Parks Victoria's Management Effectiveness Evaluation Program: Where Science Meets Management

Tony Varcoe, Manager, Research and Management Effectiveness, Parks Victoria, Level 9, 535 Bourke St., Melbourne, Victoria, Australia 3000; tvarcoe@parks.vic.gov.au

Park managers around the world face a number of fundamental questions about the resources they are managing:

- How do we know if, and to what extent, our ecosystem and other park management objectives are being met?
- To what extent is the condition of our parks and visitor experiences changing and are these changes desirable or undesirable?
- How do we know whether our management actions are effective?
- How do we allocate resources to achieve the proposed management outcomes?

Different information users want to know the answers to different types of questions, including the following:

- Local or individual park managers want evaluation information that will assist them to improve their operational management decisions.
- Regional parks managers want evaluation information that can help influence how they allocate their resources to meet the best outcomes.
- Managers of parks networks want evaluation information that will provide strategic information about achievements, gaps and challenges.
- External stakeholders and Governments want evaluation information that will demonstrate whether the management of their parks are in capable hands.

What are our management goals?

Parks Victoria manages diverse landscapes for diverse objectives across 18% (4.1 million hectares) of the State of Victoria. These parks include 70 national, state and wilderness parks, 24 marine national parks and sanctuaries, various historic parks and reserves, 2,800 (mostly smaller) conservation reserves, 31 urban parks, as well as many indigenous cultural heritage places and post-settlement historic places. It also manages recreational use of major waterways, such as Port Phillip and Western Port around Melbourne.

With these diverse types of parks, Parks Victoria has very diverse management goals, including the following:

- Protection of representative examples of the most undisturbed terrestrial and marine ecosystems in the state.
- Conservation of diverse flora and fauna including the majority of states threatened species.
- Provision of essential ecosystem services to communities such as clean water.

- Protection of remnant vegetation both in rural and urban landscapes.
- Building understanding and support for healthy parks.
- Contribution to the states fire management program including wildfire, fire ecology and fire recovery.
- Developing and sustaining mutually beneficial relationships with traditional owners.
- Including protection and interpretation of significant cultural sites and places, employment and business opportunities and fostering connection to country.
- Provision of diversity, equity and quality in visitor experiences including recreational settings and facilities, education and interpretation and nature-based tourism.
- Provision of social and health benefits to communities.
- Contribution to the Victorian economy through nature based tourism and regional employment.
- Improvement of Melbourne's liveability through its urban parks system.

How can we evaluate our management effectiveness across all of these diverse goals?

In a national and international context, more systematic approaches to the evaluation of management effectiveness and reporting have grown significantly over the past decade with the dual aims of improving park management outcomes as well as being able to report these outcomes to the community.

Parks Victoria is implementing a comprehensive management effectiveness program which consists of four key components:

1. Application of the IUCN Management Effectiveness Evaluation Framework.
2. Implementation of a State of the Parks reporting program.
3. Building of the evidence base through scientifically robust monitoring programs (across natural values, visitor services, cultural values).
4. Application of evaluation findings through decision-support and planning tools for managers.

1. Application of IUCN Management Effectiveness Framework

The IUCN Management Effectiveness Framework has been adopted by a large number of countries and park agencies over the past decade (Hockings et al. 2006). The framework uses a systematic approach to evaluate management performance based on the adaptive management cycle. These include evaluation of park management "context," "planning," "inputs," "process," "outputs," and "outcomes". The evaluation tool uses a formalised qualitative survey of park staff, based on their knowledge (including knowledge of research and monitoring findings) and experience. While this qualitative information is very valuable for evaluation, it is not designed to replace robust monitoring programs. Indeed, the qualitative approach used in the IUCN framework can be highly complementary to science-based monitoring programs.

Parks Victoria has recently introduced its own Park Management Effectiveness Framework, based on the IUCN framework (Figure 1). The introduction of the framework is

becoming an extremely valuable management tool, not only to enable systematic evaluation of management effectiveness across the parks network, but also to clarify, refine and integrate all of the key components of effective park management, such as planning, project management, and knowledge. It has clarified and improved the important links between park management objectives and performance indicators at different scales, as well as highlighting organizational strengths and gaps which have generated new directions for Parks Victoria's management. An advantage of this evaluation tool is that it can

Figure 1. Parks Victoria's Management Effectiveness Framework.

be applied at a range of scales, from individual park to the whole parks network, to assist park managers.

2. State of the Parks (SoP) reporting

Parks Victoria produced its first State of the Parks report in 2000 which was the first in Australia and one of the first reports of its type in the world. The second SoP report was released in 2007. The SoP has four objectives:

- Contribute to a better understanding of park values, their condition and threats that impact on them.
- Summarise findings of the evaluation of management in delivering long-term objectives.
- Inform planning and decision-making (corporate to park level).
- Improve communication of park management to the public.

The target audiences for the SoP report have included both Parks Victoria managers (including Senior Executive and the Board) as well as the broader community (including government). Beyond the public report, which has focused on the whole parks network, the information collected through the SoP program is intended to provide valuable information for park managers about the local and regional effectiveness of their programs so that they can adapt their management programs accordingly.

The SoP program summarizes the previous five years in relation to the major activities, achievements, and management outcomes across each of Parks Victoria's output areas (including natural values, cultural values, and visitor services). It provides the following:

- Medium to long-term management objectives for each output.
- A framework of indicators and measures for each output.
- A summary of the current status, condition, and trends of and park values and assets, and on-going and emerging risks and threats.
- A summary of the major actions to achieve the objectives.

- A summary of the major information gaps, management challenges, and proposed responses.
- An assessment of outcomes weighted against management objectives.

The SoP program uses a combination of quantitative and qualitative data, including the following:

- Corporate and state-wide databases and datasets (e.g., Environmental Information System, Asset Management System).
- Commissioned reports such as risk assessments and asset condition reports.
- Monitoring programs (e.g., asset condition assessments, visitor satisfaction surveys, natural values monitoring data).
- A comprehensive staff questionnaire.

Over time it is expected that the reporting of management outcomes (particularly ecosystem condition) will be based on an increased proportion of quantitative data, based on more robust monitoring programs. Nevertheless Parks Victoria considers that the use of both quantitative and systematic qualitative data is an appropriate way to evaluate management effectiveness across all of its diverse management objectives. Evaluation based predominantly on quantitative monitoring programs will only ever be sustainable and achievable across a sub-set of parks and issues.

The SoP program has helped build an improved awareness of the need for objective evaluation of management within Parks Victoria. Some of the benefits and outcomes of the program have included the following:

- Building in of formal "review-time."
- The *process* of evaluation improves staff knowledge about their priority objectives, values and threats.
- The establishment of a framework of indicators for effectiveness with links to parks network objectives.
- Strong influence on corporate and business plan priorities.
- The application of SoP information with other planning and resource allocation tools to inform park priorities and strategies.
- Facilitating the introduction of new Parks Victoria initiatives, such as improved monitoring and information management systems.

While there have been a range of benefits arising from the SoP program, there are also a number of lessons learned for the future, including the following:

- The need for improved alignment of SoP "products" to meet the needs and expectations of different users. For example network scale strategic reports may be appropriate for Government and Senior Executives, however local and regional park managers need

information at more meaningful management scales, in more accessible and useable formats.
- The need to rationalize the number and types of indicators for communication to managers and the community.
- Greater effort to improve interpretation and application of SoP data for park managers and decision-makers at all levels.
- The need to review evaluation and reporting cycles, with staff seeking evaluation to be built more into routine management cycles.
- Further development and roll-out of new integrated monitoring programs to provide a stronger evidence base.
- The need for faster feedback of results to park staff, and more automated and accessible information management systems (e.g. web-based staff questionnaire, standardized data queries and park profiles).

3. Building the evidence base through monitoring and research

To improve the value and rigor of Parks Victoria's management effectiveness evaluation program, Parks Victoria is involved in a number of initiatives to apply a more science-based approach to management and evaluation. These include improvements to ecological monitoring programs, implementation of adaptive experimental management programs and new approaches to visitor management using social science techniques.

Ecological monitoring program

A recent review of ecological monitoring programs across Parks in Victoria's estate found that although there has been much monitoring activity over the years, it has been very difficult to determine the condition and trends of natural values in many parks due to issues such as inconsistent methods, insufficient sampling, and unclear objectives (Parks Victoria 2007). These concerns are not unlike those that a number of other park agencies have faced around the world.

Parks Victoria is currently developing a new, more strategic approach to its ecological monitoring, the "Signs of Healthy Parks" (SoHP) program. This new program seeks to accomplish the following:

- Improve our management based on evidence and good science.
- Detect change and trends in park condition.
- Determine the effectiveness of actions so we can adjust our management.
- Provide early warning systems for impending threats.

The SoHP program uses Parks Victoria's natural values monitoring framework which is based on three scales of monitoring: activity, effectiveness, and environmental outcome (Figure 2). It includes three broad indicator groups: landscape context, disturbances and threatening processes, and ecosystem condition and environmental outcomes.

The SoHP program is currently being trailed in six pilot parks, with draft monitoring

plans developed. A range of "user-friendly" monitoring protocols and a monitoring guide have been developed and trialled to enable ranger staff to implement many of the programs.

Using social science to inform visitor use planning and management

Since the mid-1990s Parks Victoria has been undertaking scientifically sound monitoring of visitors and the

Figure 2. Parks Victoria's monitoring framework.

community. This includes monitoring of visit numbers, visitor experience and community perceptions of management. With more than a decade of robust visitor satisfaction monitoring data, that data has now been analyzed to produce a comprehensive picture of visitor preferences through market segmentation (Zanon, Shaw, and Hall 2008). Major segments defined include Nature Admirers, Urban Socials Trail Users, Passives and Other Users, Activity Centrics, Access Made Easy and Country Vacationer, each with their own characteristics. Further analyses have been conducted to identify individual sub-segments within each of the major segments. Subsequent analysis using Structural Equation Modeling provides evidence that the relationships between services and satisfaction are better understood when considering segments (Zanon, Shaw, and Hall 2008).

Parks Victoria has been using market segmentation of visitor use as a planning tool to feed into applications such as park management planning, tourism and marketing strategy, visitor risk management, and wild fire recovery plans.

Application of adaptive experimental management programs

Adaptive management decreases uncertainty in complex management systems, or decreases the risk of failure (or lack of sustainability) by making the uncertainty more explicit (Robley et al. 2008). In 2001 Parks Victoria initiated the Fox Adaptive Experimental Management (AEM) project in partnership with the Arthur Rylah Research Institute for Environmental Research (ARIER) to measure the costs and benefits of a range of fox control strategies, and more broadly examine the applicability of AEM for large-scale pest management programs. The five-year project has provided some important management lessons relating to techniques, costs, and sustainability of predator control programs including the following:

- Baiting across the landscape and throughout the year was effective in producing a sustained reduction in fox numbers.
- Seasonal or perimeter baiting does not result in a sustained reduction in fox numbers.
- Sustained effort is needed for sustained reduction in fox numbers.
- Lower costs do not necessarily equate to increased efficiency.
- Sustained management and monitoring effort are required to enable sufficient data to be collected to appropriate standards.
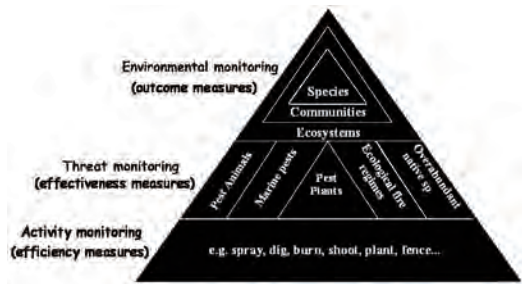
In another application of adaptive experimental management, this time for the invasive weed English broom (*Cytisus scoparius*), a scientific program has tested efficiency (costs/benefits) of different strategies, effectiveness in reducing broom cover and abundance, and response of native vegetation species (Allan et al. 2006). The AEM has informed the parks' weed management in Victoria's alpine area by providing new information on issues such as the effects of fire on English Broom reproduction and survival, timing of control programs, treatment frequency, effectiveness and impact of different herbicide treatments, environmental and other impacts of repeated, broadscale chemical control, and costs and resources required to achieve desired outcomes.

4. Applying evaluation findings for park managers—decision-support systems

Parks Victoria has developed the Levels of Protection (LoP) tool to aid planning and resource allocation by placing individual parks in a statewide and ecosystem context. LoP groups parks according to a number of biodiversity criteria, and allocates broad conservation objectives to each group.

Based on this biodiversity data, LoP establishes an index score for each park and a hierarchy of management response that is useful to park managers in defining the level of management effort to be applied in parks and reserves in each group, and for determining management and resourcing priorities. Six terrestrial (A1, A2, B, C, D, and E) and three marine (A, B, and C) LoP park groups have been defined. Each group has particular characteristics and broad conservation objectives, and an assigned standard for level of protection. The LoP tool has had a major influence on resource allocation across Parks Victoria parks network since its introduction. An equivalent system for visitor services standards, the Levels of Service, has also been developed which establishes broad objectives and standards at both the park and site scale.

Conclusion

Parks Victoria's management effectiveness program is designed to use the best available data, while recognising that park staff and expert opinion are valuable inputs into adaptive park management. A fundamental goal of the program is that park managers have access to meaningful, useful information to assist them in their many complex decisions.

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