Protected Areas Programme

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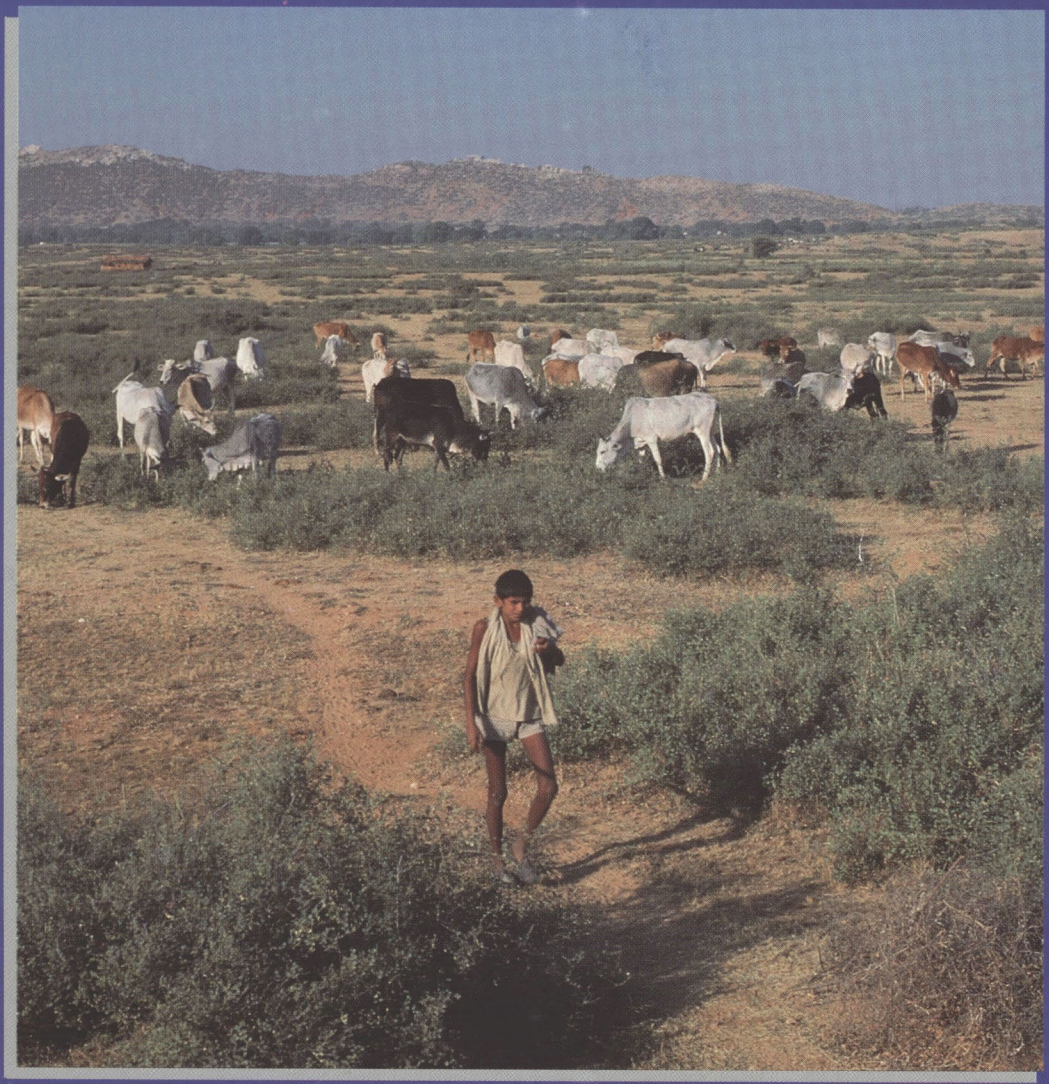
Management Effectiveness of Protected Areas



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PARKS, 36 Kingfisher Court, Hambridge Road, Newbury, RG14 5SJ, UK
Fax: [+ 44] (0)1635 550230
Email: parks@naturebureau.co.uk

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PARKS is published to strengthen international collaboration among protected area professionals and to enhance their role, status and activities by:

- maintaining and improving an effective network of protected area managers throughout the world, building on the established network of WCPA
- serving as a leading global forum for the exchange of information on issues relating to protected area establishment and management
- ensuring that protected areas are placed at the forefront of contemporary environmental issues such as biodiversity conservation and ecologically sustainable development.

Cover photo: Over-grazing by cattle on *Sehima - dichanthum* grassland at the Karera Bustard Sanctuary, India. Photo: Paul Goriup.

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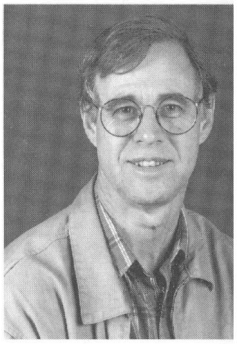
Editorial

MARC HOCKINGS



I AM WRITING this editorial on my way home from Costa Rica where I have been attending a workshop on management effectiveness of protected areas – the topic of this edition of PARKS. I am sure that this workshop will come to be seen as a key event in the development of this field. Unfortunately, due to space constraints, we are unable to include a full description of the meeting in this issue, but a summary of the discussions that took place over the three days appears at the end of this editorial. The meeting was organised by the IUCN/WWF Forest Innovations Project and the IUCN World Commission on Protected Areas with funding from the WWF/World Bank Alliance and Forests for Life Campaign. The meeting was held at the Tropical Agronomic Centre for Research and Education (CATIE); an appropriate venue given the extensive work on assessment of management effectiveness that has been carried out by staff and students at this institution, in association with WWF. Unfortunately an English version of the paper outlining the WWF/CATIE system was not available for publication in this issue, but a translation is now being arranged as part of the IUCN/WWF Forest Innovations Project.

The workshop, with participants of more than 14 nationalities across five continents, provided an opportunity to share experiences and plan for future developments. Despite the relative lack of published information on management effectiveness, the participants at the workshop were able to report on an impressive and growing body of experience 'in the field'.

The involvement of various forest programmes in the conduct of this workshop reflects the fact that much of the practical experience in the assessment of management effectiveness comes from work in forest biomes. It was however encouraging that the meeting did not have too much of a 'forest' feel to it and participants recognised that this is an issue for all protected areas, whatever the biome or category of protected area.

The papers in this edition of PARKS reflect some of the diversity of work in this area. They include studies on the level and adequacy of funding for protected areas, a study of 'paper parks' and reports of the results of studies of management effectiveness using a variety of methodologies. In the first paper (Hockings and Phillips) we suggest that a single methodology for assessing management effectiveness is neither desirable nor possible and that we need a 'toolbox' of approaches from which appropriate methods can be selected to suit individual needs. There are nevertheless advantages in harmonising efforts where possible. The dialogue that has commenced, and which this issue promotes, should assist in this process. One of the principal aims of the WCPA Management Effectiveness Task Force is to facilitate this sharing of ideas. We are establishing a website which will be operational in late 1999 to help us achieve this objective. You will be able to access the site through a link from the general WCPA website (http://www.iucn.org/themes/wcpa/index.html).

The Task Force has established an ambitious work program leading up to the World Parks Congress in 2002. We will be looking for ideas, comments and inputs

from the broad protected area community over this period. I hope that you find the papers in this issue both interesting and informative and that they might stimulate you to contribute to the development of ideas in this emerging field.

Management Effectiveness of Protected Areas - summary of an international workshop

Summary of the first day's discussions

Rod Taylor (Chair).

The day's discussions outlined a series of general issues that need to be addressed in any system. These are summarised in note form below:

- variation: the need for assessment systems to fulfil multiple needs and multiple users.
- level of assessment: assessment of individual protected areas and national/regional protected area systems – the link to users.
- participation: the importance of involving managers, stakeholders *and* independent assessors – the problem of political pressures.
- terminology: the need for clarification of typology.
- realistic system: the importance of choosing indicators that can be measured – a trade off between cost and accuracy.
- political implications: the importance of considering how the assessment can be used to generate positive change – risks of alienating important stakeholder groups.
- human and ecological wellbeing: impacts of people on protected areas and impacts of protected areas on people.
- time: the need to include temporal issues in assessment.
- IUCN Categories: the need to address a range of categories.
- harmonisation rather than standardisation.

The day ended with a reception held for the workshop participants hosted by CATIE and WWF.

Workshop days 2 and 3

For the remainder of the workshop, participants worked in working groups and in plenary sessions to develop proposals relating to the further development of assessment systems and to options for some global framework for measuring effectiveness. Much of the discussion took place in three groups, which addressed a series of questions:

- what is the objective of the assessment?
- who is going to use assessment systems?
- how is information going to be used?
- what are the key elements and at what level?
- who is going to carry out assessment?
- how is assessment going to be made?
- what are the possible models?

In addition, the participants identified a series of draft ***principles*** for assessment.

The following notes are a summary of these discussions. Many of the questions have been answered, at least in part, through the medium of the principles and are therefore not addressed specifically below.

Objective

To improve management effectiveness of protected areas – including analysis of individual protected areas and analysis of protected area systems – as an important input to biodiversity conservation.

How is the information going to be used?

- to help *managers* to improve protected area management.
- to influence *policy* to improve protected area systems and management.
- to raise *awareness* of civil society.
- to enable *accountability* of protected area effectiveness.

Draft principles

- assessment systems should be as *participatory* as possible and stakeholders should also be involved in the process as early as possible.
- assessment should be based upon a *transparent, comprehensible* and *accessible* system.
- assessment of inputs, processes, outputs and outcomes all contribute to an overall evaluation of management.
- indicators should wherever possible cover biology, geography, social and cultural issues, economics, management, information and policy.
- when assessment systems are not able to address all of the possible factors and indicator types, the limitations should be clearly stated in assessment reports.
- the system should show *progress* over time through periodic assessments.
- assessments of management effectiveness should focus on the most important issues – including threats and opportunities – affecting the achievement of the management *objectives*, which in turn must be clearly defined and understood by the managers and the assessment team.
- in reporting on assessment, issues should be divided between those that are within and outside the manager's control.
- assessment should collect data that allow *prioritisation* of conservation effort. Clear recommendations for management improvement should be a feature of all assessments.
- assessments should be based on sound and appropriate *ecological* and *social* science. Assessment is likely to include both quantitative and qualitative information.

Guidelines for widespread adoption

- awareness of need for assessments.
- political will to promote and support them among agencies, governments and donors.
- conceptual framework.
- availability of practical, cost-effective assessment methods.
- training and extension in assessment systems/methods.
- oversight of assessment – quality control.

- mechanisms for consolidating, synthesising and reporting on global information at ecosystem, IUCN management category, and site-specific levels.

Marc Hockings, Co-Chair, WCPA Management Effectiveness Task Force, School of Natural and Rural Systems Management, University of Queensland, Queensland 4345, Australia. Email: hockings@uqg.uq.edu.au

Erratum: Apologies to anyone who has tried to e-mail Bob Pressey in response to the articles published in the last issue of *PARKS* (9.1 Reserve Design and Selection). The correct e-mail address is: bpressey@ozemail.com.au

How well are we doing? - some thoughts on the effectiveness of protected areas

MARC HOCKINGS AND ADRIAN PHILLIPS

While the extent of the protected area estate around the world continues to expand, the attention of managers, policy makers and advocates for protected areas is increasingly being directed to the question of how effectively these areas are being managed. Information on management effectiveness is required for a variety of purposes and by a variety of people and this leads to the need for a 'toolbox' of methodologies that can address this diversity.

AROUND THE world, protected areas are seen as a key to conserving natural resources, on land and at sea. Some 30,000 or more such areas now meet the IUCN definition of a protected area:

An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of associated cultural and natural resources, and managed through legal or other effective means. (IUCN 1994).

Together, protected areas now cover nearly 12.8 million km^2, or 9.5% of the total land area of all countries (Green and Paine 1997). International agreements such as the Ramsar Convention, the World Heritage Convention and the UNESCO MAB programme require the setting up of *individual* protected areas, whilst the Convention on Biological Diversity, some regional initiatives, such as the European Natura 2000 network, and many national policies (e.g. National Development Planning Agency 1993, Department of Environment, Sport and Territories 1993) call for the establishment of a comprehensive *system* of protected areas. Protected areas contribute to a country's social and economic objectives through supporting ecosystem services, promoting sustainable use of renewable resources, and underpinning much tourism and recreation (IUCN 1992). The constituency for protected areas is therefore broad and diverse.

However, protected areas can only deliver their environmental, social and economic benefits if they are effectively managed. There is increasing concern that this is often not the case (Dudley *et al.* 1999), and governments, management agencies and international aid and conservation organisations have begun to devote attention to the question of how to assess management effectiveness.

However, in an almost infinitely diverse world, there can never be just one standard methodology for such a task. A sophisticated approach that will work in a wealthy country like Canada, may not work in Chad; a process suitable for a vast area like the Great Barrier Reef Marine Park would be inappropriate for a small marine reserve; a methodology for a wilderness area in Alaska could not be applied in a lived-in protected landscape in Western Europe. So the need is to develop a toolbox of approaches which are derived from a single, broad conceptual framework.

In this paper we explore such questions such as:

- why assess effectiveness and how can such assessments improve management?
- who is going use the information on management effectiveness?
- who will collect the information?
- what do they want to know?
- how will it be used?

Why? - the role of evaluation in protected area management

There are many reasons why people want to assess management effectiveness. Funders, policy makers and conservation lobbyists may use the results to highlight problems and to set priorities; or to promote better management policies and practices by management agencies. Managers may wish to use evaluation results to improve their performance (adaptive management) or to report on achievements to senior managers, the government or external stakeholders (accountability). Local communities and other stakeholders need to establish how far their interests are being taken into account.

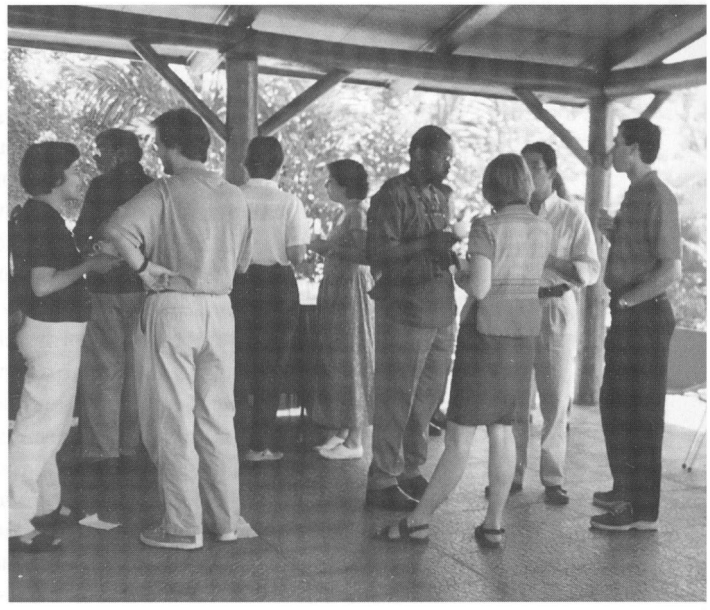
Our view of protected areas management is that it is a circular, not a linear process, and that evaluation is about using information concerning the past to enhance the way management is conducted in future – helping management to adapt through a learning process. Whatever other purposes it may serve, evaluation should be seen primarily as a tool to assist managers in their work, not as a system for watching and punishing managers for inadequate performance. It must be used positively to support managers and as a normal part of the process of management rather than negatively, or as a response to a perceived failure of management.

Below and opposite: participants at the workshop on management effectiveness of protected areas in Costa Rica. Photos: Sue Stolton.

Evaluation consists of reviewing the results of actions taken and assessing whether these actions have produced the desired results. It is something that all good managers already do where the link between actions and consequences can be simply observed; for example, in assessing whether site hardening has been effective in reducing the level of some localised environmental impact.

But the link between action and outcome is often not so obvious. Faced with the daily demands of their job, many protected area managers are not able to systematically review the results of their efforts. In the absence of such reviews, however, money and other resources can be wasted on programmes that do not achieve their objectives. Protected area managers must expect to come under ever greater pressure to introduce systems of monitoring and evaluation, at both the programme and project level, which will:

- promote and enable an adaptive approach to management where managers strive to learn from their own and others' successes and mistakes.
- keep track of the consequent changes in management objectives and practices so that people can understand how and why management is being undertaken in this way.
- improve planning, either at the time of initial design or as a review of lessons learnt during a pilot programme.
- compare results derived from addressing common problems in different ways in a number of protected areas, thus allowing managers to select the best approach.
- review programmes, using the results of evaluation for prioritisation, and deciding whether programmes should be continued or resources transferred to competing initiatives or areas.



Who is interested in knowing about management effectiveness and what do they want to know?

International involvement in protected areas management has grown as conservation of natural resources has become an increasingly significant issue of global concern. The international community expresses its interest through global and regional conventions and other initiatives concerned with protected areas, through support for international biodiversity conservation programmes (such as the GEF), via development assistance programmes many of which support activities relating to protected areas, and through the efforts of international NGOs. All need to know where to prioritise their investments (Green *et al.* 1997), and are therefore concerned with the effectiveness of management at the site level, and cumulatively at national and international levels.

Site level assessment is generally met through project evaluations, usually undertaken by external review teams during the life of the project or more commonly at its conclusion. In common with general developments in programme evaluation (see O'Faircheallaigh 1992), there has been a recognition that the focus of such assessments should shift from questions about the resources that have been devoted to a project, how the project was carried out, and what was done, towards answering the question "did the project achieve its objectives?" Embedded in such an apparently simple question are further challenging issues that require resolution:

- who defines the objectives?
- are there multiple and conflicting objectives and which ones should be given attention?
- what time scale is appropriate for assessing achievement?
- who should make the assessment?

what constitutes success? (Managers and local people may have very different perspectives on these questions.)

Though some form of evaluation is now undertaken for almost all programmes funded through international agencies, experience suggests that such questions are often difficult to answer if these issues were never explicitly addressed at the planning stage. Indeed, one of the benefits of evaluations is that they focus attention on project objectives. Moreover evaluation exercises themselves must have clearly defined objectives and involve a broad range of stakeholders, including local and indigenous communities living in or adjacent to protected areas, in the assessment process.

Nationally, a monitoring and evaluation system should be incorporated into the national protected area system plan called for under Article 8 of the CBD. Advice on preparing such a system plan was recently given by IUCN (Davey 1998). The principal stakeholder in the evaluation of protected area management effectiveness at the national level will usually be the protected areas' planning and/or management agency. It needs to know both whether individual sites are being effectively managed and whether national policies and legislation on protected areas are being effectively implemented. Often, the agency is accountable to other sectors in government and needs to be able to demonstrate whether resources are adequate to manage the protected area network effectively. Donors in the private or non-governmental sectors also have an interest in such information. The significance of protected areas to tourism, sub-national levels of government, and conservation NGOs has increased in many countries as the size and diversity of the protected area network have grown. It is necessary to take account of the interests and concerns of all such stakeholders if they are to accept changed management priorities which emerge as a result of the evaluation.

Though there have been several calls for comprehensive protected area evaluation systems (e.g. Silsbee and Peterson 1991, Chrome 1995, Briggs *et al.* 1996, Davey 1998), few protected area management agencies have implemented such systems. In the UK, the Countryside Council for Wales has developed an approach to monitoring their Sites of Special Scientific Interest which is closely tied to planning and management systems (see Alexander and Rowell, p. 50). In Australia, the Great Barrier Reef Marine Park Authority and the Australian Institute of Marine Science have established a programme of long-term monitoring for the Great Barrier Reef (Sweatman 1997). Both these initiatives, however, concentrate on biological conditions and cannot be regarded as comprehensive assessments of management effectiveness. Efforts at addressing management effectiveness more broadly have generally focused on relatively few, selected areas and have often depended on staff from educational or research institutions working with managers (e.g. Hockings 1998, Valery n.d., Thorsell 1982).

One-off evaluations of a management agency or one of its programmes are more common (e.g. Kothari *et al.* 1989, Edwards 1991, Countryside Commission 1991, World Wide Fund for Nature and the Department of Environment and Conservation 1992, Environment and Development Group 1997). Monitoring programmes looking at particular aspects of management, or the status of particular resources, are also relatively common, although they do not often provide a reliable guide to overall management effectiveness. However, monitoring programmes of this kind, targeted at resources of special value or concern, should be an integral part of any comprehensive assessment system.

Less attention has been paid to the state of protected area management at regional and global scales. There is no generally accepted methodology that can be applied and no organisation with direct responsibility to collect or collate such information. The most active institutions have been the IUCN World Commission on Protected Areas (WCPA) (formerly the Commission on National Parks and Protected Areas – CNPPA) and the World Conservation Monitoring Centre (WCMC). They work closely together to compile and maintain a global protected areas database. This database, which currently holds over 30,000 records (Green and Paine 1997), has concentrated predominantly on basic descriptive information about the name, location, designation, IUCN protected area management category, size and year of establishment of each protected area. It forms the foundation for the periodical *United Nations List of Protected Areas* (IUCN 1998). While at present only limited information on aspects such as budgets and staffing is held in the database (see paper by James, p. 15), WCMC intends to expand this to encompass other measures of management effectiveness as indicators are developed and data become available (Green and Paine 1997). The decennial World Parks Congresses provide a means of updating and improving information of this kind. Following the last such event in Caracas 1992, a review of protected areas was published under the title *Protecting Nature: Regional Reviews of Protected Areas* (McNeely *et al.* 1994). While this represents the most comprehensive review of protected areas ever undertaken, it necessarily took a broad brush approach. It is to be expected that the next congress, to be held in South Africa in 2002, will be used to secure a significant improvement in the quality of global data relating to protected areas and the effectiveness of their management.

The key questions that are of interest at this global and systemic level are whether the responsible authorities have the capacity to manage their protected areas effectively and whether this management is being delivered on the ground. Capacity to manage has many components and cannot be summarised in a single measure: the principal dimensions are the system of governance, level of resourcing and community support (Figure 1). The measurement of these dimensions are all contextual. What is effective legislation in one country may be entirely inappropriate in another with different legal and social systems. Similarly, it is only possible to assess the adequacy of resourcing for management in the context of some estimation of management needs (Figure 2).

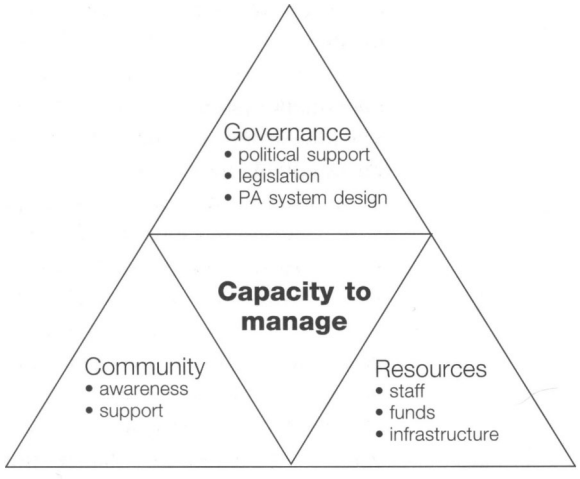


Figure 1. The dimensions of 'Capacity to manage'.

Beyond such questions relating to the way in which protected areas are managed, the international community is even more interested in the outcomes of such management, i.e. the impact 'on the ground'. Issues such as the impact of protected areas on the conservation of biodiversity, and on other natural and cultural heritage resources, are of great concern. So too are the implications of protected areas for other sectors of public policy, such as social justice and sustainable development. Protected area evaluation programmes should be designed to throw light on such topics.

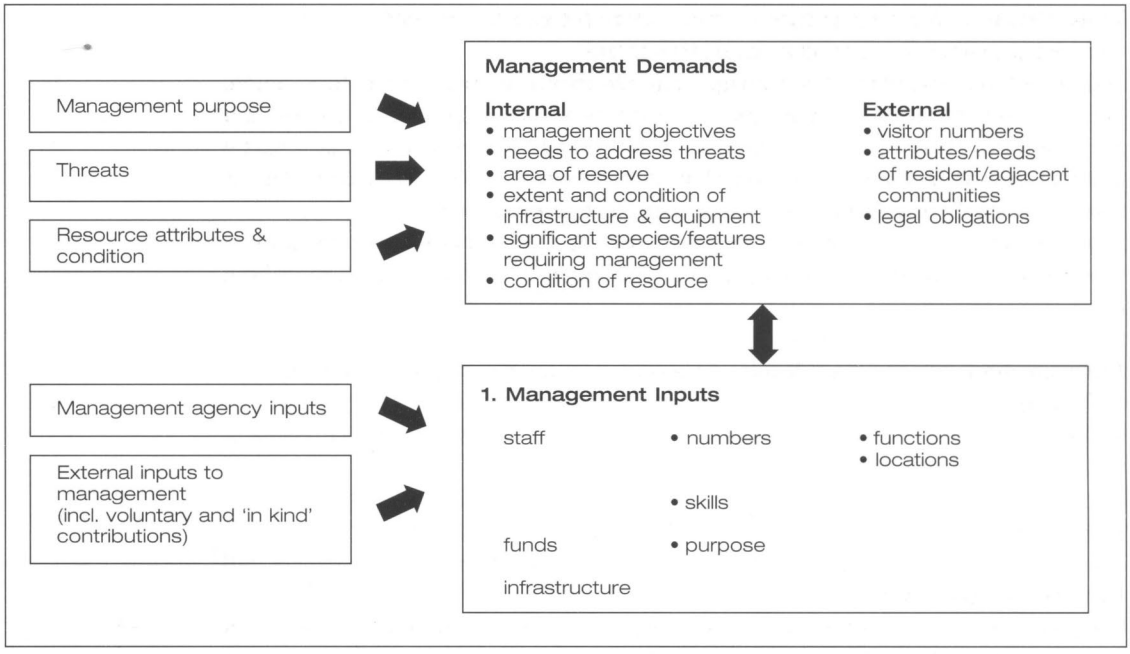


Figure 2. Relationship between management demands and inputs in protected area management.

Who should be involved in the assessment process?

Ideally the assessment process should involve a partnership between many players. Depending on circumstances, this may include:

- local managers.
- senior agency managers.
- government agencies in different sectors.
- different tiers of government.
- local communities.
- indigenous peoples groups.
- NGOs.
- donors.
- international convention staff.
- private sector bodies involved in management of protected areas.
- representatives of other sectors and interests.

Some of these groups should be involved in the design and execution of the assessment system , while for others it may be sufficient to know that the evaluation is being carried out and to have periodic access to the results. However, if assessing management effectiveness is to encourage adaptive management, then managers must be involved in, and support the evaluation system. Unfortunately, local managers and local communities have sometimes been marginalised in evaluations of international projects carried out by teams of visiting experts who may only visit the area for a brief period. In general, long-term monitoring and evaluation programmes should give a central role to protected area staff and provide opportunities for local community participation. Like planning, evaluation should be as much a 'bottom up' as 'top down' exercise. In highly controversial cases, it may be advisable to also involve neutral or external people, such as staff from higher education or research institutions, in the assessment process to enhance confidence in the results.

The WCPA framework - an approach to how assessments can be conducted

The WCPA has established a Management Effectiveness Task Force to promote interest in questions of management effectiveness and to help develop assessment methods. The Task Force has proposed a framework for evaluation that can be flexibly applied to meet the needs of protected areas in different circumstances (Hockings 1997). The framework is founded on two principles:

- it aims to be strongly linked to the concerns and interests of managers; and
- it aims to be useable by managers in a wide range of circumstances around the world.

The framework suggests the division of evaluation into five areas (Figure 3):

1. design.
2. input.
3. process.
4. output.
5. outcome.

Design evaluation

Design evaluations assess the likely effectiveness of a project or programme based on the plans or design of the programme. In the context of protected areas, an important element of assessing effectiveness is the adequacy of the network in terms of the comprehensiveness, adequacy and representativeness of the protected area system.

Input evaluation

Input evaluation seeks to answer the questions: are sufficient resources being devoted to managing the protected area/system; and how are resources being applied across the various areas of management? The key resources to be assessed are funds, staff, equipment and infrastructure.

Process evaluation

The assessment of management processes focuses on the way in which management of a protected area or system is conducted. The objective of process evaluation is to assess the standards of the management system, and of the

Figure 3. Evaluation and the protected area management cycle. (Source: Hockings, 1998).

Management activity	Planning	Resourcing	Implementation	Outputs	Impacts
	• reserve design	• staff • funds • equipment	• management systems • management processes	• services & facilities • results of management actions	• effects of management in relation to objectives
	⬇	⬇	⬇	⬇	⬇
Type of evaluation	Design	Input	Process	Output	Outcome
Focus of evaluation	Appropriateness	Economy	Efficiency	Effectiveness	Effectiveness Appropriateness

processes and functions used in administering the area. This is largely a qualitative rather than quantitative process. The starting point for process evaluation is to establish standards for the conduct of management that can be used as a basis for assessing performance.

Output evaluation

One way to assess management effectiveness is to look at the outputs derived from management activity. This type of evaluation is most useful where pre-existing plans, targets or standards have been established against which achievements can be measured. Two principal questions are involved: what products and services have been delivered? and have the managers carried out their planned work programme?

Outcome evaluation

Outcome indicators are important because they measure the real impacts of management action by assessing the extent to which management objectives are being achieved. As such, they need to be based upon a clear understanding of what it is that managers want to accomplish. The process of establishing an outcome-based monitoring and evaluation programme is likely to highlight areas where objectives need to be clarified.

The use of indicators

As it is not practical to measure directly all the attributes that relate to protected area management (either the condition of the environment itself or aspects of management action), a limited number of representative indicators should be selected. The selection of priority issues, and hence indicators, for monitoring should be guided by the natural, cultural and social values of the area, known or suspected threats to these values and attention to those aspects of management that involve significant investment of resources. As far as possible, indicators should:

- have an unambiguous and predictable relationship to the attribute being assessed
- be sensitive to change in the attribute being assessed.
- integrate environmental effects over time and space (i.e. reflect enduring change rather than short-term or localised fluctuations in conditions).
- reflect changes and processes of significance to management (including biophysical, social, cultural, economic, political and managerial attributes).
- reflect changes at spatial and temporal scales of relevance to management.
- be cost-effective and simple in terms of data collection, analysis and interpretation.

It is important that data collection programmes for the selected indicators are sustainable within the budget and skill limits of the monitoring staff. For example, Hockings and Twyford (1997) showed that a simple indicator of camping impacts in the Fraser Island World Heritage Area could be developed from the monitoring of aerial photographs. This provided sufficiently reliable information to guide management decision-making at a fraction of the effort and cost required by more traditional on-ground survey methods and indicators.

Because indicators should reflect the achievement of management objectives, a common set of indicators for several protected areas in different locations can be developed only where these areas share common objectives. General objectives for management, such as those specified in the IUCN Guidelines for Protected Area Management Categories (IUCN 1994), could provide a basis for

establishing a common set of indicators. These could be modified to allow for regional differences in legislation or agency policy, and fine-tuned to match the particular environmental, social and managerial characteristics of an individual protected area or system.

The framework suggested by the WCPA Task Force could be applied at different scales from an individual protected area, to an agency and even at the national scale. At an agency or national scale, the assessment of management effectiveness should focus on the effectiveness with which sites within the system are managed and the agency or system-wide issues that affect the overall operation of the protected area network. Cumulatively, information gathered through the application of this framework could eventually be assembled to give a regional or even a global picture.

Assessing the outcomes of protected area management requires the selection and monitoring of appropriate indicators: Establishing a vegetation monitoring plot on the Fraser Island World Heritage Area.

Conclusion

There is general agreement amongst the protected areas community that more attention needs to be paid to questions of management effectiveness. While pilot programmes have been initiated in a few locations around the world, there is as yet no agreed framework for the collection and application of such information on a broad scale. This may be due, in part, to a lack of agreement on what sort of information is required, how it should be used and who should be involved in the process of collecting, interpreting and applying the results. As these issues are addressed, and monitoring and evaluation programmes are put into place, it is necessary to share experience and develop methodologies to meet the varying needs at local, regional and global scales. The WCPA Task Force on Management Effectiveness is working to encourage the sharing of experience in evaluation, and to develop a globally-applicable framework and agreed guidelines and principles for monitoring and evaluating management effectiveness. WCPA expects to present these at the next World Parks Congress in South Africa, 2002 for review and refinement.

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Marc Hockings is a Senior Lecturer in the School of Natural and Rural Systems Management at the University of Queensland, Australia. He is the Co-Chair of the WCPA Task Force on Management Effectiveness.

Adrian Phillips is Chair of the World Commission on Protected Areas and Professor of Countryside and Environmental Planning at Cardiff University, UK.

Institutional constraints to protected area funding

ALEXANDER N. JAMES

Protected area budgets average $157 per km² per year in the developing countries, and $2,058 per km² in the developed countries, according to a recent study by WCMC. On average, the developing countries' budgets are less than one third adequate to meet their stated conservation objectives. One way to address this problem is to allow management agencies to retain the revenues raised in protected areas; where this has been tried, budgets are many times higher than in agencies that depend solely on government allocations. Such financially autonomous agencies have taken advantage of a range of revenue raising mechanisms. However, implementing such a programme requires institutional change at the level of the agency's statutory authority, its corporate culture, and in the attitudes of resource users. Though resistance to change can occur at any of these levels, the experience of successful agencies indicates that conservation funding can be improved significantly.

THE WIDELY held impression that conservation resources are severely lacking throughout much of the world was confirmed in a recent WCMC study of protected area budgets and staffing (James *et al.* 1999). In 1993 and 1995 WCMC conducted two global surveys of protected area agencies to obtain systematic data on national conservation expenditures. Table 1 presents a summary of the WCMC results.

In the table, the budget data consist of the annual expenditure of each countries' national protected area agencies, on the basis of 1996 US dollars per km² protected. The reported budgets include both capital expenditure and funds obtained from external sources such as foreign aid. The staff data, presented as the number of staff per 1,000 km² protected, include field staff, administrative staff, and other staff. The total area column refers to the area protected by the agencies that reported data, rather than for the country's entire protected area system. Further information on data presentation methods, the reporting protected area agencies, and detail on budget expenditures and staff occupations, is available in the WCMC report, *A Global Review of Protected Area Budgets and Staffing* (James *et al.* 1999).

The WCMC study found that the global mean protected area budget is $893 per km². Of the 108 countries in the survey, 13 reported budgets below $10 per km²,

Table 1. Protected area budgets and staffing.

country	protected area km²	budget '96$/km²	staff per 1,000km²	country	protected area km²	budget '96$/km²	staff per 1,000km²
Europe				Greece	11,830	842	9
Austria	23,135	990		Hungary	1,907	3,162	252
Croatia	3,929	428	64	Iceland	3,148	1,159	56
Czech Rep	12,806	1,020	78	Latvia	602	3,539	
Denmark	2,522	19,414		Lithuania	927	677	
Estonia	4,233	81		Luxembourg	660	1,426	20
Finland	27,782	457		Macedonia	1,083	717	216
France	47,088	2,331	24	Netherlands	6,850	32,533	

Table 1. continued.

country	protected area km²	budget '96$/km²	staff per 1,000km²
Norway	20,677	883	3
Poland	67,773	182	
Portugal	5,107	4,280	72
Slovak Rep	1,976	564	132
Sweden	35,143	1,032	
UK	59,394	3,402	41
Africa			
Angola	81,812	<1	1
Botswana	100,250	51	6
Burkina Faso	31,937	4	
Burundi	1,135	189	228
Cameroon	25,948	25	4
Cent Afr Rep	46,949	7	9
Chad	124,884	6	1
Cote d'Ivoire	19,929	70	
Ethiopia	32,403	57	2
Gabon	18,170	14	3
Gambia	575	78	
Ghana	13,049	71	52
Kenya	32,726	409	123
Malawi	10,585	63	75
Mauritius	75	67,374	14
Namibia	112,159	70	5
Niger	84,163	1	1
Nigeria	34,218	99	
Senegal	22,417	55	
Sierra Leone	1,744	6	26
South Africa	57,638	2,129	130
Sudan	187,000	12	35
Seychelles	40	970	649
Tanzania	258,997	30	35
Togo	6,487	59	62
Uganda	8,336	47	
Zaire	100,262	4	17
Zambia	80,740	23	
Zimbabwe	30,089	436	81
Asia			
Bangladesh	949	246	207
Bhutan	6,606	93	8
Brunei	1,036	3,771	165
Hong Kong	417	66,107	3,180
South Korea	7,568	7,466	163
Laos	24,400	1	
Malaysia	14,848	500	109
Myanmar	3,622	69	186
Nepal	15,025	80	59
Pakistan	31,337	6	92
Sri Lanka	7,864	1,087	85
Taiwan	3,222	14,087	207
Thailand	68,056	667	201
Middle East			
Afghanistan	1,834	29	
Algeria	2,350	1,150	
Cyprus	115	8,908	
Israel	3,929	3,652	64
Morocco	4,783	127	
Qatar	139	1,383	2,778
Saudi Arabia	323,996	30	
Tunisia	408	1,083	491
Turkey	24,935	683	52
Yemen	3,625	25	
Pacific			
Australia	445,600	359	6
Fiji	8	46,440	772
Fr. Polynesia	178	<1	
New Zealand	89,978	898	15
Papua N. G.	10,448	211	14
Vanuatu	33	1,002	
W. Samoa	234	213	
Caribbean			
Antigua	104	9,615	1,375
Bahamas	1,253	298	9
Barbados	2.5	48,133	8,800
Bermuda	111	82,895	928
Dominica	166	3,667	572
Dom. Rep.	10,086	68	
Jamaica	803	220	171
Montserrat	8	9,615	714
Neth. Antilles	9	16,791	250
St Kitts Nev	26	4,044	
St. Lucia	0.3	1,279,391	221,779
Trin. & Tob.	269	64	41
TurksCaicos	519	225	26
Latin America			
Brazil	179,098	97	3
Chile	139,797	29	3
Colombia	90,988	109	4
Guatemala	8,644	12	
Honduras	21,450	1	5
Mexico	107,061	36	4
Panama	15,566	288	3
Peru	164,974	8	
N. America			
Canada	295,345	1,017	13
United States	693,765	2,358	33

and 32 countries reported budgets below \$100 per km^2. Overall, the sample ranged from less than \$1 per km^2 to greater than \$1,000,000 per km^2, illustrating the extreme variability in nature conservation investment throughout the world.

The developed country mean expenditure is \$2,058 per km^2, compared to only \$157 per km^2 in the developing countries. In total, the developed countries account for 90% of global protected area expenditure. The developing country regions account for a mere 10% of expenditure but have nearly 60% of the area under protection.

The global mean staffing of protected areas is 27 staff per 1,000 km^2. The global distribution of staffing is much more even than for budgets. Overall, the developing countries have a staffing ratio of 27.6 per 1,000 km^2, slightly greater than the 26.9 reported for the developed regions. The developing country regions reported 56% of global staff and the developed countries 44%.

The geographical distribution of budgets and staffing is illustrated in Figures 1 and 2. Figure 1 shows that the developed country regions (North America, Europe, Australia/New Zealand) each have protected area budgets considerably greater than the global mean. Interestingly, the newly industrialised economies of East Asia (Hong Kong, Taiwan, and South Korea) have the highest budgets in the world. Regions consisting of small island states (Caribbean and Pacific) also have higher than global mean budgets.

The regional distribution of protected area staff levels (Figure 2) illustrates that several developing country regions have higher than global mean staffing. These regions include South Asia, Southeast Asia, Africa (Eastern/Southern), North Africa and Middle East, and Caribbean. Two developed country regions reported lower than global mean staff inputs: North America and Australia/New Zealand.

The regional analysis of budget and staffing inputs suggests that economic, demographic and geographic factors all play a role in the allocation of government resources for conservation. Specifically, regions with small or fragmented protected areas tend to have higher per km^2 costs, indicating an economy of scale in protected area management (Caribbean and Pacific). Regions with less population pressure on

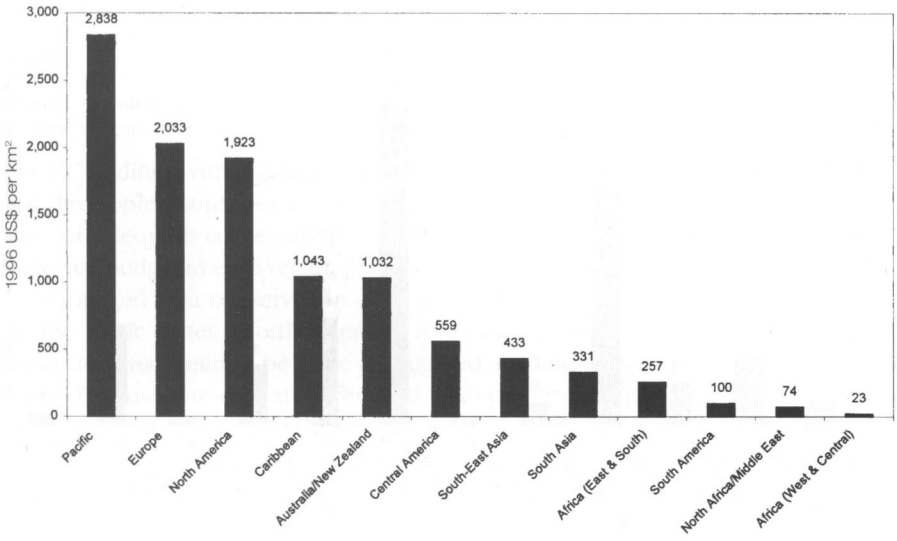


Figure 1. Protected area budgets: regional means in 1996 US$ per km^2 (not shown: East Asia, \$12,308 per km^2).

protected area resources tend to require less staffing input (Australia/New Zealand and North America). Economic growth and higher incomes are clearly associated with greater nature conservation budgets (Europe, North America, Australia/New Zealand, and East Asia). These and other relationships are explored in more detail in the WCMC report (James *et al.* 1999).

In conclusion, the disparity of budgetary resources is a cause for concern, despite the fact that staffing levels in the developing countries may be comparable to those of the developed countries. Without adequate financial resources for physical infrastructure and training, the effectiveness of protected area staff is compromised. The substantial staff numbers in developing country protected area agencies offers an opportunity for institutional capacity building. But this will require greater financial resources than are being currently devoted to protected areas in the developing countries, though how much greater funding is still an open question. The next section addresses the question of financial adequacy of current expenditure levels and estimates the cost of adequate protected area conservation in the developing countries. Later sections will address the institutional adaptations that may be necessary to achieve these higher levels of expenditure.

Adequacy of resources for protected areas

In previous studies, the cost of adequate protected area conservation has been estimated at $200 and $230 per km^2 (Bell and Clark 1984, Leader-Williams and Albon 1988). These estimates are now over a decade old, and pertain specifically to conservation in Eastern and Southern African protected areas (in fact, the latter estimate refers specifically to the deterrence of rhino poaching). It would be reasonable to expect the cost of adequate protected area conservation to vary among regions, based on factors such as population pressures, protected area size, economic development levels, and biological diversity richness, among others.

To capture country specific differences in the cost of protected area management, the WCMC study asked survey respondents to estimate the additional funding needed to achieve their agencies' stated conservation objectives. Table 2 summarises the

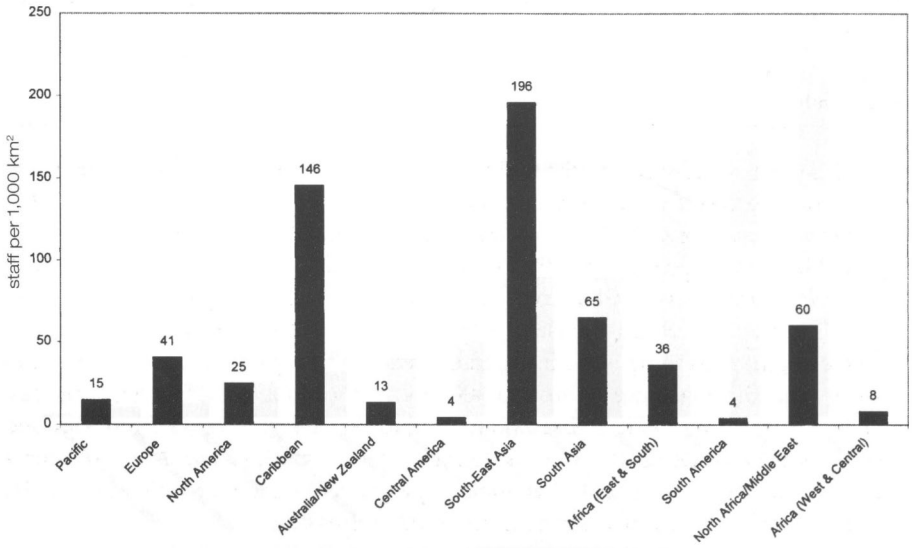


Figure 2. Protected area staffing: regional means of total staff per 1,000 km^2 (not shown: East Asia, 432 per 1,000 km^2).

Table 2. Shortfall budgets and conservation costs by region: developing countries (budgets in 1996 US$ per km²).

WCPA region	actual budget	shortfall estimate	projected cost	protected area (km²)	additional requirement
lower cost					
South America	100	90	190	1,838,826	165,779,757
North America (Mexico only)	52	234	286	159,669	37,423,635
Africa (East/South & West/Central)	114	215	329	2,074,451	446,061,174
intermediate cost					
South-East Asia	433	309	742	518,864	160,328,976
South Asia	331	413	744	212,924	87,937,612
North Africa & Middle East	74	715	789	1,037,576	741,833,426
Central America	559	250	809	86,049	21,540,227
higher cost					
Baltic states	575	2,389	2,964	19,403	46,348,738
Caribbean	1,043	1,949	2,992	108,637	211,739,462
Pacific	2,838	**500**	3,338	13,113	6,556,500
insufficient data					
East Asia (developing)		**500**		846,856	423,428,500
North Eurasia (former USSR)		**500**		638,532	319,266,000
total	157	353	510	7,554,900	2,668,243,507

(figures in **bold** type are WCMC estimates)

WCMC findings with regard to the regional cost of protected area conservation (only the developing countries are included here due to data availability). The estimated cost of adequate conservation for each region is equal to the sum of the mean reported budget in each region plus the mean reported shortfall (on a per km² basis).

Protected area conservation costs are highest in the Caribbean, the Pacific, and in the Baltic States (North Eurasia), at around $3,000 per km². In these regions, protected areas tend to be more fragmented, leading to higher per km² conservation costs. Intermediate cost areas (around $800 per km²) include South Asia, Southeast Asia, North Africa and Middle East, and Central America. Lower cost regions (around $300 per km²) include South America, Mexico (North America), and Africa (Eastern/Southern and Western/Central). Insufficient data was obtained for China (East Asia) and the states of the former Soviet Union (North Eurasia).

The average adequacy of protected area agency budgets in developing countries is around 31%, according to the respondents to the WCMC survey. The 31% adequacy may underestimate the actual shortfalls in developing country budgets if the survey response is biased in favor of better funded agencies. The adequacy of budgets varies considerably by region from North Africa and Middle East (9% adequate) to Central America (69% adequate).

The shortfalls in developing country regions can be extrapolated to estimate that the developing countries have unmet financial needs of $2.6 billion annually (Table 2). This corresponds to an additional $350 per km^2 in expenditures, which would increase the mean developing country protected area budget from $157 per km^2 to $507 per km^2. An additional amount would be required to achieve adequacy in the protected area budgets of the developed countries.

Opportunities to increase funding: financial autonomy

Given the need to triple conservation budgets in the developing countries, the question that arises is how to do it. Foreign assistance for protected area systems and biodiversity conservation does not appear to be sufficient (RSPB 1996), and represents an unsustainable dependence on foreign institutions to accomplish national goals. There are, however, an expanding number of new or potential funding sources for conservation that national protected area agencies might access.

Sources of funds for protected areas include conventional activities, emerging opportunities, and some future prospects. The most prominent conventional source of revenue is from park visitation, now called ecotourism, and represents a large and growing financial opportunity (Ceballos-Lascurain 1998). Emerging opportunities include site specific or national environmental funds (endowed with a combination of debt swaps, government and donor contributions, and private sector donations), increasing user fees for protected area resources such as water, the commercialization of wildlife and wild products, attracting private sector investment in joint venture projects on a commercial basis, and attracting non-traditional donors (IUCN-IADB, 1993) More exotic sources of revenue may eventually include the sale of bio-prospecting rights and payments for carbon offsets.

Protected area managers respond entrepreneurially when given an incentive to actively recruit these new sources of funds. Recent experience has shown that financially autonomous protected area agencies have successfully raised and diversified their funding bases. A financially autonomous conservation agency has the authority to raise and retain revenues from the management of protected area resources. These agencies may have different legal structures, and are variously known as parastatal agencies, conservation trusts, or may simply remain as a government department with special provisions for the retention of revenue. Financially autonomous agencies pay no dividends to shareholders, so all of the surplus revenues raised in protected area operations are devoted to conservation activities. This opportunity to re-invest funds in conservation activities creates an incentive for mangers to look for ways to increase revenues from conventional and non-conventional uses of protected area resources.

In a study of protected area agencies in Africa and the Caribbean, it was found that financially autonomous agencies had demonstrably higher conservation funding

rates and more diverse sources of funds than did comparable government-dependent agencies (James *et al.* 1997). The study found that financially autonomous, or 'parastatal', agencies in the Caribbean spent twice as much on conservation activities than did comparable government funded agencies. In the African region, the parastatal agencies on average spent 15 times more on conservation than did government funded agencies (Figure 3).

The study discovered that parastatal protected area managers in both regions actively took steps to increase and diversify their funding sources. All of the financially autonomous agencies reported that they had initiated new revenue-generating programmes, including increasing visitor entrance fees, raising boat docking fees, increasing fees charged to concessionaires in the parks, setting up trust funds and soliciting donations from a wide variety of public and private sector organisations, inviting the private sector to bid on joint venture projects in eco-tourism developments, and so forth.

For the government funded agencies, the primary constraint to initiating these activities is their inability to retain the revenues raised in protected areas. When the revenues raised in protected areas are returned to the national treasury, there is little incentive to implement revenue raising programs. Moreover, the organisational culture tends to reflect the dependence on government funding sources, and these agencies are less dynamic even in implementing mechanisms which do not require financial autonomy, such as trust funds. Further, the lack of financial autonomy discourages those who would like to take the initiative in building links with the private sector.

Accessing the new funding opportunities requires experimentation. Many of the opportunities are either new or untested, and implementing them requires a high degree of entrepreneurship. Further, many of these mechanisms involve increasing the use of protected area resources where the conservation side-effects are not well known. However, protected area managers are best placed to assess these risks, and should be given the responsibility, and the incentive, to balance the rewards and risks of increasing resource use. Thus protected area management institutions need to be designed to allow managers to experiment and take risks with new revenue raising programmes.

Challenges to institutional change

There is no single model for increasing the funding of protected area agencies. Instead, it is more constructive to think in terms of creating incentive systems that are appropriate to a specific country or park. As Bensted-Smith and Cobb stated in a previous issue of *PARKS*, "Just as a species adapts to the ecosystem in which it lives, so the protected area institutions must adapt to the nation's society, government and policies. However, species also influence the ecosystems of which they are part, and protected area institutions can use their special advantages to lead the way in developing capable, accountable national bodies" (Bensted-Smith and Cobb 1995: 18). These authors touch on two critical points in institutional theory: the need for institutions to be socially appropriate, and the dynamic nature of institutional change.

In a recent application of institutional theory to protected area management performance, Presber-James (1997) argues that the behavior of protected area stakeholders is not the consequence of one law or social custom but of the interaction of a complex and multi-layered institutional environment. In this framework,

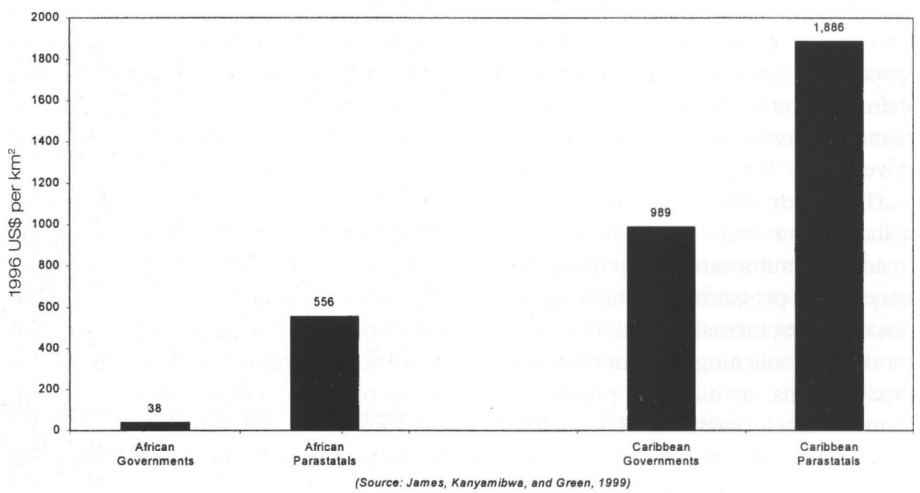


Figure 3. Mean protected area expenditure in government and parastatal agencies compared, Africa and Caribbean regions.

Appendix. Protected area agencies included in Figure 3.

Africa Government	**Africa Parastatals**	**Caribbean Government**	**Caribbean Parastatals**
Ethiopian Wildlife Conservation Organization	Tanzania National Parks Authority	Dominican Republic Directorate of National Parks	Bahamas National Trust
Zaire Institute of Nature Conservation	Kenya Wildlife Service	Turks & Caicos Dept. Environmental & Coastal Resources	Netherlands Antilles (Saba & Bonaire Marine Parks)
Sudan Wildlife and National Park Forces	South Africa National Parks Board	Dominica Forestry and Wildlife Division	Antigua National Parks Authority
Namibia Ministry of Environment and Tourism	Zimbabwe Dept of National Parks & Wildlife Management	Jamaica Natural Resources Conservation Auth.	Barbados (Folkestone Marine Park)
Zambia National Parks and Wildlife Service		Trinidad & Tobago Wildlife Section	Montserrat National Trust
Malawi Dept of National Parks, Wildlife, Tourism		St. Kitts & Nevis Conservation Commission	St. Lucia National Trust
Botswana Dept of Wildlife and National Parks		Bermuda Dept of Agriculture, Fisheries and Parks	
Uganda National Parks			

institutions consist of the structure of legal and social rules that humans impose on their dealings with each other. Organisations are seen as the 'players' within the institutional environment. The institutional approach emphasises the importance of informal, social rules and conventions in determining human behaviour, and thus management

outcomes. Social customs and practices often outweigh the rule of formal law in explaining human behaviour. As a result, those wishing to improve protected area management institutions must be aware of the power of informal, social custom to influence both the pace and direction of change, and its ultimate success or failure.

Coast dunes of Great St. Lucia Wetland Park which is managed by Kwazulu-Natal Nature Conservation Service.
Photo: Jim Thorsell.

The interaction of social conventions with formal or legal rules, together with the effectiveness of enforcement mechanisms, creates 'institutional incentives' that govern individuals' activities (Presber-James 1997, North 1990). Formal institutions include protected area laws, regulations regarding resource use and access, and the statutory authority of the management agencies. Informal institutions include the conventions of resource use that local communities, businesses, and visitors adhere to, and the views of politicians and society toward the role of parks and protected areas (particularly with respect to the extent of sustainable use permitted), and the corporate culture within the administrative agencies. The level of compliance to these social conventions and to the formal laws is critical in determining the success of protected area management. Formal protected area laws require impartial third party enforcement; where it is lacking laws are of little value. Formal protected area laws must also be consistent with informal conventions; inappropriate laws have little chance of enforcement either.

Steps must be taken to ensure that institutional changes are reinforced at many levels simultaneously: new policies must have legal backing, political support, judicial enforcement, and importantly, support within the protected area organisation and the wider public. For example, in their discussion of the challenges in implementing financially autonomous agencies in East Africa, Bensted-Smith and Cobb noted that "the pace and success of the change has been a function of the chemistry of the relationship between the essential participants in it: appropriate levels of political support; governments, as the legislators and the facilitators of policy change; leaders of the institutions, with the energy and vision to bring about the changes; staff willing to change; and donors willing to support the venture" (Bensted-Smith and Cobb 1995:17).

The implementation of new management institutions inevitably encounters opposition from affected parties, sometimes from other government departments, sometimes from resource users, and sometimes from within the agencies themselves. This resistance usually arises when informal or conventional resource use practices are changed, either through the implementation of new charges on the use of previously open access resources. But it is possible to overcome opposition, as institutions are dynamic and individuals adjust to new incentives. Sometimes the 'losers' in a change of system will eventually stand to gain, and over time resistance fades as their gains become apparent. For example, when the Bahamas National Trust decided to prohibit fishing within the Exuma Cays Land and Sea Park, opposition from visitors to the park and local communities was intense. However, over time

"There has been an increase in support for this position, boosted in no small measure by the noticeable increase in fish returning to the reefs" (Holowesko 1995: 22).

In another example, the Natal Parks Board in South Africa encountered years of resistance to the control they began to assert over access to the province's protected areas. As Hughes (1997: 54) notes: "In the 1950s, the Board's conservation strategy was dominated by a law enforcement philosophy aimed at controlling the use of wildlife outside of protected areas, consolidating and increasing the size of the early game reserves and adding new nature reserves. This was a difficult period, as little headway was made in changing the prevailing public attitudes, and there was considerable hostility experienced from private landowners (mainly whites) and rural indigenous communities ... The Board gradually achieved control over this period and began to earn a grudging respect from resource users. There is little doubt that the positive change in attitudes was as a result of the Board's early belief that people should enjoy the parks."

But before park resource users can be persuaded to accept a new management regime, the protected area staff themselves may have to adopt new practices. This is especially true when conservation agencies become financially autonomous and are faced with the opportunity to raise revenues. A 'commercial culture' must be adopted, which means that staff must begin to run a protected area like a business, charging for the goods and services the park provides and looking for ways to expand resource use while balancing conservation objectives. Conservation staff are often "rightly concerned that commercialization, with which they are not familiar, should not be at the expense of conservation, to which they have long been committed" (Bensted-Smith and Cobb 1995: 14).

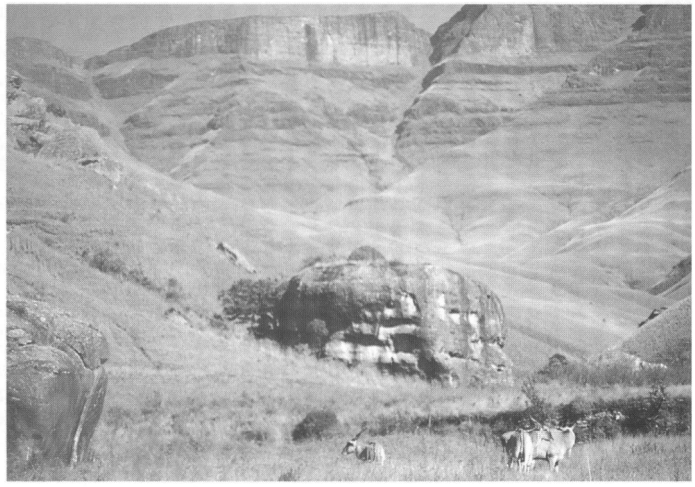
As a result, progress in achieving institutional change is gradual. The experience of the Natal Parks Board is instructive in showing that opposition can be overcome, and the source of funding broadened considerably. Hughes (1997: 61) notes that: "It has taken fifty years for the Natal Parks Board to evolve from a traditional nature conservation organisation, with a commendable but narrow vision, to a modern body dedicated to making biodiversity relevant to all sectors of society". In accomplishing this transformation, the Board has been guided by four principal strategies: to develop a viable wildlife conservation industry; to promote ecotourism; to increase the involvement of private citizens and landowners through the Conservancy and Biosphere movement; and to actively develop new institutions for community participation in the management of resources from the parks in order to make biodiversity relevant to underprivileged and previously disadvantaged communities (Hughes 1997).

Thus, institutional change is a multidimensional process. The adoption of a single measure, such as a decree making a national protected area agency a financially autonomous unit, is insufficient in itself to create the incentives to increase conservation funding. Institutional change requires change at the level of business practices within the agency, in the expectations and conventions of resource users, and in the understanding and practices of other government departments toward the newly independent agency. Successful institutional change is difficult and often time consuming because of the social nature of an 'institutional incentive'.

In essence, the entire environment governing the management of protected areas has to be adjusted, and this environment exists in the mind sets of the individuals involved.

Conclusion

Protected area systems are in need of management institutions that will create incentives to capitalise on the large inherent values in parks. Protected areas cover 8% of the earth's land surface, representing enormous economic and environmental assets. These assets should no longer be allowed to languish with insufficient funding and management, especially when new mechanisms are emerging that allow capture of potential sources of revenues. The challenges ahead consist of identifying appropriate institutional structures for protected area agencies, and in overcoming the resistance inherent in implementation.



Eland's in Drakensberg. Financial autonomy for protected areas can lead to significantly increased funding for protected area management. Photo: Jim Thorsell.

In many cases, protected area institutions have not changed in response to the expanding financial opportunities. For example, tourism to natural areas is a significant share of the $600 billion world tourism industry, yet few parks and protected area systems are institutionally equipped to gain financially from international visitation. Most protected area systems labor on under an institutional constraint, unable to raise and retain revenues from the valuable services they provide to visitors, instead having to depend upon the meager resources of their national government budgets.

While financial autonomy presents a promising institutional option, it is not the same as financial self-sufficiency. Because protected areas provide a range of public goods for which there are no efficient mechanisms for compensation, continued government support is justified. On the other hand, there are many parks and park systems that are capable of financial self-sufficiency, as the experience of the US state park system has shown (Leal and Fretwell 1997). In fact some parks can generate surplus revenues that can be used to subsidise conservation activities in other units of a protected area system. There is always likely to be a range of financial generating power among the parks within a protected area system, and among different countries. For this reason, there is no one institutional blueprint appropriate to all protected area systems. However, the incentives created by financial autonomy – as opposed to financial self-sufficiency – are likely to be widely applicable.

Implementation of new protected area management institutions is likely to be time consuming and to encounter opposition. But experience has shown that opposition from user groups can be overcome, and protected area managers can become more commercially minded. The financial opportunities are great, but the challenges are severe. More sharing of successful experience is certainly one way to enable protected area agencies begin to address the challenges posed by institutional change.

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Alexander N. James is a graduate student in the Department of Land Economy, University of Cambridge, 19 Silver Street, Cambridge, UK CB3 9EP.

A preliminary survey of management status and threats in forest protected areas

SUE STOLTON AND NIGEL DUDLEY

Many protected areas are not effectively protected at all. A recent survey of ten key forest countries carried out for the WWF-World Bank Alliance showed that only 1 % of forest protected areas were regarded as secure and a quarter were suffering from degradation and loss. A range of trends in protected area status were identified and threats were listed and discussed.

IN 1997, WWF formed a partnership with the World Bank to implement two forest conservation targets, drawn from the IUCN/WWF *Forests for Life* strategy. The first target was to create 50 million hectares of new forest protected areas, while the second aimed to ensure that independent certification of good management took place in an additional 200 million hectares of forest, half in the tropics and half in the temperate countries. Following recognition of the scale of threats facing existing protected areas, it was suggested that the protected area target be extended to include *improvement* of management in either unimplemented protected areas ('paper parks') or in protected areas currently threatened or undergoing degradation; this is additional to the original target.

As part of the planning for the new target, the WWF-World Bank Alliance commissioned a survey of the status of forest protected areas. This included a detailed literature survey of existing information and an expert survey of management status and threats in ten important World Bank client countries. The following article summarises some of the study's findings.

Why forest protected areas are under threat

All protected areas are under some degree of threat. This pessimistic analysis is a good common-sense background to any assessment, but does not help in prioritising funding or programmatic activities. Clearly, threats that are either only of minor consequence or are still remote possibilities should receive less attention than major threats that are undermining the whole reason for protection. The aims of the current project were therefore to identify:

- trends in protected area status.
- those parts of the world in which protected areas are under sufficient threat as to require urgent remedial action.
- the type and cause of the threats to help plan effective strategies to relieve these threats.

This analysis is inevitably quite complex; *the most serious threats are not necessarily the most obvious*, nor are the most serious causes necessarily those that can be identified through occasional field visits or local interviews. A forest that looks intact but has lost its wildlife to the bushmeat trade may be under greater overall threat

than one that has suffered erosion at the edges but maintains an intact core. Similarly causes of damage such as illegal logging may actually be driven by far more distant pressures, such as international debt or issues of land tenure. Air pollution remains invisible in most cases but can cause major impoverishment to lower plant communities and can also impact on other groups.

It is difficult to assess threats to protected areas, because:

- all protected areas are under some degree of threat.
- data are often poor or absent.
- any given criterion of threat only gives partial information.
- experts often disagree on the level or seriousness of any threat.
- threats change over time.
- first impressions can be wrong.

Trends in protected area status

Establishment of a protected area does not necessarily guarantee protection for the biodiversity, environmental or cultural features that it contains. Many different trends – ranging from recovery to continued decline – can follow protection.

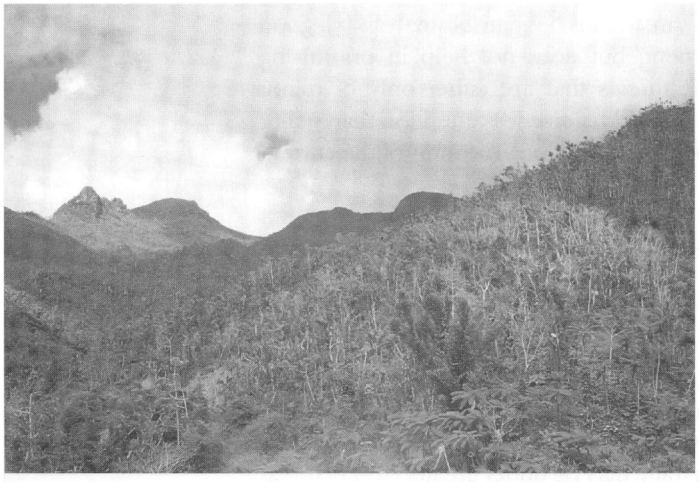
For the purposes of the current study, we postulated a range of six generalised 'trend scenarios', outlined below. Identifying trends in quality can help pinpoint those protected areas that would benefit most from increased resources and/or special projects to improve management capability.

Scenario 1: stable forest protected area

Often seen in large protected areas remote from human habitation, or in protected areas that attract priority funding and high political status.

Scenario 2: recovering forest protected area

Generally associated with smaller protected areas in cultural landscapes, where protection can quickly result in partial recovery, or in badly degraded landscapes where protection is supported by the majority of the population, often because it will permit restoration of environmental services.



Hurricane damage at Luguillo Exptol Forest protected area in Puerto Rico. Hurricanes are expected to increase due to global warming. Photo: Sue Stolton.

Scenario 3: declining protected area

Where protection status does not halt a decline in quality. This is often, but by no means always, associated with protected areas in heavily populated areas and can be the result of lack of capacity or implementation (paper parks) or extreme pressure, for example from human populations or illegal commercial operations.

Scenario 4: initial decline followed by recovery

This trend is more common than often

recognised. Protection status in itself does not guarantee actual protection and in some cases can accelerate decline; for example if local inhabitants feel disenfranchised from the land and traditional sustainable management practices are abandoned. However, with the provision of proper support, alternative livelihoods (such as ecotourism) and perhaps a gradual acceptance of the protected area, overall quality starts to increase again.

Scenario 5: previously stable forest protected area facing a sudden crisis

In this case apparently secure protected areas face a sudden decline due to a particular change, for example an unexpected influx of people or a new industrial activity. Such a change creates a crisis for protected area managers who have to adapt protection strategies to meet the new circumstances.

Scenario 6: initial recovery of forest protected area followed by decline

A possibly increasing trend in the future. This could be caused either because initial support for the protected area among local populations started to decline (for example if hoped-for tourist revenue did not materialise) or because of external factors such as air pollution or climate change.

In terms of improving forest protected areas, the greatest impact could probably be made in converting scenario 3 (declining protected areas) into scenario 4 (protected areas where initial decline is replaced by recovery). In addition, there are places where political and financial influence can help to address sudden crises, as outlined in scenario 5. Lastly, provision of increased capacity might on occasion avoid the 'mid period decline' outlined in scenario 6.

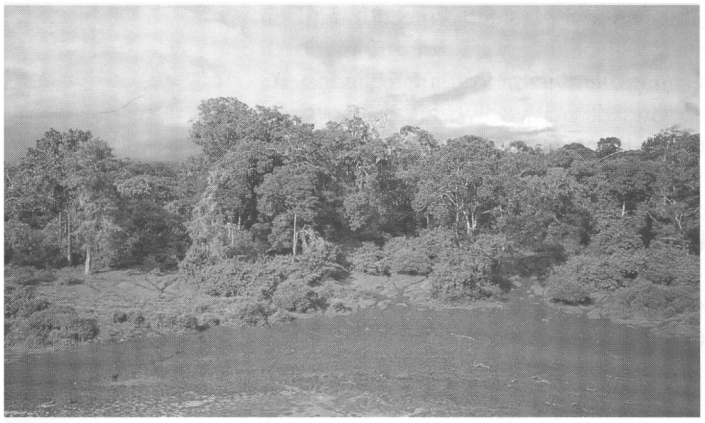
The main types and causes of damage to forest protected areas

Not all threats result in impacts that are immediately visible and, conversely, the most obvious signs of damage are not necessarily the most significant. Three 'categories' of threats to protected areas have been identified as part of the current assessment:

- *individual elements of the protected area are removed without alteration to the overall vegetation structure* (e.g. animal species used as bushmeat, valuable timber trees, exotic plants).
- *overall impoverishment of the ecology of the protected area takes place* through e.g. encroachment, long-term air pollution damage or persistent poaching pressure.
- *major conversion and degradation occurs* through e.g. removal of forest cover, driving roads through the protected area, major settlements or mining.

Key external threats that *directly* impact on forest protected areas include (not listed in order of importance):

- encroachment by human settlements.
- agriculture and overgrazing.
- forestry operations.
- mining and fossil fuel extraction.
- bushmeat hunting.
- collection of exotic species for sale.



Elephant water hole, Mount Kenya. Photo: Nigel Dudley.

- fire.
- pollution and climate change.
- invasive species.
- war.
- tourism and recreational pressure.

These immediate threats to forest protected areas are in turn the result of several underlying causes. Two key underlying causes were identified. High consumption levels amongst the richest quarter of the world's population stimulate agro-industrial, tourism, logging and mining developments that in turn impact on protected areas and on land around protected areas. In parallel, poverty amongst the poorest proportion of the world's population leads to increased pressure on protected areas to supply land and resources. These two factors are related to other causes, including:

- international debt and the flow of resources from poor to rich.
- pressure for trade and development.
- land tenure.
- population.
- social relations, including gender relations.
- corruption.
- inequality.
- lack of capacity.
- lack of education.
- war and conflict.

Such external threats are, for the foreseeable future, an inevitable factor in protected area management. However, in many cases these threats are exacerbated by lack of money and capacity amongst protected area authorities. Protected areas currently cover 8.9 per cent of the world's land surface but most are managed on a shoestring: these are the 'paper parks' or unimplemented protected areas where provision of extra resources can be effective. The survey identified a range of problems:

- lack of financial resources.
- lack of staff and staff training.
- inadequate institutional capacity.
- lack of political/legislative support.
- lack of communication with local residents.
- lack of involvement of local residents in management plans.
- lack of coordination among managing organisations.
- a poor legal framework and lack of adequate enforcement tools.
- absence of comprehensive land-use plans.
- poor definition of protected area boundaries.

These are the key policy issues that should form the main focus for efforts at improving protected areas management.

Previous attempts to survey threats to protected areas

Using published information, *threats to forest protected areas were identified in 76 countries*. Threats ranged from problems created by conflict, through issues of poaching, mining, logging, poor infrastructure and invasive species. Lack of information from many other countries means that the problem is almost certainly even more widespread.

However, this information is both partial and sometimes of poor quality for a number of reasons:

- **data are often poor or absent:** The *1997 United Nations List of Protected Areas* lists 12,754 protected areas and refers to 17,596 more that fall below the 1,000 ha minimum limit for inclusion, making a global total of over 30,000 protected areas covering 8.81 % of the land area. The current survey suggests that *considerably less than 10 % of protected areas have been subject to any kind of analysis of threat*, and far less have been subject to a detailed assessment.
- **any given criterion of threat only gives partial information and is often open to different interpretations**: all the specialists interviewed for the survey stressed the problems of assessing threats by using set criteria. For example, many successful protected areas have no written management plan and few staff, although both these factors are usually assumed to indicate the likelihood of problems. Whilst more thorough assessments are possible, these are expensive.
- **threats change over time**: so that information is almost bound to be out of date. This is certainly the case for some of the published information that still remains the best or only source of information on protected area status.

Experts' survey of threats to forest protected areas

Because of the lack of information, the project organised a special survey of forest protected areas, focusing on key World Bank client countries with a high forest cover: Brazil, China, Gabon, Indonesia, Mexico, Papua New Guinea, Peru, Russia, Tanzania and Vietnam.

The survey used country experts to assess protected areas with respect to several important issues:

- identification of 'paper parks'.
- assessment of management capacity.
- identification of protected areas under threat.
- identification of key threats to protected areas.

Experts, including many members of the World Commission on Protected Areas answered a standard questionnaire that summarised information on both management status and key threats on a national scale and also with respect to 4–5 protected areas within each country. The results were then analysed to draw general conclusions about protected area status for the countries in question.

Guatemala – illegal canal in Montevico protected area. Photo: Nigel Dudley.

Results

Protected areas remain under threat – but many are continuing to retain their conservation values.

The survey was limited in both time and resources and results should be treated as a relatively speculative introduction to the issues; further work is required to refine and improve these conclusions. The survey referred to a limited number of countries, albeit covering a wide range of conditions and holding a large proportion of the world's remaining natural forests. Despite the limitations, the work draws on the experience of some of the world's leading experts in protected areas and provides a valuable 'first cut' at assessing management status and levels of risk.

The main findings are summarised below and in Figure 1:

- less than a quarter (0–24 %) of forest protected areas were considered to be "well-managed with a good infrastructure" in the countries assessed, and 17–69 % of forest protected areas in these countries had *no* management.
- only 1 % of forest protected areas were regarded as secure in the long term.

A further 1 per cent had been so badly degraded that they had lost the values for which protection was given. Some 22 % were suffering various levels of degradation and 60 % were currently safe but faced possible future threats. A further 16 % had not been categorised.

These figures give grounds for both alarm and hope. There are clearly many protected areas without adequate management and this is in some cases leading to degradation. However, a very small proportion were thought to have been ruined and many 'unimplemented' protected areas have retained many of their values, suggesting that protection status alone is helping to provide some security.

The future

It seems likely that the WWF-World Bank Alliance will develop a target relating to forest protected area effectiveness. The survey methodology employed here, whilst useful to identify trends and hotspots, remains simplistic and subject to distortion.

While single experts can assess protected areas fairly accurately in small countries with good transport systems, people working in large areas with poor infrastructure

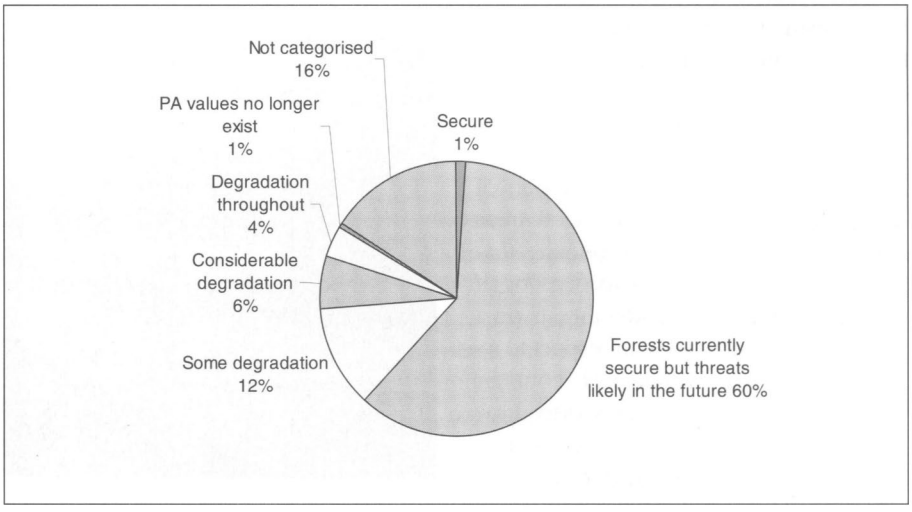


Figure 1. Status of forest protected areas in countries included in the WWF-World Bank Alliance survey.

face an impossible task in terms of knowing more than a fraction of protected areas at all well. As a result, the Alliance will be sponsoring some additional research into a methodology of rapid, country-level assessment of protected area effectiveness, suitable for measuring progress towards the target. This will form a complement to the more detailed survey systems outlined elsewhere in this issue of *Parks*.

Acknowledgements

The survey was carried out by the IUCN/WWF Forest Innovations project for the WWF-World Bank Alliance. Experts from 11 countries took part in the survey under agreed conditions of anonymity – we are very grateful for their time and knowledge. Thanks are also due to others who have commented on the results, including Bruce Cabarle, Rod Taylor and Adrian Phillips. Valuable feedback was also received from participants in a recent workshop in Costa Rica, described on page 2.

Sue Stolton and Nigel Dudley established Equilibrium, a UK-based environmental consultancy, in 1991. They have wide experience in forest conservation issues and have worked with IUCN, WWF and the World Bank. Email: Equilibrium@compuserve.com

Assessing management effectiveness of wildlife protected areas in India

SHEKHAR SINGH

This paper describes the efforts made in India to assess the management effectiveness of protected areas. It outlines the methodology used, presents the major national level findings and indicates the action taken on these findings and on the consequent recommendations.

INDIA HAS a network of 85 national parks and 448 sanctuaries, covering 4.2% of its land area (MoEF 1998). This number has progressively increased over the last 25 years. In 1975, there were only five national parks and 126 sanctuaries. This increased to 19 parks and 210 sanctuaries by 1983 and to 53 and 247 respectively by 1985.

Areas having significant biodiversity value are declared national parks or sanctuaries under the Wild Life (Protection) Act of 1972, as amended in 1991. Before this act, national parks and sanctuaries were set up under various state or area specific acts but were transferred to the Wild Life (Protection) Act (WL Act) on its inception. National parks provide for complete protection of wildlife and habitat and prohibit all human use of resources and private land holdings within the park. Sanctuaries are accorded a lesser level of protection, and grazing and some community or individual rights can be permitted. National parks correspond to Category Ia (Scientific Reserves) of the IUCN categorisation system for protected areas while sanctuaries correspond to Category IV (Habitat and Wildlife Management Area).

Surveying management effectiveness

With the increase in human populations and the growing thrust on infrastructure development, the pressures on protected areas have grown tremendously. So much so that, in recent years, it has become increasingly difficult to continue to protect these wildlife areas using the laws and procedures laid down decades earlier. Also, there is a new recognition of the value of biodiversity, the need for its conservation and the need to have at least some representative ecosystems free from human manipulation and degradation.

However, if the old management systems are to be changed and updated, we first need to understand current limitations and identify areas for improvement. This involves studying not only individual protected areas but also looking at trends and universal problems across states and the whole country.

The first all India survey: 1984–1987

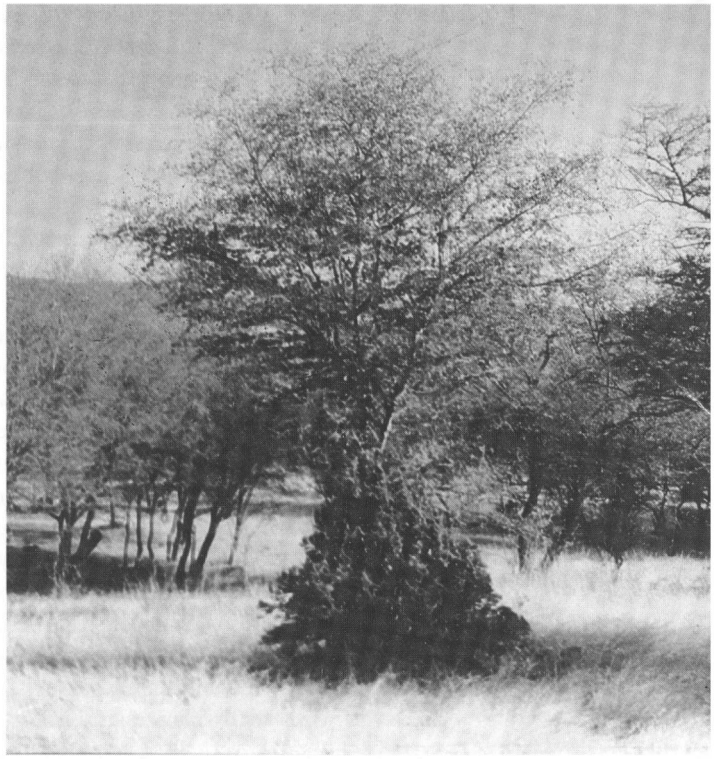
In order to meet this need, the Government of India, through its Department of Environment, commissioned the Indian Institute of Public Administration (IIPA) to survey the national parks and sanctuaries in India[1] with the objectives of:

[1] The survey was jointly directed by Mrs Dilnavaz Variava of the Bombay Natural History Society and the author, from the Indian Institute of Public Administration, New Delhi.

- documenting, analysing and making public information on the laws, policies, practices and problems relevant to the management of protected areas in India.
- making recommendations aimed at improving their management.
- documenting and making public information on the flora, fauna and habitats of these protected areas.

The methodology

Based on detailed discussions with experts, a methodology was developed which would have a good chance of success, given the constraints of time, and of human and financial resources. A detailed questionnaire was sent out to the directors of each of the protected areas (questionnaire I). This questionnaire had five sections covering legal issues, social and human use issues, biological and geographical descriptions, management issues, and the perceptions of the protected area directors. There were over 300 questions covering most aspects of protected area management. The questionnaire asked not only for basic description and listings, but also required the protected area managers to identify problems and prioritise concerns, to trace the history and trends of events and activities, and to describe the initiatives taken by the managers in various matters.



Ranthambhore National Park. Photo: Shekhar Singh.

A second questionnaire was designed for state governments[1]. A briefer questionnaire, it sought information about state level financial provisions for wildlife management, state level wildlife policies and institutions, and plans for the expansion and strengthening of the protected area network in the state.

The third questionnaire was designed for non-government organisations (NGOs), community groups and individual experts. It sought to record their observations and thoughts about the protected areas that they worked in or were familiar with.

Two of the major challenges were to ensure that the questionnaires were completed and to authenticate the information that was received. Fortunately, the state governments cooperated remarkably well and, with the encouragement of the Government of India, a very large proportion of the protected areas in India sent back completed questionnaires. This was despite the scepticism, expressed by many, that it would be impossible to persuade busy protected area managers to complete such a lengthy questionnaire.

[1] India has a federal structure of government with 32 states and union territories. The Constitution of India lists certain matters as state subjects, exclusively to be handled by the states, while others are central subjects. Some, like environment, are concurrent, where both have jurisdiction. National parks and sanctuaries are, however, set up and managed by state governments.

The state level and NGO questionnaires were also completed and returned though, in the latter, the amount of information forthcoming was disappointing. Clearly, though a large number of NGOs and individuals were interested in wildlife management, they did not have much hard data. However, NGO inputs were useful in identifying specific issues that needed further investigation and lists of species found in protected areas were forthcoming from many amateur wildlifers.

Authentication of the data received was the next challenge. Given the amount of data and the large number of protected areas responding, a detailed physical verification was out of the question. It was, therefore, decided to organise field visits to a large sample of the protected areas responding. There were 293 protected areas (51 national parks and 242 sanctuaries) at the start of the study. Of these, 261 (89 %) completed and sent back questionnaire I. Field visits, by teams of two or more researchers, were completed for 150 protected areas (57 %).

Within each protected area, certain categories of information were verified during the field visit. Primarily the focus was on sensitive information, of the sort that the protected area managers might hesitate to openly admit to. Illegal activities within the protected area, especially when they were by other government agencies or at the behest of political or administrative bosses are an example. Another priority was information regarding tensions between local communities and the protected area authorities, especially as the perceptions of managers often differed from those of the affected communities. The field team observed, discussed issues with the protected area staff, with local villagers and NGOs, and occasionally with other local officials. Where necessary, official documents were also examined.

The field teams also filled in critical gaps in the information, clarified seeming contradictions and ambiguities, and collected locally available documents. Before the visit of a field team, the relevant questionnaire was analysed and any obvious questions and gaps were communicated to the protected area manager in advance. This allowed the manager to collect the required additional information in time for the team to discuss it during the visit.

However, despite this elaborate effort to verify the information collected and received, it was recognised that many bits of information remained unverified or even unverifiable. This fact was stressed in the final report under sections in almost each chapter titled 'Limitations of the Data'.

This survey produced the first national database on the management of national parks and sanctuaries in India. Various publications emanated from this database. The first, soon after the study started, was the *Directory of National Parks and Sanctuaries in India* (Variava and Singh 1985), which contained basic information about most protected areas in India. In 1991, a detailed analysis of the management status of national parks was produced (Mehta *et al.* 1991). Simultaneously, directories of national parks and sanctuaries of each state started being prepared, using the base data from the survey (Singh *et al.* 1990, Pande *et al.* 1991 and Lal *et al.* 1994). However, the main report of the findings of the study was published in 1989 (Kothari *et al.* 1989).

Major findings of the first survey

The first survey collected and analysed data on many aspects of protected area management. Some of the important ones are listed below.

Legal steps: Only 21 (40 %) of the 52 national parks responding had completed their legal procedures. Significantly, this meant that only 21 of the 52 parks were legally national parks. Only 16 (8 %) of the 209 sanctuaries responding had completed their legal procedures[1].

Human population: Information was obtained separately for human populations residing inside each park or sanctuary and those living in areas adjacent to it (i.e. within a 10 km radius). This radius was specified because preliminary surveys showed that, by and large, direct pressure on the protected area came from people living inside the protected area or within 10 km of the boundary.

Population within parks and sanctuaries

Of the 32 national parks and 138 sanctuaries responding, 18 (56 %) and 100 (72 %) respectively reported human populations within their boundaries. Since the absolute quantum of population inside is not a good indicator of the potential pressure put on the ecosystem, the database was used to work out population densities. This was calculated by dividing the total population with the total area of each park and sanctuary (Table 1). Contrast this with the average population density of India, which was then about 2.5 per ha.

Population adjacent to parks and sanctuaries

Of the 23 national parks and 132 sanctuaries responding, 19 (83 %) and 115 (87 %) respectively, reported populations in their adjacent areas. An index of population pressures was worked out for each protected area by dividing the total population reported from adjacent areas with the total area of the park or sanctuary. (Table 2).

Rights and leases: All rights and other human uses are prohibited within national parks. In sanctuaries certain rights can be allowed, however, these should be within the carrying capacity of the area.

In 19 (43 %) of the 44 national parks and 128 (68 %) of the 187 sanctuaries responding there existed some rights or leases. This meant that these 19 national parks were still not being protected according to the legal requirements. As at that time it was mandatory to extinguish all rights even in sanctuaries (prior to the 1991 amendment), the 128 sanctuaries reporting the existence of rights were not being managed as stipulated.

Table 1. Densities of human population within protected areas.

density	**number**		
(persons per ha.)	**national parks**	**sanctuaries**	**total**
> 10.00	0	3	3
5.0 to 10.00	0	3	3
1.0 to 4.99	0	24	24
0.5 to 0.99	1	14	15
0.1 to 0.49	4	35	39
0.01 to 0.09	11	22	33

[1] The number of protected areas under each head differs because all the protected areas who completed the questionnaire did not respond to every question.

Table 2. Index of population pressures on national parks and sanctuaries.

pressure	**number**		
(persons per ha.*)	**national parks**	**sanctuaries**	**total**
> 1000.00	0	2	2
100.0 to 1000.00	0	3	3
10.0 to 99.00	2	9	11
5.0 to 9.90	2	11	13
1.0 to 4.99	6	38	44
0.5 to 0.99	1	19	20
0.1 to 0.49	3	26	29
0.01 to 0.09	2	6	8

*Note that the index thus worked out was in relation to the area of each park and sanctuary, and not in relation to the area adjacent.

A giant buttress tree in Saddle Peak National Park in the Andaman and Alicobar Islands. Photo: Shekhar Singh.

Grazing by livestock: Of the 36 national parks and 138 sanctuaries responding, 14 (39 %) and 101 (73 %) respectively, *allowed* grazing of livestock within their boundaries, while 24 (67%) and 114 (83 %) respectively reported *incidence* of grazing. In other words, grazing was occurring, though it was not authorised, in ten national parks and 13 sanctuaries.

Extraction of fodder: Of the 51 national parks and 204 sanctuaries responding, seven (14 %) and 63 (31 %) respectively reported *permitting* extraction of fodder and from all these areas fodder was, in fact, being extracted.

Extraction of timber and non-timber forest products: The law prohibits the extraction of timber and other forest produce from national parks. From sanctuaries, timber and other biomass can only be extracted if its extraction is "for the better management of wildlife", although after the 1991 amendment, extraction can also be allowed from a sanctuary if it is a right that has been allowed by the Chief Wildlife Warden. Of the 44 national parks and 183 sanctuaries responding, seven (16 %) and 78 (43 %) respectively reported extraction of timber while 14 (36 %) of the 39 national parks and 104 (56 %) of the 185 sanctuaries responding reported extraction of non-timber forest products.

Use and occupation by other government departments and agencies: Any activity by a government agency or department in a national park or sanctuary has to be cleared by the Chief Wildlife Warden. Of the 45 national parks responding, 25 (56 %) reported use or occupation by government departments and agencies other than the Wildlife Section. Similarly, of the 188 sanctuaries responding, 119 (63 %) had such uses.

Illegal occupation and use by other agencies: Of the 36 national parks and 176 sanctuaries that responded, three (8 %) and 46 (26 %) respectively reported incidence of illegal occupation or illegal use, or both.

Encroachment: Three (7 %) of the 44 national parks and 32 (20 %) of the 160 sanctuaries responding reported encroachment. Though encroachment is also 'illegal occupation', a distinction is made here between illegal location by government or other outside agencies (occupation) and by local people (encroachment).

Offences: Of the 45 national parks and 172 sanctuaries responding, 31 (69 %) and 96 (56 %) respectively reported incidence of one or more types of offences. The absence of recorded offences in a protected area does not necessarily mean that the protected area is either well managed or that the pressures on it are low but may reflect that violations of the law are not being recorded or acted upon.

Clashes: Conflicts over the use and control of natural resources become law and order problems and often result in clashes and physical confrontations between the local people and the protected area authorities. Sixteen (37 %) of the 43 national parks and 31 (17 %) of the 179 sanctuaries responding reported the incidence of such confrontations or clashes.

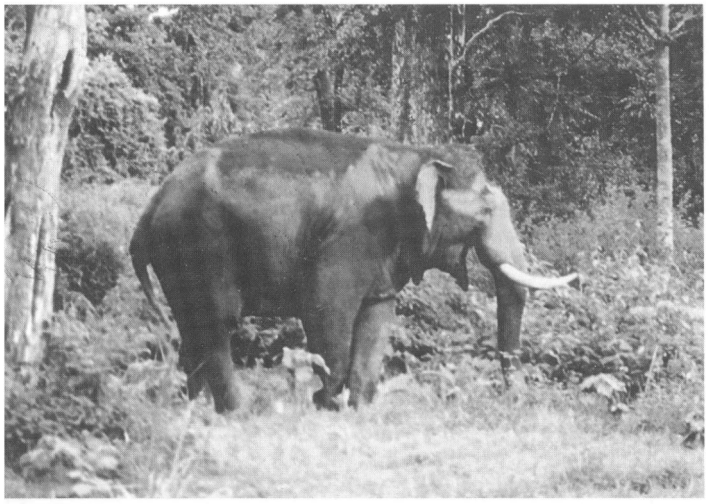
Management

Management plan: Of the 52 national parks and 208 sanctuaries responding, 26 (50 %) of the parks and 65 (31 %) of the sanctuaries reported the existence of management plans. In all the other areas, management was carried out on an *ad hoc* basis without a long-term perspective.

Relocation of human population: Of the 16 national parks and 88 sanctuaries which had human population inside them and which had responded to this question, five (31 %) of the parks and four (5 %) of the sanctuaries had proposed to relocate a part or whole of their population prior to 1984. Actual relocation till 1984 had been done in four (25 %), of the national parks and three (3 %) of the sanctuaries. This represents 80 % of the parks and 75 % of the sanctuaries where relocation was proposed. This does not however mean that relocation has been complete (i.e. that all the villages proposed for relocation have been shifted).

Compensation payable for injury or death of livestock: Ten (22 %) of the 45 national parks and 57 (31 %) of the 182 sanctuaries responding have reported that compensation is payable for injury or death of livestock, by wild animals, within the protected area. Corresponding figures for adjacent areas are: 20 (44 %) of the 45 national parks and 59 (32 %) of the 182 sanctuaries responding. Only nine (20 %) of the national parks and 46 (25 %) of the sanctuaries pay compensation for injury or death both inside and outside.

Compensation for damage to crops: Two (5 %) of the 43 national parks and 19 (10 %) of the 188 sanctuaries responding reported that compensation is payable for crop damage inside the protected area, by wild animals. For the adjacent area, the figures were five (12 %) of 43 national parks and 26 (14 %) of the 188 sanctuaries



A male elephant in Naparahole National Park. Photo: Shekhar Singh.

responding. Compensation was payable both inside and in adjacent areas in only one (2 %) of 43 national parks and 18 (10 %) of 188 sanctuaries responding.

Research and monitoring: Sixteen (42 %) of the 38 national parks responding and 38 (23 %) of the 166 sanctuaries responding reported that research work had been undertaken or was underway. Monitoring was reported from nine (20 %) of the 46 national parks and only 21 (11 %) of the 193 sanctuaries responding.

Water pollution: Of the five national parks and 20 sanctuaries reporting incidence of water pollution from among those responding, three (60 %) and eight (40 %) respectively had taken some remedial measures. Measures ranged from lodging of protest with the relevant authorities to chemical treatment.

Personnel: The data show that 45 (90 %) of the 50 parks and 171 (87 %) of the 196 sanctuaries responding have staff allocated to them. The data further show that of the 45 parks reporting existence of staff, 30 (67 %) had at least one staff member trained in wildlife management. Corresponding figures for sanctuaries were 61 (36 %) out of 171.

Association of NGOs: The involvement of people and people's organisations in wildlife management has been recognised as crucial to the protection of wildlife areas. The National Wildlife Action Plan, drawn up by the Government of India, repeatedly stresses this point: "The involvement of Non-Government Organisations is of great importance to the total conservation effort of the country and there is an urgent need to define the role of such organisations and identify particular ways in which they can be of assistance". There has also been a task force, set up by the Indian Board for Wildlife, to report on ways and means of eliciting public support for wildlife conservation. Unfortunately, there does not seem to be much evidence of association of NGOs with parks and sanctuaries. Of the 47 national parks and 198 sanctuaries responding, only eight (17 %) and 23 (12 %) respectively reported association of NGOs.

Management constraints

The findings of the survey brought out many important constraints to the effective management of protected areas. They also established that, though the expansion of the protected areas network, both in numbers and in the area covered, had been rapid, growth in management effectiveness had not kept pace. Some of the major constraints to effective management that the survey brought out are described below.

Cumbersome legal processes

Setting up of protected areas under the WL Act has proved to be a cumbersome process. Before the 1991 amendment, the government had to declare its intention to constitute an area into a national park after which, local people were asked to prefer

any rights and other claims that they might have in the notified area. These rights were then to be settled. Only after the rights and claims were settled or the affected area excluded from the intended national park, could it be finally notified. To set up a sanctuary, the government had only to notify an area as a sanctuary and the area legally became so from the date of notification. The rights and claims of the people were settled after the area was fully notified.

Experience showed that in a large proportion of the national parks, the final notifications were not done even decades after the initial intention had been declared. This was partly because the settlement of rights was to be done by the collector or the collector's nominee. In India, collectors are very busy people who rarely find time to take up this responsibility and as their department is not responsible for managing protected areas, settlement of rights is often given low priority. Consequently, many of the so-called national parks actually have no legal status.

A similar problem existed for sanctuaries, although in this case the area became a legal sanctuary from the date of the first notification. However, the non-completion of the processes to identify and settle rights and claims meant that they continued to be exercised in the sanctuary, making proper management an almost impossible task.

Even for areas, which were originally reserved forests, the WL Act prescribed that all the procedures to determine and settle rights and other claims were to be carried out before it could be made into a national park. This was despite the fact that a procedure to determine and settle rights and claims had already been completed when the area was declared a reserved forest. As no new rights could be acquired in a reserved forest, the repetition of this lengthy process was a waste of time and money.

Inadequate management inputs and capacities

Almost on all fronts, protected areas in India were found to be lacking management capacity. Few had management plans, even fewer had operationalised these plans; budgets were mostly inadequate, personnel few and mostly untrained, with little research and almost no equipment. In many protected areas, the control of the entire area had not been handed over, as required, to the wildlife department and, in others, forestry operations unsuitable to wildlife protected areas were still prevalent. Most disturbingly, a large number of government departments continued to use the protected areas in ways that were illegal and destructive. The ability of the protected area manager or the wildlife department, despite the best of intentions, to prevent this was limited. In fact, the survey found that the government itself was the largest violator of the WL Act!

Poor support and involvement of the local communities

Support and involvement of the local communities was almost totally absent in most of the protected areas. In fact, in many of them there was evidence of hostility between the protected area authorities and the local communities. This was characterised by clashes, often involving violence, between them. The hostility of the local communities was usually because they saw the protected area as illegitimately curtailing their access to resources. The protected area managers, on the other hand, saw themselves as being bound by the law to curtail the access of local communities and without the mandate to provide any alternatives to the affected communities, or

even compensate them for their loss. Other causes of tensions between managers and local communities were:

- crop and stock losses caused by wild animals.
- fear of attacks on humans by wildlife.
- lack of prompt and adequate compensation.
- loss of employment resulting from closure of tree felling and plantation activities.

Lack of a regional perspective

Managers lacked the ability to regulate land use and other activities in areas adjacent to the protected area. This meant that the protected area could not be effectively protected from pressures, especially pollution, emanating from outside the protected area boundary. This constraint was especially critical where mines or polluting industries were allowed to operate outside but adjacent to the protected area.

Lack of research and monitoring

Scientific inputs into protected area management were almost non-existent. Very few of the protected areas had active research programmes and even fewer had programmes relevant to their management needs. Most protected areas did not even have an authentic listing of the main faunal and floral species found within their boundaries. Biological, institutional and socio-economic monitoring was almost entirely absent. Apart from annual or biannual census of some of the larger animals, very little other information was being collected or analysed on a regular basis.

Follow up

Many of the recommendations made in the study report were accepted and adopted by the Government of India. For example, the legal procedures were simplified and areas which were already reserved forests or territorial waters of India, did not have to go through a detailed process of determining and settling rights (1991 amendment of the WL Act). Currently the act is again being revised to make the process of finally notifying protected areas less cumbersome in other ways. The financial allocations to the wildlife sector were also significantly enhanced in the coming years. Training of wildlife personnel was stepped up and special efforts were made to develop management plans for all protected areas.

Based on the findings of this study, the World Wide Fund for Nature-India (WWF India) filed a case in the Supreme Court of India, requesting the court to direct the Union Government and the respective state governments to complete the legal procedures required to set up national parks and to rid sanctuaries of unwanted pressures. The Supreme Court, in an interim order, so directed the concerned governments and gave them a time schedule to complete this process.

But perhaps the most significant development of all was the introduction of schemes of ecodevelopment, aimed at minimising the deprivations faced by local communities due to the setting up of the protected area, and at progressively getting the support and involvement of the local communities in the management of protected areas.

Planning for ecodevelopment: 1992–1995

The results of the first survey, published in 1989, and other studies and assessments, made it clear that one of the most difficult challenges facing protected area managers

was the reconciliation of the requirements of biodiversity conservation with the local community's demands for resources and income from the protected area. The law, on the one hand, prohibited access to almost all the resources within a protected area. On the other hand, these communities had few other survival options. Besides, many of the local people living in and around protected areas had been using these resources for years, sometimes for generations, and usually from well before the protected area was established. The sudden restrictions on their access not only resulted in severe hardships but also made them hostile to the protected area managers.

An elephant-proof trench in a sanctuary in Orissa. Photo: Shekhar Singh.

In order to tackle this problem, the Government of India decided to launch a programme for introducing ecodevelopment around protected areas. Ecodevelopment[1], as an approach, seeks to assess the adverse impacts that local people have on the protected area and the protected area has on the lives of the people. It then attempts to minimise these impacts by helping develop ecologically and socially acceptable alternative sources of incomes and natural resources. It does this through supporting the local communities to develop a village level plan exploring and establishing either alternative sources of fuel, fodder and other biomass, or alternatives to such resources. It also seeks to develop income generation opportunities that can divert the dependence of the local population from the protected area. The involvement of the local communities in the management of the protected areas is also encouraged and support is given for strengthening protected area management, training and research.

In 1992, the IIPA was commissioned by the Ministry of Environment and Forests (MoEF), Government of India, to do a series of studies to identify the best ecodevelopment strategies for selected protected areas. Between 1992 and 1995, detailed studies were carried out in 11 protected areas. Based on these studies, ecodevelopment projects were sanctioned and initiated in nine out of these 11 protected areas through the World Bank supported Forestry Research, Education and Extension Project (FREEP) and the India Ecodevelopment Project (1997), supported by the Global Environment Facility (GEF).

Prioritising among protected areas

The experience of developing detailed plans for these 11 areas showed that the time and resources required for developing a workable plan were such that it would be impossible to concurrently plan for all the protected areas in India. The need for prioritising among protected areas was, therefore, great. In 1996, a project was

[1] For a detailed description see Singh, S., 1997 *Biodiversity Conservation Through Ecodevelopment: Planning and Implementation Lessons from India*. UNESCO, Paris.

initiated to prioritise sites, species and strategies for biodiversity conservation. This project, called the Biodiversity Conservation Prioritisation Project (BCPP), was sponsored by the Biodiversity Support Programme (BSP)[1] and implemented collaboratively by a group of NGOs and individuals, with the administrative support of WWF India[2]. Among the various types of sites selected for prioritisation were national parks and sanctuaries. The prioritisation of national parks and sanctuaries was done collaboratively by IIPA and WWF India (Mehta 1998).

The methodology

In order to prioritise from among the protected areas, it was decided to use the databases at IIPA and elsewhere, and grade each protected area in terms of its biological value, the level of pressures or threats it faces and its management and legal status. Values were determined by considering:

- **biological value** (classified as high or very high) – based on the diversity and rarity of forest types and subtypes occurring in the protected area, the endemicity, rarity, and threat status of faunal species occurring in the protected area, the protected area size, geographical link with other protected areas, and on the percentage of the biogeographic province under protection.
- **pressures or threats** (classified as low or high) – based on the extent of consumptive human use and other reasons.
- **management and legal status** (classified as low or high).

By ascribing the values described above, protected areas were classified within each biogeographic province. The protected areas that had very high biological value were obviously the first priority. From among them, those with high pressures were higher priority and if they also had a low legal and management status, they were the highest priority, as conservation focus was most needed there. By applying this methodology, a list of priorities was built up from among 253 protected areas in India[3]. The aggregate total findings and final priority rankings are given in Table 3 and Table 4 respectively.

The priority list of protected areas, developed under the BCPP, is being increasingly used to channel additional funding to the high priority areas. For example, the preliminary list of 40 protected areas to be taken up in the GEF funded second India Ecodevelopment Project, currently under planning, is based on this prioritisation exercise.

The second all India survey: 1998–2001

Over ten years having passed since the last survey (1984–1987), it was thought desirable to conduct a fresh survey and to assess the changes that have occurred in the interim. Accordingly, the MoEF sponsored the IIPA, with financial assistance from the World Bank, to conduct a fresh survey to determine the status of wildlife protected areas in India, including their legal and administrative status, socio-economic

[1] The BSP is located in Washington DC, USA, and is a consortium of World Wildlife Fund, World Resources Institute and Nature Conservancy. It is supported by USAID.

[2] The project was coordinated by a steering group, chaired by the author. Raman Mehta of WWF India carried out the study on protected areas.

[3] The 105 protected areas of Andaman and Nicobar Islands were not included in this exercise as it was felt that a separate prioritisation exercise should be done for them. Of the remaining 428, adequate data were only available for 253. Data on biological aspects were, however, available for 278 protected areas.

Table 3. Valuation of protected areas.

biological value		human pressures		management and legal status	
very high	**162**	high	**135**	high	**166**
high	**116**	low	**118**	low	**87**
total	**278**	**total**	**253**	**total**	**253**

Table 4. Final priority ranking.

priority/category	numbers
1. very high biodiversity + high pressure + low legal and management status	**17**
2. very high biodiversity + high pressure + high legal and management status	**54**
3. very high biodiversity + low pressure + low legal and management status	**19**
4. very high biodiversity + low pressure + high legal and management status	**52**
5. high biodiversity + high pressure + low legal and management status	**25**
6. high biodiversity + high pressure + high legal and management status	**39**
7. high biodiversity + low pressure + low legal and management status	**26**
8. high biodiversity + low pressure + high legal and management status	**21**
total	**253**

pressures, management planning and implementation, staffing, research, monitoring, and tourism.

Amongst other things, the methodology is designed to permit comparison with the 1989 report as well as to describe and prioritise protected areas in terms of their management needs. The survey is also designed to assess national laws, policies, schemes and programmes relevant to protected area management and ecodevelopment, recommend changes, if required, and identify legal and other external interventions that might be required for the proper conservation of protected areas. The database from this survey will be used both for training and for subsequent monitoring.

In order to fulfil these objectives, it is proposed to survey *all* the national parks and sanctuaries in India in terms of their:

- **legal status**: How many of the steps prescribed for setting up a national park or sanctuary, under the WL Act, have been carried out? With whom does the control over the protected area vest?
- **management status**: Are there up-to-date and approved management plans? Are there appropriate budget provisions? What levels and numbers of staff are in position, and how many are trained in wildlife management? What are the organisational structures and systems? What are the management practices, especially relating to control of poaching, regulation of visitors, and prevention and vacation of encroachments? What is the availability of equipment, literature and reference materials? What interpretation, education and extension facilities and activities are in evidence? What level of participation is there of the local people in the protection and management of the protected area? What ecodevelopment initiatives have taken place?
- **biological profile**: What habitat and ecosystem types occur in the protected area, what is their location and extent, and what is their status? What species of fauna and flora occur in the protected area; what is their distribution and status? What habitat connection, if any, does the protected area have, through corridors and such

like, with other protected areas? What are the special biological values of the protected area? How adequate is our protected area network in terms of protection of priority species?

- **geographical profile**: What is the location of the protected area and how best can it be reached? What is the nature of the terrain and what are the significant physical features, including the high and low points? What is the climate like? What are the locations of other human made and natural features?
- **socio-economic profile**: How many people live within or adjacent (10 km radius) to the protected area? What is their socio-economic status and their dependence on natural resources, especially those of the protected area? What is the nature and legitimacy of their use of the protected area, past and present? What is the tourism value of the protected area and how many and what sorts of tourists visit it, and when? What are the religious and cultural values of the protected area? What impact does the protected area have on the local people, especially adverse impacts including depredation by wild animals and restrictions on the use of resources? What alternate resource bases can be, or have been, developed for the local people, especially through an ecodevelopment approach?
- **management issues**: What are the major threats to the habitat and species, including those through pressures from the local people? What is the incidence and nature of illegal activities in the protected area? What is the incidence and impact of activities within the protected area by other government departments? What is the cause, intensity and frequency of law and order problems, including tensions with local people?

The methodology

As this survey will be related to the earlier survey, in order to assess the changes that have occurred in the interim, the basic methodology being followed is the same. This methodology is described below.

- a questionnaire seeking information on all these aspects will be sent to the directors or officers-in-charge of each national park and sanctuary.
- another questionnaire will be sent to NGOs and individuals knowledgeable about protected areas.
- meanwhile, a search of secondary literature on each protected area, dealing with any of the listed aspects, will be undertaken, and the documents compiled.
- simultaneously, a database will be created of the known distribution of prioritised plant and animal species and of biomes, across India and, based on that, a listing of what species and biomes could ordinarily be expected to occur in each protected area.
- a survey of census records and other related data will be made and details of the human population and socio-economic parameters relevant to protected areas and their adjacent areas will be compiled from these sources.
- maps showing the boundaries the forest cover of each protected area will be developed to form base maps on which all additional information will be depicted.
- national and state budgets and plans will be analysed to identify the allocations and schemes relevant to each protected area and to its adjacent area.
- the completed questionnaires will be analysed and gaps or questions, if any, would be taken up with the protected area authorities.

- protected areas that warrant a field visit will be identified from a preliminary analysis of the questionnaires and from existing data. The views of local level officials and communities will also be sought in selecting sites for field visits.
- teams of three or more researchers, who collectively represent all the different areas of expertise required, will undertake the field visits. These teams will not only visit the protected area and meet with the forest officials but also, where required, meet revenue and other officials connected with the protected area and its adjoining areas. The teams will also meet with local NGOs and other knowledgeable and concerned individuals, including a sample of the local villagers.
- the information so gathered will be compiled and a profile constructed of each protected area. There will also be a compilation of state level data. These profiles will be sent back to the protected area/state and, wherever necessary, discussions held at the state level.
- following data analysis and preparation of a draft report, workshops will be held to assist review and finalisation of the report.

Expected outputs

The survey is expected to produce:

- a profile of each protected area, along with a description of its adjacent areas.
- a map of each protected area and of its adjacent areas.
- a map of each state and of the country, depicting the location of the protected areas and the ecosystems they cover.
- an analysis of the changes that have taken place, since the last survey, in the biological, geographical, socio-economic and managerial status of each protected area, and of the protected area network in each state and nationally.
- an analysis of the major management issues in each protected area, and for the protected area network in each state and in the country.
- a gap analysis of the coverage that protected areas are providing of different species of fauna and flora, especially threatened and endangered species, and of various ecosystems.
- a priority listing of protected areas in terms of their conservation value and their management needs.
- a photographic profile of the protected area network, to assist in training, education and monitoring.
- an assessment of the existing and possible management strategies at all levels of the protected area network.
- recommendations at the policy and implementation levels.

Current status of the survey

The survey started in 1998 and a detailed questionnaire was developed and sent to all the protected area directors. The questionnaire was designed to provide information that allowed comparison with the earlier database and yet had new and changed questions, based on the experience of the last survey. Field research teams have been identified in different parts of the country and have been put through a basic orientation programme. Field visits to the selected protected areas are currently underway.

Concurrently, a survey of secondary literature is being conducted and information on protected areas is being compiled. A new feature of this survey is the development

of a species gap analysis. An assessment is being made to determine the distribution and status of the faunal and floral species, prioritised as a part of the BCPP, within the protected area system. This should produce a gap analysis which will supplement and update the earlier analysis done by Rodgers and Panwar (1987).

Conclusions

Over the last 15 years there have been various attempts at surveying and assessing the management of wildlife protected areas in India. Due to a paucity of precedents, the methodology for carrying out such surveys had to be developed through trial and error, keeping in mind the Indian conditions, especially the general paucity of scientific data. Fortunately, the findings and recommendations of the various surveys and studies were taken cognisance of by government and changes were made to laws, policies and programmes relating to wildlife conservation.

However, the major constraint in fully assessing the management effectiveness of individual protected areas continues to be the paucity of scientific data. The cost of data collection across over 500 protected areas is prohibitive and it is thought, with some justification, that this money is better spent in supporting protected area management. There is, nevertheless, a need to strike a balance between investments on planning and those on implementation.

The major constraints to increased management effectiveness continue to be the paucity of financial and human resources, and a historical inability to involve the local communities in the management of protected areas. Fortunately, there is evidence of a change for the better. Investment in wildlife management is increasing, both through national budgets and through externally supported projects. Whereas earlier, bilateral and multilateral donor agencies often supported forestry projects with no wildlife or biodiversity conservation component, this has now changed. Most such projects now have funds specifically committed for wildlife conservation.

Training opportunities in wildlife management have also increased substantially and an increasing number of senior forest officers have voluntarily opted for wildlife postings. However, the ability to attract good and interested field staff, is still a problem.

Most happily, the attitudes of the government, and particularly of protected area managers, towards the involvement of local communities in protected area management have changed for the better. Apart from changing attitudes, programmes like ecodevelopment have given protected area managers the wherewithal and the official legitimacy to start working with the local people. It is in this direction that hope for the future lies.

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Professor Shekhar Singh is a faculty member of the Indian Institute of Public Administration, New Delhi, India and a member of the WCPA Task Force on Management Effectiveness. Email shekharsingh@vsnl.com

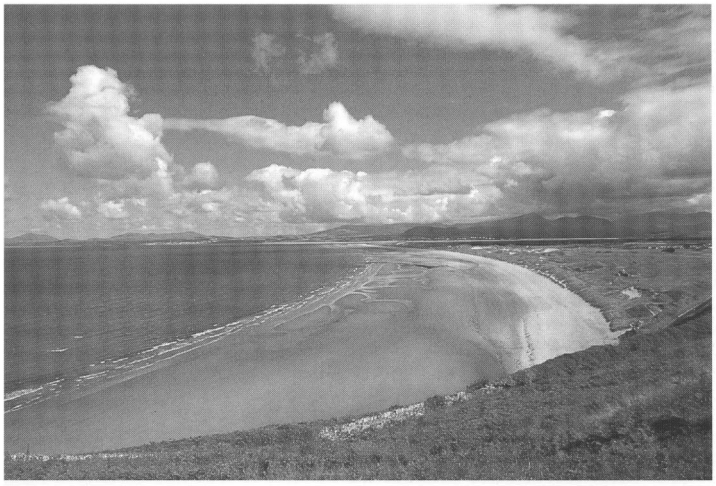
Recent developments in management planning and monitoring on protected sites in the UK

M. ALEXANDER AND T.A. ROWELL

The formal linking of monitoring of protected site features with conservation objectives set out in site management plans, which provides a standard way of making decisions about conservation and reporting outcomes, has forced widespread management planning and the use of carefully quantified objectives. While monitoring in this way provides some quality assurance checks on the effectiveness of conservation management, a formal process of audit of management plan implementation has been developed in Wales to strengthen this process.

STATUTORY NATURE conservation in the United Kingdom has a long history of management planning (Wood & Warren 1978, Idle 1980, Nature Conservancy Council (Wales) 1981, Nature Conservancy Council 1983, Nature Conservancy Council 1987, Alexander 1996). In general, planning has been restricted to National Nature Reserves (NNR), and reserves managed by voluntary bodies. The vast bulk of statutory sites; those comprising the national series of Sites of Special Scientific Interest (SSSI), remained without plans at the end of the last decade.

Up to this point, the SSSI series and its supporting legislation suffered a great deal of criticism because of a continuous trickle of damage, and some complete loss. An intensive study of the problem indicated that poorly designed monitoring methods meant that the recording of damage was unlikely to be complete (Rowell 1991). The study recommended that all SSSIs should have management plans as a context for proactive and reactive work, and that objectives for each site should be clearly stated. It also recommended a range of actions to improve the monitoring of the sites. This paper outlines the changes to management planning and monitoring practice that have occurred since.



Morfa Harlech: this is an SSSI, NNR, SAC and offshore a marine SAC. The main feature of interest on the site is the extensive sand dune system, one of the most important natural accreting systems in Wales. Photo: Mike Alexander.

The need for common standards

In 1991, the Great Britain conservation agency (the Nature Conservancy Council) was split up to form three separate bodies, one for each constituent country; England, Scotland and Wales. To maintain coordination of some aspects of nature conservation work across Great Britain, a committee of the three agencies was also set up, the Joint Nature Conservation

Committee (JNCC); Northern Ireland is an informal member of JNCC, so that there is a degree of coordination across the UK. One of the 'special functions' of JNCC is to establish common standards for monitoring nature conservation, a role that has obvious relevance in terms of context setting, and necessary for UK reporting of progress under European directives and international conventions. One of JNCC's early projects was to develop high-level common standards for monitoring designated sites to provide an indication of the state of the properties.

The development of 'Common Standards Monitoring'

The SSSI series consists of more than 6,000 sites with a vast array of habitats and species. Many sites are also important for earth science features. Conventional monitoring of habitats and species has focused on trends, indicating whether an attribute was increasing, decreasing, or stable. Clearly, for any one site we would not be able to make observations of all habitats and species, and we would have difficulty arranging trend information into a consistent view of the state of the site itself. This was made even more problematic by a realisation that trend information could not, in itself, be used as a standard. Compare, for instance, the difference between an increase from a poor position to a mediocre position, and an increase from an ideal position to one where conflicts occur with another habitat or species.

These two problems were resolved in the following way (Rowell 1993, Reed and Rowell 1995):

1. Only those features which were the reasons for the site being selected would be monitored (in practice, other aspects of a site would be monitored for management purposes, as discussed below). This provided a clear decision about what to monitor, based on what had already been identified as critically important about the site.

2. A stricter definition of monitoring was used which involves making observations against a standard for each feature, and categorising the feature accordingly. The standard would be developed individually for each feature at each site, in the form of a conservation objective within the context of a management plan.

This approach meant that we could categorise any feature as either meeting its conservation objective (favourable condition) or not (unfavourable condition). This basic approach was built into a simple model involving feature condition, and the human activities and natural events that might impact on a feature. In addition to recording whether a feature is in a favourable or unfavourable condition, we also record whether the condition is unchanged, recovering or declining relative to previous monitoring periods. Human activities are classed as positive when they are likely to achieve the conservation objective, and are operating at the correct intensity, timing, frequency, etc., or as potentially damaging where they are likely to have a negative impact on the condition of the feature. Lack of action, where it is needed, should be classed as a potentially damaging activity.

The 'Common Standards Model' gave the statutory conservation agencies a basis for obtaining information about the SSSIs that could be summed across the series (a butterfly population could be in favourable condition, so could an oak woodland – the audit trail to exactly what is meant by 'favourable' in each case is in the site management plans). This makes reporting relatively simple, and easy to understand. The great advantage, however, lies in the link to site management. A feature which is in unfavourable condition needs recovery management, while one which has become favourable may need some change from recovery management to a

maintenance regime. The collection of data for reporting was now tightly linked to the day-to-day observations necessary for management the sites.

After a long gestation period, during which much development occurred, the common standards were adopted by the country agencies (JNCC 1998).

The impact of the common standards model on management planning

Common standards monitoring has had quite major impacts on management planning. These include influencing what aspects of the site are planned and managed, and how the plan is structured and developed (Alexander 1996).

Management plans for SSSIs are developed principally, and in most cases solely, in respect of the features for which the site was selected. This focuses attention and resources to the critical parts of the site. This approach is obviously a compromise, but one that clearly does not preclude attention to the integrity of the entire site, inasmuch as it supports the important features. Nor does it preclude attention to additional aspects of the site where owners have particular interests.

In 1993 when common standards monitoring was proposed, conservation objectives were written in a simple way that could be applied to all features at all sites, but which meant little more than a restatement of a standard policy. The usual formula was "To maintain and enhance the ...". As a guide to monitoring, or a standard against which the monitoring could be judged, this was of no use. It was clear that a quantified objective was essential.

As ideas about conservation objectives developed, it became clear that they would usually have to deal with both quantity and quality, and would have to identify attributes of the feature in question which could then be quantified to express a measure of favourable condition. Inevitably, we fell into various traps along the way. The first of these was to believe that the conservation objective was a definition of favourable condition. Clearly, it cannot be so as it cannot address the complete dimensionality of condition. More recently, we have recognised that the conservation objective is simply a statement of the evidence we would accept as indicating favourable condition. The second major problem, and one that is difficult to eradicate from the perceptions of some conservation managers, is that conservation objectives should address the feature alone, and not the factors that influence its condition. So, we might include structural attributes in a conservation objective for grassland, but we should not include attributes of the grazing regime. The third trap is to assume that the conservation objective can take into account the natural variability of a feature. We now recognise that we will rarely have sufficient knowledge to define variability. Much better, from a management viewpoint, for the conservation objective to express,

Coedydd Maentwrog, SSSI, NNR, SAC. An outstanding example of western oceanic humid wood. Important, in addition to the woodland habitat, for important population of Atlantic bryophytes. Photo: Mike Alexander.

through upper and lower limits to each attribute, when we would become concerned and want to take some action. The objective operates as a set of triggers for action.

Despite excluding operational factors from our conservation objective, they are not ignored within the management plan. Instead, all relevant operational factors are set out, and limits set to facilitate their management. Just like the attributes identified within the conservation objective, the operational limits are subject to monitoring, and exceeding the limits results in immediate action. They do not, however, contribute to the assessment and reporting of feature condition.

The UK programme of management plan development and protected sites monitoring

Common standards monitoring has acted as a spur to develop management plans for all SSSIs, simply because monitoring does not make sense without a plan in place. Exact practice has differed in the country agencies, with Wales following the guidance set out in Alexander (1996). At present, the agencies have completed one pilot year of common standards monitoring, and are developing a programme to cover all sites in a six-year cycle. This means, of course, that plans should also exist for all sites by that time.

Application of common standards monitoring to other designations has also begun, notably to Special Areas of Conservation designated under the EC Habitats Directive. Several special projects, co-funded by the EC, have adopted the common standards approach, and have developed conservation objectives and linked monitoring. These include projects dealing with terrestrial habitats in Wales, marine habitats and species, rivers, and Atlantic oakwoods across the UK.

The first of these projects, covering all habitats on the Annex to the Directive that occur in Wales, is in the process of reporting. Specifically designed to demonstrate the link between management planning and monitoring (see Brown and Rowell 1997), this project has had a strong developmental aspect. In particular, it has examined the technical aspects of implementing common standards monitoring. This allows us to use relatively simple methods for monitoring habitats, secure in the knowledge that they are based on good principles. For instance, although we set targets and limits for whole features, we often decide to collect evidence from only a sample, a small portion of a whole feature. It is important, therefore, to be able to make the logical connection

Gannets Sula bassana *on Grassholm Island. Grassholm is an SSI, NNR and SPA owned and managed by the RSPB. The island is almost totally occupied by 33,000 pairs of gannets, one of the largest colonies in the UK.*
Photo: Mike Alexander.

between the evidence we collect from a sample, and our decision about whether or not our objective has been met for the entire feature (Brown, in prep.). The project has also trialed methods for developing conservation objectives.

Quality assurance

Writing a management plan is obviously only the first step to good quality conservation management. The first element in quality assuring our conservation management is to quality assure the plan. In Wales, plans for SSSIs are the responsibility of local officers. Each of the five Management Areas takes responsibility for checking the quality and signing off each plan. Wales-wide standards are maintained by checking a sample of plans centrally each year.

On the sites that we manage directly – the NNRs – we go a step further. A system of formal internal audit of the implementation of NNR management plans is now in place, and completion of these audits is a published target of the Countryside Council for Wales. This process helps ensure that standards of management are satisfactory, and improves our chances of restoring all important features of these sites to favourable condition.

For the SSSIs, the process of monitoring against agreed, quantified conservation objectives is the best quality assurance procedure we have. Recognising, however, the importance of developing our field staff's expertise in monitoring, CCW has expanded its team of monitoring advisers.

In conclusion

The development of common standards monitoring has forced the wider application of management planning, and tightened up the planning process itself. We have seen the terminology of common standards monitoring creep into the jargon of nature conservation in Britain – we are less likely to want to simply 'maintain and enhance', but rather to get features into 'favourable condition'. This is evident, for example, in the species and habitat action plans published under the *UK Biodiversity Action Plan*. Wider planning means more opportunity for proactive management of sites, and better preparedness for reactive work. Our impression is that we now have more confident conservation managers with a better understanding of what's important and where they are going. We have gained all this, yet the UK programme of common standards monitoring is hardly beyond its pilot year.

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M. Alexander is Conservation Management Co-ordinator at the Countryside Council for Wales.

Terry Rowell is Head of Environmental Audit at Countryside Council for Wales and a member of the WCPA Task Force on Management Effectiveness. They can be contacted at the Countryside Council for Wales, Plas Penrhos, Ffordd Penrhos, Bangor LL57 2LQ, Wales UK. e-mail: m.alexander@ccwales.demon.co.uk and t.rowell@ccw.gov.uk

Monitoring protected area management in Central America: a regional approach

JOSÉ COURRAU

This paper outlines the system of monitoring protected area management developed by The Nature Conservancy as part of the PROARCA/CAPAS project. Indicators organised in five different areas (social, administrative, natural resources management, political-legal and economic-financial) form the central component of the system. The system is currently being implemented in all the protected areas of Panama and Costa Rica and also in pilot sites in Nicaragua, El Salvador, Guatemala and Belize. The system is expected to be adopted by more protected areas in the near future.

THE IV World Congress on National Parks and Protected Areas that took place at Caracas, Venezuela in 1992 recommended the following:

- *the protected areas monitoring programmes are an important element in the environmental management of a region.*
- *coordinated and comprehensive research and monitoring programmes are essentially and urgently required.*

The need to assess and document protected area management in Central America led to The Nature Conservancy developing a monitoring framework for protected area management as a benchmark of the PROARCA/CAPAS project[1].

The monitoring of biological, social and management aspects is important in any protected area. Ecosystems, communities, flora and fauna suffer habitat fragmentation and other negative impacts mostly from human activities inside and outside protected areas. The increasing occurrence of such impacts require the implementation of monitoring techniques that will help detect changes in the long term. Monitoring in protected areas represents the 'barometer' to measure those changes. These measurements, at the same time, support decision-making and allow for progressive improvement of protected area management. Protected areas managers often use intuition and experience as the basis for decision-making. However, administrative actions based solely on intuition and experience tend to lack precision, consistency, public support and accountability.

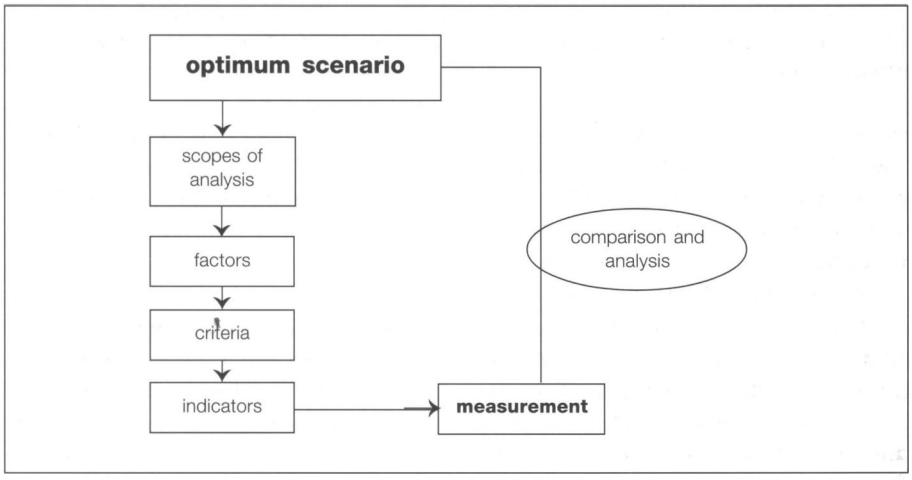
In Central America, as elsewhere, the information needed for assessing management has been fragmented, outdated, lacking scientific rigor or simply nonexistent. In addition, the establishment of assessment systems within management agencies was hampered by a lack of concern about monitoring within the institutional culture, a lack of appropriately trained staff, and inadequate budgets.

[1]PROARCA/CAPAS is a partnership of the Central American Commission on Environment and Development (CCAD), the US Agency for International Development (USAID), the International Resources Group, Ltd (IRG) and The Nature Conservancy (TNC). The objective of PROARCA/CAPAS is to provide political, technical, and economic support for the management of protected areas in Central America.

Structure of the framework

A participatory process was followed to develop the monitoring framework. The project technical staff developed an outline of the monitoring system which was then reviewed, discussed and significantly improved in a regional workshop of experts from seven Central American countries. The workshop participants stressed the need for a system that is simple, low cost, and able to generate data and promote improvement in protected area management within a short timeframe.

The system starts with the definition of the optimum scenario the protected area wants to achieve. The optimum scenario is defined in terms of five major aspects of management; referred to as scopes in this system and comprising social, administrative, natural resource management, political-legal, and economic-financial aspects. For each scope, a number of factors are defined that characterise the scope. Assessment criteria and indicators for each factor are then developed. The relationship among these components is as follows:



The foundation for scoring the criteria was taken from "The Scorecards: Protected Area Consolidation Criteria" method developed by The Nature Conservancy (TNC) Parks in Peril Program (Mansour 1995). Each indicator is assessed using a five point scale, with 1 representing the worst condition and 5 representing the desired condition in relation to any indicator. The desired condition must be detailed in the optimum scenario for that indicator. An example[1] of how the system is elaborated in relation to two of the factors within the Administrative Scope is given in Table 1.

Implementation of the framework

A basic requirement for implementation is the concept of open participation with the involvement of interest groups as well as staff being a fundamental part of the approach. The first step in implementation consists of the development of an optimum scenario for the protected area. This scenario represents the goals the protected area wants to accomplish in a determined period of time (e.g. five years). The indicators for each criteria are then defined in relation to this optimum scenario.

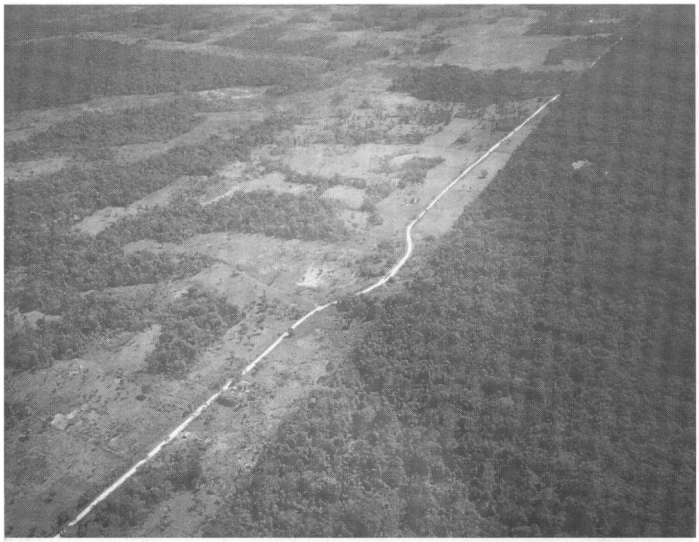
[1]There are a number of criteria specified for each factor and a number of factors within each scope. One single example has been used for illustrative purposes in this table.

Table 1.

Scope	Factors	Criteria	Indicators
Administrative	Infrastructure	Equipment (requirements are defined in the optimum scenario)	5 = 100% of required equipment available 4 = 75% of required equipment available 3 = 50% of required equipment available 2 = 25% of required equipment available 1 = there is no equipment
	Planning	Management Plan	5 = plan has been completed and fully implemented 4 = plan has been completed and is partially implemented 3 = plan has been completed but not implemented 2 = plan is being developed 1 = there is no management plan

Monitoring sessions are conducted every six months. In this session the protected area staff and representatives from interest groups (communities, associations, tourism chambers and others) get together to review and qualify the status of the indicators based on the current situation in the protected area. Each indicator is presented to the group and discussed. Based on the discussion and the submission of reliable evidence in the form of reports, maps, letters, and others, the group assigns an agreed rating on the five point scale to the indicator.

The results from the first monitoring session become the baseline for the area. Every six months the results are compared against the scenario in order to measure progress. Since the framework's focus is the protected area and its optimum scenario, comparisons should be made of the same protected area against itself across time. Comparisons between and among protected areas are discouraged since the factors that influence the management are different in each case.



The hard 'edge' of Laguna Lachua protected area, Guatamala, from the air.
Photo: Sue Stolton.

The main characteristics of this approach are:

a. simplicity.

It is very easy to use, does not require special technology or training and can be applied by most protected area staff.

b. low cost.

The method does not require a large investment in equipment or time, which makes it very attractive to Central American protected areas because of the obvious logistic and economic limitations.

c. has capacity to improve and adapt to local needs.

New criteria and indicators can be developed to refine the existing ones and to cover gaps.

d. applicability.
Even though the Central American protected areas present obvious differences in ecosystems, management style and level of development, the method is widely applicable. The diverse coverage of protected areas management issues in the indicators allows the protected area staff to select those they consider applicable based on management category, ecosystems, and other factors.

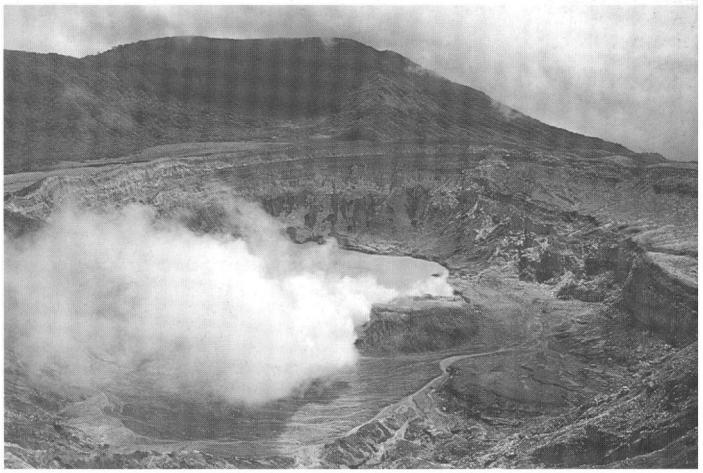
e. promotes improvement in protected areas conservation.
The application of this method through time (every six months or annually, for instance), promotes improvement in protected area management. At the same time, it encourages staff to document management decisions. The information contained in this institutional memory is very valuable for the future and can be used to keep decision-makers at higher levels informed about park management on the ground.

Pilot projects and future prospects

To validate the method, Braulio Carrillo National Park, Poás Volcano National Park, Irazú Volcano National Park, Guayabo National Monument and Bosque del Niño Forest Reserve (Costa Rica); Reserva de Manantiales de Cerro San Gil (Guatemala); Crooked Tree y Cockscomb Wildlife Sanctuaries (Belize); and Río Plátano Biosphere Reserve (Honduras) were selected as pilot programmes. Following the success of these pilots, the framework has been officially adopted in the Sistema Nacional de Areas de Conservación (SINAC) in Costa Rica. In Panama, the Autoridad Nacional del Ambiente (ANAM) has also adopted the framework and most of the protected areas of the country are already implementing it. Pilot sites have been supported in Belize in co-operation with the Belize Audubon Society (Cockscomb and Crooked Tree Wildlife Sanctuaries). In El Salvador the framework has been implemented in close co-ordination with Parques Nacionales y Vida Silvestre (PANAVIS) (Montecristo National Park) and in Nicaragua five protected areas have implemented the framework in cooperation with the Ministerio de Ambiente y Recursos Naturales (MARENA).

The response from protected areas where the monitoring framework is being implemented is extremely positive. Especially positive are the reactions from protected area managers who perceive the framework as a useful tool for planning and monitoring. The optimum scenario, data from the different monitoring sessions, the evidence that supports the assessment of the indicators, and the participation of staff and interest groups all become valuable resources that help establish a common vision for the future and assist and inform the protected area managers in carrying out their work.

Further steps to develop and consolidate the system are underway. An advanced version of the monitoring framework has been developed and is currently under peer review. This version



Poas Volcano National Park in Costa Rica has been one of the pilot study sites for The Nature Conservancy's system of evaluating management effectiveness. Photo: Marc Hockings.

is directed to protected areas with high management capacity. Although there are few of these areas in Central America, we have felt the need to provide the next stage of monitoring for protected areas that have reached more complex levels of management. Following the success in implementation of the framework at the site level, we anticipate the need to summarise and make efficient and effective use of the information at the national level. A national version of the monitoring strategy is currently being developed with the goal of informing national level decision-makers.

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José Courrau is the Protected Area Specialist with The Nature Conservancy's PROARCA/CAPAS Project based in Costa Rica, PO Box 230–1225 San Jose Costa Rica.

Résumés

Développements récents dans la planification et le suivi de la gestion des sites protégés au Royaume-Uni

M. ALEXANDER ET T.A. ROWELL

La relation formelle du suivi des caractéristiques de sites protégés avec les objectifs de conservation réside dans les plans de gestion de sites, qui offrent une manière standard de prise de décisions sur la conservation et le report des résultats, a imposé une planification de gestion largement répandue et l'utilisation d'objectifs quantifiés avec précaution. Tandis que le suivi offre de cette manière certains contrôles d'assurance qualité sur l'efficacité de la gestion de conservation, un processus formel d'audit de mise en œuvre des plans de gestion a été développé au Pays de Galles pour renforcer ce processus.

Comment allons-nous bien faire ? - Quelques idées sur l'efficacité des zones protégées

MARC HOCKINGS ET ADRIAN PHILLIPS

Tandis que l'étendue des terres en zone protégée à travers le monde continue de s'agrandir, l'attention des gestionnaires, des décideurs politiques et des juristes pour les zones protégées est de plus en plus dirigée sur la question de savoir avec quelle efficacité ces zones sont gérées. Les informations sur l'efficacité de la gestion sont demandées pour toute une variété d'objectifs et par toute une variété de personnes et ceci conduit au besoin d'une "boîte à outils" de méthodologies qui puissent aborder cette diversité.

Contraintes institutionnelles au financement de zones protégées

ALEXANDER N. JAMES

Les budgets des zones protégées sont en moyenne de 157 $ par kilomètre carré par an dans les pays en développement et 2058 $ par kilomètre carré dans les pays développés, d'après une étude récente du WCMC. En moyenne, les budgets des pays en développement sont à moins du tiers adéquat pour répondre à leurs objectifs de conservation établis. Une façon de s'attaquer à ce problème est de permettre aux agences de gestion de conserver les revenus collectés dans les zones protégées ; là où cela a été essayé, les budgets sont maintes fois plus élevés que dans les agences qui dépendent exclusivement des attributions des gouvernements. De telles agences financièrement autonomes ont tiré avantage d'une gamme de mécanismes de collecte de revenus. Cependant, la mise en œuvre d'un tel programme nécessite un changement institutionnel au niveau de l'autorité statutaire de l'agence, de sa culture d'entreprise, et dans les attitudes des utilisateurs de la ressource. Bien que la résistance au changement puisse se manifester à n'importe lequel de ces niveaux, l'expérience des agences qui réussissent indiquent que le financement de la conservation peut être significativement amélioré.

Une étude préliminaire du statut de gestion et des menaces dans les zones forestières protégées

SUE STOLTON ET NIGEL DUDLEY

De nombreuses zones protégées ne sont pas efficacement protégées du tout. Une étude récente de 10 régions forestières clés effectuée pour l'Alliance WWF - Banque Mondiale a montré que seulement 1 pour cent des zones forestières protégées étaient considérées comme sures et qu'un quart souffraient de dégradations et de pertes. Une gamme de tendances dans le statut des zones protégées a été identifiée et les menaces ont été listées et discutées.

Evaluer l'efficacité de la gestion des zones protégées pour la faune sauvage en Inde

SHEKHAR SINGH

Cet article décrit les efforts faits en Inde pour évaluer l'efficacité de la gestion des zones protégées. Il expose dans les grandes lignes la méthodologie employée, présente les découvertes majeures au niveau national et indique les actions engagées sur ces découvertes et sur les recommandations consécutives.

Suivi de la gestion des zones protégées en Amérique Centrale : une approche régionale

JOSÉ COURRAU

Cet article met en évidence le système de suivi de la gestion des zones protégées développé par The Nature Conservancy (Protection de la Nature) comme partie du projet PROARCA/CAPAS. Des indicateurs organisés en cinq domaines différents (social, administratif, gestion des ressources naturelles, politique - légal et économique - financier) forment le composant central du système. Le système est actuellement en cours de mise en œuvre dans toutes les zones protégées du Panama et du Costa-Rica et aussi sur des ites pilotes au Nicaragua, au Salvador, au Guatemala et au Belize. On s'attend à ce que le système soit adopté par davantage de zones protégées dans un avenir proche.

Resumenes

Desarrollos recientes en la planificación de gestión y monitoreo en áreas protegidas del RU.

M. ALEXANDER Y T.A. ROWELL

La unión formal entre el monitoreo de determinadas características de áreas protegidas y los objetivos establecidos en la planificación de la gestión de las áreas, lo cual proporciona un modo estandarizado de toma de decisiones sobre la conservación e informe de resultados, ha generalizado la planificación de gestiones y el uso de objetivos cuidadosamente objetivos. Mientras que el monitoreo permite asegurar la calidad en la efectividad de la gestión de conservación, se ha desarrollado en Gales un proceso formal de auditoría de la implantación del plan de gestión para fortalecer este proceso.

¿Cómo de bien lo estamos haciendo?- Algunas consideraciones sobre la efectividad de las áreas protegidas

MARC HOCKINGS Y ADRIAN PHILLIPS

Mientras que la extensión de áreas protegidas alrededor del mundo continúa expandiéndose, la atención de los gestores, políticos y abogados encargados de las zonas protegidas se centra cada vez más en cómo de efectiva es la gestión de estas áreas. Debido a que esta información sobre la efectividad de la gestión es requerida para diferentes propósitos y por diferentes grupos de personas, nace la necesidad de una "caja de herramientas" de metodologías que tengan en cuanta esta diversidad.

Complicaciones Institucionales en el Patrocinio de Zonas Protegidas

ALEXANDER N. JAMES

Los presupuestos de las zonas protegidas suman una media de $157 por kilómetro cuadrado y año en los países en vías de desarrollo y $2058 por kilómetro cuadrado y por año en los países desarrollados, según un reciente estudio de WCMC. Como media, los presupuestos de los países en vías de desarrollo son menores que un tercio adecuados para conseguir sus objetivos de conservación estipulados. Una manera de tratar este problema es permitiendo que las agencias gestoras retengan las rentas obtenidas en las zonas protegidas. Cuando este procedimiento se ha llevado a cabo los presupuestos han sido mucho mayores que aquellos de agencias que dependen tan solo de asignaciones gubernamentales, debido a que estas agencias autónomas se han aprovechado de numerosos mecanismos para aumentar los beneficios. Sin embargo, la implantación de programas de este tipo requiere un cambio institucional tanto a nivel de la autoridad estatutaria de la agencia como de su cultura corporativa, así como de las actitudes de los usuarios de los recursos. Aunque el grado de resistencia al cambio puede tener lugar en cualquiera de estos niveles, experiencias de éxito de algunas agencias indica que el patrocinio de la conservación puede mejorar considerablemente.

Reconocimiento preliminar del estado de gestión y amenaza de las áreas de bosque protegidas

SUE STOLTON Y NIGEL DUDLEY

Muchas de las zonas de protección no están protegidas realmente. Un estudio reciente en diez países importantes en cuanto a bosques realizado por la Alianza WWF-Banco Mundial, concluía que tan sólo un 1 por ciento de las zonas de bosques protegidas se consideraban como seguras, mientras que un cuarto sufrían degradación y pérdidas. Se identificaron un abanico de tendencias en el estado de las zonas protegidas y se realizó un listado comentado de las diferentes amenazas a las que están expuestas.

Evaluación de la Efectividad de la Gestión en Zonas Protegidas de Fauna en la India.

SHEKHAR SINGH

Este artículo describe el esfuerzo llevado a cabo en la India para evaluar la efectividad de la gestión de áreas protegidas. Resume la metodología utilizada y presenta las conclusiones principales a nivel nacional, así como indica las acciones a llevar a cabo y las subsecuentes recomendaciones.

Monitorización de la Gestión de Áreas Protegidas en Centro América: un Enfoque Regional

JOSÉ COURRAU

Este artículo resume el sistema de monitorización de gestión de áreas protegidas del Nature Conservancy como parte del proyecto PROARCA/CAPAS. El componente principal del sistema está formado por indicadores agrupados en cinco áreas diferentes (social, administrativa, gestión de recursos naturales, político-legal y económico-financiero). Este sistema está siendo implantado en todas las áreas protegidas de Panamá, El Salvador, Guatemala y Belice, esperando que sea adoptado por más áreas protegidas en un futuro próximo.

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