6. Managing the challenges of tourism in protected areas

6.1 Management of risk and safety

All outdoor recreation involves some level of risk. Dealing with such risk is an important component of park tourism management. Visitor risk management is the systematic identification, analysis and control of the broad range of visitor risks, which threaten an agency or its ability to achieve its objectives.

6.1.1 Risk management

A risk, in the broadest sense, involves exposure to an unintentional event or situation that can cause a loss. The loss for a protected area management might be as simple as the pain of a twisted ankle or as complex as a liability claim ending in a lawsuit. Risk is often expressed in terms of an equation: \( \text{Risk} = \text{Frequency of Incident} \times \text{Severity of Consequences} \). Risk has some element of chance to it, but “risk management” involves foresight and control. Foresight is essential in risk management because, by being proactive, it is possible to reduce the level of risk. The concept of control means action: only through thoughtful action can an organisation reduce the probability of a risk and limit its negative consequences.

Effective visitor risk management practices are important in managing protected areas. Many forms of visitor activity and recreation have inherent risk associated with them: indeed this may be an integral component of the recreation. However, the potential for large personal injury claims and payouts, the aggressive pursuit of such claims in the courts, and the greater recourse to the courts which now occurs in many countries, means that it is important to identify hazards in a systematic way.

6.1.2 Shared responsibility

Protected area managers need to understand their existing and potential visitors, and what they want and do. Visitor management is a client-oriented approach to planning and service delivery that considers the visitors’ needs, expectations and satisfaction. Visitor management techniques are useful in understanding the factors that lead to incidents (e.g. lack of experience, or the willingness of visitors to take risks).

The prevention of public safety incidents, and when necessary the delivery of public safety, and of Search and Rescue services, should be a shared responsibility between protected area managers, tourism operators and other stakeholders, visitors and users. Box 6.1 illustrates one example of this shared responsibility, as utilised by Parks Canada.
Box 6.1 Shared safety responsibilities (agencies, operators, visitors)

**Park managers**
- Identify and address priority risk issues related to the environment, infrastructure, communications, visitor characteristics and programme management
- Plan visitor risk management and public safety for their area of responsibility
- Organise targeted prevention education, and information programmes that encourage self reliance
- Communicate site-specific hazards to tourism operators, stakeholders, visitors and other users
- Establish and maintain appropriate levels of search and rescue services
- Establish co-operative agreements, training and communications with other government departments, NGOs, tourism operators, concessionaires and service providers

**Tourism operators**
- Identify and where appropriate address priority risk issues unique to their business operations
- Plan visitor risk management and public safety for their business operation
- Carry out targeted prevention education, and information programs for their clientele
- Communicate site-specific hazards to their clientele and to park managers
- Establish appropriate levels of search and rescue services, including training of staff as first responders
- Establish co-operative agreements, training and communications with park managers, government departments, NGOs and service providers

**Visitor/tourists**
- Recognise the risk inherent in their activities and ensure that they have the knowledge, skills and physical fitness to participate
- Get trained, be properly equipped, and, if necessary, be prepared to deal with an emergency situation until professional help arrives
- Seek and heed advice from park managers and tourism operators concerning risks and how to prepare for them

Visitors/tourists should observe and adhere to regulations, information brochures, fencing barriers and signs. Both park managers and tourism operators must place a high priority on the prevention of incidents to ensure the provision of opportunities for high quality visitor experiences and to limit their exposure to liability.

*Source: Parks Canada, 2002.*
6.1.3 Emergencies and emergency planning

An emergency is considered here as an abnormal situation that requires prompt action beyond normal procedures to prevent or limit injury to persons or damage to physical property or the environment. Emergency planning, which may overlap with public safety questions (such as risk assessment and prevention, and search and rescue services) is concerned with developing proactive and reactive responses to high frequency-low impact/consequence events (e.g. overdue party, broken limb). It also deals with the broader area of emergency programming for lower frequency-higher impact/consequence events (e.g. floods, tornadoes, hurricanes, fires, landslides and avalanches). It is primarily reactive. Through the risk evaluations described above, these types of events can be identified, and emergency plans developed.

6.1.4 Visitor risk management programme

Essentially, evaluating risk requires:

- Assessing – asking what can go wrong?
- Controlling – asking what can be done about it?
- Financing – asking how it can be paid for?

The approach advocated here is to develop a visitor risk management programme, which involves a broad-based understanding of risks, and deploys the staff time and funds in a cost-effective way so as to minimise possible incidents.

The components of a Visitor Risk Management Programme include:

- Staff training;
- Inspection and identification of risk areas;
- Networking with legal advisors, insurers and other agencies;
- Reporting incidents.

The main elements of such a programme include:

- a policy statement setting out the goals, objectives, strategies and performance indicators (to help monitor how well objectives are achieved);
- a structured process to (1) identify risks, (2) assess them, (3) manage them, and (4) monitor what happens and review policy (ANZECC, 2001). This is set out as Guidelines in Figure 6.1. An alternative approach is Parks Canada’s (2002) Visitor Risk Management Process, which is a little more complex, with seven steps.
6.2 Principles of visitor management in protected areas

Park tourism depends on the quality of the natural and cultural resources of the protected area. The impacts of visitation on these resources must be carefully managed, directed and mitigated wherever possible. Even small levels of recreational use can lead to negative impacts, and all recreational use causes some impact. Some of the consequences of protected area tourism, for example the generation of income, may be desirable, and indeed the reasons behind park establishment. Therefore a certain level of

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**Source:** adapted from ANZECC, 2001.

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impact may be acceptable. The principal question confronting park tourism planning is to determine what degree of impact is acceptable. Such decisions, while informed by science, represent value judgements about the relative worth of the trade-offs involved. How much damage to the natural environment is worth the positive economic and quality of life gains from park tourism? What impacts on natural and cultural resources would occur if park tourism did not exist and the resources were utilised for some other purpose?

To help answer such questions, Table 6.1 sets forth some key principles for visitor management.

**Table 6.1 Principles of visitor management**

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1. Appropriate management depends on objectives | - Objectives provide definitive statements of the outcomes of protected area management.  
- They identify the appropriateness of management actions and indicate acceptable resource and social conditions.  
- They allow evaluation of success of management actions.  
- The specific objectives are likely to be more contentious than general value statements.  
- The process of establishing objectives is essentially political; therefore, public participation is essential. |
| 2. Diversity in resource and social conditions in protected areas is inevitable and may be desirable | - Impacts, use levels, and expectations of appropriate conditions tend to vary (e.g. impact of a camp-site in periphery vs. centre of the protected area).  
- Environmental variables influence visitor use and level of impact (e.g. topography, vegetation, access).  
- Managers can identify this diversity, then make decisions on its desirability, thereby separating technical decisions from judgmental ones.  
- Using zoning explicitly to manage for diverse recreation opportunities is more likely to preserve important values. |
| 3. Management is directed at influencing human-induced change | - Protected areas often protect natural processes as well as features, so management is generally oriented to managing human-induced change since it causes most disturbances.  
- Human-induced change may lead to conditions considered to be undesirable.  
- Some changes are desirable and may be the reason for the creation of the park. For example, many parks are created to provide recreation opportunities and local economic development.  
- Management actions determine what actions are most effective in influencing amount, type and location of changes. |
| 4. Impacts on resource and social conditions are inevitable consequences of human use | - Even small amounts of recreational use can lead to disproportionately large biophysical or social impacts, so any level or use leads to some impact.  
- Many impacts are purposefully designed, for example providing a certain level of environmental education for park visitors.  
- Managers must ask: “How much impact is acceptable or desirable?”  
- The process to determine the acceptability of impact is central to all visitor planning and management.  
- Managers must utilise appropriate actions to create and manage this acceptable level of impact. |
5. Impacts may be temporally or spatially discontinuous

- Impacts from visitor use or management activities may occur out of the protected area, or not be visible until later (e.g. prohibitions of use may displace that use to other areas; or poor water treatment may result in water pollution downstream).
- Planners need substantial knowledge of relationships between use and impacts to predict relationships at a variety of scales and over time.

6. Many variables influence the use/impact relationship

- Many variables other than level of use affect the use/impact relationship in protected areas (e.g. behaviour of visitors, travel method, group size, season, and biophysical conditions).
- Education and information programmes, as well as regulations aimed at restricting visitor behaviour, may be necessary in addition to limits of use.

7. Many management problems are not dependent on numbers of users

- Management issues relating to the density of human use often have relatively simple technological solutions (e.g. parking, toilet facilities, water supply). But the relationship to use is not always linear. For example, the facilities designed for a few users may have very large impacts, but facilities designed for many more users have proportionally less additional impact.
- Similarly, social conditions (e.g. visitor satisfaction) are not always density-dependent.

8. Limiting use is only one of many management options

- A use-limit policy is only one of a number of potential management actions available, and is one of the most intrusive actions that protected area managers can employ.
- There are many issues involved in employing limits to use, such as choosing appropriate allocation or rationing techniques.
- Limiting use can have major political problems because of the necessary decision of who does not get access, and how access is allocated.

9. The decision-making process should separate technical decisions from value judgments

- Many protected area management decisions are technical (e.g. location of trail, design of visitor centre). But others reflect value judgments (e.g. decisions to limit use, and how, types of facilities, tourism opportunities provided).
- Decision processes should separate questions of “existing conditions” from “preferred conditions.”

6.3 Protected area management frameworks

During the 1970s, carrying capacity was advanced as a technique for managing tourism in sensitive environments. This encouraged managers to try to solve visitor use problems merely by setting limits to numbers based upon a pre-determined level, derived from ecological, social and other analyses. However, this approach has serious limitations. It is basically a restrictive concept, founded on limits and constraints. As a result it can be seen as working against protected area objectives designed to encourage appropriate visitor enjoyment and valuation of the resource. When the limitations of this approach became evident, a number of more sophisticated frameworks were developed to provide a structure for the management of protected area visitation and tourism.

6.3.1 A choice of frameworks for management

Some frameworks which have been used in various parts of the world include:

1) Limits of Acceptable Change (LAC)
2) Visitor Impact Management (VIM)
3) Visitor Experience and Resource Protection (VERP)
4) Visitor Activity Management Process (VAMP)
5) The Recreation Opportunity Spectrum (ROS)
6) Tourism Optimization Model (TOMM).

There is literature about each approach and their pros and cons have been documented in Appendix D and Table 6.2, which compare and contrast these frameworks.

A number of challenges arise when approaches like these are adopted:

- They all require staffing, funding and time to implement;
- There are often gaps in scientific knowledge about visitor impacts, so judgments have to be made subjectively, or with limited information; and
- The management action called for is not always taken, even when limits are far exceeded, because of the lack of staff resources or because management is unwilling to face up to hard choices.

While these Guidelines introduce the reader to the existence of these frameworks and their main features, managers intending to apply them should consult the relevant documents and contact planners with experience in their application. However, a rather fuller overview of the LAC technique is provided below. It is featured because of its widespread use and acceptance, and because there is abundant literature and experience available to assist novice users in its application.

6.3.2 The Limits of Acceptable Change Planning Process (LAC)

It is essential to develop goals for tourism in protected areas. All subsequent actions, such as building facilities, developing recreation programmes and assigning levels of tourism service, flow from these goals.

The LAC offers a way to do this that does not focus so much on the relationships between levels of use and impact, but on determining the desirable environmental and social conditions for the visitor activity, and the management actions required to achieve these conditions. It uses a process that is systematic, explicit, defensible and rational, and involves public participation.

**Guidelines** for the application of the LAC framework are presented in Table 6.3. An example of the practical application of LAC is given in Box 6.2 below.
<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Main areas of application</td>
<td>Protected areas, especially IUCN Category Ib</td>
<td>Sites within protected areas</td>
<td>Primarily National Parks in the USA</td>
<td>Primarily Canadian National Parks, but applicable elsewhere</td>
<td>Any protected or multiple use area with nature-based tourism present</td>
<td>Australian system, but applicable in situations of communities with nature-based tourism</td>
</tr>
<tr>
<td>Able to assess and/or minimise visitor impacts</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Considers multiple underlying causes of impacts</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Facilitates selection of a variety of management actions</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Produces defensible decisions</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Separates technical information from value judgements</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Encourages public involvement and shared learning</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Incorporates local resource uses and resource management issues</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Planning investment needed</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Overall effectiveness based on experience</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Key:* + = Positive attributes; - = Negative attributes (with scale from - to ---)
*Sources:* Based on and adapted from Hall and McArthur, 1998; Farrell and Marion, 2002
### Table 6.3 Limits of Acceptable Change: Process and guidelines

<table>
<thead>
<tr>
<th>Steps</th>
<th>Guidelines</th>
<th>Comment on Purpose</th>
</tr>
</thead>
</table>
| 1. Identify special values, issues, and concerns attributed to the area | Citizens and managers:  
- Identify special features or qualities that require attention  
- Identify existing management problems and concerns  
- Identify public issues: economic, social, environmental  
- Identify role the area plays in a regional and national context and political/institutional constraints | Encourages a better understanding of the natural resource base, a general concept of how the resource could be managed, and a focus on principal management issues. |
| 2. Identify and describe recreation opportunity classes or zones | **Opportunity classes** describe subdivisions or zones of the natural resource where different social, resource, or managerial conditions will be maintained  
- Identify opportunity classes for the natural resources  
- Describe different conditions to be maintained  
(Bob Marshall Wilderness Complex case study, Box 6.2 below illustrates the opportunity classes used there) | Developing classes (or zones) provides a way of defining a range of diverse conditions within the protected area. |
| 3. Select indicators of resource and social conditions | **Indicators** are specific elements of the resource or social setting selected to be indicative of the conditions deemed appropriate and acceptable in each opportunity class  
- Select a few indicators as indicative measures of overall health  
- Use economic, social, environmental, political indicators  
- Ensure indicators are easy to measure, relate to conditions in opportunity classes, and reflect changes in recreational use | Indicators are essential to LAC because their condition as a group reflects the overall condition of the opportunity class and guides the inventory. |
| 4. Inventory existing resource and social conditions |  
- Use chosen indicators to guide the inventory of resource and social conditions  
- Use inventory data to provide a better understanding of area constraints and opportunities  
- Map inventories to establish status (location and condition) of indicators  
By placing the inventory as step 4, rather than the first step as is often done, planners avoid unnecessary data collection and ensure that the data collected is useful | Inventory data are mapped so both the condition and location of the indicators are known. Helps managers establish realistic standards, and used later to evaluate the consequences of alternatives. |
| 5. Specify standards for resource and social conditions in each opportunity class |  
- Identify the range of conditions for each indicator considered desirable or acceptable for each opportunity class  
- Define conditions in measurable terms, to represent the maximum permissible conditions allowed (limits)  
- Ensure conditions are attainable and realistic | Provides the basis for establishing a distinctive and diverse range of protected area settings, serving to define the “limits of acceptable change.” |
<table>
<thead>
<tr>
<th>Steps</th>
<th>Guidelines</th>
<th>Comment on Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Identify alternative opportunity class allocations</td>
<td>This stage identifies alternative allocations of opportunities. Identify different types/location/timing of alternatives, using steps 1 and 4 to explore how well the different opportunity classes meet the various interests and values.</td>
<td>Provides alternative ways of managing the area to best meet the needs, interests, and concerns.</td>
</tr>
<tr>
<td>7. Identify management actions for each alternative</td>
<td>Analyse broad costs and benefits of each alternative. Identify the kinds of management actions needed to achieve the desired conditions (direct or indirect).</td>
<td>This step involves an analysis of the costs and benefits of each alternative.</td>
</tr>
<tr>
<td>8. Evaluation and selection of a preferred alternative</td>
<td>Review costs vs. benefits of alternatives with managers, stakeholders and public. Examine the responsiveness of each alternative to the issues. Explicitly state the factors considered, and their weight in decision-making. Select a preferred alternative.</td>
<td>Builds consensus and selects the best alternative.</td>
</tr>
<tr>
<td>9. Implement actions and monitor conditions</td>
<td>Develop implementation plan with actions, costs, timetable, and responsibilities. Develop a monitoring programme, focusing on the indicators developed in step 3. Compare indicator conditions with standards to evaluate the success of actions. If conditions do not correspond with standards the intensity of the management effort might need to be increased or new actions implemented.</td>
<td>Ensures timely implementation and adjustment of management strategies. Monitoring ensures that effectiveness of implementation is known. If monitoring shows problems, actions can be taken.</td>
</tr>
</tbody>
</table>
Box 6.2  Bob Marshall Wilderness Complex, Montana, USA: an example of wilderness management using Limits of Acceptable Change

The Bob Marshall Wilderness Area is a Category Ib type protected area (a wilderness area), where, by law, no permanent human habitation is allowed. When LAC is applied to Category II, III or V areas, for example, a far wider range of activities, facilities and use types would be permissible.

The Bob Marshall Wilderness Complex is located in north central Montana, and managed by the US Forest Service (USFS) under provisions of the 1964 Wilderness Act. It comprises 600,000 hectares of un-roaded temperate forest, and attracts 25,000 visitors, primarily from June through November. June to September is dominated by backpacking and horse-supported backcountry trips. In the autumn, most use is for big game hunting.

In 1982, the USFS embarked on a planning effort based on the LAC process. It involved continuous public participation through a taskforce consisting of a range of stakeholders: the public, scientists and managers. The process took five years. LAC focused effort on addressing how much change in wilderness, biophysical and social conditions is acceptable. By designing a public participation process that incorporated the full range of values involved in the Wilderness area, participants developed a set of management actions that were effective in reducing and controlling human-induced impacts, and achieved the social and political acceptability necessary for implementation.

The plan has three broad characteristics:

1. It establishes four opportunity classes (zones) designed to protect the pristine character of the wilderness, yet realistically permits some trade-offs between recreation use and human-induced impacts.

2. It identifies indicator variables – things to monitor to ensure conditions remain acceptable and to use to establish the effectiveness of actions implemented to control or mitigate impacts. For each indicator, quantifiable standards exist, indicating what limit of change from the natural baseline is acceptable in each zone.

3. It indicates for each zone the management actions in order of their social acceptability. This gives the manager a choice of tool, and determines what management action will be most acceptable in controlling impacts. This procedure thus encourages the least intrusive management action first.

Zones thus form the framework for managing human-induced impacts. Each zone is described by the biophysical, social and managerial setting conditions that are acceptable. The opportunity classes represent amounts of impact permitted on a continuum with Opportunity Class I being most pristine, while Opportunity Class 4 is least pristine (see table below).

LAC Opportunity Classes in Bob Marshall Wilderness

<table>
<thead>
<tr>
<th>Zone</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class 1</strong></td>
<td>Biophysical</td>
<td>Unmodified natural environment. Environmental impacts minimal</td>
</tr>
<tr>
<td></td>
<td>Social</td>
<td>Isolation and solitude, no evidence of human activities. Few encounters with users. High opportunities for cross-country travel, with maximum outdoor skills</td>
</tr>
<tr>
<td></td>
<td>Managerial</td>
<td>Strong emphasis on enhancing natural ecosystems. Little direct management of visitors. Communication of rules outside the area (e.g. trailheads or boundary gates)</td>
</tr>
<tr>
<td><strong>Class 2</strong></td>
<td>Biophysical</td>
<td>Unmodified natural environment. Environmental impacts of use are low</td>
</tr>
<tr>
<td></td>
<td>Social</td>
<td>High isolation. Few user encounters. Good opportunities for independence and self-reliance</td>
</tr>
<tr>
<td></td>
<td>Managerial</td>
<td>Emphasizes enhancing natural ecosystems. Minimum on-site management contact. Communication of rules outside the area (e.g. trailheads or boundary gates)</td>
</tr>
</tbody>
</table>
### Sustainable Tourism in Protected Areas

<table>
<thead>
<tr>
<th>Zone</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class 3</strong></td>
<td>Biophysical</td>
<td>Unmodified natural environment. Some natural processes affected by users. Moderate environmental impacts, mostly along travel routes and sites.</td>
</tr>
<tr>
<td></td>
<td>Social</td>
<td>Moderate isolation, and low to moderate encounters with users. Moderate opportunities for independence and self-reliance</td>
</tr>
<tr>
<td></td>
<td>Managerial</td>
<td>Emphasises enhancing natural ecosystems. Routine visitor contact on-site. Communication of rules outside the area (e.g. trailheads or boundary gates)</td>
</tr>
<tr>
<td><strong>Class 4</strong></td>
<td>Biophysical</td>
<td>Predominantly unmodified natural environment. Conditions may be affected by impact of users, especially on travel routes, river corridors, shores, and entry points</td>
</tr>
<tr>
<td></td>
<td>Social</td>
<td>Moderate to low opportunities for isolation. Encounters likely. High opportunity for interaction with environment, but with low to moderate challenge or risk</td>
</tr>
</tbody>
</table>