Monitoring and management of bush camp grounds in an Australian national park

Kelly Hunt de Bie, The University of Melbourne, Australia, khun@unimelb.edu.au;
Peter Vesk, The University of Melbourne, Australia

The Australian state of Victoria has a large and varied protected area network covering 3.96 million hectares. In line with global trends, visitation to Victoria's parks has increased significantly over the past ten years, to 88.5 million visits in 2010. The planning and management of Victoria's parks aims to provide equitable access for a range of recreation and tourism activities, and to minimise the impact of these activities on natural and cultural values (Department of Natural Resource and Environment 2002). However, Victoria currently has no structured approach to management of visitor impacts in protected areas and very little monitoring of impacts is undertaken. The organisation responsible, Parks Victoria, has recently endeavoured to remedy this through the development of a coordinated state-wide approach for monitoring and managing recreation and visitor impacts.

Parks Victoria developed a framework for sustainable, adaptive management of the ecological impacts of tourism and recreation activities in the Parks Victoria Estate. The framework seeks to identify and prioritize sites and impacts, design monitoring plans, capture data and inform management actions. The framework was primarily derived from the Levels of Acceptable Change planning framework (Stankey et al. 1985), Visitor Research and Protection framework (Hoff and Lime 1997) and the Integrated Framework for Developing Ecological Indicators of Visitor Use in Protected Areas (Castley et al. 2009) and designed to utilise data already available for the Parks Victoria Estate.

The Grampians National Park was used as a case study for implementation of the visitor impact framework. The Grampians is one of the most highly visited parks in the state and is particularly popular as a camping destination. Campgrounds in the Grampians vary from small, wilderness, non serviced camps through to large, organised camping areas and commercial camping operations. The large number of bush campsites in the park was identified as unsustainable and has resulted in issues such as track proliferation and vegetation loss and damage. Bush campsites have generally been developed by the user with minimal planning strategies or environmental or cultural consideration involved in their placement, with sites mostly created prior to the creation of the national park in 1984. No monitoring of bush camps had been undertaken and the location of the camps was not recorded. Therefore, a census style approach with condition classes was employed to allow for a rapid and thorough inventory of all bush camp sites. Once sites were located, categorical data was recorded on the inventory and impact attributes listed in Table 1.

A total of 273 bush camps was located during the survey, with a relatively equal distribution between small (<25m^2), medium (<100m^2) and large (>100m^2) sites. The management decision in response to the monitoring data was to close and rehabilitate some sites. Sites were selected for closure if they were located in non-compliant management zones or had low site impact (non active sites, with high vegetation cover and small size). This was to be an adaptive management approach with a number of closure techniques employed and ongoing monitoring to determine compliance to closure and rehabilitation success.

Ongoing monitoring and management of retained sites was needed to assess camp site footprint and ensure impacts did not increase with the changes to site availability due to closures. In order to build an effective and functional monitoring regime, a structured decision making process was used. Structured decision making (SDM) is a decision framework that is increasing in popularity for natural resource management applications (Lyons et al. 2008). The process involves three basic steps 1) identifying objectives, 2) a set of potential actions from which to choose, 3) some expectation of the consequences of consequences related to each potential action, given the objectives. When determining suitable monitoring of visitor impacts, there is a long list of issues and questions that should be addressed (Cole 1989). SDM gives structured method for developing answers to these questions, on a site by site basis, given explicit problem statements and knowledge of the specifics of the system in question and management options available. It is particularly useful for this application as it allows for a realistic, site based assessment of management alternatives and defensible and transparent decisions. This process allows for identification of targeted monitoring methods that are tailored to inform management decisions.

For the Grampians National Parks example, the SDM approach identified the fundamental objectives as continuing to providing a bush camping experience within the park and ensuring that this experience was sustainable. The performance measures for ensuring a sustainable camping experience included minimising tree damage, informal trails, evidence of human waste and maintaining site size, signifying the need for a multiple indicator approach to monitoring. As information on the scale of any change in condition will be needed to trigger management action, and evidence of such change required to elicit ongoing funding support, quantitative measures are needed.

In this case, the application of a visitor impact framework was successful in identifying and prioritising sites and impacts and directing monitoring efforts. However, once the problems had been identified, a SDM approach proved to be an effective method for making site specific decisions about visitor management and identifying suitable monitoring methodologies. In places like Victoria where management decisions are often determined on a park by park basis, SDM may prove a valuable tool for visitor impact management.

Table 1. Parameters measured at bush camp sites in the Grampians NP.

Inventory parameters	Impact parameters
Forest Type	Footprint (m^2)
Forest Size	Ground cover impact (%)
Access method	Overall impact (determined
Soil type	by combination of footprint
Distance to water body	and ground cover)
User Group	Fire Scars
	Fire places

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