

Process guidelines for indicator selection for Protected Area Management Effectiveness Evaluation

December 2008

Background

As part of the ARC Linkage project on “*Building capacity for adaptive management in protected areas through improved systems for monitoring and evaluation*”, we have been asked to develop guidelines on indicator selection for assessing management effectiveness of protected areas. These draft guidelines have been developed for this purpose and are being circulated for discussion and comment. Feedback has already been obtained from four groups of protected area professionals as part of a workshop held at the Australian Protected Areas Congress 08 in Queensland in November 2008.

While what needs to be evaluated and the selection of appropriate indicators and measures may seem a simple and almost intuitive process, factors such as cost of measurement, comprehensiveness, transferability and influence on decision-making are often poorly considered in indicator selection. Therefore, we propose a process for indicator selection that seeks to ensure selected indicators and measures appropriately consider practical, functional and operational constraints and use purposes.

Indicator selection steps

A fundamental tenet of our work on management effectiveness evaluation is that to understand management effectiveness, one must evaluate the effectiveness of steps in the management process. This seeks to identify, not only the outcomes, but also how achieving the outcomes may have resulted from management interventions. Therefore, evaluation system design is the basis for development of a management effectiveness evaluation system and indicator selection. The IUCN-WCPA Management Effectiveness Evaluation Framework (Hockings et al. 2006) provides a comprehensive starting point with general criteria and broad guidance on relevant issues to be addressed in developing indicators. Whether the IUCN-WCPA Framework or some other evaluation framework is used, a similar process can be followed in developing specific indicators to be used in the system. These consist of seven steps: (1) clarify purpose; (2) determine scope and framework for management effectiveness

evaluation; (3) identify what needs to be evaluated with a focus on key management concerns (values, threats to values and other issues); (4) explore reporting requirements and needs (legislative, mandated, funder and community) and internal requirements for use of assessment information; (5) review existing monitoring and evaluation programs; (6) determine purposeful, significant and relevant indicators within the context of the overall evaluation framework; and (7) determine indicator assessment methods and measures (Figure 1).

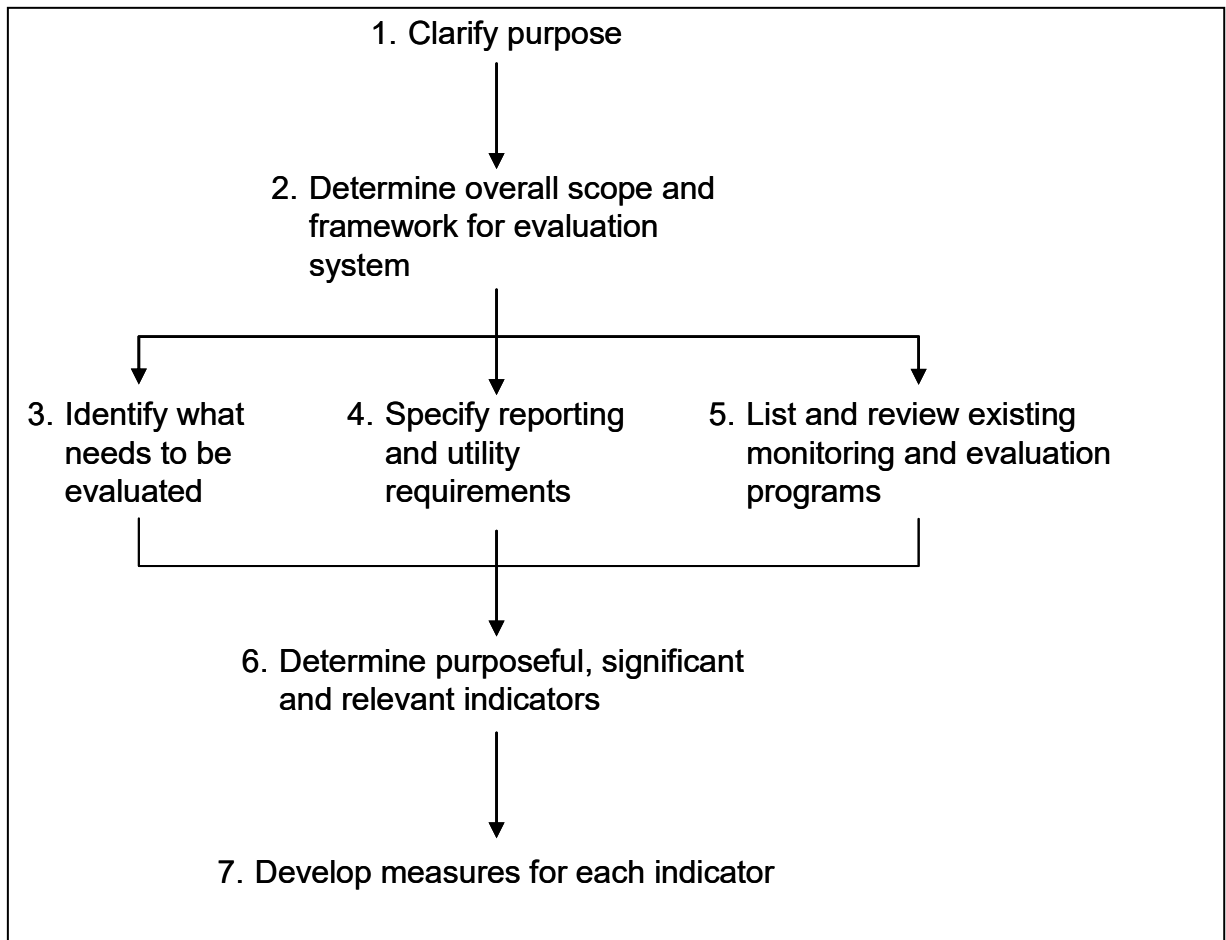


Figure 1: Steps for selecting indicators

Step 1: Clarify the purpose of the system

Evaluation systems can serve several purposes: meeting reporting requirements, tracking performance in park management (internal accountability), learning by doing, and a formalised process of adaptive management, or a combination of these. The nature of data, its uses and its limitations can depend on the purpose for its collection. Evaluation needs to be targeted. Time and other resource constraints mean that every management action can not be

assessed. Hence, it is important to consider the purpose for conducting evaluation and the audience for the information and to be cognisant of these factors when developing indicators. Consulting with agency executive and field staff ensures that the purpose of the evaluation is understood by those participating in identifying indicators and reporting against them. The potential political sensitivity of evaluation information needs to be understood and considered. The support of senior management and staff is an important factor in ensuring a useful and sustainable evaluation system.

Step 2: Determine overall scope/scale and framework for the evaluation system

Management effectiveness evaluations vary in scope/scale from detailed assessments of site management (e.g. Enhancing our Heritage approach developed for World Heritage sites but applicable to any protected area) to approaches intended to be applied to a collection of sites or whole systems of protected areas (e.g. State of the Parks assessments in NSW and Victoria). These system-level evaluations may focus on the whole of agency, looking at aspects of organisational management and performance or may focus on the system as a collection of sites which are each evaluated separately, or a combination of both. A number of broad frameworks can be used to develop evaluation systems such as pressure-state-response or project cycle approaches (Stem *et al.*, 2005). One of the most widely used frameworks in protected area management effectiveness evaluation is the IUCN-WCPA Framework (Hockings *et al.*, 2000, 2006). The scale and scope of the evaluation system will influence decisions made in the remaining steps although the steps themselves remain the same. Other important factors that need to be resolved before indicators are considered are the level of resources available to undertake the management effectiveness evaluation and the timeframe and periodicity intended for the evaluation system. These issues will have a direct impact on the type of indicators and data collection methods used.

Step 3: Identify what needs to be evaluated

The identification of significant enduring management issues and concerns helps to ensure assessment relates to key values of sites and factors impacting on them. The content of the evaluation should have a primary focus on the values of the protected areas (at either site or system level), and threats to those values. In addition to this focus on value and threats, it is also recommended to include other issues of importance to the agency or site: management activities or objectives that are of interest to managers or external stakeholders.

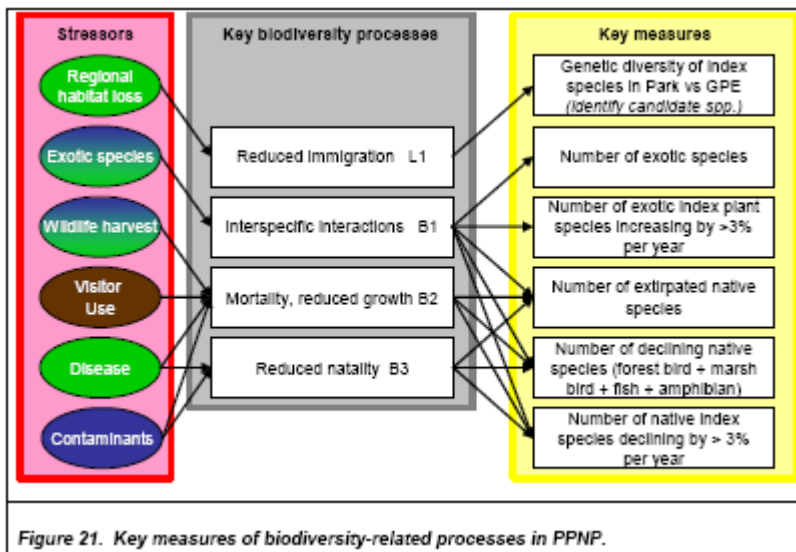
Identifying these provides the context for assessing many aspects of management performance. In short, it helps to ensure that indicators are relevant. The scale of the evaluation system is important here: key issues, values, threats and issues at a system level will be different from what might be important if a more detailed evaluation system for a single protected area is being developed.

Example:

Values that could be included in management effectiveness evaluations include biodiversity, other natural values, cultural values, economic values, educational values and other social values. Values information can be obtained through review of site nomination reports, statements of outstanding values, planning documents and/or interviews with managers and stakeholders. Threats include major problems facing a site (e.g. pest - fox). Each threat has a cause or causes (e.g., absence of natural predators), and impacts on species in different ways (e.g. predation of ground-dwelling marsupials). Impacts of threats on values vary in extent and severity.

Conceptual models of relationships between system components (including relationships between threats and values) provide a process that can help clarify important relationships and to identify indicators (see Box 1). For more information on the use of conceptual models in conservation management, see Heemskerk et al. (2003). It is important to consider both long-term outcomes (e.g. maintenance of values such as biodiversity) and the intermediate results of management needed to achieve these outcomes (e.g. activities to address issues of concern such as weeds). The conceptual model should include both biophysical and socio-economic aspects of management at intermediate and long-term scales.

Box 1: An example of the use of models to identify indicators at the site level (from Carlson et al., 2005 - Point Pelee National Park in Canada)



Step 4: Specify reporting requirements and indicators identified within legislation, policy frameworks, by funders and articulated by the community. Consider how the information from the assessment will be used.

Management effectiveness evaluation can be an added expense for agencies managing protected areas. A common view exists among field staff that time and money spent on evaluation could be better spent producing outcomes. However, the current operational environment for conservation is characterised by limited funding and uncertainty about what management actions are most effective. It is therefore important not only to conduct evaluation, but also to consider reducing the cost burden by looking for synergies with other management systems. One potential synergy is to align evaluation system development with management reporting. Aligning the monitoring and evaluation design, data storage and reporting systems can lead to considerable savings in effort and enhance use of the information from the assessments. Considering how the information will be used in reporting and decision making at this stage can guide indicator selection in relation to the level of precision required for individual indicators. There is no point in collecting information at a level of precision (and often at higher cost) than is required for the purpose.

Activity:

Create a gridded table of program areas and WCPA elements or alternative framework. Categorise your accountability and reporting requirements against the grid, detailing specific information requirements (e.g., monitoring of status of threatened species) and identify whether qualitative or quantitative data is required for each (Table 1). Often a choice of data types exists depending on resources available at the site).

Table 1: Fictional example of reporting requirements categorised in relation to program areas and WCPA framework elements

	Biodiversity	Visitation	Heritage
Context	Threatened species occurring on reserves (quantitative)	Characteristics of the user market.	Numbers of Heritage registered sites (quantitative)
Planning	Implementation of threatened species recovery plans on reserves (qualitative)	Status of visitation plans for reserves (qualitative and quantitative)	
Inputs	Operational budgets (quantitative)	Expenditure on visitor services	
Processes	Adherence to fire management standards (qualitative)		Health and Safety standard compliance of built structures (qualitative)
Outputs	Area treated for pest control operations (quantitative)	Number of visitors. Number of interpretive programs conducted (quantitative)	
Outcomes	Status of threatened species (quantitative where data can be collected, qualitative for other sites)	Visitor satisfaction (quantitative or qualitative)	Condition of heritage registered sites (quantitative or qualitative)

Step 5: List and review existing monitoring and evaluation programs

Multiple monitoring and evaluation programs are likely to exist in agencies or organisations managing protected areas. Within these programs, a range of indicators and measurement methodologies are also likely to exist. In some cases, these may have been developed with the development of the reserve network, and appear as somewhat *ad hoc* in terms of what is monitored and the methods used for monitoring. The development of a management effectiveness evaluation system provides an opportunity to streamline existing programs (e.g. identify areas of duplication and areas where standardisation is needed, monitoring programs where there is little evidence of use of the data in decision making or reporting). The guiding principle is to ensure that monitoring information collected informs management decisions. Management effectiveness systems are likely to be most cost effective when existing systems are leveraged so that information that is already being collected is used in the evaluation

process. Consider other sources of information and groups who contribute to the monitoring program where this is relevant (e.g. traditional and community knowledge).

Activity:

Create a table of program areas and WCPA elements or other framework. Categorise existing monitoring and evaluation programs against the grid.

Table 2: Fictional example of existing monitoring and evaluation programs categorised in relation to program areas and WCPA framework elements

	Biodiversity	Visitation	Heritage
Context			Register of Heritage sites
Planning	Status of objectives within plans		
Inputs	Budgets for pest control operations		
Processes		Perceptions of staff in relation to interpretation program standards	
Outputs	Area treated for pest control operations	Number of vehicles using visitor sites Number of campers at specific sites	Number of meetings with Indigenous groups
Outcomes	Monitoring of highest priority threatened species (population size and distribution)	Visitor satisfaction ratings for key sites	

Step 6: Determine purposeful, significant and relevant indicators

In Step 3, evaluation needs were identified and in Step 4, existing reporting requirements were identified. However, it is unlikely that they are equivalent or that existing monitoring and evaluation programs (identified in Step 5) are sufficient to meet these needs and uses. Evaluation purpose and needs, reporting requirements and existing monitoring and evaluation programs need to be considered together to determine appropriate indicators for evaluating management effectiveness.

Compare the assessment of monitoring and reporting needs with existing monitoring and evaluation programs.

- Where a mis-match occurs, revise existing indicators. Develop new indicators where gaps exist.
- As much as possible, ensure indicators focus on one evaluation element (i.e. do not select indicators that confuse, or combine, outputs with outcomes or planning and implementation).
- Align indicators with the management system and monitoring and reporting needs (e.g. record staff time per program area instead of overall staff time if you want to be able to assess performance in relation to effort for individual program areas).
- Where multiple indicators exist for the same evaluation element and work area, determine if all are required. If they need to be combined for reporting purposes, determine how this will be done.

7. Develop measures for each indicator

The first step is to define an appropriate measure. There is a large body of literature on indicator selection and assessment methods. It is not the purpose of these guidelines to review the body of work on indicator measurement but to develop a process for indicator selection for management effectiveness evaluation. Comment on appropriate indicator measurement can be found in Margoluis and Salafsky (1998) and Spelleberg (2005). Attributes of good indicators are given in Box 2, with the added criterion of cost of measurement. Once indicators have been selected, design of monitoring programs can begin. This involves multiple tasks. Firstly, methods for assessing each indicator need to be selected. Consideration needs to be given to the appropriateness of methods that relate to each indicator. It may be appropriate to collect multiple data sets and types of data for each indicator. In such a case, consideration needs to be given to how results will be combined to inform overall assessment for that indicator.

Box 2: Characteristics of appropriate indicators

Modified from Hockings et al. (2000:25) and Margoluis and Salafsky (1998), indicators should:

- have an unambiguous and verifiable relationship to the attribute (e.g. values, threat) being assessed
- be sensitive to change in that attribute.
- reflect enduring change rather than short-term or localised fluctuation
- reflect changes of significance to management;
- reflect changes at scales relevant to management;
- be feasibly collected, analysed and reported on in a timely and cost effective way;
- be able to influence future action.

Management context and the level of evaluation detail desired can influence indicator selection and measurement methods, especially whether indicators should be measured qualitatively, quantitatively, or a combination of both data types. Consider the following:

- If assessing across a large protected area network, the distributions of values across the landscape can make it impossible to quantitatively measure the same indicators across all reserves. Consider use of a scoring system that provides an option of using quantitative data where it is available or qualitative assessments in other cases.
- Capacity may not exist to measure all indicators in a quantitative way. Decisions will need to be made about the use of quantitative data, or qualitative data and the need for an estimate of confidence or detailed justification if a score-based approach is used. In determining which indicators need to be measured quantitatively, consider reporting requirements and the level of certainty required for decision making. Give preferences to the situations in which high certainty of information is required.

Monitoring protocols (or assessment guidelines for survey data) are important as they promote consistency in the way that data are collected. Protocols can also be developed for storage and analysis. In combination, they provide consistency that enables comparison over time and between locations. If a substantial amount of data is to be collected, data management systems may also need to be developed. The development of thresholds for action (i.e. what is the acceptable range for an indicator and the point that corrective management action should be initiated) at the outset of an evaluation can guide selection of appropriate measures. Planning for monitoring programs is essential to ensuring that

information is eventually used to adapt management. Once planning is complete, baseline monitoring can commence.

References

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