6.4 Arches National Park (USA): Indicators and Standards of Quality for Sustainable Tourism and Carrying Capacity

Image, Crowding, Visitor Perceptions, Visual Response, VERP, Ecotourism

This case shows a practical method to identify how visitors react to different types of landscapes, trails and levels of use in natural environments, providing managers with improved information to support tourism and destination management.

Carrying capacity is a perennial and challenging issue in the management of national parks. Parks and related areas are to be protected, yet are also to be made available for public use and appreciation. However, public use of parks can cause impacts to natural and cultural resources at levels as the quality of the visitor experience. How much and what types of use can be accommodated in parks before there are unacceptable impacts to park resources and the quality of the visitor experience (See also Carrying Capacity p. 309).

Research on carrying capacity suggests that it can be defined and managed through formulation of indicators and standards of quality of the visitor experience. Indicators of quality are measurable, manageable variables that define the quality of natural/cultural resources and the visitor experience. Standards of quality define the minimum acceptable condition of indicator variables. Once indicators and standards of quality have been formulated, indicator variables are monitored, and management action is taken to ensure that standards of quality are maintained. This approach to carrying capacity is central to contemporary park and outdoor recreation planning and management frameworks, including the Visitor Experience and Resource Protection (VERP) method, developed by the U.S. National Park Service.

An initial application of VERP focused on Arches National Park, Utah, USA. Arches National Park covers 73,000 acres of high-elevation desert with outstanding slick rock formations, including nearly 2,000 sandstone arches. Many of the park's scenic attractions are readily accessible through a well-developed road and trail system. Visitation to Arches has increased dramatically in recent years and the park now receives over three-quarters of a million visits annually.

A two-phase research program was designed to help support application of the VERP framework at Arches. Phase I was aimed at identifying potential indicators of quality of the visitor experience. (A parallel program of research was conducted for the resource component of carrying capacity.) Personal interviews were conducted with park visitors and a series of 20 focus groups were conducted with park staff and local community residents and interest groups, in order to identify indicators. Questions on park conditions and issues provoked what visitors and others considered important in determining the quality of the park experience.

Indicators of visitor experience quality identified included:

- number of people at developed attraction sites and along trails;
- number of visitor groups encountered along backcountry trails and campsites;
- number of social trails ( unofficial trails, shortcuts, visible paths created by the off-trail actions of the visitor themselves and level of soil and vegetation impacts associated with creation and use of these trails);
- level of trail development;
- level of visitor knowledge of regulations regarding off-trail hiking.

Phase II research was designed to help formulate standards of quality for the indicator variables noted above. A survey of park visitors was conducted using both personal interviews and mail-back questionnaires. Visual-research methods were used to illustrate a range of conditions for indicator variables. For example, a series of 16 computer-generated images was created to represent a range of
visitor use levels at Delicate Arch, a principal visitor attraction. These images were created using photo editing software.

Representative examples of these images are shown in the photos above. These images were presented to a representative sample of visitors who had just completed a hike to Delicate Arch. Respondents were asked to judge the acceptability of each image on a scale of -4 ("very unacceptable") to +4 ("very acceptable"). Analogous sets of images were created for the number of hikers along developed trails, environmental impacts caused by off-trail hiking, and level of trail development.

The graph below shows study findings for the acceptable number of people at Delicate Arch. The figure represents the average (mean) acceptability ratings for each of the 16 study images. It is clear from the graph that acceptability declines with increasing use. Average acceptability ratings fall out of the acceptable range and into the unacceptable range at about 30 people at the same time at Delicate Arch, and park staff selected this number as the minimum acceptable standard of quality. In a similar manner, standards of quality were formulated for other indicator variables and other features and areas in the park. The park is now monitoring indicator variables to ensure that standards of quality are being maintained. Moreover, management actions have been taken, including sizing the parking lot at Delicate Arch to help ensure that no more that 30 people are at the arch at any one time.
Box 6.1 Average acceptability ratings for the 16 photographs illustrating a range of use levels at delicate arch.

The VERP framework, including its emphasis on indicators and standards of visitor experience quality, provides a theoretically sound and rational process for defining and managing carrying capacity. It provides a structured framework within which to conduct a systematic, thoughtful, traceable, and defensible analysis of carrying capacity. An associated research program aimed at helping to identify and formulate indicators and standards of quality can provide a strong empirical basis for applying the VERP framework.

VERP has been applied at a number of diverse units of the U.S. National Park System, and research has helped identify and formulate a variety of indicator variables and associated standards for both resource conditions and the quality of the visitor experience. A VERP Handbook has been developed by the National Park Service, along with a workbook of management actions designed to support application of the VERP framework. (See http://planning.nps.gov/document/verphandbook%2Epdf).

References:


