MANAGING VISITOR IMPACTS

MODULE 3

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OVERVIEW

As more people choose to live, work, and play along coasts and waterways, resource management professionals are challenged with balancing the changing demands of the public with the management of resources under their care. There are an array of management tools available to assist managers in understanding, monitoring and managing impacts created by visitors while ensuring a rich experience for the visitor.

Without some means of monitoring negative visitor impacts, there is no way to tell whether the tourism at a site is truly "sustainable", with the benefits outweighing the costs. Management frameworks that can help determine this include new concepts of carrying capacity and the Limits of Acceptable Change (LAC) management framework. A user-friendly decision process has been developed that builds from each of these frameworks and provides a way to move from planning to implementation. This simplified, systematic approach can assist managers in identifying and monitoring visitor impacts (to resources, to visitor experiences, and to the community), choosing management tactics to address the impacts, and, finally, implementing the plan. Whatever management system is chosen, stakeholders should be involved to the fullest extent possible.

An adaptive management approach can help protected-area managers incorporate the on-going information from monitoring programs into an effective management program. Adaptive management is a "learning-by-doing" approach to management. It acknowledges the uncertainties, incomplete knowledge, and changing situations that are inherent in protected-area management. Adaptive management places high emphasis on ongoing monitoring, and expects that policies may need to be adjusted from time to time, in order to continue moving toward the agreed-upon goals. Adaptive management can be used in conjuction with community involvement principles to create an ongoing process of community-based management.

LEARNING OBJECTIVES

✓ Recognize the need for and utility of visitor-use planning and management
✓ Understand the importance of monitoring visitor impacts
✓ Understand and identify effective indicators and standards for visitor impacts
✓ Apply the decision process to identified local/regional issues
✓ Learn how to apply Limits of Acceptable Change
✓ Be able to develop adaptive management responses for specific scenarios of change
✓ Understand the importance of engaging the community, and the key principles that will help build bridges and forge partnerships

LESSON PLAN

Introduction

Handout 3.1 - Key Points for Addressing Visitor Impacts

Promoting recreation and tourism so that visitors can learn about and appreciate a MPA, without damaging the values for which it was established, can be challenging. As we have seen in previous modules, tourists can negatively impact both resources and the experience of other visitors. Some of these impacts include disturbing wildlife, littering, removing "souvenirs" and damaging mangroves, seagrass beds and reefs. Tourists may also unknowingly offend cultural standards; for example, through improper dress, or by taking photographs of people or traditional sites without permission. Any tourism program will result in many visitor use activities that will have impacts, both positive and negative. An effective sustainable tourism program seeks to achieve a balance between protecting the resources and providing for enjoyment of the area by visitors. The *monitoring* and *managing* of visitor impacts are fundamental to sustainable tourism management strategies, but are often overlooked once the plan is underway.

> *If you do not know what effects your sustainable tourism activities are having on the site's natural environment and the surrounding communities, then you cannot say whether you are successful.*

If visitor impacts are not carefully monitored, gradual degradation of environmental quality can occur without MPA staff noticing until the damage is quite far advanced. Similarly, gradual detrimental changes may begin to occur in local communities. To detect and correct problems before they proceed too far, careful monitoring of impacts, both positive and negative, needs to be a **primary** activity of the site's overall management.

Be aware that monitoring will cost money and will require trained personnel and the assistance of interested stakeholders; but it is an essential piece of the sustainable tourism plan.

To begin with, a MPA manager should have a good idea of how much tourism use the site can withstand. If tourism becomes too intense and crosses a threshold at which impacts become unacceptable, the MPA manager will need to take action. How can we know where these thresholds are, and how can we detect if they have been crossed?

Carrying Capacity

> **_What visitors do, when and where they do it, how they behave, and protective measures at the site itself are frequently more important in determining visitor impacts than simply the number of visitors._**

The first methods developed to address tourism impacts evolved from the concept of *carrying capacity*, which originated in the field of range management for grazing animals. Several definitions of carrying capacity have been developed in the literature, depending on how and where the concept was applied. The motivations and behaviors of visitors; the mode of visitor transport and lodging; the effectiveness of guides; and the season(s) in which most use occurs will all affect impacts. As such, carrying capacity in a recreational context refers to the amount and type of use that can be accommodated in a particular area over time, while sustaining desired biophysical resource conditions and opportunities for high-quality visitor experiences at given levels of management input. This concept is the conceptual underpinning for all the major recreation resource management frameworks in use today.

In other words:

> **_Carrying capacity is the maximum amount of tourist activity that can be sustained without damaging the environment or decreasing visitor enjoyment._**

Estimating carrying capacity

Quantifying carrying capacity is difficult, and it will vary for each MPA depending on ecological conditions, the resilience of ecosystems to recover from disturbance (which may vary over time) and the behavior of the visitors. Often the information needed to estimate this is not available. In many MPAs, methods that evolved from carrying capacity are used to assess visitor impacts and have included important recreational resource management innovations like The Recreation Opportunity Spectrum, Limits of Acceptable Change, Visitor Impact Management Planning and the Visitor Experience and Resource Protection planning process. However, in certain situations in which tourists tend to carry out an activity in a very predictable, consistent manner, the carrying capacity concept can be useful.

As an example, carrying capacity is commonly used to set limits for **divers at coral reefs** since most divers behave in a roughly similar way (i.e., similar lengths of time underwater). Research in the Red Sea and Bonaire (in the Caribbean) indicate a maximum carrying capacity of 4,000-6,000 divers per dive site per year. However, even in this case there is great variation between reefs. Number of divers has been assumed to be a reliable indicator of damage to the reef, however carrying capacity does not account for the impacts caused by the behavior of divers, the activities they carry out, and the physical and ecological characteristics of a particular dive site.

Spending resources on trying to quantify carrying capacity may therefore not be useful, as figures generated would not be applicable indefinitely and would vary in different parts of a MPA. However, because this concept has driven a large part of the work related to visitor use within recreation resource management approaches, it is important to understand its application.   Too much use can ultimately damage the MPA's natural, cultural, historical resources and the visitor experience itself.

Limits of Acceptable Change (LAC)

Tthe basic steps in determining the LAC (adapted from Wallace, 1993)

Handout 3.2 - Limits of Acceptable Change

The framework of Limits of Acceptable Change (LAC) incorporates the consideration of carrying capacity and considers other potential underlying causes of impact. It is a decision process that addresses unacceptable impacts to resource conditions and visitor experiences in protected areas.   The LAC involves determining whether levels of existing impact at a site are unacceptable, selecting management strategies and tactics, developing an action plan and carrying it out, and monitoring. As with any approach, planning for monitoring occurs early and monitoring happens throughout the process. When monitoring indicates that the threshold of unacceptable impact has occurred, management action is taken.

Carrying capacity is aimed at deciding *how many people/visits* a resource can sustain, while LAC tries to define *how much change* is acceptable as a result of those visits and how to address it. The LAC assists in specifying the scope, severity, and cause of the problem ideally before it becomes unacceptable. It encourages managers to assess a range of alternatives rather than

being locked in to one solution. It is a flexible system that may be tailored to the specific ecology, biodiversity, or socio-cultural considerations of each site.

The LAC approach is based on three major assumptions:

- Impact is inevitable, so the focus is on identifying how much impact is acceptable;
- Different sites will have different environments and social conditions;
- A given level of tourism may have different impacts in these different situations.

The LAC process was originally developed by the United States Forest Service for use in forested terrestrial habitats. It is now in wide use in a variety of other locales, including many marine parks. South African National Parks have developed a similar method, based on what is termed "Thresholds for Potential Concern" for determining when management intervention is needed in a certain situation.

The basic logic of the LAC process is as follows: *(excerpted from VERP Handbook 1997)*

1. **Identify two goals in conflict.** In the case of protected areas, the two goals are usually the protection of environmental conditions and visitor experiences (goal 1) and the unrestricted access to resources for recreational use (goal 2).

2. **Establish that both goals must be compromised.** If one or the other goal cannot be compromised, then the LAC process is not needed — one goal must simply be compromised as necessary to meet the one that cannot be compromised.

3. **Decide which goal will ultimately constrain the other.** In the case of protected areas, the goal of protecting environmental conditions and visitor experiences will almost always constrain the goal of unrestricted access.

4. **Write LAC standards for this ultimately constraining goal**. LAC standards express the *minimally acceptable* conditions for the environment and visitor.

5. **Compromise this goal <u>only until</u> the standards are reached**. Allow the environmental conditions and visitor experiences to degrade only to the minimally acceptable standard. Recreational access should not be substantially restricted until the standards are reached.

6. **Compromise the other goal <u>as much as necessary</u>**. Once standards for environmental conditions and visitor experiences are reached, no more degradation is allowed, and recreational access is restricted as needed to maintain standards.

Looking at the basic logic of the LAC process in this way is helpful for several reasons. First, this way of thinking illustrates that the fundamental challenge in visitor use management is not so much the resolution of resource protection and visitor use conflicts. Instead, the emphasis should be on defining *complementary* visitor experience opportunities and resource conditions, and then determining to what extent unrestricted recreational access can be accommodated. Second, this logic allows managers to recognize that *unrestricted* access — a value held strongly by many recreationists — is a valid goal, but one which cannot always be accommodated in light of the equally valid goals of visitor experience diversity and resource protection. Third, an understanding of the generic thought process is helpful in understanding how the various frameworks may be

adapted or fine-tuned for different situations without losing the critical elements of the frameworks. Fourth, because there has been interest on the part of managers to apply the LAC process to problems other than carrying capacity, the examination of the generic process helps in determining the situations in which such applications may be useful and those situations in which they may not.

With this background in mind of the basic logic of the carrying capacity and LAC approaches, consider several case studies. Which approach was used in each of the examples below? Was the approach effective? (We will discuss the details of how to apply LAC methodology in the next section.)

Case studies: Galapagos and the Seychelles

Handout 3.3 - Visitor Numbers at Galapagos National Park

Handout 3.4 - Cousin Island, Seychelles

Methods of Controlling Excessive Visitor Impacts

Handout 3.5 – Management Options for Managing Visitor Numbers

If carrying capacity or LAC thresholds are exceeded, there are several general management strategies that managers can choose from to address recreational use impacts:
1. **Increase the supply** of recreational opportunities, areas, and facilities to accommodate increased demand.
2. **Reduce public use** at specific sites, in individual management zones, or throughout the park.
3. **Modify the character of visitor use** by controlling where the use occurs, when the use occurs, what type of use occurs, or how visitors behave.
4. **Alter visitor attitudes and expectations.**
5. **Modify the site or resource** by increasing the durability of the problem site, or by maintaining or rehabilitating the site.

In the above strategies, there are many specific management actions or tactics that can be used. These tactics fall into five general categories:

1. **Site management** (e.g., facility design, the use of vegetation barriers, site hardening, area/facility closure)
2. **Rationing and allocation** (e.g., reservations, queuing, lotteries, eligibility requirements, pricing)
3. **Regulation** (e.g., the number of people/stock, the location or time of visits, activity, visitor behavior, or equipment)
4. **Deterrence and enforcement** (e.g., signs, sanctions, personnel)
5. **Visitor education** (e.g., promote appropriate behavior, en-courage/discourage certain types of use, provide information regarding use conditions)

Examples of Specific Management Options to Reduce Visitor Impacts
Within this general framework of strategies and tactics to reduce visitor impacts, there are a wide variety of possible actions. The list below, and the accompanying handout, gives some examples. You may be able to think of others.

- **Seasonal or temporal limits** on use, e.g. limiting visiting times; restricting car parking, accommodation facilities or public transport; ensuring visits occurs at appropriate times of day (which may vary diurnally and seasonally)

- **Regulating group size**, particularly for specialist activities; requiring pre-registration (visits only by prior arrangement); providing guided tours that allow for more control and maximize enjoyment.

- **Restricting visitor behavior**, e.g. ensuring that visitors stay on specified routes and do not trample vegetation or disturb animals, and that noise and the use of light at night (e.g. during visits to turtle nesting beaches) is minimized.

- **Using zoning**, e.g. closing area to visitors, or reducing visits to ecologically important areas.

- **Increasing entrance fees** at peak periods or to popular areas.

- **Constructing facilities and trails** that reduce impact but allow more visitors and help them to see the wildlife - boardwalks, overlooks, hides, pontoons, etc.

- **Providing garbage bins** to encourage visitors to not leave litter.

- **Educating visitors** via visitor guidelines, codes of conduct, information boards, etc., made available at the MPA or distributed through tourism facilities.

- **Increased guide training** to increase visitor education and monitor visitor behavior.

Certain specific habitats may be amenable to specific types of management actions. For example, mangrove forests are commonly protected by constructing boardwalks. See the accompanying handout for some "best management practices" for mangroves and coral reefs.

Handout 3.6 - Best Management Practices for Mangroves & Reefs

Visitor education should be a major component of visitor impact management. Not only can it alter visitor behavior and thus directly reduce impacts, but it can also enhance the visitor experience and spread the sustainability and conservation message. Sustainable tourism attracts an ideal audience for environmental education. Visiting mangroves and coral reefs, seeing marine mammals and other marine life, visitors want to understand what they are experiencing, as well as the challenges of conserving these resources. At the same time, visitor guidelines for low-impact behavior at specific sites and habits can be distributed to guides and visitors. Education will be discussed in more detail in a later module.)

Handout 3.7 - Tips for Beach-Goers, Divers and Boaters

3.2 METHODOLOGY FOR MONITORING IMPACTS

The techniques outlined above require active and ongoing monitoring – of visitor numbers, indicators, visitor behavior, and so on. Without monitoring, the MPA manager cannot know whether a problem is developing, nor whether the desired standards are being met. The effective monitoring of resource and social indicators provides the feedback and documentation needed to implement meaningful management action.

Monitoring may identify one of two situations that should trigger corrective actions:

1. Deterioration. One situation that would trigger action would be monitoring data that document that resource or social conditions are deteriorating over time, i.e., a trend is identified that shows conditions are moving toward the minimum acceptable standard. In this case, management action may, and perhaps should, be taken to slow or reverse the trend. If conditions are still better than the standard, actions should be selected that will not restrict recreational access to any substantial degree. Remember that in the LAC process, the ultimate constraining goal (environmental conditions and visitor experiences) may be compromised to the minimum acceptable standard before the second goal (unrestricted access) is allowed to be compromised substantially.

2. Out of Standard. The second situation that would trigger management action would be monitoring data showing that resource or social conditions are out of standard, i.e., conditions are unacceptable. This is a more urgent situation. In this case, management action should be taken that restricts or modifies recreational use *as much as necessary* to restore and maintain acceptable conditions.

If either of these situations occur, managers will need to select appropriate strategies and tactics such as in the lists and handouts provided above.

To aid planners and managers in selecting among the many possible management tactics, there are several questions, or _selection criteria_, that may make decisions easier. Answers to these and related questions can help to assess the trade-offs or the costs of competing actions:
- Does the tactic adequately address the underlying *cause* of the impact or visitor use problem?
- How effective is the tactic likely to be in resolving the impact in question?
- Is the tactic likely to lead to the creation of new problems?
- Is the tactic subtle or obtrusive, in terms of visitors being aware that they are being managed?
- Is the tactic direct or indirect, in terms of how it impacts or influences visitor behavior?
- Does the tactic preserve the visitors' freedom of choice?
- Does the tactic affect a large or small number of visitors?
- Does the tactic affect an activity to which some visitors attach a great deal of importance?
- Are visitors likely to resist the management action?
- What are the costs to managers in implementing and administering the tactic?

After considering these and other questions, and weighing the trade-offs, park managers

may select the strategies and tactics that best suit their situation and that they believe will most effectively address visitor impacts while minimizing total costs to managers, visitors, other stakeholders, and resources.

Methodology for Limits of Acceptable Change

There are two very good methodologies that can be used to monitor visitor impacts: "Measures of Success" and "Limits of Acceptable Change." As mentioned above, Limits of Acceptable Change (LAC) has evolved specifically to allow tourism to address the shortcomings of the carrying capacity concept, although it has also been applied to more general management situations. Measures of Success can be applied to any management planning situation, not just tourism, and relies primarily upon the setting of objectives that can be easily monitored.

As discussed above, LAC accepts that change is inevitable but sets limits on what degree of change is acceptable. To implement an LAC methodology, MPA managers will need to consult with stakeholders to determine a common vision of what a site's acceptable conditions should be; set indicators and standards related to the amount of change stakeholders deem to be unacceptable in those sites; and monitor to continually assess the effects tourism is having upon the previously-determined standards.

If an indicator passes over the agreed-upon acceptability threshold, then management must take action to mitigate negative impacts. *The LAC approach forces managers to come to grips with the details of management in a way that goes far beyond any simple number for overall carrying capacity.* In addition, by setting limits of acceptable change that involve as many stakeholders as possible, managers acquire much more credibility when they request or require management changes that affect other people, such as tour operators, guides and community people.

Handout 3.8 - Types & Examples of Indicators

Handout 3.9 - Standards for Indicators

Public Participation
A key aspect of the LAC process is that it involves stakeholders. Standards and indicators, and courses of action, are determined in participatory meetings with stakeholders. Stakeholders are not just informed of the indicators and standards; *they help decide them*. The experience of the U.S. Forest Service in developing and modifying the LAC process has shown that *stakeholder involvement is essential*.

The process should be guided by a steering committee composed of protected area/ecotourism site managers, tourism industry representatives and community leaders. It would include the following steps:
1. Community meeting to discuss concerns and potential impacts of ecotourism.
2. Steering committee meeting to determine indicators and standards, and to assign monitoring responsibilities.
3. Community meeting to present monitoring program and to discuss limits or ranges of acceptable change.
4. Training of monitoring and analysis team.
5. Implementation of monitoring.
6. Analysis of results, evaluation of management needs, and small-scale management

adjustments made.
7. Community meeting to discuss monitoring results and management recommendations.
8. Continued implementation of monitoring and management.

Case Study: Setting LAC indicators and Standards in Wilson Bay, New Zealand
The LAC system was used to define acceptable water quality in Wilson Bay Marine Farm Zone, New Zealand. This Aquaculture Management Area is over 3000 ha, and harbors the largest block of marine farms in New Zealand, particularly mussel farms. Mussel farms can result in reduction in phytoplankton, with concomitant reductions in zooplankton and larval fish. An LAC meeting attended by all relevant stakeholders agreed on a key indicator - percentage of phytoplankton depletion from average levels - and a standard: 20% depletion over 10% or more of the bay. In other words, if phytoplankton levels drop 20% from average levels over 10% or more of the area, management must take appropriate action. All meeting participants agreed that this was a fair limit. In addition, another standard and indicator were set for individual locations in the bay: if phytoplankton levels drop 25% in a small area near a mussel farm, appropriate action will be triggered. (Participants also agreed on exactly which actions will be triggered.)

Steps of the Limits of Acceptable Change Process

1. Identify the concerns & issues for the area. With stakeholders, discuss your site's unique values, attractions, opportunities, threats and problems.

2. Define & describe opportunities for tourism. Consider all of the different types of activities that sustainable tourism might involve. The desirable activities should then be applied to specific sites/zones. For example, consider where tourists might dive, water-ski, fish, where they might interact with local residents and how, etc.

3. Select indicators: These indicators should be selected for the parameters of greatest concern at a given site in a given zone. They should be indicators directly related to the activities of visitors that can be controlled. The following questions should be asked when identifying indicators:
*   Does the indicator tell us what we want to know? What question are we trying to answer?
*   Does the indicator relate directly to an important resource, social or economic condition?
*   Can the indicator be measured easily and relatively inexpensively?
*   Can the indicator alert managers to a deteriorating condition before it reaches an unacceptable level?
*   Can the indicator be measured without affecting the quality of the visitors' experience?
*   Will the indicator provide information that is worth the time and cost needed to obtain it?
*   Who will carry out the necessary monitoring?

Indicators may include a mix of biological, physical and social measures.
Examples of indicators:
*   Breeding success of seabird or marine mammal colonies
*   Presence or absence of certain key species within the MPA
*   Beach erosion
*   Water quality
*   Noise
*   Crime rates
*   Traffic accidents related to tourism
*   Number of local residents employed in tourism-related jobs
*   Satisfaction of local residents

• Satisfaction of tourists

4. Assess current conditions of the site for each indicator. You cannot set standards for change if you do not know the starting point. For example, if an indicator is "Number of sea lions at breeding colony", you will want to know how many sea lions *currently* breed in the colony. You will also need to assess whether the current conditions are acceptable, or whether they are already below acceptability.

5. Establish standards for each indicator: The standards should set some limit of acceptable change. Some impacts are inevitable, but managers must be willing to say how much impact they will tolerate before changing the way they are managing. If trails are eroding faster than it is feasible to maintain them, if viewing areas are getting too big, if some animals are changing their behavior in an unacceptable way, then management actions must be taken (e.g., group sizes reduced, hardening of some sites, fences put up, patrolling increased). Establishing standards requires taking the indicators from the previous step and *placing a quantitative value on them*: e.g., two landslides per year; 90% of visitors who characterize their visit as "very enjoyable"; two new ecotourism entrepreneurs per year in community X; 25 individual monarch butterflies sighted along trail X between 10 and 11 a.m. on July 20th.

Remember that these quantitative values represent limits of some sort that are acceptable; fewer than 90% of visitors who are "very satisfied," or fewer than 25 butterflies sighted along a given trail at a given time, means that *managers must determine what is wrong and work to fix it*. Establishing indicator standards should involve as many stakeholders as possible so that the standards agreed upon represent everyone's best faith effort, and so that they will commit to trying to achieve these limits. Some standards and indicators should be chosen from each general type of indicator mentioned above. They should also be chosen for each type of visitor environment, usually by using the zoning system set up in your management plan. The types of visitor environment range from intensive use sites where lots of visitors will be found (and there will be high impacts) to primitive and perhaps even wilderness zones, where a high degree of isolation may be desired and managed for (and visitor impact is generally lower).

Another major consideration in choosing standards and indicators is the availability of baseline information. If there is little or no information on which you can base your standards, then you will be making only a very subjective guess about what a realistic standard would be. At first, it may be appropriate to set provisional standards and later adjust them if need be. Bringing in relevant specialists, say a biologist who is familiar with a particularly pertinent species of plant or animal, may help in your decision-making.

6. Decide on appropriate actions to take if a standard is exceeded. (Shown in three steps in the earlier figure). This will be a process of exploring several different possible strategies and then settling on the best one. Specific, step-by-step management actions should be defined for every indicator. Different actions might be triggered by different levels of change, for example, if water pollution passes one threshold, the action might be to limit the number of visitors to an area, while if pollution passes a second, more severe threshold, the area could be closed entirely.

7. Monitor conditions and implement actions: If acceptable limits have been exceeded,

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implement the agreed-upon changes that will bring resource, social or economic conditions back within acceptable limits.

Case Study: Komodo National Park, Indonesia

Management at Komodo National Park developed a comprehensive list of indicators and standards for a wide variety of possible visitor activities in the park, including wildlife viewing and interactions with local community members. A small selection of the propsed indicators and standards is listed in accompanying handout.

Handout 3.10 - LAC Indicators at Komodo National Park

Exercise: Develop Limits of Acceptable Change for an MPA

The large group should select one or two MPAs in which visitor impacts are of particular concern. In small groups, using the worksheets provided and following the method described above, discuss and develop five Limits of Acceptable Change for each MPA. For each indicator, set a standard and appropriate actions. What baseline data need to be obtained before a meaningful limit can be set?

Other Methodologies for Monitoring Impacts

Several other management strategies have been developed that, like LAC, take an adaptive-management approach to monitoring ongoing potential problems and responding to impacts. While not developed specifically for protected areas, they can be useful in some aspects of sustainable tourism management.

The **Measures of Success** methodology applies the concept of adaptive management and sees monitoring as an essential element of project planning and management. In this process, monitoring is integrated into the project cycle and is developed as part of the conceptual model and management plan. Once project goals, objectives and activities are selected, a clear and precise monitoring plan is drawn up. The steps involved in this process are:
1. Determining the audiences for monitoring information.
2. Determining the information needed based on project objectives (which are prepared so that monitoring can determine whether or not they are being met).
3. Designing a monitoring strategy for each information need.
4. Developing one or more indicators for each information need.
5. Applying and modifying the indicators as needed.
6. Determining methods of measuring indicators by using four selection criteria: accuracy/reliability, cost-effectiveness, feasibility and appropriateness.
7. Developing an operational plan for applying the methods: listing the tasks, people responsible for carrying out those tasks, monitoring the sites and a timeline for carrying out the plan.

Another approach for determining project success can be useful in some sustainable tourism circumstances. Entitled "**Threat Reduction Assessment,**" this approach identifies and monitors

threats in order to assess the degree to which project activities are reducing the threats and achieving success. The process contains the following steps:

1. Define the project area spatially and temporally.
2. Develop a list of all direct threats to the biodiversity at the project site present at the start date.
3. Rank each threat based on three criteria: area, intensity and urgency.
4. Add up the score for each threat across the three criteria.
5. Determine the degree to which each threat has been reduced by management activities.
6. Calculate the raw score for each threat.
7. Calculate the threat reduction index score. Precise social science approaches are often easier to apply, particularly by or about community members/projects. Community members become active participants in future mitigation activities by being involved in this assessment.

(For further information on Threat Reduction Assessment and how to apply it, see www.fosonline.org, under Monitoring & Evaluation – Assessing Threats.)

Collecting the Information: Baselines & Monitoring

The use of indicators and standards to assess overall progress requires that site management have good information about past and present conditions at the site. Thus, a specific monitoring program must be incorporated into the site's routine management scheme (if it has not been already). Monitoring requires that certain kinds of information be collected on a systematic, routine basis. Baseline information is crucial, to compare with subsequent data and to assess the direction management is taking. Considerations for monitoring:

Cost - The collection of baseline data and subsequent data should involve procedures that are relatively simple to implement and do not require large investments of time or cost to the site's administration. To the extent possible, the cost of the monitoring program should be financed from tourism revenues.

Personnel - Most of the data should be collected by the site's staff, but strategic use of third parties such as university biologists, naturalist guides, concessionaires and community members should also be considered. Naturalist guides may also be recruited to carry out certain observations on a routine basis. Cooperative agreements can be signed with local universities that permit scientists (e.g., biologists, ecologists) to carry out research in return for providing information that will supply baseline data, or to provide data on an ongoing basis that will allow monitoring of a particular management concern. Site staff may need special training to collect certain data. University scientists can train rangers to identify certain insects, bird songs and plants that may be the object of monitoring activity. They can also be trained to take water samples and even do some basic water sample testing.

Recordkeeping - Some types of data that need to be collected on a daily, systematic basis (which requires a very good recordkeeping system) include: visitor numbers and other visitor characteristics (e.g., age, nationality), fee collection amounts, and visitor observations and complaints.

Visitor surveys & questionnaires - In addition, sustainable tourism management requires frequent evaluation of visitor characteristics and levels of satisfaction with different aspects of the site: facilities, staff, interaction with other visitors, etc. This is usually done using surveys and questionnaires, which can be carried out by site staff or third parties. Ideally, a standard survey addressing the management objectives and indicators of concern should be prepared and presented to a random sample of visitors on a regular basis (for example, every quarter);

alternatively, a select group could be targeted on a more frequent basis, depending upon what is being measured. Visitor comment registers can be placed in strategic places to obtain visitors' opinions. While this is not a scientific method for obtaining visitor input, it can give a sense of what visitors are thinking.

3.3 ADAPTIVE MANAGEMENT

Handout 3.11 Adaptive Management

The ecosystem approach requires **adaptive management** to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning. Ecosystem processes are often non-linear, and the outcome of such processes often shows time-lags. The result is discontinuities, leading to surprise and uncertainty. Therefore, management must be adaptive in order to be able to respond to such uncertainties, and must contain elements of "learning-by-doing" or research feedback. Measures may need to be taken even when some cause-and-effect relationships are not yet fully established scientifically.

Ecosystem processes and functions are complex and variable. Their level of uncertainty is increased by the interaction with social constructs, which need to be better understood. Adaptive management can accommodate this uncertainty by involving a *learning process*, which helps to adapt methodologies and practices to the ways in which these systems are being managed and monitored. Because of the inherent uncertainties, adaptive management for protected areas should also use the *precautionary approach*. Implementation programs should be designed to adjust to the unexpected, rather than to act on the basis of a belief in certainties.

Adaptive management needs to recognize the diversity of social and cultural factors affecting natural-resource use and sustainability.

A key aspect of adaptive management is its *flexibility in policy-making and implementation*. Long-term, inflexible decisions are likely to be inadequate or even destructive. Adaptive management should be envisaged as a long-term experiment that builds on its results as it progresses. This 'learning-by-doing" also allows managers to learn how best to monitor the results of their management actions, and evaluate whether established goals are being attained. Therefore, adaptive management makes monitoring a priority.

Implementing adaptive management in relation to sustainable tourism and biodiversity requires the active cooperation of all stakeholders, and especially those in the private sector, with biodiversity managers. Changes in impacts on biodiversity at a particular location may require rapid curtailment of visits by tourists to prevent further damage, and to allow for recovery, and in the longer-term, may necessitate an overall reduction in tourist flows. It may be possible for tourists to be redirected to less sensitive areas in such cases. In all cases, maintenance of the balance between tourism and biodiversity will require close interaction between tourism managers and biodiversity managers, and appropriate frameworks for management and dialogue are likely to need to be established.

Governments, including designated biodiversity managers, in conjunction with all other stakeholders, will therefore need to understand the need to take actions and occasionally change policies, as appropriate, to address any problems encountered and to keep on track towards agreed goals. This may include changes and additions to conditions set in the original approval, and may require ongoing participation of and consultation with the developer and/or operator of

the tourism facilities and activities concerned, and with local communities. Adaptive management can also be undertaken by all those who have management control over any specific site, including local governments, indigenous and local communities, the private sector, non-governmental organizations and other organizations. ***Where necessary, legal frameworks may need to be reviewed and amended to support adaptive management***, taking into account experience gained.

Handout 3.12 - Adaptive Management Exercise

Exercise: Adaptive management

While the whole group is together, 5 different participants describe 5 different impact scenarios in each of 5 different habitats. In describing the situation, include information such as:
 Baseline condition of resource
 Visitor impact management model (Carrying capacity, LAC, etc.)
 Types and level of human use
 Management actions already in place (zones, signange, etc)
 Infrastructure and capacity to manage

Break into 5 small groups. Each group work on a different scenario and describe what your management responses might be, based on the categories in the matrix in handout 6.11. Each group will then present to the large group.

When determining your response, remember the following tips:

1) First, clearly understand if there is a problem. Is the impact exceeding your impact threshold? Do not find yourself in a situation where you have a solution in search of a problem!

2) Before taking any corrective action, it is important to understand the possible root causes of why conditions are deteriorating.

3) Not all strategies are appropriate in all settings and situations.

4) Don't be afraid to use a combination of strategies.

3.4 COMMUNITY-BASED MANAGEMENT

It should be amply clear by now that a community-based participatory approach is fundamental to a successful MPA. Local community members who are dependent on coastal resources are often the most committed and conscientious trustees of those resources if they receive direct benefits from their efforts. In the preceding sections we discussed the community's role in sustainable tourism, the roles of other stakeholders, and several tools that can be used to gather information from stakeholders. These are just the first steps in an ongoing process of community-based management. We will close this module with an overview of the basic principles of community-

based management.

Involving the public in the planning process helps a planning team to:

• Learn about public concerns, issues, expectations, and values

• Educate people about the planning process, issues, and proposed management action

• Learn about the values placed by other people and groups on the same resources and visitor experience

• Collect data and validate proposals (e.g., information on public values and issues, on how people use a park, on existing and desired conditions, and on the acceptability of proposed indicators, standards, and management actions)

• Define the range of alternatives

• Build support among local stakeholders, visitors, government, and others for implementing the plan

Developing a public involvement strategy is one of the planning team's first tasks. The strategy should outline opportunities for public involvement throughout the planning effort and should be carefully and systematically designed as part of the decision-making process. The public and the planning team should exchange information and ideas throughout the process, not just after decisions have been made. When this does not occur, public comment is likely to be received either too early or too late to be usable, or it may fail to focus on the critical issues.

The public needs to understand how their input will be used, how decisions will be made, and the consequences of potential management action. There should be a link between public comment and decision making, or the public will see no reason to participate.

The success in implementing a public involvement strategy depends upon pre-planning and preparation. For each element in the plan it is important to know *why* the team is involving the public, *what* needs to be accomplished, and *what* information needs to be exchanged between the Park Service and the public. Only after these questions have been answered should the team determine which public involvement techniques would be most appropriate. The timing of public involvement events should be sensitive to the amount of information generated and the decisions made since the last time the team interacted with the public.

The planning team may need to actively solicit the views of some groups that might not otherwise participate and may need to explore alternative forms of public involvement that are sensitive to the groups' needs and culture. It is important to involve as many people, organizations, and agencies as possible that may be affected by or have a stake in the outcome of planning and implementation decisions. All groups and individuals should have equal access to information as well as equal opportunities to interact with the planning team.

Good planning ensures that everyone who has a stake in the outcome of a decision understands and can accept the decision as it is being made. To achieve this objective the public must be convinced and understand that:
• doing something is better than doing nothing
• the planning process is reasonable and fair, and not predetermined
• MPA managers are truly listening to the public
• MPA managers are trying to minimize hardships while still solving the problem
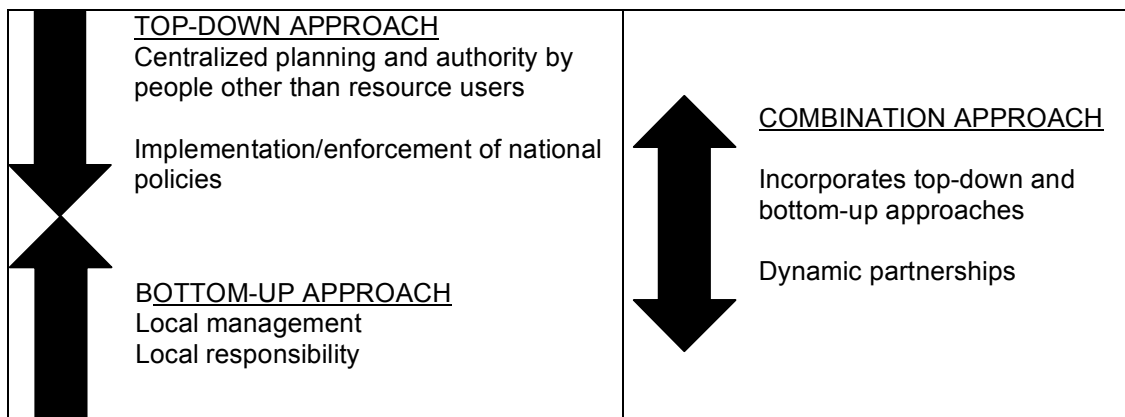
Three Management Approaches

All management strategies consistent of either a top-down, bottom-up or combination approach.

1. Top-down approach — People other than the resource users make decisions about managing resources and enforcing rules. For example: a government department that makes all the decisions and rules about the resources.

2. Bottom-up approach — People who are directly affected by resource use make the major decisions regarding the resource use. For example: a community-based system in which fisher people vote to decide on rules and regulations for fisheries.

3. Combination approach — a mixed approach in which the "top" people consult frequently with the "bottom" people, and frequently use their input and opinions in shaping decisions.

TOP-DOWN APPROACH
Centralized planning and authority by people other than resource users

Implementation/enforcement of national policies

COMBINATION APPROACH

Incorporates top-down and bottom-up approaches

Dynamic partnerships

BOTTOM-UP APPROACH
Local management
Local responsibility

Here is how the following three types of coastal management apply to these three management approaches.

1. Integrated coastal management — Integrated coastal management (ICM) is a "top-down" approach that is characterized by centralized planning and authority. This approach ensures that decisions are consistent with the national legal and jurisdictional framework for coastal management. ICM has many purposes and addresses the connections between development, human activities, biophysical processes, and economic sector activities in inland areas, coastal lands, coastal waters, and offshore waters. ICM, when effective, provides a supporting framework for community-based and collaborative approaches.

2. Community-based coastal resource management — In contrast to centralized planning and authority, community-based resource management is a bottom-up approach that involves local resources users and community members in active management and responsibility for coastal resources. The bottom-up approach assumes that local users, if given responsibility for their resources will manage their resources in sustainable ways and enforce community-derived rules. Bottom-up approaches evolved in response to the failure of more centralized approaches and with the recognition that local management may be more effective than a top-down approach.

> *Community-based management is consistent with the tenets of co-management — described below — since government is always involved in the management process.*

3. Collaborative or co-management of coastal resources — Co-management or collaborative management incorporates both a top-down and bottom-up approach. It describes in reality most management processes by which governments (especially local governments) share responsibility and work together in dynamic partnerships. This collaborative process is based on the participation of all individuals and groups that have a stake in the management framework. Social, cultural, and economic objectives are an integral part of the management framework. Government retains responsibility for overall policy and coordination, while the local community plays a large role in day-to-day management.

> *Co-management also creates the opportunity to take advantage of <u>scientific and technical knowledge</u> (often from outside the community) and <u>local or traditional knowledge</u> (within the community). The former brings the rigors of the scientific method from government agencies and research institutions; the latter contributes site-specific and historical information, customary practices, and traditional values that add local experience and an important social dimension to the MPA planning process.*

The trend in MPA management has been to become more integrated across habitats and sectors, and more focused on community-based or local-level management rather than centralized approaches.

In all cases, equity, respect for traditional knowledge, gender fairness, and empowerment of local resource users are also important components of a participatory community approach.

Levels of Community Involvement

Community participation in management planning and implementation is a continuum. At one end, community members may be completely unaware of what is happening the MPA, and not involved at all in any decision-making. At the other end, community members might keep fully engaged, aware of all available information, and actively decision-makers who take proactive steps in pushing for various management changes. In between, community members can be informed and/or active in decision-making to various degrees.

PASSIVE ⟶ *INFORMED* ⟶ *ACTIVE* ⟶ *DECISION-MAKERS*

Handout 3.13 - Levels of stakeholder involvement

Handout 3.14 - Hypothetical situations

Exercise: Hypothetical Situations

Review the hypothetical situations in handout 5.7 with your group and discuss the following:

1. What groups of individuals were involved in the project activities in each situation?
2. In what ways were they involved?
3. What were (and might be) the benefits of their involvement?
4. What problems might arise in the future?

Participatory Techniques

Discussion: Sharing participatory techniques

What are some of the techniques or tools you use in your MPA to bring the community together? Please explain in detail.

A variety of participatory techniques such as workshops, discussion groups, and seminars can be used to help organize the community, identify issues of concern, identify important stakeholders, and identify potential leaders in coastal and marine resource management. Earlier we looked at some of these techniques for use with local communities (focus groups, surveys, and mapping); here we provide a fuller list of participatory techniques. These same tools will also be useful for talking with other stakeholders, such as the tourism industry stakeholders that we will discuss tomorrow.

Natural group or informal interviews — Casual conversations with groups of people in their natural surroundings. This technique provides a broad overview of key issues.

Focus group interviews — Semi-structured discussions with groups of people with common interests or characteristics. Participants are chosen either using statistical or non-statistical sampling methods (e.g., cross-section of ages, different villages). These techniques are useful for identifying and describing group perceptions, attitudes and needs.

Semi-structured interviews — Interviews using a checklist of topics instead of a detailed questionnaire. The interviewee is encouraged to speak generally on each topic without interruption by the interviewer, who may prompt on items that have been overlooked. This technique enables unforeseen topics to surface.

Brainstorming sessions — A facilitated discussion that is used to identify problems and issues in the community. The purpose of a brainstorming session is to encourage members of the community to think creatively about a particular topic and generate new ideas and opinions. The facilitator writes down all the ideas as they arise and does not encourage lengthy discussions of each one.

Observational walks and boat trips — Undertaken by a group of local people and useful for identifying social, environmental and livelihood issues, and evidence of degradation. This technique often helps local community members to get a new perspective on resources.

Participatory mapping — Large sketches of the local area created with local materials. These maps are discussed in a group and used to gather data on both natural resources and social issues, and to encourage stakeholder involvement. Data can be incorporated into more formal maps through GPS recording.

Venn diagrams — The use of overlapping shapes to illustrate and summarize relationships, conflicts and issues among stakeholders. Stakeholder groups can draw or use pre-cut shapes. The final overlap is captured by the interviewer. This technique can be used during a focus group.

Gender analysis — The study of gender relations and how they might be affected by an intervention, either during the establishment of a MPA or if a new female is introduced into the group.

Many of these techniques can be used in conjunction with each other to develop a **Participatory Coastal Resource Assessment** (PCRA), which is particularly useful in showing community resources and their condition.