BEST PRACTICE IN PERFORMANCE REPORTING IN NATURAL RESOURCE MANAGEMENT

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ANZECC Working Group on National Parks and Protected Area Management – Benchmarking and Best Practice Program

Natural Resources and Environment

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TABLE OF CONTENTS

SUMMARY

This project assessed the current status of outcome-based management of natural resources in Australian parks management agencies. The objectives of this project were:

- *To identify the processes used by State and Territory agencies to report on the management of natural resources in parks and protected areas*
- *To identify ecological performance indicators utilised by agencies for natural resource management and evaluate their usefulness*
- *To identify and evaluate how agencies utilise ecological performance indicators in reporting on their performance at both the park level and at the agency level*
- *To use benchmarking to determine the best practice processes for reporting on performance (at the agency level) in the management of natural resources.*

A literature review found that there was very little material on world's best practice in natural resource management in parks, but that there is now considerable interest in developing these tools within some agencies. However, the development of outcome-based programs for natural resource management in these agencies is at an early stage and much remains to be done.

Based on a review of Australian and international approaches, a best practice model for performance assessment in natural resource management in parks and reserves was developed based on the following criteria:

1. a clear nexus between an agency's legislative requirements and its strategic objectives for natural resource management
2. clearly stated management goals (desired outcomes) that are derived directly from the strategic objectives
3. a plan of natural resource management programs and activities at both the agency and the park level for meeting the strategic objectives within a specified time-frame (both medium term and annual)
4. performance indicators and targets against which the degree to which goals were achieved can be assessed, at both the agency and the park level
5. natural resource monitoring programs that provide data for the assessment of performance indicators.

When assessed against this model, none of the agencies assessed, either in Australia or overseas, meet all the criteria for best practice in natural resource management in parks. A number of agencies (eg SA Department of Environment and Natural Resources, NSW National Parks and Wildlife Service, Parks Victoria, US National Parks Service) have put into place the framework of a hierarchy of objectives, goals and activities for natural resource management, but have not made any significant progress in the actual measurement of performance and assessment against targets. Parks Canada, also a leader, has adopted a more "bottom-up" approach, and thus has made more progress in developing performance indicators and targets and in setting up monitoring systems. However, the Parks Canada approach is based on the narrow concept of "ecological integrity" and thus it only covers part of the spectrum of natural resource management.

Overall, little progress has been made in Australia or overseas in performance assessment in natural resource management at the individual park level, with a relatively low proportion of within-park programs that are outcome-based and with none of these identified as meriting best practice status.

Those working on this topic have frequently noted the difficulty of developing performance indicators for natural resource management. This may, however, be an overly negative view. Due to the early stage at which most agencies are at in developing a outcome-based culture,

the logical hierarchies of goals and outcomes that are required to generate performance indicators have not been fully developed. In addition, much of the thinking about indicators has been based on what has been measured in the past or on what scientists would like to measure, rather than reflecting the needs of performance assessment. An analysis based soundly on a well-developed hierarchy of goals and outcomes and specifically aimed at meeting the needs of performance assessment is likely to be more successful.

It is important to note that simple indicators can be very informative and that being able to confidently answer a number of simple questions about performance in conservation management will be a huge step forward for most agencies. The large body of existing monitoring effort documented by the responses to the questionnaire in this study also suggests that there is considerable scope for refocussing monitoring resources and building on existing programs in a cost-effective manner.

INTRODUCTION

In September 1994, the ANZECC Standing Committee on Conservation agreed to the establishment of a Best Practice Program to be developed by its Working Group on National Parks and Protected Areas Management. This study of *Best Practice in Performance Reporting in Natural Resource Management* is one of a number of national management projects that have been or will be initiated under the Best Practice Program.

Conservation of natural resources is the primary mandate of State and Territory national park management agencies. The diversity of Australian protected areas and their management regimes complicates the process of organisational comparison and the establishment of national standards for assessing management performance.

The objectives of this project were:

- *To identify the processes used by State and Territory agencies to report on the management of natural resources in parks and protected areas*
- *To identify ecological performance indicators utilised by agencies for natural resource management and evaluate their usefulness*
- *To identify and evaluate how agencies utilise ecological performance indicators in reporting on their performance at both the park level and at the agency level*
- *To use benchmarking to determine the best practice processes for reporting on performance (at the agency level) in the management of natural resources.*

The requirement in the Brief to use benchmarking to determine best practice needs some elaboration. The Treasury Board of Canada Secretariat (1996) provides a good practical definition of benchmarking and best practice for public agencies:

> *The process of benchmarking and the sharing of best practices are ways of learning from the experience of others, adapting the knowledge gained and significantly improving operational performance. Simply stated, if you are going to redefine or reshape the way you serve your internal and external customers, check to see if someone else has already gone in the direction you're headed.*
>
> Benchmarking *is the continuous, systematic process of measuring and assessing products, services and practices of recognised leaders in the field to determine the extent to which they might be adapted to achieve superior performance.*
>
> Best practices sharing *is the capture, dissemination and sharing of a work method, process or initiative to improve organisational effectiveness, service delivery and employee satisfaction.*

During this project it became clear that there were many agency staff who were unfamiliar with the concepts of benchmarking and best practice or, if they were aware of them, were sometimes unclear as to their definition. In order to provide some further background in this area, Appendix 1 provides a brief overview of the topic.

METHODS

A review of the literature on performance standards and benchmarking in relation to natural resource management and performance reporting was undertaken. Further information was obtained through direct contact with staff of Australian and overseas agencies (see Acknowledgments for list of respondents). Appendix 2 summarises the results of this review.

A questionnaire was sent to the nominated ANZECC contact officer in all State and Territory protected area management agencies and in the Australian National Parks and Wildlife Service. A copy of the questionnaire is contained in Appendix 3. In summary, the questionnaire asked:

- For examples of outcome-based monitoring and reporting and/or performance assessment undertaken in protected areas covering:

    - species/groups of species/specific environments
    - whole parks
    - the whole agency or the whole park estate.

- For information on the agency's monitoring of a range of ecological parameters.

- How does the agency provide input to any State of Environment (SOE) reporting process?

- For the two best examples of *activity-based* monitoring (eg annual reports, reviews, etc) undertaken by your agency at the park or organisational level.

The aims of this questionnaire were to:

- assess the degree to which outcome-based monitoring and performance reporting was utilised by agencies
- determine the methods used
- make an assessment of the extent of ecological monitoring programs and their relevance to performance assessment and reporting
- assess the value of any SOE reporting for performance assessment
- briefly assess, for comparative purposes, the best practices in activity-based monitoring.

A best practice model for performance reporting in natural resource management was developed and then used to assess the performance management practices of the respondent agencies.

FRAMEWORK FOR THE DEVELOPMENT OF A BEST PRACTICE MODEL FOR NATURAL RESOURCE MANAGEMENT AND PERFORMANCE REPORTING

Best Practice Model

Based on the approaches reviewed in Appendix 2, it is clear that a best practice model for performance assessment and reporting in natural resource management in parks and reserves should meet the following criteria (see Figure 1):

1. a clear nexus between an agency's legislative requirements and its strategic objectives for natural resource management
2. clearly stated management goals (desired outcomes) that are derived directly from the strategic objectives
3. a plan of natural resource management programs and activities at both the agency and the park level for meeting the strategic objectives within a specified time-frame (both medium term and annual)
4. performance indicators and targets against which the degree to which goals were achieved can be assessed, at both the agency and the park level
5. natural resource monitoring programs that provide data for the assessment of performance indicators.

Each of these best practice criteria is discussed below.

1. A clear nexus between an agency's legislative requirements and its strategic objectives for natural resource management

Any assessment of the effectiveness of a park management agency requires an evaluation of the extent to which that agency has met its legislative obligations. There needs to be a clear nexus between the strategic objectives of the agency as embodied in its corporate and business plans and the responsibilities assigned to it under the legislation. This points to the critical importance of the legislative requirements in setting a performance framework and suggests that the presence of clear and relatively similar legislation for all Australian parks management agencies is a positive factor for benchmarking between agencies.

The strategic objectives should be the principal corporate objectives of the agency in relation to natural resource management as identified in enabling legislation. The strategic objectives establish a consistent and defensible rationale to guide and unify all levels of agency decision making about natural resources, and provide an ideal against which all decisions can be tested against the degree to which they assist the achievement of these objectives (NPS 1996).

A mission statement may sit above these strategic objectives, but it must be:

- relevant to and consistent with the strategic objectives
- concrete and specific, in order to reflect the capabilities and strengths of the agency, the challenges facing it, and to provide a useful guide to decision making at any level.

"We will be the best" type mission statements do not meet these criteria.

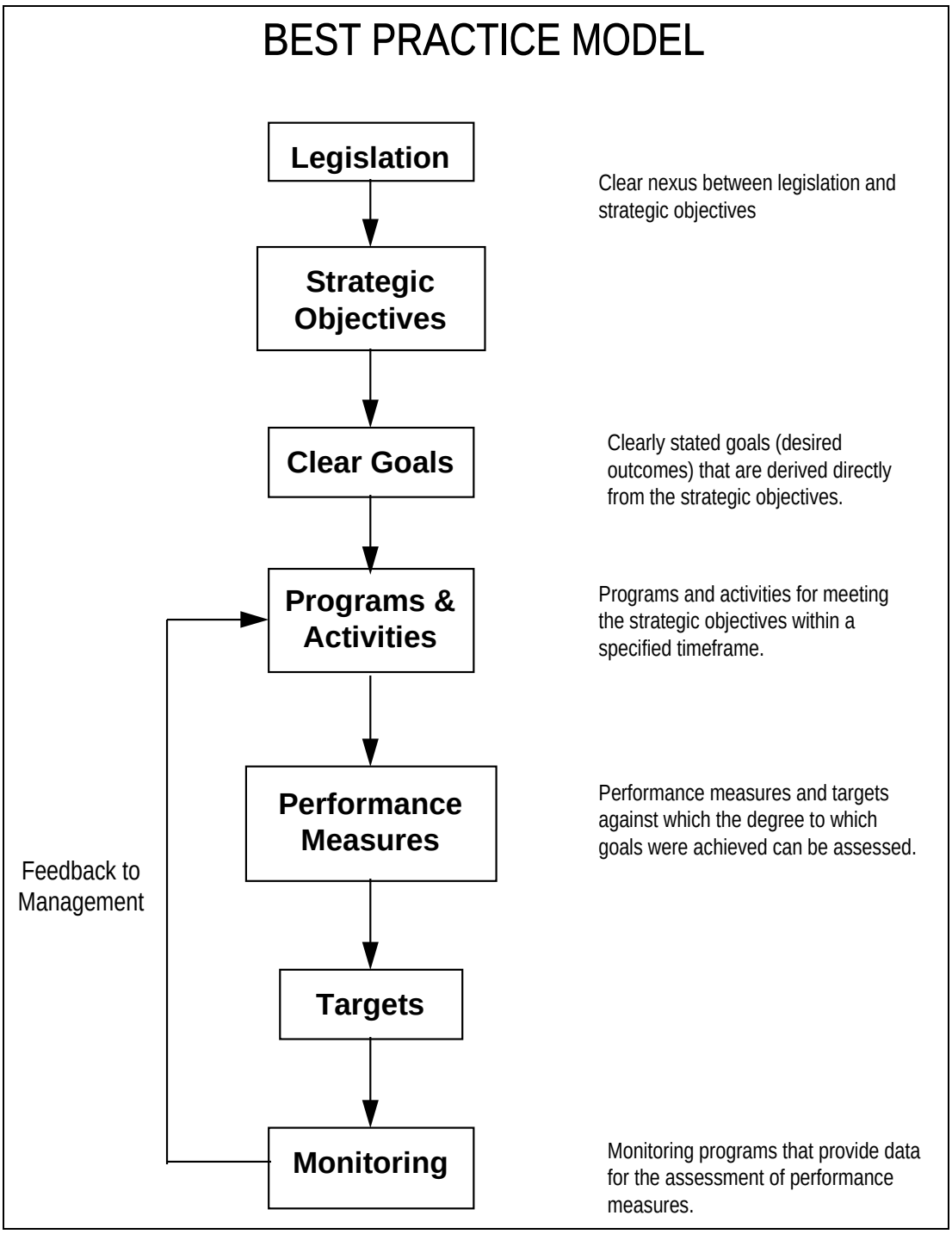

Figure 1. The best practice model.

2. Clearly stated goals for natural resource management (desired outcomes) that are derived directly from the strategic objectives

The goals for natural resource management are a bridge between the ideals of the strategic objectives and the practical short-medium term (1-5 year) planning. They help to establish performance indicators for the agency as a whole, they guide the development of reporting methods and they are specific and measurable. They should give clear guidance to agency staff for organising and prioritising programs and activities to achieve the strategic goals.

Goals should be concrete outcomes, not general aims. A goal does not describe an ideal state (eg the conservation of all species in perpetuity) but a practical end (eg 20% of populations of

endangered species in parks stable or increasing within five years). It does not define the means, and should allow for the means to be changed if required to meet the end.

3. ***A plan of programs and activities at both the agency and the park level for meeting the natural resource management goals within a specified time-frame (both medium term and annual)***

Performance plans should be developed both at the agency level and at the park level. All plan outcomes must contribute to satisfying one or more natural resource management goals. Each plan should identify the performance outcomes for the planning period, the outputs (products and services) needed for success, and the inputs (staffing and funding) required to achieve them. The plan links outcome-related performance goals with specific outputs and inputs for the planning period.

This planning phase recognises that the strategic objectives and goals must be approached incrementally and addressed systematically within a coordinated planning framework.

The park plans should be the main planning documents. The agency level plans should deal only with programs for those resource management goals that require coordinated actions across a broad range of parks or the whole agency. The agency level plans should not be lists of natural resource management goals, as these should already be in place.

4. ***Performance indicators and targets against which the degree to which natural resource management goals were achieved can be assessed, at both the agency and the park level***

The development of performance indicators for natural resource management and the procedures for monitoring those indicators (including frequency) is a crucial component of this best practice model. Performance indicators must be measures of the degree to which the desired outcomes have been achieved, *not* measures of process or activity. Performance indicators at the park level should be based on measures of the degree to which the natural resource management goals have been achieved in that park, not on the level to which activities have been carried out (outputs). At the agency level, performance indicators should measure the degree to which the higher level goals have been achieved, either through measuring the outcomes of agency-wide programs or through aggregating the park level indicators to create suitable higher level indicators.

Targets should not be confused with performance indicators. Targets represent the level at which a performance indicator will indicate that a goal or a planning objective has been achieved. In some cases, particularly at the early stages of implementation, there may be insufficient information to enable the setting of meaningful specific targets and qualitative targets may need to used instead.

5. ***Natural resource monitoring programs that provide data for the assessment of performance indicators***

The development of natural resource monitoring programs for measuring performance requires first that the indicators be determined. The two processes should proceed together, as there is no point in developing indicators that cannot be monitored due to methodological, logistic or cost reasons. Monitoring should occur regularly at appropriate intervals and there should be minimal delay between the collection of the data and feedback to the performance assessment program.

Best Practice Analysis – Natural Resource Management

Table 1 summarises the results of the agency survey questionnaire and Appendix 4 provides a more detailed analysis. Table 2 analyses the results of the agency survey in terms of the criteria for the best practice model set out in the previous section.

Little progress has been made in Australia in performance assessment and reporting for natural resource management, with a relatively low proportion of programs that are outcome-based and with none of these identified as meriting best practice status. This is not surprising, as little progress has been made elsewhere, with, for example, the US parks system largely lacking in this area. By comparison, considerable success has been achieved by a number of agencies in developing performance indicators in other areas of operation, such as asset management, visitor satisfaction and corporate services.

It can be seen from Tables 1 and 2 that none of the agencies assessed, either in Australia or North America, meet all the criteria for best practice in natural resource management. Most of those agencies that are performing well (SA DENR, NSW NPWS, Parks Victoria, NT PWS, US NPS) have put into place the framework of a hierarchy of objectives, goals and activities and have embarked on a process of determining performance indicators for natural resource management, but have not achieved a high level of practice in the actual measurement of performance and assessment against targets.

Parks Canada, also a leader, has adopted a more "bottom-up" approach, and thus has made greater progress than any other agency in developing performance indicators and targets and in setting up appropriate monitoring systems. While Parks Canada has developed the strong objective- and goal-based hierarchical framework that is necessary to maintain a consistent approach, their approach to natural resource management is based largely on the narrow concept of "ecological integrity" and thus it only covers part of the spectrum of natural resource management. Thus, while the Parks Canada approach merits consideration as a current best practice example, its narrow conceptual base limits its wider applicability as a model for performance assessment in natural resource management.

Both the NSW NPWS and the SA DENR performance assessment frameworks for natural resource management are as conceptually strong as the US approach and both appear further advanced in terms of development and implementation. All three organisational frameworks might be regarded as current best practice examples, but such a statement is premature as each has significant further development to do in the area of natural resource management. Moreover, several of the other agencies reviewed (Parks Victoria, NT Parks and Wildlife Commission) are well down the same track of actively developing performance assessment frameworks and the level of difference between all these agencies is relatively small.

In terms of performance assessment related to species, communities, habitats or specific threats, there is a range of very good examples in Australia. As the emphasis in this study was on performance assessment at the park or agency level, no attempt was made to benchmark these programs against overseas programs. However, from the author's awareness of the literature, there is little doubt that the best Australian programs are as good as most of the best overseas programs. The issue here is that so many of these more specific programs are still not outcome-based and there needs to be a strong move in that direction.

	Project-specific monitoring	Park-specific monitoring	Agency- or estate-wide monitoring	Ecological monitoring (general)	Awareness of performance monitoring
SA DENR	H-M	L	M	H*	H
NSW NPWS	H-M	L	M	H	H
NT PWC	H	M-L	L	H	H
Qld NPWS	M	L	L	H*	M
Parks Victoria	M	L	L	H	H
ACT PCS	H	M	L	H	M
Tas PAWS	H	M	L	H	L
WA CALM	H-M	M	L	H	L
Environment Australia	H	M	L	H	L

Table 1. Summary of the results of the agency survey questionnaire on natural resource monitoring (see Appendix 4 for detailed results). The ratings indicate the level to which each activity occurs across the whole agency.

Key: H = high (occurs throughout agency), M = moderate (occurs through many parts of the agency but there are significant gaps), L = low (uncommon or absent from agency). Asterisks indicate where an agency achieves the stated level in those parks that are reasonably accessible but not in parks that are very remote or difficult of access.

	Strategic NRM objectives based on legislation	Clear NRM goals based on strategic objectives	Medium term plan of NRM programs and activities to meet strategic objectives	Annual plan of NRM programs and activities to meet strategic objectives	NRM perform-ance indicators	NRM perform-ance targets	Monitoring of natural resource data for performance indicators
SA DENR	H	H	M	H	M	M	L
NSW NPWS	H	H	M	L	M	L	L
NT PWC	H	L	M	L	L	L	L
Qld NPWS	M	M	M	L	L	L	L
Parks Victoria	M	L	L	L	M	L	L
ACT PCS	L	L	M	L	L	L	L
Tas PAWS	M	L	L	L	L	L	L
WA CALM	?	L	L	L	L	L	L
Environment Australia	L	L	L	L	L	L	L
USA	*H*	*H*	*M*	*M*	*L*	*L*	*L*
Canada	*H*	*M*	*L*	*M*	*H*	*M*	*M*

Table 2. Analysis of the results of the agency survey questionnaire in terms of the criteria for the best practice model of natural resource monitoring.

Key: H = high (consistent with best practice model), M = moderate (partially meets best practice model), L = low (does not meet best practice model), ? = unable to assess; NRM = natural resource management.

Case Studies

The NSW NPWS Corporate Plan 1995/96-1997/98 sets out a clear and comprehensive framework for outcome-based assessment of the agency's activities. The Corporate Plan sets out Key Program Areas. Within these, there are Sub-Programs, which have Priority Activities. These are combined with an assessment of the Service's Operating Environment, to determine Priority Corporate Issues (PCIs), and the outcome sought for each PCI is defined. Key outcomes are determined and performance indicators set for these.

Performance indicators and indicators will also be developed at other levels in the organisation: regions, divisions, zones, districts, head office branches and units.

The Corporate Plan sets out performance indicators in relation to key outcomes. For the Key Program Area of "protection of conservation assets", the key outcome is:

> *The natural environment and the cultural heritage of New South Wales are protected, both within and outside the park and reserve system, in accordance with legislative requirements and community expectations.*

When it comes to performance indicators for this key program area, however, the Corporate Plan notes that these are currently being developed but that "the development of real measures of performance in this area – rather than focussing on "outputs", at very best – has proven most difficult, and is a major task for the recently established working group on performance reporting". By comparison, performance measures (ranging from quite specific and quantitative to general and qualitative) have been developed for all four other key outcome areas.

The SA DENR Natural Resources Group Strategic Plan 1996-1997 also sets out a clear and comprehensive framework for outcome-based assessment of that agency's activities. Performance measurement is based on key performance indicators (KPIs) that asses performance in relation to Critical Success Factors (CSFs). At the park management level, there is a hierarchy of goals, strategic directions, actions and key actions, from which KPIs are developed. This approach will applied to other activity areas within the agency.

INDICATORS

Developing Outcome-based Performance Indicators for Natural Resource Management

The practical issues associated with developing outcome-based performance indicators in a public natural resource management organisation require consideration. Relatively little research information is available in this area due to the newness of the approach. It is sometimes claimed that outcome-based performance indicators will be difficult to measure and may be more costly to measure than process-based performance indicators. Again, this can be addressed by framing the goals, standards and performance indicators appropriately, although there is a danger that the underlying goal may become "achieve what can be easily measured" if this approach is undertaken naively.

It is important to note that simple (and cost-effective) indicators can be very informative (despite what some scientists and managers seem to feel) and that being able to confidently answer a number of simple questions about performance in natural resource management would be a huge step forward for most agencies.

Those working on this topic have frequently noted the difficulty of developing performance indicators for natural resource management. This is an overly negative view. Due to the early stage at which most agencies are at in developing an outcome-based culture, the logical hierarchies of goals and outcomes that are required to generate performance indicators have not been fully developed. In addition, much of the thinking about measures has been based on:

(a) what has been measured in the past, or
(b) on what scientists would like to measure,

rather than reflecting the needs of performance assessment. An analysis based soundly on a well-developed hierarchy of goals and outcomes and specifically aimed at meeting the needs of performance assessment is likely to be more successful.

If this approach to developing performance indicators is taken, then a series of robust, cost-effective and – most importantly – meaningful indicators and associated monitoring programs should be able to be developed.

Developing indicators will be an evolutionary process. As goals are refined over time, performance indicators will become more specific (eg initially, performance might have to be assessed by the preparation and implementation of recovery plans, but, as data from these programs becomes available, specific criteria in terms of population numbers or trends could be set as performance indicators).

The large body of existing natural resource monitoring effort documented by the responses to the questionnaire in this study suggests that there is considerable scope for refocussing monitoring resources and building on existing programs, so that monitoring for performance assessment need not be a major new cost.

CONCLUSION

The development of outcome-based management and performance assessment in natural resource management within parks agencies (or other public land management agencies) is in its infancy, despite considerable progress in outcome-based performance assessment in other areas of their operations. The methodological framework for developing appropriate systems is now established, but only some agencies have begun to grapple with the issues associated with practical implementation.

Those Australian agencies that are performing well have generally put into place the framework of a hierarchy of objectives, goals and activities, and some are now embarking on the process of determining performance indicators for natural resource management. However, none have achieved any significant progress in the actual measurement of performance in natural resource management and assessment against targets. The picture is largely the same overseas, although Parks Canada has made some important progress in developing indicators, but they have only addressed one narrow component of natural resource management (ecological integrity).

It is too early to designate any one agency as a best practice example, although there is clearly a group of Australian parks management agencies that are progressing well ahead of most others. This report found, while the development of suitable indicators of outcomes in natural resource management is clearly more difficult than in many other areas of agency operation, there are no insurmountable barriers to success. It also found that monitoring of the indicators should be feasible and achievable in a cost-effective manner. The next few years will undoubtedly see considerable progress in this area.

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APPENDIX 1

Defining 'Benchmarking' and 'Best Practice'

The Treasury Board of Canada Secretariat (1996) provides a good practical definition of benchmarking and best practice for public agencies:

> *The process of benchmarking and the sharing of best practices are ways of learning from the experience of others, adapting the knowledge gained and significantly improving operational performance. Simply stated, if you are going to redefine or reshape the way you serve your internal and external customers, check to see if someone else has already gone in the direction you're headed.*
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> Benchmarking *is the continuous, systematic process of measuring and assessing products, services and practices of recognised leaders in the filed to determine the extent to which they might be adapted to achieve superior performance.*
>
> Best practices sharing *is the capture, dissemination and sharing of a work method, process or initiative to improve organisational effectiveness, service delivery and employee satisfaction.*

The Australian Department of Finance (1996) provides a useful discussion on benchmarking and best practice for the Australian government sector (available on the Internet – see References) and much of the following discussion is based on that document.

Benchmarking has traditionally been used by managers to compare organisational or program performance with market or field leaders. This comparative element can act as a driver for better performance and spur experimentation and innovation in work practices. Benchmarking can also contribute to improving departmental or agency performance information. While the concept originated in the private sector as a means for businesses to enhance or regain market share, the technique also has been shown to produce notable benefits for public sector organisations.

Benchmarking is not an end in itself. It is one of a number of tools that can contribute to building an overall culture of improvement and thereby lead to the development of a "learning organisation". However, it is a particularly important tool because it requires managers to both focus on the performance of internal activities and consider adopting innovative external practices and ideas.

Benchmarking can assist public managers to improve the quality of their performance information, helping the organisation to also improve its external and internal reporting and accountability.

One of the main benefits of benchmarking is that it allows organisations to develop a better understanding of the processes that they use to produce outputs, the link between these processes and the outcomes that they intend to achieve. It allows organisations to recognise that they area not unique and that there are many potential sources of ideas for performance improvement, sometimes including organisations that may at first appear very different.

Process versus results benchmarking

Process benchmarking relates to improving the organisational processes that achieve results. Process benchmarking requires that managers avoid becoming bogged down in the detail and to focus on the key tasks and actions that most contribute to outputs.

Results benchmarking involves comparing organisational outcomes against set

outcome-related performance indicators. Although results benchmarking does not assess the efficiency and effectiveness of internal processes, it can identify areas where results are poor and that therefore processes need to be looked at.

Performance Indicators and Reporting

Typically public organisations have assessed their performance in terms of *process* (eg compliance with guidelines) or *activity* (eg dollars spent, numbers employed, etc). The assessment of performance on the basis of *outcomes* (eg goals achieved, success of services, etc), while commonplace in the management of commercial organisations, is a relatively new concept for many government agencies.

Process- or activity-based performance indicators and reporting has been the norm in public agencies worldwide and Australia is no different.

The process-based reporting framework can be summarised as:

- goals (broadly defined, often not measurable, generally organisationally-based; not always set)
- standards (process-based, not clearly related to goals)
- performance indicators (compliance with standards and/or level of activity)
- reporting.

The outcome-based reporting framework can be summarised as:

- goals (specific, measurable, issue-based)
- standards (outcomes, clear relationship to goals)
- performance indicators (measurement of outcomes)
- reporting
- feedback into management.

The key differences between the two approaches are in:

- the setting of goals
- the relationship of standards to goals
- the aim of PI assessment
- feedback into management.

By way of example, the following table takes an imaginary parks management service and looks at the potential application of process-based performance indicators and of outcome-based performance indicators to the organisation.

	Process-based	Outcome-based
Goal	"To be the best park managers in Australia"	"To maintain and enhance the ecological condition and integrity of the park estate and to ensure that biodiversity within parks is maintained at the regional and state level"
Standards	Guidelines, manuals, codes of practice, prescriptions; eg: weed control manuals, manuals for wildlife management, prescriptions for location, design and construction of tracks, etc	No loss of total species richness; No loss of threatened species; Reducing the number of species on the threatened list; No loss of area of rare vegetation types; <1% loss of area of common vegetation types
Performance Indicators	Degree of compliance with guidelines, etc (occasionally); $s spent, person-hours, staff levels, etc (usually)	No. of species; No. of threatened species; No. of species on threatened list; Area of vegetation types
Reporting	Level of activities undertaken (ie inputs not outputs); generally doesn't report on levels of compliance with standards	Comparison between standards and measured performance indicators; Review and discussion of trends
Feedback Mechanism	None specific	Use performance indicators to improve organisational performance by learning from successes and failures and feedback to managers

The selection of performance indicators is one of the most crucial aspects of benchmarking. The development of useable performance indicators requires considerable skill. Inappropriate performance indicators can skew organisational performance.

Performance indicators should not be targets but rather indicators to gauge the extent of achievement of targets.

Comparing Process-based and Outcome-based Reporting

The advantages of outcome-based performance indicators seem clear. Outcome-based performance indicators:

- require clear goals that relate directly to the issues that the organisation exists to deal with and that society expects it to deal with
- allow improved accountability, as customers can make judgements about its performance in dealing with those issues
- give clear guidance to all levels of the organisation as to what they should be trying to achieve (although not how to achieve it)
- allow and encourage organisational learning and improvement
- enable comparisons between organisations, especially where (as is mostly the case for public land management agencies) they operate as local monopolies (Smith 1995).

There are, of course, advantages associated with process-based performance indicators. Process-based performance indicators:

- are simple and cheap
- encourage specific processes to be developed and adhered to (this is good if the processes are effective)
- allow assessment of compliance with the process, a indicator that is frequently requested by the public and which, in some cases, may be a legal obligation.

The latter two advantages of process-based performance indicators can be easily and consistently incorporated into outcome-based performance assessment if they are appropriate or required. The reverse does not apply for the advantages of outcome-based performance indicators, however. This leaves simplicity and cost as the main advantage of process-based performance indicators.

APPENDIX 2

Literature Review

Australia

State of Environment Reporting/Environmental Audits

A range of state-of-the-environment type studies at various levels have begun to look at environmental indicators (eg CSIRO 1996, Commissioner for the Environment 1988, 1991), but these are often extremely broad (eg the OECD environmental indicators) or are not directly related to the needs of natural resource management. The environmental audit process, which is widely used by a range of organisations, has generally ignored ecological factors and concentrated on chemical and physical criteria or on organisational attitudes and commitments. Both the SOE process and the auditing process have tended to lack practical outcomes that feed back into improved environmental outcomes.

The Australian Heritage Commission has developed an audit methodology for the condition of places on the Register of the National Estate (Biosis Research 1997). The National Estate criteria are a very particular set of factors that are not necessarily directly relevant to the needs of all land managers. Nonetheless, this work has already pointed to a number of interesting results:

1. the whole area of auditing and performance assessment in relation to management and conservation of natural resources has received very little attention until recently
2. the clear goals that are inherent in the National Estate concept have lead to the definition of de facto standards (criteria and thresholds)
3. that while some criteria are complex, multi-dimensional and/or difficult to indicator, simple indicators could be developed for most of them
4. the indicators, while simple, were nonetheless powerful and provided considerably more information than could be obtained at present
5. the indicators could be measured cost effectively
6. those indicators that provided the best assessment of the actual condition of a place were outcome-based (eg changes in area of native vegetation, changes in weed populations, etc) not process-based (eg is there a management plan?).

Species Management Plans

Some species management plans have, especially in recent years, adopted specific and measurable performance criteria and these have often been amongst the most successful plans in terms of outcomes. The adoption of performance criteria, however, has generally not been an explicit aim of the management planning process, and so where it has occurred has often been somewhat by accident rather than by design. It is notable that Action Plans under the Victorian *Flora and Fauna Guarantee Act* have specific management performance objectives attached to their management actions. This has already had the effect of focussing managers on to key outcomes in a number of cases. These have often been simple and cheap to achieve but have simply never been done because the previous process-based framework did not encourage such actions.

Protected Areas Management

McNeill (1994) reviewed 267 marine protected areas in Australia and found that formal natural resource monitoring occurred in few and that none had clear performance criteria or baseline studies that enabled management outcomes to be assessed.

The Victorian Auditor-General undertook a review of the Victorian National Parks Service in 1995 (Auditor-General of Victoria 1995). This review contains much that is relevant to all protected area management agencies. The research undertaken by the Auditor-General found that there was very little material on world's best practice in natural resource management in parks, and that there were no documented minimum standards for management of protected areas in Australia.

It also noted that any assessment of the effectiveness of the NPS requires an evaluation of the extent to which the agency has met its legislative obligations. There needs to be a clear nexus between the strategic objectives of the NPS as embodied in its corporate and business plans and the responsibilities assigned to the Director under the legislation. This is equally true for performance assessment in other agencies and points to the critical importance of the legislative requirements in setting a performance framework. This also suggests that the presence of clear and relatively similar legislation for all Australian parks management agencies is a positive factor for benchmarking between agencies.

The Auditor-General also noted the importance of having systems for periodic environmental monitoring of parks and for performance assessment based on that monitoring. The dispersed nature of parks systems means that effective dissemination of strategic objectives and priorities, appropriate systems of delegation, and a consistent approach to performance monitoring and reporting are vital. The report suggested that there should be:

- clear articulation of corporate and business objectives with a visible nexus between those objectives and the agency's legislative responsibilities
- specific information on priority tasks linked to the objectives
- strategies to be implemented to achieve the objectives
- time-frames and performance indicators for monitoring progressive action against planned tasks, and
- sound management systems so that decision making can be made across the agency based on reliable data.

The report also noted that agencies need to develop benchmarking alliances with other Australian and international parks agencies and need to establish minimum standards. However, uniform standards across all Australian agencies may not be appropriate or simple to achieve in the short term. The best approach may be the development and application of agreed common nomenclatures and a best practice program to facilitate consistency of management of parks throughout Australia. Nonetheless, minimum standards are an important first step in achieving best practice.

Other countries

Spellerberg & Sawyer (1996) have developed outcome-based biodiversity standards for plantations in New Zealand, independent of baseline data. Their aim was to ensure that new forestry plantations provide an environment that enhances biodiversity conservation. As they were dealing with new plantations it was not possible to set a standard based on a baseline figure (eg maintain current levels of biodiversity) and as each plantation can be quite different from others (in size, species, topography, biogeographical region, soils, etc), it was not appropriate or efficient to have fixed prescriptions. They suggested a scheme that sets general (but specific and measurable) goals at a hierarchical level appropriate for all plantations, with standards and performance indicators to be set by managers for specific plantations or even specific stands, with a feedback mechanism to ensure that management practices are improved as information comes in.

Perhaps the most complex example of outcome-based performance assessment of natural area management has been undertaken in Canada by Woodley (1993) for his doctoral thesis. Woodley developed a set of indicators of "ecological integrity" and tested this approach on

Fundy National Park in New Brunswick. His indicators included:

- degree of human disturbance
- rates of succession
- species richness
- average body size of mammals
- population of an indicator species
- efficiency of nutrient cycling
- degree of fragmentation
- population viability of threatened species.

He then set standards based on best estimates of the situation at the time the park was declared and assessed performance against these standards. He found that on most indicators the ecosystem had undergone significant degradation and that this was likely to continue in the absence of management intervention. While a powerful analysis, a number of his indicators are either very difficult or costly to measure, especially across more than one park, or are subject to high levels of error. Interestingly, results from the simpler indicators were as informative as those from the more complex and costly ones. His work also showed that a number of indicators that could have been quite difficult and costly to assess, were simple and cheap to survey and analyse using remote-sensing and GIS.

Parks Canada is currently developing a major monitoring program based on Woodley's work (Andre Savoie, Parks Canada, *personal communication;* Geomatics International Inc. 1995). The Parks Canada experience in developing an outcome-based performance assessment system has been that it is almost impossible to develop and implement a credible system without specific ecosystem goals and objectives. These will be achieved through the development of an *Ecosystem Integrity Statement* within park management plans and through the implementation of Ecosystem Conservation Plans.

Ecological Integrity Statements will be short (3-5 pages), and will contain:

- a context for the park in its region (size, adjacent activities, fragmentation, reference to ecozone)
- a sense of the history of human use in the park, in the adjacent area and region
- a broad park goal statement
- a set of more specific objective statements based on the national ecological integrity framework (as developed from Woodley's work)
- a brief description of stressors affecting the park
- a description of actions taken to date to deal with the stressors.

An Ecosystem-based Management Standard and Principles and an integrated monitoring strategy is also under development.

A suite of indicators built around the ecosystem integrity work of Woodley is being applied for the preparation of the biannual State of the Parks report. However, because parks represent different ecoregions and are affected by different stresses, some indicators have to be specific to regions. The selection of regional indicators is based on the following principles:

- a valid relationship of the indicator to the phenomenon of interest
- convenience and cost-effectiveness for repeated measurement
- ability to distinguish changes caused by human activities from natural changes
- indicator should be attractive to the public.

It is planned to use remote sensing data and GIS extensively.

The US National Parks Service is also currently developing an agency-wide performance

assessment framework in response to the US Government Performance and Results Act, which requires strategic planning and performance indicators from all US government agencies.

The framework is still under development but the current thinking is set out in the Strategic Plan (Final Draft) (NPS 1996). The Draft Strategic Plan takes approach based on a clear hierarchy of goals and programs:

Mission Statement
Mission Goals
Long Term Goals
Annual Performance Plans and Goals
Performance Indicators.

The Mission Goals set out the *ideals* that the NPS is striving to attain and provide the basis for the long term goals. An example: *Natural and cultural resources are protected, restored, and maintained in good condition.*

The Long Term Goals are a bridge between the ideals of the Mission Goals and the practical annual goals. They help to establish performance indicators for the agency as a whole, they guide the development of reporting methods and they are specific and measurable. Examples relating to the above Mission Goal are:

- *By 2002, 10% of disturbed lands in parks that have been targeted for restoration in resource plans prior to 1997 are restored.*
- *By 2002, 25% of the parks' listed threatened and endangered species populations have an improved status, and 50% of species have stable populations.*

The Annual Performance Plans and Goals are developed through two parallel processes, one agency-wide, the other at the park, program or unit level. All annual goals must contribute to satisfying one or more Mission or Long Term Goals. An annual plan identifies the performance goals for that year (outcomes), the outputs (products and services) needed for success, and the inputs (staffing and funding) required to achieve them. The annual plan links outcome-related performance goals to specific outputs and inputs for that year.

Performance is monitored and evaluated against performance indicators. At this stage, there is little information on performance indicators.

Review of Recent Examples of Indicators

As already noted, the definition of suitable performance indicators remains the major obstacle to implementing performance assessment in natural resource management. There are, however, a growing number of agencies seeking to develop appropriate indicators in this area, and the types of indicators that have been suggested are summarised below:

Parks Canada indicators of *ecological integrity* (Woodley 1993) - degree of human disturbance; rates of succession; species richness; average body size of mammals; population of an indicator species; efficiency of nutrient cycling; degree of fragmentation; population viability of threatened species.

Australian Heritage Commission indicators of the condition of the National Estate (Biosis Research Pty. Ltd. 1997) - native vegetation cover; hydrology; pest plants & animals; resource utilisation; other human activities; physical changes to the site; possible threats to National Estate values.

BC Parks (R. Gowans, pers. comm.) – visitor satisfaction with conservation management.

Tasman Institute (unpublished) – changes in condition of biological and physical features (eg presence/loss of species, condition of species (*sic*), pest plants and animals); pest and weeds eradicated; fire risk control; endangered species management; wildlife research; ensuring desirable biodiversity; community satisfaction with management of conservation assets.

Vora (1997) – protection of rare species habitats and rare ecosystems; population trends of indicator species; short term evaluation of experimental or controversial management practices; participation in long term or regional monitoring programs; *ad hoc* monitoring.

Hockings (in prep.) – distribution/abundance of indicator species; extent of change in vegetation species composition and abundance in major habitats; extent of change in gross habitat structure.

In terms of the best practice model, most of these "indicators" are too general and need further development to be useful performance indicators. In fact, they appear to be have been mostly derived by thinking about what can be measured or what is usually measured rather than by analysing the hierarchy of goals and outcomes and then asking *"what are the things we need to measure"*. Woodley's analysis differs in that it is addressing quite specific issues in relation to measuring a single goal (maintenance of ecological integrity) at the level of the individual park. The work on measuring change in the condition of the National Estate by Biosis Research (1997) is also addressing a specific set of criteria (the criteria for the assessment of national estate values), however these are not necessarily suited to broader performance assessment in natural resource management.

None of these studies sets targets. Woodley (1993) sets standards based on an assessment of the state of each indicator at the time a park was declared, but these are for assessing trends rather than necessarily being targets for managers to achieve at this stage.

Monitoring

Monitoring of simple data may occur quite frequently (eg water quality in a stream supplying water for a major camp ground might be weekly) but many indicators are likely to be measured only annually. Where measurements are made at intervals of more than a year, "surrogate" indicators may need to be considered to provide some feedback during the non-measurement period. For instance, a labour-intensive population survey for a cryptic species might only be feasible once every five years, but, in the interim a surrogate indicator such as "number of incidental sightings" or some simple measure of the condition of the species' habitat might be used.

The Canadian experience has found that the involvement of skilled ecologists in on-ground park management has significantly increased the success and efficiency of their monitoring programs and has lead to more rapid detection of unexpected changes (Andre Savoie, Parks Canada, *personal communication*).

APPENDIX 3

Questionnaire

The following questions:

- relate only to parks and protected areas managed by national park agencies
- relate to a hierarchy of assessment - (a) species- or environment-specific, (b) park-specific, (c) at the organisational level
- are particularly aimed at eliciting information about *outcome* based monitoring and performance assessment, not the more traditional *activity* or *process* based approach.

When deciding whether an approach is outcome based, look for some or all of the following attributes:

- specifically stated objectives or goals
- sets of standards and/or performance guidelines
- measurable (at least qualitatively) indicators of outcomes/performance
- a review and reporting process
- feedback mechanisms into management.

The first group of questions (A) aims to determine what the current situation is in relation to ecological performance monitoring, while the second group of questions (B) aims to assess whether existing ecological monitoring programs might be relevant to ecological performance monitoring. The third question (C) relates to State of Environment reporting, an area that in many cases will be relevant to performance monitoring. The final question (D) seeks to obtain a quick overview of state-of-the-art activity-based monitoring to broaden our understanding of the current situation and to provide a comparison between the two approaches.

QUESTIONS:

1. Can you provide specific examples of outcome-based monitoring and/or performance assessment undertaken in the parks or reserves under your agency's management for:

a) specific species or groups of species, specific environments (eg vegetation communities), or specific threats (eg pest plants or animals, diseases, etc) *(please limit to no more than four examples)*,

b) individual parks (either as an assessment of general "park condition" or related to specific threats or objectives) *(all relevant examples)*, and

c) your whole agency or park estate (either as an assessment of general "condition" or related to specific threats or objectives) *(all relevant examples)*.

Please use the following format for each category, answering those questions that are relevant to that category:

A) Name of agency:

B) Program title

C) Key personnel and their contact details

D) Name of species/species group/environment/threat

E) Name of parks/reserves involved (answer “all” if whole agency program)

F) Objectives of monitoring

G) Standards or performance guidelines for outcomes to be attained

H) Indicators used

I) Are these indicators combined in any way to create an index?

J) Review and reporting process

K) Process for feedback into management

L) Period and frequency of monitoring

M) Do you consider the program to have been successful?

N) Any other comments/information.

Please attach any relevant reports or other documentation.

2. Do you monitor any of the ecological parameters listed in the attached table? If so, please complete the relevant boxes in the table *(see attached A3 sheet).*

3. Does your agency provide input to any “state of environment” reporting process? If so, please provide a brief summary.

Please attach any relevant reports or other documentation.

4. Please give the two best examples of activity-based monitoring (eg annual reports, reviews, etc) undertaken by your agency at the park or organisational level.

Please attach any relevant reports or other documentation.

APPENDIX 4

Responses to Questionnaire

The questionnaire was sent to nine Australian parks management agencies:

- ACT Parks and Conservation Service
- Environment Australia
- NSW National Parks and Wildlife Service
- NT Parks and Wildlife Commission
- Parks Victoria
- QLD National Parks and Wildlife Service
- SA Department of Environment and Natural Resources
- Tas Parks and Wildlife Service
- WA Department of Conservation and Land Management.

Response Rates

All nine agencies responded to the questionnaire. The completeness of the responses varied considerably, as did the timeliness of response (deadline plus one week to deadline plus 23 weeks).

All agencies responded to question 1. A number of programs were listed that were not outcome-related and in some cases this may reflect a lack of understanding of the concept while in others they were noted as having the potential to become outcome-related. This is discussed further below.

Seven agencies completed the answer table for question 2, although the responses from one of those agencies were too unclear and incomplete to be fully used in the analysis. The two agencies that did not complete the answer table either provided information that was relevant to this question (Environment Australia) or provided a general discussion as detailed organisation-wide information was not readily available (NSW NPWS).

All agencies answered question 3.

Eight agencies answered question 4.

Analysis of Responses

1 (a). Can you provide specific examples of outcome-based monitoring and/or performance assessment undertaken in the parks or reserves under your agency's management for specific species or groups of species, specific environments (eg vegetation communities), or specific threats (eg pest plants or animals, diseases, etc).

All agencies provided examples in answer to this question, with a total of 31 programs listed. However, not all of these programs were in fact outcome-related, with 12 (39%) having clear performance objectives and 14 (45%) involving clear outcome-based standards or performance guidelines (13 (42%) programs met both criteria). A further five programs (16%) had performance objectives and outcome-based standards/performance guidelines that were considered to be too general for practical application, but which otherwise were clearly outcome related, making total of 19 programs (61%) that could be considered to meet the basic criteria for performance-based monitoring or assessment.

Feedback into management is an important component of performance monitoring. Nearly all

programs had some form of feedback into management, but only 9-12 (30-40%) appeared to have direct feedback loops, mostly through involvement of management staff in the conduct of the program, less often through a formal process. The most common forms of feedback were indirect (eg recommendations in reports) or informal liaison between staff. Those projects that involved direct feedback into management were all regarded by the respondents as highly successful, most especially those that involved the participation of management staff.

Those programs that were assessed as being performance-related fell into the following groups:

research or monitoring	7
rare species management/recovery plans	6
pest plants and animals	2
management of exploited species	2
habitat rehabilitation	1
fauna atlas program	1.

The research and monitoring group of programs differed from most of the others in that the performance criteria did not relate to specific management objectives but to achieving a research objective (eg *to ascertain long term changes in native grassland in response to management actions*). These research and monitoring programs could perhaps be considered to be output-related rather than outcome related. However, in the context of ecological systems, there will often be occasions where specific management outcomes cannot be sensibly defined without research and monitoring. If a research or monitoring program fits the criteria of clear goals, performance guidelines or standards and a feedback mechanism into management, and if it was being carried out on a topic for which useful outcomes could not yet be set due to inadequate knowledge, then it was assessed as falling within the outcome-related framework.

The frequency of programs related to the management of specific species (rare species, pests, exploited species) is not surprising as such programs are perhaps the simplest for which to generate quite specific and measurable goals and performance criteria. Several of the research examples also related to either rare species or pest species.

The lack of outcome assessment in relation to management of environments (vegetation communities, habitats) is also notable, reflecting the greater complexity of such management and the associated greater difficulty in generating outcome goals and indicators. However, there were a number of habitat management programs listed where useful goals and indicators could have set but had not been. It should also be noted that a number of the research and monitoring examples related to habitat or community monitoring.

A number of agencies put forward their wildlife atlas programs as examples of monitoring but only the NT PWC atlas had clear outcome goals (although general) and had some outcome-related indicators, based on outcomes related to the development of the NT protected areas system.

Best Practice examples:

The best practice examples of monitoring of species, communities or threats all combined the following factors:

- clearly stated goals (desired outcomes)
- performance indicators that were indicators of the degree to which goals were achieved
- monitoring programs that provided data for the assessment of performance indicators
- clear pathways for feedback into management (usually simple and direct).

A range of the best examples provided is listed below:

- Norfolk Island rainforest rehabilitation (Environment Australia)
- Magpie Goose monitoring (NT PWC)
- Crocodile monitoring (NT PWC)
- Mimosa control program (NT PWC)
- *Ptychosperma bleeseri* monitoring program (NT PWC)
- Recovery Plans eg Orange-bellied Parrot (Tas PAWS), Brush-tailed Bettong (SA DENR), Noisy Scrub-bird (WA CALM)
- Flora and Fauna Guarantee Action Statements eg Little Tern, Buxton Gum, etc (Parks Victoria)
- Long term monitoring of natural temperate grasslands (ACT PCS).

1 (b). Can you provide specific examples of outcome-based monitoring and/or performance assessment undertaken in the parks or reserves under your agency's management for individual parks (either as an assessment of general "park condition" or related to specific threats or objectives).

All agencies provided examples in answer to this question. No agencies have made assessments of "park condition" although several (NSW, Victoria, SA) indicated that they were investigating the potential for such assessments.

Of the 15 examples provided, two (13%) had specific performance objectives and three (20%) had general performance objectives, and four (27%) had clear outcome-based standards or guidelines, with a further three (20%) having less well-defined standards or guidelines. Two programs (13%) had both clear objectives and clear standards. In total, seven programs (47%) were assessed as being outcome-related.

Those park-based programs that were assessed as being outcome-related fell into the following groups:

pest plants and animals	4
fire management	2
water quality monitoring	1.

Pest plant and animal management would appear to be one area of protected area management that is frequently conducted within a outcome-related framework, as it also featured strongly in the responses to question 1(a).

It seems that, at the park level, outcome-based management is most strongly developed around the "traditional" land management areas of weeds, fire and perhaps water, while species and habitat management is more generally seen as a cross-parks management issue, with performance assessment related to state-wide or species specific programs. This generally reflects the administrative split between on-ground park management and research and wildlife management.

Best Practice examples:

None of the examples provided stood out as being "best practice". There are a number of well planned and executed monitoring programs in parks undertaken by all agencies, but less than half of these are outcome-related. Those that were outcome-related did not tend to differ significantly in approach and quality between agencies and did not necessarily correspond to the "best practice" in all areas. It should be noted that there were a number of well designed and conducted within-park monitoring programs that were examples of best practice in terms of, say, methodology, but which were not assessed as being outcome-related. It should also be noted that some outcome-related programs that were species-based or conducted across a

range of parks could also have been utilised on a within-park basis.

All those programs that met basic performance assessment criteria were programs related to specific threats within a park. Such programs (eg pest plant or animal monitoring, fire fuel loads, etc) could be taken as setting the minimum or, at best, average standard for within-park management assessment, and used as a basis for developing improved practices for threat monitoring.

It will be important to concentrate on developing broader within-park monitoring practices, covering biodiversity and ecological integrity, as well as threats.

1 (c). Can you provide specific examples of outcome-based monitoring and/or performance assessment undertaken in the parks or reserves under your agency's management for your whole agency or park estate (either as an assessment of general "condition" or related to specific threats or objectives).

Few agencies had whole agency performance assessment programs and the responses of those that did varied considerably, so the results of this question are best discussed agency-by-agency.

Environment Australia and Tas PAWS do not undertake agency-wide performance assessment and did not indicate any programs to develop capability in this area.

NT PWC and Parks Victoria indicated a strong commitment to developing performance assessment at a range of levels but were at an early stage in the process. Some performance assessment occurs within Parks Victoria through the purchaser/provider framework, with Service Agreements that set "performance indicators". Many of these are not well structured (eg they are output targets, not indicators of outcomes) or are not able to be reliably measured (Auditor-General of Victoria 1995).

Queensland NPWS and the ACT PCS also indicated a developing interest in the area and noted that some administrative tools were being developed that were a move towards performance assessment. The Qld NPWS Annual Report 1994-95 lists Program Goals for all its programs, but assessment of performance remains activity-based. ACT PCS is currently developing "output statements" which are output- rather than outcome-based but which will contain specific performance standards.

The NSW NPWS Corporate Plan 1995/96-1997/98 sets out a clear and comprehensive framework for outcome-based assessment of the agency's activities. The Corporate Plan sets out Key Program Areas. Within these, there are Sub-Programs, which have Priority Activities. These are combined with an assessment of the Service's Operating Environment, to determine Priority Corporate Issues (PCIs), and the outcome sought for each PCI is defined. Key outcomes are determined and performance indicators set for these.

Performance indicators and indicators will also be developed at other levels in the organisation: regions, divisions, zones, districts, head office branches and units. The Corporate Plan sets out performance indicators in relation to key outcomes.

The SA DENR Natural Resources Group Strategic Plan 1996-1997 also sets out a clear and comprehensive framework for outcome-based assessment of that agency's activities. Performance measurement is based on key performance indicators (KPIs) that asses performance in relation to Critical Success Factors (CSFs). At the park management level, there is a hierarchy of goals, strategic directions, actions and key actions, from which KPIs are developed. This approach will applied to other activity areas within the agency.

2. Does your agency monitor any of the ecological parameters listed in the attached table? If so, please complete the relevant boxes in the table (see attached A3 sheet).

All the agencies undertake a broad range of monitoring programs and collect a range of data. All collect baseline data on the range of ecological parameters listed in Table ?, with some exceptions (not all agencies had base data on indicator species). Most agencies also collected time series data for many of these parameters, an interesting exception being Queensland, as, due to the recent start to many of their programs, they are still largely collecting baseline data. While all agencies had baseline data on area of native vegetation, only NT, SA and Queensland had time series data, although some other agencies plan to collect such data.

Much of the data collection began in the 1970s and 80s in most agencies, except for Queensland and the Northern Territory, which both began major programs of ecological data collection later.

Most data that have been collected are quantitative and all agencies stated that much of the data can be analysed to assess the direction, amount and rate of change over time. However, many data sets did not directly address causes of change, although this could be inferred in some cases.

The degree of coverage was variable, with a general pattern of statewide coverage in the smaller states, with regional coverage in WA, Queensland and the Northern Territory.

The responses to this question clearly demonstrate that there is already a high level of ecological monitoring being undertaken by all agencies and that much of it is in a form that could contribute to performance assessment. Given this, performance assessment will not necessarily require significantly greater expenditure on ecological monitoring, but will certainly require the setting up of an appropriate strategic framework and the reassessment of monitoring programs within that framework.

3. Does your agency provide input to any "state of environment" reporting process? If so, please provide a brief summary.

All agencies indicated that they provided input to SOE processes but most indicated that the data provided were at too broad a level to be useful for assessing management performance. As the literature review also found that the SOE process was not particularly useful for performance assessment, this report does not discuss it further.

4. Please give the two best examples of activity-based monitoring (eg annual reports, reviews, etc) undertaken by your agency at the park or organisational level.

The eight responses to this question all consisted of annual reports or strategic plans. All annual reports were entirely activity- or output-based, even where the importance of performance assessment had been recognised by the agency. This is a reflection of three factors. Firstly, the requirements for the content of annual reports often specify that activity or output information will be provided. Secondly, the culture of such reporting is deeply embedded in the corporate systems of most/all agencies and the thinking of staff. Finally, it reflects the very early stage that the agencies are at in developing their performance assessment systems.

It will be important to ensure that the guidelines for the content of annual reports are modified to encompass outcome-based reporting. It will be equally important to ensure that outcome-based reporting is implemented in a manner that involves the whole organisation and which aims to change the organisational culture.

All annual reports and strategic plans responded directly to the requirements of the relevant

legislation, which, as previously noted, provides a strong basis on which to begin the move to performance assessment. All agencies had developed mission statements (or the equivalent), also an important first step to performance assessment.