Integrating experience-based zoning into current management system in Yu Shan National Park

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Protected areas such as national parks are increasingly valued as an effective approach to protecting landscapes and biodiversity while providing outstanding recreational and educational opportunities (Hocking et al. 2006, Lockwood et al. 2007). However, growing demands of nature-based recreation and tourism can compromise the effectiveness of protected areas in accomplishing their conservation goals. Indicator-based management frameworks, such as Limits of Acceptable Change (LAC) and Visitor Experience and Resource Protection (VERP), are tools that were developed to address the visitor management challenge. These management frameworks emphasise the establishment of management objectives, indicators, standards, monitoring and appropriate management actions. Another commonality among them is that zones must be clearly defined for a protected area, and management objectives for each zone articulated in order to develop zone-specific indicators and standards (McCool et al. 2007).

Spatial zoning is a common strategy for protected area management (Walther 1986) and has been established for various administrative and managerial reasons. Zoning concepts have also been applied widely in visitor use management (McEwen et al. 1976, Leung & Marion 1999). Recreation Opportunity Spectrum is a well-known approach to zoning that focuses on the diversity of recreation experiences, the compatibility with other resource uses, matching of recreation demand with resource capabilities, and defining acceptable environmental, social and managerial conditions (Clark & Stankey 1979). In fact, previous implementations of LAC and VERP frameworks have relied primarily on ROS-based zoning (McCool et al. 2007). In US national parks and forests where most implementations took place, ROS-type zoning was developed as part of individual areas' management planning process (NPS 1997). As the frameworks are being applied to non-U.S. park systems, the zoning step in a framework application can become a major challenge as the existing zoning systems in other park systems do not necessarily follow the ROS system. An important question is whether and how the ROS-type zoning scheme can be integrated with existing park zoning system(s). We attempted to address this question in a current project which supports the first application of VERP in Taiwan's national parks. This paper discusses the process, challenges and preliminary results of applying ROS-type zoning in Yu Shan National Park where the project took place.

Yu Shan National Park is situated in central-south Taiwan. It contains high biodiversity with the tallest peak in East Asia, and it is also a popular tourist destination for domestic and foreign tourists. In 2007, the park started the process of adapting key elements of VERP framework to address many resource and social impact concerns in the park (Hsu et al. 2009a). An early but crucial step of the VERP process was to define zones with zone-specific management objectives relating to visitor experience and/or resource protection. However, Yu Shan had already enforced a land-use zoning system that had no direct link to visitor experience and resource impact issues. The five land-use zones under this system include ecological protection zone, historic preservation zone, special landscape zone, general control zone and recreation zone.

In order to define a zoning system that can inform subsequent steps in the VERP process and to resolve the problem with overlapping zoning systems, we conducted a number of workshops with

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experienced park managers and volunteers to introduce concepts of ROS and VERP. The workshop participants also brainstormed about management zoning in relation to resource conditions and visitor experiences. This effort resulted in a two-tier management zoning system (Hsu et al. 2009b). It was decided to keep the existing land-use zoning terminology as the first tier to maintain continuity and maximise support from the park staff. At the second tier, one or more ROS-based zones were assigned to each first-tier land-use zone. All of the second-tier zones were categorized using ROS terminology such as rural, semi-primitive non-motorized, semi-primitive motorized and primitive recreation opportunities (Clark & Stankey 1979). Zone boundaries, trails, management objectives, and desired environmental, social and managerial conditions were specified for each second-tier zone. This set of zoning procedures was pilot tested in three administrative districts of Yu Shan and is being expanded to other districts. The two-tier zoning system combining the existing management zoning and ROS-based zoning is expected to be adopted by the next Yu Shan Comprehensive Management Plan, which will pave the way for the remaining steps in the park's implementation of the VERP framework. Lessons learnt from this experience should inform those park systems which are contemplating application of an indicator-based management framework.

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