11. Monitoring tourism in protected areas

11.1 Why monitor?

*Monitoring* is an essential component of any planning or management process, for without monitoring, managers know nothing about progress towards the objectives they have been set or have set themselves. Monitoring is the systematic and periodic measurement of key indicators of biophysical and social conditions. The word *systematic* means that an explicit plan should exist to set indicators, chart how and when these should be monitored, and show how the resulting data will be used. *Periodic* means that indicators are measured at predetermined stages. This chapter outlines some considerations involved in developing and implementing a monitoring programme as this relates to tourism in protected areas.

While management experience is an important element of decision-making, the results of systematic monitoring provide a more defensible basis for management actions. Subjective impressions of conditions are not good enough: the public demands to see the data upon which decisions are taken, and to be assured that they were collected in a scientifically reliable manner. Without the data on conditions and trends that monitoring provides, managers cannot respond to many public concerns and criticisms, nor can they properly fulfil their responsibilities, nor judge the effectiveness of actions they take. Moreover, if managers do not undertake the monitoring, someone else will—and such monitoring may well be biased. However, monitoring requires ample funding, trained personnel, access to data and sufficient time to implement programmes. In reality, the resources for monitoring are not always readily available and implementation often falls well short of what is desirable.

There are two particular aspects of monitoring tourism in protected areas:

1. **Monitoring visitor impacts**: Visitors to protected areas have environmental and social impacts. Managers should understand and manage those impacts. Through the appropriate planning process for the park, tourism and related objectives are defined and indicators developed. Through periodic measurement of indicators, data on visitor impacts are collected, analysed and evaluated. Managers should then determine what action is needed to address problems.

2. **Monitoring service quality**: The planning process also determines the kind of experience which it is intended to provide for visitors. Monitoring service quality, therefore, involves collecting, analysing and evaluating information about the fulfilment of the needs of visitors.

11.1.1 What should managers monitor?

*Indicators* should be identified early on in the planning process. Indicators relate to issues or conditions which are influenced by some action or trend. Monitoring provides
managers with essential information about the protection of the values for which the area was established. Indicators need to be selected carefully, because of scarce financial and personnel resources. Also, because the appropriateness of indicators can change over time, their suitability should be reviewed periodically.

Several points should be noted about the use of indicators to monitor tourism in protected areas:

1. They should identify *conditions* or *outputs* of tourism development or protected area management (e.g. the proportion of the park impacted by human activity or annual labour income from tourism) rather than *inputs* (e.g. the money spent on a programme);
2. They should be descriptive rather than evaluative;
3. They should be relatively easy to measure; and
4. Initially only a few key variables should be selected for monitoring.

The Nature Conservancy (TNC) reviewed monitoring methods for protected area programmes in Latin America (Rome, 1999). They found monitoring programmes were most effective when they addressed impacts and threats, and dealt with issues that affected both the full range of stakeholders, and the protected area.

TNC listed the impacts for which indicators should be developed for monitoring purposes as follows:

1. Environmental impacts – on the protected areas and surrounding lands, both physical and biological (usually measured through quantitative methods);
2. Experiential or psychological impacts – on visitors (usually qualitative methods);
3. Economic impacts – on communities and protected areas (usually quantitative methods);
4. Socio-cultural impacts – on communities (usually qualitative methods); and
5. Managerial or infrastructure impacts – on protected areas and surrounding lands.

**Box 11.1 Makira, Solomon Islands and Irian Jaya/Papua, Indonesia: Biodiversity Conservation Network (BCN) monitoring of ecotourism activities**

The BCN supports biodiversity conservation activities. In these ecotourism projects, environmental indicators were selected as dependent variables, affected by ecotourism as well as other income-generating activities (e.g. nut gathering in the Solomon Islands).

In Makira, Solomon Islands, the indicators were:
1. Fruit dove frequency measured by a range of surveyors, including tourists and guides, and

In Irian Jaya/Papua, the indicators of the biological conditions of coral reef include:
1. Numbers of butterfly fish, live coral, and other fish caught at designated sites, and
2. Beach trash and a range of socio-economic indicators in the community.

Cont.
An example of a monitoring programme dealing with ecotourism impacts, which was taken from the TNC study, is shown in Box 11.1.

### Box 11.1 Makira, Solomon Islands and Irian Jaya/Papua, Indonesia: Biodiversity Conservation Network (BCN) monitoring of ecotourism activities (cont.)

Measurement programmes in Makira resulted in changed management actions, including seasonal restrictions on pigeon hunting, and bans on pesticides.

Those in Irian Jaya/Papua led to experimental transplanting of coral, and pressure on government agencies to discontinue practices damaging coral reefs.

These examples demonstrate how monitoring stimulated community concern and remedial management activities.


### 11.1.2 Where should managers monitor?

Monitoring should be focused on:

1. Areas where problems are most acute, and/or where staff or visitors have indicated concerns. These are likely to include:
   - places where conditions are at the limit, or violate existing standards (e.g. a slight change in camp-site conditions that results in camp-site impacts becoming unacceptable and thus may lead to a closure);
   - places where specific and important values are threatened; and
   - places where conditions are changing rapidly (Cole, 1983).

2. Areas where new management actions are taking place (e.g. if the management plan introduces a wilderness zone, with the aim of reducing visitor numbers or modifying visitor behaviour, managers should consider monitoring in that area to determine how the policy is working);

3. Areas where the effects of management are unknown. For example, while there has been much research on the effects of recreation on soil, vegetation, and camp-site conditions, there has been little research on the effectiveness of rehabilitation techniques, and how recreation variables influence rehabilitation;

4. Areas where information is lacking, and a monitoring programme will provide data on tourism and protected area conditions and trends.

### 11.1.3 When should monitoring occur?

Frequently asked questions include: “At what season should camp-site impacts be measured?” or “When should trail encounters be measured (on the “average” day, on peak days, on randomly selected days in the season)?”. Timing depends on the indicator being monitored. Research on visitor impacts can be used to identify the most appropriate frequency for re-measurement.

By the time that environmental impacts are clearly evident – for example, erosion has taken hold on an over-used trail – management options may be reduced. It then becomes
a choice of reducing numbers or limiting visitors’ activities (politically difficult, though often necessary), or making the environment more resistant to impacts through hardening (financially difficult to find budgets for infrastructure and maintenance). But if impacts had been measured earlier, and remedial action taken promptly, there would be less impact and lower management costs.

The establishment of a monitoring programme at the outset of project development, and the gathering of baseline information allows for early warning of impending changes, enabling timely management action to take place. It is therefore critically important to develop baseline data on initial conditions. The values placed on all subsequent monitoring data will depend upon the changes observed compared to the baseline data.

11.1.4 Who should monitor?

It might be thought that trained staff would be required for monitoring, and for some specialised aspects of the programme that is true. But other groups can also be involved:

- field staff and rangers;
- the local community;
- local schools and universities;
- specialist tourist programmes that support protected area research, such as Raleigh International and Earthwatch;
- tourism operators; and
- visitors (e.g. visitors to Itala Nature Reserve, KwaZulu/Natal, are issued with observation cards to help locate movements of wildlife).

Box 11.2 summarises a monitoring programme where staff, guards and scientists collaborated.

Box 11.2 A protected area monitoring programme. Noel Kempff Mercardo National Park, Bolivia: A collaboration of efforts

At this national park, an ecotourism site, simple biological monitoring occurs between a Nature Conservancy partner, Fundacion Amigos de la Naturaleza (FAN) and the Bolivian national park system.

What? They monitored megafauna and endangered species for some years. There is no monitoring of cultural and socio-economic impacts because there are no communities in the park.

Who? Park guards and FAN staff are responsible. Nature guides have been involved recently.

How? They use data collection procedures recommended by visiting scientists. The nature guides collect information on bird and animal sightings.

Results? Information collected helped staff to plan and manage more effectively. They now know better when river turtles are nesting, when they hatch, when they are in most demand by locals, when fish are migrating, etc. Also, they have baseline data from which to assess future impacts, particularly if ecotourism should grow more.

Source: Rome, 1999
Web site: http://nature.org/aboutus/travel/ecotourism/resources/
11.2 The characteristics of a monitoring system

Monitoring should be approached in an organised, systematic manner. The following are the ideal characteristics of a monitoring system:

- **Meaningful variables** – the variables measured should provide information that is useful in leading to management change;
- **Accurate results** – the results should reflect actual conditions;
- **Reliable system** – the monitoring should lead to repeatable results, from which reliable conclusions can be drawn;
- **Able to detect change** – the system must be able to detect change resulting from human activity and environmental fluctuations;
- **Affordable** – the monitoring design must consider the ability of the agency to fund and carry out the recommended procedures;
- **Easy to implement** – procedures should be as simple and straightforward as possible; and
- **Appropriate to management capability** – the monitoring protocol must be capable of implementation within the capacity of the protected area management (if it calls for additional resources, this must be made explicit).

TNC has developed **Guidelines** for monitoring programmes, see Box 11.3.

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**Box 11.3 The Nature Conservancy guidelines for monitoring programmes**

1. Monitoring should be incorporated into general planning and management.
2. Monitoring must be grounded in protected area management and community development objectives.
3. The complex causes of impacts must be recognised and analysed.
4. Indicators and methods for measuring them must be selected carefully.

A number of criteria are recommended for selecting good indicators:

- Measurability
- Precision
- Consistency
- Sensitivity
- Degree of relationship with actual tourism activity
- Accuracy
- Utility
- Availability of data
- Cost to collect and analyse

5. When selecting standards or acceptable ranges for measuring indicators, several factors must be considered (for biological indicators, it is important to ensure that minimum levels are sufficient to maintain population numbers and genetic diversity; when considering visitor reactions, it is important to realise that visitors generally recognise physical and experiential impacts more accurately than biological ones).

Cont.
11.3 Developing a monitoring programme

A formal monitoring plan is needed to give effect to a monitoring programme in a scientific and professionally responsible way. This should be a formal exercise for several reasons. The process of writing a plan requires considerable thought, demands that planners evaluate what the plan is designed to achieve, reveals to others intended actions, and thus encourages professional critique. Also, from time to time protected area managers are re-assigned from one area to another. When this happens, the existence of a formal monitoring plan helps maintain monitoring procedures, an important consideration because the effects of many management actions may not be visible for years.

To be effective, a monitoring plan should be developed with these features:

1. **Objectives and rationale** – the goals of the monitoring plan relate directly to the goals outlined in the protected area management plan;
2. **Indicators** – the chosen indicators are those that best indicate the conditions to be monitored;
3. **Monitoring procedures** – the frequency, timing and location of measurement activity, as well as specific instructions on methods used;
4. **Analysis and display of monitoring data** – procedures for data analysis and for the presentation of results; and
5. **Personnel** – explicit indication of responsibility for monitoring, effectively integrating the monitoring task into the overall management of the protected area.

TNC recommends the steps appropriate for developing and implementing a tourism impact monitoring plan (Box 11.4).

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**Box 11.3 The Nature Conservancy guidelines for monitoring programmes (cont.)**

6. Local stakeholder participation is critical. In developing areas, local communities are demanding increasingly larger roles in the establishment, planning and management of protected areas. Therefore, impact monitoring must go beyond what happens in the protected area itself.

7. Monitoring methodology and analysis of findings must be user-friendly and minimally demanding in time or budget.

8. Monitoring results must be carefully analysed to determine appropriate management options.

9. Monitoring must lead to specific management and awareness-building actions.


11.4 Research

Research can provide new knowledge, insight and procedures for tourism management. Ongoing research programmes frequently reveal trends and patterns that are valuable for planning and management. All stakeholders can benefit from research. The benefits are most apparent when protected area management involves tourism providers in research, and when all protected area staff and all private tourism operators are informed of research findings, so that they can use these in their work.

There are several key Guidelines to be considered in the stimulation and management of park tourism research:

**Consider involving a wide range of researchers:** Research may be done by agency or company employees, consultants, university teachers and students. Much valuable research can be obtained for a very low cost through the creation of a supportive and encouraging environment. Harmon (1994) provides additional guidelines to assist park managers in co-ordinating and managing research in protected areas.

**Adopt an open attitude to research:** It is important that park managers encourage potential research. Some agencies do this by maintaining an inventory of potential research topics that would be of use for park management. To be useful, the inventory should include a title for the research, a description of the topic, a contact name within the agency, possible research sites and information on the availability of funding. Ideally the inventory should be made widely available to potential research partners in hard copy and electronic format.

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**Box 11.4 Steps to develop and implement a tourism impact monitoring plan**

A) Planning for monitoring
   1) Formation of a steering committee.
   2) Holding a community meeting.

B) Developing a monitoring programme
   3) Identifying impacts and indicators to be monitored.
   4) Selecting methods of measurement.
   5) Identifying limits or ranges of acceptable change.
   6) Developing an operational monitoring plan.

C) Conducting monitoring and applying results
   7) Training staff, managers and community representatives.
   8) Carrying out monitoring and examining data.
   9) Presenting monitoring results.

D) Evaluating and Advancing Monitoring
   10) Evaluating the monitoring programme and conducting outreach.

Set up a research permit process: Many protected area agencies maintain a research permit process in order to screen topics for suitability, to assist with the maintenance of a research record, and to set conditions for the conduct of the research. It is common to request all researchers to provide a copy of their research publications to the protected area. Those who do not fulfil the permit requirements may be penalised, such as having their research privileges denied at a future date.

Give practical help to researchers and institutes: Some park agencies take special steps to encourage directed park research. These can include:

- sharing employment costs for a research leader between a university and a park agency;
- maintaining research facilities and accommodation for researchers;
- maintaining a library of all studies undertaken in the protected area;
- maintaining a database of past research data sets;
- providing transport for researchers within the protected area; and
- generally fostering a positive attitude by park staff towards research and researchers.

Conduct tourism research using protected area staff or consultants: Where this is done, the studies should be made available to the larger research community outside the park and the agency. Many protected areas do a poor job of making their own research findings available to the larger community, yet stakeholders will be interested in research findings. When an agency makes its data available for secondary research by outside researchers, it is considered an act of responsible goodwill, since the data can be mined for secondary analysis.

Involving private sector tourism operators: These are often willing and useful partners in a park tourism research programme, helping to fund the research and provide assistance in its conduct. They may make their own research findings available to the park. Private-public partnerships can be positive vehicles in encouraging tourism research in parks.

Communicate the results of research: This is crucial. In some countries protected area personnel actively encourage research dissemination, through conferences, special lectures and the direct mailing of research findings. It is often useful to compile books of research findings for a park or for a subject area. Research findings should be made available to field staff in a form and language that they understand. Many park interpretive programmes explain park research findings to visitors, which in turn can improve tourism management efforts. For protected areas with specialisation ecotourism programmes, it is very important that the private sector operators and their staff are kept informed of the most recent research findings: some managers do this when they hold regular information meetings with their private sector operators.

Stimulate research with awards: Some agencies provide awards to tourism researchers. These encourage and support good research work and stimulate further interest in the field. Ongoing research effort requires constant encouragement and support efforts by senior managers of the protected area agency.

Note: For a fuller introduction to this topic, the reader is referred to a recent IUCN publication in this series: Evaluating Effectiveness: A framework for assessing the management of protected areas (Hockings et al., 2000).