



CHAPTER 28

PROTECTED AREA MANAGEMENT EFFECTIVENESS

Principal authors:

Marc Hockings,
Fiona Leverington
and Carly Cook

CONTENTS

- Introduction
- What is protected area management effectiveness evaluation?
- Purposes of protected area management effectiveness evaluation
- Protected area management effectiveness evaluation globally
- The IUCN protected area management effectiveness framework
- Designing and implementing assessments
- Making a difference: Towards more effective management
- Conclusion
- References



Convention on
Biological Diversity

PRINCIPAL AUTHORS

MARC HOCKINGS is a Professor and Program Manager for Environmental Management in the School of Geography, Planning and Environmental Management at the University of Queensland, Brisbane and Senior Fellow, UNEP World Conservation Monitoring Centre.

FIONA LEVERINGTON is a Director of the consultancy Protected Area Solutions and an Adjunct Research Fellow at the School of Geography, Planning and Environmental Management at the University of Queensland, Brisbane.

CARLY COOK is Lecturer in Ecology in the School of Biological Sciences at Monash University, Melbourne.

ACKNOWLEDGMENTS

Recognition is extended to Diane Matar, Geoffroy Mauvais, Andrew Growcock, Tony Varcoe and Gail Cleaver-Christie for their Case Study contributions.

CITATION

Hockings, M., Leverington, F. and Cook, C. (2015) 'Protected area management effectiveness', in G. L. Worboys, M. Lockwood, A. Kothari, S. Feary and I. Pulsford (eds) *Protected Area Governance and Management*, pp. 889–928, ANU Press, Canberra.

TITLE PAGE PHOTO

Carefully located track head, parking and visitor information facilities developed in consultation with the traditional indigenous owners provide access to the spectacular Bungle Bungle Range in the World Heritage property, Purnululu National Park, in the Kimberley region, Western Australia
Source: Ian Pulsford

Introduction

As far back as 1746, the British statesman Philip Stanhope gave his son the advice that ‘whatever is worth doing at all, is worth doing well’ (Widger 2012). It is advice we could well follow today in managing the growing network of protected areas around the world. Earlier in this book, the changing paradigm of protected areas and the spectacular growth in the number and coverage of protected areas have been documented. We have clearly decided that protected areas are ‘worth doing’ and we have abundant advice on how to manage them well, as is evident in the preceding chapters of this book. We have, however, limited knowledge of whether we are following this advice and keeping true to Stanhope’s counsel to manage them well.

The growing interest in the effectiveness of management of protected areas can be traced through the emergence of the topic at the decadal World Parks congresses (Hockings et al. 2004)—first emerging in papers at the third congress (in Bali) in 1982, gaining momentum at the fourth congress (in Caracas) 10 years later and then being one of the priority topics discussed at the fifth congress in Durban in 2003 after a significant effort by the International Union for Conservation of Nature (IUCN) and others to advance work on this issue in the intervening period. Protected area management effectiveness is now a key element of a broader examination of progress towards the Convention on Biological Diversity (CBD) strategic plan and its constituent Aichi Targets—especially Target 11, which addresses the contribution that an effectively and equitably managed protected area system can make to the overall goals of the convention:

By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through *effectively and equitably managed*, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

(CBD 2011; emphasis added)

Woodley et al. (2012) have analysed this target in detail, drawing the linkages between management effectiveness and other key issues for protected area success. They argue for a ‘holistic interpretation of Target 11 as a way for the

global community to use protected areas to change the current unacceptable trends in global biodiversity loss’ (Woodley et al. 2012:23).

After the fourth world parks congress in Caracas in 1992, a number of methodologies for assessing the management effectiveness of protected areas were developed, primarily in Central and South America (Courrau 1997; de Faria 1993; Izurieta 1997) and Australia (Hockings 1998). In 1996, the IUCN World Commission on Protected Areas (WCPA) commenced work on a framework and guidelines for assessing the management effectiveness of protected areas, which led to the first edition of the IUCN guidelines for *Evaluating Effectiveness: A framework for assessing the management of protected areas* (Hockings et al. 2000). This framework, revised in 2006 (Hockings et al. 2006), has formed the foundation for most of the protected area evaluation systems developed and applied around the world since that time. It is extensively referred to in this chapter as the IUCN WCPA framework.

The expansion of protected area management effectiveness evaluations is in keeping with the general rise in evaluation and performance assessments within governments and other public bodies across the world. In the environmental sector, donors, governments and other bodies are increasingly requiring management bodies to show evidence that their money is well spent (Saterson et al. 2004; Keene and Pullin 2011). 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, during the past 15 to 20 years. New methodologies and approaches have developed in a number of fields, with many common issues and some productive exchanges of ideas across the sectors (Foundations of Success et al. 2003). Protected area management involves biophysical, cultural, socioeconomic 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.

In this chapter, we will outline the main approaches to assessing the effectiveness of the management of protected areas, the purpose and process of evaluation and how the assessment methods and processes can be designed to produce relevant and reliable results. This guidance is aimed at practitioners who might be responsible for designing and implementing evaluation systems as well as senior managers who are responsible for policies and programs and who will be among the significant

Table 28.1 Approaches to assessing the effectiveness of protected areas

Approach		Key questions that underpin the approach
1	Assessment of extent and location of protected areas, including their coverage of biological and landscape diversity	<p>How many protected areas are there in a country or region, and what is their total area?</p> <p>How effectively do the protected areas cover key ecoregions or habitats?</p> <p>How well do protected areas represent the diversity of ecoregions and habitats?</p> <p>How effectively do the protected areas represent other features such as landscape elements, wetland types and species?</p>
2	Assessment of the effectiveness of protected areas as a conservation mechanism at larger scales, and the impact of protected areas on people	<p>Have protected areas reduced deforestation and other habitat loss?</p> <p>How have protected areas affected local communities—have they increased or alleviated poverty?</p>
3	Assessment of overall protected area management effectiveness (PAME)	<p>How well designed is the protected area and the protected area system?</p> <p>Are adequate and appropriate planning, resources and processes in place to enable management?</p> <p>Are protected areas achieving their objectives and conserving their values?</p>
3A	Outcomes of protected areas in conserving their biodiversity values (a subset of approach 3 but focused just on outcomes)	<p>Are protected areas protecting species and habitats?</p> <p>Are values such as endangered species being conserved or restored?</p> <p>What is the impact of protected areas on communities?</p>

users of evaluation results. The chapter concludes with advice and examples of how management effectiveness assessments can be used to adapt and improve management. While many of the examples used in the chapter relate to management effectiveness evaluations undertaken by protected area management agencies or non-governmental organisations (NGOs) across a large number of sites, the principles and approaches are applicable to all protected areas and systems regardless of their size and governance type.

What is protected area management effectiveness evaluation?

Four complementary management effectiveness evaluation approaches can be taken when considering the impact of protected areas and protected area systems (Leverington et al. 2010a), as shown in Table 28.1.

Approach one: Protected area extent and location

The first approach assesses the extent and location of protected areas, especially in relation to the range of biodiversity values that protected areas aim to conserve. The well-known graph showing the steeply rising number and global extent of protected areas (Chapter 2, Figure 2.2) is the simplest measure of this aspect, but increasingly attention is turning to the location of protected areas in relation to the distribution of species and habitats. Approaches to identifying such sites include Important Bird Areas (IBAs) and the Alliance for Zero Extinction (AZE) sites (Butchart et al. 2012), and are more generally covered under current efforts to identify key biodiversity areas and use these as an important guide for the establishment of new protected areas (Eken et al. 2004; see also Chapter 3). Systematic conservation planning studies (Margules and Pressey 2000) also fall within this approach but focus on representation of ecoregions and habitats rather than species or species collections (see Chapter 13).



Visitors viewing the limestone cliffs in Geikie Gorge National Park, which are remnants of an ancient uplifted Devonian reef that straddles the remote Kimberley region, Western Australia

Source: Ian Pulsford

Approach two: Large-scale assessments

A second approach assesses the extent to which protected areas can be shown to reduce large-scale impacts such as forest clearing or habitat degradation, or at least the extent to which the location of protected areas can be correlated with lower levels of impact. Most studies have been in tropical forest environments (Bruner et al. 2001; Scharlemann et al. 2010; Barber et al. 2012; Green et al. 2013), but studies have also examined marine systems (Selig and Bruno 2010). While results from these studies are mixed, most have demonstrated the effectiveness of protected areas in reducing rates of habitat change (Geldmann et al. 2013). The economic as well as environmental impacts of protected areas at a national scale can be assessed using economic and spatial tools (Sims 2010, 2014).

Approach three: Protected area management effectiveness

Assessments using the third approach are generally referred to as 'protected area management effectiveness' (PAME) evaluations. This approach forms the main focus of this chapter. Since the late 1990s, significant efforts have been made to develop and apply PAME

evaluations of individual protected areas, groups of sites and whole systems of protected areas (Leverington et al. 2010a). Management effectiveness evaluation is defined by the IUCN as 'the assessment of how well the protected area is being managed' (Hockings et al. 2006:1).

Approach three (A): Protected area outcomes

A developing approach to management effectiveness evaluation that constitutes a subset of PAME examines the outcomes of protected area management based on detailed monitoring and reporting on the condition and trend of protected area values, especially biodiversity values (Geldmann et al. 2013). Methodologies for directing, undertaking and reporting on such detailed studies in a systematic way that aids adaptive management have been developed by groups such as The Nature Conservancy (Parrish et al. 2003) and park management agencies in South Africa, Australia and Canada (Growcock et al. 2009; Timko and Innes 2009). Ideally, such detailed information should underlie judgments about outcomes that may be made in broader PAME assessments and linked to other elements of the evaluation cycle (Box 28.1).

Box 28.1 Management effectiveness definitions

The *evaluation of management effectiveness* is generally achieved by the *assessment* of a series of *criteria* (represented by carefully selected *indicators*) against agreed objectives or *standards*. The following definitions refer specifically to the context of protected area management effectiveness.

- **Management effectiveness evaluation:** This 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:
 1. design issues relating to both individual sites and protected area systems
 2. adequacy and appropriateness of management systems and processes
 3. delivery of protected area objectives including conservation of values.
- **Assessment:** The measurement or estimation of an aspect of management.
- **Evaluation:** The judgment of the status/condition or performance of some aspect of management against predetermined criteria (usually a set of standards or objectives)—in this case, including the objectives for which the protected areas were established.
- **IUCN WCPA Management Effectiveness Evaluation Framework:** A system for designing protected area management effectiveness evaluations based on six elements—context, planning, inputs, processes,

outputs and outcomes. It is not a methodology in itself, but is a guide to developing comprehensive assessment systems.

- **Element:** A major component of the evaluation framework defined by the aspect of management that is being assessed. The elements relate to the steps in a strategic planning and management cycle. Performance within each element is assessed by reference to a number of defined criteria.
- **System:** A specific process for undertaking monitoring and evaluation, generally accompanied by steps or guidance (equivalent to an *evaluation approach* as defined by Stem et al. 2005).
- **Criterion:** A major category of conditions or processes—quantitative or qualitative—which helps define the thing being measured. A criterion is characterised by a set of related indicators.
- **Indicators:** Quantitative or qualitative variables that provide useful information about a criterion and can be used to help compile a picture of the status and trends in protected area effectiveness.
- **Tool:** An instrument that aids in the actual undertaking of evaluation—for example, a questionnaire or scorecard (Stem et al. 2005).
- **Monitoring:** Collecting information on indicators repeatedly over time to discover trends in the status of the protected area and the activities and processes of management.

Source: Hockings et al. (2006:xiii)

The limited monitoring of species populations in protected areas, however, means that the availability of such detailed data from protected areas tends to be the exception rather than the rule. Where detailed monitoring information is available, PAME studies (approach three) can play a critical role in interpreting the information and making it relevant to managers so it is actually used in decision-making. For example, Growcock et al. (2009) indicate that the state of the parks assessment system in New South Wales (Australia) is not a substitute for species, site or issue-specific monitoring and research but that it has made the results of such studies more available for decision-making by considering the results within a management effectiveness evaluation framework.

Purposes of protected area management effectiveness evaluation

Increasingly, management effectiveness studies are an accepted part of the management cycle in large organisations, but what is their purpose? There are a number of reasons people and organisations wish to assess management effectiveness. Broadly speaking, such evaluations can:

- enable and support an adaptive approach to management by providing essential information to managers at all levels about the extent to which management interventions are being implemented and are being successful
- assist in effective resource allocation by indicating gaps and areas of highest need and likelihood of success—in some cases, facilitating ‘triage’ where resources are scarce

- promote accountability and transparency through providing senior management, funding bodies, stakeholder groups and the public with information about how resources are being used and decisions made
- involve the community, build a constituency to support protected areas and promote protected area values at a particular site or more generally across a system of protected areas.

As well as these substantive benefits, the process of assessing management effectiveness can itself provide a number of procedural benefits such as improved communication and cooperation between managers and other stakeholders. Managers have an opportunity to reflect on the challenges they face in managing their sites and systems from a different perspective, away from the day-to-day concerns of management. Many managers have commented that the major benefits to them have come during the assessment process rather than from any formal report produced from the PAME process. Growcock et al. (2009) indicate that the management effectiveness evaluation process in New South Wales, Australia, seeks to achieve all four purposes and has facilitated adaptive management, supported planning and decision-making and provided clarity to managers in determining priorities. In a survey of 62 management effectiveness studies in 19 countries, 97 per cent of respondents said the process had been useful to staff (Paleczny 2010).

In addition, evaluation has benefits in exposing protected area managers and other stakeholders to 'evaluation culture'—a way of thinking that may otherwise be quite foreign and new to many practitioners, but which helps them to better interact with funding bodies and top-level management. The benefits of this 'learning how to learn' process may last much longer than the findings of the initial evaluation (Patton 1998). Birnbaum and Mickwitz (2009) point out that evaluation has been slow to develop in the environmental arena, in part due to the complexity of environmental problems and the difficulties this entails for evaluation.

Examples of the values of evaluation include: clarity, specificity and focusing; being systematic and making assumptions explicit; operationalising program concepts, ideas and goals; distinguishing inputs and processes from outcomes; valuing empirical evidence; and separating statements of fact from interpretations and judgments. These values constitute ways of thinking that are not natural to people and that are quite alien to many. When we take people through a process of evaluation—at least in any kind of stakeholder involvement or participatory process—they are in fact learning things about evaluation culture and often learning how to think in these ways (Patton 1998:226).



Community involvement: schoolchildren performing the black-necked crane (*Grus nigricollis*) dance for the community at the fifteenth annual black-necked crane festival in the Phobjikha Valley adjacent to Black Mountain National Park, Bhutan, to raise community awareness of and support for the conservation of this highly endangered migratory species

Source: Ian Pulsford

Protected area management effectiveness evaluation globally

PAME has grown rapidly from a new and untried concept in the 1990s to become an integral part of global and national conservation agendas. The Global Environment Facility (GEF) has adopted, as a standard requirement, the use of the Management Effectiveness Tracking Tool (METT), which had been developed by the World Bank and the World Wide Fund for Nature (WWF) as a means to track progress against their joint forest initiative target of improving the management of 70 million hectares of forest protected areas. The GEF has required the use of the METT to assess management effectiveness at the initial, mid-term and final evaluation of all funded projects in protected areas.

Following on from the recommendations of the Fifth IUCN World Parks Congress, the CBD developed its Programme of Work on Protected Areas (PoWPA) in 2004 (CBD 2004) with a goal and associated targets to promote the development and adoption of PAME systems (Box 28.2). This has been perhaps the most significant development at an international policy

Box 28.2 CBD Programme of Work on Protected Areas

The PoWPA explicitly addressed management effectiveness as part of Goal 4 dealing with standards, assessment and monitoring. Although the 2010 target date for the PoWPA has passed, the targets remain relevant to countries in the current period of the CBD Aichi Targets leading up to 2020. The PoWPA Target 4.2.2 was updated at the meeting of the CBD Conference of the Parties in 2010 as follows.

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 (updated to 60% of the total area of protected areas by 2015).

- 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.

Suggested supporting activities of the Executive Secretary

- 4.2.5 Compile and disseminate information on management effectiveness through the clearing-house mechanism and develop a database of experts in evaluation of protected area management effectiveness and consider the possibility of organizing an international workshop on appropriate methods, criteria and indicators for evaluating the effectiveness of protected area management.
- 4.2.6 In cooperation with IUCN WCPA and other relevant organizations, compile and disseminate information on best practices in protected area design, establishment and management. (CBD 2010b)

Source: CBD (2004)

level promoting the need for effective management of protected areas and the monitoring and reporting systems needed to drive this improvement. While the target of assessing management effectiveness of 30 per cent of protected areas had not been reached by 2010, progress had been so encouraging that the Conference of Parties to the CBD decided to call on parties to 'expand and institutionalize management effectiveness assessments to work towards assessing 60 per cent of the total area of protected areas by 2015 using various national and regional tools and report the results into the global database on management effectiveness' (CBD 2010a; emphasis added).

Information about management effectiveness assessments across the world has been compiled in a global database linked to the UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) World Database on Protected Areas (WDPA). The management effectiveness database records the date, location and methodology used, and where possible the results of each assessment, and includes written reports where available (Leverington et al. 2010a, 2010b;



Serchu Nature Trail in the Royal Botanic Park, Nepal

Source: Ian Pulsford

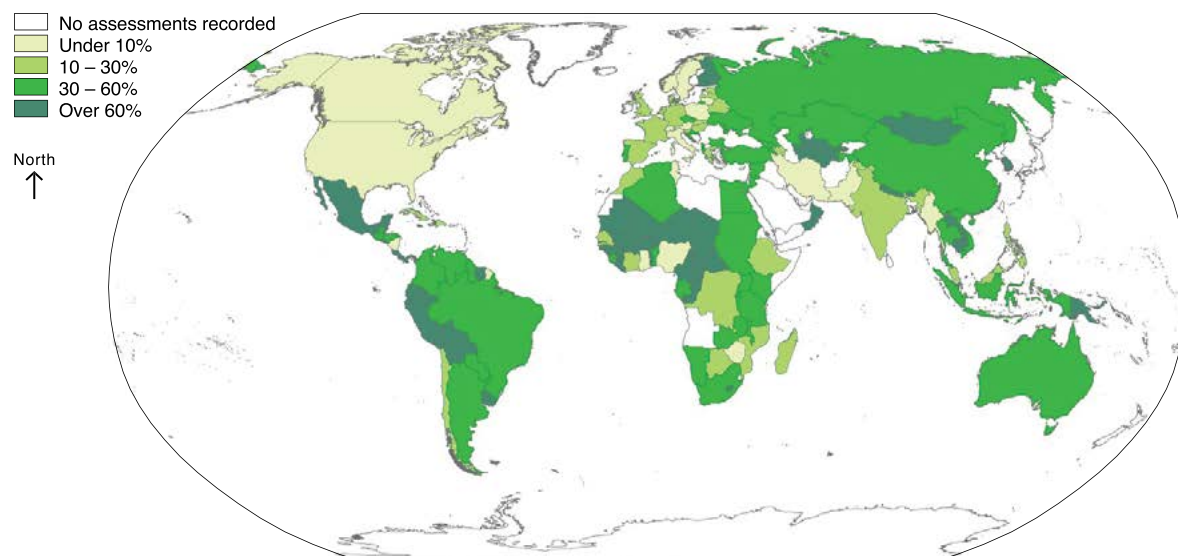


Figure 28.1 National progress towards the CBD 30 per cent and 60 per cent targets for PAME assessments

Note: Progress is measured by the percentage of the total area of the nationally designated protected area network that has been assessed.

Source: Coad et al. (2013)

Nolte et al. 2010). This compilation has been made possible through a collaborative study by the University of Queensland, the IUCN, Oxford University, the UNEP-WCMC, the Biodiversity Indicator Partnership and major NGOs such as WWF and The Nature Conservancy, and has been supported by many partners in the desire to compile global information on the effectiveness of management of protected areas.

Coad et al. (2013) used this information to assess progress towards the PoWPA PAME target (Figure 28.1). By the end of 2012, at least one PAME assessment had been recorded for 29 per cent of the area of nationally designated protected areas, with greatest progress in Africa and Latin America (Coad et al. 2013). Of the 194 parties to the convention, 90 countries had met the 2010 target of 30 per cent of protected areas assessed, with 45 countries already having achieved the 60 per cent target set for 2015 (Coad et al. 2013).

There was a bias in where assessments had been conducted, with larger protected areas and IUCN Category II sites more likely to have been assessed. More assessments had been recorded in countries with low Human Development Index (HDI) scores (Coad et al. 2013), although these countries also had lower overall scores (Leverington et al. 2010c). This association between the extent of PAME and HDI is likely to be a result of both the focus of GEF projects in low HDI countries (and consequent METT assessments; see

Box 28.3) and the concentration of NGO-sponsored assessments in these countries using a variety of PAME assessment methods.

Management effectiveness of protected areas has also been adopted by the CBD as one of the protected area indicators used to assess progress towards meeting biodiversity conservation targets, and information on both coverage and results of assessments is being collected to track this indicator (Leverington et al. 2010a; Coad et al. 2013). At a national level, many countries have adopted PAME as part of their national policy for protected areas—such as in Australia, where the Natural Resource Management Ministerial Council included PAME in the policy for the national protected area system (NRMMC 2009)—or have implemented comprehensive evaluation systems across their protected area networks (for example, Colombia, Republic of Korea, South Africa). Most of these assessments have been undertaken using evaluation methodologies developed from the evaluation framework developed by the IUCN WCPA.

The needs, aims and circumstances of protected area evaluations are diverse. As discussed above, management effectiveness studies can serve a number of purposes, and the demand for information comes from a range of sources. Managers, local communities and others directly involved in management of a protected area site or system will be most interested in information that can be used to support planning and adaptive management (Case Study 28.1). Senior administrators, donors and

Box 28.3 Two widely used management effectiveness evaluation methodologies: RAPPAM and METT

The Rapid Assessment and Prioritisation of Protected Area Management (RAPPAM) methodology (Ervin 2003) has been implemented in more than 50 countries and more than 1800 protected areas in Europe, Asia, Africa, Latin America and the Caribbean. The methodology is questionnaire-based and is implemented through one or more workshops bringing together protected area managers with other stakeholders and experts to compile and share knowledge. It is designed for broad-level comparisons among many protected areas, which together make a protected area network or system. It can:

- identify management strengths, constraints and weaknesses
- analyse the scope, severity, prevalence and distribution of a variety of threats and pressures
- identify areas of high ecological and social importance and vulnerability
- indicate the urgency and conservation priority for individual protected areas
- help to develop and prioritise appropriate policy interventions and follow-up steps to improve protected area management effectiveness.

It can also answer a number of important questions.

- What are the main threats affecting the protected area system, and how serious are they?
- How do protected areas compare with one another in terms of infrastructure and management capacity? And how do they compare in effectively producing outputs and conservation outcomes as a result of their management?
- What is the urgency for taking actions in each protected area?

- What are the important management gaps in the protected area system?
- How well do national and local policies support the effective management of protected areas? Are there gaps in legislation and what are the governance improvements that are needed?
- What are the most strategic interventions to improve the entire system?

The Management Effectiveness Tracking Tool (METT) (Stolton et al. 2007) has been implemented in more than 100 countries and more than 2000 protected areas, and is required at the beginning, midpoint and end of all protected area projects resourced through the World Bank and the Global Environment Fund.

The methodology is a rapid assessment based on a scorecard questionnaire. The scorecard includes all six elements of management identified in the IUCN WCPA framework (context, planning, inputs, process, outputs and outcomes), but has an emphasis on context, planning, inputs and processes. It is basic and simple to use, and provides a mechanism for monitoring progress towards more effective management over time. It is used to enable park managers and donors to identify needs, constraints and priority actions to improve the effectiveness of protected area management.

It is designed primarily to track progress over time (rather than to compare sites) and can reveal trends, strengths and weaknesses in individual protected areas or in groups. It is rapid to complete, with only 30 questions; however, if it is applied in a workshop situation, it leads to a good deal of discussion and reflection. If it is fully completed, with comments and 'next steps', it can be valuable in setting directions and in evaluating progress towards improving protected area management.

policymakers are likely to be seeking information that can be used to improve resource allocation as well as being interested in accountability and efficiency. While the information relating to accountability is primarily to inform external audiences, managers will also be interested in this aspect of evaluation. Some stakeholders may hope for assessments to reveal shortcomings in funding or policy, while scientists are interested in whether protected areas can be shown to effectively protect particular values.

This diversity means that a single system for evaluating management effectiveness will not be able to address all needs and circumstances. For this reason, the IUCN WCPA proposed a *framework* for assessing management effectiveness. The framework has been used to develop specific methodologies for assessment to match

particular purposes, capacities and other needs while still retaining a common underlying logic and approach to evaluation, similar criteria and, in some cases, common assessment methods and tools (Case Study 28.2). Use of a common framework can also lend credibility to and promote greater acceptance of the assessment system because people can see that the evaluation approach and assessment criteria accord with an international standard.

Case Study 28.1 Resilient people, resilient nature: PAME in Lebanon

Amid a frantic political and socioeconomic context, determined groups of people are resilient in their efforts to conserve the natural and cultural heritage of the mountains of Lebanon. This small eastern Mediterranean country (10 452 square kilometres) is known for its iconic cedar tree (*Cedrus libani*)—featured on the national flag—as well as for its rich ecosystem and biodiversity values. Lebanon is also a preferred resting spot on an avian seasonal flyway. Internationally designated sites include the UN Educational, Scientific and Cultural Organisation (UNESCO) Biosphere Reserves of Shouf and Jabal Moussa. These sites, co-governed by national authorities and NGOs, demonstrate interesting cases of PAME initiatives at different stages of planning and implementation (Abu-Izzedin 2013).

Management effectiveness evaluation: Integral to management planning—Jabal Moussa Biosphere Reserve (JMBR)

Jabal Moussa (meaning ‘Mountain of Moses’ in Arabic) is a mountainous biosphere reserve situated 40 kilometres from the capital, Beirut. The reserve extends over 65 square kilometres, and its core area constitutes a nationally protected forest and natural site. Jabal Moussa’s conservation value is of national and international importance, as it hosts more than 720 plant species, of which 26 are nationally endemic, and more than 19 mammals including the grey wolf (*Canis lupus*), striped hyena (*Hyaena hyaena*) and rock hyrax (*Procapra capensis*). More than 137 bird species have been observed in the reserve, of which some are globally threatened—hence its designation as an Important Bird Area.

Although relatively new in the region, JMBR was able to accomplish many of its objectives in a short period. These include: setting up a qualified team, mostly recruited from the local community; defining its vision and long-term goals; and building good relationships with national and international partners. This could partially be attributed to proactively tapping knowledge from different international and local sources, and learning from more established biosphere reserves.

One essential project responding to the requirements of UNESCO’s Man and the Biosphere (MAB) program is the 10-year management plan. The plan was developed using an innovative approach that blends recognised planning guidelines and concepts from both protected areas and biosphere reserve systems (Jaradi and Matar 2012).

Its integrated strategies build on a comprehensive inventory of biodiversity and cultural values, and are centred on the functional zonation scheme of biosphere reserves, while emphasising the importance of establishing strong partnerships with rural communities.

On the basis of the systematic conservation planning guidelines and the CBD requirements, the management plan included monitoring and evaluation as essential parts of its detailed action plan. For more concrete implementation, this objective was further detailed into actions with corresponding indicators (biological and management) that allow for follow-up. For this and other objectives, resources and priorities were allocated. In this perspective, the case of JMBR demonstrates that effective PAME starts at the planning stage, though success ultimately lies in implementation and follow-up. Recent field observations by local scientists, staff and visitors have shown that flowering plant populations such as the Lebanon cyclamen (*Cyclamen libanoticum*; endemic to JMBR) and the peony *Paeonia kesrouanensis* (endemic to the region) are increasing in number. Moreover, encounters with mammals such as the rock hyrax have become more frequent, indicating improvements in habitat condition.

Management effectiveness evaluation for adaptive management: Shouf Biosphere Reserve

The Shouf Biosphere Reserve (SBR) consists of a core zone (161 square kilometres), a buffer zone (54 square kilometres) and a development zone (233 square kilometres). The core area was declared a nature reserve in 1996. The reserve hosts three magnificent cedar forests with the largest stands of Lebanese cedars (*Cedrus libani*), representing 25 per cent of the remaining cedars in the country. The biosphere reserve is home to 32 species of wild mammals, of which nine are of international significance, in addition to 270 bird species and 27 species of reptiles and amphibians.

The SBR is among the best-managed biosphere reserves in the region. It is particularly renowned for its strong partnerships with local communities in ecotourism and sustainable production of rural produce that focuses on the empowerment of women. In 2011, the reserve was selected, from 106 applicants, by the UNESCO MAB International Advisory Committee as one of the few winners of the ‘Michel Batisse Award’, which recognises management efforts that meet international standards.



Family of rock hyraxes (*Procapra capensis*) in Jabal Moussa Biosphere Reserve, Lebanon

Source: Association for the Protection of Jabal Moussa



Lebanese cedar (*Cedrus libani*) in Shouf Biosphere Reserve, Lebanon

Source: Nizar Hani

In 2009, an evaluation of threats to conservation values was conducted for the first time in SBR using the modified version of the Threat Reduction Assessment (mTRA) tool in a participatory workshop with staff (Matar and Anthony 2010). The TRA is a method created by Salafsky and Margoluis (1999) and modified by Anthony (2008) to account for negative trends in threats. It is used to quantitatively assess the trends in threats to biodiversity and protected areas over a defined period, as an indirect measure of reaching conservation targets.

The mTRA tool was rated as very useful by the team for examining trends in local threats such as overgrazing by goats, human-induced fire and recreational hunting. The mTRA index showed that the management team was able to successfully decrease the overall threats by 51 per cent over a three-year period to 2009. The assessment results were integrated into the latest SBR management plan, which was updated to include appropriate threat-abatement actions (Abulzedin 2013). The case demonstrates a good use of PAME tools such as the mTRA, as part of an adaptive management approach.

Other PAME initiatives have taken place in Lebanon—most notably, the successful evaluation of two marine protected areas using the METT as part of a joint IUCN–Ministry of Environment project that aims at developing and strengthening the national marine protected area network. Evaluation results led to useful recommendations for improving marine protected area management in the country (Allam Harash and El Shaer 2011).

The PAME initiatives in Lebanon reflect a recently increased awareness of its international importance; however, they are so far done as ‘one-off’ evaluations within specific projects and lack follow-up on the implementation of resulting recommendations. The key factors that will determine future success are: 1) building internal capacity for staff to run systematic evaluations rather than relying on external resources; 2) finding reliable financing mechanisms to take adaptive action; 3) mainstreaming PAME into national protected area strategies and follow-up on implementation. If these challenges are overcome, compliance with the CBD requirement to implement and report on PAME results will also be improved.

In the framework of conflict, economic difficulties and limited resources, management accomplishments recorded to date demonstrate a great level of perseverance and passion for nature. Protected areas in Lebanon, as in many other countries experiencing conflict, hold a message of hope for reconciliation and peace.

— Diane Matar, Environmental Sciences and Policy, Central European University, Budapest

The IUCN protected area management effectiveness framework

The IUCN Management Effectiveness Evaluation Framework is based on a simple management cycle (Figure 28.2) that:

- begins with understanding the context of the protected area, including its values, the threats it faces and opportunities available, its stakeholders, and the management and political environment
- progresses through planning: establishing vision, goals, objectives and strategies to conserve values and reduce threats
- allocates inputs (resources) of staff, money and equipment to work towards the objectives
- implements management actions according to accepted processes
- eventually produces outputs (goods and services, which should usually be outlined in management plans and work plans)
- results in impacts or outcomes, hopefully achieving defined goals and objectives.

The assessment of outcomes—including biodiversity, social, cultural and economic outcomes of protected area management—is a critical component of PAME. Understanding outcomes alone, however, is not sufficient. If PAME is to achieve any of the four purposes of evaluation outlined above, we need to also understand the other five elements in the evaluation cycle and the relationships between them. This is especially critical for using evaluation results to support adaptive management where an understanding of the factors leading to or limiting success is important.

More detail about elements of the cycle and how it can be applied can be found in the IUCN WCPA guidelines for management effectiveness evaluation (Hockings et al. 2006). According to evaluation terminology, PAME might be regarded as an evaluation system, as it has all four of the criteria required, as outlined by Leeuw and Furubo (2008):

1. a distinctive perspective and discipline
2. evaluation activities carried out by evaluators within organisational structures and institutions and not only (or largely) by individual evaluators without connection to management agencies
3. permanence or longer-term use
4. a focus on the intended use of results of evaluations.

Case Study 28.2 Management effectiveness assessment in West and Central Africa, 2008–2011

Management effectiveness of protected areas is becoming an increasing concern to the world of conservation. The IUCN Program on African Protected Areas and Conservation (IUCN PAPACO) undertook a major project with the support of the French Global Environment Facility and the French Development Agency. This project aimed at improving management of protected areas in West and Central Africa and their capacity to fulfil their missions and, consequently, their results. It covered sub-Saharan Africa, from Mauritania (in the west) to Burundi (in the east), a region where most protected areas do not yet achieve their goals of conservation and/or development.

System or site-level assessments were based on the global methodology developed by the IUCN WCPA. The project adapted this framework to the regional context, then trained a team of African evaluators and carried out multiple pilot evaluations. Fourteen country systems have been evaluated, as well as four networks of sites (marine protected areas, Ramsar sites, forest protected areas of Central Africa and World Heritage properties) and individual sites, finally including about 170 sites using methodologies such as RAPPAM, METT or Enhancing our

Heritage (EoH). These evaluations have allowed the IUCN PAPACO to develop a brief synthesis of all assessments and bring technical support to selected sites with targeted training courses to respond to the main issues identified (with the support of the Senghor University of Alexandria, Egypt). The project gave particular attention to the use of assessment results in developing new projects, capacity building and related initiatives to improve site management and conservation.

A scientific and technical committee, comprising IUCN WCPA members and other relevant experts, was created at the beginning of the project to ensure coordination of the assessments. The project helped to identify management strengths and weaknesses and examples of best-practice management on the ground. The results were used to conduct studies of aspects of protected area management and to start work on more formal recognition of good management practices as a way of improving management.

— Geoffroy Mauvais, IUCN PAPACO, Nairobi

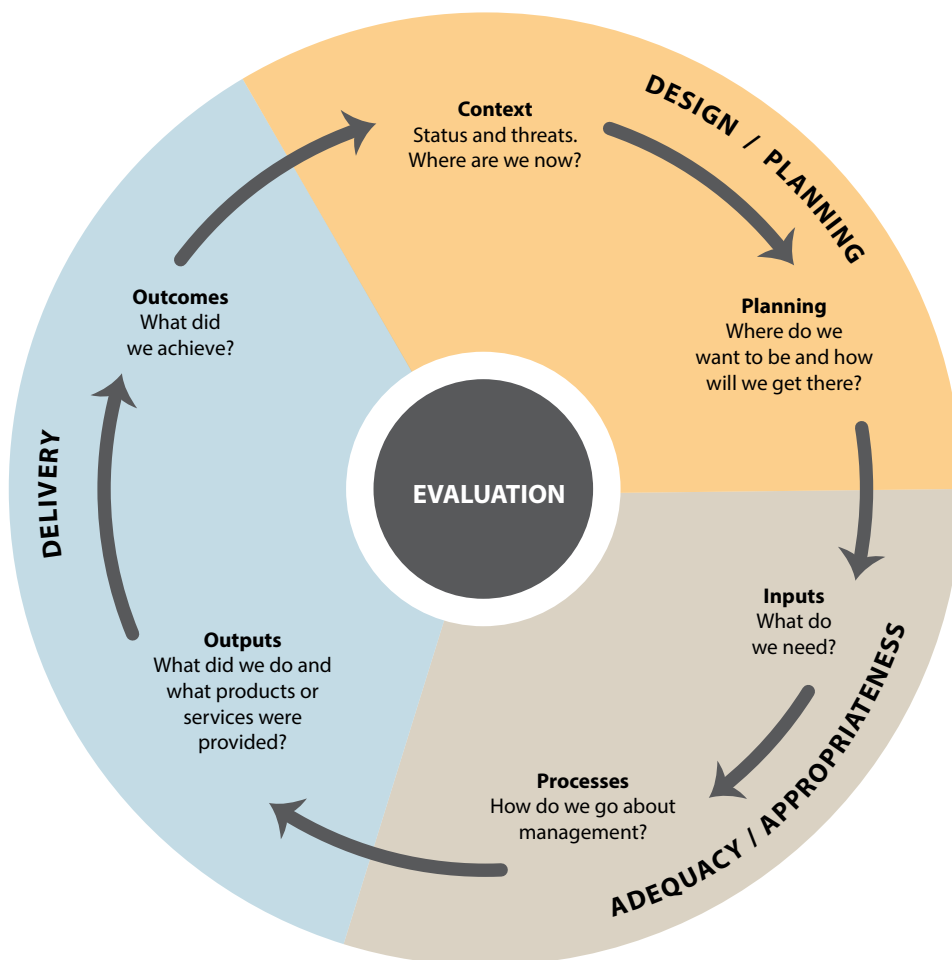


Figure 28.2 IUCN Framework for evaluating Protected Area Management Effectiveness (PAME)

Source: Hockings et al. (2006)

The IUCN PAME framework has been used to design a number of assessment methodologies, which vary in scope and scale (Hockings 2003; Leverington et al. 2008), from relatively rapid, questionnaire-based assessments that are conducted by a few protected area staff and through workshops with stakeholders to more extensive assessments based on field monitoring as well as workshops and stakeholder consultation (Hockings et al. 2009a; Carbutt and Goodman 2013).

In addition to assessments undertaken in response to the GEF and other donor requirements, PAME assessments have been widely applied by NGOs such as WWF and The Nature Conservancy (Ervin 2002, 2003) and by international organisations such as the IUCN and UNESCO (Hockings et al. 2008). Increasingly, PAME systems have been integrated into the operations of management agencies with prominent examples from Colombia (Mayorquin et al. 2010), South Africa (Cowan et al. 2010; Carbutt and Goodman 2013), South Korea (Korean National Parks Service 2009; Heo et al. 2010), and the States of New South Wales (DEC 2005; Hockings et al. 2009a) and Victoria (Parks Victoria 2007) in Australia.

Designing and implementing assessments

In this section, we outline eight key principles and four phases for designing and implementing a management effectiveness evaluation program. We then describe each of these steps in more detail and provide some of the underpinning theoretical concepts. This section compiles some of the findings from the past two decades of protected area management effectiveness evaluations, as documented in workshops, the IUCN WCPA guidelines, journal papers and other experience. The extensive literature on evaluation from other fields, including health, international development, forestry and agriculture, has contributed much to the development of PAME. There are some excellent associations, publications and websites to assist and encourage evaluations, which are both effective and ethical (CMP 2004; Kusek and Rist 2004; DAC 2006; UNDP 2009). Practitioners who are particularly interested in this field are encouraged to explore these resources. The concept and practices of 'utilisation-focused evaluation' (Patton 1997) are particularly appropriate, as they concentrate on improving management and the achievement of outcomes, rather than being academic assessments.

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 Regional Environmental Program for Central America (Programa Ambiental Regional para Centroamérica: PROARCA) manual (Corrales 2004a). An excellent synthesis of guidelines was also presented in the report on strengthening PAME in the Andes region (Cracco et al. 2006). The IUCN WCPA guidelines on management effectiveness (Hockings et al. 2006) are highly recommended reading and provide detailed guidance on how evaluations can be planned and implemented, and some of the material in this chapter is drawn from these guidelines, while recommendations and summaries relating to methodologies can be found in documents produced by the global study (Leverington et al. 2010b, 2008) and a study of PAME in Europe (Leverington et al. 2010c; Nolte et al. 2010).

Drawing from all the sources, eight principles for PAME are included in this section. In summary, these principles state that evaluations of management effectiveness of protected areas should be:

- 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
- practical to implement with available resources, giving a good balance between measuring, reporting and managing
- useful and relevant for improving protected area management; for yielding explanations and showing patterns; and for improving communication, relationships and awareness
- logical and systematic: working in a logical and accepted framework with a balanced approach
- based on good indicators, which are holistic, balanced and useful
- accurate: providing true, objective, consistent and up-to-date information
- cooperative and participatory: with good communication, teamwork and participation of protected area managers and stakeholders throughout all stages of the project wherever possible
- focused on positive and timely communication and application of results.

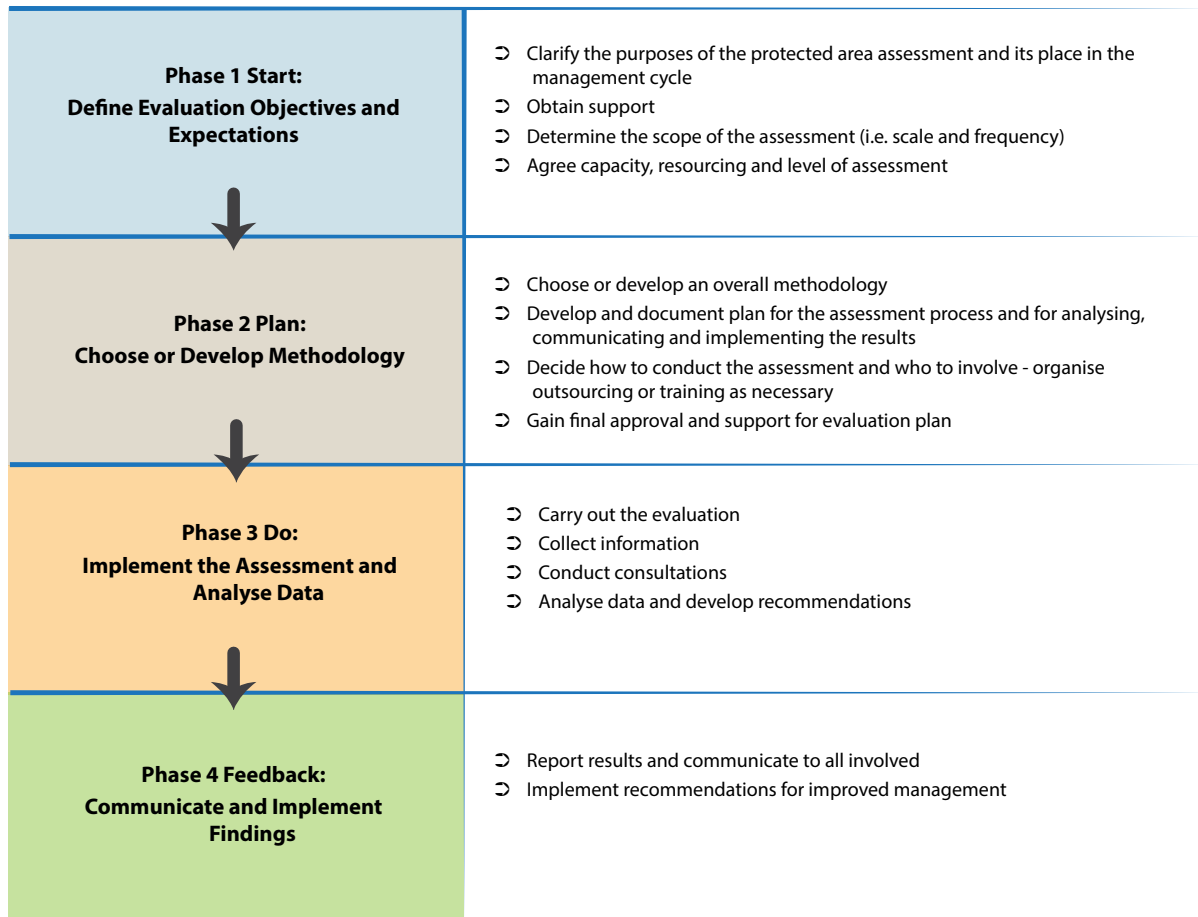


Figure 28.3 Process of designing and implementing PAME

The process of a PAME assessment, as shown in Figure 28.3, can be divided into four major phases.

1. Defining exactly why an assessment is being undertaken and ensuring it fits into a management learning cycle.
2. Planning the assessment and choosing or developing a good methodology.
3. Implementing the study—collecting and analysing the data.
4. Reporting, communicating and implementing the findings.

Phase one: Objectives and expectations

Management effectiveness evaluation is undertaken for a range of reasons, and this greatly influences how it will be planned and implemented. Clear purpose, scope and objectives for the assessment are essential to avoid later confusion and disputes—that is, it is important at the beginning of an evaluation project to know what it

is expected to achieve, and to understand the levels of resourcing and support that can be expected. Agreement among all partners on assessment objectives and scope should be secured before a more detailed methodology is selected or developed. In all likelihood, however, there will be some changes during the process, and expectations should not be too rigid. In most cases, a PAME study should be an integral part of the management cycle of the management agency or another organisation involved with the protected area. This is the first principle of management effectiveness.

- Principle 1: The evaluation should be part of an effective management cycle—linked to defined values, objectives and policies.

Evaluations that are integrated into management culture and processes are more successful and effective in improving management performance in the long term. PAME should be part of the core business cycle and reporting requirements of the agency, closely linked with protected area planning, monitoring, research and annual work programs.

Box 28.4 System-wide evaluations

As well as compiling information about site-level assessments, there is 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 sub-national levels as well as at site level.

Robust and effective management is needed at the 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 headquarters level. Support for site-level management from these centres is also vital. PAME systems that 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 country and system-wide scales.

Some methodologies, notably RAPPAM (Ervin 2003), are intended to assess protected areas over an entire protected area system, and include a number of questions that relate to the design and management of the system as a whole. Such studies have been undertaken in many countries including Brazil, Russia, Papua New Guinea, and in countries across Eastern Europe and West Africa. 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 were at the system level. Other assessments of protected area systems include a similar study in Lithuania (Ahokumpu et al. 2006) and an extensive, ongoing assessment in India (Vinod Mathur, pers. comm.). System-level assessments have also been conducted in Korea, Colombia and Thailand (marine parks) (Heo et al. 2010; Hockings et al. 2012).

In other studies, data are 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. These studies are often conducted as the core element of a ‘state of the parks’ assessment system that is repeated on a regular cycle, usually every three years. Examples include Colombia, South Korea, South Africa and the States of New South Wales and Victoria in Australia. 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 the protected area site level and are more likely to share and transparently report on results at the system level.



Puyehue Volcano in Puyehue National Park, Patagonia, Chile—before serious eruptions began in 2011

Source: Eduard Müller

The initial step

The first step in conducting a management effectiveness evaluation therefore is to define the overall objectives for the exercise, by considering its purpose and scope (including scale and frequency) in light of the resources available for assessment and the subsequent level of the assessment to be attempted. Evaluation can be undertaken at the scale of:

- an individual protected area (or sometimes part of a large protected area)
- a group of protected areas (grouped geographically, by category, by biome or linked to specific projects)
- all protected areas managed by a single agency (including communities or organisations)
- all protected areas within a country (Box 28.4).

Frequency

In some cases, a one-off assessment might be conducted for a particular purpose, but in general, evaluation is most useful as a tool for improving management effectiveness if it is repeated at regular intervals, because this gives better information on trends and also shows if management changes are improving site condition. When protected areas are in an establishment or strengthening phase or under particular threat, yearly assessments may be necessary, but usually two to five-year intervals are adequate to reveal changes and guide management.

Level of assessment

The level of the evaluation—that is, whether it is a relatively quick assessment based on available data or a more in-depth assessment—will be determined by the purpose, the resources available and the organisational capacity and willingness to undertake an assessment.

The quickest and cheapest assessments need little or no additional field research and use established assessment methodologies. This type of evaluation will rely largely on literature research and the informed opinions of site or system managers and/or independent assessors, assessing the *context* of the protected area network or individual site along with the appropriateness of *planning*, *inputs* and *processes* of management and limited assessment of *outputs* and *outcomes*. A more detailed assessment is likely to include some additional monitoring, particularly of *outputs* and *outcomes* of management and the methodologies. The most detailed and thorough assessments will place the greatest emphasis on monitoring the extent of achievement of management objectives through focusing on *outputs* and *outcomes* as well as *context*, *planning*, *inputs* and *processes*. This leads us to the question of resourcing. The second principle relates to the balance of resourcing given to PAME compared with other aspects of management.

- Principle 2: The assessment should be practical and not too expensive to implement, giving a good balance between measuring, reporting and managing. Evaluation is important but should not absorb too much of the resources needed for management. Methodologies that are too expensive and time-consuming will not be repeated, and are less acceptable to staff and stakeholders. An ability to make the most of existing information (from pre-existing monitoring and research) is important. It is critical that all monitoring and evaluation processes within a particular area are aligned and information is shared as much as possible, and that repetition by different organisations and methods is avoided.

Phase two: Planning the assessment

Finding a methodology

Once executives and practitioners are clear about what they wish to achieve, the next step in planning an evaluation will be to select, adapt or develop a methodology. There are advantages in adopting or adapting a PAME methodology that has already been widely used and tested: apart from savings in time and money, the prior experience of other people can be used, and evaluators will be able to share data and



Elevated walkways and viewing areas provide restricted visitor access to the eroding, highly culturally significant and sensitive 'Walls of China' dune in Mungo National Park World Heritage Property, New South Wales, Australia. Mungo is one of the most important places in Australia for studying the environment of the past and the people who lived there.

Source: Ian Pulsford

findings across protected areas and boundaries. Using a 'module' approach, all or parts of the more common methodologies can be taken and combined to develop a methodology that will suit the circumstance.

The most commonly applied PAME methodologies are as follows.

- RAPPAM (Ervin 2003), which measures effectiveness across a group of protected areas in a region or country, has been used in more than 57 countries across the world.
- METT (Stolton et al. 2007) is a requirement for all GEF projects on protected areas and has been applied in at least 110 countries.
- PROARCA/CAPAS scorecard evaluation (Corrales 2004b), which has been applied across six Central American countries on a number of occasions.
- Parks in Peril Site Consolidated Scorecard (The Nature Conservancy Parks in Peril Program 2004), which was applied in 15 Latin American countries as part of the Parks in Peril aid program.
- State of parks assessments in the Australian States of New South Wales and Victoria (for example, Growcock et al. 2009; and Case Study 28.3), which have assessed more than 1200 protected areas at least three times in the past decade. The assessment system, based on a common approach, has been adapted to suit individual management systems in each of the States and has also been used as a model for the development of assessment systems in South Korea and Thailand.

- Enhancing our Heritage methodology (Hockings et al. 2008), developed by the IUCN and UNESCO for application in natural World Heritage sites but which has subsequently been adapted and applied in other protected areas. It represents one of the most detailed site-level evaluation systems.

Principles three, four and five relate to the design of methodologies and might be considered by practitioners when choosing what is most appropriate for their needs.

- Principle 3: The methodology is useful and relevant in improving protected area management, yielding explanations and showing patterns and 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. The process benefits should also be clear and lasting. The indicators used need to be clearly relevant to the protected area and management needs and should help in understanding whether protected area management is achieving its goals or making progress. The initial context step in the IUCN WCPA framework specifies the definition or clarification of protected area values as the basis for the assessment process. This can be useful in itself because many protected areas lack an explicit definition of values. The methodology 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.

Scaling of indicators

Many methodologies use a hierarchical structure that contains different layers of indicators or questions assessing any particular element or dimension. Layers of questions should proceed logically and link from the very general level (for example, biodiversity or community relations) to a more specific and measurable level (for example, the population of one animal species recorded at one time in one place; or the opinions of stakeholders about a particular issue). This hierarchical, nested structure means that information can be ‘rolled up’ or desegregated easily to answer different needs and reporting requirements.

- Principle 4: The methodology is logical and systematic, working in a logical and accepted framework with a balanced approach.

A consistent and accepted evaluation system such as the IUCN WCPA framework provides a solid theoretical and practical basis for assessment and enhances the capacity to harmonise information across different assessments. It is preferable for a methodology to be published, or at least clearly documented and available, so the results are defensible and clearly related to a sound approach.

While some methodologies might focus on particular aspects of management, it is desirable to measure all six elements of the IUCN PAME framework, balancing the need to assess the context, inputs, planning, process, outputs and outcomes of management. There should also be a balance between the different themes or dimensions of management—for example, governance and administration, natural/ecological integrity, cultural integrity, and social, political and economic aspects.

Where assessments are closely tied to management planning or project planning, the systematic methodology may also draw on ideas such as program logic, where the causal chains and assumptions between strategies and desired outcomes are clearly identified.

Topics and indicators: What do we assess?

Topics and indicators in PAME represent the aspects of management that are considered essential if a protected area is to be considered ‘effective’. Development or adoption of sound indicators is a key step in management effectiveness evaluation. The fifth principle for PAME emphasises the need for balance as well as usefulness in informing management.

- Principle 5: 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.

The indicators chosen have some explanatory power, or are able to link with other indicators to explain causes and effects.

The selection of evaluation topics and indicators tends to reflect the interests and viewpoints of people designing or conducting the evaluation; so, for balanced assessments, care needs to be taken to avoid bias. For example, academics and scientists may consider that only outcomes of management are important, while senior management tends to be interested in efficiency and value for money. Indicators chosen by Aboriginal

Table 28.2 Criteria for each element in the IUCN WCPA Framework

Context	Planning	Inputs	Processes	Outputs	Outcomes
<ul style="list-style-type: none"> ↳ Values and significance ↳ Threats ↳ Stakeholder attitudes and relations ↳ Influence of external environment 	<ul style="list-style-type: none"> ↳ Legal status/ gazettal ↳ Tenure issues ↳ Adequacy of legislation ↳ System design ↳ Site design ↳ Management planning 	<ul style="list-style-type: none"> ↳ Staff ↳ Funding ↳ Equipment and facilities ↳ Information 	<ul style="list-style-type: none"> ↳ Governance and leadership ↳ Policy development ↳ Administration, work programming and internal organisation ↳ Evaluation ↳ Maintenance of infrastructure, facilities, equipment ↳ Staff training ↳ Human resource management ↳ Law enforcement ↳ Community involvement ↳ Communication, education and interpretation ↳ Community development assistance ↳ Sustainable resource use - management and audit ↳ Visitor management restoration and rehabilitation ↳ Resource protection and threat reduction ↳ Research and monitoring 	<ul style="list-style-type: none"> ↳ Achieving work program results/outputs 	<ul style="list-style-type: none"> ↳ Achieve objectives ↳ Condition of defined values ↳ Trend of defined values ↳ Effect of protected area on community

traditional owners to evaluate protected areas in Australia mostly focused on processes, particularly related to governance and social relationships (Stacey et al. 2013). In the global study review (Leverington et al. 2010a), the lack of indicators relating to cultural and social aspects of management was notable.

Most PAME methodologies use a hierarchical approach with between two and five levels of organisation. Names for these levels vary, so we shall refer to them here as topics and indicators. At the first level are a small number of broad topics—often some combination of the following: administration, social and political issues, management of natural and cultural resources, community participation

and legal aspects. Other methodologies specifically use the elements of the IUCN WCPA framework as the first level of organisation.

Features that are important to good management at the next, more specific level are then 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. At the last level of organisation, specific indicators for each of these aspects are chosen and described.

Table 28.3 Headings for the indicator matrix

Dimensions of Management		Natural Integrity				Cultural and Spiritual				Socio-economic, Community Engagement and Recreation					
Elements	Fields	Biodiversity	Ecosystem function	Landscape and geology	Climate change resilience	Material culture	Cultural (other)	Spiritual	Aesthetic/ scenic	Recreation	Sustainable resource use	Economic	Science and educational use	Community	Human health and wellbeing
	Context														
	Planning														
	Inputs														
	Process														
	Outputs														
	Outcomes														

Note: Only the elements of management are shown in the row headings, but a full matrix would also include the more detailed criteria shown in Table 28.2.

Where methodologies specifically use the IUCN WCPA framework, the primary basis for organising indicators may be the cycle of management. By working with the framework's *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 underrepresented in rapid-assessment methodologies that focus on 'input' and 'process' indicators. Where methodologies have been designed using different ways of organising indicators, the IUCN WCPA framework can still be applied, by coding or tagging the questions or indicators appropriately. Perhaps the most useful approach organises or analyses indicators according to both the framework's elements and the more commonly nominated fields of management.

A grid matrix represents a convenient way to view the complex array of potential and existing indicators. As we have seen above, the elements of the management cycle are the basis for the IUCN WCPA framework, and provide evaluations with powerful tools for understanding and improving management. Under each element are a number of *criteria* (Table 28.2).

Methodologies often organise indicators according to what protected areas manage, reflecting management agency organisation and reporting needs. For example, headings relate to biodiversity conservation, weed management or

recreation management, or to a capacity issue like staffing, context and planning. We refer to these as the *dimensions* (and below them, *fields*) of management.

A 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 management issues, questions and 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, more than 2000 indicators were mapped on a matrix based on that shown in Table 28.3, to understand the most common questions asked in evaluations. This analysis was then used to help generate a 'common reporting format', which allowed analysis of PAME studies using a wide range of methodologies.

While there is a huge array of potential indicators and questions of interest, it is important to keep the number of indicators to a reasonable level. One way to do this is to focus on the most important aspects of management affecting protected areas. While this will vary from region to region or be affected by other circumstances surrounding a protected area system, some subjects are likely to be generally regarded as important in many parts of the world.

Table 28.4 Example of a four-point scale measuring aspects of ecological integrity

OVERALL VIABILITY SUMMARY – EAST MOLOKAI – HAWAII					
CONSERVATION TARGETS		Landscape Context	Condition	Size	Viability Rank
1	North Shore Forests and Cliffs	Fair	Good	Fair	Fair
2	Montane Wet Forest	Fair	Very Good	Fair	Good
3	South Slope Mesic Forest and Shrubland	Poor	Good	Poor	Fair
OVERALL BIODIVERSITY HEALTH RANK					Fair

Source: TNC (2000)

Scales and scoring

A range of different rating and scoring systems is used in PAME methodologies. Once topics and indicators of evaluation have been defined, most methods follow a four-step process.

- 1. Defining the ideal situation** for each indicator—or in some methodologies, the target is set as an achievable level over a chosen time frame.
- 2. Defining a scoring and rating system.** Usually the lowest score represents no progress, negligible progress or a very poor situation, and the highest represents the current situation. Some methodologies, including most of those adopted in Latin American countries, use a five-point scale, as proposed by Cifuentes et al. (2000). Most of these then measure or estimate the current state as a percentage of a defined optimum or achievable state. Other methodologies including METT and RAPPAM follow a four-point scale, to avoid the tendency of responses to cluster at a midpoint. The four-point scale also corresponds well with the ecological evaluation work being undertaken by The Nature Conservancy (TNC), which proposes that a scale of 'poor', 'fair', 'good' and 'very good' has scientific merit (Parrish et al. 2003), as shown in Table 28.4. The meaning of these four categories has been clearly defined, and in our experience the scheme is well accepted by protected area managers. This four-point scale using red to green colours has also been well accepted by traditional owners in Australia, with the visual presentation of information considered very effective (Stacey et al. 2013).
- 3. Defining the meaning of grades or scores**, which represent levels of progress towards achieving the optimum state. Most methodologies either carefully define what each of these levels represent (that is, 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 to calculate scores for staff, finances or equipment. The more clearly the categories are defined for local circumstances, the more accurate and consistent will be the responses. Sometimes subjective terms—such as 'adequate', 'sufficient' and 'appropriate'—are deliberately used to ensure that assessment categories can be applied to protected areas with a range of different contexts. For example, the level of visitation appropriate to a nature reserve that is protected specifically for important biological features will be very different to that for reserves protected as spaces for recreation. In these cases, it is important to ensure that definitions of what is appropriate are clear to all assessors, to avoid errors derived from using poorly defined language (Regan et al. 2002).
- 4. Considering weightings** for indicators, so that scores for individual indicators can be combined or 'rolled up' into the level or levels above. The indicators at each level may be weighted to reflect the relative importance and contribution to the field. Any weighting should be carefully developed and explained, with assumptions outlined, or the validity of the evaluation can be reduced.

Ensuring accuracy in assessments

There is an increasing level of scrutiny of PAME assessments, and issues of credibility and accuracy are being raised in the literature (for example, Carbutt and Goodman 2013). A current focus for practitioners is on finding ways to increase and clearly demonstrate the reliability of results, as discussed in the sixth principle.

- Principle 6: 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 need to be as accurate and objective 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 resource use and visitor patterns. Links to clear planning, and clarification of assumptions, are important so that any inferences derived from the assessments can be substantiated.

Careful wording

Most management effectiveness evaluations are based on ‘expert elicitation’ using workshops, interviews or questionnaires, which capture the knowledge of assessors. As such, they are prone to errors and cognitive biases (Burgman 2001; Martin et al. 2010; Speirs-Bridge et al. 2010). In particular, qualitative assessment tools can be prone to what are known as framing effects, whereby people have variable interpretations of what they are being asked to assess (Fischhoff 1995). Loosely defined assessment questions can lead to several aspects of the way a question is framed (the assessment frame) being misinterpreted, particularly the scope (which aspects of management are being considered), the scale (which parts of the protected area are being considered) or the time frame (the period over which outcomes are being considered) (Cook et al. 2014a). These types of error are called framing effects and mean that assessors consider different things when making their judgments, such that evaluations cannot be confidently compared between different protected areas. For example, one assessor may evaluate outcomes across the whole protected area, while another only evaluates the area of the reserve under active management. To minimise framing effects, it is important to make sure that these aspects



The unique wildlife such as the Galápagos land iguana (*Conolophus subcristatus*) in the Galápagos National Park, Ecuador, are conserved because visitor impacts are lowered by strict enforcement of limitations to visitor numbers and activities

Source: Ian Pulsford

of the evaluation are made clear in the wording of the assessment questions (Cook et al. 2014a). It cannot be assumed that assessors will understand what is expected of them without explicit directions.

It can be particularly difficult to gain consistent responses to questions that assess several different things simultaneously and offer response choices that are quite complicated—for example, questions that measure both the numbers and the capacity of staff, or those that assess the availability and implementation status of management plans. These should be avoided. To enable greater consistency across different methodologies and studies, some aspects of management effectiveness can draw on standard classifications and lexicons (CMP 2013), such as the standard threat classification (Salafsky et al. 2008).

Measuring trends

Another aspect of evaluations that needs to be made explicit is how evaluations monitor trends in the effectiveness of management over time. Trends can be captured in one of two ways:

1. Using assessment categories that capture the current trend in a management issue—for example, the impacts of invasive plants is increasing, stable or decreasing.

2. Using assessment categories that capture the current status of a management issue (such as the impacts of invasive species are minor, moderate or major) and then using consecutive assessments to build a picture of change over time.

The advantage of evaluations that assess current trends is that multiple years of assessments are not required to determine whether the trajectory for a management issue is positive or negative. This can be particularly important if evaluations are unlikely to be conducted on a regular basis for a prolonged period. The disadvantage of capturing trends within the assessment categories, however, is that subsequent evaluations can be difficult to interpret. For example, if the current impacts of invasive species are assessed as increasing, the impacts may have increased from 5 to 10 per cent or from 90 to 95 per cent—two very different situations. Likewise, an assessment that impacts are increasing in one evaluation period followed by an assessment that impacts are decreasing in a subsequent assessment period may indicate a very large or a very small change in impacts. In these cases, it is more meaningful to record the current status and then provide an indication of the trend in impacts from the previous assessment period (for example, increase, stable, decrease) alongside the current status. In these cases, it would be helpful to encourage assessors to provide more detail about trends in an explanatory field.

Descriptive versus quantitative scores

Assessment scores can be defined using qualitative statements that provide general descriptions of the status of management, such as descriptive categories of the extent to which the natural values of the protected area are intact or degraded (Hockings et al. 2009a). Alternatively, assessment categories can be defined as quantitative thresholds (Timko and Innes 2009), such as the proportion of native vegetation communities within the acceptable fire frequency threshold, or the proportion of the protected boundary adequately demarcated (Corrales 2004a).

The choice of whether to use qualitative or quantitative assessment categories can depend on the management issue being assessed. Quantitative assessment categories tend to be best suited to aspects of management that can be measured numerically, such as the status of biological attributes (for example, population status or vegetation condition) and the number of visitors to a protected area. Some aspects of management, however, are less suited to quantitative metrics, such as whether protected area managers have sufficient information about protected

area values to make informed management decisions. In these cases, qualitative descriptions are required to capture the relevant information.

Management effectiveness evaluations are commonly based on a set of four or five assessment categories. Ideally, these categories reflect an even rating scale of management standards, such that the interval between the poor and moderate management standards is equal to the interval between good and very good management standards. The advantage of using quantitative assessment categories is that it limits subjectivity in the assessment process, so there is no ambiguity about which assessment category should be selected for any particular value. When 50 per cent of vegetation communities are within fire frequency thresholds, the assessment will always be 'moderate' and when 60 per cent are within the threshold, the assessment will always be 'good'—regardless of who is conducting the evaluation. Another advantage of a quantitative assessment scale is that the reason for a particular assessment in any given year is also transparent and can be verified by consulting the available data.

Conversely, using qualitative statements for assessment categories introduces additional subjectivity to the assessment process, so assessments may vary between assessors and between different assessment periods due to differences in how categories are interpreted and applied (Cook et al. 2014a). Several methodological approaches can be employed, however, to limit the influence of subjectivity in assessments, such as providing assessors with face-to-face training and written guidelines that describe how qualitative assessment categories should be interpreted (Cook and Hockings 2011). Some methodologies also bring on-ground protected area managers and stakeholders together to complete assessments in a workshop setting. These workshops facilitate discussion and can standardise how assessment categories are applied to different protected areas and help to minimise the influence of any particular point of view (Cook and Hockings 2011).

Qualitative versus quantitative assessment process

Whether the assessment categories are defined using qualitative statements or quantitative values, selecting the appropriate grade or score for the protected area being assessed should be based on the best available evidence. The type of evidence best suited to support an assessment is influenced by the type of management issue being evaluated (Hockings et al. 2009b). Evaluating the outcomes of management, such as ecological condition assessments, is best suited to empirical data

(for example, research and monitoring data), while management process measures, such as the adequacy of management directions, are better suited to qualitative evidence (for example, expert opinion or experience). While empirical data may be the most appropriate data in some circumstances, often these data are not available to inform assessments, so assessors must rely on other sources of evidence, such as qualitative survey data (for example, visitor satisfaction surveys), expert opinion (for example, scientists or other experts with detailed knowledge of the protected area) or local knowledge (for example, traditional owners and protected area managers) (Cook et al. 2010).

The advantage of using empirical data is that they can be objective sources of evidence, which reduces subjectivity and provides an independent reference point for those wishing to understand why a particular assessment was given. Conversely, qualitative information can be more subjective, meaning that the reason for a particular assessment is less transparent and therefore may be less repeatable in subsequent years. This type of subjectivity may also mean similar information is interpreted differently by different individuals, leading to variation in how assessments are made between different protected areas. The distinction between the reliability of quantitative and qualitative evidence can be a false dichotomy, with the quality of the evidence available being the most important factor in which type of evidence is the most robust (Sechrest and Sidani 1995). Expert elicitation processes can be designed, tested and calibrated to provide a high degree of rigour, and this is important where decisions will be made based on the results of the evaluation (Martin et al. 2012).

It is valuable for assessors to record the evidence used to inform the assessment and the rationale for their judgment. The sources of evidence used to inform the assessment can be recorded through the use of generic categories, such as 'monitoring data', 'management plan' and 'local knowledge' (Hockings et al. 2009a). Evidence sources can also be documented in detail. The rationale for an assessment can be captured in a free text field, placing the assessment in context (for example, a recent fire in the protected area destroyed all infrastructure) and ensuring that the reasoning is transparent. Capturing this additional information can provide a valuable source of information for those conducting future assessments.

Reviewing assessments

It can be important to include review processes within management effectiveness evaluations, whereby assessments are checked by line managers, peer reviewers or a steering committee to ensure consistency between

protected areas. It is important, however, to ensure that this process is constructive. When the original assessment for a protected area is changed due to a review process highlighting an inconsistency, a manager's assessment should not simply be overruled. A non-consultative review process can make assessors feel that their perspective is not valued. One option to avoid a review process being a negative experience is to ensure that it is collaborative, where reviewers discuss any concerns they have about assessments with the assessor in a constructive way and all parties agree on the need for a change.

Triangulation

Triangulation is a process in which several different pieces of evidence are sought to verify or refute a particular conclusion, and it has long been recommended to increase the validity of qualitative data (Patton 1997). There is uncertainty associated with any piece of evidence, through measurement error or other forms of bias (Regan et al. 2002), but when multiple different sources of evidence support a particular view they provide greater confidence that a conclusion is correct (Sechrest and Sidani 1995). Triangulation can be incorporated into an evaluation process by encouraging assessors to consult a range of different types of evidence, leading to more confident assessments. Given that protected area managers do seek multiple lines of evidence to support their management decisions (Cook et al. 2012), a triangulation process can also lead to more complete assessments, which capture the relevant ecological, social, political and economic perspectives. For example, a ranger's response to a questionnaire asking for the level of threat from invasive species could be backed up by spatial mapping and by an external expert.

Pilots

It is unlikely that the initial design phase will lead to a perfect management effectiveness evaluation tool. There can be great benefits to designing a preliminary assessment tool that is piloted with a cross-section of assessors to ensure the questions are clear and that evaluations will represent the full range of management contexts being considered. This pilot stage is likely to provide valuable feedback that can be used to achieve a more effective and representative evaluation tool. It can also be a cheaper alternative to conducting a full survey to find that the evaluation tool needs to be modified.

Any changes made to an assessment tool will mean that at least some of the data collected cannot be compared between subsequent evaluations periods. The trade-off between ensuring the best evaluation tool is developed and achieving continuity between evaluation datasets

means it is best to invest in the redevelopment of the tool as early as possible. This can be achieved by conducting one or more rounds of piloting the tool with a broad cross-section of protected areas before conducting the initial survey across the network. Another advantage of testing the tool in this way is that it can ensure assessors become familiar with the assessment questions.

Phase three: Implementing the assessment and analysing information

Communities, partners and stakeholders

Protected area management practice has increasingly moved towards the recognition of the rights of local communities, neighbours and other stakeholders in planning and decision-making. This participatory approach should wherever possible also apply to the assessment of management effectiveness. As recognised in the seventh principle, a cooperative approach should be adopted from the beginning of the assessment process, including the planning phase.

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

Gaining the 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. 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.

Ideally the assessment should involve a partnership between many players, sharing the power, information and benefits that derive from such a process. Community members have different perspectives and often have longer history and more in-depth knowledge of some aspects of management than protected area staff. Their participation in the evaluation process is important both because they may have information and insights not shared by managers and because their views on the site are closely bound up with overall management success. Involving partners and local people in the assessment can also help all parties understand other viewpoints. In indigenous and community-managed protected areas, it is

essential that collaborative evaluation is a measure of joint management as well as protected area performance, and is a process of negotiation and trust-building (Stacey et al. 2013). The participatory approach improves accuracy, completeness, acceptance, use of information, transparency and cooperation; although it is more expensive and time-consuming to implement, it achieves more credible and sustainable results than processes that are purely internal (Paleczny and Russell 2005; Paleczny 2010).

To help ensure effective stakeholder involvement in evaluation, stakeholders and partners should be regularly informed about:

- the planning process for monitoring and evaluation and their own role in the process—including in some cases decisions about indicators and methodologies
- opportunities to participate in the evaluation exercise
- issues on which they will be asked for their opinion
- how their opinions will be used
- how they will be informed of the progress of the evaluation and the final outcomes
- how the results will be used.

Once all the partners have been identified, it will be necessary to clarify expectations and roles, and in particular to avoid giving participants a false impression of what the assessment offers. For the evaluation process to be rigorous, particularly if it is based on the self-assessment approach, it is advisable to build a team of stakeholder representatives to work with managers to develop and agree on the monitoring and assessment process. This team should include both key protected area personnel (for example, the site manager) and a number of other individuals involved in management issues. The process of conducting meetings and interviews needs to be carefully managed, and it is important to consider how to manage any conflicts that may arise from discussion of management performance.

Internal or external assessors?

An important consideration in planning a management effectiveness evaluation is who will lead or conduct the assessment. In many cases, assessments are conducted by the on-ground protected area managers (self-assessment). This has the advantage of accessing their in-depth knowledge of the management processes and conditions within the protected area. It can also be a valuable time for managers to come together and reflect on management outcomes, share information and facilitate strategic planning activities. Self-assessments may, however, be inaccurate if managers are concerned that negative assessments will reflect badly on their job

performance, particularly in cultures where self-criticism and ‘losing face’ are avoided. Conversely, a desire to attract additional funding for on-ground management actions may give managers an incentive to provide overly pessimistic assessments (Cook et al. 2010). In addition, new staff members may not have the understanding needed for the evaluation. These issues can be resolved if line managers review assessments to check for accuracy and consistency, though this process could also be open to misrepresentation.

The few studies that have investigated the accuracy of self-assessments of management effectiveness have found no evidence to suggest managers conducting self-assessments misrepresent the management of their protected area (Cook et al. 2014b). Preliminary attempts to validate self-assessments for one protected area network in Australia suggest that 75 per cent of protected area managers provide assessments of protected area conditions that match quantitative data. When managers made assessments that did not match measured assessments they tended to be conservative in their judgments of condition, underestimating the outcomes of management relative to measured assessments (Cook et al. 2014b).

External assessors also conduct evaluations, either independently or on behalf of the management agency. External assessors may be consultants, scientists or members of civil organisations. One advantage of external assessors is that they are independent of the management process and, depending on their origins, may be more impartial than managers and stakeholders. They can bring a freshness of vision and have greater expertise in facilitation and assessment procedures; they are also likely to raise issues that have been missed. The disadvantage of external assessors is that detailed knowledge of current and historical conditions and the protected area’s management history may not be captured. In addition, managers may be wary of admitting failures and issues in front of external assessors. When outsiders complete the evaluation, they also often take with them much of the information and perspectives gained, which are then no longer available to management. Unfortunately, local managers and local communities have sometimes been marginalised in the evaluation of international conservation projects carried out by teams of visiting experts who may only visit the area for a brief period. A code of ethics similar to that used by UNDP evaluators (UNDP 2009) may be desirable.

To achieve the best of both approaches, external assessors can work cooperatively with protected area managers and other partners and stakeholders to capture the local on-ground knowledge and the other sources of evidence available to make an objective assessment.

How should information be collected?

As discussed above, some of the information used in PAME assessments is derived from pre-existing data including monitoring data, which can be compiled and interpreted at any stage of the assessment. It is often useful for assessors to have this information, including up-to-date maps or spatial data, before workshops or questionnaires are applied.

Depending on the circumstances, expert elicitation processes can be conducted through online or written surveys, individual interviews, focus groups or workshops with protected area staff, managers, partners and other stakeholders. Guidelines for conducting such processes ethically and to maximum effect are contained in some of the management effectiveness methodologies, and also in other manuals on extension and fieldwork generally. Well-planned and organised workshops with good facilitation and record-keeping are essential; if workshops are chaotic or boring, people will not want to participate the next time. A wide range of techniques is available to engage all participants in the process. For example, more detailed protected area evaluation exercises with communities can make use of tools such as visual aids, oral histories and storylines, which were developed for participatory rural appraisal, adaptive management and allied methods (Chambers 1997; Salafsky et al. 2001; UNDP 2009; Petheram et al. 2012).

‘Conceptual models’ that visually represent values, threats and chains of cause and effect in conservation (Margoluis et al. 2009) are particularly useful for workshops where outcomes as well as processes are being discussed, and can work well with indigenous communities as well as protected area staff and experts (C. Mitchell, pers. comm.). These can be incorporated into computer-based planning and evaluation programs such as Miradi, which is used as an evaluation tool as part of an integrated process by a number of NGOs and protected area managers (CMP 2013; see Chapter 13). Where resources allow, the use of projected spatial images can also be a powerful tool, so threats, values and other elements of protected area management can be mapped and recorded with participants in workshop situations. These maps are then included in assessment reports and presentations and the spatial data stored with other information.



Figure 28.4 Example of simple graphical reporting, from a RAPPAM report

Note: The scale on the y axis represents cumulative scores of the five indicators on a one-to-five scale.

Source: Stanišić (2009)

Online computer-based tools to facilitate streamlined data collection, storage, analysis and reporting have been used very successfully for some management effectiveness methodologies. Online tools can now be used through smartphones, tablets or other portable devices in the field and in workshops, as well as through computers. The advantage of these tools is that the data input into the online interface are transferred automatically into a database. These systems can also enable the dataset to be queried for different purposes and can enable assessors to see and display relevant information, including details from past assessments, while conducting the current assessment. These systems are possible, however, only where there is access to the necessary computer skills, equipment and infrastructure.

Studies evaluating existing management effectiveness evaluation tools provide the following recommendations for how to streamline evaluations and make them easier for assessors to complete (Hockings et al. 2009a; Cook et al. 2014a).

- Ensure the assessment frame is clear and front of mind for assessors when making their assessment. This can be achieved by making explicit in the wording of the questions the important aspects of how assessors should frame their assessments.
- Provide mechanisms to enable assessors to resolve concerns about how to interpret assessment questions.

There are many different options to minimise the bias associated with aspects of the evaluations that may be open to interpretation. These include providing training sessions, facilitated workshops, written guidelines and a hotline that assessors can call to seek advice during the assessment period. Any or all of these approaches can help assessors seek clarification about what they are being asked to evaluate (Cook and Hockings 2011).

- Allow assessors to indicate when they feel there is insufficient information to be confident about making a judgment for a particular management issue. Allowing assessors to opt out of answering questions will prevent assessors feeling they must guess, introducing higher levels of uncertainty into some assessments and potentially leading to inaccurate assessments. Having a record of issues and protected areas that lack adequate information can allow management agencies to identify knowledge gaps. Best practice in eliciting expert opinion includes asking experts to indicate their confidence in the judgment they have provided (Speirs-Bridge et al. 2010).
- Encourage assessors to record as much information as possible during the assessment. Completing comprehensive management effectiveness assessments can be time-consuming, and protected area managers may be reluctant to spend time providing

detailed assessments. Yet there are many benefits to encouraging assessors to document the considerations they make, the rationale for their judgment, the evidence they used and any difficulties they had in completing the assessment. These additional details provide valuable context for consistency checking, assist assessors making evaluations in the future and provide important information to interpret the results of current evaluations. This information can be an invaluable resource for new protected area managers and can form the basis of an induction to the protected area.

Storage and analysis of data

Though data storage and analysis are listed as part of this third phase of evaluation, it is vital that these are thoroughly considered at the outset of the evaluation process, to save wasting time and resources. Data systems that can collect and collate information and allow for different analyses and reporting without re-entering data will obviously save time and minimise the chances of errors. In addition, thinking about future analyses from the outset will influence what data (including metadata) are collected and how they are organised. This can benefit both local analysis and the compilation of national and international data. For example, recording consistent information about the protected area such as the WDPA code, current reserved area, budget, visitor numbers and number of staff will enable patterns of management success to be analysed in relation to many other protected areas. As management effectiveness evaluation datasets can be very large, it is important to have good systems to store and manage data.

Analysis of data can be undertaken at a number of levels. The first level of analysis is a simple compilation of collected data, either for one site or across sites, usually in the form of tables and graphs (Figure 28.4).

Summary results

Many evaluation methodologies can derive summary results, which summarise many data for each protected area into one score or a small number of headline indicators. Such summary scores provide a quick and easy way for an audience to determine comparative conditions. While protected area managers generally want more detailed reporting, quantitative data and analysis, scores are attractive to policymakers and NGOs as they give an instant overview of relative success and a way of comparing protected areas. Visual reporting with colours representing progress is particularly effective for communicating with a range of audiences including senior decision-makers.

Total or average scores, however, risk oversimplifying complex issues, distorting results and being misinterpreted. When people summarise or average scores to produce one overall result, two assumptions are made.

1. They assume that the assessment categories provide a linear scale, whereby the difference between good and very good performance is equal to that between good and moderate performance. This can be difficult to achieve when defining assessment categories using qualitative statements.
2. They assume that all the indicators and sub-indicators are of equal importance. This is rarely true, and a lot of thought should be put into how the scores are 'rolled up' or combined. Methods such as the 'analytical hierarchy process' (Saaty 1995) can be used in a participatory process to ensure that weighting reflects perceptions about the relative importance of indicators.

Statistical analysis

It may be possible for more advanced statistical analyses to be conducted, looking at trends in data and attempting to draw out broader patterns (Kelman 2010). Manipulating results through summing and averaging, however, or assigning weights to different indicators, and through the use of scales and indexes, can give misleading results, particularly if the data are limited in either quantity or quality. In particular, any qualitative data that are converted into quantitative data should be treated with care and their limitations fully recognised.

Multivariate analyses can provide important insights into whether greater financial investment in management will lead to better management outcomes, and where there may be factors, such as proximity to densely populated areas, that may provide intractable challenges for the management of protected areas. The potential use of evaluation data for any or all of these purposes should guide how the evaluation tool is designed.

Statistical advice might be necessary if advanced analyses are considered. Most management effectiveness data can be regarded as 'ordinal', where 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. A purely ordinal dataset, however, would just order responses from the best to the worst, while all PAME methodologies have attempted to develop ratings that reflect steps towards ideal management that are as even as possible. So although 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 (Leverington et al. 2010a). 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.

SWOT analysis

A ‘strengths, weaknesses, opportunities and threats’ (SWOT) analysis can be a useful tool for analysing information further—usually carried out in a workshop with agency staff and/or other stakeholders. SWOT involves categorising data and initial assessments under one or another of these headings. This method can provide a quick summary of management effectiveness in a format that is appropriate for communication with busy top-level managers and politicians and is also a valuable way of identifying the next steps for management (see Chapter 8).

Conceptual models

Management of protected areas is a complex process and it can be very difficult to attribute results and outcomes to any single cause. Generally, it is important to understand as fully as possible the reasons for outcomes. If we cannot understand the reasons for management success or failure, attempts to improve performance or to emulate successful programs may be ineffective. Evaluation that assesses all the elements discussed above with clearly framed questions, carefully chosen indicators, good monitoring and sound methodology is most likely to reveal some useful links and explanations. Conceptual models to understand the dynamics of the protected area and its management can greatly aid in the interpretation of results (Margoluis et al. 2009).

Comparative analysis

Analysis is often strengthened by looking at changes over time or space, such as by comparing several protected areas within a system or measuring how the effectiveness of a single protected area changes over time. Comparison between protected areas can be valuable but needs to be treated with caution, particularly if different assessors have been involved (or even different assessment systems). The WWF RAPPAM methodology (see above) is designed to assess all the protected areas within a country or district, in a workshop situation, where managers provide a certain amount of peer review for each area. Comparisons are useful for identifying trends (including, for instance, common threats or weaknesses) that may need to be addressed at a systems level and also for identifying protected areas that are particularly stronger or weaker than average. Comparison between countries also provides interesting data, but here the risks of distortion are comparatively greater and results should always be treated with caution.

Comparing individual protected areas over time is probably more valuable. It is usually worth repeating assessments at intervals to check on progress and to identify trends. Except in the case of special-purpose single-event evaluations, repeat evaluations are almost always desirable and it is important to adopt an assessment system with low enough costs to allow this. Very simple assessments could be applied annually, while more expensive, time-consuming exercises will probably only be worth undertaking every few years. This approach is applied in Colombia with annual, mid-term and long-term elements to their evaluation system. Assessment does not need to cover all aspects every time. For example, most protected area managers will wish to track implementation of management plans and work plans quite regularly, and evaluations are often required on a regular basis for specific projects within protected areas.

The desire to compare between evaluations over time is sometimes in conflict with the opportunity to improve the assessment system. Evaluation is itself a learning experience, and better indicators, changed circumstances and access to improved technology will all tend to shape evaluation projects over time. Participatory evaluations, by their nature, need to be flexible and respond to people’s needs and perceptions. Changing methodology or indicators will, however, obviously make it much more difficult to compare results over time. In general, changes in survey instruments should be minimised to those that are really important and statistical and other possible adjustments made to help keep results comparable.

Phase four: Communicating results and implementing findings

The best PAME study will be ineffective or have negative impacts 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 so that improvements are encouraged. 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.

- Principle 8: Communication of results is positive and timely and undertaken in a way that is useful to the participants. 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.

Case Study 28.3 'State of the parks' management effectiveness evaluation tools

The 'state of the parks' (SoP) is a system-wide approach to evaluating the effectiveness of protected area management focused on assessing all or most of the protected areas in a network (Hockings et al. 2009). The approach uses consistent indicators across all sites, although the specific indicators used are tailored to the jurisdiction, rather than employing a one-size-fits-all approach. The goal of SoP evaluations is to improve management by using the best available knowledge about the status of park values and their key threats, achievements, gaps and emerging issues to inform future priorities; however, there are often multiple purposes, such as informing strategic planning decisions and increasing accountability through public reporting of the condition of and pressures on protected areas (Leverington et al. 2008). The SoP approach has been used in many different countries, including Canada, the United States, Brazil, Finland and Australia (Hockings et al. 2009).

In Australia, the SoP approach has been widely adopted, and this case study focuses on the approach developed by two management agencies in particular: the NSW Office of Environment and Heritage (NSW OEH) and Parks Victoria (PV). In the NSW OEH, SoP evaluations are used to assess all of the protected areas managed by the agencies, while the SoP tool developed by PV is used to assess the 300 most significant protected areas and other parks within their jurisdiction (10 per cent of the number of parks but approximately 90 per cent of the area managed). In both cases, the evaluation tools have the main purpose of informing and improving management decision-making. While these two SoP evaluation systems were ordained for the same purpose and share many features in common, they are two distinct evaluation tools designed for the specific context and needs of each agency.

Australian protected area management systems are charged with protecting the natural and cultural assets within reserves, along with facilitating the public enjoyment of these publicly owned spaces. The SoP evaluation tools provide a comprehensive view of the effectiveness of management across these different aspects of management. Both the NSW OEH and the PV SoP tools have been developed around the different aspects of the IUCN framework (Figure 28.2), with all these aspects being evaluated within the tool. The context for each protected area is captured by recording the most significant values, threats and stakeholders relevant to the reserve. The important plans relevant to the reserve are recorded. Management inputs, processes, outputs and outcomes are evaluated through a series of targeted assessment questions addressing a wide range of different aspects of management, such as adequacy of information, planning and direction setting, law enforcement, asset management, along with visitors, indigenous heritage and biodiversity management. The emphasis on management outputs and outcomes is rare within management effectiveness assessment tools (Cook and Hockings 2011), but provides a much clearer understanding of the condition of and pressures on individual reserves, as well as across the protected area system.

The assessment questions within the SoP tools are built around four qualitative assessment criteria (see Hockings et al. 2009), which reflect management standards—for example, considering the condition of a value from poor, to moderate, good and very good—and are evaluated by the primary reserve manager or management group. To ensure that the qualitative statements that form the assessment criteria are applicable to protected areas within a wide range of contexts, they are built around subjective terms,



A herbivore-proof exclosure located in montane forests at the headwaters of the Murray River in the Alpine National Park, Victoria, Australia, provides scientific proof of the impact of grazing and trampling by a large population of wild horses (brumbies) for State of Parks reporting.

Source: Ian Pulsford

such as 'adequate', 'sufficient' and 'appropriate', which are interpreted according to the circumstances for the reserve and defined in guidelines. For example, in both jurisdictions, nature reserves are set aside primarily for the protection of biodiversity and visitation is discouraged. Therefore, the appropriate visitor facilities in nature reserves are significantly different to those in multipurpose reserves such as national parks.

Wherever possible, the qualitative categorised assessments are based on measured information (for example, biodiversity monitoring results), but where this is not possible assessments are based on specialist opinion and other knowledge. In other cases (for example, the extent of community involvement in decision-making), qualitative assessments are the most appropriate method.

These qualitative assessments are accompanied by a justification where the rationale for the assessment is given, providing vital context for interpreting evaluations. The justification also allows managers to record important events, such as wildfires, that may have significantly altered the condition of the reserve from one assessment period to the next. Managers are also asked to record the evidence available to support their assessments. In Victoria, this is done through generic categories, such as systematic monitoring or anecdotal evidence. In New South Wales, the generic categories are accompanied by the capacity to provide specific details, such as the name of management plans, research papers or underlying monitoring data.

While qualitative assessments can introduce bias into assessments, there are several features of the SoP tools that attempt to minimise this. Each assessment question enables managers to opt not to assess when they are unsure because insufficient information is available. To maximise consistency and minimise bias, both agencies have established comprehensive quality-assurance processes. While public reporting of SoP results has been undertaken, both agencies have focused heavily on application of the SoP tool for knowledge and adaptive management through an extensive program of 'closing the loop' workshops with park staff. In both agencies, this includes the development of web-based user-focused reporting tools to enable all agency staff to access and share results.

One of the most important features of the SoP program from both agencies is the active follow-up of results through 'closing the loop' workshops with parks staff. These workshops feed results back to managers, ask 'why' a particular evaluation result was achieved and seek to inform management responses for the next planning period.

— Carly Cook, Monash University; Andrew Growcock, NSW Office of Environment and Heritage; Tony Varcoe, Parks Victoria

While there is a focus on data from management effectiveness studies, reports that provide context, explanation and recommendations for improvement may be more useful in leading to improved management. Evaluation reports should be clear and specific enough to improve conservation practices—and realistic, addressing priority topics and feasible solutions.

All participants and stakeholders should be provided with some form of feedback as soon as possible, in a format that suits the intended audience. Methods of presentation, language and terminology should be commonly understandable, though more technical language will be appropriate for some audiences. Very brief and pointed reports with attractive visual elements are often needed for senior executives and politicians.

Possible methods of communication include interactive internet sites; reports in hardcopy and available on the Internet; attractive publications and brochures to increase public interest; presentations to managers, decision-makers, interest groups and other stakeholders; field days and special events; media coverage and displays.

Limitations and flaws in the process and potential improvements should be identified in the assessment report. Strengths and weaknesses of management should be identified and clear recommendations made for improving management. Evaluations should spell out the need for planned change or should encourage reinforcement of what is going well at the site or organisational level.

Making a difference: Towards more effective management

Management effectiveness evaluations are worthwhile where they lead to improved management and better outcomes, both ecological and social (Case Study 28.4). This can result quickly and directly from the evaluation process, leading to better cooperation, to clearer understandings and to learning among all partners. Protected area managers can be exposed to new sources of information and new viewpoints, while other stakeholders gain a greater understanding of the challenges facing managers and communities. In some cases, an evaluation workshop also inspires or reminds managers to take immediate action to remedy a situation or begin a new initiative.

The more formal process of 'substantive' improvement occurs where results are analysed so that shortcomings can be addressed. Cases where targeted actions are taken to raise management effectiveness scores appear to be

Case Study 28.4 The value of assessing management effectiveness of protected areas: The Western Cape Nature Conservation Board, South Africa

In 2008 the national government body responsible for conservation in South Africa, the Department of Environmental Affairs (DEA), developed the South African Management Effectiveness Tracking Tool (METT-SA) in order to provide a uniform performance evaluation tool assessing the management effectiveness of protected areas in the country. The METT-SA was conducted in all protected areas in South Africa and the results were published in the DEA report *Management Effectiveness of South Africa's Protected Areas* (Cowan et al. 2010).

The DEA, in agreement with the CEO forum on protected areas, set the national norm for management effectiveness for protected areas in South Africa at a minimum of 68 per cent.

After the report by Cowan et al. (2010), actions were identified at protected area (site) level, organisational (Provincial) level and national level (Table 28.5). CapeNature developed action plans for each reserve in order to address at least five issues per annum pertaining to the METT-SA.

Table 28.5 A summary of actions taken to improve management effectiveness in South Africa, 2010–14

Management effectiveness	Protected area (site) level	Organisational (Provincial) level	National level
Legal status and boundary demarcation	Title deeds and surveyor-general diagrams obtained for land verified	Verification of declarations and boundary descriptions of protected areas Secondment of staff member to assess state land transfer required from national to Provincial government in order to secure land in terms of <i>National Environmental Management: Protected Areas Act (NEMPAA)</i>	Guidelines for the declaration of protected areas Development of geo-database of South African protected and conservation areas (2013)
Protected area expansion	Management of additional land as part of the protected area	CapeNature (Provincial) Protected Area Expansion Plan (Purnell et al. 2010) Protected area expansion in partnership with WWF-SA and Leslie Hill Succulent Karoo Trust with the purchase of more than 100 000 ha	Outcome 10—national protected area expansion targets National Protected Area Expansion Strategy (2008) Intervention with the Department of Minerals and Energy regarding their objection to the proclamation of the Knersvlakte Nature Reserve
Protected area regulations		Legal review to align Provincial ordinance with new legislation, including <i>NEMPAA</i> (Biodiversity Bill in draft)	Brenton Blue Special Nature Reserve Cape Floral Kingdom World Heritage site application <i>NEMPAA</i> 2003 regulations for the proper administration of nature reserves (2012) Draft norms and standards for the management of protected areas (2013)
Strategic plans and conservation development frameworks	Management plans completed for 21 protected areas	The establishment of multidisciplinary management planning teams to guide the development of action plans and processes to ensure that the results from monitoring and research inform management decisions as part of the management planning process Implementation of strategic management planning through the development and implementation of the so-called 71-Step Plan The prioritisation of conservation development frameworks for protected areas with high tourism potential and a process to develop sensitivity zonation of protected areas	Guidelines for the development of a management plan for a protected area in terms of the <i>NEMPAA</i> (Cowan and Mpongoma 2010)
Advisory committee/ neighbours/ community	The establishment of protected area advisory committees to ensure community input into protected area management planning processes and implementation	Guidelines for the establishment of protected area advisory committees developed	

CapeNature conducted METT-SA assessments in 2008, 2011, 2012 and 2013 for protected areas, including marine protected areas, and the results are summarised in Table 28.6. METT scores increased from only five protected areas meeting the national norm (5 per cent) in 2008 to 92 protected areas (84 per cent) in 2013.

Initially the METT-SA assessments were met with some resistance by staff, but as CapeNature has evolved and lent support to protected area managers to address the higher-level challenges, their buy-in to this process has been overwhelming. A very valuable lesson learnt has been the role the four regional ecologists have played to ensure consistency in the interpretation of questions and the resulting scoring. This has ensured consistency across the Province. The increase in scores from 2008 to 2011 could largely be attributed to the effort made in ensuring the regional ecologists agreed on the interpretation of the questions. The improvement of METT scores has been linked to individual performance management in CapeNature, which has ensured staff is rewarded for good work.

The highest improvement in management effectiveness can be seen where the entire protected area management team, including all support services, works together efficiently. The lowest METT scores have been linked to a lack of teamwork and resources.

The partnership and commitment by all levels of government to address shortcomings have significantly improved management effectiveness in South Africa and Western Cape Province. Continued efforts to improve management effectiveness are bringing good results.

— Gail Cleaver-Christie, CapeNature, Directorate: Conservation Management, Stellenbosch, Republic of South Africa

Table 28.6 CapeNature METT-SA Results

Year	No. of protected areas assessed	Area assessed (ha)	No. of protected areas with METT-SA score > 67%	Percentage with METT-SA score > 67%	Area (ha) with METT-SA score > 67%	Percentage area (ha) with a score > 67%
2008	93	789 923	5	5	32 192	4
2011	97	817 907	36	37	347 936	43
2012	100	822 535	54	54	538 020	84
2013	111	839 120	92	84	753 818	90



Marine management workshop, Lamberts Bay, South Africa, September 2010

Source: Gail Cleaver-Christie, CapeNature



African bush elephants (*Loxodonta africana*) in Kruger National Park, South Africa. Maintenance of healthy populations of iconic species such as elephants provides powerful evidence of management effectiveness

Source: Ian Pulsford

very successful provided sufficient resources are available. For example, protected areas in South Africa's Eastern Cape Province improved management effectiveness scores by 33 per cent over a three-year period, due to a concerted effort to address management gaps and raise all the reserves to be considered as 'soundly managed' (Jeckelman et al. 2012). Two key factors determine whether evaluation findings will make a practical difference to management:

- a high level of commitment to the evaluation by managers and owners of the protected areas
- adequate mechanisms, capacity and resources to address the findings and recommendations (Hockings et al. 2006).

Conclusion

Over the past two decades, management effectiveness evaluation has become an integral part of good protected area management. Increasingly, policymakers, senior managers, donors, stakeholders and protected area managers on the ground are looking to this information as a key part of their planning and decision-making armoury. Most importantly, the process of management effectiveness evaluation is becoming institutionalised within management systems. This gives confidence that management effectiveness evaluation will not be a 'passing fad' but part of a contemporary approach to best-practice management. The adaptive approach to planning and management that good PAME can support will certainly be needed if protected areas are to fulfil their role as the key element of global nature conservation efforts. Many challenges remain. Improving the evaluation of social, economic, community and governance aspects of protected area management is one of these. Establishing more explicit standards to guide protected area managers and making the case for more extensive monitoring of key protected area values are others that the IUCN and its WCPA will continue to work on over coming years.

References




Recommended reading

- Abu-Izzedin, F. (2013) *Shouf Biosphere Reserve Management Plan*, [Internal document], Shouf Biosphere Reserve, Lebanon.
- Ahokumpu, A., Brueggemann, J., Gullbiinas, Z. and Kotiimäki, T. (2006) 'Management effectiveness of Lithuanian protected areas', in *Institutional strengthening and modernization of state protected areas service administrations*, Report of Phare Project EuropeAid/114746/D/SV/LT, Savcor Indufor, Metsahallitus, COWI SA, Lithuanian University of Agriculture Consortium, Lithuania.
- Allam Harash, K. and El Shaer, H. (2011) *Management effectiveness evaluation of two nature reserves in Lebanon (Tyre Coast Nature Reserve–Palm Islands Nature Reserve)*, Report prepared under IUCN project from the Lebanese Ministry of Environment, Beirut.
- Anthony, B. (2008) 'Use of modified threat reduction assessments to estimate success of conservation measures within and adjacent to Kruger National Park, South Africa', *Conservation Biology* 22: 1497–505.
- Barber, C. P., Cochrane, M. A., Souza, C. and Veríssimo, A. (2012) 'Dynamic performance assessment of protected areas', *Biological Conservation* 149: 6–14.
- Birnbaum, M. and Mickwitz, P. (2009) 'Environmental program and policy evaluation: addressing mythological challenges', [Editor's notes], *New Directions for Evaluation* 122: 1–7.
- Bruner, A. G., Gullison, R. E., Rice, R. E. and da Fonseca, G. A. B. (2001) 'Effectiveness of parks in protecting tropical biodiversity', *Science* 291: 125–8.
- Burgman, M. A. (2001) 'Flaws in subjective assessments of ecological risks and means for correcting them', *Australian Journal of Environmental Management* 8: 219–26.
- Butchart, S. H. M. and 42 others (2012) 'Protecting important sites for biodiversity contributes to meeting global conservation targets', *PLoS ONE* 7: e32529.
- Carbutt, C. and Goodman, P. S. (2013) 'How objective are protected area management effectiveness assessments? A case study from the iSimangaliso Wetland Park', *Koedoe* 55(1): 1–8.
- Chambers, R. (1997) *Whose Reality Counts? Putting the first last*, Intermediate Technology Publications, London.
- Cifuentes, M., Izurieta, A. and de Faria, H. (2000) *Measuring Protected Area Management Effectiveness*, WWF, GTZ and IUCN, Gland.
- Coad, L., Leverington, F., Burgess, N. D., Cuadros, I. C., Geldmann, J., Marthews, T. R., Mee, J., Nolte, C., Stoll-Kleemann, S., Vansteelant, N., Zamora, C., Zimsky, M. and Hockings, M. (2013) 'Progress towards the CBD protected area management effectiveness targets', *Parks* 19: 13–24.
- Conservation Measures Partnership (CMP) (2004) *Open Standards for the Practice of Conservation*, Conservation Measures Partnership. <www.conservationmeasures.org/CMP/Library/CMP_Open_Standards_v1.0.pdf>
- Conservation Measures Partnership (CMP) (2013) *Open Standards for the Practice of Conservation. Version 3.0*, Conservation Measures Partnership. <www.conservationmeasures.org>
- Convention on Biological Diversity (CBD) (2004) *Programme of Work on Protected Areas*, Secretariat of the Convention on Biological Diversity, Montreal.
- Convention on Biological Diversity (CBD) (2010a) *COP 10 Decision XI/31, 19a*, Secretariat of the Convention on Biological Diversity, Montreal. <www.cbd.int/decision/cop/?id=12297>
- Convention on Biological Diversity (CBD) (2010b) *COP 10 Decision VII/28*, Secretariat of the Convention on Biological Diversity, Montreal. <www.cbd.int/decision/cop/?id=7765>
- Convention on Biological Diversity (CBD) (2011) *Strategic Plan for Biodiversity and the Aichi Targets*, Secretariat of the Convention on Biological Diversity, Montreal. <www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf>
- Cook, C. N. and Hockings, M. (2011) 'Opportunities for improving the rigor of management effectiveness evaluations in protected areas', *Conservation Letters* 4: 372–82.

- Cook, C. N., Carter, R. W. and Hockings, M. (2014a) 'Measuring the accuracy of management effectiveness evaluations of protected areas', *Journal of Environmental Management* 139: 164–71.
- Cook, C. N., Carter, R. W., Fuller, R. A. and Hockings, M. (2012) 'Managers consider multiple lines of evidence important for biodiversity management decisions', *Journal of Environmental Management* 113: 341–6.
- Cook, C. N., Hockings, M. and Carter, R. W. (2010) 'Conservation in the dark? The information used to support management decisions', *Frontiers in Ecology and the Environment* 8: 181–6.
- Cook, C. N., Wardell-Johnson, G., Carter, R. W. and Hockings, M. (2014b) 'How accurate is the local ecological knowledge of protected area practitioners?', *Ecology and Society* 19(2): 32.
- Corrales, L. (2004a) *Midiendo el éxito de las acciones en las áreas protegidas de Centroamérica: Medición de la Efectividad de Manejo* [Measuring the Success of Actions in the Protected Areas of Central America: Measurement of management effectiveness], Tegucigalpa, PROARCA/APM, Guatemala de la Asunción, Guatemala.
- Corrales, L. (2004b) *Manual for the Rapid Evaluation of Management Effectiveness in Marine Protected Areas of Mesoamerica*, PROARCA/APM, USAID and TNC, Guatemala City.
- Courrau, J. (1997) *Estrategia de monitoreo de áreas protegidas de Centro América*, PROARCA/CAPAS, Resultados del Primer Taller de Monitoreo de Areas Protegidas de Centroamérica [Monitoring Strategy for Protected Areas in Central America, PROARCA/LAYERS: Results of the first workshop on monitoring of protected areas of Central America], Tegucigalpa, Honduras.
- Courrau, J. (1999) *Strategy for Monitoring the Management of Protected Areas in Central America*, PROARCA, CAPAS, CCAD and USAID.
- Cowan, G. I. and Mpongoma, N. (2010) *Guidelines for the Development of a Management Plan for a Protected Area in terms of the National Environmental Management: Protected Areas Act, 2003*. Department of Environmental Affairs, Pretoria.
- Cowan, G. I., Mpongoma, N. and Britton, P. (2010) *Management Effectiveness of South Africa's Protected Areas*, Department of Environmental Affairs, Pretoria.
-  Cracco, M., Calvopiña, J., Courrau, J., Medina, M. M., Novo, I., Oetting, I., Surkin, J., Ulloa, R. and Vásquez, P. (2006) *Fortalecimiento de la Efectividad de Manejo en los Andes*, Análisis comparativo de herramientas existentes, UICN, Quito, Ecuador.
- de Faria, H. H. (1993) A procedure to measure the effectiveness of protected wildlands management and its application in two protected areas of Costa Rica, MSc thesis, Tropical Agricultural Research and Higher Education Center, Costa Rica.
- Department of Environment and Conservation (DEC) (2005) *State of the Parks 2004*, NSW Department of Environment and Conservation, Sydney.
- Development Assistance Committee (DAC) (2006) *DAC Evaluation Quality Standards (for Test Phase Application)*, DAC Evaluation Network, OECD, Paris.
- Eken, G., Bennun, L., Brooks, T. M., Darwall, W., Fishpool, L. D. C., Foster, M., Knox, D., Langhammer, P., Matiku, P., Radford, E., Salaman, P., Sechrest, W., Smith, M. L., Spector, S. and Tordoff, A. (2004) 'Key biodiversity areas as site conservation targets', *BioScience* 54: 1110–18.
- Ervin, J. (2002) *WWF Rapid Assessment and Prioritization of Protected Area Management (RAPPAM) Methodology*, WWF, Gland.
- Ervin, J. (2003) 'Rapid Assessment of Protected Area Management Effectiveness in four countries', *Bioscience* 53(9): 833–42.
- Fischhoff, B. (1995) 'Risk perception and communication unplugged—20 years of process', *Risk Analysis* 15: 137–45.
- Foundations of Success, Wildlife Conservation Society and Conservation International (2003) *Conservation synthesis for the measuring conservation impact study*, Draft.
- Geldmann, J., Barnes, M., Coad, L., Craigie, I. D., Hockings, M. and Burgess, N. D. (2013) 'Effectiveness of terrestrial protected areas in reducing habitat loss and population declines', *Biological Conservation* 161: 230–8.

- Gilligan, B., Dudley, N., Fernandez de Tejada, A. and Toivonen, H. (2005) *Management Effectiveness Evaluation of Finland's Protected Areas*, Nature Protection Publications of Metsähallitus, Series A 147, Finland.
- Green, J. M., Larrosa, C., Burgess, N. D., Balmford, A., Johnston, A., Mbilinyi, B. P., Platts, P. J. and Coad, L. (2013) 'Deforestation in an African biodiversity hotspot: extent, variation and the effectiveness of protected areas', *Biological Conservation* 164: 62–72.
- Growcock, A., Sutherland, E. and Stathis, P. (2009) 'Challenges and experiences in implementing a management effectiveness evaluation program in a protected area system', *Australasian Journal of Environmental Management* 16(4): 218–26.
- Heinonen, M. (2006) 'Case study V: "Management effectiveness evaluation of Finland's protected areas"', in M. Hockings, S. Stolton, N. Dudley, F. Leverington and J. Courrau (eds) *Evaluating Effectiveness: A framework for assessing the management of protected areas*, pp. 73–8, 2nd edn, IUCN Best Practice Protected Area Guidelines Series, IUCN, Gland.
- Heo, H. Y., Hockings, M., Shin, W. W., Chung, H. J., Dudley, N., Shadie, P., Vaisanen, R., Vincent, G., Kim, H., Park, S. Y. and Yang, S. W. (2010) 'Management effectiveness evaluation of Korea's protected area system', *Journal of National Park Research* 1: 169–79.
- Hockings, M. (1998) 'Evaluating management of protected areas: integrating planning and evaluation', *Environmental Management* 22: 337–45.
- Hockings, M. (2003) 'Systems for assessing the effectiveness of management in protected areas', *BioScience* 53: 810–23.
- Hockings, M., Cook, C. N., Carter, R. W. and James, R. (2009a) 'Accountability, reporting, or management improvement? Development of a state of the parks assessment system in New South Wales, Australia', *Environmental Management* 43: 1013–25.
- Hockings, M., Ervin, J. and Vincent, G. (2004) 'Assessing the management of protected areas: the work of the World Parks Congress before and after Durban', *Journal of International Wildlife Law and Policy* 7: 1–12.
- Hockings, M., James, R., Stolton, S., Dudley, N., Mathur, V., Makombo, J., Courrau, J. and Parrish, J. (2008) *Enhancing our Heritage Toolkit: Assessing management effectiveness of natural World Heritage sites*, UNESCO, Paris.
- Hockings, M., Shadie, P., Vincent, G. and Suksawang, S. (2012) *Evaluating the management effectiveness of Thailand's marine and coastal protected areas. Report for the Mangroves for the Future project*, IUCN Asia Office, Bangkok.
- Hockings, M., Stolton, S. and Dudley, N. (2000) *Evaluating Effectiveness: A framework for assessing the management of protected areas*, IUCN, Gland.
- Hockings, M., Stolton, S., Dudley, N. and James, R. (2009b) 'Data credibility: what are the "right" data for evaluating management effectiveness of protected areas?', *New Directions for Evaluation* 122: 53–63.
-  Hockings, M., Stolton, S., Leverington, F., Dudley, N. and Courrau, J. (2006) *Evaluating Effectiveness: A framework for assessing management effectiveness of protected areas*, 2nd edn, IUCN Best Practice Protected Area Guidelines Series, IUCN, Gland.
- Izurieta, A. (1997) Evaluación de la eficiencia del manejo de áreas protegidas: validación de una metodología aplicada a un subsistema de áreas protegidas y sus zonas de influencia, en el Área de Conservación Osa, Costa Rica [Evaluation of the effectiveness of the management of protected areas: validation of a methodology applied to a subsystem of protected areas and their zones of influence in the Osa Conservation Area, Costa Rica], MSc thesis, Turrialba, CATIE, Costa Rica.
- Jaradi, G. R. and Matar, D. (2012) *Jabal Moussa Biosphere Reserve Management Plan 2013–2023*, [Internal document], Association for the Protection of Jabal Moussa, Lebanon.
- Jeckelman, J., Fielding, P. and Norval, M. (2012) *ECPTA Provincial Nature Reserves METT Assessment Report 2012*, Eastern Cape Parks and Tourism Agency, East London, South Africa.
- Keene, M. and Pullin, A. S. (2011) 'Realizing an effectiveness revolution in environmental management', *Journal of Environmental Management* 92: 2130–5.

- Kelman, J. (2010) *Analysis of Protected Area Management Effectiveness Evaluation Data and its Application for Increasing Understanding of Management*, University of Queensland, Brisbane.
- Korean National Parks Service (2009) *Korea's Protected Areas: Evaluating the effectiveness of South Korea's protected areas system*, Korean National Parks Service, Seoul.
- Kusek, J. Z. and Rist, R. C. (2004) *Ten Steps to a Results-Based Monitoring and Evaluation System: A handbook for development practitioners*, The World Bank, Washington, DC.
- Leeuw, F. L. and Furubo, J. E. (2008) 'Evaluation systems: what are they and why study them?', *Evaluation* 14: 157–69.
- Leverington, F., Costa, K., Pavese, H., Lisle, A. and Hockings, M. (2010a) 'A global analysis of protected area management effectiveness', *Environmental Management* 46: 685–98.
- Leverington, F., Costa, K. L., Courrau, J., Pavese, H., Nolte, C., Marr, M., Coad, L., Burgess, N., Bomhard, B. and Hockings, M. (2010b) *Management Effectiveness Evaluation in Protected Areas: A global study*, 2nd edn, University of Queensland, IUCN WCPA, TNC and WWF, Brisbane.
-  Leverington, F., Hockings, M., Pavese, H., Costa, K. T. and Courrau, J. (2008) *Management effectiveness evaluation in protected areas—a global study. Supplementary report No. 1: Overview of approaches and methodologies*, University of Queensland, TNC, WWF and IUCN WCPA, Brisbane.
-  Leverington, F., Kettner, A., Nolte, C., Marr, M., Stolton, S., Pavese, H., Stoll-Kleeman, S. and Hockings, M. (2010c) 'Protected area management effectiveness assessments in Europe: overview of European methodologies', *BfN-Skripten* 271b, German Federal Agency for Nature Conservation, Vilm, Germany.
- Likert, R. (1932) 'A technique for the measurement of attitudes', *Journal of Social Psychology* 5: 228–38.
- Margoluis, R., Stem, C., Salafsky, N. and Brown, M. (2009) 'Using conceptual models as a planning and evaluation tool in conservation', *Evaluation and Program Planning* 32: 138–47.
- Margules, C. R. and Pressey, R. L. (2000) 'Systematic conservation planning', *Nature* 405: 243–53.
- Martin, T. G., Burgman, M. A., Fidler, F., Kuhnert, P. M., Low-Choy, S., McBride, M. and Mengersen, K. (2010) 'Eliciting expert knowledge in conservation biology', *Conservation Biology* 26: 29–38.
- Matar, D. A. and Anthony, B. P. (2010) 'Application of modified threat reduction assessments in Lebanon', *Conservation Biology* 24: 1174–81.
- Mayorquin, A., Valenzuela, S. and Rangel Ch, J. (2010) 'Evaluación de la efectividad de manejo en reservas naturales de la sociedad civil: una propuesta metodológica [Evaluation of the effectiveness of management in natural reserves of civil society: a methodological proposal]', *Caldasia* 32: 381–97.
- National Reserve System Task Group, Natural Resource Management Ministerial Council (NRMMC) (2009) *Australia's Strategy for the National Reserve System 2009–2030*, National Reserve System Task Group, Natural Resource Management Ministerial Council, Canberra.
-  Nolte, C., Leverington, F., Kettner, A., Marr, M., Nielsen, G., Bomhard, B., Stolton, S., Stoll-Kleeman, S. and Hockings, M. (2010) 'Protected area management effectiveness assessments in Europe: a review of applications, methods and results', *BfN-Skripten* 271a, German Federal Agency for Nature Conservation, Vilm, Germany.
- Palczy, D. (2010) *Protected Area Assessment and Reporting: An examination of current approaches and evolving needs with application of an integrated model in Egypt*, University of Greenwich, UK.
- Palczy, D. R. and Russell, S. (2005) 'Participatory approaches in protected area assessment and reporting', in *Proceedings of the Parks Research Forum of Ontario*, pp. 87–95, University of Guelph, Ontario.
- Parks Victoria (2007) *Victoria's State of the Parks Report*, Parks Victoria, Melbourne.
- Parrish, J., Braun, D. P. and Unnasch, R. S. (2003) 'Are we conserving what we say we are: measuring ecological integrity within protected areas', *BioScience* 53: 851–60.
- Patton, M. Q. (1997) *Utilization-Focused Evaluation: The new century text*, 3rd edn, Sage, Thousand Oaks, CA.

- Patton, M. Q. (1998) 'Discovering process use', *Evaluation* 4: 225.
- Petheram, L., Stacey, N., Campbell, B. M. and High, C. (2012) 'Using visual products derived from community research to inform natural resource management policy', *Land Use Policy* 29: 1–10.
- Purnell, K., Kirkwood, D. and Maree, K. (2010) *CapeNature Protected Area Expansion Strategy and Implementation Plan 2010–2015*. CapeNature, Bridgetown, South Africa.
- Regan, H. M., Colyvan, M. and Burgman, M. A. (2002) 'A taxonomy and treatment of uncertainty for ecology and conservation biology', *Ecological Applications* 12: 618–28.
- Saaty, T. (1995) *Decision Making for Leaders: The analytical hierarchy process for decisions in a complex world*, RWS Publications, Pittsburgh.
- Salafsky, N. and Margoluis, R. (1999) 'The threat reduction assessment (TRA) approach to measuring conservation success: a practical and cost-effective framework for evaluating project impact', *Conservation Biology* 13: 830–41.
- Salafsky, N., Margoluis, R. and Redford, K. (2001) *Adaptive Management: A tool for conservation practitioners*, Biodiversity Support Program, Washington, DC.
- Salafsky, N., Salzer, D., Stattersfield, A. J., Hilton-Taylor, C., Neugarten, R., Butchart, S. H. M., Collen, B., Cox, N., Master, L. L., O'Connor, S. and Wilkie, D. (2008) 'A standard lexicon for biodiversity conservation: unified classifications of threats and actions', *Conservation Biology* 22: 897–911.
- Saterson, K. A., Christensen, N. L., Jackson, R. B., Kramer, R. A., Pimm, S. L., Smith, M. D. and Wiener, J. B. (2004) 'Disconnects in evaluating the relative effectiveness of conservation strategies', *Conservation Biology* 18: 597–9.
- Scharlemann, J. P., Kapos, V., Campbell, A., Lysenko, I., Burgess, N. D., Hansen, M. C., Gibbs, H. K., Dickson, B. and Miles, L. (2010) 'Securing tropical forest carbon: the contribution of protected areas to REDD', *Oryx* 44: 352–7.
- Sechrest, L. and Sidani, S. (1995) 'Quantitative and qualitative methods: is there an alternative', *Evaluation and Program Planning* 18: 77–87.
- Selig, E. R. and Bruno, J. F. (2010) 'A global analysis of the effectiveness of marine protected areas in preventing coral loss', *PLoS One* 5(2). <doi:10.1371/journal.pone.0009278>
- Sims, K. R. E. (2010) 'Conservation and development: evidence from Thai protected areas', *Journal of Environmental Economics and Management* 60: 94–114.
- Sims, K. R. E. (2014) 'Do protected areas reduce forest fragmentation? A microlandscapes approach', *Environmental and Resource Economics* 58: 303–33.
- Speirs-Bridge, A., Fidler, F., McBride, M., Flander, L., Cumming, G. and Burgman, M. (2010) 'Reducing overconfidence in the interval judgments of experts', *Risk Analysis* 30: 512–23.
- Stacey, N., Izurieta, A. and Garnett, S. T. (2013) 'Collaborative measurement of performance of jointly managed protected areas in northern Australia', *Ecology and Society* 18(1): 19.
- Stanišić, N. (2009) *Results of the Initial Evaluation of Protected Area Management in Montenegro using RAPPAM Methodology*, Ministry of Tourism and Environment of Montenegro and WWF Mediterranean Program, Podgorica.
- Stem, C., Margoluis, R., Salafsky, N. and Brown, M. (2005) 'Monitoring and evaluation in conservation: a review of trends and approaches', *Conservation Biology* 19(2): 295–309.
-  Stolton, S., Hockings, M., Dudley, N., MacKinnon, K., Whitten, T. and Leverington, F. (2007) *Reporting Progress in Protected Areas: A site-level management effectiveness tracking tool*, 2nd edn, World Bank/WWF Forest Alliance, Gland.
- The Nature Conservancy (TNC) (2000) *The Five-S Framework for Site Conservation: A practitioner's handbook for site conservation planning and measuring conservation success*, The Nature Conservancy, Arlington, VA.
- The Nature Conservancy Parks in Peril Program (2004) *Measuring Success: The Parks in Peril site consolidation scorecard manual*, [Updated 10 May], The Nature Conservancy, Arlington, VA.
- Timko, J. and Innes, J. (2009) 'Evaluating ecological integrity in national parks: case studies from Canada and South Africa', *Biological Conservation* 142: 676–88.

United Nations Development Programme (UNDP)
(2009) *Handbook on Planning, Monitoring and Evaluating for Development Results*, UNDP, New York.

Widger D. (ed.) (2012) 'Letter 1 Bath, October 9, 1746', in *The Project Gutenberg Edition of Chesterfield's Letters to His Son, by the Earl of Chesterfield*, Project Gutenberg. <snowy.arsc.alaska.edu/gutenberg/3/3/6/3361/3361-h/3361-h.htm>

Woodley, S., Bertzky, B., Crawhall, N., Dudley, N., Londoño, J. M., MacKinnon, K., Redford, K. and Sandwith, T. (2012) 'Meeting Aichi Target 11: what does success look like for protected area systems', *Parks* 18: 23–36.

This text taken from *Protected Area Governance and Management*,
edited by Graeme L. Worboys, Michael Lockwood, Ashish Kothari, Sue Feary and Ian Pulsford,
published 2015 by ANU Press, The Australian National University, Canberra, Australia.

Reproduction of this ANU Press publication for educational or other non-commercial purposes is authorised without prior written permission from the copyright holder, provided the source is fully acknowledged. Reproduction of this publication for resale or other commercial purposes is prohibited without prior written permission of the copyright holder.