Environmental Performance Reporting for Natural Area Tourism: Contributions by Visitor Impact Management Frameworks and Their Indicators

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Environmental performance reporting is being increasingly demanded of many sectors of society, including those responsible for managing natural area tourism. Recent approaches include corporate reporting, state-of-the-environment reporting, and environmental management systems. This paper evaluates the usefulness of visitor impact management frameworks and associated resource and social indicators, both of which have a rich history of application to wilderness and backcountry management, for performance reporting on natural area tourism management. The evaluation draws on a recently developed evaluation framework for protected area management, plus detailed criteria, to address today's environmental performance reporting needs. Against these criteria, the visitor impact management frameworks rated well, with the Limits of Acceptable Change rating the highest. Resource and social indicators also showed great potential for performance reporting provided they are meaningful to senior managers, politicians and other stakeholders. Integrating these frameworks and their resource and social indicators into today's performance reporting, especially into state-of-the-environment reporting and environmental management systems, could significantly advance meaningful performance reporting for natural area tourism management.

Introduction

It is estimated that natural area tourism has risen from approximately 2% of all tourism in the late 1980s to about 20% of all leisure travel today (Ecotourism Society, 1998; Weaver & Oppermann, 2000). This form of tourism is now estimated to be worth US$20 billion a year (WTO, 1999). At this magnitude it now has the capability to change dramatically both natural areas and the experiences of tourists themselves (Newsome et al., 2002). Many of these natural areas are national and marine parks managed by governments for the public, using predominantly public funds. In the face of increasing visitor use, managers have considerable investments to protect, as well as requirements to be publicly accountable for their management actions.

Demand is increasing across all sectors of society to measure and report on environmental performance (Hocking et al., 2000). This demand has its origins in large part in the advent of economic rationalism in the 1980s and the associated management paradigm of managerialism (Hood, 1991). This paradigm is distinguished by its reliance on management by objectives, imbedded within strategic planning, and reporting achievement against these objectives using performance
indicators (Davis et al., 1993). This doctrine has dominated public sector reform over the last 10 to 15 years in countries such as the United Kingdom, Australia, New Zealand and the United States (Hood, 1991; Kickert, 1997). Managers of natural areas are being increasingly required to report to senior staff, government ministers, and the broader public on their environmental performance. Where natural areas are used by tourists, then their reporting must include details on visitor management. Two increasingly common forms of performance reporting are state-of-the-environment reporting and environmental management systems. Additionally, many public agencies are being required to provide environment-related outcomes in their annual corporate reports.

There is a rich history, over the last three decades and predominantly in North America, of monitoring and reporting on the impacts of visitors on wilderness and backcountry areas (Farrell & Marion, 2002; McArthur, 2000a; Nilsen & Tayler, 1997). The most common approaches or frameworks are the Recreation Opportunity Spectrum (ROS) (Clark & Stankey, 1979), Limits of Acceptable Change (LAC) (Stankey et al., 1985), Visitor Impact Management (VIM) (Graefe et al., 1990), Visitor Activity Management Process (VAMP) (Payne & Graham, 1993) and Visitor Experience Resource Protection (VERP) (Hof & Lime, 1997). Two at least have been specifically developed for tourism – the Tourism Opportunity Spectrum (TOS) (Butler & Waldbrook, 1991) and Tourism Optimisation Management Model (TOMM) (Manidis Roberts Consultants, 1997). Performance reporting, based on assessing the achievement of objectives by identifying and measuring indicators and standards, is a crucial concern within these frameworks. To date, however, none of these frameworks has been explicitly applied to the performance reporting increasingly being required of public land managers.

In a similar vein, extensive research has been undertaken, again predominantly in North America, on indicators of resource and social conditions as influenced by visitors to natural areas (Cole, 1983a,b; Hammitt & Cole, 1998; Hendee et al., 1990; Manning & Lime, 2000; Marion, 1991; Merigiano, 1990). Visitor impact frameworks have a central reliance on these indicators to help translate objectives into reality and to guide what to monitor and against what standards (Farrell & Marion, 2002; Newsome et al., 2002). As managers increasingly struggle to find meaningful indicators for agency performance reporting it seems opportune to explore the contributions this wealth of research activity could make.

As such, the purposes of this paper are twofold. The first is to evaluate the usefulness of existing visitor impact management frameworks, such as LAC, for reporting on the performance of tourism management in natural areas. The second, related purpose is to evaluate the suitability of these resource and social indicators for performance reporting.

**Methods**

The most widely used and well-known environmental performance reporting approaches and visitor impact management frameworks are briefly described along with associated performance indicators. A framework developed by Hockings et al. (2000) for evaluating the performance of protected area
Table 1 Hypothetical performance reporting framework and associated indicators for natural area tourism

<table>
<thead>
<tr>
<th>Component</th>
<th>Elements and description</th>
<th>Focus of evaluation and examples of tourism indicators</th>
</tr>
</thead>
</table>
| Design                           | Context – conservation and other values of area, its current status and threats, policy environment | Status  
Indicators – threats, current resource condition                                           |
|                                  | Planning – legislation and policy, area/reserve design, status of management planning      | Appropriateness  
Indicators – existence of management plan                                                     |
| Management systems and processes | Inputs – resources to agency, site and partners                                           | Resources  
Indicators – staff, funds, infrastructure                                                   |
|                                  | Processes – how management is conducted                                                   | Efficiency, appropriateness  
Indicators – interpretation programme, budget and financial control                          |
| Delivery                         | Output – delivery of products and services                                                | Effectiveness  
Indicators – extent of management plan implementation, quantitative measures of services and products |
|                                  | Outcome – success in achieving objectives                                                | Effectiveness, appropriateness  
Indicators – measurement of achievement against objectives in management plans and other relevant policies |

Source: Hockings et al. (2000)

management (Table 1) is used to position each performance reporting approach and visitor impact management framework in terms of its evaluative scope. These descriptions provide background essential for the subsequent evaluation of the usefulness of existing visitor impact management frameworks and their indicators.

Two sets of criteria were then developed and applied. The first set, for evaluating the existing visitor impact management frameworks, were derived from today's performance reporting requirements as detailed in journal articles, books and reports. The second set, for evaluating the resource and social indicators developed for wilderness and backcountry use (Belnap, 1998; Cole, 1983a, 1983b; Leung & Marion, 2000; Marion, 1991; Merigliano, 1990), were derived from two main sources: previously published criteria and methodological considerations associated with these indicators and requirements for today’s performance indicators as given in journal articles, books and reports. Both sets of criteria were developed, applied and the evaluation undertaken by this paper’s authors. The evaluation concludes by drawing together information from the preceding analyses around two themes. First, how would application of these frameworks and their indicators significantly enhance current efforts in performance reporting, and second, what changes are needed to enhance their contribution?
<table>
<thead>
<tr>
<th>Performance reporting approach</th>
<th>Description</th>
<th>Purposes</th>
<th>History and general application</th>
<th>Natural area tourism application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate environmental performance reporting in public sector</td>
<td>Public sector agencies report, usually annually, to government/parliament on performance against stated objectives • Management-by-objectives and associated reporting requirements as part of managerialist paradigm • Reporting by state/provincial or national government agencies – macro level</td>
<td>To make public sector agencies more accountable, efficient and effective • Allows managers to determine whether programme resources are achieving desired outcomes in most effective, efficient manner</td>
<td>Reporting back to parliament on expenditure has a long history in the public sector • Appearance has accompanied the advent of managerialism worldwide over last 2 decades • Reporting on environmental performance has appeared over last decade in private (e.g. mining) and public sectors</td>
<td>Public sector agencies in ‘managerialist’ countries now reporting annually on performance including provision and management of tourism on public lands</td>
</tr>
<tr>
<td>State-of-the-environment/park reporting (SOE/SOP)</td>
<td>Reporting regularly on the state of the environment, usually accompanied by indicators that can be measured to determine environmental trends over time • Most common reporting model is ‘pressure-state-response’ • Reporting by state/provincial or national governments – macro level</td>
<td>To report regularly on the environment and provide up-to-date information for the public • To stimulate action on environmental issues</td>
<td>State-of-the-environment reporting part of membership of OECD* with many countries (e.g. United States, Australia, Canada, the Philippines, Italy and Japan) reporting over the past 2 decades</td>
<td>SOP has potential for individual or groups of protected areas • Limited evidence of adoption</td>
</tr>
<tr>
<td>Environmental management systems (EMS)</td>
<td>Systems for determining and implementing environmental policies in public and private sector organisations • Most widely-recognised system is ISO 14001 with 5 principles: commitment and policy, planning, implementation, measurement and evaluation, and review and improvement • Reporting by individual protected areas through to state government – micro to meso level</td>
<td>To achieve continuous improvement in environmental performance • To develop and maintain the organisational structures necessary to achieve environmental outcomes</td>
<td>Originated from mining and manufacturing sectors last decade based on concerns regarding implementation of environmental policies</td>
<td>Little application to tourism management to date, however, environmental certification by Green Globe 21 requires an EMS</td>
</tr>
</tbody>
</table>


* Organisation for Economic Co-operation and Development.
Table 3 Comparison of focus of evaluation across performance reporting and visitor impact management frameworks

<table>
<thead>
<tr>
<th>Evaluation component*</th>
<th>Examples of indicators</th>
<th>Corporate environmental performance reporting</th>
<th>State-of-the-park reporting</th>
<th>Environmental management systems</th>
<th>Recreation opportunity spectrum</th>
<th>Limits of acceptable change</th>
<th>Visitor impact management</th>
<th>Tourism optimisation management model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition of area</td>
<td>Threats, current resource condition</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear objectives set</td>
<td>Objectives exist</td>
<td>√✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Status of planning</td>
<td>Existence of management plan</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Management processes and systems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inputs – resources</td>
<td>Staff, funds, infrastructure</td>
<td>✓✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processes –programmes, controls</td>
<td>Interpretation programme, budget, financial control</td>
<td>✓</td>
<td>✓</td>
<td>✓✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Delivery</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output – delivery of products and services</td>
<td>Extent of management plan implementation, quantitative measures of products and services</td>
<td>✓✓</td>
<td>✓</td>
<td>✓✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓✓</td>
</tr>
<tr>
<td>Outcome – success in achieving objectives</td>
<td>Measurement of achievement of management plan objectives</td>
<td>✓✓</td>
<td>✓</td>
<td>✓✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓✓</td>
</tr>
</tbody>
</table>

✓✓✓ = evaluation component present and comprehensively undertaken; ✓✓ = evaluation component mostly present and usually comprehensive; ✓ = infrequently present, not particularly comprehensive; – = absent

* Evaluation components derived from Hockings et al. (2000)
Environmental Performance Reporting Approaches and Associated Indicators

No single, comprehensive system exists for reporting on and evaluating the management of natural area tourism. Hockings et al. (2000) proposed a framework covering all stages of protected area management from policy initiation through to on-ground delivery noting that no such framework currently exists (Table 1). This framework contributes here to describing three of the most widely known and used performance reporting approaches: corporate performance reporting, state-of-the-environment/park reporting and environmental management systems.

Corporate environmental performance reporting in the public sector

The first of these is corporate environmental performance reporting (Table 2). The advent and institutionalisation of such reporting in the public sector is a key feature of managerialism (Beckwith & Moore, 2001). Public sector agencies such as the Department of Conservation and Land Management in the state of Western Australia, responsible for managing over 22.5 million ha of land and water (CALM, 2000a) for tourism and nature conservation, reports annually on a suite of performance measures to the State Government's Auditor General and Parliament. Measures include number of visits to CALM lands, visitor satisfaction and cost per visit (CALM, 2000a). Using this agency's corporate performance reporting as a guide and then placing it in the broader context provided by Hockings et al. (2000), it seems that such reporting focuses on evaluating the outputs of management (e.g. number of visits), with some attention to the inputs (e.g. cost/visit) and limited attention to the current context (Table 3).

Corporate performance indicators are chosen to enable reporting on the appropriateness, efficiency and effectiveness of programme delivery. Identifying and reporting on useful, meaningful indicators continues to be particularly vexing (Beckwith & Moore, 2001). Indicators must enable progress against broader organisational goals to be determined. For example, one of the Department of Conservation and Land Management's organisational goals is providing opportunities and services to the community that allow them to enjoy the natural environment without compromising conservation and other management objectives (CALM, 2000b). An associated indicator is visitor satisfaction. It is not clear how data from this indicator helps measure achievement against all aspects of this goal. Another concern is selecting indicators that are meaningful to managers as well as politicians. To date, indicators such as cost per visit and the ratio of total cost of service to operating revenues, which are meaningful to politicians, have been used but the approach and evaluation outcomes have not necessarily been embraced or considered important by managers.

State-of-the-environment/park reporting

Both corporate performance reporting and state-of-the-environment (SOE) reporting blossomed in the 1980s and 1990s (Table 2). Most reports use a 'pressure-state-response' model and associated indicators to describe the current state of the environment (OECD, 1994). Pressures are the human activities causing environmental issues, the 'state' is the condition of the environment, and
responses include government legislation, administrative and community actions and other policy instruments. Three associated types of indicators are suggested – pressure (i.e. a measure of the causes of issues), state or condition (usually severity and extent), and response indicators. Such reporting has usually been conducted at a national or state scale; for example, the Australian Government produced its national state of the environment report in 1996 (State of the Environment Advisory Council, 1996). The state of Western Australia produced its first SOE report in 1992 and then a revised version in 1998 (Government of Western Australia, 1998).

There have been some moves towards state-of-the-park (SOP) reporting, conducted along similar lines to the SOE reporting, but at a national park or individual protected area scale. One reason for such reporting seems to be the increasing interest policy-makers have in being able to assess the status, threats and trends in the natural areas they manage (Hockings et al., 2000; Landres et al., 1994). SOP reporting provides the means of monitoring threats as a ‘pressure’. Landres et al.’s (1994) suggest selecting a few core indicators to monitor trends in threats, conditions, visitor demand and societal values. This form of performance reporting seems most focused on the condition of an area (i.e. Hockings et al.’s (2000) design component) and less so on evaluating processes or delivery (Table 3).

Cope et al. (2000) suggested that SOP reporting may become a regular feature of managing natural areas. They report that the North York Moors National Park Authority is using SOP reports to record and review sustainability indicators and trend indices. At a state level, the national park management agency in New South Wales, Australia, has recently published the first part of their new approach to SOP reporting. This first stage provides details on the state of their parks and associated threats/issues (NSW NPWS, 2001). They intend to provide indicators for outcomes in the next report. Few other examples of SOP reporting exist, despite its obvious potential as a reporting mechanism and management tool.

Environmental management systems

Environmental management systems (EMS) appeared in the 1990s in the mining and manufacturing sectors to measure implementation of environmental policy (Table 2). They are ‘the organisational structure, responsibilities, practices, procedures, processes, and resources for determining and implementing environmental policy’ (British Standards Institute, 1994). Today the most widely recognised environmental management systems is the International Standard ISO 14001. This form of performance reporting most closely matches the complete framework provided by Hockings et al. (2000). It potentially enables reporting on the design, management processes and systems, and delivery components of natural area tourism (Table 3).

To date EMS have not been widely used by protected area managers or the tourism industry; however, practitioners believe they could be (Font et al., 2001; Todd & Williams, 1996). EMS could be part of company reporting, for example, by tour operators or the managers of built accommodation such as hotels and resorts. Environmental certification systems for tourism companies, such as Green Globe 21, require an EMS for the company’s operations (Font & Buckley,
Visitor Impact Management Frameworks and Associated Indicators

Much has been written about these frameworks, their purposes, similarities and differences (Fennell, 1999; Hammit & Cole, 1998; Lindberg et al., 1997; McArthur, 2000a, 2000b; Newsome et al., 2002; Nilsen & Tayler, 1997). Although these frameworks and associated resource and social indicators were initially developed for managing recreational use of wilderness and backcountry areas in North America, they have increasingly been transferred into natural area tourism (Farrell & Marion, 2002; Newsome et al., 2002).

These frameworks share some common features (Table 4, Figure 1). Most rely on a management-by-objectives approach and are iterative, ongoing processes enhanced by involving the public as well as managers (Cole & McCool, 1997). Most begin with efforts to define management objectives before moving onto identifying desired resource and social conditions. Next comes selection of indicators and standards to measure and monitor these conditions. Monitoring is a critical element of most frameworks (Newsome et al., 2002). Monitoring against standards is required to compare desired and actual conditions. The differences between the frameworks is summarised against ‘distinguishing characteristics’ in Table 4.

Resource and social indicators are an integral part of most of these management frameworks (Nilsen & Tayler, 1997). Efforts have been made in a number of countries (USA, Canada, Australia) to integrate these indicators into visitor management frameworks for protected areas (e.g. Belnap, 1998), but such work has not been widespread or well reported (Manning & Lime, 2000). A review paper by Merigliano (1990) is an exception.

Significant research associated with resource indicators has occurred to determine the condition of wilderness and other backcountry areas in the United States and Canada (Manning & Lime, 2000). A limited amount of work has been conducted at developed campsites in other countries (e.g. in Uganda by Obua & Harding, 1997, and in Australia by Smith & Newsome, 2002). Much of this resource indicator work has focused on determining the impacts of visitors at campsites and along trails on the natural resource base (Cole, 1983a,b, 1989; Cole et al., 1997; Leung & Marion, 1999a, 1999b, 2000; Marion, 1991, 1995; Parsons & MacLeod, 1980). Information on conditions can be collected using indicators as diverse as campsite area, damage to trees and amount of litter, and reported in an equally diverse number of ways, from a single, visual condition rating through to detailed quantitative measurements of more than 10 parameters (Table 5).

Social indicators have also received research attention but to a lesser extent (Manning & Lime, 2000; Morin et al., 1997; Roggenbuck & Lucas, 1987; Roggenbuck et al., 1993; Watson & Cole, 1992; Watson & Roggenbuck, 1998). The social indicators most commonly measured, usually via a written questionnaire, include a number of other parties encountered (for trails, rivers and lakes) and number of parties camped within sight or sound (Table 6).
<table>
<thead>
<tr>
<th>Framework characteristics</th>
<th>Recreation opportunity spectrum (ROS)</th>
<th>Limits of acceptable change (LAC)</th>
<th>Visitor impact management (VIM)</th>
<th>Tourism optimisation management model (TOMM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central focus</td>
<td>Identifying and providing a range of experiences for visitors to natural areas</td>
<td>Identifying indicators and standards for desired resource and social conditions for visitors to natural areas</td>
<td>Very similar to LAC</td>
<td>Identifying optimal conditions, indicators and acceptable ranges, manage and monitor accordingly</td>
</tr>
<tr>
<td>Steps</td>
<td>Identify current and desired future opportunities for visitors to natural area tourism and implement</td>
<td>Begins with recognising current opportunities, then moves onto selecting and inventoring indicators of social and resource conditions and concludes with managing and monitoring to provide the desired opportunities and conditions</td>
<td>Begins by reviewing the area's objectives, then selects indicators and standards and compares with existing conditions, causes of impacts are then identified and required management actions implemented</td>
<td>Moves from describing the management context to developing a monitoring programme with associated indicators, acceptable ranges and benchmarks, to implementation and further adjustment of management</td>
</tr>
<tr>
<td>Distinguishing characteristics</td>
<td>Recognition of need to provide a range of experiences for tourists and manage accordingly; indicators and standards not considered</td>
<td>Relies on indicators and standards to assist management; presents a major alternative approach to carrying capacity by asking 'how much change is acceptable?' rather than 'how much use is too much?'.</td>
<td>Focuses on visitor impacts without considering the need to provide a range of opportunities; identifies causes of impacts and manages accordingly; relies on indicators and standards</td>
<td>Explicitly recognises social and political context within which natural areas sit; makes explicit provision for involving stakeholders throughout; uses acceptable range for indicators rather than single standard</td>
</tr>
<tr>
<td>Current scale(s) of application</td>
<td>Applied within and to groups of natural areas to identify opportunity classes</td>
<td>Most commonly applied to single, large, natural areas</td>
<td>Most commonly applied to single, complex sites</td>
<td>Has been applied to regions with multiple land uses and to individual, large, natural areas</td>
</tr>
</tbody>
</table>

Sources: Clark & Stankey, 1979; Graefe et al., 1990; Manidis Roberts, 1995; Manning & Lime, 2000; McArthur, 2000; Newsome et al., 2002; Nilsen & Tayler, 1997; Stankey et al., 1985
The last piece of the indicators puzzle is setting standards. Managers are often loath to set standards, generally because data on impacts and their causes are often lacking and they may be concerned about the political consequences of poorly informed management decisions (Newsome et al., 2002). Partially to address these concerns, managers have adopted benchmarking. Benchmarking provides a value for an indicator at a particular point in time against which further changes can be measured and compared (Johnson, 2000). On Kangaroo Island, off the coast of southern Australia, benchmarks have been set for a number of indicators based on the best information available in 1996. For wildlife, it was the size of the seal populations at designated sites (Manidis Roberts Consultants, 1997). Such benchmarks may not reflect the desired standard/condition but they do provide a starting point for a monitoring programme.
Table 5 Resource indicator monitoring approaches for measuring the impacts of visitors in natural areas

<table>
<thead>
<tr>
<th>Approach</th>
<th>Design</th>
<th>Data type</th>
<th>Description</th>
<th>Advantage</th>
<th>Disadvantage</th>
<th>Examples of indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campsite approaches</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photographs</td>
<td>Reconnaissance</td>
<td>Interval/ratio</td>
<td>Site or quadrat-based photos</td>
<td>Rapid</td>
<td>No accurate information on indicators</td>
<td>Campsite area, barren core area, condition of ground cover vegetation, tree damage, exposed tree roots (as a measure of erosion), site development (e.g., signs, fire rings, seats), social trails, amount of litter, impacts to soil organic horizons and to mineral soil</td>
</tr>
<tr>
<td>Condition class</td>
<td>Reconnaissance</td>
<td>Nominal/ordinal</td>
<td>Single descriptive rating given to each site</td>
<td>Rapid</td>
<td>Single measure and associated data loss</td>
<td></td>
</tr>
<tr>
<td>Multiple-indicator rating</td>
<td>Multiple-indicator</td>
<td>Ordinal</td>
<td>Ratings for individual indicators summed for each site</td>
<td>Efficient; good overview of conditions obtained</td>
<td>Composite rating not statistically proper</td>
<td></td>
</tr>
<tr>
<td>Multiple-indicator measurement</td>
<td>Multiple-indicator</td>
<td>Interval/ratio</td>
<td>Quantitative measurement of each indicator</td>
<td>Accurate, statistical analysis possible</td>
<td>Time-consuming, training needed</td>
<td></td>
</tr>
<tr>
<td>Trail approaches</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photographs</td>
<td>Reconnaissance</td>
<td>Interval/ratio</td>
<td>Aerial photos</td>
<td>Rapid</td>
<td>No accurate information on indicators</td>
<td>Soil erosion/trail depth, excessive trail width, excessive root exposure, multiple trails, wet soil, running water on the trail</td>
</tr>
<tr>
<td>Condition class</td>
<td>Reconnaissance</td>
<td>Nominal/ordinal</td>
<td>Descriptive ratings given to trails/segments</td>
<td>Rapid</td>
<td>Single measure and associated data loss</td>
<td></td>
</tr>
<tr>
<td>Point sampling</td>
<td>Sampling</td>
<td>Interval/ratio</td>
<td>Measurements at a series of points (randomly or purposively selected)</td>
<td>Statistical analysis possible</td>
<td>Re-location of sampling points, field time</td>
<td></td>
</tr>
<tr>
<td>Quadrat sampling</td>
<td>Sampling-based</td>
<td>Interval/ratio</td>
<td>Measurements in a series of quadrats (randomly or purposively selected)</td>
<td>Statistical analysis possible</td>
<td>Re-location of sampling points, field time</td>
<td></td>
</tr>
<tr>
<td>Section evaluation</td>
<td>Census-based</td>
<td>Ordinal/percentage</td>
<td>Sectional evaluation within trails</td>
<td>Rapid</td>
<td>Definition of sector, scale dependence of results</td>
<td></td>
</tr>
<tr>
<td>Problem assessment</td>
<td>Census-based</td>
<td>Interval/ratio</td>
<td>Census of all pre-defined problems (e.g., erosion)</td>
<td>Provides data on impact frequency, extent and distribution</td>
<td>Difficult to quantify impact problems; variability between surveyors</td>
<td></td>
</tr>
</tbody>
</table>

### Table 6 Social indicators for measuring the impacts of visitors in natural areas

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Location of monitoring</th>
<th>Data collection methods</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of groups encountered</td>
<td>Campsites, trails, rivers and lakes</td>
<td>Written questionnaires</td>
<td>Commonly used indicator</td>
</tr>
<tr>
<td>Number of people camped within sight/sound</td>
<td>Campsites</td>
<td>Written questionnaires</td>
<td>Commonly used indicator</td>
</tr>
<tr>
<td>Incidences of inconsiderate behaviour</td>
<td>Campsites</td>
<td>Written questionnaires</td>
<td>Little used</td>
</tr>
<tr>
<td>Number of boats moored</td>
<td>Rivers and lakes</td>
<td>Written questionnaires</td>
<td>Less-widely used</td>
</tr>
<tr>
<td>Hours in sight of others each day</td>
<td>Trails, rivers and lakes</td>
<td>Written questionnaires</td>
<td>Less-widely used</td>
</tr>
<tr>
<td>Persons per viewscape</td>
<td>Trails</td>
<td>Photo simulation and questionnaires</td>
<td>Used to-date for high use areas (e.g. Arcadia National Park, USA)</td>
</tr>
<tr>
<td>Visitor satisfaction</td>
<td>Not necessarily site-specific</td>
<td>Written questionnaires and personal interviews</td>
<td>Widely-used with measures obtained and interpreted in many different ways</td>
</tr>
</tbody>
</table>

*Sources: Manning, 1998; Manning and Lime, 2000; Newsome et al. 2002; Roggenbuck and Lucas, 1987*
Visitor Impact Management Frameworks for Performance Reporting

Given 20 years of use, there is now a wealth of experience surrounding the relevance and use of visitor impact management frameworks. A range of indicators have also been developed and applied. Both potentially have much to offer in today’s performance reporting environment.

The following set of criteria has been constructed to evaluate the suitability of these frameworks (Table 7). The first four criteria draw on the perceived performance reporting needs for tourism in natural areas. These perceptions were influenced in large part by the evaluation framework of Hockings et al. (2000: Tables 1 and 3). The last four criteria are more generic, focusing on features that make any evaluation more useful and broadly applicable. For example, if a framework is easy to understand (criterion 5) it is more likely to be suitable than a difficult-to-understand framework.

1. The framework is based on clear objectives explicitly given or generated at the start of framework development.
 Performance reporting, particularly at a corporate level, is objective-driven predominantly so that organisations can report on the achievement of programme goals (Beckwith & Moore, 2001) (Table 3). Most of the visitor impact management frameworks begin with objectives (Table 7). ROS and LAC do this implicitly by identifying and then managing to achieve desired opportunity classes. VIM explicitly reviews existing objectives, hence this framework fully meets this criterion. TOMM begins by reviewing the planning context but there is no explicit mention of objectives.

2. Indicators are integral to the framework and they are used to measure progress in meeting the specified objectives.
 Performance reporting relies not only on setting objectives but on the use of indicators to measure outputs and outcomes to determine whether objectives are being met. Three of the four frameworks (ROS is the exception) rely on indicators (Table 4). For TOMM, the absence of explicit objectives means that these indicators lack an overarching reporting focus, hence this framework meets this criterion in only a very limited way (Table 7). LAC and VIM, on the other hand, fully meet this criterion.

3. The framework provides for as many of the evaluation components as possible for performance reporting.
 Given the resource and time constraints under which most land management agencies operate, any form of performance reporting must be as parsimonious and efficient as possible. The ideal reporting framework would cover as many of the evaluation components listed by Hockings et al. (2000: Table 1) as possible. Collectively, the current performance reporting approaches collectively cover all of Hockings et al.’s (2000) evaluation components, from reporting on the status of an area and its management, through the inputs and processes by which management occurs, to the outputs and outcomes of such activities (Table 3). Individually, however, each has a different emphasis. SOP focuses on evaluating
<table>
<thead>
<tr>
<th>Criterion</th>
<th>Recreation opportunity spectrum</th>
<th>Limits of acceptable change</th>
<th>Visitor impact management</th>
<th>Tourism optimisation management model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Framework is based on clear objectives explicitly given or generated at the start of framework development</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>—</td>
</tr>
<tr>
<td>2. Indicators are integral to the framework and are used to measure progress against objectives</td>
<td>—</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>3. Framework provides as many evaluation components as possible for performance reporting</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>4. For components covered, the evaluation is comprehensive</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>5. Framework easy to understand and use</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>6. Framework has explicit provisions for involving stakeholders</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>7. Framework can be applied to a range of spatial scales</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>8. Framework can be applied to a range of settings</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Ranking of frameworks</strong></td>
<td>4 (12)</td>
<td>1 (18)</td>
<td>2 (17)</td>
<td>3 (13)</td>
</tr>
</tbody>
</table>

✔✔✔ = fully meets criterion; ✔✔ = partly meets criterion; ✔ = meets criterion in very limited way; — = doesn’t meet criterion.
current condition, while corporate reporting and EMS have a strong focus on measuring outputs and outcomes. In terms of the visitor impact management frameworks, all address condition of the area and three of the four (ROS is the exception) outputs and outcomes (Table 3). Reporting on outputs is also a clear strength of these frameworks, again with ROS as the exception. None reports on management processes and systems. Only TOMM reports on the status of planning (Table 3). For these reasons, the frameworks only partly met this criterion (Table 7).

4. The evaluation is comprehensive for the components covered by the framework. A lack of reporting breadth may not be an issue if a visitor impact management framework is selected to report on only one or two components, for example, on the condition of a protected area. It is an issue, however, if such a selection does not allow a comprehensive evaluation of that component to be undertaken. Such a lack of comprehensiveness is likely to waste resources. In applying this criterion, two or less ticks against an evaluation component in Table 3 was regarded as a lack of comprehensiveness. As such, both ROS and TOMM fared poorly because, for several components at least, the evaluation was not comprehensively undertaken (Table 7). For example, in terms of evaluating the condition of the area, TOMM provides for a description of the context but not necessarily from the perspective of threats and/or statements regarding environmental conditions. LAC and VIM both appear to cover comprehensively most of the components they address. However, none of the frameworks deals comprehensively with outcome evaluation.

5. The framework can be clearly understood and used by policy-makers, politicians and natural area managers.

Any framework adopted must be easy for managers to understand and use. The evaluation against this criterion is based on the extent of implementation of these frameworks as reported by McArthur (2000a). The accompanying assumption is that implementation provides a surrogate measure for ‘easy to understand and use’. Such an assumption may be confounded by the ‘age’ of the frameworks, with ‘older’ frameworks such as ROS having had a longer period to be implemented compared with ‘newer’ frameworks such as TOMM. The scoring in Table 7 suggests that three of the four frameworks (TOMM is the exception) are easy to understand. However, none fully met this criterion because these frameworks, with their vague language and confusing acronyms, can appear complicated (Newsome et al., 2002; Nilsen & Tayler, 1997).

6. The framework has explicit provisions for involving stakeholders in one or more of its steps.

Involving stakeholders in performance reporting provides a means of improving the information used as well as helping manage conflict by consulting along the way (Hall & McArthur, 1998). TOMM and LAC explicitly include stakeholders, while ROS and VIM do not (Newsome et al., 2002: Table 7).

7. The framework can be applied at different spatial scales – from an individual tourist site, through to a whole natural area such as a national park, or to a group of parks.
Performance reporting is required for a number of geographic and/or administrative scales, from an individual site in a protected area, through to, and more commonly, a large natural area or system of natural areas across a state or country. As such, the framework must be able to cope with larger spatial scales. The analysis here is based on examples of practice from around the world (McArthur, 2000a). ROS has and can be applied regionally as can TOMM (Manidis Roberts Consultants, 1997; Watson, 1997; Table 7). At the other end of the spectrum, VIM has only been developed for single sites, such as Jenolan Caves in Australia (Manidis Roberts Consultants, 1995). LAC is somewhere in between, having been developed for large natural areas such as the Bob Marshall Wilderness Complex in Montana, USA (Stokes, 1990).

8. The framework can be applied to a range of settings— from marine to terrestrial, from natural areas inhabited by people to unoccupied areas, and from undeveloped, pristine sites through to resorts and marinas.

These frameworks have been applied predominantly to largely undeveloped, terrestrial areas. TOMM is an exception as it was conceived and used to manage tourism in a terrestrial and marine environment with a range of sites from undeveloped to developed (Table 7). Although the application of the other three frameworks has been much more limited, they probably have scope for marine application and for extension to the more developed end of the recreation and tourism spectrum (Butler & Waldbrook, 1991; Newsome et al., 2002). Hence they were assessed in Table 7 as partly meeting this criterion.

To summarise, and based on the analysis in Table 7, all four frameworks show strong possibilities as approaches to performance reporting for tourism management in natural areas. VIM and LAC, however, seem most suited given their higher ranking especially across the four criteria specific to the perceived performance reporting needs for tourism in natural areas. VIM ranks highest against these criteria, but its lesser suitability across larger spatial scales and lack of explicit inclusion of stakeholders placed it slightly behind LAC.

Indicators of Resource and Social Conditions for Performance Reporting

Resource and social indicators have been used for over 20 years as part of natural area visitor management. The following set of criteria has been constructed to evaluate the suitability of these indicators for today’s environmental performance reporting (Table 8). The first six are derived from previous criteria and methodological considerations used to select the ‘best’ resource and social indicators for natural area visitor management. Criteria 7 and 8 draw on the performance reporting needs for tourism in natural areas, influenced in large part by the Hockings et al.'s (2000) evaluation framework (Tables 1 & 3). The last three criteria are more generic, focusing on features that make any form of evaluation more useful and broadly applicable.

1. Indicators can be operationalised and measured.

Key to performance reporting is being able to measure an indicator. This means identifying a variable whose meaning is clear, specific and can be measured.
Table 8 Evaluation of suitability of resource and social indicators for performance reporting

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Resource indicators</th>
<th>Social indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Indicators can be operationalised and measured</td>
<td>✔️️</td>
<td>✔️️</td>
</tr>
<tr>
<td>2. Indicators can be measured and re-measured in cost-effective ways at acceptable levels of accuracy and precision</td>
<td>✔️️</td>
<td>✔️️</td>
</tr>
<tr>
<td>3. Condition of indicators related to level, type or location of use and /or behaviour of visitors</td>
<td>✔️️</td>
<td>✔️️</td>
</tr>
<tr>
<td>4. Indicators should reflect changes in conditions as they occur or within a short period of time</td>
<td>✔️️</td>
<td>✔️️</td>
</tr>
<tr>
<td>5. Condition of indicators responds to and helps determine the effectiveness of management actions</td>
<td>✔️️️</td>
<td>✔️️️</td>
</tr>
<tr>
<td>6. Indicators help define and report on quality of the visitor experience</td>
<td>✔️️</td>
<td>✔️️</td>
</tr>
<tr>
<td>7. Indicators can report against as many evaluation components as possible for performance reporting</td>
<td>✔️️</td>
<td>✔️️</td>
</tr>
<tr>
<td>8. For components covered, sufficient choice of indicators is provided to ensure reporting is effective/ comprehensive</td>
<td>✔️️️</td>
<td>✔️️️</td>
</tr>
<tr>
<td>9. Indicators are meaningful to senior managers, politicians and other stakeholders as well as natural area managers</td>
<td>✔️️</td>
<td>✔️️</td>
</tr>
<tr>
<td>10. Measurement data from indicators can be aggregated within a site to provide a single index of performance for that site</td>
<td>✔️️️</td>
<td>✔️️</td>
</tr>
<tr>
<td>11. Measurement data from indicators can be aggregated across sites or natural areas and then ‘rolled up’ to provide agency, state- or nation-wide reports</td>
<td>✔️️️</td>
<td>✔️️️</td>
</tr>
</tbody>
</table>

✔️️️ = fully meets criterion; ✔️️ = partly meets criterion; ✔️ = meets criterion in very limited way

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Manning and Lime (2000) use the example of ‘solitude’ being too general and therefore difficult to operationalise and measure compared to a much more specific variable such as ‘the number of groups encountered in one day’. A range of resource and social indicators currently exist that meet this criterion (Tables 5 & 6). For example, for trails, depth of erosion meets this criterion.

Table 8 indicates that this criterion is slightly better met by resource than social indicators. A set of well-researched and used indicators exists (Table 4). There has been less focus on social impacts although there has been extensive research to identify the social contributors to visitors’ experience of natural areas (Manning & Lime, 2000). It is also more problematic to try to operationalise and then measure indicators of ‘experience’.

2. Indicators can be measured and re-measured in cost-effective ways at acceptable levels of accuracy and precision.

A number of resource and social indicators are available that meet this criterion. However, there is often a trade-off between cost and accuracy. Using the example of resource indicators for campsites, more rapid, cheaper monitoring approaches and associated indicators (e.g. condition class ratings) can be used with lower levels of accuracy or more time-consuming and therefore expensive but much more accurate approaches (e.g. multiple-indicator measurement) can be selected (Table 5). This criterion was evaluated as partly rather than fully met because these indicators do not automatically have these features. Careful selection is required.

This criterion appears to be slightly better met by resource than social indicators (Table 8). This rating difference is based on the different design approaches taken in resource and social indicator monitoring. Resource monitoring generally relies on censusing the whole population of sites or trails (Cole, 1989), hence finding a representative sample is not a concern. Monitoring work on trails in Great Smokey Mountains National Park (Leung & Marion, 1999b) is an exception where 35% of the trails were selected and sampled to be representative of the range of environmental and use-related conditions in the Park. Social indicators rely on sampling visitors and then extrapolating to the whole population of visitors. This makes re-measurement more problematic because the surveyor can never be completely sure they are sampling a population comparable to the last monitoring event.

3. Condition of indicators related to level, type or location of use and/or behaviour of visitors.

Of fundamental interest to monitoring and performance reporting is how is a natural area coping with visitors? This can only be clearly reported if the indicators being monitored reflect changes in the levels, types and locations of visitor use, and/or changes in their behaviour (Stankey et al., 1985). Such information is crucial to enable managers to identify those aspects of visitor use requiring management intervention (Manning & Lime, 2000).

Resource and social indicators, if selected with this criterion in mind, can be clearly related to levels, types of use and so on. In relation to campsites, for example, disappearance of ground vegetation is clearly related to levels of use (Cole, 1982). Similarly, a social indicator such as the number of encounters with
other parties on trails is related to levels of use. This criterion was also evaluated as partly rather than fully met because resource and social indicators do not automatically relate to levels and types of visitor use. They have to be selected to make sure they do so.

4. **Indicators should reflect changes in conditions due to visitor use when they occur or within a short period of time.**

Indicators need to reflect changes in condition when the impact occurs or as soon as possible afterwards. If there is a long time lag between the impact occurring and the change being reflected by the indicator then it may become difficult to draw conclusions about what impact led to the changed condition. Just as important, if it takes a long time for the effects of the impact to become evident it may be too late to take the necessary action or the impact may become of such magnitude that it becomes expensive and/or impossible to manage.

The same comment applies here as for the previous criterion. Resource and social indicators, properly selected, such as those given as examples in Tables 4 and 5, will rapidly reflect changes in conditions. But if they are not carefully selected with this criterion in mind, then this rapid reflection may not be the case, hence the ‘partly met’ ratings in Table 8.

5. **Condition of indicators responds to and helps determine the effectiveness of management actions.**

Indicators are needed that not only report on current environmental conditions and reflect types and levels of visitor use, they also need to respond to management actions. For example, a resource indicator such as trail erosion reports on environmental conditions, reflects types and levels of visitor use, and can respond to management actions such as realigning trails and improving drainage. Environmental performance reporting depends in many circumstances on being able to report on how an organisation has performed (i.e. have management actions been successful?). Resource and social indicators clearly allow such reporting (Table 8).

6. **Indicators help define and report on quality of the visitor experience.**

The visitor experience has been of central concern in much of the recreation and tourism research conducted in natural areas (Manning & Lime, 2000). Visitor impact management frameworks seek to provide the experiences wanted by visitors with an experiential focus being a central focus of ROS, the earliest of the frameworks (Clark & Stankey, 1979). It has proved difficult, however, to capture information on the quality of this experience, leading to reliance on surrogate measures such as crowding with associated indicators including ‘number of visitors camped within sight or sound’. A number of social indicators developed as surrogate measures of quality of experience have been used over the years (Table 5). They usefully report on crowding, but the link between degrees of crowding and experience is by no means clear, hence this criterion is partly rather than fully met for social indicators (Table 8). For resource indicators, their relationship to quality is one of influencing rather than reporting on it, hence for them this criterion is met in only a very limited way. For example, damage to trees influences the quality of experience but is not a measure of experiential quality.
7. Indicators can report against as many evaluation components as possible for performance reporting.

Assessment against this criterion requires linking resource and social indicators back to the visitor impact management frameworks. All of the frameworks except ROS include these indicators. Reviewing Table 3 suggests that indicators (as part of these frameworks) are very useful for evaluating the design and delivery parts of tourism management in natural areas, but they do not contribute to evaluating management processes and systems, another requirement for today’s performance reporting. For this reason they only partly met this criterion (Table 8).

8. For the components covered, sufficient choice of indicators is provided to ensure reporting is effective/comprehensive.

There is sufficient choice from a suite of resource and social indicators to ensure that the condition of the environment and outputs (delivery of products and services, such as campsites and trails) can be comprehensively and effectively reported (Table 8).

9. Indicators are meaningful to senior managers, politicians and other stakeholders as well as natural area managers.

Resource and social indicators are certainly meaningful to natural area managers and associated stakeholders including visitors (Martin et al., 1989, 1997; Roggenbuck & Lucas, 1987). If they are to be used in today’s performance reporting they will also need to be meaningful to senior managers and politicians. An important concern associated with this broader use is the negative tone of the current language (McArthur, 2000a; Newsome et al., 2002), with resource and social indicators currently focusing on the adverse impacts of visitors and deteriorating environmental conditions. When organisations want to report on positive outcomes from their management, it is difficult to do so when the terms available are largely negative. Even in reporting poor conditions, it may be more palatable to senior staff and politicians to use more positive language. As such, resource and social indicators only partly met this criterion (Table 8).

10. Measurement data from indicators can be aggregated within a site to provide a single index of performance for that site.

Performance reporting may be required on a site-by-site basis (e.g., for campsites, walk trails and their segments). One way to do this is by deriving a single score for each site, enabling ready comparisons to be made between sites to assess relative conditions as well as assist in resource allocation decisions. Resource indicators have been used for more than two decades to provide these numbers (Table 5). Using condition class ratings, an individual campsite or walk trail segment receives a rating, usually from 1 to 5 (Frissell, 1978). Multiple-indicator ratings have also been derived, with a number of indicators rated (usually on a scale of 1 to 3) and then summed, with or without weightings, to give a single aggregate score (Cole, 1983).

Deriving a multiple-indicator rating involves adding ordinal-level data. Sarantakos (1998) notes that such a procedure with ordinal-level data is regarded as mathematically improper because the intervals between the categories may
not be equal. Leung and Marion (1999) also critique such an approach saying that averaging or summing such ordinal-scale variables requires an assumption that they are additive, which is often unwarranted. However, such approaches continue to be widely used and provide useful comparative data across time and space. Smith and Theberge (1987) noted, however, that such uses should be accompanied by a clear statement of associated rationalisations and assumptions.

An alternative approach is to quantitatively measure selected resource indicators (e.g. number of damaged trees) to obtain ratio-level data. For campsites, this is known as multiple-indicator measurement (Table 5). Such data, where true zero is a measurement option, can be added, subtracted, multiplied or divided. And, it is mathematically acceptable to calculate a single score for a site by summing these measurements. Leung and Marion (1999a), rather than calculating a single score for each site, used multivariate methods to compare single quantitative measures, such as number of damaged trees, across a number of sites. CSIRO (1999) has suggested caution in combining indicators into ‘a single index of a system ... and basing decisions on that single measure’, even when ratio-level data are used. As such, aggregating data to provide a single score must be accompanied by explicit details on the associated assumptions and limitations. Increasing attention is being paid to these assumptions and limitations in working with resource indicators, hence this criterion was assessed as fully met.

Similar comments hold for social indicators. There has been less research into social indicators and hence less attention to efforts to produce a single rating for a particular site or trail segment. Also in contrast to resource indicators, a number of which (and the associated methods) produce ordinal ratings, most social indicators are measured to provide ratio-level data (e.g. number of groups encountered). This means it is mathematically acceptable to sum an average site or trail data to produce indices if desired. There is little evidence that such approaches, although feasible, have been applied. For this reason, rather than lack of suitability, this criterion was assessed as partly rather than fully met.

11. Measurement data from indicators can be aggregated across sites or natural areas and then ‘rolled up’ to provide agency, state- or nation-wide reports.

Performance reporting for a natural area or group of natural areas relies heavily on ‘rolling up’, where data are collected at sites and then aggregated to provide information on performance. For example, in Western Australia, the Department of Conservation and Land Management in its annual performance reporting, aggregates visitor satisfaction information from individual sites to provide a single, statewide figure for visitor satisfaction. Can resource and social indicators, and the associated methods, provide data that can then be similarly aggregated? The answer is yes and no for very similar reasons to those discussed above under criterion 10. Ratings data can be aggregated and used to report regionally or nationally; however, such processes are regarded as statistically improper procedures (Marion, 1991). If they are used, such use should be tempered by this recognition and the associated assumption that the differences between measures for the ordinal-level variables are equal.

More acceptable would be to work with ratio-level variables, that is, where the measure may be zero (e.g. area of bare ground, number of trees damaged). The
data for such variables can be more confidently manipulated (Sarantakos, 1998). Even if such an analysis is done, common sense should be used to make sure that aggregating the variables does not lead to nonsensical results. Given these provisos, both resource and social indicators perform well against this criterion. Both provide data that can be rolled up, either as quantitative measures for selected indicators summed and averaged across a number of sites or as individual site ratings, with the associated concern regarding such operations with ordinal-level data. Such a possibility is essential for corporate performance reporting which generally relies on aggregating information across an organisation or across multiple sites to provide a single measure of performance.

Discussion and Conclusions

An ‘ideal’ approach to performance reporting would evaluate the design, management systems and processes, and delivery components of natural area management as detailed in Hockings et al.’s (2000) hypothetical framework. None of the current performance reporting approaches covers all three components, although EMS comes the closest (Table 3). And similarly, none of the visitor impact frameworks covers all three. The component most neglected is management processes and systems.

The visitor impact management frameworks do, however, provide very robust means of reporting on threats to and the condition of an area (i.e. the design component) and management outputs and outcomes (i.e. delivery). They can, therefore, make an important contribution to all three forms of performance reporting, especially where there is an emphasis on design and delivery reporting, such as in SOP reporting.

The strengths of these frameworks lie in their inclusion of objectives, integral reliance on indicators, and their applicability across a range of spatial scales and settings (Table 7). The last two features are particularly important given the need in performance reporting to cover not only a single setting or a single area but being able to report across a range of settings and often across a range of geographic areas. For example, if a state or national agency is reporting on its performance across its system of protected areas it needs to be able to report across settings and possibly across disparate geographic areas.

Two concerns need to be allayed to maximise the usefulness of these frameworks in today’s reporting environment. First, the scope of the visitor impact management frameworks must be broadened to include management processes and systems (the second component of Hockings et al.’s (2000) framework). Such a modification will necessitate developing and including indicators for inputs, such as staff and funds, and for processes, such as programme management and associated controls. Such indicators have been developed as part of EMS activities (Todd & Williams, 1996) and could be sourced from that work.

Second, and less important, the visitor impact management frameworks must be made as easy as possible to use and understand. Part of this problem can be resolved by removing vague language and confusing acronyms (Newsome et al., 2002; Nilsen & Tayler, 1997). Adopting the current performance reporting language would also help. For example, making it explicit that a framework is
reporting on the condition of the environment makes it immediately relevant to SOP reporting.

The resource and social indicators, either as part of visitor impact management frameworks or independently, also have a great deal to offer. Similarly to the frameworks of which they are often an integral part, they can be used to report on the condition of the environment, outputs and outcomes. For corporate reporting, these indicators enable reporting on outputs and outcomes. In SOP reporting, they can be used to report on the current condition of natural areas as well as responses to management. As a component of EMS, they can be used to measure the achievement of objectives and associated targets.

The ability of resource and social indicators to capture and report on the effectiveness of management actions is a crucial feature. This is a great strength of these indicators (Table 8). As many managers struggle to find meaningful indicators, the suite of resource and social indicators provide a comprehensive array from which to choose. Another strength is being able to aggregate data for these indicators from a number of sites and then ‘roll them up’ to report across an agency on environmental performance in relation to managing natural area tourism.

A key question is: Is it ‘better’ to consider and use these indicators within or outside the visitor impact management frameworks of which they are so often part? Several advantages of their being embedded in a framework exist. Most of the frameworks rely on management-by-objectives, a key feature of performance reporting. Thus, the frameworks directly translate into today’s approaches to performance reporting. Also, all of the frameworks detail how monitoring should focus on indicators and that action should be taken if indicators show unwanted changes are occurring. Such frameworks provide clarity on how reporting must relate to management actions. However, there may be cases where the framework approach is not needed and in these circumstances, resource and social indicators can be valuably applied independent of the performance reporting approach taken.

The contributions of resource and social indicators to performance reporting could be enhanced by making them more meaningful to stakeholders, such as senior managers, politicians and visitors. Using positive rather than negative language to report on conditions is likely to make the results more palatable. For example, indicators such as ‘vegetation cover’ have a much more positive ring than ‘damage to trees’.

Two other challenges remain in relation to resource and social indicators. The first is trying to get meaningful, simple indicators of visitor experience. Research continues in this area (Manning & Lime, 2000). Part of the solution is not to accept the vagueness of customer satisfaction as a surrogate for experience. It seems preferable to continue using encounters and numbers camping within sight and sound. Current qualitative research with visitors in situ in natural areas to try and better understand the crucial elements of experience is promising (D. Cole; T. Hall, pers. comm., 2002).

The second concern relates to the selection of indicators. Indicators of resource and social conditions exist that are related to level of use, rapidly reflect changes in use and can be easily and inexpensively measured (Table 8); but these criteria
need to be kept in mind when selecting them. Not all available indicators meet these criteria.

A final consideration is integrating resource and social indicators to provide an index of condition that includes both. There has been extensive research on composite ratings and indices for resource indicators, but little work on a social one and none on integration. Integration of resource and social indicators (Leung et al., 2002) is currently the focus of significant research attention in wilderness and backcountry management. The next step and particularly useful for performance reporting is an integrated site index. Any such development must be cognisant of the issues associated with using ordinal-level data to construct indices and the preferability for using ratio-level data.

Clearly, visitor impact management frameworks and their indicators have a great deal to offer today’s environmental performance reporting. As protected area managers move towards SOP reporting and they and the tourism industry consider implementing EMS, the benefits of these frameworks and indicators to these enterprises will become increasingly apparent. To enhance their adoption and usefulness, the issues raised above need to continue receiving research attention. Additionally, those familiar with these frameworks and their indicators can assist their adoption for performance reporting by working proactively with management agencies and government to help them realise the wealth of experience and benefits offered to natural area tourism management by these frameworks.

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References


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