Parks & Culture: Visitor Monitoring and Research

Sustainable Tourism Online is an EarthCheck initiative.

Sustainable Tourism Online (STO) is a comprehensive online information resource delivering substantial research, data and tools within three main sustainability themes – Destinations & Communities, Business Operations, and Parks & Culture. STO also offers relevant information and knowledge on broader sustainability tourism topics.

Developed by Australia's Sustainable Tourism Cooperative Research Centre (STCRC) in 2010 to support sustainable policy, planning and practice, STO provides access to tourism research and tools developed by STCRC as well as other trusted sources of information.

Visitor monitoring and associated performance reporting have emerged as a response to a strong trend in public accountability, whereby objectives for management are developed and the progress of agencies in achieving these objectives is documented and reported. Monitoring, and the accompanying use of indicators, assesses the extent to which these objectives have been achieved. Reporting is increasingly being directed towards achieving **sustainability** and its triple bottom line of environmental, social and economic outcomes.

Monitoring is the systematic gathering and analysis of data over time. For protected area tourism and recreation this involves developing monitoring programs that can collect data on both the natural environment and its visitors. Monitoring should occur at three levels; site, park and corporate. Monitoring is important for the following reasons (see Natural Area Tourism):

- **Managing the natural** environment – it provides information needed to mitigate impacts and assess management effectiveness;
- **Planning** – it provides information needed for management planning, recreation and tourism planning frameworks and site design activities;
- **Resource allocation** – it provides managers with a systematic basis for allocating funds and resources;
- **Public accountability** – it provides information to the corporate levels of park agencies to assist with accountability and transparency;
- **Marketing and interpretation** – it provides information needed to successfully market and interpret natural areas; and
- **Legislative and legal requirements** – it may be a legal requirement in some jurisdictions.

Monitoring of local communities and beyond is also critical to gauge the level of engagement with and support for protected areas.

Management effectiveness evaluation provides a means by which managers can evaluate their performance in achieving sustainable visitor use. "Management effectiveness evaluation measures the degree to which a protected area is protecting its values and achieving its goals and objectives" (see Managing Protected Areas). Such evaluation is dependent on monitoring to generate the information needed to assess performance. The management effectiveness framework developed for the IUCN-WCPA in 2000 and recently revised enables managers to report on a park's context, planning, inputs, processes, outputs and outcomes (see Evaluating Effectiveness and Management Effectiveness Evaluation in Protected Areas). An adaptive approach to management is the ultimate goal. The IUCN-WCPA framework has been comprehensively applied in NSW, and to a lesser extent in other states and territories of Australia.

AN INTEGRATED FRAMEWORK FOR DEVELOPING ECOLOGICAL INDICATORS OF VISITOR USE OF PROTECTED AREAS
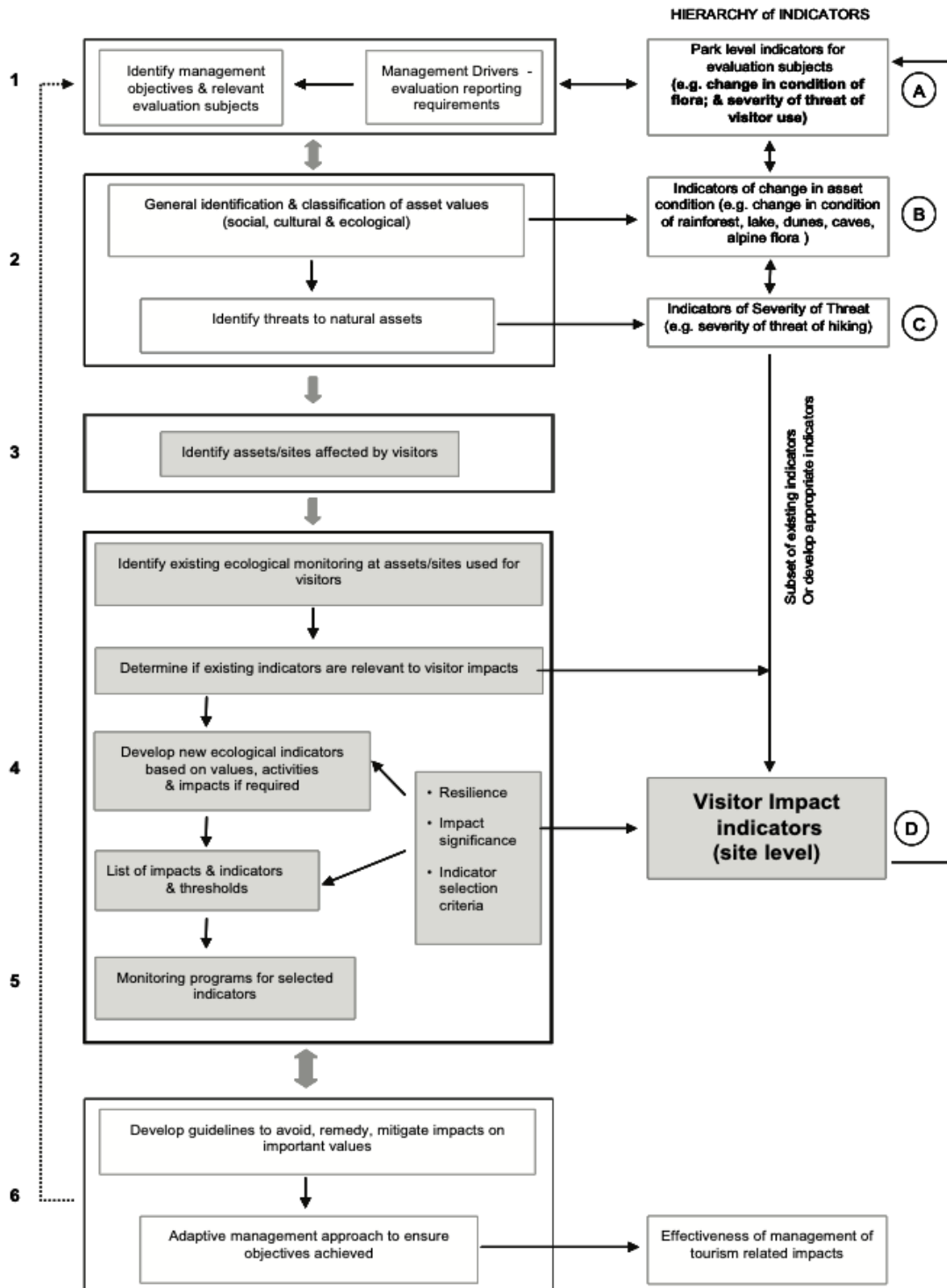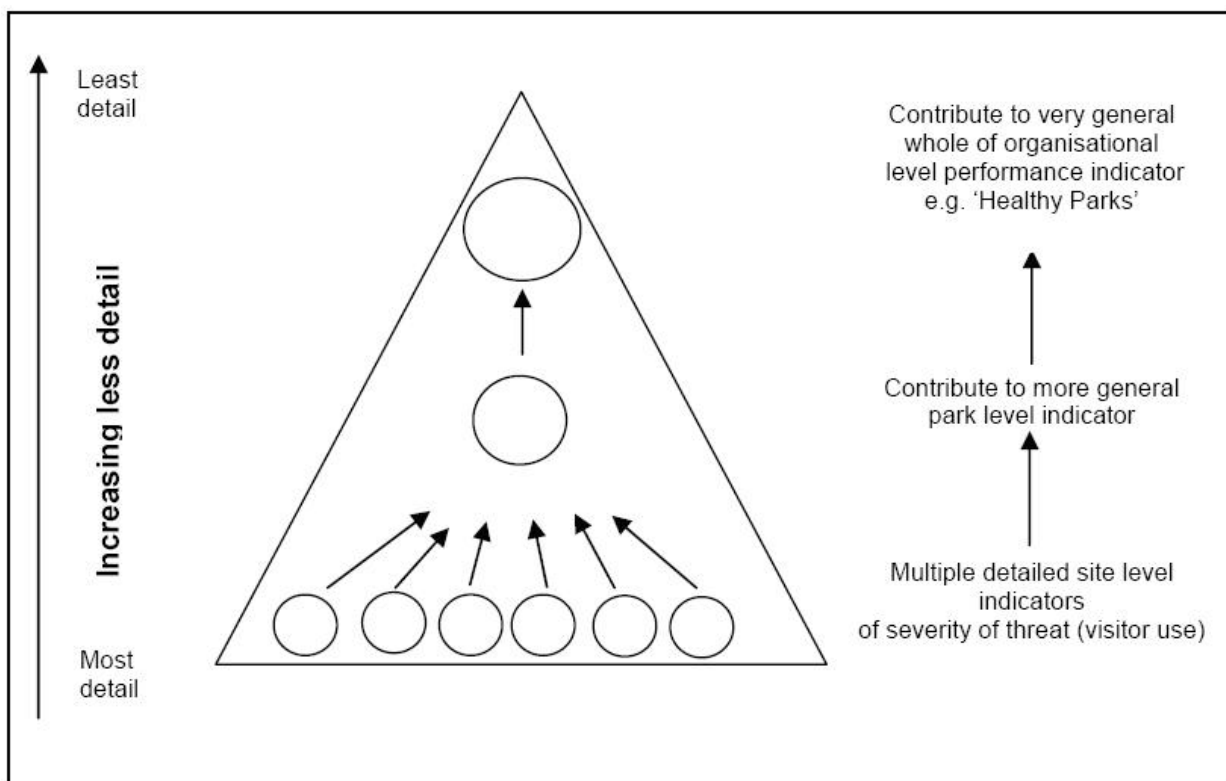

Figure 6 Integrated framework for developing ecological indicators of visitor impacts in protected areas

Source: Castley, et al., 2008 An Integrated Framework for Developing Ecological Indicators of Visitor Use of Protected Areas, Sustainable Tourism Cooperative Research Centre

Assessment of visitor use is only one component of the IUCN-WCPA evaluation framework, which is concerned with all aspects of park management (e.g. biodiversity conservation, pest and weed control, fire management). Research by the STCRC in Australia supports the value of the IUCN-WCPA framework, with this research emphasising the importance of a **framework that integrates monitoring and evaluation** into the cycle of management. Also important is generating feedback that enables managers to learn from and progressively improve management. The effectiveness of overall management evaluation, however, is limited by:

- lack of corporate coordination, direction and strategic planning in developing monitoring programs;
- inconsistent data records and reporting formats;
- inadequate, inefficient data collection, storage and management systems;
- low priority afforded by protected area agencies to performance evaluation and reporting; and
- lack of consistency in purpose and design of visitor surveys.

Source: Castley, et al., 2008 An Integrated Framework for Developing Ecological Indicators of Visitor Use of Protected Areas, Sustainable Tourism Cooperative Research Centre

The effectiveness of monitoring and then managing visitor use in protected areas has also been analysed by the STCRC with the following issues identified:

- lack of baseline data for priority visitor threats and pressures;
- lack of knowledge of walker impacts;
- lack of research into the long term impacts of plant diseases such as dieback (from Phytophthora sp.)
- inadequate understanding of visitor impacts and visitor management; and
- inadequate methodology for monitoring subtle changes in high quality wilderness areas.

Recent research by the STCRC has also focused on developing an integrated framework delivering a range of indicators appropriate at a variety of park management levels. This integrated framework focuses on the ecological impacts of visitors. It does not address the visitor experience or consequences for local communities. Key findings include:

- Visitor monitoring should be **integrated into a general framework for evaluating the effectiveness of park management**;
- When using an integrated framework it will be possible to prioritise sites for visitor monitoring and identify appropriate indicators for use in protected areas;
- Four groups of indicators have been identified as necessary for measuring the ecological impacts resulting from visitor use: (1) vegetation e.g., changes to vegetation composition and community structure; (2) soil e.g., soil compaction, track duplication, area of bare ground; (3) wildlife e.g., displacement of wildlife and behavioural changes; and (4) species diversity e.g., changes in biodiversity indices and numbers of invasive species;
- There is a clear need for more research in different ecosystems to identify/quantify/understand the range and intensity of visitor impacts both direct and indirect; and
- Monitoring programs need to be localised to detect visitor use impacts.

There are six steps to the application of this ecologically-focused integrated framework: (1) **identifying management objectives** and relevant evaluation subjects, (2) classifying natural assets and threats to those assets, (3) prioritising sites for visitor monitoring, (4) selecting **ecological indicators of visitor impacts**, (5) **developing monitoring programs** for indicators and (6) using results to improve future management (**adaptive management**).

Recent visitor monitoring research in Australia supported by the STCRC has focused on three broad areas:

- **Ecological** – mainly concerned with physical site alteration, removal and redistribution of materials, disturbance to plants and animals, harvesting of plants and animals and pollution of water via human waste;
- **Social** (visitors and local communities) – mainly concerned with visitor experiences, such as crowding, satisfaction, over-use, safety, impacts on local communities and indigenous heritage; and
- **Economics** – mainly concerned with the sources and levels of visitor revenue generated, the costs of providing services and facilities in parks and the economic impacts of parks on regional economies.

1. A GUIDE TO DEVELOPING AN INTEGRATED MONITORING PROGRAM FOR VISITOR MANAGEMENT IN PROTECTED AREAS

Developing a monitoring program for visitor management in protected areas can be a daunting task. The widely adopted IUCN-WCPA framework for evaluating management effectiveness provides a useful, practical starting point. The framework has six main parts: context, planning, inputs, processes, outputs and outcomes. Managers are asked to monitor each of these parts to get a complete picture of where they are being effective and where more work is needed (see Evaluating Effectiveness).
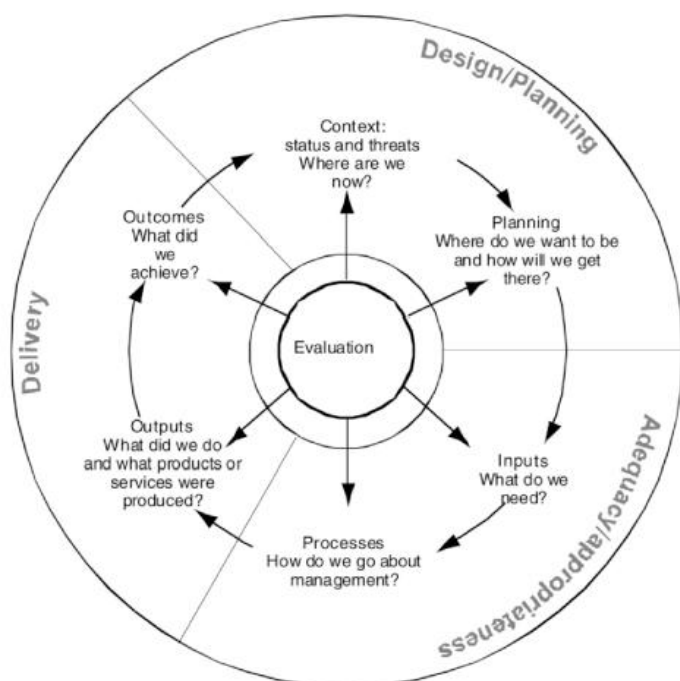
Source: Hockings, M., Stolton, S. & Dudley, N. (2004) Management effectiveness: assessing management of protected areas? Journal of Environmental Policy & Planning, 6(2), pp. 157–174.

Many monitoring programs focus only on outputs and outcomes. This management cycle approach (as shown above) emphasises the importance of looking at all stages of management as all are likely to influence the delivery of desired outcomes and hence achievement of an agency's management objectives.

IUCN-WCPA Management Effectiveness Evaluation Framework (see Evaluating Effectiveness)

Development of this IUCN-WCPA framework was based on a worldwide review of evaluation systems already in use for protected areas, combined with an extensive consultation process. It provides a system and associated indicators for evaluating management effectiveness, building on the management cycle approach. In order to develop an effective monitoring system monitoring needs to occur for each of the six components.

This framework involves monitoring and evaluating components of the **evaluation elements** below:

- Context – not an analysis of management, but provides information that helps put management decisions into context, e.g. values, threats, opportunities, political environment;
- Planning – evaluation of appropriateness of policies, plans and design;
- Inputs – evaluation of adequacy of resources (staff, funds, facilities) employed for management
- In the context of visitor use, this relates to inputs targeted at visitor management and servicing;
- Processes – evaluates adequacy and appropriate of management systems relative to management objectives;
- Outputs – evaluates products or services provided as a result of management, e.g. number of patrols run, restoration activities achieved – whether these have been delivered as planned and to some extent the quantities delivered; and
- Outcomes – evaluates whether objectives have been achieved.

From a synthesis of STCRC research the following steps guide the development of an integrated monitoring program for visitor management in protected areas.

STEP 1. SELECTION AND APPLICATION OF AN EVALUATION FRAMEWORK

STCRC research recommends the IUCN-WCPA management effectiveness evaluation framework. The framework elements and evaluation subjects for visitor management given in the table below provide detailed guidance at the park level. They are derived from and closely related to the elements and subjects widely used and applied through the IUCN-WCPA framework (see Evaluating Effectiveness). A similar table (see below) is available for the agency (corporate) level. The elements in these tables are also consistent with ecological monitoring allowing integration of results.

The approach relies heavily on the adoption of a values-based approach. Using key values to drive management has advantages. A reliance on values rather than threats is less time-bound and gives a more holistic perspective. Also, values have much greater political currency than threats as they let politicians and other key stakeholders know what is important and should be protected. Selecting key values also enables managers to monitor and manage what is important.

	Visitor related 'evaluation subject'	Definition/ scope of visitor related evaluation subject
Context		
Values and significance	Values	Identification of key visitor/tourism related values, including recreation opportunities
	Priority	Priority rating or category with regard to visitor-related importance
Threats/issues/pressures	Threat identification	Identification of key visitor-related threats
	Threat rating	Rating of visitor-related threat or impact level (may be existing and/or potential)
	Threat trend	Trend in visitor-related threats
Stakeholder attitudes and relations	Visitor attitudes	Visitor or tourism industry attitudes, visitor reasons for visiting parks, relationship between visitors/ tourism industry and parks – collected as context for planning
	Community attitudes	Community perceptions/attitudes regarding visitation to parks
Influence of external environment	External constraints	Availability of alternative recreational opportunities in region, marketing pressures etc
Planning		
System design	Legal	Adequacy of legislation in relation visitor and commercial tourism management
Management planning	Design	Appropriateness of design in relation to visitor needs
	Management planning	How well management planning addresses visitor issues

	Visitor related 'evaluation subject'	Definition/ scope of visitor related evaluation subject
Inputs		
Staff	Staff numbers/time	Adequacy of staff allocation for tourism, visitor management, interpretation (including time allocated by staff; i.e. staff hours)
Funding	Funding	Adequacy of funding allocation for tourism, visitor management, interpretation
Funding security	Funding security	Security of visitor-related funding allocation
Equipment and facilities	Infrastructure	Adequacy of visitor, tourism and interpretation infrastructure, equipment and facilities
Information	Information	Adequacy of visitor-related information, including monitoring programs (including of impacts etc.) and their utilisation for adaptive management
Process		
Capacity		
Governance, high-level management and leadership	Administration	Effectiveness of administration of visitor management and tour operator permit systems
Building and maintenance of infrastructure, facilities and equipment	Facility maintenance	Adequacy of maintenance of visitor facilities
Human resource management	Staff training	Adequacy of staff training in interpretation, visitor management, tour operator management
	Staff skills	Adequacy of skill level in interpretation, visitor management, tour operator management

	Visitor related 'evaluation subject'	Definition/ scope of visitor related evaluation subject
Relating to people	Law enforcement adequacy	Adequacy of law enforcement in relation to visitors and tour operators
Law enforcement	Law enforcement issues	Identification of visitor/ tour operator related law enforcement issue(s)
Community involvement and relationships	Relationship appropriateness	Appropriateness of relationships with visitors or tour operators
Communication, education and interpretation	Relationship description	Descriptive field for above programs
	Interpretation	Adequacy or appropriateness of interpretation program(s)
Community development assistance	Communication	Adequacy of communication with visitors and tourism operators
Sustainable resource use – management and audit	Tourism/visitor involvement	Adequacy of involvement of tourism industry/ park visitors (not community in general) in planning and management
Visitor management	Recreation opportunities	Descriptive field for types of visitor opportunities/ character of facilities and services
	Visitor services	Adequacy of visitor services in general or other than interpretation and communication
	Impact management	Adequacy of management of visitor impacts
	Visitor fee management	Adequacy of systems for collecting entrance fees etc.
	Tourism management	Adequacy of systems for managing tour operators e.g. permitting, marketing etc.
Managing the resource		
Research and values monitoring	Impact monitoring	Adequacy of monitoring of visitor

	threats/ impacts

	Visitor related 'evaluation subject'	Definition/ scope of visitor related evaluation subject
Outputs		
Achieving work program	Work program achieved	Achievement of work program relating to visitors/ tourism
Results/outputs	Services provided	Provision of specified visitor-related services (e.g. interpretation services).
	Visitor use	Visitor numbers, seasonal/spatial distribution
	Visitor characteristics	Visitor demographics and other characteristics e.g. income (excludes attitudes).
	Operator use	Tourism operator numbers, distribution, characteristics
	Revenue	$ from visitor-related fees
Outcomes		
Achieve objectives	Achieving visitor objectives	Achievement of visitor use/ management objectives in general (not specific to any of next 6 rows)
	Visitor satisfaction	Extent of visitor satisfaction/ meeting of expectations etc. (even if no explicit objectives in this document)
	Visitor safety	Visitor safety/ incident levels (even if no explicit objectives in this document)
	Visitor access	Extent to which appropriate/ equitable access to park by visitors/ tourism industry is provided (even if no explicit objectives in this document)

	Visitor related 'evaluation subject'	Definition/ scope of visitor related evaluation subject
Achieve objectives	Visitor cognitive outcomes	Attitudes/perceptions of visitors to park/conservation/natural or cultural values or new knowledge gained in response to visiting park/ interpretation programs
	Visitor compliance	Extent to which visitors comply with rules (esp. re impact management)
State of park	Presentation values trend	Trend – are the presentation/ recreational values improving or decreasing in quality?
	Presentation values condition	Extent to which the recreational values have been maintained
	Conservation values condition	Extent to which conservation values impacted by visitors have been maintained
	Economic impacts	Economic impacts of park-related visitation on community
	Social impacts	Social impacts (attitudes, perceptions, objective measures) of park-related visitation on community, including health

Source: Higginbottom et al., (2010). Current Practices in Monitoring and Reporting on Sustainability of Visitor Use of Protected Areas, STCRC.

STEP 2. DEVELOP INDICATORS FOR RELEVANT EVALUATION SUBJECTS

The STCRC has a number of research reports providing guidelines to help identify indicators for evaluating the effectiveness of visitor management in protected areas. These reports also explain how to collect, store, analyse and then use (in management) the information obtained from these indicators. Details follow.

Visitors

Community

Economic

Ecological

Ecological – Aquatic

STEP 3. SET PRIORITIES FOR MONITORING

Protected areas are managed in a resource-poor environment. As such, setting priorities for what will and won't be monitored (and then managed in response to the findings from monitoring) is critical because there are never enough resources to do everything. First, monitoring should only be undertaken if it will improve protected area management. Second, the choice of what to monitor must be based on priority setting. Priorities are influenced by how monitoring can contribute to protected area management. Contributions are usually to one or more of the following (from [Evaluating Effectiveness](#)):

1. Better management under changing circumstances;
2. Effective resource allocation;
3. Accountability and transparency; and
4. Involving the community and promoting protected areas.

Priorities must also be based on:

1. Whether the benefits of monitoring (e.g. to biodiversity, visitors, communities) and follow-up management exceed the costs; and
2. The likelihood of:
   ○ Monitoring being able to measure what matters.
   ○ Management actions subsequent to monitoring being undertaken.
   ○ Management actions subsequent to monitoring being successful in moving a protected area towards desired outcomes.

Such priority setting has received rapidly increasing attention in conservation management, where an analysis of the values at risk, biodiversity/community/visitor benefit, probability of success and cost is being used to guide resource allocation decisions. The term 'triage' (taken from emergency medicine) has been proposed to describe this process of prioritising the allocation of limited resources to maximise the benefits to conservation.

Elements of risk management are also evident in these priority setting processes, with the consequences of action (or inaction) and the likelihood of success (or otherwise) being used to decide where they allocate scarce resources. There are two tiers in considering the 'risk' associated with monitoring visitor management: the risks associated with monitoring itself and those associated with follow-up management. The 'consequences x likelihood' analysis needs to be applied to both.

Step 4. Implementing the monitoring program

Some tips for implementing a monitoring program:

Conduct of monitoring and evaluation

- Get baseline information as early as possible;
- Use pilot studies when developing new monitoring systems to ensure the system is suitable before instituting on a wide scale;
- Build flexibility into systems for collecting and storing data for monitoring and evaluation;
- Provide adequate training and support for on ground staff who will conduct monitoring;
- Repeat monitoring and evaluation at regular time intervals, with appropriate interval depending on what is being evaluated; and
- Agency staff conduct monitoring and evaluation, with review by external facilitators every 3 to 5 years.

The following tips relate to data collection and storage and their application in management:

Data collection

- Explore simple, innovative data collection techniques;
- Use an adequate, representative sample;
- Undertake systematic, regular collection of visitor data;
- Ensure data collected have spatial and temporal elements where possible;
- Use limited resources wisely;
- Use existing and secondary data;
- Regularly calibrate counters; and
- Aim for quality not quantity of data.

Data storage

- Verify data to ensure they are error-free before storage and use;
- Geo-reference data so they can be used in spatial databases and associated applications;
- Design and maintain databases that are user-friendly;
- Guarantee the confidentiality of data;
- Display and provide data outputs in ways that readily inform decision-making; and
- Transfer data efficiently and accurately to storage databases.

Data application in management

- Use the available visitor data for numerous applications;
- Collect data to enhance understanding of visitor perceptions, motivations and values; and
- Establish and maintain strong links between data collection and application

STEP 5. ADAPTIVE MANAGEMENT

Monitoring is the 'check' part of the adaptive management cycle (see the figure below). Adaptive management relies on collecting information (monitoring) to determine what has been achieved (outputs) and how this has contributed to desired outcomes (e.g. values protection).
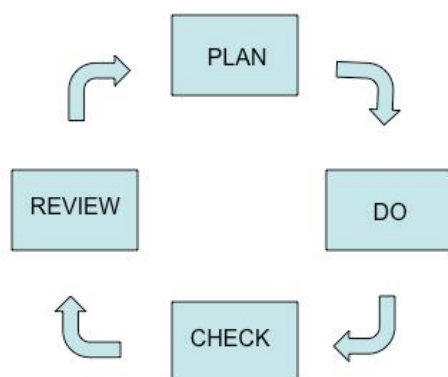
Source: Susan A. Moore and Kate Rodger (2009) Recommendations: Reforming management planning for national parks, conservation parks and nature reserves in Western Australia – 2010 and onwards. Report prepared for the Conservation Commission of Western Australia, by Murdoch University.

2. ECOLOGICAL

The main focus of this research has been **developing indicators** for ecological communities including their condition, structure and function and perceptions of naturalness i.e., the extent of human modification to the environment. The ecologically focused integrated framework (and drawing on the IUCN-WCPA framework described previously) has also been a central part of this research.

Specific research has focused on developing indicators for aquatic systems in protected areas. This research assesses the range of activities generally undertaken in and around aquatic sites and the potential indicators that may assist in detecting the effects of these activities. A suite of indicators is potentially useful for monitoring and assessing visitor impacts in and around aquatic ecosystems within protected areas:

- Potential ecological indicators include filamentous algae counts, coliform counts, benthic metabolism, presence of exotic species, pins for measuring erosion, nutrient concentrations, turbidity; and
- Potential social indicators include human waste, track widening, visitor noise, campsite capacity and management, visitor numbers, litter, modification of substrate and water flow.

The selection of indicators to assess visitor impacts in aquatic ecosystems is a complex and challenging task for managers of all natural areas with heavily visited aquatic ecosystems. Traditional water quality indicators may not be appropriate in the assessment of visitor impacts due to their spatial and temporal extent and anticipated lack of response to visitor activities and disturbances. On the basis of research by the STCRC it is recommended that protected area managers follow a six-step process to develop and implement monitoring programs assessing visitor impacts in and around aquatic ecosystems.

1. Assess visitor activities and perceptions.
2. Assess the physical and chemical and biological characteristics of sites.
3. Propose indicators for use in a monitoring program using the approach detailed by Hadwen et al. (2008) and in relation to the findings of 1) and 2) above.
4. With the assistance of aquatic ecologists, design indicator performance trials.

5. On the basis of indicator trials, select a suite of appropriate indicators for the specific site and visitor activities and design a spatially and temporally defendable monitoring program around these indicators.
6. Examine spatial and temporal trends in all indicators (social and environmental indicators) to examine the spatial extent and temporal persistence of visitor-mediated changes.

Other specific research has focused on **Australia's World Heritage Areas** developing a framework, guidelines and tools to enhance the reporting and evaluation of visitor use. Key findings and conclusions include:

- Recreation and tourism are recognised as appropriate uses of World Heritage Areas, with many of Australia's World Heritage Areas having very high levels of visitation;
- World Heritage Areas are generally better resourced than for other protected areas and therefore how these agencies research, assess and evaluate the pressures and threats associated with visitor management should represent Australian best practice;
- While park agencies recognise the need to implement monitoring programs, systems and approached vary between agencies; and
- Only a few park agencies have formal systems in place to implement adaptive management.

3. SOCIAL (LOCAL COMMUNITIES) AND ECONOMIC

Recent research by the STCRC recommends the following for measuring the socio-economic changes in local communities where protected areas are a dominant social and economic force:

- Robust and regular visitor surveys, including different market segments;
- Collection of expenditure details from visitors as part of visitor surveys (link to rapid assessment toolkit);
- Initiating effective interagency collaboration and establishing closer community partnerships in planning and management;
- A coordinated and systematic approach to data collection across regions including park agency financial (revenue and expenditure) data and visitor centre accommodation and tour bookings;
- Periodic residential surveys regarding park use, perceptions and attitudes of park management and visitors, and

- Tourism satellite accounts at the regional level.

Other research by the STCRC has focused on identifying a set of social indicators for tourism communities and to advance techniques in the field of social impact assessment. STCRC research has produced an instrument for assessing and tracking a host community's perceptions of the impact of tourism on their quality of life.

Economic research by the STCRC in Australia has determined the economic and social values of parks and natural areas by assessing direct economic expenditure and developing practical and cost efficient methods of data collection including rapid assessment toolkits.

4. SOCIAL – VISITORS

Visitor monitoring is vital for effective protected area management and requires the **systematic gathering, analysis and integration into management systems of data** relating to both the natural environment and visitors over time. Park monitoring has historically focussed on the physical and biological aspects of the environment, with the systematic collection of visitor data being generally overlooked, and managers relying on ad hoc approaches. To address this shortcoming the STCRC, in partnership with Australia's protected area agencies and tourism organisations, has undertaken a range of research on visitor monitoring.

Research into visitor use of protected areas initially focused on:

- exploring key elements affecting the quality of visitor experiences in national parks and other protected areas in Australia;
- examining levels and patterns of visitation to Australian national parks and other protected areas, as well as tourism industry involvement in these areas through commercial tour operations and facility provision; and
- identifying the main reasons why tourists visit national parks and other protected areas and factors that affect the quality of experiences sought.

A key finding was the lack of good quality time series data in all jurisdictions, making it difficult to discern any clear trends and patterns in visitation levels. Subsequent research has focused on improving the collection, storage and application of visitor data for the planning and management of protected areas. A set of simple guiding principles for visitor monitoring are providing covering overall system design, data collection, data storage and data application.

The most recent research has focused on developing a systematic, nationally consistent approach to collecting and managing visitor data across Australian protected areas jurisdictions

to inform protected area management, planning and decision-making processes. The information collected is most relevant to the park level of management, but is also of central interest for corporate reporting.

There are three important areas of focus for visitor information

- The types of data collected;
- The use of data;
- The storage and management of data.

Data that should be collected by protected area agencies fall into two broad categories: **core** and **supplementary**.

A recommended survey instrument (questionnaire) has been developed (which can accommodate both core and supplementary data collection) for the collection of information on visitor use of protected areas. Key recommendations for visitor surveys include:

- Keep questionnaires short and limited to information required for management decisions;
- Continue including questions in visitor surveys about the importance of and satisfaction with key services and facilities;
- Always ask about overall satisfaction (used for corporate performance reporting) in surveys;
- Choose a sampling approach that provides the best possible data for decision making; and
- Provide training for staff administering surveys and where possible rely on direct contact for questionnaire distribution and return.

This survey instrument readily lends itself to software-based approaches to data collection, aggregation, dissemination and reporting of park-based activity across Australian protected area agencies.

In addition to this strategic research, a number of site-specific studies at key Australian nature-based tourism destinations have been undertaken (see reports listed below). These focus on visitor use, satisfaction, visitor experience and visitor patterns. Survey destinations include: in NSW – Barrington Tops National Park, Mungo National Park, northern NSW national parks and Kosciuszko National Park; in Victoria – Brambuk-Grampians National Park and Aboriginal Cultural Centre, Melbourne and its Metropolitan parks, and Mt Buffalo National Park. Other related research has investigated the factors associated with visitor experience and track usage in national parks.