management. Combining targeted fourth level (monitoring) studies with third level (management effectiveness) information is an efficient way to overcome this issue.

This paper primarily draws information from third level PAME assessments, which in some cases draw on detailed monitoring data. We used raw data and reports from a range of different methodologies to investigate some questions of concern to the conservation community: the extent to which PAME evaluations have been undertaken, the level of management effectiveness in places which have been assessed, and factors which appear to be most highly correlated with effective management.

1.5 Development of PAME

The importance of evaluation in effective management and project cycles has been progressively recognised in many fields of endeavour, including health and international development as well as conservation over the past fifteen to twenty years. New methodologies and approaches have developed in a number of fields, with many common issues and some productive exchange of ideas across the sectors (Foundations of Success *et al.* 2003). Protected area management involves biophysical, cultural, socio-economic and managerial factors as well as numerous stakeholders, so monitoring and evaluation must draw on tools from a wide range of disciplines. Approaches such as participatory rural appraisal and project cycle management have offered many useful ideas.

The need to develop 'tools and guidelines' to 'evaluate the ecological and managerial quality of existing protected areas was recognised in the Bali Action Plan adopted at the end of the Third World Congress on National Parks (the Bali Congress) in 1982. The IVth World Parks Congress in 1992 identified effective management as one of the four major protected area issues of global concern and called for IUCN to further develop a system for monitoring management effectiveness of protected areas. Following these congresses, the issue of management effectiveness of protected areas began to appear in international literature and particularly within the work and deliberations of WCPA.

The development and application of PAME since that time has been strengthened by an interaction of theoretical and practical interests:

- Academic study, including indicator and scoring development, methods of analysis, field trailing of different systems, and validation of field studies;
- Work by conservation organizations (NGOs) attempting to evaluate programs, create greater awareness, and strengthen management; and
- Work by government protected area management agencies to conduct internal evaluations.

Latin America has been particularly rich in terms of debate and development of PAME. Progress in that region was reviewed by Cifuentes *et al.* (2000), and since then there has been further development of methodologies and extensive application of some systems. The history of some of the countries and methodologies is discussed in Cracco *et al.* (2006).

The earliest known published material on PAME included an assessment in Venezuela (Rivero Blanco and Gabaldon 1992) and an academic work on indicator selection and scoring (de Faria 1993). In 1996 a Task Force was formed within the IUCN WCPA and in 2000 it published a Framework and guidelines for assessing the management of protected areas (Hockings *et al.* 2000). At the same time as the Task Force was preparing these guidelines, a number of other groups and individuals around the world were addressing the same issue. By 2000, several methodologies existed and were being applied around the world.

A second, substantially revised edition of the IUCN-WCPA Framework was released in 2006 (Hockings *et al.* 2006). The Framework is not, in itself, a specific methodology for assessing effectiveness of management but a framework for developing assessment systems and guidance for the practice of evaluation. It is based on the idea that protected area management follows a process with six distinct stages, or elements (Figure 1):

- it begins with reviewing context and establishing a vision for site management (within the context of existing status and pressures),
- progresses through planning and
- allocation of resources (inputs), and
- as a result of management actions (process),
- eventually produces goods and services (outputs),
- that result in impacts or outcomes.

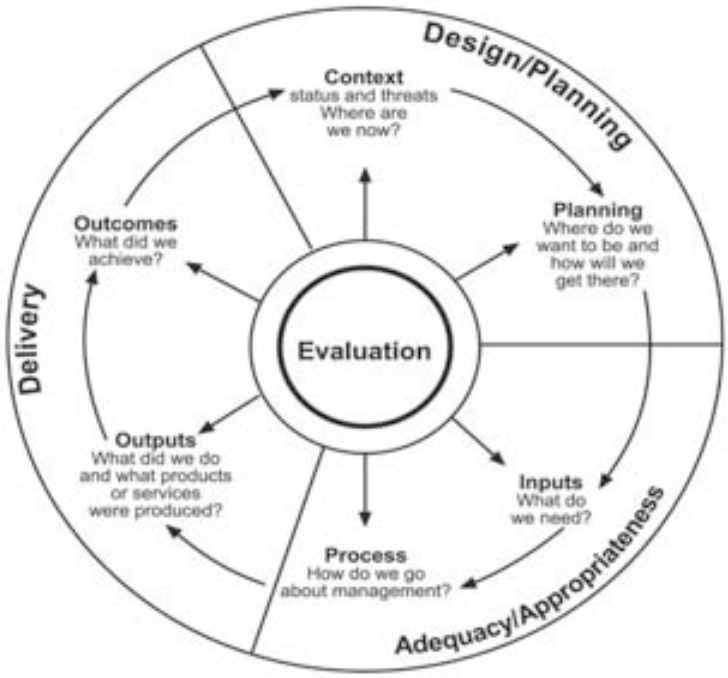


Figure 2: The management cycle and evaluation of protected area management (from Hockings *et al*., 2006)

Evaluation that assesses each of the elements of Figure 2 (and the links between them) should provide a relatively comprehensive picture of management effectiveness. The Framework can be used to develop rapid evaluation systems, assessing management of an entire system of protected areas, rapid assessments of individual sites or detailed on-going assessments of management of a site based on extensive monitoring programs. One benefit of using the Framework approach is that all these assessments can be conceptually linked, using a common set of broad criteria and a similar approach to evaluation.

Within the four major purposes for evaluation outlined in Section 1.1, assessments differ in methodology, geographic, topical scope and level of detail. The *scope* of the assessment can vary from a specific topic, such as community relations, to all aspects of management. The level of detail can vary from rapid assessments to detailed evaluation.

In addition, every protected area system has individual circumstances and needs, and assessment exercises are often tailored to suit these. Often, especially in earlier years, people had undertaken a number of assessments before they became aware of other approaches, and there was a natural reluctance to abandon methods which had been applied and accepted in the field. For all these reasons, the community of practice involved with management effectiveness evaluation has been reluctant to adopt or recommend a single methodology, preferring to work within the general IUCN-WCPA Framework.

Since the first publication of a draft of this Framework in 1997, it has been used to develop specific management effectiveness evaluation systems which are being applied around the world. They include broad, system-wide assessments such as the WWF RAPPAM system (Ervin 2003b) and systems developed in Finland (Gilligan *et al.* 2005), Catalonia in Spain (Mallarach and Varga 2004), New South Wales in Australia (NSW Department of Environment and Conservation 2005) and Korea (Korean National Parks Service and IUCN 2009) rapid, site-level systems built around questionnaires or scoring aimed at being applied in multiple sites, such as the World Bank/WWF Tracking Tool (Stolton *et al.* 2007) and a related version developed for marine protected areas (Staub and Hatziolos 2004); and detailed, site level monitoring and assessment programs (Hockings *et al.* 2007; Paleczny *et al.* 2007).

1.6 The Global Study approach and study methods

We followed the following steps in the Global Study, with additional information and analysis being obtained through the regional studies for Latin America and the Caribbean and Europe.

Review of methodologies and development of principles

- Collection and review of all known management effectiveness methodologies through literature research, information networks, and appeals for information;
- Correspondence with developers and users of methodologies where possible;
- Review of documents which discuss, analyse and compare methodologies;
- Review of evaluation literature and of recorded experiences from expert workshops and discussions.

List of assessments

- Compilation and data entry of all known assessment sites with any available metadata and methodology;
- Cross-checking against World Database on Protected Areas or reports for metadata.

Development of common reporting format and minimum data set

- Analysis of different layers and terminologies of headings, subheadings and indicators used in the various methodologies, according to the IUCN-WCPA Framework and other dimensions;
- Development of a 'classification grid' showing indicators: topics were defined by reviewing questions and indicators used in over 40 different methodologies, and by looking at a logical division of management responsibilities;
- Distillation of possible combinations to commonly reported 'headline indicators' which represent the range of indicators used;
- Discussion and workshop with colleagues; development of proposed set of indicators for 'minimum data set'; and
- Coding of indicators according to closest match with common reporting format.

Entry and translation of raw data [1]

- Compilation of raw data where possible: this is in a range of different formats.
- Development of a method and a 'translation tool' in *Excel* to distil results from many different methodologies into common reporting format headline indicators.

Analysis of results

- Calculation of means, standard deviations and item-corrected correlations for headline indicators for all results.

Collection and analysis of studies

- Collection and review of reports of evaluation studies from around the world;
- Analysis of observations and conclusions for common patterns, including strengths and weaknesses of management and common threats.

This report has drawn on analysis of both raw data and studies to define patterns and correlations of protected area management.

[1] More details of this methodology are discussed in Section 3.2.

Chapter 2 Progress in evaluating management effectiveness

2.1 What studies have been undertaken?

To date we have identified 9250 specific PAME assessments from 6720 protected areas, derived from 54 different methodologies. Figure 3 and Figure 4 indicate the approximate proportion of protected areas in each country where PAME assessments have been recorded to date. These maps have been derived by comparing our records with protected areas on the World Database on Protected Areas.

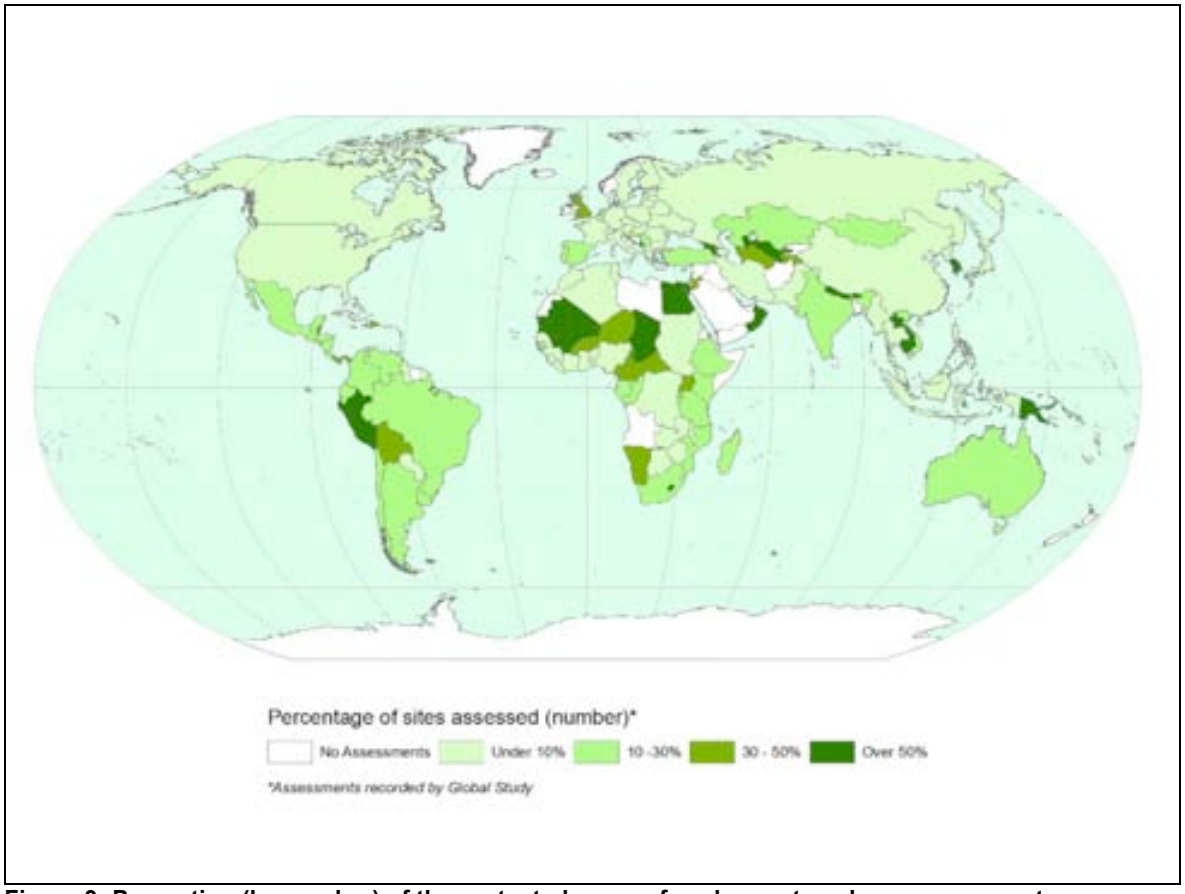


Figure 3: Proportion (by number) of the protected areas of each country where assessments have been recorded

While we are sure that there are some assessments that we did not locate and include in the Global Study database, and others where we were not able to obtain spatially accurate data, we are reasonably confident that we have included the majority of assessments that have been completed and in the public arena. Given this, the gap between completed assessments and the 2010 target under the Convention on Biological Diversity Programme of Work on Protected Areas of assessment of 30% of the world's protected areas is substantial.

Assessments recorded in the Global Study represent just 6% of the more than 100,000 protected areas included in the WDPA. However, 35 countries have achieved at least the 30% target and 63 countries have assessed more than 15% of their protected areas. On an area basis, progress is even more impressive with 67 countries meeting the 30% target and 99 countries assessing more than 15% of the area under protection. This represents significant progress over the position of just a few years ago. There is also evidence of many more countries commencing ambitious programs of evaluation of management effectiveness of their protected area systems in all regions of the world.

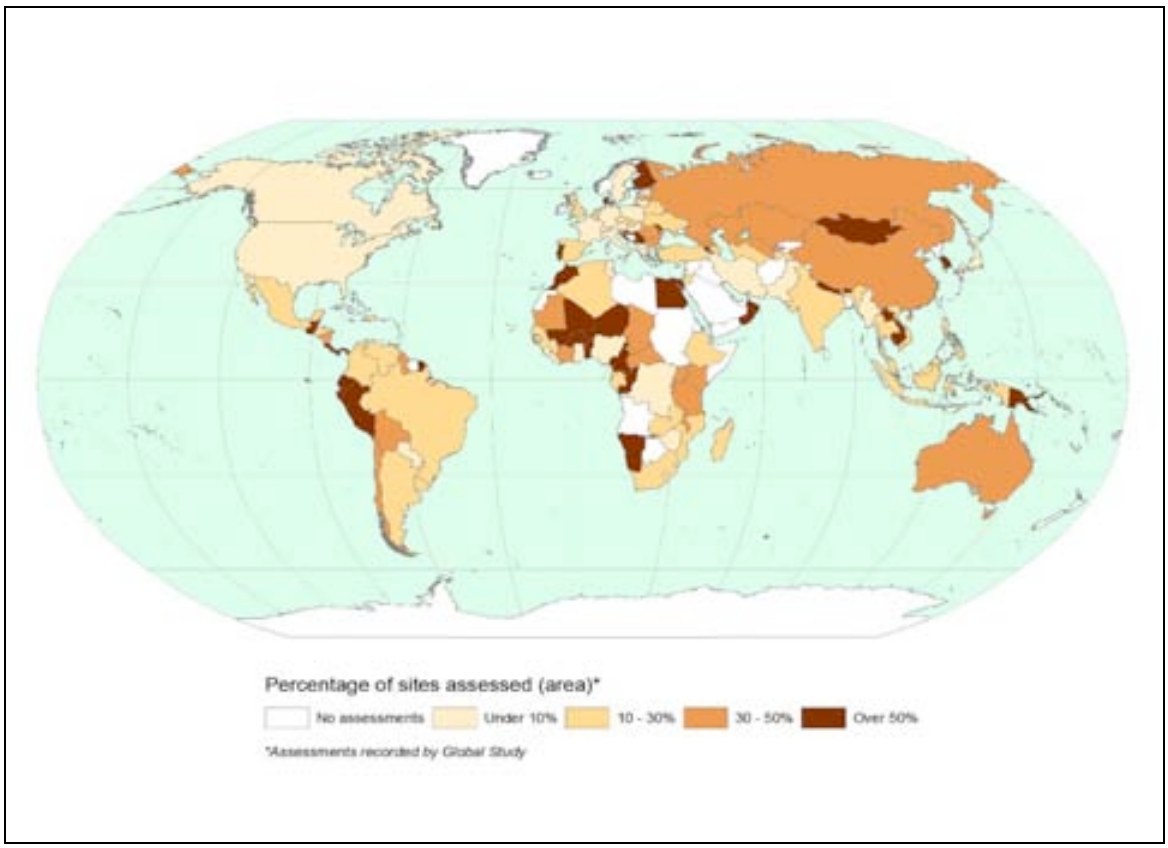
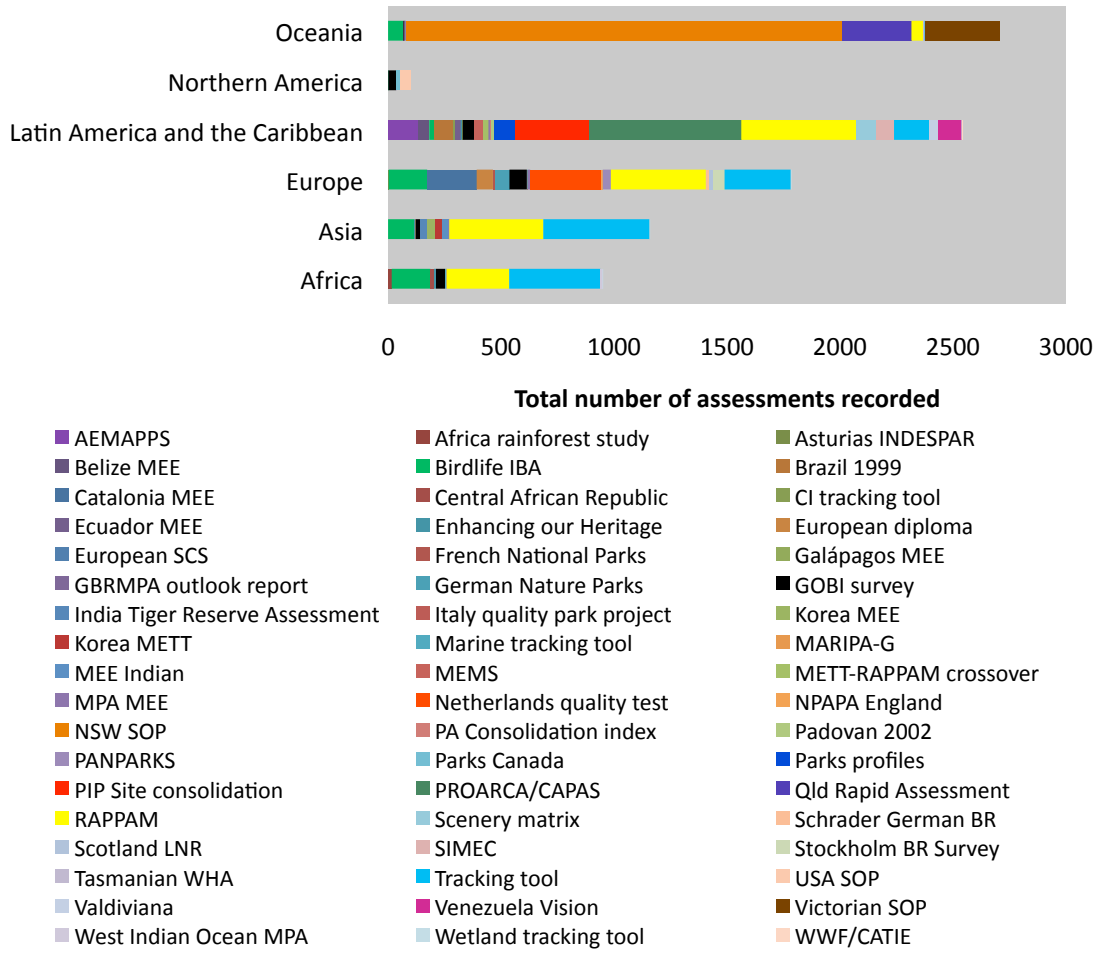


Figure 4: Proportion (by area) of protected areas of each country where assessments have been recorded

The Biodiversity Indicator Partnership is compiling information about the global extent and accuracy of a range of indicators, including protected area coverage and management effectiveness, and is attempting to understand some of the linkages between them. The overall picture is of declining biodiversity, but some indicators of interventions are encouraging (Butchart *et al.* 2010; Hoffmann *et al.* 2010).

Above: BIP global partnership meeting 2010

Figure 5 shows the application of PAME methodologies across different regions. A list of these methodologies, including their full names and references where available, is included in Appendix One.



(numbers represent each assessment in individual protected areas for each methodology – where there are multiple studies for one site these are counted also)

Figure 5: Application of PAME methodologies in different regions (data entered by October 2010)

The most commonly applied methodologies we recorded were:

- RAPPAM (Ervin 2003b) which measures effectiveness across a group of protected areas in a region or country and has assessed over 1600 protected areas in 53 countries
- The Management Effectiveness Tracking Tool (Stolton et al. 2007) which has been applied more than 1300 times across over 1100 reserves in 87 countries and is a requirement for all Global Environment Facility projects on protected areas
- ProArca/CAPAS scorecard evaluation (Corrales 2004b) which has been applied in 156 protected areas in six Central American countries and (over 675 assessments overall)
- Assessments of Important Bird Areas (BirdLife International 2006) : 546 assessments over 364 IBAs in 114 countries (only those IBAs with more than 80% represented in protected areas were recorded in our database)
- Parks in Peril Site Consolidated Scorecard (The Nature Conservancy Parks in Peril Program 2004) which was applied in 56 protected areas over 15 Latin American countries (325 assessments) as part of the Parks in Peril aid program.
- New South Wales State of Parks evaluations (NSW Department of Environment and Conservation 2005) which have assessed all reserves (650+) in one Australian state three times.

PAME story: Management effectiveness assessment in West Africa
Geoffroy Mauvais, IUCN-Papaco

Management effectiveness of protected areas is becoming an increasing concern to the world of conservation. IUCN-Protected Areas program (IUCN-Papaco) based in IUCN regional Office in West and Central Africa (IUCN-Paco) has developed a project on this topic, with the support of French Global Environment Facility. This project aims at improving management of protected areas in the region and their capacity to fulfil their missions and, consequently their results. It covers 17 countries of sub-Saharan West Africa, from Chad to Cap Verde, a subregion where most protected areas do not achieve yet their goals of conservation and/or development. The project will end in October 2010.

Systems or site level assessments are based on the global methodology developed under the coordination of the World Commission on protected areas of IUCN (WCPA). The project adapted this framework to the subregional context, then trained a team of West African evaluators, and carried out multiple pilot evaluations. To date, nine country systems have been evaluated, as well as three networks of sites (marine protected areas, RAMSAR sites and World Heritage sites) concerning around 120 sites using methodologies such as RAPPAM, PAMET or EoH. These evaluations have allowed IUCN-Papaco to bring targeted technical support on duly selected sites after assessments and to develop targeted training courses to respond to the main issues identified. The project also gives particular attention to capitalization and a synthesis of all assessments is currently under construction.

The project management is ensured by the Regional office of IUCN, based in Ouagadougou and a scientific and technical Committee (STC), composed of WCPA members and other relevant experts, has been created at the beginning of the project. Protected areas manager are committing voluntary to a “quality” approach. In the long term, this should allow the identification of best practices, examples to be followed, and the recognition of good management (certification) and would thus ensure the continuity of the project (already supported by new donors).

More information on www.papaco.org).

2.2 What is evaluated: fields, aspects and indicators

As discussed earlier, some PAME methodologies have been designed or adapted using the IUCN-WCPA Framework (such as RAPPAM and the Tracking Tool), while others, such as the Site Consolidation Scorecard, predate it but refer to it in more recent analyses (Martin and Rieger 2003).

Where methodologies specifically use the IUCN-WCPA Framework, the primary basis for organising indicators is the cycle of management. By working with the Framework *elements*, methods pay systematic attention to all parts of the management cycle, including context issues (values, threats and external influences on management), outputs (achievement of work programs, products and services) and outcomes (achievement of objectives, changes in values, and effects on the community). Some of these elements can be under-represented in methodologies which focus on 'input' and 'process' indicators.

Where methodologies have been designed using different organisational frameworks, the IUCN-WCPA Framework can still be applied, by considering how the methodology relates to the IUCN-WCPA Framework and 'coding' the questions and indicators appropriately. For example, a recent assessment in Belize used a different system, but the analysis included reporting according to the Framework elements.

Perhaps the most useful approach, used in several recent methodologies, organises indicators according to both the Framework elements and the more commonly nominated fields of management. Results can easily be analysed either way.

Though questions are framed differently, many methodologies have some indicators relating to the protection of threatened species.

Above: Hyacinth macaw, Brazil

A grid matrix represents a convenient way to map indicators from a variety of PAME systems. As we have seen above, the *elements* in the IUCN-WCPA Framework (the rows in this grid) make sense but when we review the evaluation instruments that have been applied, the series of questions often cut another way. For example, they look at biodiversity conservation, weed management or recreation management, or at a capacity issue like staffing, and follow that thread down the columns from context and planning through input, process and output to outcome. We refer to this as the *dimensions* of management, and these form the columns in the indicator grid. The row and column headings are listed in **Table 1**and a small portion of the matrix is shown in Table 2.

This matrix provides a way of understanding the diversity and similarities of indicators more easily, by ranging the elements and criteria of the IUCN-WCPA Framework against dimensions of park management. Most questions/ indicators can be fairly easily mapped into a cell on the grid, though sometimes a question covers two or more cells. In many cases, multiple questions will be asked about one cell – for example, the 'biodiversity value' cell.

This matrix can be used to map or to generate indicators for studies at any level from very general to very detailed. During the process of the Global Study, over 2000 indicators were mapped to understand the most common questions asked in evaluations. This analysis was then used to help generate a 'common reporting format', which will be described in the next section.

Figure 6, Figure 7 and Figure 8 show the results of mapping indicators according to the matrix.

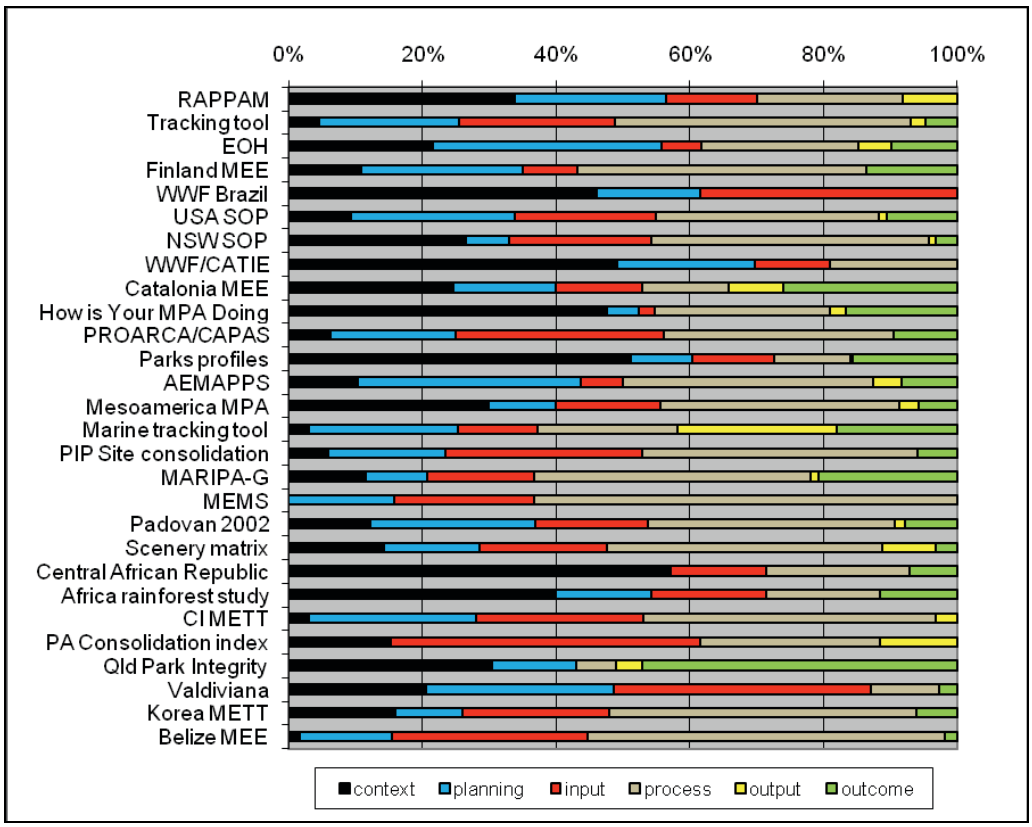


Figure 6: Representation of the proportion of indicators coded according to the IUCN-WCPA Framework elements for a sample of methodologies. (see also the European report for analysis of European methodologies)

Sharing experiences in management and in evaluation has been critical in developing and improving PAME methodologies and approaches. Non-government organisations have played a key role in training and in facilitating the exchange of information across protected areas and countries.

Left: Asia-PNG Workshop on the Management Effectiveness Tracking Tool

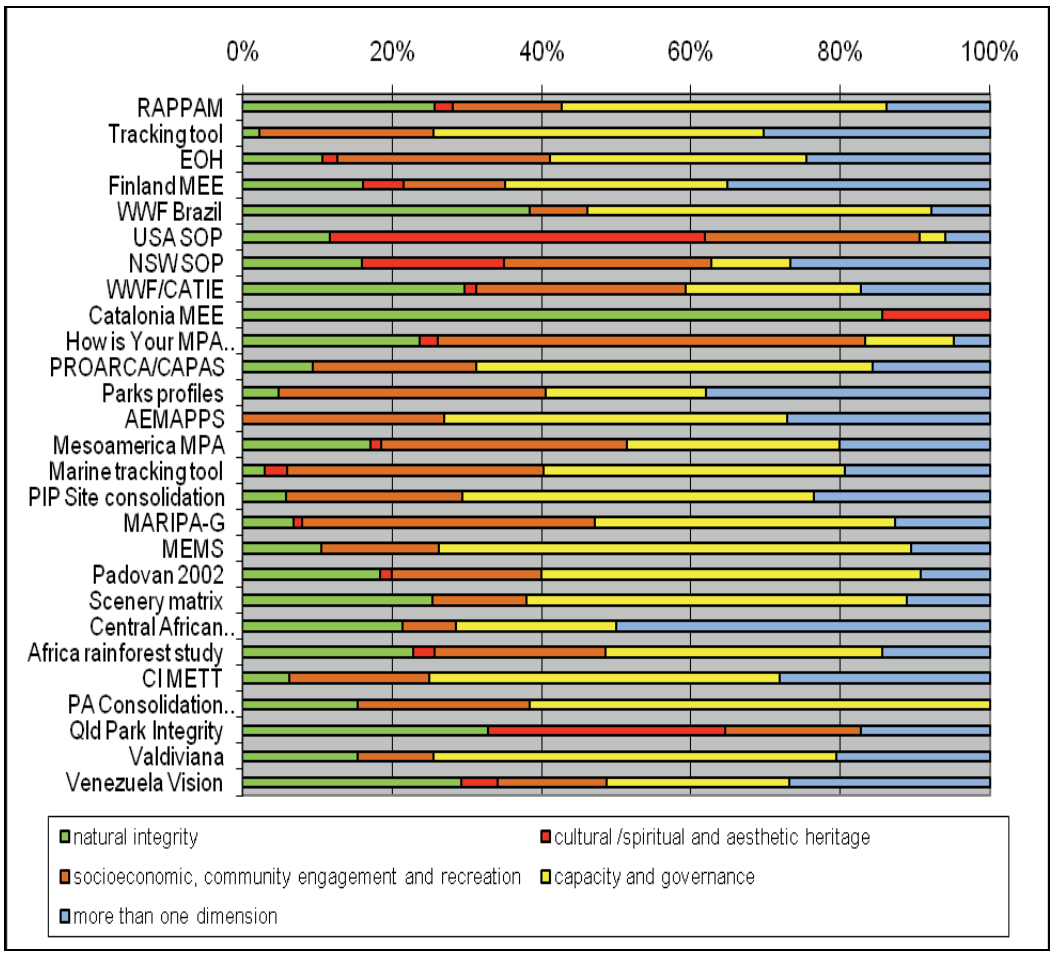


Figure 7: Representation of the proportion of indicators coded according to dimensions of management for a sample of methodologies.

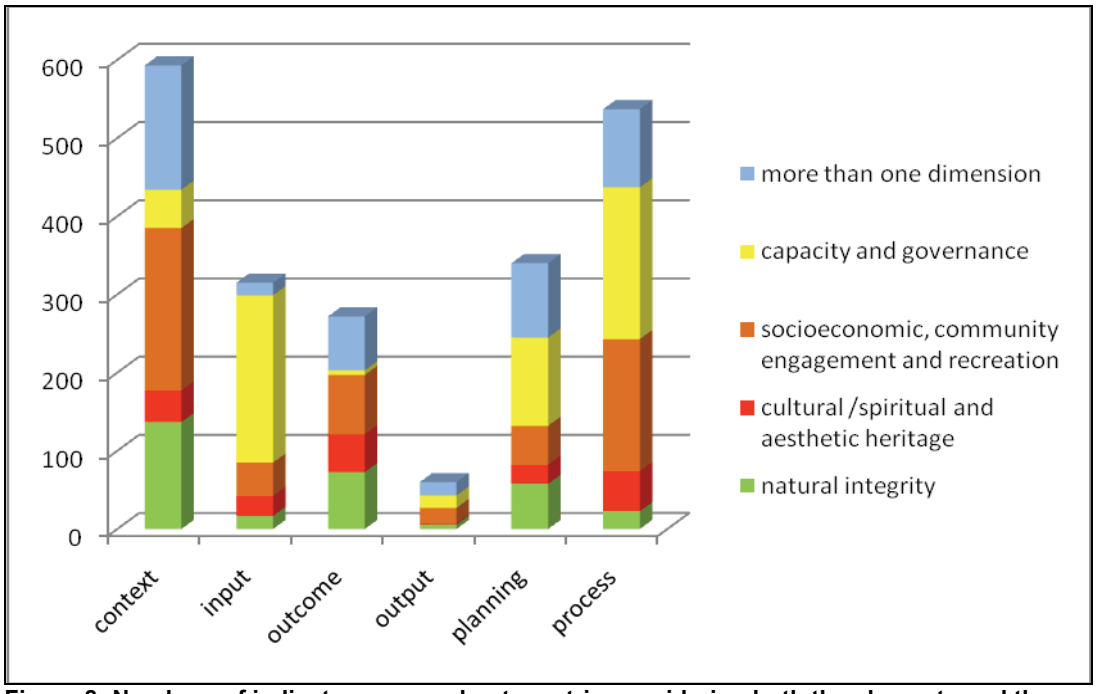


Figure 8: Numbers of indicators mapped onto matrix considering both the elements and the dimensions of management

Table 1: Headings for the indicator matrix

ELEMENTS AND CRITERIA (ROWS in the grid)
Context
values and significance
threats/issues/pressures
stakeholder attitudes and relations
influence of external environment
Planning
legal status/ gazettal
tenure issues
Adequacy of legislation
system design
site design
management planning
Inputs
staff
funding
equipment and facilities
information
Process
capacity
governance, high-level management and leadership
policy development
administration, work programming and internal organisation
evaluation
maintenance of infrastructure, facilities, equipment
staff training
human resource management
relating to people
law enforcement
community involvement
communication, education and interpretation
community development assistance
sustainable resource use - management and audit
visitor management
managing the resource
restoration and rehabilitation
resource protection and threat reduction
research and monitoring
Outputs
achieving work program
results/outputs
Outcomes
achieve objectives
condition of defined values
trend of defined values
effect of protected area on community

DIMENSIONS OF MANAGEMENT (COLUMNS in the grid)
conserving natural integrity
biodiversity
ecosystem function
landscape and geology
conserving cultural/ spiritual and aesthetic
cultural (material)
cultural (other)
spiritual
aesthetic/ scenic
socio-economic, community engagement and recreation
recreation
sustainable resource use
economic
science and educational use
community
human health and well-being
capacity to manage/ governance
staff capacity
information availability
governance and administration
legal framework
equipment and facilities
enabling policies
budget capacity
enabling social, legal and civil environment

Table 2: Section of the indicator matrix showing where indicators might lie

ELEMENTS AND CRITERIA / **DIMENSIONS OF MANAGEMENT**	**conserving natural integrity**	biodiversity	ecosystem function	landscape and geology	**conserving cultural/ spiritual and aesthetic**	cultural (material)	cultural (other)	spiritual
Context								
values and significance		X						
threats/issues/pressures								
stakeholder attitudes and relations						X		
influence of external environment			X					
Inputs								
staff		X				X		
funding				X				

Chapter 3 Analyzing diverse information common reporting format, minimum data fields and common threat framework

3.1 Analysis across methodologies

The previous sections have shown the diversity of methodologies and indicators applied across the world. Though this diversity has many advantages, it means that it is difficult to look across the different studies to find out common patterns and issues for management in the region. The need to undertake broader-scale analysis has been increasing in recent years, with information particularly required by international funding and policy organisations as they wish to answer questions such as:

- What are the major strengths and weaknesses of management in a region or across a particular resource type or designation (e.g. World Heritage areas)?
- What major threats at protected area and system level need attention?
- Which are the priority areas (both spatially and in terms of scope or topic) requiring additional funding or technical assistance?

One aim of the Global Study was to find a mechanism to enable cross-analysis of data from methodologies using a variety of different indicators.This mechanism has two components: 'matching' the topic of each indicator to a common 'headline indicator'; and establishing a 'translation' system so that the different scoring systems are incorporated in a consistent way. It is hoped that the mechanism used in the Global Study provides a meaningful way to meet these requirements.

A particular challenge in cross-analysing data is understanding and evaluating the condition of diverse environments across the world.

Left: Mangrove ecosystem

Protected area level common reporting format

For the purpose of cross-analysis, a '**common reporting format**' has been developed. This is a 'bottom-up' compilation of 'headline indicators', which was derived from reviewing over 2000 questions and indicators from more than 40 different protected area management effectiveness evaluation (PAME) methodologies. The 'headline indicators' were selected by reviewing the matrix headings listed in **Table 1**. The aim was to include as many as possible of the topics covered by the different methodologies in a logical list.

The common reporting format is intended to:

- represent most indicators found in any PAME methodology;
- provide a platform for cross-analysis of results from PAME studies using different methodologies, while maintaining as much information as possible;
- be flexible, with the potential to add more 'headline indicators' in the future.

It should be noted that the common reporting format is **NOT** intended to represent a required set of information (see the minimum data set below), nor to be a questionnaire to be filled out by park managers or agencies. It is merely a list of topics included in the range of evaluation methodologies, used so that analyses can be undertaken.

A simple translation tool' mechanism (using *Excel*) for converting data from diverse methodologies and scoring systems into the common reporting format and into the minimum data set has been developed by the Global Study. Indicators in the principal methodologies have been allocated to appropriate 'headline indicators', and this has enabled cross-analysis of all data available to date. This tool can if desired be built into spreadsheets or databases generated by individual studies, so that only information rolled up into the common reporting format needs to be forwarded to coordinating agencies. Other reporting and analysis can continue through individual methodologies in the usual manner.

A number of international meetings on PAME also proposed that a smaller summary indicator set should be defined. This would be a set of information which all countries or protected area systems are encouraged to collect to fulfil obligations such as CBD reporting. As with the common reporting format, it should be noted that the minimum data set is merely a list of topics included in the range of evaluation methodologies, used so that analyses can be undertaken. It is *not* intended to be a new methodology or questionnaire to be filled out by park managers or agencies, but methodologies may be altered to ensure that they include assessment of the fields mentioned.

For convenience and to maximise the ability to utilise information already being collected, the team associated with the Global Study and the WCPA have worked to develop a summary indicator set which meets the needs of international agencies but also would be able to be derived from the common reporting format.

As shown in Figure 9, a two-stage process enables e global reporting on a set of 45 indicators or a summary set of 14 indicators, using data collected from the variety of existing methodologies. The common report headline indicators at these two levels are shown in **Table 3**.

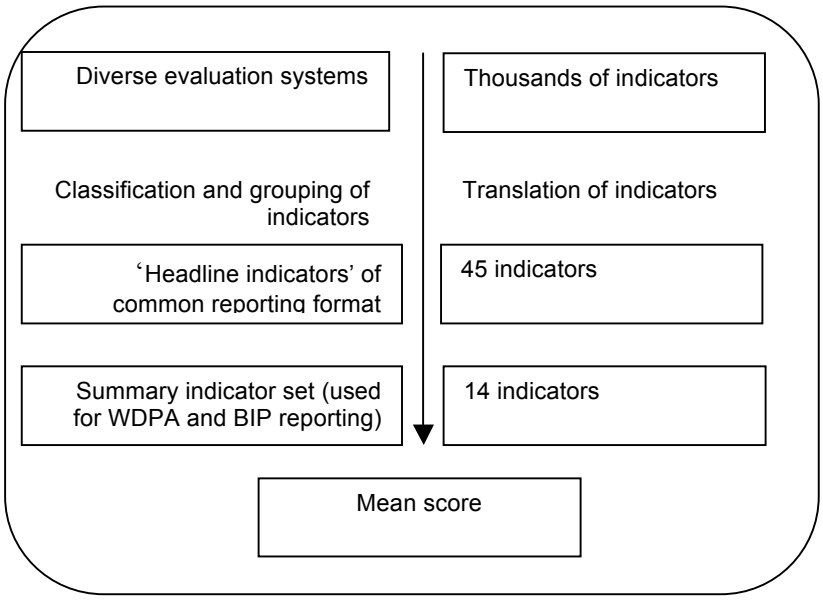


Figure 9: From many to a few: the process of developing a common reporting format and summary data set.

Table 3: Common reporting framework headline indicators. Starred indicators are qualitative

Element	Summary indicator set	Common reporting format headline indicators
Context	Value and significance	Level of significance
		Five important values*
	Threats and constraints	Level of extent and severity of threats
		Trend of threats
		Five important threats*
		Constraint or support by external political and civil environment
Planning	Site design and establishment	Park gazettal
		Tenure security and issues
		Appropriateness of design
		Marking and security/ fencing of park boundaries
		Adequacy of p.a. legislation and other legal controls
	Management planning	Management planning
Input	Management resources	Adequacy of current funding
		Security/ reliability of funding
		Adequacy of infrastructure, equipment and facilities
		Adequacy of staff numbers
	Information base	Adequacy of relevant, available information for management
Process	Internal management systems and processes	Staff morale
		Effectiveness of governance and leadership
		Model of governance*
		Effectiveness of administration including financial management
		Management effectiveness evaluation undertaken
		Adequacy of building and maintenance systems
		Staff/ other management partners skill level
		Adequacy of staff training
		Adequacy of hr policies and procedures
	Visitor management	Character of visitor facilities and services*
		Visitors catered for and impacts managed appropriately
		Level of visitor use
	Natural and cultural resource management systems	Threat monitoring
		Natural resource and cultural protection activities undertaken
		Sustainable resource use - management and audit
		Research and monitoring of natural/ cultural management
	Stakeholder relations	Communication program
		Involvement of communities and stakeholders
		Appropriate program of community benefit/ assistance
		List community benefit/ assistance program*
	Law enforcement	Adequacy of law enforcement capacity
		List (up to) five main issues for law enforcement*
Output	Achievement of work program	Achievement of set work program
		Results and outputs have been produced
Outcome	Conservation outcomes	Proportion of stated objectives achieved
		Conservation of nominated values -condition
		Conservation of nominated values - trend
	Community outcomes	Effect of park management on local community

As an example, some indicators relating to natural and cultural resource management are listed in Table 4.

Table 4: Example of indicators relating to natural and cultural resource management processes

Methodology	Indicator examples
AEMAPPS	Percentage of the area protected with management of some competent authority
Catalonia MEE	Fire prevention plan and management
EOH	Cultural/ historical resource management: Are the site's cultural resources adequately managed?
Korea METT	Historic and cultural resources management
Parks profiles	Are there any active conservation projects?
Scenery matrix	Physical barriers for fire prevention
Scenery matrix	Protection Programme
Tracking Tool	Is access/resource use sufficiently controlled?
Tracking Tool	Is the protected area adequately managed (e.g. for fire, invasive species, poaching)?
Tracking Tool	There are active programmes for restoration of degraded areas within the protected area and/or the protected area buffer zone

These indicators would be grouped under the common reporting format headline indicator (one of 45): 'Natural resource and cultural protection activities undertaken' and in the summary data set indicator (one of 14): 'Natural and cultural resource management systems'.

System-wide assessment common reporting format

As well as compiling information about site-level assessments, there is also a need to evaluate how well entire systems of protected areas are being managed. Under the CBD requirements, countries have committed themselves to develop frameworks for reporting on management effectiveness at national and regional level as well as at site level.

Robust and effective management is needed at system level where critical financial disbursement and management, protected area acquisition, wide-scale community engagement, and overall planning and policy initiatives usually occur. For national or regional agencies, these important activities are often concentrated at central office or district headquarter level. Support for site-level management from these centres is also vital. PAME systems which consider these indicators as well as those concerned with individual protected area management will gain a better measure of progress in protected area management on a country and system-wide scale.

Some methodologies, notably RAPPAM (Ervin 2003b), are intended to assess protected areas over an entire protected area system, and include a number of questions which relate to the design and management of the system as a whole. Such a study was undertaken in Brazil in 2006, where RAPPAM was applied at a system level, assessing a total of 246 federal protected areas (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis and WWF-Brasil 2007). A valuable study conducted in Finland (Gilligan *et al.* 2005; Heinonen 2006) was aimed at the system level, and while the assessors visited a number of parks and considered information relating to individual protected areas, all the indicators are at system level (this was combined with a RAPPAM study to look at site-level indicators). Other assessments of protected area systems include a similar study in Lithuania (Ahokumpu *et al.* no date) and an extensive assessment under way in India (Vinod Mathur *pers. comm.*). System level assessments have recently been conducted or are underway in Korea, Colombia and Thailand and it is likely that more studies at this scale will be conducted in the future.

In other studies, data is gathered at the protected area level, but reports available to the public 'roll up' the data and present results at the system or group of protected areas level. In this way, the evaluation is presented as an evaluation of the system as a whole rather than of

individual areas. Sometimes agencies are reluctant to publicly discuss evaluation results at protected area site level and are more likely to share and transparently report on results at system level.

Evaluation of a protected area system usually consist of two types of indicators:

- Indicators aimed at protected area level, reported at system level; and
- Indicators aimed at system/ agency level.

Management planning is an indicator used in almost all PAME methodologies and is one of the 'headline indicators' of the common reporting format. It can be reported at both protected area level (existence and quality of management plans) and at system level (planning systems and policies, manuals, and the system-wide proportion of protected areas with management plans).

Above: PAME workshop discussing management planning indicators, Colombia

Table 3 lists common indicators that have been used for reporting at the system level. Additional indicators 'rolled-up' or analysed from protected area level reporting can be added, but this Table outlines the minimum recommended fields.

Table 5: Common Reporting Format at system level (note: other indicators can also be 'built up' by summarising site-level results). Shaded fields are most easily obtained from combining site-level data

Element	'Headline indicators'	Comment
CONTEXT	International cooperation and support	Includes commitment to international treaties, international aid, participation in regional/ cross-boundary initiatives
	Supportive national government policies, laws and mechanisms for protected are management	Includes policies for cooperative conservation management
	Extent of integration of protected area policy with other sectoral policies	
	Overall level and trend of threats to protected area system	Build up from PA results
	Most common threats to protected area system	Build up from PA results
	Level of community support for protected area system	
PLANNING	A systematic and clearly articulated design/ vision for establishment of a representative protected area system	Principles for reserve selection, gap analysis conducted

Element	'Headline indicators'	Comment
	Adequacy of current protected area system to protect diversity of ecosystems, biodiversity and natural processes across the landscape	
	Adequacy of current legislation	Evaluation of system-wide legislative basis. Could also include complementary legislation if relevant
	Use of appropriate range of IUCN PA categories and governance types to achieve conservation and community well-being goals	
	Proportion of parks with management plans	Build up from PA results
	Extent to which protected areas in the system are linked by sympathetic land use/ remnant habitats on other lands	
	Adequacy of system-wide management vision/ strategic plan	
INPUT	Sufficient financial resources for management of the PA system; stability of funding	
	Sufficient human resources for PA system	Staff numbers and training/ capacity, including support staff and system managers
	Adequate information and information systems to manage the PA system	Includes overall system-wide knowledge of biodiversity, cultural issues
PROCESS	Effective system of governance, leadership and administration at system-wide level	Unlikely to be measured by internal audit
	Monitoring and research programs for threats and values of PA system	
	Participation/ involvement of stakeholders at system level	System-wide advisory committee; transparency of agency dealings etc
	Management effectiveness evaluation	e.g. Regular state of parks assessments
	Training and capacity-building program for staff	Planned system-wide training initiatives and support for staff
	Effective enforcement of protected area laws at all levels	e.g. existence of support staff for enforcement
	System-wide program of communication, education and stakeholder relations	
	Adequacy of system-wide policies, standards and guidelines for PA management	
	Areas of greatest strength and weakness in management	From analysis of PA results
OUTPUT	Extent to which system plan has been achieved over previous period	
OUTCOME	Protection of cultural heritage	
	Protection of natural integrity/ biodiversity	
	Expectations of visitors generally met or exceeded	May be linked with question below
	Overall impact of/ perception of protected area system on communities	e.g. As shown by national/ regional community attitude surveys in relation to their opinions and experiences with PAs

3.2 Transforming data into the common reporting format

Information in this section is extracted from Leverington et al. (2010b)

'Matching' the indicators

In order to combine and analyse information from studies using different methodologies, the first step is to 'match' indicators from each methodology with the 'headline indicators' listed in the common reporting format. In the Global Study database, the indicators for each system are coded according to their logical matching with one (or in some cases two) of the headline indicators from the common reporting format. This matching has to be done individually for each methodology and variation in indicators. Some subjectivity is inevitable in this matching so the work has all been done or checked by one person to maximize the consistency. Once the indicators are matched with the common reporting format headline indicators, scores from different systems can also be 'translated'.

Where there is more than one indicator matching to a headline indicator, the scores are divided by the number of applicable questions in order to derive a score for the headline indicator. However, in some cases one indicator is clearly more important than another.. For this reason, each of the n individual indicators (S_j) was allocated a weight (W_j) between zero and one in terms of its contribution to a headline indicator (I) such that the sum of weights was equal to 1.

$$I = \sum_{j=1}^{n} S_j W_j$$

For example, in the Tracking Tool there are five questions matching the headline indicator 'management plan'. The question 'Is there a management plan and is it being implemented' is a key question here and is therefore weighted more heavily than the other, supplementary questions. An sample of questions from the Tracking Tool is shown in Table 6.

Table 6: An example of the matching and weighting process for some indicators from the Management Effectiveness Tracking Tool (Stolton and others, 2007) across to the headline indicators

Question	Headline indicator	Weight
Does the protected area have legal status?	Park gazettal (legal establishment)	1
Are inappropriate land uses and activities (e.g. poaching) controlled?	Adequacy of law enforcement capacity	0.5
Can staff enforce protected area rules well enough?	Adequacy of law enforcement capacity	0.5
Is there a management plan and is it being implemented?	Management plan	0.5
Have objectives been agreed?	Management plan	0.125
The planning process allows adequate opportunity for key stakeholders to influence the management plan	Management plan	0.125
There is an established schedule and process for periodic review and updating of the management plan	Management plan	0.125
The results of monitoring, research and evaluation are routinely incorporated into planning	Management plan	0.125

In most cases, the allocation of weightings was very simple due to the low numbers of indicators relating to the common reporting format in each methodology. In more complicated cases, allocating the weightings has been undertaken through a very simplified version of an Analytical Hierarchy Process, with collaborative decision-making (Saaty 1995).

Note that for some headline indicators there are no contributing indicators, so they are left out. Where a question has not been answered, the weightings are recalculated so they still add up to one.

The nature of the data and converting it to a common scale

The next challenge in cross-analysis is posed by the fact that a range of different rating and scoring systems are used in PAME methodologies. However, most are variations on the theme of defining the ideal situation for each indicator and measuring the progress towards achieving that ideal. Thus the lowest score represents no progress, negligible progress or a very poor situation, and the highest represents the ideal (or in some methodologies the achievable) situation. This best practice or optimum situation may be defined broadly for the country or in the system methodology, or may be defined for individual protected areas during the evaluation process.

Some data is quantitative (though often 'best estimate) interval or 'ratio' data, for example where people estimate the amount of funding needed for a protected area and then estimate what proportion of this funding they have.

Most of the data set could be regarded as 'ordinal', where the ratings are in order from lowest to highest. The gaps between the different scores are not entirely even and consistent, and are sometimes difficult to quantify (for example, the quality of a management plan or how 'good' a protected area design is). However, the data is much richer than a purely ordinal data set might be: a purely ordinal data set would just order responses from the best to the worst. All PAME methodologies have attempted to develop ratings that reflect steps towards ideal management that are as even as possible, and there is extensive discussion on these points during methodology development and in evaluation processes. That is, though we cannot definitively say that a score of four is twice as good as a score of two, this is as close to the truth as possible. These scores are in many ways analogous to the Likert scales commonly used in much sociological research (Likert 1932), and there is much debate in the literature about the nature of data derived from such questionnaires.

Some methodologies, including most of those adopted in Latin American countries, use a five-point scale, as proposed by Cifuentes *et al.* (2000), based on the recommendations of ISO 1004. Most of these systems work on the concept of what percentage of the optimum (or the optimum desirable/achievable) state currently exists.

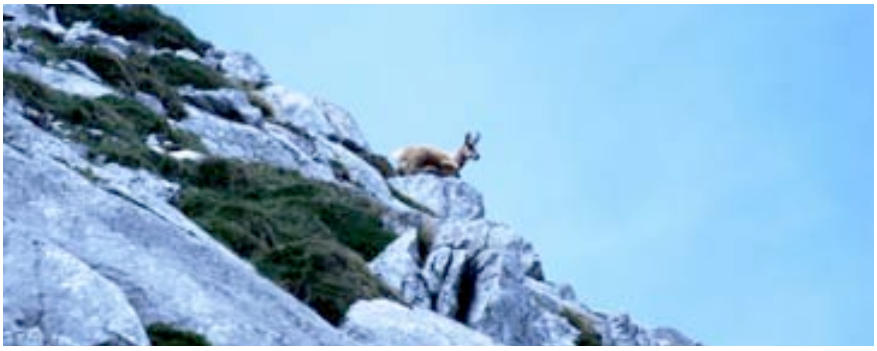
Other methodologies follow the scoring system used by the Tracking Tool (McKinnon 2003), which uses a four-point scale to avoid the issue of most responses clustering to a mid-point. RAPPAM (Ervin 2003b) uses a variation of the four-point scale. The four-point scale also corresponds well with the ecological evaluation work being undertaken by TNC, which proposes that a scale of 'poor', 'fair', 'good' and 'very good' has scientific merit (Parrish *et al.* 2003).

The variation of scoring systems poses the question of how best to use the different data types and how to 'translate' systems using different scales without losing statistical validity. It was recommended by a University of Queensland statistician (Allan Lisle *pers. comm*.) that the most valid way to undertake this is to map all ratings onto a zero to one scale, where zero represents the lowest measurement and one the optimum situation. This approach has minimised the loss of information and enables averages to be calculated. The scoring systems of some of the major PAME methodologies are shown in Table 7, with the 'translation' to a zero to one scale in the bottom row for each system.

Table 7: Scoring systems with translations to a zero to one scale

Methodology		Ratings				
		lowest		mid		best
Rappam	Original response	no	Mostly no	n/a	Mostly yes	yes
	Score	0	1	n/a	3	5
	translation	0	0.33	n/a	0.67	1.00
Tracking Tool	Original response	0	1	n/a	2	3
	General meaning of responses	No progress in the topic	Work begun	n/a	Quite good progress	Very good – ideal situation achieved
	translation	0.00	0.33	n/a	0.67	1.00
PROARCA	Original response	1	2	3	4	5
	Score	0% ideal	25%	50%	75%	100%
	translation	0.00	0.25	0.50	0.75	1.00
MPA scorecard	Original response	0	1	n/a	2	3
	translation	0.00	0.33	n/a	0.67	1.00
AEMAPPS	Original response	1	2	3	4	5
	Score	very low	low	medium	high	excellent
	translation	0.00	0.25	0.50	0.75	1.00
TNC site consolidation	Original response	1	2	3	4	5
	translation	0.00	0.25	0.50	0.75	1.00

It was intended to always maintain the integrity of the original scoring system, by keeping the gaps between the rescaled scores the same. However, analysis of preliminary results showed that this was creating false differences in results among different methodologies, so a more consistent conversion was applied[2].



Above: Chamois in Picos de Europa Nature Park, Spain

3.3 Analysis of data

Raw data was available for 5878 assessments of individual protected areas recorded in this study. About a quarter of these were repeat studies applying the same methodology at the same protected area over time, so studies were separated into older iterations and 'most recent' assessments. Many of the analyses were conducted on the 'most recent' data only and all summary statistics reflect this.

After the raw data was transformed into the common reporting format 'headline indicators' and data from all studies combined, the resulting figures were analysed to obtain averages

[2] The RAPPAM methodology used a 0,1,3,5 scale and this is now converted to 1, 1/3, 2/3, 1 (with consistent gaps between scores) so it is more compatible with other methodologies.

and standard deviations for total overall management effectiveness and for each headline indicator. As mentioned above, this data was sorted according to whether the study was the first or most recent using a particular methodology in a protected area, so the averages presented in this report do not contain repeated studies. None of the methodologies ask questions relevant to all the 'headline indicators', so the number of records vary for each indicator. Where the number of records is very small or from only one localized study, the results are interpreted with additional caution or excluded from analysis.

Though the data may not be regarded as true parametric interval data, we considered that, given the very large sample size, data patterns which approach normal distribution and the thoughtful nature of the indicators, it was valid to use averages and standard deviations to develop the general pictures of strengths and weaknesses presented here. Further statistical work will be undertaken in the future.

Overall averages are comprised of whichever 'headline indicators' are available from the information at hand, and therefore vary widely in their composition depending on the methodology used. To confirm whether the arithmetic averages would be significantly biased according to the fields used to calculate it, a comparison was made between the 'least square means' (which take into account which indicators are missing) and the overall arithmetic averages. The results showed clearly that there was very little difference between the two methods of calculation and it was concluded that the simple approach of calculating the average of available indicators appears to be sound (Allan Lisle *pers. comm*.). Numbers of 'most recent' assessments used in analyses for the Global Study are shown in.
Table 8

Table 8: Assessments with available 'most recent' data

	Africa	Asia	Europe	LAC	N. America	Oceania	Total
AEMAPPS				18			18
Birdlife IBA	86	94	59	19	1	67	326
Central African Republic	16						16
GOBI survey	39	21	76	51	33	5	225
Korea MEE		39					39
MEE Indian		30					30
MEMS				23			23
METT-RAPPAM crossover				8			8
NSW SOP						682	682
Parks profiles				62			62
PIP Site consolidation				53			53
PROARCA/CAPAS				146			146
Qld Rapid Assessment						308	308
RAPPAM	221	253	351	386		45	1256
Stockholm BR Survey			104				104
Tracking tool	314	203	212	134		3	866
Victorian SOP						102	102
Total	**676**	**640**	**802**	**900**	**34**	**1212**	**4264**

** Some assessments contribute to less than six headline indicators (e.g. most of the 'Park Profile'' studies), so valid means could not be calculated for these results.

Correlations between headline indicators and averages: To investigate which factors of management appear to be most closely linked to each other and to overall effectiveness, we

analyzed the data using Pearson's Correlation Coefficient[3]. For this analysis, we used all data including earlier assessments where there were repeat studies. We tested the strength of the correlations between these individual headline indicators and the overall average score for management effectiveness. We used corrected item-total correlation calculations, where the score for the individual item is not included in the average against which it is correlated (Guilford 1954). Correlations with outcome indicators (the current status of values and the effect of the protected area on the community) were also calculated.

Changes over time: In addition, for 272 repeat studies – where two or more assessments have been conducted over time in the same protected area using the same methodology – we compared mean scores for the first and last assessments to investigate the extent to which protected area management changed over time.

3.4 Cautions and constraints

When considering the results presented in this report, the reader should be aware of the following constraints:

- We have considered only information that is available from studies already conducted. There is no reason to believe that the protected areas evaluated are a 'representative sample' of the protected areas across the world. Many of the studies have been undertaken by non-government conservation organizations because the protected areas concerned were considered to be particularly vulnerable. In other cases, government agencies have evaluated all or a sample of their protected areas. There has been no attempt to moderate these results: they reflect the picture of the available assessments.

- As discussed above, most of the information in this report is derived from qualitative assessments, and scoring may vary depending on the point of view and knowledge of the evaluators. Parametric analyses have been conducted on the basis of the data being robust and the belief that such analyses are 'meaningful' (Knapp 1990), but these results should be interpreted with caution and are only intended to reveal general patterns.

- Statistical analysis is conducted only on the assessments for which we have been provided with usable raw data, which is about 50% of the known assessments.

- Translation of raw data into the common reporting format enables cross-analysis but inevitably leads to a loss of the 'richness' in data, especially information obtained from more detailed studies. People interested in more detail should consult the original reports.

- The information content of the headline indicators varies widely: some methods ask numerous questions about one broad topic such as community involvement, which are then combined into only one headline indicator, while other methods have only asked one question relating to this topic. This also means that the original weighting systems of the methodologies are often not reflected in our analysis.

3 Correlation measures the strength and direction of a relationship between two sets of variables (such as two different indicators). That is, the more strongly they are positively correlated, the more you will expect that as one increases, the other one will increase too. If the two indicators are completely independent, the correlation will approach zero. If they always vary in exactly the same way, the correlation will be one. (If they vary in the opposite way, the correlation will approach -1).
If the correlation is significant at $p<.0001$, this means that there is a very low probability (less than one in 10,000) that the observed correlation arose simply by chance. A positive correlation does not necessarily mean that there is a 'causal' relationship: there might be some other factor (such as resourcing) that influences both variables.

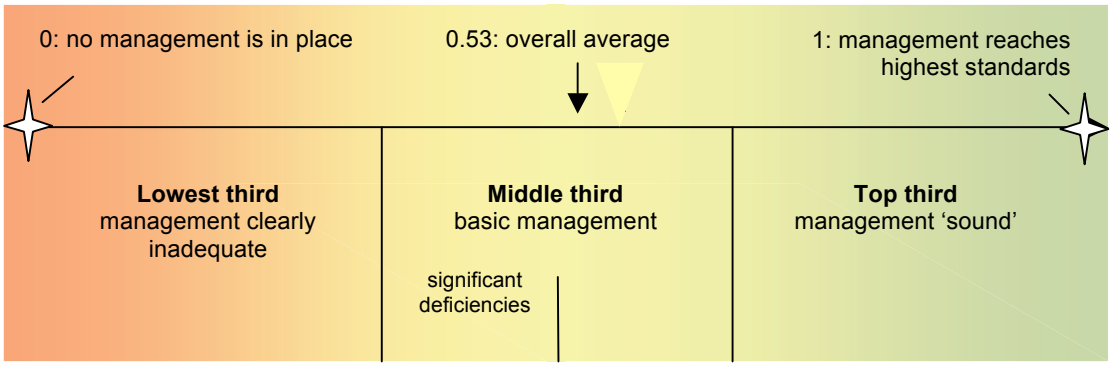
- The methodology for combining and cross-analyzing data is the best available to look across the diversity of methodologies, but we recognize the imperfections, and the fact that data collected by different methodologies may not always paint the same picture of a protected area.

PAME can be applied in private as well as public protected areas and is often required for accountability of such reserves.

Above: Private protected area on the Rio Negro, Brazil

3.5 What do the headline indicator and overall average scores represent?

As the mean scores are based on headline indicators rated between zero and one, they reflect a continuum from no management at all to high management standards. As shown in **Error! Reference source not found.**, the lowest third of this continuum (below 0.33) means that overall protected area management is clearly inadequate. Scores between 0.33 and 0.67 indicate that while basic management is in place, considerable improvement is still needed. As most scores fall in this category, we further split this into those between 0.33 and 0.5 (basic but with major deficiencies) and those between 0.5 and 0.67. Generally a "sound" level of management would begin at a score of around two-thirds (0.67). Scores above this mean that the area is being managed relatively well. These cut-off points accord with the meaning of the most common assessment systems that provided the data for this analysis.



Chapter 4 Trends in protected area management

4.1 How effective is protected area management?

Protected area management on average is just reaching a basic standard.

The overall mean score is 0.53 out of a maximum of one for the 4151 'most recent' assessments for which averages could be obtained (some studies with few indicators were excluded). The distribution of the average scores is shown in Figure 11.

Scores for individual protected areas measured vary from zero to very high. Only 13% are in the 'clearly inadequate' range. Most protected areas are clustered in the middle third (basic management), with 27% of the total in this range but below 0.5 (basic but with major deficiencies) and 35% above 0.5. Nearly a quarter (24%) are in the 'sound' range.

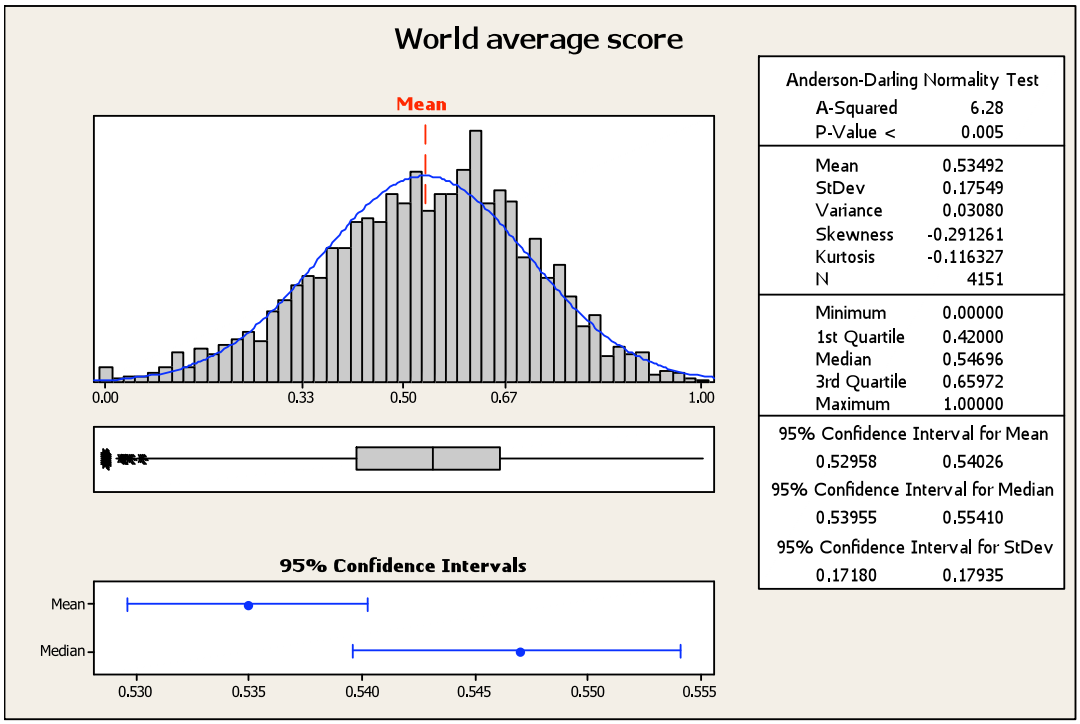


Figure 11: Distribution of average scores for 'most recent' assessments

Scores vary according to the regional context and the economic environment of management.

Statistically, the average scores vary significantly according to the UN region (see Table 9), but these differences are not considered to be particularly meaningful. These regions encompass huge variation in the standard of protected areas and the assessments considered do not attempt to sample this variation: for example the assessments in Oceania include a small number in Papua New Guinea and a large number in Australia, with none from the Pacific Island Nations. The European data set is biased towards protected areas in eastern Europe and Russia.

However, some patterns can be observed. All regions – including the developed nations – include a proportion of well managed and some poorly managed protected areas. Proportionally more of the African protected areas evaluated have little effective management and are in great need of assistance, though many of these are newly created. Protected areas in Latin America tend to score mostly in the 'basic' range.

Table 9: Overall averages from most recent data (North America omitted due to lack of comparable data)

	Africa	Asia	Europe	LAC	Oceania
Number of assessments	644	634	794	853	1193
Overall mean	0.49	0.53	0.57	0.51	0.56
Management level	**Proportion of assessments in each level**				
'Clearly inadequate' (<.33)	22%	16%	8%	13%	11%
'Basic but with major deficiencies' (.33 - .5)	31%	25%	23%	33%	25%
'Basic' (.5 - .67)	31%	34%	39%	37%	35%
'Sound' (>.67)	17%	26%	29%	16%	29%

An analysis per country is not presented as this study has committed to avoid making comparisons which could be interpreted as criticisms of individual agencies. Contextual information is needed to interpret results at this finer scale.

However, an analysis of results according to the Human Development Index (HDI) – which is applied per country - shows highly significant differences which may be more meaningful. As expected, the scores are much higher in those countries with high and medium HDI ratings (Table 8).

Table 10: Average scores (most recent) analysed according to HDI with Kruskall-Wallis test

HDI	N	Median	Ave Rank	Z
High	1888	0.5834	2317.5	11.86
Medium	1842	0.5229	1940.3	-6.52
Low	388	0.4104	1470.3	-10.46
no entry	33	0.687	2953.5	4.22
Overall	4151		2076.0	

H = 217.08 DF = 3 P = 0.000

4.2 Which aspects of management are most effective?

There are clear patterns in the strengths and weaknesses of different aspects of management , and most of these are consistent across regions and methodologies. Average scores for individual headline indicators vary from 0.38 (very low) to 0.82 (high) on a zero to one scale.

Of the five management aspects assessed as strongest overall (scoring over 0.6) four are from the 'planning' element of the IUCN-WCPA Framework: gazettal and legal status, marking of protected area boundaries, tenure issues, and design of protected areas. (However, the 'management planning' indicator scores much lower). The 'process' indicator relating to governance and leadership also scores highly.

The six aspects of management on average assessed as most unsatisfactory (below 0.45 on a zero to one scale) include inputs (funding adequacy, funding security and staff numbers) and the process indicators relating to community assistance programs, management effectiveness evaluation, and building and maintenance.

Figure 12 shows average scores from the most recent assessments for each 'headline indicator' in descending order[4]. Shading indicates for each indicator which element it

[4] Headline indicators with 500 or fewer records have been omitted from this figure but are included in the table. None of the methodologies include indicators relevant to all headline indicators, so the number of records for each varies. In addition, some records are blank.

matches from the IUCN-WCPA Framework explained in Section 1.5 (Hockings *et al.* 2006). For more details, see Table 13, which presents average scores for each indicator including the number of assessments and standard deviation. Averages for each region are also shown in Table 13 . Overall, one headline indicator is rated as 'sound', 22 are 'basic' and 12 'basic with significant deficiencies'.

When the strengths and weaknesses are examined across the UN regions, there is a remarkable similarity in the patterns of the headline indicator scores. The exception is Oceania, where the ten highest scoring factors include visitor management and building and maintenance programs (which are low in other regions). This reflects a greater emphasis and capacity in this regard in the Australian protected areas assessed. Management planning is also stronger there, where a concerted effort to increase the coverage of management plans has been made in recent years.

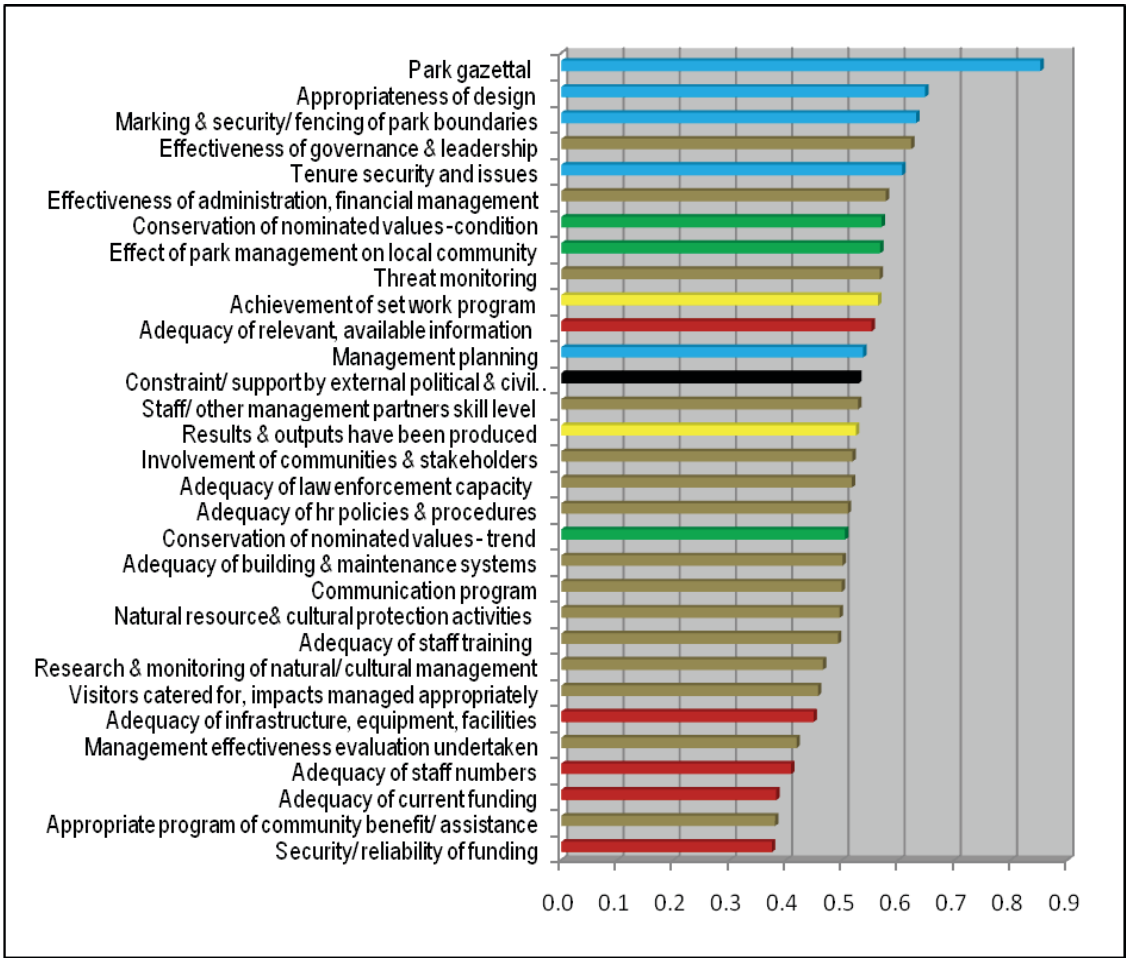


Figure 12: Average scores for headline indicators from 'most recent' studies

Notes: Where there have been multiple studies at a site using a methodology, only the most recent data has been used. While data from 4264 assessments was analysed, most headline indicators have fewer entries (see Table 11) Headline indicators with less than 500 entries have been deleted from this figure. Colours used to indicate the element of the IUCN-WCPA Framework: Black indicates 'context' factors, aqua 'planning' , red 'inputs', brown 'process' ,yellow ' outputs', and green 'outcome'

Planning is the strongest of the elements overall, but management planning itself is weak. Aspects of management relating to the establishment of protected areas are relatively strong and the data possibly underestimates the real picture. For example, large dataset from Australia does not include indicators about gazettal or tenure issues as all protected areas in the states concerned are legally gazetted before they are included in a protected area system, so this would score a uniform '1'. However, in some areas tenure issues and boundary

marking remain major constraints on management (note the higher standard deviation relating to these scores).

Though tenure rates well overall in all regions, it seems that where tenure issues still exist, they tend to be serious: for example these are noted to be of concern in a number of eastern European countries which have undergone major political changes (Nolte *et al.* 2010), and there are also problems with establishment of protected areas and community rights in some countries in Latin America and Asia.

Management planning scores at only just the basic level (0.53), and inadequate management planning is often mentioned as a major issue in reports. The figure for Africa is particularly low, but again this is mentioned as a problem in workshops and reports from all over the world. Even where plans exist, they are often inadequate, out of date, or not well integrated into management.

Table 11: Mean average scores for each headline indicator. Shading key same as above.

Headline Indicator		N	Mean	St Dev
Constraint or support by external political and civil environment	C	1893	0.53	0.23
Park gazettal	P	2559	0.85	0.28
Tenure security and issues	P	1106	0.61	0.38
Marking and security/ fencing of park boundaries	P	2794	0.63	0.34
Appropriateness of design	P	2340	0.65	0.26
Adequacy of p.a. legislation and other legal controls	P	364	0.56	0.29
Management planning	P	4039	0.54	0.31
Adequacy of staff numbers	I	2504	0.41	0.29
Adequacy of current funding	I	2642	0.38	0.28
Security/ reliability of funding	I	2032	0.37	0.32
Adequacy of infrastructure, equipment and facilities	I	2702	0.45	0.28
Adequacy of relevant, available information for management	I	3869	0.55	0.27
Effectiveness of governance and leadership	PR	519	0.62	0.33
Effectiveness of administration including financial management	PR	3339	0.58	0.31
Management effectiveness evaluation undertaken	PR	1493	0.42	0.29
Adequacy of building and maintenance systems	PR	2985	0.50	0.34
Adequacy of staff training	PR	2319	0.49	0.28
Staff/ other management partners skill level	PR	1589	0.53	0.30
Adequacy of hr policies and procedures	PR	2369	0.51	0.26
Staff morale	PR	503	0.47	0.29
Adequacy of law enforcement capacity	PR	3054	0.52	0.29
Involvement of communities and stakeholders	PR	3094	0.52	0.27
Communication program	PR	3361	0.50	0.29
Appropriate program of community benefit/ assistance	PR	1091	0.38	0.39
Sustainable resource use - management and audit	PR	328	0.48	0.36
Visitors catered for and impacts managed appropriately	PR	3356	0.46	0.32
Natural resource and cultural protection activities	PR	3580	0.50	0.26
Research and monitoring of natural/ cultural management	PR	2881	0.47	0.27
Threat monitoring	PR	959	0.57	0.28
Achievement of set work program	OP	918	0.56	0.25
Results and outputs have been produced	OP	761	0.52	0.26
Proportion of stated objectives achieved	OC	150	0.58	0.24
Conservation of nominated values -condition	OC	2229	0.57	0.28
Conservation of nominated values - trend	OC	593	0.50	0.21
Effect of park management on local community	OC	2421	0.57	0.28

Input indicators score at below an acceptable level, especially those relating to budget adequacy and reliability, staffing and infrastructure and equipment. It appears that the basic resources for protected area management are missing in many cases, and that where it is present, there is often little security for the future. Information availability scores better than other input indicators.

Processes range from very weak to acceptable, but most need improvement on a global scale. Those processes particularly correlated with management outcomes estimates (see section 4.3) such as communication and community relations; and natural and cultural resource management score relatively poorly and may need special attention.

Outputs are rated as just acceptable, though these are measured in only half the assessments (notably RAPPAM and the NSW State of Parks, but not the Tracking Tool).

Outcomes of management are generally scored relatively highly. While these are often subjective estimates, there is no reason why these indicators would be scored more highly than others. In Australia there is some evidence that protected area staff in workshops are quite accurate in their assessment when compared with objective data, and tend to err on the more pessimistic side (Cook pers comm.).

Patterns in this study confirm many of the observations made in relation to scoring of questions in the Tracking Tool (Dudley *et al.* 2007) as shown in Table **12**. Here also, design and legal status were the highest scoring factors, with low ratings for funding, visitor management and community relations.

Table 12**: Highest and lowest scored questions from an analysis of Tracking Tool data from 331 forest protected areas (Dudley *et al.* 2007)**

Ten highest scored questions (in descending order)	***Ten lowest scored questions (in descending order)***
▪ Legal status ▪ Protected area demarcation ▪ Protected area design ▪ Biodiversity condition assessment ▪ Protected area objectives ▪ Resource inventory ▪ Regular work plan ▪ Protected area regulations ▪ Resource management ▪ Economic benefits assessment	▪ Education and awareness ▪ Current budget ▪ Security of budget ▪ Fees ▪ Management plan ▪ Monitoring and evaluation ▪ Indigenous peoples ▪ Local communities ▪ Visitor facilities ▪ Commercial tourism

Visitor management and facilities are concerns for management across the world, and often score poorly in assessments. Overcrowding and loss of natural character are significant threats to iconic areas
Above: Visitors at Dunes of Pyla protected area, France

Table 13: Regional means for each headline indicator (<100 assessments grey, 'sound' range green, 'basic' blue (>0.5 dark; .33-.5 light), 'clearly inadequate' pink.

		Africa		Asia		Europe		LAC		N. America		Oceania	
Indicator		**N**	**Mean**	**N**	**Mean**	**N**	**Mean**	**N**	**Mean**	**N**	**Mean**	**N**	**Mean**
Constraint / support by external political and civil environment		255	0.50	344	0.46	591	0.57	620	0.53	33	0.64	50	0.58
Park gazettal	P	605	0.84	544	0.90	617	0.90	684	0.81	0		109	0.64
Tenure security and issues	P	217	0.59	253	0.51	351	0.69	240	0.58	0		45	0.69
Marking and security/ fencing of park boundaries	P	568	0.67	474	0.58	635	0.70	723	0.55	33	0.70	361	0.66
Appropriateness of design	P	563	0.59	500	0.64	618	0.73	594	0.63	15	0.63	50	0.53
Adequacy of PA legislation	P			41	0.43	178	0.51	145	0.67	0		0	
Management planning	P	642	0.43	634	0.50	687	0.54	851	0.51	32	0.67	1193	0.64
Adequacy of staff numbers	I	529	0.44	483	0.41	665	0.47	780	0.33	0		47	0.35
Adequacy of current funding	I	568	0.31	500	0.41	734	0.44	756	0.38	32	0.35	52	0.14
Security/ reliability of funding	I	435	0.26	450	0.44	361	0.50	741	0.35	0		45	0.27
Adequacy of infrastructure, equipment and facilities	I	567	0.38	497	0.44	724	0.50	829	0.46	30	0.74	55	0.22
Adequacy of relevant, available information for management	I	601	0.50	607	0.57	697	0.58	780	0.52	0		1184	0.57
Effectiveness of governance and leadership	PR	37	0.59	98	0.58	123	0.72	228	0.56	25	0.88	8	0.96
Effectiveness of administration/ financial management	PR	530	0.44	484	0.54	561	0.60	730	0.52	0		1034	0.69
Management effectiveness evaluation undertaken	PR	335	0.35	197	0.46	149	0.51	127	0.31	0		685	0.44
Adequacy of building and maintenance systems	PR	524	0.34	518	0.46	552	0.56	698	0.45	0		693	0.66
Adequacy of staff training	PR	565	0.49	466	0.46	424	0.58	785	0.48	27	0.66	52	0.17
Staff/ other management partners skill level	PR	217	0.54	252	0.48	351	0.55	416	0.45	0		353	0.63
Adequacy of hr policies and procedures	PR	563	0.50	456	0.49	547	0.52	725	0.52	28	0.73	50	0.27
Adequacy of law enforcement capacity	PR	530	0.53	484	0.53	561	0.63	692	0.54	0		787	0.40
Involvement of communities and stakeholders	PR	437	0.43	489	0.53	320	0.61	762	0.53	0		1086	0.51
Communication program	PR	568	0.44	507	0.53	738	0.54	793	0.51	33	0.53	722	0.47
Appropriate program of community benefit/ assistance	PR	379	0.29	236	0.44	220	0.44	222	0.39	27	0.53	7	0.45
Sustainable resource	PR	34	0.56	19	0.52	60	0.61	106	0.50	15	0.62	94	0.31
Visitors catered for and impacts managed appropriately	PR	524	0.33	516	0.38	559	0.48	657	0.41	0		1100	0.57
Natural resource and cultural protection activities	PR	603	0.46	611	0.49	523	0.54	675	0.45	0		1168	0.52
Research and monitoring of natural/ cultural management	PR	567	0.40	474	0.48	644	0.53	805	0.47	30	0.53	361	0.41
Threat monitoring	PR	133	0.55	121	0.57	161	0.58	483	0.56	0		61	0.56
Achievement of set work program	OP	118	0.54	39	0.70	0		1	0.75	0		760	0.56
Results and outputs have been produced	OP	108	0.54	152	0.50	160	0.57	280	0.52	0		61	0.49
Proportion of stated objectives achieved	OC	0		30	0.42	104	0.62	16	0.63	0		0	
Conservation of nominated values -condition	OC	389	0.55	345	0.60	224	0.56	256	0.55	0		1015	0.58
Conservation of nominated values -trend	OC	39	0.60	45	0.52	64	0.51	101	0.53	32	0.47	312	0.49
Effect of park management on local community	OC	559	0.57	453	0.61	664	0.54	681	0.57	11	0.37	53	0.50

4.3 Which factors are most strongly linked to effective management?

To investigate which factors of management appear to be most closely linked to overall effectiveness, we analysed all data (including earlier assessments) using Pearson's Correlation. We calculated corrected item-total correlations between individual headline indicators and the overall mean management effectiveness score, so the score for each individual item is not included in the average against which it is correlated (Guilford 1954). Correlations of individual headline indicators with two outcome indicators (the current status of values and the effect of the protected area on the community) were also calculated.

Table 14: Item-corrected correlation of headline indicators with mean (corrected to exclude each relevant item) (all are significant at p=.000)

Indicator		Correlation with mean
Adequacy of infrastructure, equipment and facilities	I	0.693
Effectiveness of administration including financial management	PR	0.674
Communication program	PR	0.633
Adequacy of relevant, available information for management	I	0.587
Adequacy of staff training	PR	0.58
Management planning	PL	0.577
Adequacy of hr policies and procedures	PR	0.577
Research and monitoring of natural/ cultural management	PR	0.576
Achievement of set work program	OP	0.576
Adequacy of building and maintenance systems	PR	0.574
Visitors catered for and impacts managed appropriately	PR	0.57
Security/ reliability of funding	I	0.568
Management effectiveness evaluation undertaken	PR	0.553
Adequacy of current funding	I	0.548
Appropriate program of community benefit/ assistance	PR	0.539
Adequacy of law enforcement capacity	PR	0.538
Effectiveness of governance and leadership	PR	0.531
Staff morale	PR	0.528
Adequacy of staff numbers	I	0.505
Constraint or support by external political and civil environment	C	0.499
Involvement of communities and stakeholders	PR	0.498
Adequacy of PA legislation	PL	0.498
Results and outputs have been produced	OP	0.464
Threat monitoring	PR	0.397
Sustainable resource management	PR	0.395
Appropriateness of design	PL	0.388
Marking and security/ fencing of park boundaries	PL	0.387
Proportion of stated objectives achieved	OC	0.387
Staff/ other management partners skill level	PR	0.382
Conservation of nominated values -condition	OC	0.372
Natural resource and cultural protection activities	PR	0.36
Conservation of nominated values - trend	OC	0.31
Effect of park management on local community	OC	0.306
Park gazettal	PL	0.288
Tenure security and issues	PL	0.271

That these correlations do not necessarily mean a causative link, but show a picture where the most effectively managed protected areas are characterized by certain factors.

Overall management effectiveness was most strongly linked to adequate infrastructure, equipment and information; good administration; communication, adequacy of information, staff training and good management planning (Table 14).
There was low correlation with the highest-scoring indicators (park gazettal and tenure security) and with outcome measures of both values and community impacts.

We also correlated all indicators with outcome measures. The condition of protected area resources were most strongly correlated with the support and constraint of the external environment (a measure of context), and with inputs and processes including research and monitoring, staff numbers and training, effectiveness of administration, natural resource management and communication (Table 15).

Table 15: Correlations of headline indicators with estimated condition of values (all are significant at p=.000)

Indicator (top 12 shown)		Correlation with condition of values
Constraint or support by external political and civil environment	C	0.42
Research and monitoring of natural/ cultural management	PR	0.35
Appropriateness of design	PL	0.334
Adequacy of relevant, available information for management	I	0.332
Effectiveness of administration including financial management	PR	0.322
Adequacy of staff numbers	I	0.309
Natural resource and cultural protection activities	PR	0.306
Communication program	PR	0.303
Adequacy of infrastructure, equipment and facilities	I	0.3
Adequacy of staff training	PR	0.296
Adequacy of law enforcement capacity	PR	0.295
Adequacy of PA legislation	PL	0.294

Effect of the protected area on the community was most strongly linked with communication, involvement of communities, and community benefits programs (Table 16).

Table 16: Correlation of headline indicators with estimated effect on community (all are significant at p=.000)

Indicator (top 12 shown)		Correlation with effect on community
Communication program	PR	0.335
Involvement of communities and stakeholders	PR	0.318
Appropriate program of community benefit/ assistance	PR	0.312
Management effectiveness evaluation undertaken	PR	0.296
Adequacy of PA legislation	PL	0.279
Natural resource and cultural protection activities	PR	0.247
Visitors catered for and impacts managed appropriately	PR	0.234
Management planning	PL	0.23
Adequacy of staff training	PR	0.223
Effectiveness of governance and leadership	PR	0.218
Research and monitoring of natural/ cultural management	PR	0.215
Appropriateness of design	PL	0.205

There is low correlation between measures of protected area values condition and impact on communities. These correlation measures show that when assessing management effectiveness it is essential to include outcome measures (both of protected area values and of communities) and other parts of the management cycle to gain a true picture – we cannot use measures of inputs and processes to fully predict outcomes.

4.4 Is management improving over time?

As further management effectiveness studies are conducted, there will be more evidence about how the standard of protected area management can be improved. Early analysis shows that a targeted program of protected area 'consolidation', accompanied by additional inputs and by management effectiveness studies, can show good and often dramatic results. Perhaps the most comprehensive program documented in this regard is the Parks in Peril program (Martin and Rieger 2003)

In this study, we have looked at 272 repeat studies – where two or more assessments (up to seven) have been conducted over time in the same protected area using the same methodology. The vast majority (207) showed that effectiveness improved (Table 15), with the 'most recent' score improving by an average of 0.24 (158% increase) on their original score. Six protected areas stayed the same, while 60 showed a decrease in score averaging 0.14 (2% of their original score). Figure 13 shows trends over time.

Table 17: Average improvement in PAME scores for repeated assessments

Number of repeats	N	average improvement
2	117	0.030
3	30	0.164
4	36	0.084
5	25	0.268
6	16	0.348
7	48	0.303

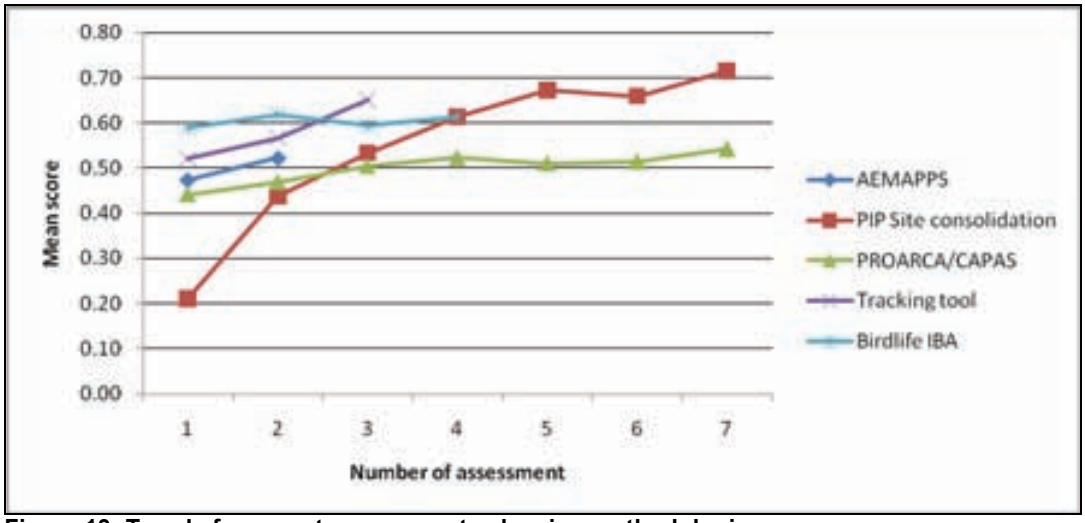


Figure 13: Trends for repeat assessments showing methodologies

In Latin America, repeat assessments for 207 protected areas[5] (a subset of the 272 shown above) were analysed for a study commissioned by IABIN in association with the Global

[5] Repeat study results for Latin America were available for protected areas assessed by AEMAPPS in Colombia (this methodology changed somewhat between the two assessments), Parks in Peril across 17 countries, PROARCA in Guatemala and Panama and a very small number of studies using the

Study (Leverington *et al.* 2007a). In this study, we measured trends for each headline indicator. Changes over time for those areas are presented in Figure 14.

Clearly improved management was seen in most of the assessed topics and sites. Headline indicator scores in the first studies varied from 0.17 to 0.68, while in the most recent studies the variation was from 0.41 to 0.79, so the poorest aspects of management had been greatly boosted. This trend data mostly represented protected areas where there have been specific intervention programs, such as the Parks in Peril program and PROARCA, and appears to indicate the success of such programs in improving these aspects of management.

The most dramatic improvements shown between the first and last assessments are in the management and auditing of sustainable resource use, and the level of land tenure issues. Strong improvement is also seen in the involvement of communities and stakeholders and in the availability and security of funding, all of which remain below 0.5, but are significantly less negative than in the earlier assessments.

Marking or fencing of protected area boundaries, measured only by PROARCA in the repeat studies, showed no improvement over time. Other factors which exhibited little positive change include processes of staff morale, adequacy of human resource policies and procedures, effectiveness of governance and leadership, and building and maintenance. None of these factors were measured by the Parks in Peril Site Consolidation Scorecard, and all are complicated processes which require considerable and consistent effort to improve.

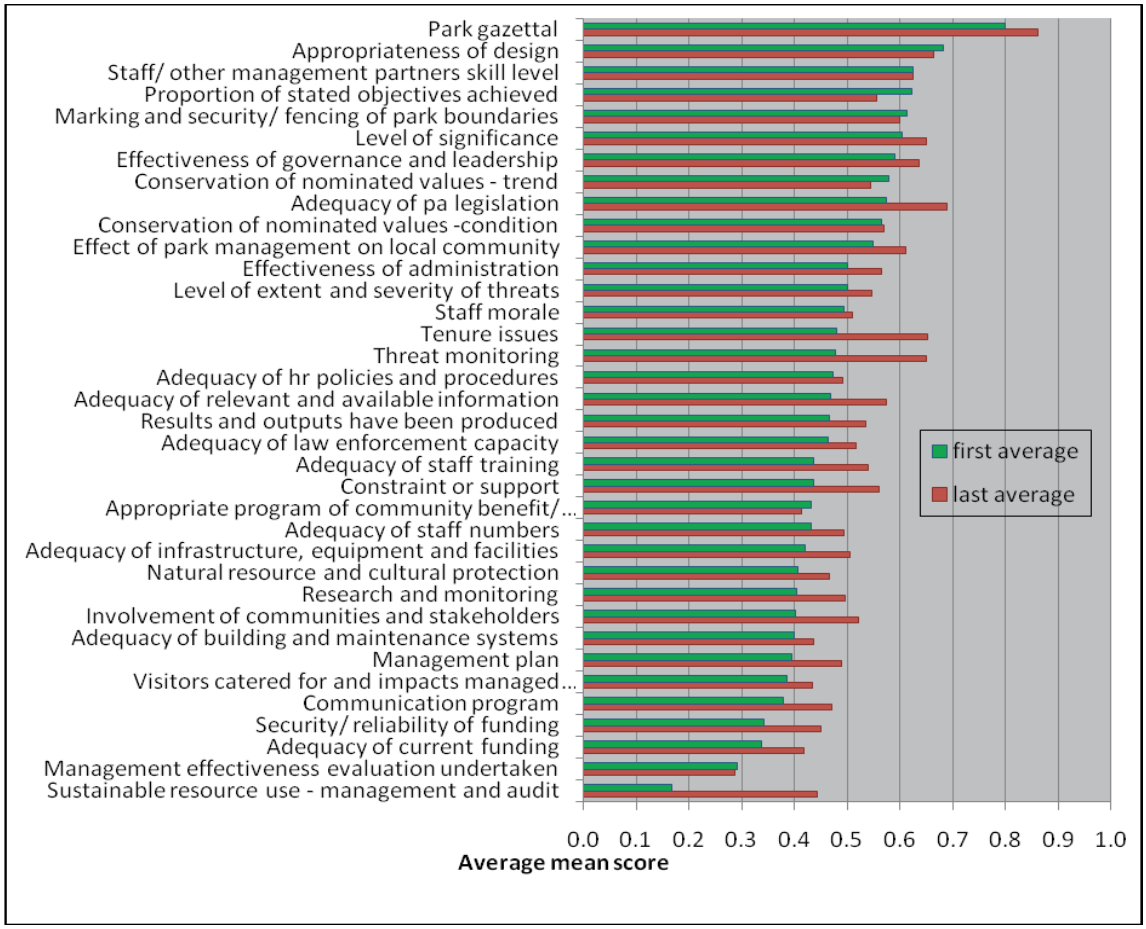


Figure 14: Average scores for headline indicators in repeat studies from Latin America, showing changes from first to most recent assessments (in descending order of change magnitude

Tracking Tool. These total 207 protected areas, but a lesser number of assessments are available for most of the headline indicators, due to variable questions asked in each methodology. Only those indicators with more than 50 records have been included.

4.5 Which are the most common threats to protected areas?

Most management effectiveness assessments evaluate, to some extent, the types and level of threats to protected area values and management. Some methodologies, such as ParksWatch and RAPPAM, provide detailed analyses of threats and potential threats in individual protected areas. As threat data has been collected in many different ways, there are challenges in combining the information obtained in the Global Study. To cross-analyse the kinds of threats listed, reports and data were reviewed and the threats and pressures coded according to their best fit with the standard classification of threats developed by the Conservation Measures Partnership (IUCN and Conservation Measures Partnership 2006; Salafsky *et al.* 2008) and adapted slightly to describe protected area threats. This classification lists several 'layers' or levels of threats from general to specific. We have reported on first and second level threats though in some cases it was impossible to distinguish between threats at the second level of detail (for example, some assessments do not distinguish between invasive plants and invasive animals or between different types of pollution).

The other complication is that some methodologies list, rate and discuss a variable number of significant threats (e.g. RAPPAM), while others list only the top two threats to each protected area (the Tracking Tool). For this reason, we have only presented information about the frequency of each threat, by calculating the number of 'studies' (that is, the application of a methodology in a country) within each region where the threat has been nominated in any report.

Further analysis of available information relating to the severity of threats is needed to better understand the situation, but at this stage severity ratings have been calculated only for European protected areas (Nolte *et al.* 2010). However, we hope that this preliminary analysis will be useful in providing an initial global picture.

This study considered threats nominated in 227 PAME reports covering 125 countries and 6125 individual protected area assessments. The data was drawn from 17 methodologies including RAPPAM, Tracking tool, IBA, Parkswatch, NSW State of Parks, Indian Tiger Reserves and Finland MEE. First level threats across the 227 studies are shown in Figure 15. Second level threats to protected areas regarded as most frequent and serious in the reports of management effectiveness across five UN regions are shown in Table 18. The shaded cells represent the ten most frequently recorded threats across the whole study and in each region.

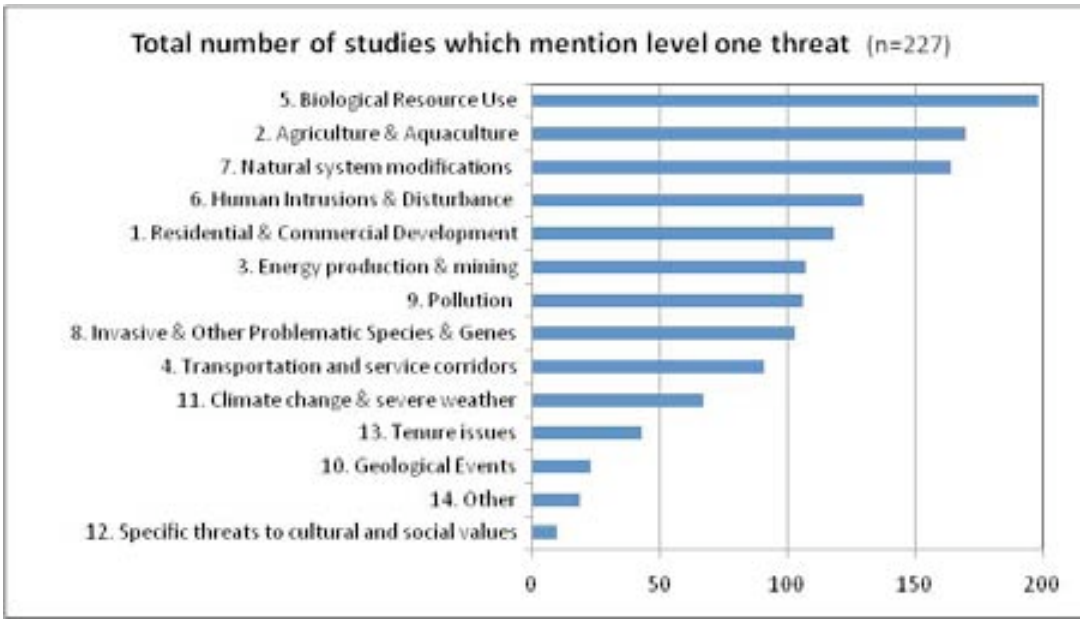


Figure 15: Frequency with which 'level one' threats are mentioned in 227 PAME studies

Biological resource use
At level one, the most common threat, discussed in 87% of the studies analysed, relates to different kinds of use of biological resources within the protected area. At level two, by far the most frequently nominated threat relates to hunting and deliberate killing of animals in protected areas. Fishing is also regarded as a threat in more than 40% of studies and is often reported together with hunting. In a few countries, hunting is not regarded as a major threat, but it is common across most countries in all regions of the world. In many areas, hunting of wild meat still provides an important protein source for local people, but there are serious concerns about its sustainability. Overhunting is thought to be causing significant extinctions and declining populations in the humid tropics (Milner-Gullanda *et al.* 2003). The issue of 'bushmeat' hunting in protected areas is discussed further in the box following Table 18.

In other areas, such as many protected areas in Europe, there is a long tradition of hunting and fishing though they are now more commonly undertaken for sport rather than essential sustenance. There are concerns about increased hunting in eastern Europe : due to past isolation and strict protection, some species remain abundant there while extinct in the western countries, and increase hunting could have serious impacts (Council of Europe Parliamentary Assembly 2004).

Logging and wood harvesting are also very frequently recorded as major threats, and comprise the second most frequently mentioned level two threat overall.

Agriculture and acquaculture
At level one, land use for primary production in some form is mentioned in 75% of studies. At level two, livestock grazing is mentioned in over half the studies overall and in 86% of studies in Asia and 90% in Europe. Cropping is also discussed in nearly half the studies, with other reports recording wood plantations, farming generally or aquaculture.

As well as farming with protected areas, activities on adjacent lands in cases where agriculture and grazing are not conducted sustainably are major issues for protected area managers in all areas

Human intrusions and disturbance
This group of threats is discussed in 57% of reports overall, with 25% recording unspecified disturbance. Recreational activities are mentioned in nearly half the studies, and this is the most commonly mentioned threat in Europe, where it is also regarded as the most serious threat (Nolte *et al.* 2010). Where tourism industries are new or very rapidly expanding, such as in parts of Eastern Europe, there are major challenges for the capacity of protected area management to cope with anticipated increases in numbers (Nolte *et al.* 2010; Pullin *et al.* 2009). The threat classification separates the impact of recreation and tourism from the issue of construction of tourism infrastructure, which is reported in 25% of studies. However, these two issues are obviously closely related.

Natural system modifications
The level one threat relating to modification of natural systems was recorded in 72% of studies. In this group, fire regimes – either undesirable fires or the suppression or lack of desirable fires – are a very serious concern in many countries. Where this threat already occurs, it is likely to exacerbated when compounded by climate change (Steffen *et al.* 2009). Other modifications frequently mentioned include dams and water management and unspecified habitat changes.

Development on protected areas
Just over half the studies nominate the level one threat relating to residential or commercial development. Within this group, housing and settlement on protected areas on protected areas are most commonly discussed, and this issue is closely related to the threats of resource use and hunting outlined above. The threat appears to be most frequent in Latin America,

where it is mentioned in two-thirds of studies. Solutions to these issues while considering human well-being are very complex. These issues are discussed at length in many of the PAME reports, and in other literature concerning protected areas and their relationships with local communities (Naughton-Treves *et al.* 2005).

Other major threats

Other very frequently mentioned level one threats include

- mining, quarrying and oil drilling (47%)
- pollution of various kinds (47%)
- invasive species (45%)
- fragmentation caused by roads and other utility lines (40%)
- severe weather and climate change (30%).

Threats in this overview have been recorded and classified as individual issues. However, for managers they are often interacting and intertwined. For example, threats associated with recreation and tourism to protected areas can include development of infrastructure, fragmentation through roads and powerlines, pollution, increased risk of wildfire, hunting and fishing, and increased populations in adjacent areas. Both evaluation and planning for better management need to understand the inter-relationships between the threats, and to identify their root causes, if effective and sustainable solutions are to be devised and implemented.

Above: While fire is a natural process in many protected areas, potentially destructive wildfires are a threat to visitor safety and local communities, as well as to the survival of wildlife in fragmented and isolated areas.

Table 18: Frequency of threats(level 2) recorded in each UN region. Figures represent the number of PAME studies where the threat is recorded. See above for data constraints. The most frequent threats overall and each country are signified by colour: see 'rank' for key.

Threat	Rank	% of total studies	total *n=227*	Africa *n=81*	Asia *n=65*	Europe *n=41*	LAC *n=31*	Oceania *n=9*
5.1 Hunting, killing & collecting terrestrial animals on protected area	1	79%	179	62	56	29	25	7
5.3 Logging & wood harvesting	2	61%	139	45	41	25	23	5
2.3 Livestock farming & grazing within protected area	3	57%	130	32	48	26	21	3
6.1 Recreational activities	4	47%	108	22	31	30	22	3
2.1 Annual & perennial non-timber crops within protected area	5	45%	103	40	24	15	19	5
7.1 Fire & Fire Suppression	6	44%	100	35	21	17	23	4
5.4 Fishing, killing & harvesting aquatic resources	7	43%	98	34	29	16	17	2
1.1 Housing & settlement within protected area	8	43%	96	21	28	20	24	3
5.2 Gathering terrestrial plants or plant products (non-timber)	9	42%	95	28	34	12	19	2
3.2 Mining & quarrying	10	40%	92	27	22	18	21	4
7.2 Dams & Water Management/Use	11	38%	87	21	26	25	13	2
4.1 Roads & Railroads	12	36%	82	20	24	17	18	3
7.3 Other Ecosystem Modifications	13	31%	70	20	19	12	17	2
6. Human impacts unspecified	14	25%	58	19	20	11	6	2
8. Invasives unspecified	14	25%	56	15	16	15	5	5
1.3 Tourism & recreation infrastructure within protected area	16	25%	56	8	17	22	7	2
9.3 Agricultural & forestry effluents	17	20%	46	17	13	6	8	2
9.4 Garbage & solid waste	18	20%	45	9	15	9	12	0
9.1 Household sewage & urban waste water	19	18%	42	12	14	5	10	1
9.2 Industrial & military effluents	20	18%	41	13	12	7	7	2
2.2 Wood & pulp plantations within protected area		17%	39	10	8	12	6	3
1.2 Commercial & Industrial Areas within protected area		16%	36	11	9	10	3	2
8.1 Invasive Non-Native/Alien Plants		16%	36	7	8	7	12	2
8.1a Invasive Non-Native/Alien Animals		15%	34	2	8	7	13	4
3.1 Oil & gas drilling		14%	33	10	4	7	11	1
11.4 Storms & flooding		14%	32	11	8	4	7	2
4.2 Utility & Service Lines		14%	32	8	8	9	7	0

Threat	**Rank**	**% of total studies**	**total** *n=227*	**Africa** *n=81*	**Asia** *n=65*	**Europe** *n=41*	**LAC** *n=31*	**Oceania** *n=9*
11.2 Droughts		14%	31	10	12	4	3	2
6.2 War, civil unrest & military exercises		14%	31	12	6	7	4	1
13.2 Human activities in the buffer zone (migration, colonization, settlements, agriculture, livestock farming and grazing, population growth)		13%	30	6	3	5	13	3
9. Pollution unspecified		13%	29	3	6	14	5	1
3.3 Renewable Energy		12%	28	8	5	10	4	1
8.2 Problematic Native Species		12%	28	11	4	10	2	1
11.1 Habitat shifting & alteration		12%	27	8	6	5	6	2
2. Agriculture and grazing unspecified		11%	25	8	7	5	5	0
2.4 Marine & freshwater aquaculture within protected area		11%	25	5	7	6	6	1
7. Natural system modifications unspecified		10%	23	4	10	7	2	0
9.5 Air-borne pollutants		9%	20	4	6	5	4	1
14. Other		8%	19	2	7	5	4	1
7.3a Fragmentation within protected area		8%	19	2	8	2	7	0
11.3 Temperature extremes		8%	18	5	6	3	3	1
8.3 Introduced Genetic Material		8%	18	7	3	4	2	1
4.4 Flight Paths		7%	15	6	2	5	2	0
11. Climate change and severe weather unspecified		6%	14	3	1	7	2	1
4.3 Shipping Lanes		6%	14	3	3	4	3	1
10.3 Avalanches/ Landslides		6%	13	4	3	2	4	0
13.1 Change in tenure/coversion of land use/unresolved property rights		5%	12	1	1	10	0	0
9.1b Noise pollution		5%	12	5	3	1	3	0
10.4 Erosion and siltation/ deposition		4%	10	1	3	2	4	0
7.3b Increased isolation of protected area from other natural habitat		4%	10	1	2	2	4	1
7.3c Other ‘edge effects’ on park values		4%	10	1	6	2	0	1

Bushmeat – the threat of hunting in protected areas

Lauren Coad, University of Oxford

The term 'bushmeat' is commonly used to describe 'the meat of any wild animal hunted for food' (Bowen-Jones *et al.* 2002) and refers to a wide range of species. Although the term originates from Africa, where the forest is often referred to as the 'bush', the subsistence and commercial use of wildlife is worldwide.

Hunting is a crucial issue for both wildlife conservation and human well-being. Bushmeat provides an important protein and income source for many rural communities for which few other options are available (Coad *et al.* 2010; DFID 2002) - estimates for the Congo Basin suggest that in rural communities 30–80% of protein and almost all animal protein come from bushmeat (Blaney 2008). The main protein alternatives to bushmeat are fish and livestock, which are often more expensive and less available than bushmeat in rural areas (Wilkie *et al.* 2005) However, increases in human population density, commercial trade in bushmeat, and access to forests through logging concessions have led to bushmeat hunting becoming the most significant immediate threat to wildlife in many African and Asian countries (Bennett *et al.* 2007; Milner-Gullanda *et al.* 2003).

Protected areas provide refuges for wildlife from the threats of habitat loss and hunting; paradoxically this also makes them attractive hunting grounds, and the benefits which protected areas can provide to local communities may put protected areas under pressure from increased population growth on their borders (Wittemyer *et al.* 2008).

To reduce hunting pressure in protected areas a number of different, often synergistic management options, have been suggested, including increased enforcement of hunting laws (increased patrolling, enforcing fines, and confiscating illegal catches), reducing local demand for bushmeat through the provision of alternative and affordable protein sources (e.g. cane rat farming, livestock rearing; (Adu *et al.* 1999), and reducing urban demand for bushmeat through environmental education programmes and enforcement of wildlife trade laws in towns. Protected areas have also been suggested as a tool for increasing village hunting sustainability, acting as sources of animals for the hunted sites, preventing the collapse of prey populations (Novaro *et al.* 2000).

To understand the outcomes and effectiveness of these management options, ecological and socio-economic monitoring within and around protected areas is crucial. Line transects, camera trapping and poaching patrol encounter rates (such as the MIST (Management Information System) programme currently employed by the Wildlife Conservation Society Asia programme) can all be used to estimate hunting pressure and prey populations; similarly hunter Catch Per Unit Effort (CPUE) in surrounding villages may provide an indirect measure of hunting effort and prey population depletion (Rist *et al.* 2010). The impacts of increased protected area enforcement on local livelihoods in surrounding villages (potentially limiting forest access and reducing hunting off-takes) should also be closely monitored, and Schreckenberg et al. (2010) provide a synthesis of suitable indicators for assessing the impact of protected area management on local livelihoods

Left: Young boys from Dibouka village, Central Gabon, showing off a cane-rat (*Thryonomys swinderianus*) caught in the village plantations

Chapter 5 Conclusions and recommendations: what can we learn?

5.1 Progress in PAME

The rapid progress that has been made in implementing management effectiveness evaluations around the world reflects, in part, a commitment to implement the CBD Program of Work for Protected areas goal and targets in this area. It also reflects a growing realisation of the benefits that evaluation can bring to improving management of protected areas.

We would like to see protected area managers develop enduring programs of assessment and improvement, which use evaluation processes and data not only for accountability and reporting but also for adaptive management. Increasing use of system level assessments, for example in Finland, South Korea, Colombia and Thailand, as well as institutionalisation of PAME processes more broadly around the world, all indicate a commitment to this more integrated type of evaluation. Over the next few years, examples of the integration of management effectiveness assessments into routine planning and decision-making processes for protected areas, such as is being developed in NSW in Australia, should further demonstrate the benefits of this approach.

5.2 Conclusions and recommendations about protected area management

Results of the assessments overall show that protected area management leaves much to be desired, with management effectiveness in most cases just meeting or missing acceptable minimum standards. While some protected areas are being well managed, about one in three is still in an 'establishment' phase where significant deficiencies are obvious, and another one in seven shows clearly inadequate management, where basic needs are not being met. This study includes many poorer protected areas which are targeted for development aid programs, but even in protected areas from more developed (high HDI) countries it is clear that management effectiveness could be substantially improved.

Assessments consider that protected areas are conserving their values and contributing to their communities. In spite of lack of inputs and adequate management processes, the 'outcome' factors of meeting objectives, conserving values and affecting the community all achieved positive and relatively high ratings. It is true that most assessments contributing to this study have used only qualitative 'self-rating' judgments, but there is no reason to believe that these indicators would be rated any more leniently than others. Studies looking at empirical evidence also suggest that on a larger scale protected areas are reducing the rate of deforestation, even where there is lack of funding and weak institutions (Naughton-Treves *et al.* 2005).

Above: In some countries, deforestation still occurs in protected areas, but several studies have shown that is significantly less within protected areas than in surrounding lands.

Numerous and serious threats to protected areas require attention if their values are to be conserved. Many of these threats relate to the interface between conservation and human welfare, so are extremely challenging to resolve. Deforestation or intensified landuse up to the protected area boundary is in many cases leading to increased pressure and 'edge effects'. This is an issue in some more developed countries, such as Australia, as well as in tropical countries with rapidly increasing populations and changing economies.

As discussed above, protected areas do appear to be performing important conservation functions and protecting biodiversity, especially from wholesale destruction. However, the frequency of threats recorded in this study from hunting, adjacent land use, farming and grazing, and settlements within protected areas across most of the world confirms the concern that protected areas which seem to be maintaining their values may in fact be experiencing more subtle declines as we see 'half-empty forests' with loss of biodiversity (Peres and Palacios 2007).

Protected areas have a vital role to play in mitigating the effects of climate change across the world (Dudley *et al.* 2010): to play this role effectively threats must be controlled and minimised. A primary defence against the impacts of climate change is to control pre-existing threats, as their impacts are likely to be compounded in the future (Dunlop and Brown 2008; Hannah *et al.* 2007).

Some protected areas still lack the basic requirements to operate effectively, and threats are aggravated by the lack of a clear management presence. Very low scores for security of funding in many assessments are a concern. There is a very strong link between adequate 'inputs' and overall effective management, with the most important individual indicators being equipment, infrastructure and information. Adequate equipment and infrastructure is very highly correlated with effective management but is one of the weakest indicators in almost all regions, so this factor deserves some serious attention.

Reports consistently mention the need for more staff, but the difficulty of attracting and maintaining good technical staff often appears to be the problem (sometimes related to human resource policies and wage levels), and the need for better training in a range of technical areas is also mentioned. Even among the best funding protected area systems in the world, staffing is regarded as 'lean', especially given the increased responsibilities in both scope of duties and areas to manage (Gilligan *et al.* 2005).

It is recommended that management agencies, partners and funders continue to cooperate to help protected areas achieve minimum basic standards. The concept of protected areas becoming 'consolidated' through defining and working towards minimum standards of management across a number of factors makes intuitive sense and has been applied in a number of methodologies. Where this approach is linked with additional funding, regular evaluations and a concerted effort towards improving the fundamentals, marked improvement can be seen over time. This is clearly evidenced by the Parks in Peril data and to a lesser extent by experience from the PROARCA program and use of the Tracking Tool. This process takes time, so long-term commitments to protected area improvement are essential (Martin and Rieger 2003), as are efforts to build sustainability into all externally-funded programs.

It is essential that national governments provide better policy support for tenure resolution in some cases, and for appropriate development planning and control around protected areas. The consistent nomination of adjacent land use or 'buffer zone management' as a major threat emphasizes the need to consider protected areas in the wider landscape, especially as they are faced with additional pressures from climate change.

Government policy, institutional coordination and integration of protected areas into the landscape all need to be improved. Better communication and collaboration among

government organizations and public institutions, including the need for better landuse planning, was a priority recommendation in numerous PAME studies. Frequently, protected area management is undermined by the activities of other government agencies such as those responsible for water infrastructure, roads, urban development, agricultural policy and tourism. Integration of protected areas into wider landscape planning is frequently recommended. For example, in Europe the need to overcome problems of fragmentation and isolation of protected areas is vital for biodiversity conservation and is made more urgent by climate change (Gaston *et al.* 2008)

Protected area establishment and design are relatively effective, so the basics of protected area systems are in place in most places. Gazettal of protected areas, resolution of tenure issues, boundary marking, and sound design of protected areas have generally scored among the strongest management factors. Reports and data indicate that there are some areas where these vital factors still need attention, but in most cases these first steps towards effective management have been achieved to an acceptable level.

A greater effort should be to be put into communication, community involvement and programs of community benefit. In all regions, these factors scored poorly but were strongly correlated with both overall effectiveness and good management outcomes. The data analysed here shows that positive impacts on communities are most strongly linked with specific communication, participation and community benefit programs (rather than with good funding, staffing or overall management processes). This finding, combined with the lack of awareness of protected areas reported in many assessments, argues for a specific effort to boost community relations. Many reports mention that staff capacity for this role is lacking.

Working with local communities to ensure that protected areas benefit those most in need, and then measuring and clearly communicating the benefits, are recommendations of evaluation reports across all parts of the world.

Above: Local community members at Wasur National Park, West Papua. Photo: Huw Davie

A related recommendation is the need for better understanding and presentation of the benefits of protected areas.

A boost to the specific program area of 'values conservation' through resource management, research and monitoring is also justified. Positive outcomes for protected area values conservation – primarily biodiversity conservation – are strongly correlated with specific resource management activities, monitoring and research and threat monitoring. It appears that if we wish to conserve the values of protected areas, a focus is needed on specific activities to manage and monitor the values: general improvement to overall management is not sufficient.

Visitor management stands out as an area of management which needs to be improved, given its poor rating in most regions, the strong links with overall effectiveness and the prevalence of uncontrolled visitation and tourism being nominated as a serious threat. Needs expressed in the evaluations include better communication with visitors, more appropriate infrastructure, facilities and waste disposal in some cases, and control of impacts which occur through unregulated use.

Managers need to build better pro-active management capacity. Management planning, monitoring and research and management effectiveness evaluation scored as comparatively weak, but all are strongly linked with good overall effectiveness. A key factor mentioned

repeatedly is the need to improve the *application and use* of planning, evaluation and management tools to deliver good and consistent management on the ground. In reports and workshops, many protected area staff stress the need for management plans which are meaningful and useful in a rapidly changing world.

5.3 Conclusions and recommendations about evaluating management effectiveness

The Global Study has given us the opportunity to analyse and learn from numerous studies of management effectiveness across the world, and to talk to many people who have learned from experiences in the field. Some of the findings have been incorporated into the IUCN-WCPA Guidelines on management effectiveness (Hockings *et al.* 2006), and others are presented below in Section 5.4, and in the Checklist in Appendix Three.

It has been emphasized that management effectiveness evaluation can be conducted for a range of different purposes. At the scale of this study, the contribution to on-ground adaptive management of protected areas is limited, but it is hoped that the recommendations in the previous section will be helpful. The definition of some key management factors might also be of interest to managers, and provides some basis for thought about the most critical issues to address at regional scales.

For the purposes of prioritisation and reporting across many protected areas, there are occasions where a very simple assessment tool with only a few indicators might be appropriate. This study has shown that a group of ten 'headline indicators' correlates very strongly with an overall average obtained from many more factors, but does not correlate so well with management outcomes. Therefore a minimum set of questions would need to relate to the 'top ten' headline indicators plus at least two outcome indicators, to separately address the conservation of values and the effect on the community. This small set of questions is not, however, recommended for general evaluation purposes, as it would not enable managers to understand enough about the protected area management to undertake necessary improvements and would not provide a learning experience for staff.

This study has shown that the range of methodologies in use often paint a remarkably similar picture of management strengths and weaknesses. Most importantly, the assessment process provides the opportunity for managers and partners to learn from each other and to raise the standard of their protected area management. This is a particularly successful technique when it is coupled with a concerted effort to apply the findings of the evaluation and to strengthen management to acceptable levels.

General guidelines for conducting management effectiveness are included in a number of reports (Ervin 2007; Hockings *et al.* 2006). A recent study of the state of PAME in Europe (Nolte *et al.* 2010) compiled recommendations for further progress in that region that also have application across the world. In summary, we recommend the following:

Start evaluating, recognising that evaluation is a vital component of governance. Obstacles to evaluation are diverse and are often associated with lack of political will. Emphasis needs to be on continual improvement rather than on judgment, and evaluations need to ensure that benefits accrue to all the participants.

Institutionalise to ensure that the results are used to improve management. Implementation of necessary changes often rests on the capacity of the evaluating organisations to influence funding and policy. Management at all levels and funding organisations need regular information which is relevant to their needs, their particular governance systems, and to the questions they need answered. A particular recommendation is that information systems must be built to make data available to mangers in an easily accessible form linked to their decision-making systems.

Keep it cost-effective, in balance with other aspects of management. Keeping PAME studies small and simple in early assessment cycles may be a good guiding principle. Potential for cost-saving through cooperation between agencies and reporting systems should be explored.

Make it transparent to the greatest possible extent so that data can be shared and collated and learning better applied.

Improve data quality – diversifying information sources and involving external experts in interpreting results can make assessments more useful and more credible. Questionnaires should be properly designed and trailed. While quantitative data is often regarded as more credible than qualitative information this is not always the case. The type of data collected should be matched to the issue being examined and the capacity of the agency or organisation to collect data in a rigorous manner (Hockings *et al.* 2009). Qualitative data collected using appropriate processes can be as reliable as quantitative data – it is most important that the data used is matched to the issue being examined. Targeted monitoring of the status of key values and threats should be undertaken and reported on, to provide more credible outcome assessments.

Move beyond site-level assessments – much important information is relevant to system-level assessments and these are becoming more frequent. The combination of site and system level assessments can provide a solid basis for improvement of an entire protected area network in a country.

See it as a learning process – though consistency is useful for comparisons over time, adaptation and revision of methodologies are valuable steps in a learning process. Where indicators are changed or added, efforts to maintain comparability should be made. Learning and discussions should be encouraged among people developing and practicing PAME.

5.4 Principles for methodologies in PAME

As well as experiences from the Global Study, we have drawn on some of the extensive literature on evaluation which has developed, especially over the last ten years, with excellent publications and websites to assist in designing and conducting evaluations. The work by Patton (1997), for example, introduces the concept and practices of 'utilisation-focused evaluation' which is particularly appropriate to protected area managers. In various areas of evaluation, primarily those connected with international development agencies, guidelines and sets of principles have been defined by groups of practitioners to encourage evaluations which are both effective and ethical (Conservation Measures Partnership 2004; DAC Evaluation Network 2006; Kusek and Rist 2004).

In the protected area context, a number of writers have listed characteristics of 'good' management effectiveness evaluations. Basic principles were defined by Courrau (1999) and recommended in the PROARCA manual (Corrales 2004b). A set of guiding principles were derived from a meeting in Melbourne in 2003, where a number of international practitioners shared the 'lessons learned': these were incorporated into a book on global change (Leverington and Hockings 2004) and the revised version of the IUCN-WCPA Guidelines on management effectiveness (Hockings *et al.* 2006). An excellent synthesis of guidelines was also presented in the report on strengthening PAME in the Andes region (Cracco *et al.* 2006).

The background into the methodology applied in Belize (Young *et al.* 2005) also provides a good summary, while the 'How is Your Marine Protected Area Doing' guidebook (Pomeroy *et al.* 2004) simply writes that evaluation should be

- Useful to managers and stakeholders;
- Practical in use and cost;
- Balanced to seek and include both scientific input and stakeholder participation;
- Flexible for use in different sites and in varying conditions; and
- Holistic through a focus on both natural and human perspectives'.

Even the best methodology will be ineffective or have negative impacts if it is applied in a punitive manner, if there is no follow-through to result in improved management, or if the process of evaluation causes serious friction and loss of trust between the parties. Where evaluations show negative trends, sensitive handling of the situation is essential. Evaluation teams should discuss in advance how to deal with cases where assessments uncover real incompetence, or in the worst scenario, deliberate misuse of power or resources.

Before an evaluation is begun, a methodology needs to be selected and adapted as necessary, and then implementation planned carefully. Adaptation and implementation planning are vital stages in the use of any methodology.

It should be kept in mind that while these are general principles, some characteristic of a 'good' evaluation will be determined by its purpose, scope and level. For example, while participation and transparency are good in principle, in some cases a less inclusive and open approach is necessary. Many of the principles described apply to more in-depth assessments (levels 2 and 3), and will be difficult to achieve in rapid, simple (level 1) exercises.

In summary, methodologies for evaluating management effectiveness of protected areas should be:

- *Useful and relevant in improving protected area management*; yielding explanations and showing patterns; and in improving communication, relationships and awareness;
- *Logical and systematic*: working in a logical and accepted framework with balanced approach;
- *Based on good indicators*, which are holistic, balanced, and useful;
- *Accurate*: providing true, objective, consistent and up-to-date information;
- *Practical to implement* within available resources, giving a good balance between measuring, reporting and managing;
- *Part of an effective management cycle*: linked to defined values, objectives and policies and part of strategic planning, park planning and business and financial cycles;
- *Cooperative*: with good communication, teamwork and participation of protected area managers and stakeholders throughout all stages of the project wherever possible; and
- *Focussed on positive and timely communication and application of results*.

Above: Discussions contributing to development of PAME methodology for Brazil

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Note: Some of the findings of this report have also been published in Leverington et al.(2010b) and Butchart et al. (2010).

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WWF India (2006) Report of the Rapid Assessment and Prioritisation of Protected Area Management for the PAs of the state of Kerala. Forest Conservation Programme, WWF-India.

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Appendix One: List of methodologies reviewed in the Global Study

Table 19: List of PAME methodologies in the Global Studies database

Abbreviation[6]	Methodology name	Organisation/ Affiliation and/or reference
International		
RAPPAM	Rapid Assessment and Prioritisation of Protected Area Management	WWF (Ervin 2003b)
Tracking Tool	Management Effectiveness Tracking Tool	World Bank/WWF Alliance (Stolton *et al.* 2007)
EOH	Enhancing our Heritage	UNESCO (Hockings *et al.* 2007)
How is Your MPA Doing?	How is Your MPA Doing?	NOAA/National Ocean Service/IUCNWCPA Marine, WWF (Pomeroy *et al.* 2004)
TNC CAP	Conservation Action Planning	TNC (The Nature Conservancy 2007)
Marine Tracking Tool	WWF-World Bank MPA score card	WWF-World Bank (Staub and Hatziolos 2004)
CI METT	Conservation International Management Effectiveness Tracking Tool	Conservation International
Birdlife IBA	Important Bird Area Monitoring	(www.birdlife.org)
GOBI	Governance of Biodiversity Survey Greifswald	University of Greifswald (e.g. Schliep *et al.* 2008)
Stockholm BR Survey	Stockholm Biosphere Reserves Survey	Stockholm University (Schultz *et al.* in review)
Africa		
Africa rainforest study	Africa rainforest study	Academic/ WCS (Struhsaker *et al.* 2005)
West Indian Ocean MPA	West Indian Ocean MPA toolkit	West Indian Ocean Marine Science Association (Wells and Mangubhai 2004)
Central African Republic	Central African Republic	academic/WWF (Blom *et al.* 2004)
Congo MEE	Assessing protected area management effectiveness in the Congo Basin	(Stolton *et al.* 2001)
Uganda threat assessment	Threat reduction assessment in Uganda	(Mugisha and Jacobson 2004)
Egyptian Site Level Assessment	Site level assessment of World Heritage Areas	(Paleczny *et al.* 2007)
Asia		
Korea METT	Korean tracking tool	Korea Parks service (Young 2005)
Korea MEE	Korea survey on protected area management status	(Korean National Parks Service and IUCN 2009)
MEE Indian	Evaluation of Management effectiveness of Indian Protected Areas	Ministry of Environment and Forests (MoEF) Government of India and the Wildlife Institute of India
Indian Tiger Reserves Assessment	Management Effectiveness Evaluation of Indian Tiger Reserves	(Project Tiger Directorate Ministry of Environment & Forests 2006)
Alder	Marine Protected Area Evaluation	Academic (Alder *et al.* 2002)
Europe		
European Diploma	European Diploma of Protected Areas	Council of Eurooe (Council of Europe 2009)
PAN Parks	Protected Area Network Parks	PAN Parks Foundation (PAN Parks 2008)
EUROPARC Transb.	EUROPARC Transboundary Parks Certification	EUROPARC Federation *(www.europarc.org/what-we-do/transboundary-parks)*

[6] These abbreviations are for convenience and are used in following graphs and tables: they are not always formally used in the method itself.

Abbreviation[6]	Methodology name	Organisation/ Affiliation and/or reference
EUROPARC ECST	EUROPARC European Charter for Sustainable Tourism	EUROPARC Federation *(www.european-charter.org)*
CPAMETT	Carpathian Management Tracking Tool	WWF Danube Carpathian Program *(cpamemt.ueuo.com)*
European SCS	European Site Consolidation Scorecard	Academic (Pfleger 2007a)
Finland MEE	Management Effectiveness Study – Finland	Metsahallitus (Gilligan *et al.* 2005)
Lithuania	Management effectiveness of Lithuanian protected areas	Lithuanian government (Ahokumpu *et al.* no date)
State of the Park Assessment Finland	SOP Finland	Metsahallitus (Heinonen 2007)
French RNP	Evaluation of French Regional Nature Parks	(FPNR 2001)
French NP (CdO)	Contrat d'Objectifs (French National Parks	*(pers. comm.)*
German Nature Parks	Nature Park Quality Campaign, Germany	Association of German Nature Parks (Verband Deutscher Naturparke - VDN) (Köster *et al.* 2006)
German National Parks	Quality Criteria and Standards of German National Parks	EUROPARC Federation (EUROPARC Germany 2008)
German BRs (EABR	Evaluation of German BRs	German MAB Committee (German MAB Committee 2007)
German BRs (Schrader)	Evaluation of German BRs)	Academic (Schrader 2006)
NPAPA England	National Park Authority Performance Assessment, England	National Park Authorities (NPAs) supported by the Department for Environment, Food and Rural Affairs (DEFRA) (e.g. Butterworth 2008)
LNR Scotland	Evaluation of Local Nature Reserves, Scotland	Scottish Natural Heritage (Land Use Consultants 2006)
NNR MEE Scotland	Performance and management effectiveness of national nature reserves, Scotland	Scottish Natural Heritage (Stolton *et al.* 2009)
NNR Wales	Countryside management system (National Nature Reserves, Wales)	Countryside Council for Wales (pers. comm.)
Italian Quality Parks	Quality Park Project Italy	ENEA, Italian National Agency for New Technologies, Energy and the Environment (Naviglio and Talamo 2009)
MEVAP Italy	Monitoring and Evaluation of Protected Areas, Italy	C.U.E.I.M., University Consortium for Industrial and Managerial Economics on behalf of the Italian Ministry of the Environment and Territory (Soffietti 2008)
Natuurmonumenten Test	Natuurmonumenten Quality Test	Vereniging Natuurmonumenten (Natuurmonumenten 2007)
Situation of National Park Network	Spanish National Parks	(OAPN 2007)
Catalonia MEE	Evaluation of the system of protected areas of Catalonia, Spain	Institució Catalana d'Història Natural (Mallarach and Varga 2004)
Tenerife MEE	Management Effectiveness Evaluation Tenerife	The Island Government of Tererife, Canary Islands(García 2008)
EUROPARC Spain Database	EUROPARC Spain DB	(EUROPARC España 2008)
INDES-PAR (Asturias)	INDES-PAR Asturias	University of Oviedo (Northern Spain)(INDUROT 2009)
Evaluation of Swedish County Administrative Boards	MEE Swedish Counties	Naturvårdsverket (Swedish Environmental Protection Agency) (Naturvårdsverket 2005)
SkötselDOS (Protection GIS System)	SkötselDOS	Swedish Environmental Protection Agency (SEPA) (pers. comm.)

Abbreviation[6]	Methodology name	Organisation/ Affiliation and/or reference
Latin America and the Caribbean		
PIP Site consolidation	TNC Parks in Peril Site Consolidation Scorecard	TNC/USAID (The Nature Conservancy Parks in Peril Program 2004)
PROARCA/CAPAS	PROARCA/CAPAS scorecard evaluation	PROARCA/CAPAS (Corrales 2004b)
Parks profiles	Parks profiles	Parkswatch (ParksWatch 2007)
WWF/CATIE	WWF/CATIE Measuring protected area management effectiveness	WWF/CATIE (Cifuentes *et al.* 2000)
Mesoamerica MPA	Rapid Evaluation of Management Effectiveness in Marine Protected Areas of Mesoamerica.	MBRS/PROARCA/CAPAS (Corrales 2004a)
Brazil 1999	Degree of Implementation and the Vulnerability of Brazilian Federal Conservation Areas	WWF Brazil with IBAMA (Lemos de Sá *et al.* 1999)
AEMAPPS	AEMAPPS: MEE with Social Participation - Colombia	Parques Nacionales Naturales de Colombia/WWF Colombia
Ecuador MEE	Ecuador MEE: Indicadores para el Monitoreo y Evaluación del Manejo de las Áreas Naturales Protegidas del Ecuador	Ministry of Environment (Valarezo *et al.* 1999)
Galápagos MEE	Manual para la evaluación de la Eficiencia de Manejo del Parque Nacional Galápagos. SPNG	SPNG (Velásquez *et al.* 2004)
MARIPA-G	Monitoring and Assessment with Relevant Indicators of Protected Areas of the Guianas (MARIPA-G)	WWF Guianas (Courrau 2005)
Belize MEE	Belize National Report on Management Effectiveness	Forest Department Belize (Young *et al.* 2005)
MEMS	Metodología de Evaluación de Efectividad de Manejo (MEMS) del SNAP de Bolivia	SERNAP (Guachalla and Zegada 2001)
Padovan 2002	Padovan 2002	IPEMA (Padovan 2002)
Scenery matrix	Scenery matrix	Forestry institute (IF-SP) (de Faria 2004)
PA Consolidation index	PA Consolidation index	Conservation International
Valdiviana	Valdiviana Ecoregion Argentina	WWF (Rusch 2002)
Venezuela Vision	Venezuela Vision	DGSPN – INPARQUES (Rivero Blanco 2005)
Peru MEE	Peru MEE	INRENA (INRENA)
SIMEC	Sistema de Información, monitoreo y evaluación para la conservación	Mexico
Oceania		
Tasmanian WHA	Tasmanian World Heritage MEE	Tasmanian PWS (Parks and Wildlife Service Tasmania 2004)
NSW SOP	New South Wales State of Parks (Australia)	NSW DEC (NSW Department of Environment and Conservation 2005)
Victorian SOP	Victorian State of Parks (Australia)	Parks Victoria
Qld Rapid Assessment	Queensland Rapid Assessment (Australia)	Queensland Parks and Wildlife Service
Fraser Island WHA	Fraser Island World Heritage Area (Australia)	Hockings
Qld Park Integrity	Queensland Park Integrity assessment(Australia)	Queensland Parks and Wildlife Service
North America		
USA SOP	USA State of Parks	NPCA (National Parks Conservation Association State of the Parks Program no date)
Parks Canada	Monitoring and reporting ecological integrity in Canada's parks.	(Parks Canada Agency 2005)

Appendix Two: Summary of regional patterns

Africa

Management effectiveness assessments in Africa have included a number of innovative projects aimed at improving management, and have resulted in some informative studies published in recent years. In addition there have been many Tracking Tool assessments, some associated with World Bank, WWF and/or GEF funded projects and others as country initiatives. Several in-depth studies of World Heritage Areas have also been conducted, and an assessment of marine areas is also available. Studies recorded in the Global Study include the following (note that most Tracking Tool assessments do not include an overall report – raw data has been used):

- Extensive and comprehensive studies conducted by IUCN West Africa Protected Area Program (PAPACO) using RAPPAM, EOH and the Tracking Tool. Reports are available on some individual protected areas and on the West African countries of Cote d'Ivoire (UICN/BRAO 2008) Togo (UICN/PACO 2008e), Chad (UICN/PACO 2008f), Mauritania (UICN/PACO 2008d), Mali (UICN/PACO 2008c) Guinea (UICN/PACO 2008a) , Guinea-Bissau (UICN/PACO 2008b), as well as regional evaluations of RAMSAR sites (UICN/PACO 2009)and World Heritage Sites. A draft report has also been prepared following a RAPPAM study in Morocco (Haut Commissariat aux Eaux et Forêts et à la Lutte contre la Désertification (HCEFLCD) 2008).
- Older RAPPAM studies have been conducted in South Africa (Goodman 2003), Malawi (WWF 2006) Cameroon (MINEF Department of Wildlife and Protected Areas and WWF Cameroon Programme Office 2002), Ghana (Republic of Ghana Ministry of Lands Forestry and Mines (Wildlife Division of The Forestry Commission) 2001), Mozambique (Republic of Mozambique 2006)
- African rainforest study (Struhsaker *et al.* 2005)
- Central African Republic (Blom *et al.* 2004)
- Paper on the threat reduction assessment methodology in Uganda (Mugisha and Jacobson 2004)
- Tracking Tool applications in Namibia and Zambia (Smith 2004a; Smith 2004b; Smith 2004c)
- In Egypt, a RAPPM system-wide study (Fouda *et al.* 2006) was complemented by site-level assessments (Paleczny 2007)and in-depth evaluations of World Heritage Areas (Paleczny *et al.* 2007)
- Assessment of management effectiveness in selected marine PA in the Western Indian Ocean (IUCN *et al.* 2004; Wells 2006).
- The forests of the Congo Basin – a preliminary assessment (Congo Basin Forest Partnership 2005).

A total of just over 960 assessments (846 'most recent') from Africa have been recorded on the Global Studies database, as shown in

Figure **16**. Of these, data was analysed for 644 most recent assessments. The overall mean is 0.49, as shown in Figure 17. This is below the world mean and is lower than any other region. This may be partly explained by the inclusion of a large dataset of Tracking Tools from new protected areas which have not yet established management structures and practices. Some 22% of the assessments scored in the bottom third of the scale (clearly unacceptable), while only 17% scored in the top third (sound management).

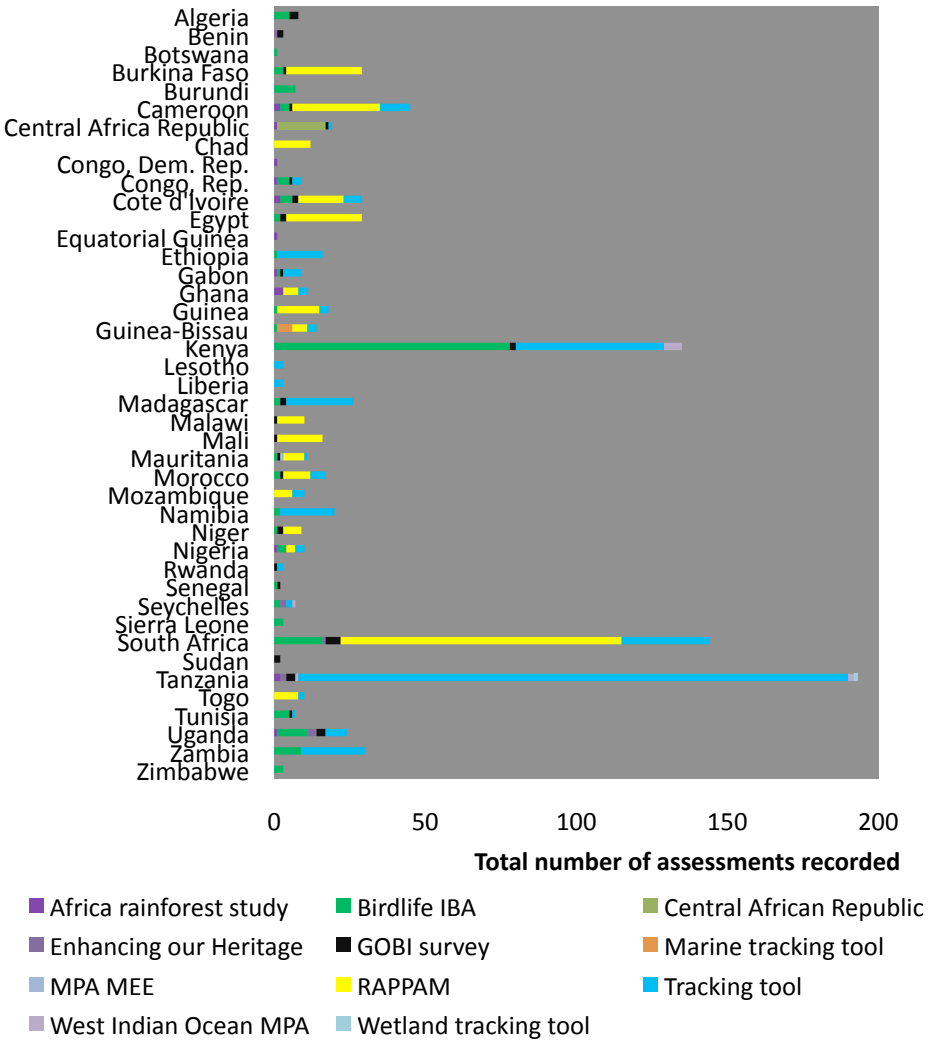

Figure 16: PAME assessments by country in Africa (UN region) recorded on the Global Studies database.

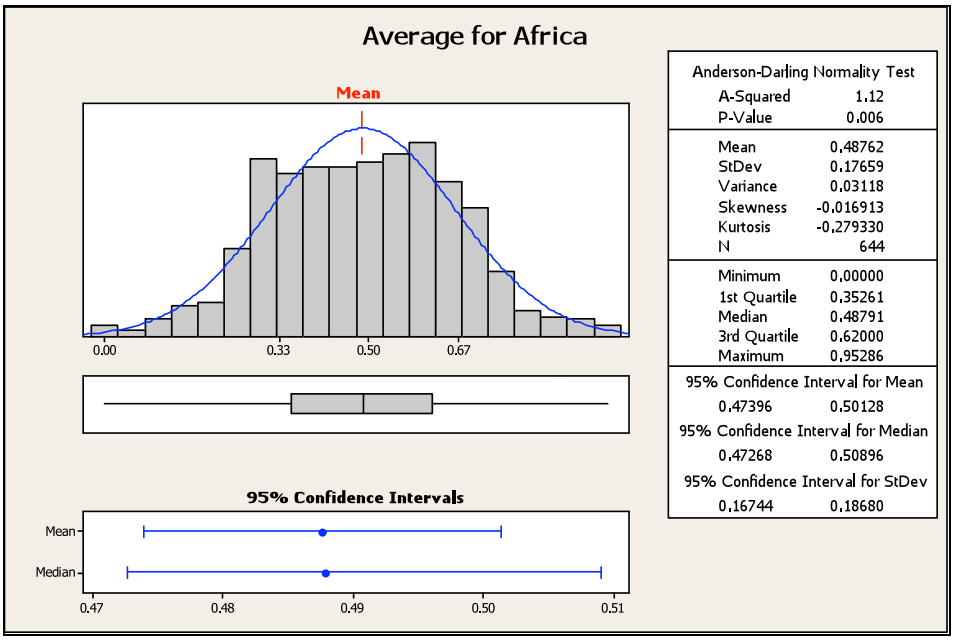

Figure 17: Overall average scores for African assessments

Asia

In the Asian region, most countries which have undertaken PAME assessments have used either the Tracking Tool or RAPPAM, and in many cases both, usually with the involvement of NGO organizations, particularly WWF, or the World Bank/GEF. The exceptions include studies in India and Korea. Studies in Asian countries are summarized in Figure 18.

Management effectiveness assessments in the Asian region used in this study include:

- Rappam studies in India (Department of Forests and Wildlife Sikkim and WWF India 2003; WWF India 2006) , Cambodia (Lacerda *et al.* 2004), Nepal (Nepali 2006), Bhutan (Tshering 2003) , Laos (Anonymous no date), Malaysia (Ministry of Natural Resources and the Environment 2006), Indonesia (Anonymous 2004) , Georgia (no report published), Turkey (Steindlegger and Kalem 2005), Vietnam and Mongolia (Nemekhjargal and Belokurov 2005) and the Yangzte Ecoregion of China (Diqiang *et al.* 2003) .
- Studies of tiger reserves in India (Project Tiger Directorate Ministry of Environment & Forests 2006)
- Application of a modified Tracking Tool in nature reserves in China (Department of Nature Conservation - State Forestry Administration and Research Center for Eco-environmental Sciences - the Chinese Academy of Sciences 2006)
- Enhancing our Heritage studies in Nepal and India (Wildlife Institute of India 2007a; Wildlife Institute of India 2007b; Wildlife Institute of India 2007c)
- A system-wide evaluation of protected areas in Korea (Korean National Parks Service and IUCN 2009)
- Indian program of rolling national, state and site level management effectiveness assessments (V. Mathur, pers. comm.; no report published)

Above: Village children listen in while conservation programs are evaluated. Kerinci National Park, Indonesia`

The overall mean score for Asia is consistent with the world average at 0.53 (see Figure 19). It is possible that culturally, the process of self-assessment in this region may lead to slightly higher scores, but many of the protected areas evaluated in this region are well-established and have very high remaining values in spite of severe threats to their integrity.

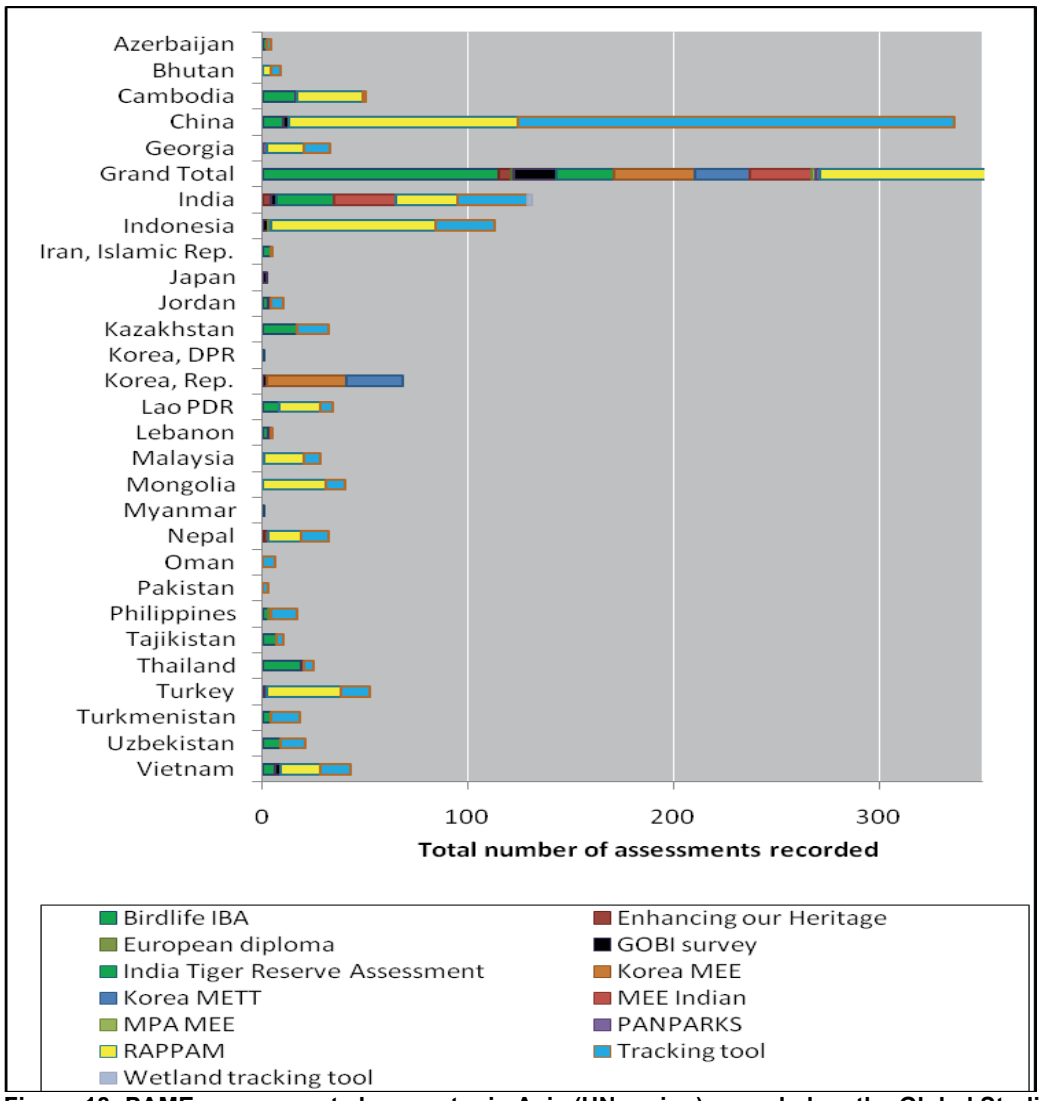

Figure 18: PAME assessments by country in Asia (UN region) recorded on the Global Studies database (note data has been analysed for only some of these)

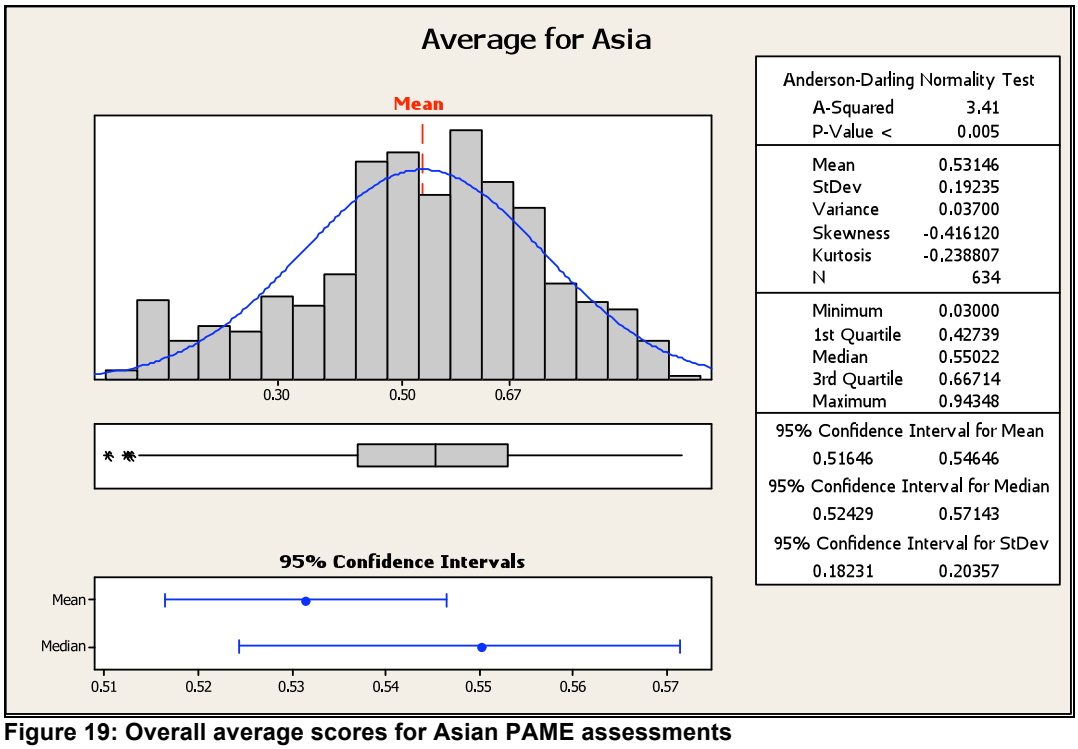

Figure 19: Overall average scores for Asian PAME assessments

Europe

The first edition of this report in 2007 included very little data on management effectiveness in Europe. A specific study on European management effectiveness was conducted to address this issue and the fact that protected area governance on the European continent has characteristic features which justified a separate analysis of methodologies, threats and success factors.

The European survey was conducted in conjunction with the Global Study and was led by the University of Greifswald (Germany) and the University of Queensland with support from UNEP-WCMC, EUROPARC Federation and the German Agency for the Conservation of Nature (BfN). The report (Nolte *et al.* 2010) is available from the BfN website. Note that the countries included in the European study include all those in the UN European region but also several which are included in Asia in this report (Turkey, Azerbijan, Georgia and Armenia).

> The European Study found that the overwhelming majority of countries in Europe have assessed at least some of their protected areas within the last decade: about one third can be expected to achieve the CBD PoWPA target for management effectiveness by area (assessing PAME of 30% of terrestrial sites by 2010). Our database recorded a total of 1786 single-site assessments, of which 240 are repeat assessments. In addition, a number of countries had conducted system-level assessments or evaluated habitat types. We recorded very few assessments for marine protected areas. Only a handful of countries have institutionalized management effectiveness evaluation by scheduling regular re-assessments, and making sure results are firmly integrated into governance and management processes.
>
> Forty different assessment methodologies have been applied in Europe; 31 of which are not used elsewhere. Evaluations have been led by a variety of entities: overseeing agencies, NGOs/policy advisors, protected area management bodies, certifiers, donors or research teams. The purpose of evaluation and the way results feed back into management are closely related to the type of leading agency. Intensity and frequency of assessments vary widely, as do the type of generated data and access to it.
>
> Most frequently used indicators in Europe are those looking at management plans, park gazettal and tenure security, involvement of communities and stakeholders, communication programs and adequacy of funding and staffing. In comparison with international methodologies, European evaluators tend to look more closely at the ecological significance of sites, visitor management issues and specific activities in the field of resource use and management; comparatively less attention is paid to the general capacity of individual sites to cope with threats (adequacy of enforcement, human resource policies, training and infrastructure).
>
> (Nolte *et al.* 2010), p. ii adjusted for regional differences

Studies in Europe have included significant assessments of protected area systems and protected areas in Catalonia, Spain (Mallarach 2006; Mallarach and Varga 2004); across Finland, combining RAPPAM and a new system assessment tool (Gilligan *et al.* 2005; Heinonen 2006); and in Lithuania (Ahokumpu *et al.* no date).

In Central and Eastern European countries, national-level assessments are usually based on the RAPPAM methodology, often as a component of WWF's regional programmes (Dinaric Arc and Danube-Carpathian regions). RAPPAM reports have also been prepared for Russia (Tyrlyshkin *et al.* 2003), which was an early trial site and used a slightly different version of the tool, and more recently for many eastern European countries including the Czech Republic (Ervin 2004b), Bulgaria (WWF 2004), Slovakia (Ervin 2004a), Romania (Stanciu and Steindlegger 2006), Serbia (Piscevic and Orlovic-Lovren 2009), Albania (Diku *et al.* 2008), Croatia (Porej and Rajković 2009) , Montenegro (Stanišić 20009), Slovenia (Kus Veenvliet and A. Sovinc 2009) and Georgia (Ravovska and Belokurov 2008) .

Tracking Tools have been applied especially in Eastern Europe where they are linked to GEF and World Bank project funding.

Looking at individual **countries**, it is encouraging to note that most European nations have had some experiences in evaluating the management of their protected areas. Roughly half have implemented assessments at the national or, as in Spain and the UK, at the sub-national level. Several Northern and Western European countries have developed their own evaluation systems; these tend to be institutionalized in the sense that they require regular re-assessments and are often tailor-made for different types or categories of protected areas. Few of these assessments have produced publicly available reports.

- Reports for nature reserve systems in Scotland (Land Use Consultants 2006) and national parks in England (English National Park Authorities Association 2009; Lloyd *et al.* 2005; Solace Enterprises 2006) and other individual park reports.
- System and site-level studies were conducted by NGOs in Greece (ARCHELON *et al.* 2005).
- A summary report has been produced from a detailed assessment of five marine protected areas in Italy (Franzosini 2009) and a report looking at marine protected area effectiveness in the UK (Gubbay 2005) is also available.

Academic studies in Europe include a discussion about management effectiveness in marine protected areas in Greece (Togridou *et al.* 2006), England (Jackson and Gaston 2008) and more generally about Europe (Gambino *et al.* 2008; Gaston *et al.* 2008). A study of three protected areas in Austria and Germany using the modified Site Consolidation Scorecard methodology (Pfleger 2007b; Pfleger *et al.* 2009).

Europe also features several regional certification systems – the European Diploma for Protected Areas, PAN Parks, the European Charter for Sustainable Tourism and EUROPARC's Transboundary Parks Programme – which involve regular re-assessments of designated sites. Two global research surveys on biosphere reserve management (GoBi Survey and Stockholm Survey) add to the picture. Finally, an important dataset has been generated by Birdlife International in the course of its monitoring of Important Bird Areas (IBAs).

A study comparing methodologies for marine protected area assessment was carried out in the UK (Gubbay 2005). A trial adapting the Parks in Peril Site Consolidation Scorecard for use in Europe was conducted in two protected areas in Austria and Germany (Pfleger 2007c).

All 27 EU member states adhere to Natura 2000 legislation and have committed to maintain or achieve "favourable conservation status" for all habitats and species of Community interest. In order to track progress towards this target, Article 17 of the Habitats Directive stipulates that member states have to continually assess, monitor and report conservation status of critical habitats and species (European Council 1992). While at present not all Natura 2000 sites are recognised as protected areas, the evaluation of these sites overlaps with protected area assessments and it is hoped they will be better integrated in the future.

The number of known 'most recent' studies in the European region are shown in
Figure 20.

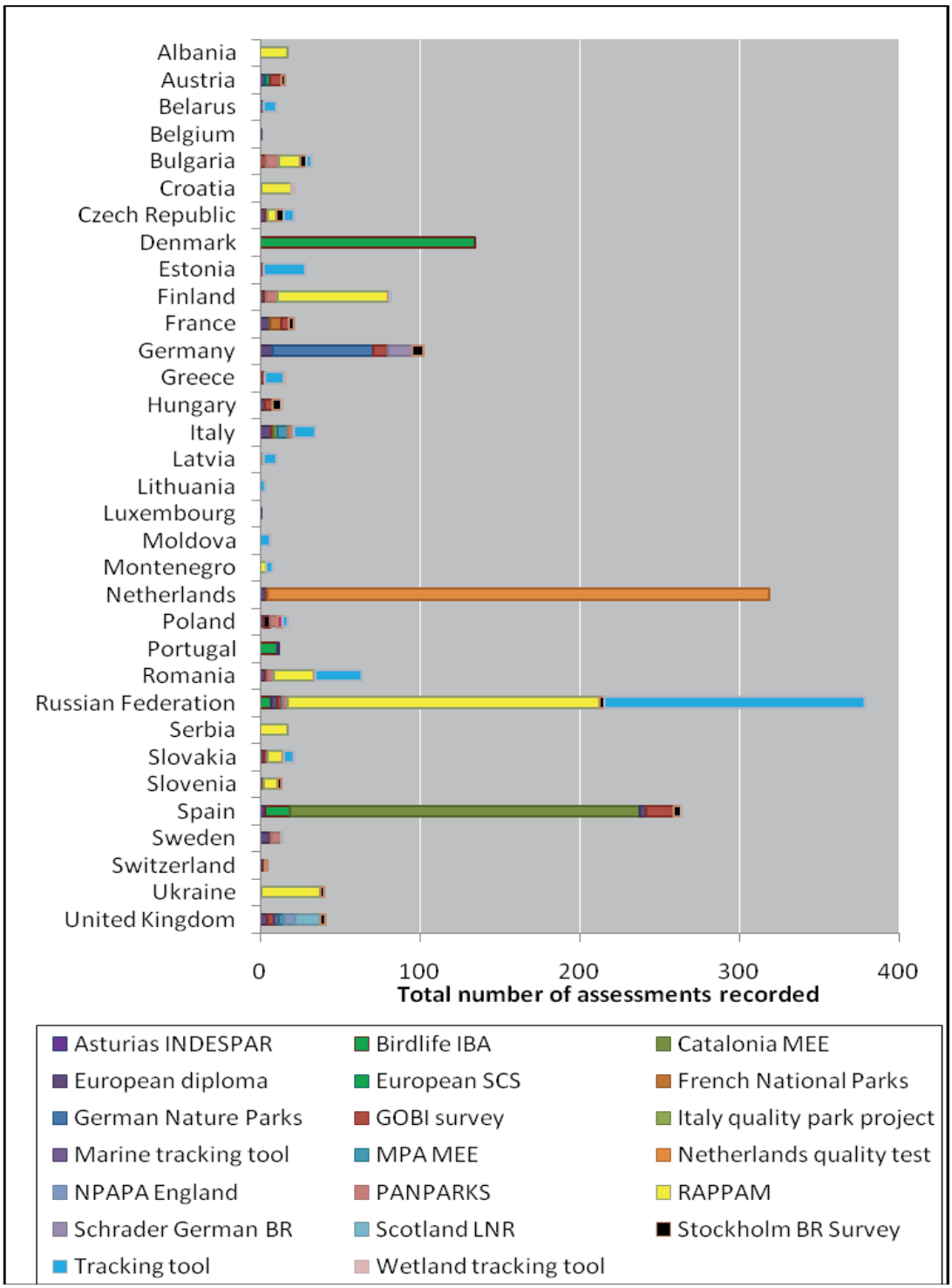

Figure 20: PAME assessments by country in Europe (UN region) recorded on the Global Studies database (note data has been analysed for only some of these)

The distribution of scores from the European data is shown in Figure 21. The mean average score for European assessments is well over the world average, at 0.57. Only 8% of the 794 protected areas assessed scored in the bottom third (clearly unacceptable), while 29% scored in the top third (sound management). An analysis of strengths and weaknesses of management and of the major issues can be found in the European Study report.

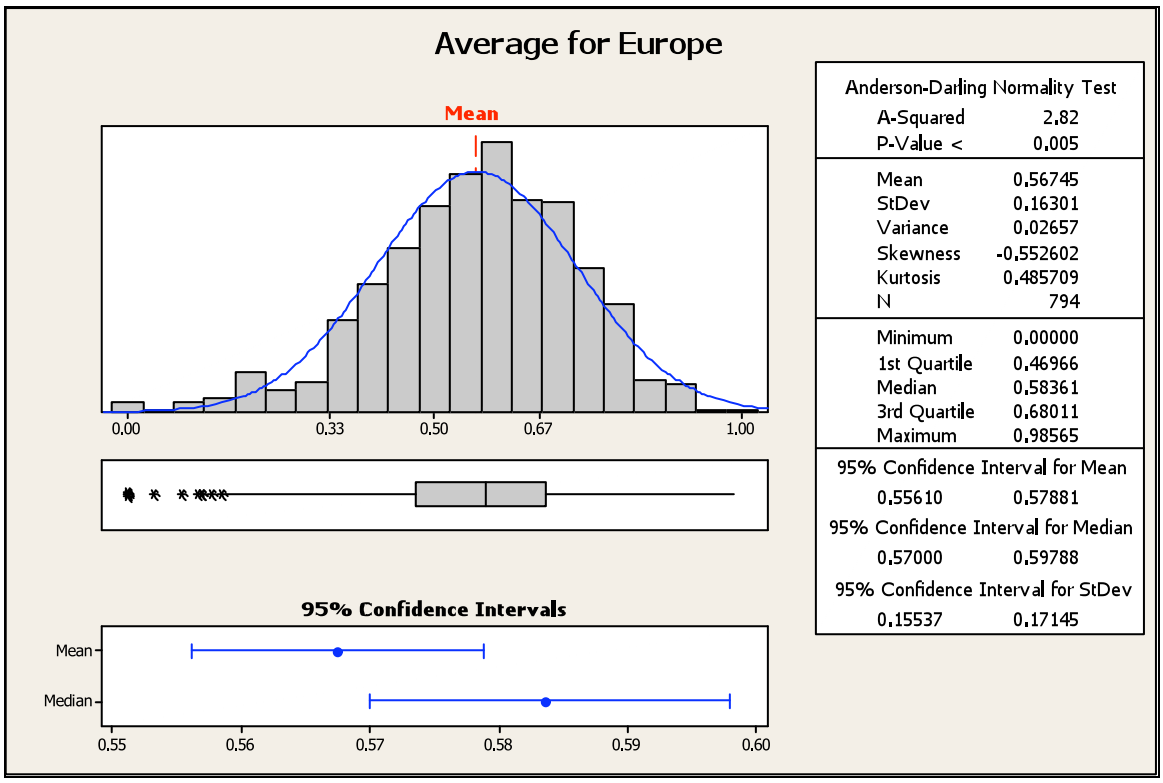

Figure 21: Overall average scores for European assessments

Above: Self-assessment in Berchtesgaden National Park using the Site Consolidation Scorecard Photo: B. Pfleger)

Latin America and the Caribbean

There has been extensive development and application of management effectiveness methodologies in LAC over the past 20 years with a wide range of methodologies developed, trialed and implemented in the region. For example, PROARCA has been adapted and implemented throughout Central America (Corrales *et al.* 2006). History of some of the countries and methodologies is discussed in Cracco *et al.* (2006).

More detailed study of management effectiveness in the region was produced in 2007 (Leverington *et al.* 2007a; Leverington *et al.* 2007b; Pavese *et al.* 2007).

Initiatives in the region are continuing, including further work currently being conducted in Brazil and a system-wide assessment in Colombia.

Reports relating to PAME in the region include:

- Reports from ParksWatch covering 87 protected areas (ParksWatch 2007);
- RAPPAM reports and/or data sheets from Brazil, Chile, Peru, Jamaica and Bolivia (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis and WWF-Brasil 2007; Ministry of Natural Resources and the Environment 2006; Olivas and Ruesta 2006; Simoes and Numa de Oliveria 2003; Tacón *et al.* 2005);
- PROARCA reports from Central American countries (Autoridad Nacional del Ambiente *et al.* 2006; CONAP 2006; Corrales *et al.* 2006; Estrada 2006; Ministerio De Medio Ambiente y Recursos Naturales El Salvador and Ministerio ye Medio Ambiente y Recursos Naturales El Salvador 2006);
- A number of reports from the 'Parks in Peril' project presenting the results of the site consolidation scorecard (Marco Robles *et al.* 2005; Martin and Rieger 2003; The Nature Conservancy no date): other reports are also available on the TNC website;
- The 'Venezuela Vision' report (FUDENA/INPARQUES 2001);
- Analysis of protected areas of the Valdiviana ecoregion, Argentina (Rusch 2002);
- A report on management effectiveness in Belize (Wildtracks 2006);
- Study of protected areas in Brazil in 1999 (Lemos de Sá *et al.* 1999) ;
- Reports on adaptation of the Tracking Tool in the Brazilian Amazon (Weigand Jr *et al.* 2007);
- Reports from the Enhancing our Heritage project (see http://www.enhancingheritage.net/docs_public.asp)
- Academic and cooperative studies trialling methodologies eg (de Faria 1998; de Faria 2004; Padovan 2004)

The known 'most recent' assessments in LAC are shown in Figure 22.

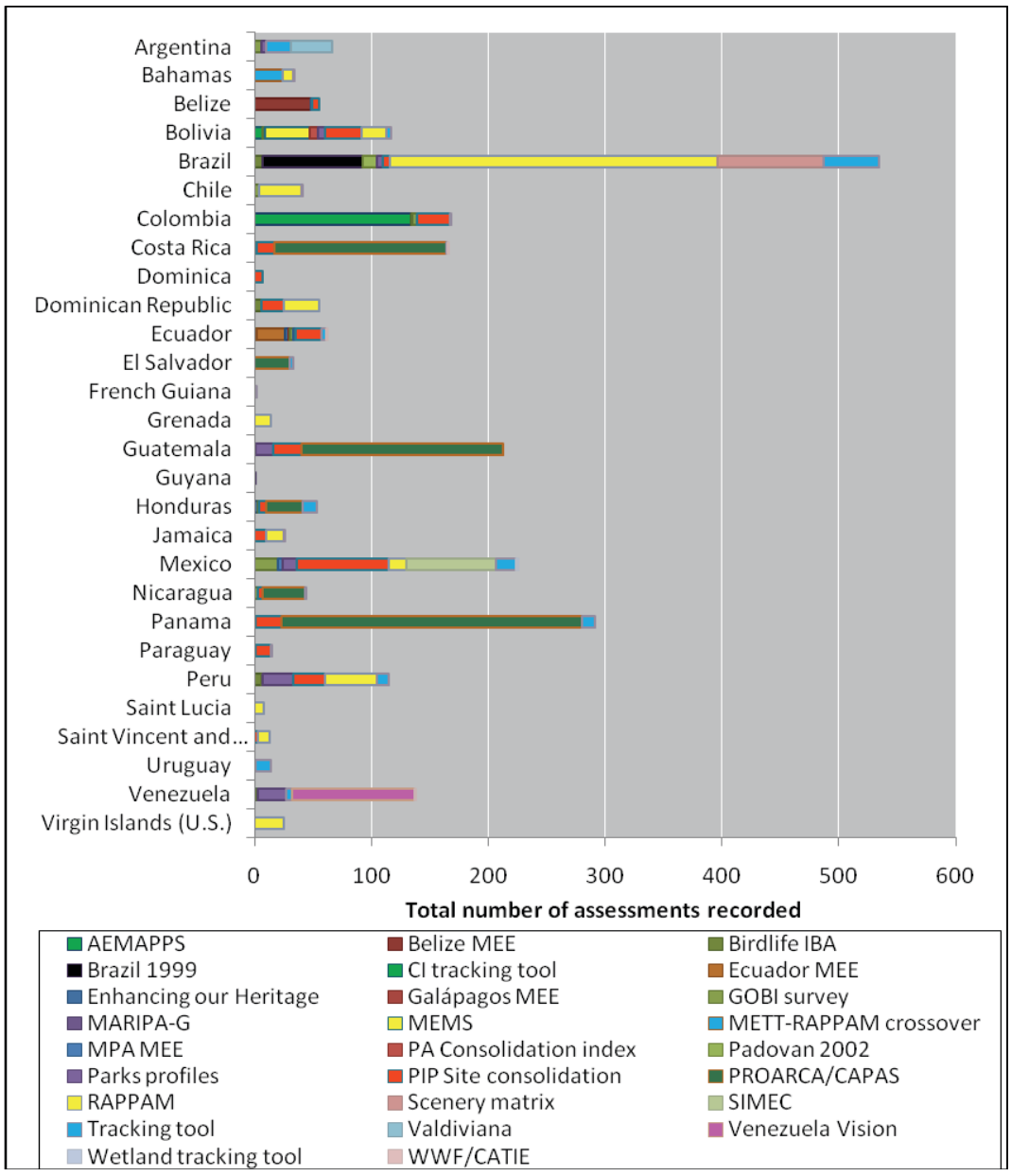

Figure 22: PAME assessments by country in LAC (UN region) recorded on the Global Studies database (note data has been analysed for only some of these)

The overall average score for the 853 most recent assessments analysed in the region is 0.51, which is slightly below the worldwide average (Figure 23). This region has more repeat studies that any other, and as discussed earlier, there has been dramatic improvement over time in those areas assessed more than once, especially where intensive management improvement programs have also been undertaken. In particular, many of the very low scores were lifted. There are still 13% of the 'most recent' assessments score in the bottom third (rated clearly unacceptable) while only 16% are in the 'sound' range.

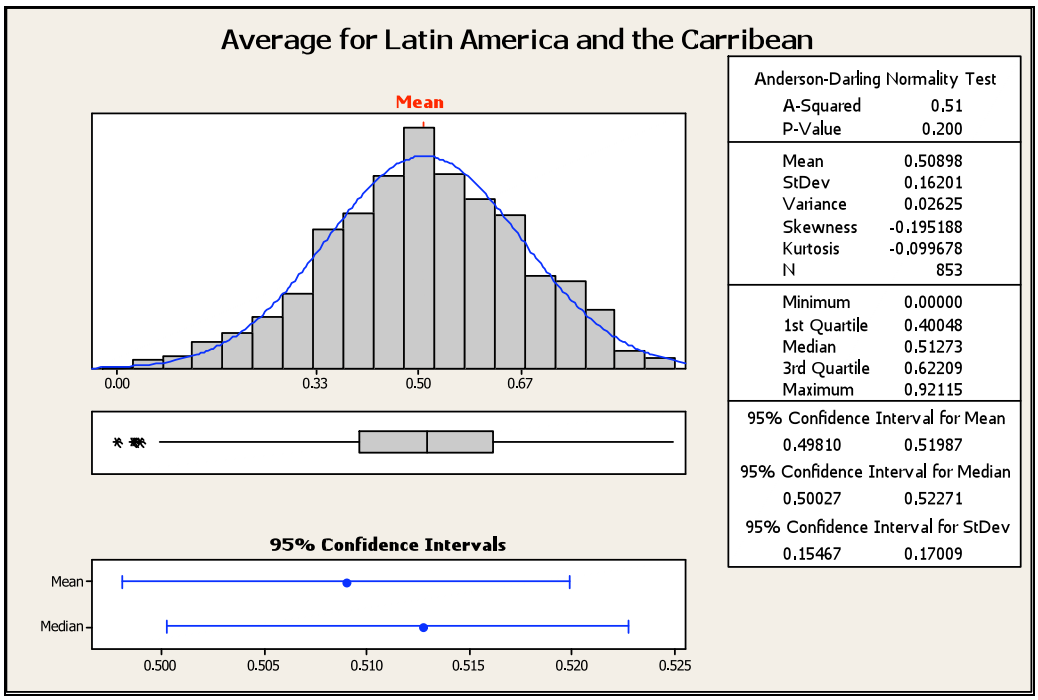

Figure 23: Overall average scores for LAC assessments

Above: Community discussion about protected area impacts, Ecuador

Oceania

Management effectiveness studies have so far been recorded and collected from only a few countries in the Oceania region, as shown in Figure 24. A RAPPAM study was conducted in Papua New Guinea (Duguman 2006), and a small number of Tracking Tool assessments have also been carried out in that country. A number of large-scale assessments have been undertaken in Australian parks services: State of Parks reporting in New South Wales (NSW Department of Environment and Conservation 2005) and unpublished work in Victoria and Queensland, with more planned or underway. An in-depth study of World Heritage areas has also been undertaken in Tasmania, Australia (Parks and Wildlife Service Tasmania 2004)

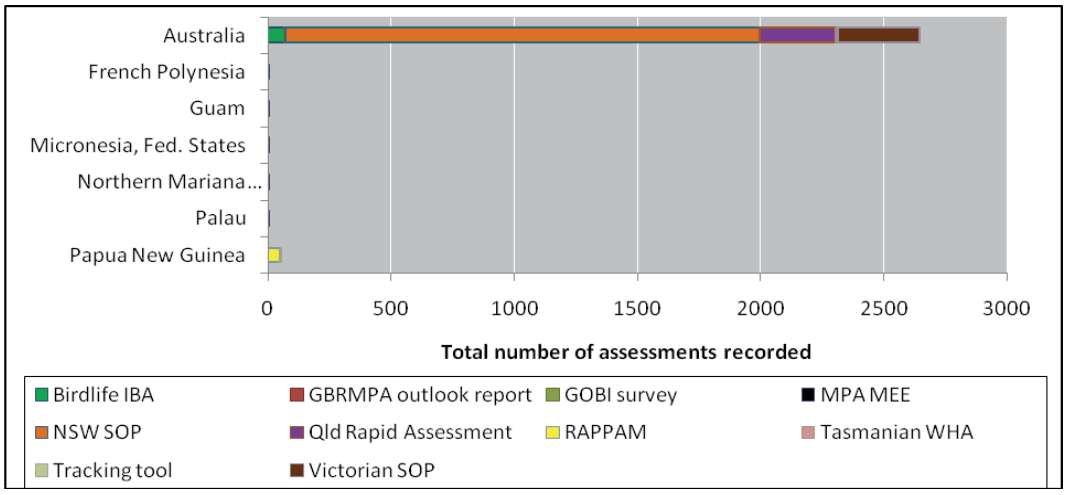

Figure 24: PAME assessments by country in Oceania (UN region) recorded on the Global Studies database (note data has been analysed for only some of these)

Data for analysis was available only from the RAPPAM study, a few Tracking Tools and results of assessments in three Australian states. The overall average score for Oceania is 0.56, above the world average. Though the Australian protected areas scored comparatively well, the overall effectiveness of that system was also constrained by factors including the large number of small protected areas where there is limited management presence.

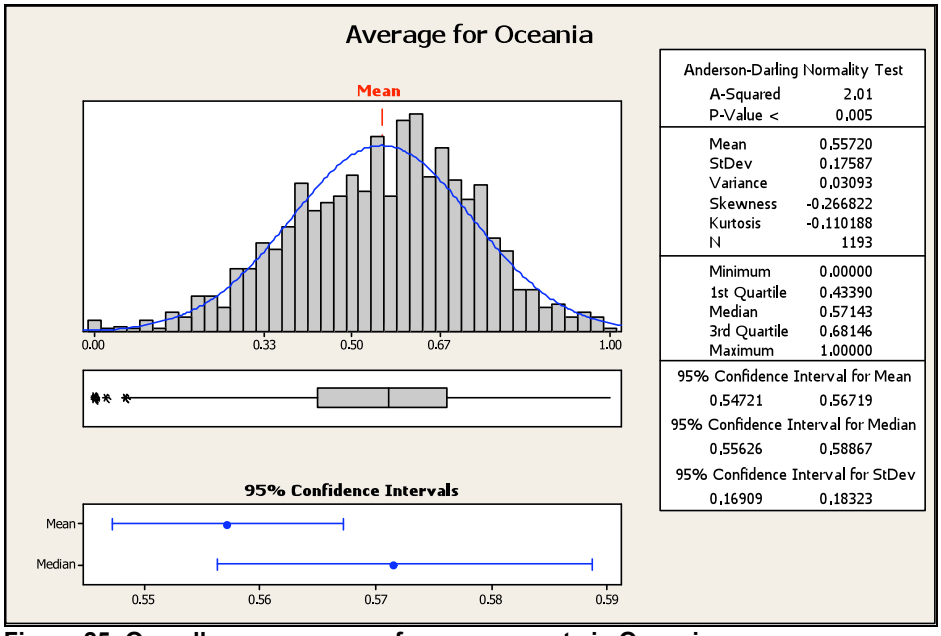

Figure 25: Overall average scores for assessments in Oceania

North America

Little information has been so far gathered on what management effectiveness evaluation has been conducted in the United States. Excellent reports have been produced by the National Parks Conservation Association detailing the results of in-depth studies using a standard methodology (State of Parks) on many of the most important protected areas across the country. These are available on the NPCA website http://www.npca.org/ and include assessments of both terrestrial and marine reserves. Comparative data has not been included in the data analysis for this project.

In Canada, Parks Canada has also developed detailed State of Parks assessments for a number of its reserves, with a focus on ecological and cultural integrity – for example see the following (David Henry *et al.* 2008; K. Alexander *et al.* 2007; Parks Canada 2007; Parks Canada 2008a; Parks Canada 2008b; Parks Canada 2008c; Parks Canada 2008d; Parks Canada 2008e; Parks Canada 2008f).

In addition, assessments have been conducted of biosphere reserves and of Important Bird Areas.

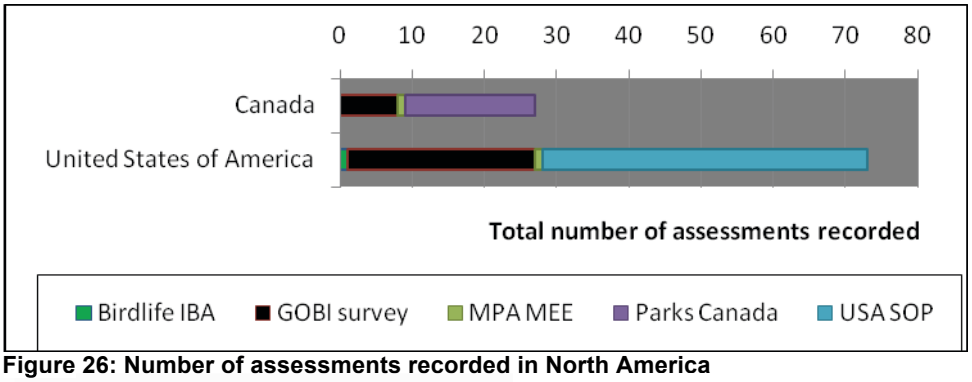

Figure 26: Number of assessments recorded in North America

Above: Joshua Tree National Park, USA Photo: Joe MacAlister

Appendix Three: Checklist for good evaluation methodologies

The discussion below presents a more detailed criteria 'checklist' for each of the principles outlined in Section 5.4. This can be used to consider the applicability of any methodology for evaluation and to conduct a 'quality check' of an adapted methodology before it is implemented. Note that this is designed as a checklist for choosing or adapting a methodology: more complete guidelines for conducting assessments are contained in the IUCN-WCPA Guidelines (Hockings *et al.* 2006).

Principle 1: The methodology is useful and relevant in improving protected area management; yielding explanations and showing patterns; improving communication, relationships and awareness

All protected area management assessments should in some way improve protected area management, either directly through on-the-ground adaptive management; or less directly through improvement of national or international conservation approaches and funding. Evaluations which do not appear to have any useful outcomes can be worse than useless, as those involved – especially at protected area level – are often less willing to be involved in other evaluations in the future.

☑	**'Checklist' of criteria**
	It is clear that using the methodology can achieve one or more of the four types of purposes outlined in Section 1.1. a) It is a useful tool for improving management/ for adaptive management or to aid understanding; b) It assists in effective resource allocation and prioritisation; c) It promotes accountability and transparency; and/or d) It helps involve the community, build constituency and promote protected area values.
	It helps understand whether protected area management is achieving its goals or making progress.
	The questions asked are relevant to the protected area and the management needs, or can be adapted or others added so they are relevant.
	It will allow useful comparisons across time to show progress and *if desired* will also allow comparison or priority setting across protected areas.
	Even simple analyses will show patterns and trends and allow for explanations and conclusions about protected area management and how it might be improved.[7]

Principle 2: The methodology is logical and systematic: working in a logical and accepted Framework with balanced approach.

A consistent and accepted approach such as the IUCN-WCPA Framework provides a solid theoretical and practical basis for assessment, and enhances the capacity to harmonise information across different systems. Evaluation exercises that assess each of the six elements in the Framework and the links between them build up a relatively comprehensive picture of management effectiveness and have greater 'explanatory power'.

Many systems use a hierarchical structure which contains different layers of indicators or questions assessing a particular element or dimension. Layers of questions should proceed logically and link from very general level (e.g. biodiversity) to more specific and measurable level (e.g. the population of one animal species recorded at one time in one place; the opinions of stakeholders about a particular issue.

[7] *Protected area management is very complex and clear explanations are difficult, but evaluations should enable at least 'reasonable estimations of the likelihood that particular activities have contributed in concrete ways to observed effects'.*

☑	'Checklist' of criteria
	The methodology is based on a systematic framework, preferably presented in a manual or other document which can be reviewed.
	All six elements of the IUCN MEE Framework are measured, balancing the need to assess the context, inputs, planning, process, outputs and outcomes of management.[8]
	There is also a balance between the different themes or dimensions of management –e.g.. governance and administration, natural integrity, cultural integrity, social, political and economic aspects.[9]
	It provides a hierarchical, nested structure so that information can be 'rolled up' or de-segregated easily to answer different needs and reporting requirements.
	Assumptions behind the indicators, and linking different levels of indicators, are clearly specified.

Principle 3: The methodology is based on good indicators, which are holistic, balanced, and useful. The indicators and the scoring systems are designed to enable robust analysis.

Development or adoption of sound indicators is a key step in management effectiveness evaluation. Careful design of the scoring and rating system is also critical, with thorough consideration given to later analysis. If any parametric statistical analyses are to be conducted (such as calculation of means, standard deviations and correlations), it is important that the differences between answers or ratings are described so they are in steps approximating even or measurable scores. That is, an answer scoring 4 should indicate twice as much progress towards a standard as an answer scoring 2.

☑	'Checklist' of criteria
	Indicators are relevant and appropriate (see principle 1) or more indicators can be added within the structure. There is clear guidance on how to measure and score the indicators.
	Indicators have some explanatory power, or able to link with other indicators to explain causes and effects.
	Characteristics of good indicators defined by (Margoluis and Salafsky 1998) are: • **Measurable**: able to be recorded and analysed in qualitative or quantitative terms; • **Precise**: defined in the same way by all people; • **Consistent**: not changing over time so that it always measures the same thing; and • **Sensitive**: Changing proportionately in response to actual changes in the condition or item being measured
	Questions should be carefully worded and trialed. They should be kept simple and clear, asking about only one aspect of management. Confusing two-or-three part questions should be avoided as they result in unreliable analysis.
	The design supports analysis by providing a consistent and logical scoring and rating system (where scoring and rating is used) and clear directions for weightings and comparisons.

Principle 4: The methodology is accurate: providing true, objective, consistent and up-to-date information

Results of evaluations can have far-reaching implications and must be genuine and able to withstand careful examination.

Data gathered needs to be as accurate as possible to ensure credibility. In most protected areas there are significant constraints on the quality of certain kinds of information, particularly those that are useful for the measurement of *outcomes* and the status of park values. Often, evaluation must make the most of what information is available. However, evaluation of management effectiveness is enhanced if it is backed up by information obtained from robust, long-term monitoring of the status of key values and of trends in such indicators as natural resources use and visitor patterns. Such monitoring systems should be designed to efficiently provide information for evaluation, so that information can be collected and processed without duplication of effort.

[8] This depends on the purpose – for a general/ overall evaluation, strive for balance, but some assessments might need a more specific emphasis

[9] As above

Both qualitative and quantitative information can be accurate, as long as it is collected with good techniques and preferably verified. We need to be sure that inferences drawn can be substantiated

For all except special-purpose single-event evaluations, it is desirable to repeat similar measures at intervals. Standardised reporting allows comparisons across sites (where appropriate) and to meet multiple reporting requirements. The system should be capable of showing changes through time.

☑	**'Checklist' of criteria**
	The methodology is structured and explained to be likely to yield accurate results.
	Techniques for implementing the methodology are clearly spelt out e.g. with guidance on how questionnaires should be filled out; how workshops should be conducted; or how the population status of a species should be estimated.
	Well-recognised and accepted – or other new but defensible – data collection techniques are used, so the assessment will be able to withstand scrutiny.
	It will be replicable – that is, easy to apply consistently across different protected areas or regions, and over time, so questions are answered in the same way and patterns are real.
	Results of monitoring can be incorporated into meaningful measures
	More detailed and accurate information can be added at a later iteration when available, and the methodology will help to develop a relevant monitoring program.
	Cultural issues are considered, so that people are likely to provide accurate answers without fear, bias or intimidation[10].
	Some 'triangulation', cross-checking or quality control is built in or can be added. The results will be honest, credible and non-corrupt.
	Opinions of a cross-section of people (stakeholders, landowners, protected area staff from different levels, technical experts) should be included wherever possible.
	The evaluation can be conducted quickly enough to provide up-to-date information.
	A record of data sources and levels of certainty is kept.

Qualitative evaluation systems are based on the exercise of expert judgement to assess management performance. Considerable attention needs to be paid to promoting consistency in assessment across sites and evaluators. Consistency can be enhanced by:

- care in choice of language in the assessment instrument to minimise potential differences in interpretation;
- provision of detailed guidance and examples in supporting documentation;
- staff training in preparation for the assessment;
- requiring supporting information such as justification for the assessment rating given and sources of information used in making the assessment;
- trialing and checking across assessments to identify clear inconsistencies or application of different standards of assessment; and
- use of a process of correction where clear inconsistencies are evident (while ensuring that bias is not introduced in this process).

Principle 5: The methodology is practical to implement, giving a good balance between measuring, reporting and managing

Evaluation is important but should not absorb too many of the resources needed for management. Methodologies which are too expensive and time-consuming will not be repeated, and are less acceptable to staff and stakeholders. Ability to make the most of existing information (e.g. from pre-existing monitoring and research) is important. As monitoring systems become attuned to providing information for evaluation, data gathered will become richer and more accurate without increasing demands on financial resources and staffing time.

Cooperation of participants is vital to ensure an accurate and easily implemented assessment, so methodologies must be designed to appeal to people in the field.

[10] This applies to protected area staff as well as to stakeholders

☑	'Checklist' of criteria
	It is possible to implement the methodology with a reasonable allocation of resources.
	It allows the use of existing information and processes wherever possible.
	All steps in the process are clear and unambiguous.
	It is comprehensible and acceptable to staff and stakeholders Language in questionnaires or presentations is simple and relevant to the local situation, and carefully chosen not to give offence to any gender, ethnic or cultural group.
	The design encourages positive interaction and discussion and immediate improvements in management practices.
	Simple and useable tools for data entry, analysis and reporting are provided.
	The methodology allows for a level of cooperation, rather than competition, with other evaluation exercises in the same area.

Principle 6: The methodology is part of an effective management cycle: linked to defined values, objectives and policies.
Evaluations that are integrated into the managing agency's culture and processes are more successful and effective in improving management performance in the long term.

To link evaluations with other aspects of management, it is critical that the key values, management goals and objectives for the protected area have been spelt out clearly. Standards against which inputs, processes and outputs can be judged are also important. As monitoring programs develop and mature, monitoring, reporting and evaluation should become one integrated efficient process.

☑	'Checklist' of criteria
	It is possible to make a commitment to repeated evaluations using this methodology.
	It will meet and be part of the core business cycle and reporting requirements of the agency.
	It ties in with protected area planning, monitoring, research and annual work programs.
	It relates to expressed values, goals and objectives of the protected area or agency and measures the extent to which these are met and policies implemented.
	Senior executives or politicians will be likely to accept the results, act on recommendations and disseminate the reports.

Principle 7: The methodology is cooperative: with good communication, teamwork and participation of protected area managers and stakeholders throughout all stages of the project wherever possible;

Gaining approval, trust and cooperation of stakeholders, especially the managers of the protected areas to be evaluated, is critical and must be ensured throughout the assessment. A wide survey of protected area assessments has found that broad participation improves accuracy, completeness, acceptance and usefulness of evaluation results (Paleczny and Russell 2005). Assessment systems should be established with a non-threatening stance to overcome mutual suspicion. Evaluation findings, wherever possible, should be positive, identifying challenges rather than apportioning blame. If the evaluation is perceived to be likely to 'punish' participants or to reduce their resources, they are unlikely to be helpful to the process.

However, as discussed earlier, there are occasions when negative repercussions may be inevitable and these cases need careful handling.

☑	Checklist' of criteria
	Different viewpoints are actively sought, including perspectives of community and field staff.
	The methodology encourages or allows good cooperation and communication between all the evaluation partners.
	An adequate but serviceable level of participation by staff and community is included in both the design and implementation.
	The implementation of this methodology will contribute to a higher level of trust, better relationships and cooperation between protected area staff at all levels and community.

Principle 8: The methodology promotes positive and timely communication and use of results. Short-term benefits of evaluation should be demonstrated clearly wherever possible.

Findings and recommendations of evaluation need to feed back into management systems to influence future plans, resource allocations and management actions.

☑	Checklist' of criteria
	The methodology includes discussion of how results should be communicated and used.
	Reports will be clear and specific enough to improve conservation practices realistic, addressing priority topics and feasible solutions.
	Benefits and results from the evaluation will be clearly visible in the short term.
	Feedback to evaluation participants can be given quickly.
	Results will influence future plans and actions in protected area management.

Steps in developing methodologies

Most methodologies for MEE have some common origins, and share the following, logical steps in their development:

1. Essential characteristics of 'good' management are defined: such as the features of a 'consolidated site' in the Parks in Peril program (Martin and Rieger 2003). Most of the methodologies firstly define the broad fields, 'ambits' or themes needed for effective management, and these form the first level (or two levels) of organisation of the indicators.

   The terminology and the approach for defining these fields varies from method to method. Often the fields include some combination of the following: administration, social, political, management of natural and cultural resources, community participation, and legal aspects. Some more recent methodologies specifically use the elements of the IUCN-WCPA Framework. In some cases, a combination of 'fields' and WCPA 'elements' is used.

2. The next, more specific level of features that are important to good management are listed and standards and expectations set. Common factors identified at this level include: good systems of financial administration, adequate staffing and funding, communication with stakeholders, environmental education programs, management planning, law enforcement and boundary marking.

3. Specific indicators for each of these aspects are then chosen and described. (Different methods vary as to the number of levels and as to which factors are considered first, second or third level indicators).

4. A scoring system is defined. While some methodologies, notably RAPPAM and the Tracking Tool, use a four-point scale, most of the methodologies in Latin America use a five-point scale: many of them have based this approach on the recommendation of de Faria (1993) and subsequent publications and adaptations of this scheme.

   Most systems either carefully define what each of these levels are (i.e. define precise criteria for each score level), or set guidelines for the individual park or system to define these standards. In some cases, quite detailed instructions or sub-indicators are included to ensure that an objective and quantitative method is used, especially for calculating the 'optimum' staff, finances, or equipment needed.

5. Analyses are then recommended. In most cases, scores for individual indicators are combined or 'rolled up' into the level or levels above, to provide overall scores for the aspects and the fields. The indicators at each level may be weighted to reflect relative importance and contribution to the field.

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02-SCIgpem March 2011 CRICOS Provider Number 00025B