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Challenges and experiences in implementing a management effectiveness evaluation program in a protected area system

*A.J. Growcock, E.F. Sutherland and P.T. Stathis**

Evaluation of management effectiveness in protected areas is increasingly being recognised as a management imperative. Such evaluations facilitate adaptive management to help improve planning processes, provide greater clarity to managers in determining priorities, and support the decision-making process through continuous learning. However, there are considerable challenges in implementing an evaluation program of an entire protected area system: ownership of the evaluation process must occur at all levels of the management agency; a reliable process needs to be developed; a system for information sharing is required; a culture of learning needs to be encouraged and supported; and an appreciation of the range of useful qualitative and quantitative evidence has to be fostered. In NSW, this evaluation process has been established through a State of the Parks program. This article explores some of the key challenges associated with the development of this program and identifies some of the lessons that have been learned.

Keywords: protected areas, evaluation, management effectiveness, adaptive management

Around the world, protected area managers are seeking to monitor and evaluate the condition of, and pressures on, protected areas and to determine how effectively these areas are being managed. For specific issues in a single protected area, this can easily be achieved and is commonly undertaken. In 2004, however, the Convention on Biological Diversity (CBD) challenged signatory states to take this a step further. A Programme of Works on Protected Areas was adopted, which included a requirement that signatory states develop and implement systems for assessing management effectiveness for at least 30 per cent of their protected area systems by 2010 (SCBD 2004).

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Many of the signatories have risen to this CBD requirement. At the end of 2007, over 6300 assessments from 100 countries were identified in a global study of protected area management effectiveness (Leverington et al. 2008a). Many of the countries undertaking these assessments completed evaluations for their entire protected area systems although using a range of different methodologies (Ervin 2003; Hockings 2003; Staub & Hatziolos 2004; Gilligan et al. 2005; Stolton et al. 2007; Hockings et al. 2008).

In New South Wales (NSW), the Department of Environment, Climate Change and Water (DECCW) met the challenge through the development of a State of the Parks program, a systematic evaluation of the entire NSW park system. This program was based on the IUCN World Commission on Protected Areas (WCPA) framework for assessing the effectiveness of the management of protected areas (Hockings et al. 2000, 2006), and has ambitious objectives:

- to improve the understanding of the values being managed for a park, their condition and the pressures upon these values
- to evaluate the effectiveness of on-ground management activities against plans and legislative objectives
- to inform planning and decision-making at a range of scales by providing clarity as to where management actions have resulted in success or otherwise
- to assist in the targeting of funding and resources to areas most likely to benefit from the investment
- to communicate the results of management actions to the community and demonstrate accountability and transparency of management.

As of late 2009, almost 800 parks and reserves are managed by the DECCW with a total area of 6.7 million hectares or 8.4 per cent of the state. The NSW park system includes a combination of national parks, nature reserves, state conservation areas, Aboriginal areas, regional parks, historic sites, karst conservation reserves and community conservation areas, and is complemented

by a system of marine parks and aquatic reserves which cover 34 per cent of the NSW coastline.

Undertaking an evaluation of the effectiveness of management for all parks and reserves can represent a considerable challenge, in particular, to ensure that the process results in adaptive management for the whole system. Information needs to be collected systematically, yet be flexible enough to capture the variation within different reserve categories and parks of different sizes. The information collected must be detailed enough to facilitate management action and reporting at a range of scales, yet not so onerous that the evaluation process becomes a significant burden for on-ground managers.

Each NSW park has been assessed separately, with considerable time and effort contributed by park managers to ensure that the information collated is accurate, consistent and meaningful. Furthermore, park managers need to evaluate the full spectrum of management issues for each protected area. This includes examining the condition of the local natural, cultural and recreational values; assessing the severity and extent of current and emerging threats; determining the inputs available to implement management actions; assessing the effectiveness of management actions for issues such as pest animals, weeds, fire, and threatened species; and evaluating whether the provision of facilities and requirements has been adequate for user demands. Since the collation of such information can represent a time-consuming exercise, tangible benefits towards conservation outcomes are required to ensure ongoing support for the program from all levels of management.

After considerable commitment and efforts by park managers, the NSW State of the Parks program is now a core management system that is increasingly being used to support improved understanding and management of the whole park system. This occurs through supporting priority setting and decision-making for on-ground managers, by providing a range of products tailored to specific management needs, and by providing state-wide information for those developing policy and strategic programs. This article considers some of the challenges that have been associated with developing and implementing the NSW State of the Parks system, examines some of the lessons learned, and discusses the impacts of the program on the ongoing management of the NSW park system.

Developing the NSW State of the Parks program

An extensive review of the NSW State of the Parks program approach and its development is presented in Hockings et al. (2009a). However, in order to consider the challenges and lessons learned from the program, an overview of the history of the program and its operation is provided.

The NSW State of the Parks program was first trialled in 2002 using 22 'representative parks'. This evaluation examined a diversity of issues using quantitative survey responses. Although the results of the evaluation were valuable, the *context* for a response was often missing and thus the meaning of the results could not be explored fully. In addition, although the sample of 22 parks included representatives of all the major park types and conditions, the data could not be extrapolated satisfactorily to demonstrate effective management across the entire park system. The data could not be used to support adaptive management in other parks, for which evaluations had not been undertaken, due to their local differences.

In 2004, after a review of how best to achieve these broader evaluation aims, a new State of the Parks approach was proposed that examined every park within the NSW system. To achieve this broadened scope, the survey process was revised towards a more qualitative approach.

This shift reflects a growing recognition, by many park managers around the world, that it is not logistically or economically feasible to collect quantitative data on all aspects of management, nor is it always required. As noted by Hockings (2003, p. 826), 'while the natures of qualitative and quantitative data differ, one is not necessarily superior to the other in terms of accuracy or meaning. Both data types are subject to error during collection, and both require interpretation…'. Therefore, to ensure that the best information is available to support management effectiveness evaluations, a combination of both qualitative and quantitative methods is arguably most appropriate (Hockings et al. 2009b). For example, a qualitative assessment could identify that 'impacts from fire are diminishing' and be supported by quantitative data that may already be systematically available - in NSW, data are collected on the proportions of vegetation communities within a park that are within their designated fire management threshold (Kenny et al. 2003).

Under the revised survey program, park managers are required, in answering key questions, to select a pre-defined answer from one of four assessment options for any particular issue (i.e. the condition of a particular park value). Where park managers can not answer a question, alternative responses are available, such as identifying

that the issue is not relevant to a particular park or that there is insufficient information to make an assessment. A justification for such responses is required and the underlying sources of information should be identified. This assists in explaining the factors contributing to the evaluation result. In this way the *context* for the answer can be assessed.

A wide variety of information was collected through this new State of the Parks approach, with the issues for assessment identified during extensive consultation with staff and experts early in the development of the program. The questions on management effectiveness were associated with key management themes, such as weeds, pest animals, fire, threatened taxa, cultural heritage, visitors and asset management. The four-tiered answer examined issues such as the approach and effect of management actions and the condition of a park value (from good condition and not at risk, to degraded and at risk).

Implementing the program

In 2004, an evaluation of the 639 parks and reserves in the NSW park system was conducted. Each park evaluation required the nomination of a 'principal assessor'. Typically, this was a ranger or other field-based park manager who was trained in completion of an assessment and on the intent of key questions. These principal assessors were responsible for ensuring that their assessments were completed and that consultation was undertaken with appropriate staff (e.g. fire management specialists) to obtain a comprehensive assessment of park management effectiveness. Once the principal assessors had completed their surveys, senior managers reviewed all assessments in their management area to ensure the validity, accuracy and consistency of the assessments. In most cases, the senior managers consulted with their specialist staff, such as regional planners. The surveys were then collated for final checking and subsequent analysis.

The results of the 2004 survey were presented in a public report in June 2005 (NSW DEC 2005), and a three-year frequency for evaluation was identified as appropriate. The three year interval was adopted for pragmatic reasons as the process of collecting the information was logistically intensive, and because changes to the environment, either naturally or as a result of management, were unlikely to be readily apparent on a shorter timescale.

In 2007, the evaluation was repeated. However, by this time, the NSW park system had grown to 774 parks and reserves - a 21 per cent increase in the number of parks since 2004. Improvements were made to the survey to enhance the applicability of results, with assessments of the *approach to* management and *effect of* that management separated to allow a better understanding of management results. The program continued to be coordinated centrally but was now completed 'on-line' using an internet-based survey tool.

The coordination team consulted with senior managers, rangers, planners, and theme specialists before and after the survey to ensure that the results would be of value to an array of users within the organisation. Most of the user requirements specified during this consultation were implemented. This included using results for operational planning and resource allocation, as well as to support external reporting requirements.

Challenges in implementing a system-wide evaluation approach

The many challenges in undertaking an evaluation of a protected area are magnified when conducting an evaluation of an entire park system. Some of these challenges were evident before beginning the process in NSW, while others became apparent as the program evolved. Although not an exhaustive list, some of the challenges included: building ownership for the program; ensuring that the results are reliable; developing a system for information sharing; recognising and accepting that all results will not be positive; and integrating science and management.

Building ownership

There are many factors that contribute to the success of evaluation programs (Guijt 1999). Critical to the success of the NSW State of the Parks program has been engendering a sense of ownership of the program among senior managers (typically office-based) and park managers (typically field-based). Without this, the ongoing success of the program would be difficult to achieve.

Ongoing leadership from senior managers has been an important element of building ownership for the NSW program. Through this, park managers gained further confidence that participation in the evaluation program was worthwhile and that their assessments were being used to guide strategic programs.

Clear communication about the program was also essential, so compulsory training was given to all park managers and senior managers involved in the evaluation process. The training, initially a full-day session in 2004,

was intended to articulate the purpose of the program and to instruct assessors on question interpretation to ensure consistency of survey responses. Local issues were raised by participants and addressed to ensure a consistent approach across the state.

Effective engagement with park managers and senior managers involved with the assessments was essential to remove preconceptions that the program was about individual work performance. Evaluations were based purely on the parks themselves. It was important that assessors appreciated this to ensure that the evaluations were as accurate as possible.

In 2007, the training was repeated and improved to incorporate feedback on previous issues and results. This provided important context for the 2007 survey, reminded park managers of the value of the data and how they could be used, and helped to create a shared understanding of the value of the program; a factor that has been shown to be important in other evaluation studies (c.f. Naccarella et al. 2007). This was important for park managers who continued to be uncertain about the intended application and use of the survey results.

The training was accompanied by a written support document, online help accessed through the survey tool, and a centralised telephone 'help-desk' available during the survey period. This combination of support tools allowed participants to use a help option that they were most comfortable with, while ensuring that they did not feel isolated in their efforts to complete the assessment. In widely decentralised workplaces, such as park management agencies, feeling part of a larger team is crucial to building ownership of a process.

Ensuring that responses are reliable

In developing the evaluation program for NSW, it was essential that the information collected was reliable. This included making sure that the approach used was appropriate, that park managers understood the purpose of the program and that the collated information was accurate.

The first step towards ensuring reliability of the results was to base the program on the IUCN-WCPA management effectiveness framework (Hockings et al. 2000, 2006). This ensured that the key elements of the management cycle were evaluated and that the results addressed multiple requirements for decision-making processes.

As well as building ownership of the program, training of park managers gave them an understanding of why evaluations are required and helped to ensure that the results were reliable and consistent. The review of results at a regional-scale (in some cases, up to 80 parks may be found in a region) was also important for ensuring reliability. Regional managers are able to take an overview of what is happening across all parks and can mediate excessive biases or misinterpretations of the results by an individual assessor. Through this, confidence has been increasingly gained as to the reliability of the results both at the park-scale and for state-wide analyses.

Developing an online system for undertaking the evaluations also has enhanced the reliability of the results. Business rules were developed to ensure that the data collected were consistent within a survey, and for program coordinators to 'pre-populate' information from corporate datasets into assessments as appropriate. Management, monitoring and research plans were used to source relevant information on a park, the landscape context, or results from a previous assessment.

Developing a system for information-sharing

The provision of products and tools that facilitate the access and use of assessment results by all occupational groups within the park agency has been fundamental to the uptake of the State of the Parks program. The inclusion of evaluation results in NSW has helped to improve on-ground management. Sharing of evaluation information supports standardised reporting of management issues and effectiveness, while improved knowledge of management strengths and weaknesses within the park system allows for the development of targeted work programs.

However, the application and use of evaluation results is an area in which protected area managers need to improve (Leverington et al. 2008b). Making the State of the Parks assessment results available and accessible to all park managers has not been without challenge. Specialised skills are required to analyse and interpret large or multi-layered datasets. The evaluation results also need to be in a format that can meaningfully inform planning and operational decisions.

In the 2004 State of the Parks evaluation, results were collated through a series of spreadsheets that were largely inaccessible to on-ground park managers. However, by 2007, the evaluation tool had been migrated to a centralised database with online reporting. All park managers could now access the information using a set of standard 'data queries'. In this way, the evaluation became a work-tool and not just a work-load; an important part of ensuring that the evaluation process is

meaningful (Bellamy et al. 2001). Queries vary from describing the features of a park (e.g. 'which parks contain wilderness in NSW and what is their size?) to assessing the effectiveness of management (e.g. 'which parks report that weed impacts are diminishing as a result of management actions?) Training in the use of the queries was undertaken as part of preparations for the 2007 assessment. Key occupational groups, such as regional planners, were trained one-on-one.

For strategic management purposes, directors and other senior managers are provided with data summaries or 'snapshots' based on the thematic or spatial area for which they are responsible. This allows a systematic way for senior managers to check if planning at local-scales is addressing issues of strategic significance appropriately. The senior managers gain an overview of their area of interest, without unnecessary detail.

The recognition that planning operates at different spatial and operational scales has been a key factor in the provision of information. To aid in the interpretation of the data, maps of the distribution of survey responses across the landscape, and of correlations between potentially related issues, can be linked to the data queries. This allows another level of interpretation, such as, whether responses of a certain type are clumped within one area of the state.

Recognising and accepting that not all results will be positive

Incorporating land into a protected area system is an important step in the conservation and protection of natural, cultural and social values. However, reservation does not necessarily remove threats to these values, which are often extensive and entrenched across the landscape. Park managers know that, with so many external pressures on park values, and limited resources, not everything can be accomplished. At the system-wide scale, performance evaluation acts as an 'early warning' system to identify areas of highest risk. This allows resourcing to be targeted and prioritised to where it is most needed and where it may be most effective. This prioritisation can be considered at a variety of scales, from local to state-wide, with subsequent changes tracked and reported over time as evaluations continue.

Park managers need to make accurate evaluations to ensure the integrity of the system and to ensure that the best information is available to make decisions. These evaluations may be positive or negative and context is always required to inform which management actions are appropriate. Some problems may be beyond the control of reasonable management interventions. Arson, for example, may cause increased fire impacts on park values while prolonged drought may be detrimental to the condition of a vegetation community or ecosystem.

It is also important to consider the landscape context of the evaluation results. The NSW State of the Parks evaluations have revealed issues about the park system for which there are no equivalent data on other or surrounding land tenures. Challenges thus develop when lack of landscape information is interpreted as meaning the issue only occurs on park tenure, and criticisms of park management may follow from this misinterpretation.

This can be of particular concern when publicly reporting evaluation results, although contextualising the results helps address some criticisms. In situations where results are undesirable or beyond management control, the management response to the issue and an explanation of why it is occurring must be addressed publicly. Where situations are within the control of park managers, solutions must be identified.

Integrating science and management

Science, particularly in the form of research and monitoring, has the potential to provide a solid, defensible foundation to support park management. Linking scientific to management information, and integrating it into a system-wide evaluation process, can be a challenge. In many cases, a large body of information may be available. However, care and time needs to be taken in translating research results into practical, on-ground management requirements for decision-making (Pullin & Knight 2005; McCleery et al. 2007).

The NSW State of the Parks evaluation approach is not a substitute for species, site or issue-specific monitoring or research. However, it has helped to make the results of monitoring and research programs, both within and external to the organisation, increasingly available for decision-making. The State of the Parks evaluation identifies the numerous data sources that are used in completing the assessments. These sources are broadly categorised as staff experience, research studies, planning documents, corporate databases, specialist opinion, community opinion, or monitoring studies. As such, while final assessments are qualitative, they are often underpinned by quantitative scientific research or monitoring. Scientific data help to build confidence in the qualitative assessment, but also become a longer-term record of information that is specifically linked to the management of a park.

The linkage of science to specific parks is helpful in supporting management for those parks, but also serves to identify information gaps across the park system and the priority research needs of the agency. The challenge is to ensure that the full range of research and monitoring results is incorporated into the assessment and that the evaluation process collects sufficient information about the knowledge gaps.

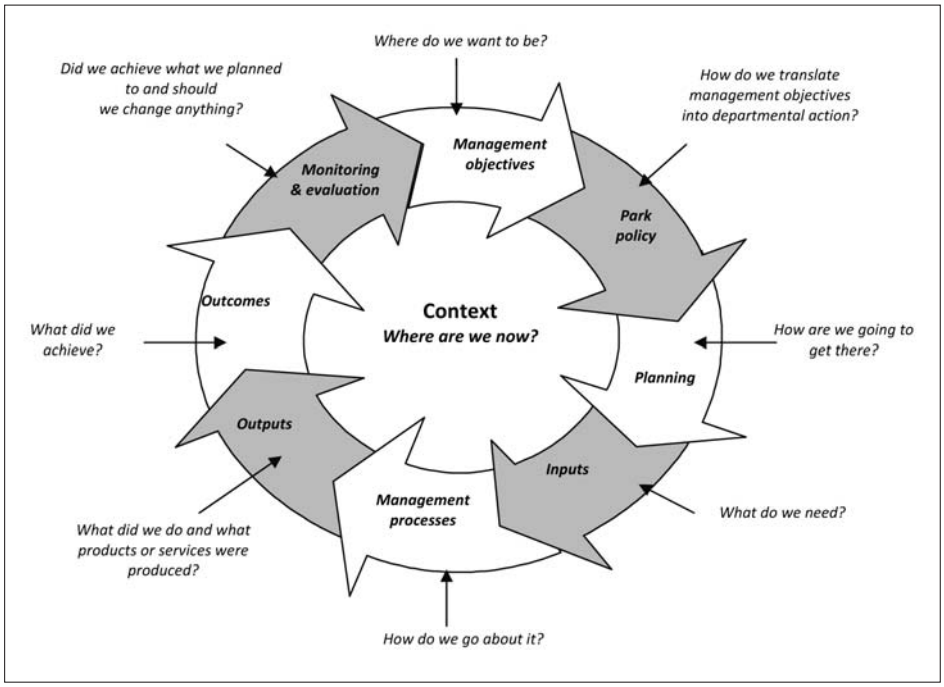

Figure 1 **The NSW Park Management Framework – a tool for supporting the management of the park system**

Lessons from implementing the evaluation program

The experiences associated with implementing the NSW State of the Parks are relevant to other organisations. The key lessons learned are applicable to individual park evaluations, but they are of particular value to those undertaking a system-wide evaluation.

Leadership at multiple levels is required

Leadership within all management levels is important to ensure the success of a program (Schultz & Fazey 2009). Since its initiation in 2001, the NSW State of the Parks program has had visible executive leadership driving the uptake and priority of the program. The project team that designed the survey included senior managers and the head of the park agency. Furthermore, in the lead-up to the first survey in 2004, the head of the agency provided direct, verbal briefings and emails to park managers on the priority of the program and the deadlines required. The ongoing commitment by the head of the agency to formalise the State of the Parks evaluation results as a consideration in annual operational planning has continued to drive the importance of the program as a tool to assist in the continued improvement of the park system.

Early adopters on the ground are also important. These are the people who champion the use of results from the evaluation, making the program relevant to on-ground management. These people may be park managers themselves or the planners that support the ongoing management of a park. Through their involvement and support, the quality of evaluations is improved and advice on how to improve the program can be gained.

Develop a system that suits your needs and context

The Convention on Biological Diversity target on monitoring, evaluating and reporting protected area management effectiveness recognised that, while frameworks such as that provided by the IUCN-WCPA should be considered, adaptation should be made for local conditions. Indeed, adaptation for local conditions is essential. Consideration needs to be given to the context in which the program is located; including such things as governance factors, policies and management requirements. Without consideration of these, any system that is developed or adopted may not succeed (Allan & Stankey 2009). This may be due to lack of political will, exclusion of relevant decision-makers, or lack of ownership by those whose support is needed to make it happen.

In NSW, the State of the Parks program has adapted the IUCN-WCPA framework by including a policy element to the framework and ensuring that context setting is considered for each step of the program. In NSW, this is called the 'park management framework' (Figure 1) and many of the work programs are considered in light of how they contribute to this management cycle (Stathis & Jacobson 2009).

Through the development of the park management framework, the agency is increasingly 'linking and aligning' existing and developing programs within the

agency. It has, for example, supported the compilation of a series of guides and manuals that address different components of the management cycle (e.g. a park management policy manual, an operations manual, and a monitoring and evaluation guide).

The State of the Parks program plays an important role in this framework by helping to 'close the management loop' and by supporting an institutional level of adaptive management. Through evaluation of the management effectiveness of all parks and incorporation of the results into the management cycle, priorities can be continually reviewed, deficiencies addressed, and new strategic directions taken. This review process is formally incorporated into the regional operational planning process and the strategic planning cycle. For example, using online enquiry tools, a regional planner can examine assessments to identify which parks are reporting that impacts from pest animals are increasing within the region. In examining the justification for an assessment, a decision about the need for intervention can be determined and actions applied. For issues that affect the entire park system or for emerging issues, consideration can be given to the need to activate or change a strategic program.

Identify acceptable management outcomes

In establishing an evaluation program, it is important to determine from the outset what represents an 'acceptable' management outcome and what is 'unacceptable'. While management agencies will continue to strive for the best possible outcomes, there will always be some limitation on what can be achieved.

In NSW, the State of the Parks program is based upon the precautionary principle. This principle states that, if there are threats of serious or irreversible environmental damage, a lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. The State of the Parks program operationalises the precautionary principle by identifying where impacts are increasing or are of concern for specific issues. In this way, the program identifies problems and provides an opportunity to respond as necessary. As an early warning system, the survey results are considered to be indicative, not conclusive.

Within the State of the Parks program, the precautionary principle is correlated with a specific response that becomes the 'baseline' level of management. At a minimum, if respondents identify that 'negative impacts on values are not increasing', then they are achieving management to precautionary principle standard. Naturally, higher levels of management are aspired to, with many park managers reporting that impacts on values are either negligible or diminishing and that the park values are in good or excellent condition. Where impacts are identified as increasing, this is considered to be unacceptable and further investigation of the causes is required.

Look beyond the assessment

The benefits of implementing a State of the Parks program extend beyond collation of information on the effectiveness of park management. The evaluations can also act as a catalyst for improved understanding, communication and learning.

Institutionalising a broad-scale evaluation program creates opportunities for people to engage about what they do, how well they do it, and what can be done better (Stathis & Jacobson 2009). In NSW parks, staff undertaking evaluations are encouraged to do so within peer groups. This encourages the park managers to examine periodically the key values that they are charged with protecting, and challenges them to examine how their management fits into the bigger picture of protected area conservation. Parks are, after all, just one element of the broader landscape for which numerous conservation activities may be occurring. That human interactions are enhanced, supported and improved is of great value to any organisation, particularly as a means of retaining and passing on the corporate knowledge of operational and specialist staff.

Such a program helps to bridge the divide between those park managers 'on the ground' and those developing broad-scale, strategic programs. This facilitates strategic program developers to maintain a perspective of what is happening on the ground and to base their programs on the cumulative advice of those who have undertaken park-specific assessments.

Encourage change through consistent and appropriate dissemination of results

Initially, the two major drivers for the NSW State of the Parks program were to support public reporting (further supporting accountability and transparency in management) and to gather information to inform management decisions. For the latter, it was quickly apparent that to actually use the findings of the evaluation to improve management required a change-management program. This can be a considerable challenge as change often takes time, particularly in

geographically dispersed organisations working on complex issues, in diverse environmental conditions.

To this end, it is important to ensure that dissemination of information is consistent and appropriate. Consistent approaches are required as change often occurs sequentially; it is typically sponsored from the executive level and transferred to the operational ranks. Thus, reliance cannot be placed on one level to guarantee appropriate dissemination of results. Consistent, repeated messaging and active communication needs to occur regularly to all occupational groups that are engaged in the change-management process.

Feedback from park managers about the appropriate dissemination of information has been essential in NSW and has resulted in improvements to the evaluation program and the way that information is provided internally. Park managers, for example, want access to all evaluation information in a format that allows them to examine the relationships between different issues. They also need to access detailed operational information about specific parks – not just know the general trends. Making both types of information available to managers has increased their desire for using evaluation data in NSW parks.

Not all of the data collected will be appropriate or valuable for public reporting. Information about management actions at a specific site is generally less relevant for public reporting than knowing the state-wide response. Public reporting is also subject to changing sensitivities and evolving agendas. As such, the reporting will often need to be responsive in illustrating the appropriateness of management to new and emerging issues of importance. For example, climate change is a factor which management effectiveness reporting must now accommodate in order to demonstrate active management of current threats and to meet the public expectation that government is managing this threat.

Conclusion

Evaluation of the effectiveness of park management is not only good practice but a management necessity. It allows an organisation to examine what it has achieved, to consider why an outcome has occurred, and to adapt management to support future change.

Agencies around the world are increasingly adopting and incorporating a diversity of evaluation programs into their management. However, there is still a long way to go to meet the targets set by the Convention on Biological Diversity. With over 100,000 protected areas around the world, the 6300 assessments that have been conducted (Leverington et al. 2008a) represent only about six per cent of all protected areas – considerably short of the 30 per cent target proposed in the convention.

Regardless of the many methodologies that can be used to determine management effectiveness, the challenges associated with each approach will often be similar. Therefore, the lessons learned through the NSW State of the Parks approach will be broadly applicable to those beginning or already undertaking their own evaluation programs.

For the NSW park system, the State of the Parks program has become increasingly beneficial in supporting planning and decision-making at a range of management levels. Getting initial 'buy in' from staff required extensive work and a commitment by program coordinators to ensure that evaluation results were provided to managers in a meaningful way. Since its establishment, the rewards of integrating a systematic evaluation into the management cycle have been growing constantly.

It would be an error nevertheless to imagine that adaptive management by an organisation ensures improvement over time. The evaluation process supports effective decision–making by ensuring that relevant information is at hand. It also provides a lens through which park managers can assess what needs to be done and where system-wide approaches have been successful. However, management of a protected area system is complex and cannot be done in isolation from the rest of the landscape. Despite the best intentions, it is not possible to eliminate all threats to all protected area values. It is how we respond to threats that is important and this requires vigilance, constant evaluation and ongoing adaptation.

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