

# TOURISM SUPPORT PACKAGE

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## **1. INTRODUCTION AND SUMMARY**

Tourism is a growing worldwide industry, currently accounting for approximately 12 percent of the world's economy. Tourists take more than 300 million trips every year, and often play an important, sometimes principal, role in the economies of developed and developing countries. At the same time, tourism can result in a host of environmental problems ranging from physical destruction of the natural environment associated with tourism-related development, to impairment of the function or value of ecosystems because of pollution and wastes from seasonal influxes of tourist population. Government policy makers increasingly are taking steps to avoid or minimize these impacts through the use of prevention and control options such as land use plans; environmental impact assessments; legislative, regulatory, and enforcement measures; training and education; research and monitoring; and local participation.

### **1.1 Purpose and Overview of the Tourism Support Package**

This support package is a general resource for government agencies and non-governmental organizations investigating the design and enforcement of approaches to manage environmental effects of tourism. It provides an overview of tourism-related environmental problems and presents a number of control options to minimize the environmental impacts of tourism-related operations. The support package surveys tourism's environmental impacts in a variety of countries and discusses several organizations and laws that are used to regulate the industry.

This text covers tourism activities in three types of ecosystems found in most regions of the world—coastal, alpine, and inland. The support package is intended as an initial reference, providing basic information for the most widespread tourism-related environmental problems. More detailed sources of information are listed in the annotated bibliography at the end of this document.

### **1.2 Tourism and the Environment**

Tourism can result in four basic types of environmental damage:

- Restructuring and elimination of the natural environment and land and water resources due to tourism-related development, such as dredging and filling of wetlands, particularly mangrove forests.
- Generation of waste and pollution from tourism activities, such as large increases in untreated and treated sewage, or increased solid waste (garbage disposal problems), which, in turn, can pollute surface and groundwater.
- Direct environmental harm caused by tourists' activities, often within fragile ecosystems. Examples include damage caused by walking on coral reefs or using off-road vehicles in deserts.
- Seasonal increases in population density caused by tourism that intensify problems of the first three types mentioned above and increase the burden on existing local infrastructure, systems, and practices (e.g. water supply, food production, and cultural practices). When these systems fail or deliver reduced services, serious threats to public health safety, and the envi-

ronment can occur.

Tourism-related environmental damage can be extremely serious, not only because of the environmental and human health risks it imposes, but also because of the economic importance to many countries of the environment-dependent tourism trade. Tourism that is poorly managed can damage the resources that attract tourists, so the tourism industry must be sensitive to changes in environmental quality. The biological concept of *carrying capacity* suggests that areas can absorb only a limited amount of tourism activity without significant deterioration of the environment. Strategic planning, and cautious development and implementation of environmental controls, are required to achieve environmentally sustainable tourism and economic growth.

### 1.3 Pollution Prevention and Control Options

There are a number of pollution prevention and control options to mitigate or eliminate the impacts of tourism. The most cost-effective approaches generally focus on pollution prevention, since it is less costly to ensure environmentally safe tourism through planning than to repair damage caused by uncontrolled tourism after it occurs. Most prevention and control options fall into the following categories:

- **Education** - educating tourists, developers, planners, tourist industries, and others about environmentally sound practices;
- **Capacity Management** - limiting the number of tourists, or promoting off-season tourism;
- **Siting** - siting tourist facilities in environmentally appropriate locations and restricting development of, and access to, sensitive areas; and
- **Improvement of Infrastructure** - upgrading water, wastewater, solid waste, and other environmental services to handle the peak population during tourist season.

Specific options for pollution prevention and control depend on the particular type of tourism involved. For more detail, see Section 3, *Principal Tourism-Related Environmental Problems and Associated Pollution Prevention and Control Options*.

### 1.4 Ecotourism

Increasingly, tourist operators and national tourist agencies are promoting “ecotourism” because they believe it has fewer impacts than some more traditional tourist activities. Ecotourism is defined by Hector Ceballos-Lascurain (see Boo, 1990, p. xiv) as follows:

*traveling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying scenery and its wild plants and animals, as well as any existing cultural manifestations (both past and present) found in these areas...*

Other definitions specifically include the idea of ecological sustainability. Ecotourism has been hailed as a way to develop profitable tourism that minimizes the “footprint” left on natural areas by tourists and developers. When properly planned, ecotourism can, indeed, attain these goals. Australia, for example, recently adopted and has begun to implement a National Ecotourism Strategy. This planning initiative is designed to

improve the environmental successes of ecotourism practices. The strategy coordinates public and private efforts to achieve positive economic, environmental, social, and cultural impacts from tourism.

Not all ecotourism efforts are as well designed, however. As in other sectors of tourism, lack of planning and foresight, even in well meaning ecotourism projects, can cause serious negative impacts. Most observers agree that ecotourism is not necessarily more environmentally meritorious than other types of tourism. All types of tourism require adequate measures to protect the environment.

## **2. PROFILE OF THE GLOBAL TOURISM INDUSTRY**

Tourism contributes significantly to the global economy. Worldwide tourism revenues in 1987 totaled almost \$159 billion (U.S.). Within the next decade, The World Bank estimates that tourism will be the single largest industry worldwide. Although European and North American nations continue to receive the most income from tourism, income from tourism in other areas is growing considerably. Combined, Africa, Central and South America, the Caribbean, East Asia and Southern Asia account for approximately 25 percent of the world's tourism revenues. In addition, strong growth is expected in two recently defined sectors of tourism that include significant educational components and must be carefully managed for long-term sustainability. Ecotourism is expected to grow at 25 to 30% per year worldwide throughout the 1990s. Culture-based tourism, centered around cultural characteristics of a destination, such as its history, customs, festivals, food, and folklore, is predicted to grow at 10 to 15% per year for the decade.

### **2.1 Categories of People Involved in the Tourism Industry**

The major groups—or stakeholders—involved in tourism are tourists, local populations (people who live at tourist destinations), tourist service providers (e.g. travel agents, tour operators, hotel companies, and transport companies) and the governments at tourism destinations. Effective interaction among all of these groups is necessary for successful, environmentally sound tourism. In the past, local populations often have been excluded from tourism activities, and problems have resulted. This issue will be discussed further in Section 4.6 on local participation.

### **2.2 Categories of Tourism**

Tourists take many different types of trips. These trips can be classified into four categories based on the environmental characteristics of tourism destinations. Descriptions of these categories are listed below:

- *coastal and marine tourism* - all tourism to beaches, islands, estuarine areas, coral reefs, and oceans, including boating and diving;
- *alpine tourism* - visits to mountains and mountain resorts, including hiking and snow skiing;
- *inland, natural area tourism* - non-coastal, non-alpine dispersed tourism directed toward enjoying wildlife or other natural features;
- *urban cultural tourism* - travel to cities for sightseeing, museum visiting, and historical touring.

Urban cultural tourism will not be discussed in this support package, because the environmental problems caused by urban tourism are hard to distinguish from those caused by the larger urban setting. Each of the other categories of tourism, however, creates different environmental problems (although there are overlaps), and each requires specific responses.

### **3. PRINCIPAL TOURISM-RELATED ENVIRONMENTAL PROBLEMS, AND ASSOCIATED POLLUTION PREVENTION AND CONTROL OPTIONS**

The three categories of tourism activities considered here can cause a variety of human health and environmental problems. Coastal and marine tourism, for example, may involve seasonal visits of large numbers of people often in fragile environments. Common problems include coastal and groundwater pollution, potable water overuse and shortages, dune erosion, sediment deposition, and destruction of coral reefs and mangrove ecosystems (both of which are important for marine and coastal wildlife, as well as sport and commercial fishing). Figure 1 summarizes some of the activities, problems, and control methods associated with coastal tourism.

Alpine tourism also places large numbers of people in very fragile environments. Problems include trampling or removal of vegetation, excessive withdrawal of water from alpine streams, destruction of wildlife habitat, creation of barriers to wildlife migration, and littering. Figure 2 summarizes some of the activities, problems, and control methods associated with alpine tourism.

Tourism in inland, natural areas can cause destruction of plants and wildlife habitat, interference with wildlife habits, forest fires, damages from roads and cars, and infringement on local populations. Figure 3 summarizes some of the activities, problems, and control methods associated with inland natural area tourism.

figure 1

figure 2

figure 3

#### **3.1 Environmental Problems and Control Options for Coastal and Marine Tourism**

##### *3.1.1 Development of Hotels and Resorts*

###### Associated Environmental Problems:

- Coastal construction can remove stabilizing beach vegetation and change the coastal structure and along-shore wave movement, causing undesirable erosion and deposition patterns.
- Hotels often dump raw or under-treated sewage into receiving water or use septic tanks in unsuitable soils near the shore, resulting in deposition of untreated sewage into the ocean or bay. Hotels also can dump large quantities of treated sewage. These actions can increase levels of pathogens and nutrients in the water, creating human health hazards and algal blooms, and eliminating desirable marine plants and animals.
- Land developers that clear mangrove forests or drain swamps to create suitable sites for hotels and resorts destroy habitat for commercially important or threatened species of plants and animals.
- Hotels and resorts can cause depletion of underground water supplies due to excessive pumping of

fresh water for operations in coastal areas, which are frequently short of other fresh water sources.

- Developments can cause saltwater intrusion due to lowered water tables or depleted freshwater lenses.
- Resort developments create large amounts of solid waste, which can create health hazards and contaminate underground water supplies.
- Large developments can cause visual and noise impacts that discourage wildlife and disrupt the natural characteristics of tourist areas.
- Resort development can cut off local people's access to coasts and beaches.
- Development of hotels and resorts is accompanied by development of access accommodations such as roads and bridges, which can cause additional environmental problems.

#### Control Methods and Examples:

- Enact legislation to control land use types, densities and the conditions under which development will be permitted and to set aside specific areas for conservation, managed resource use, and development. Land use controls can establish maximum densities for buildings and minimum setback distances for construction from mangroves, coastal rivers, or coastlines. In Fiji, the Mangrove Management Plan has successfully analyzed mangrove ecosystems and set aside various use categories for these ecosystems.
- Conduct natural resource surveys and inventories to identify environmentally sensitive sites, and to direct developers to build on sites where the least ecological damage will be caused.
- Extend, upgrade, and maintain the capacity of public infrastructure such as sewers, stormwater controls, roads, and water supplies and delivery systems to accommodate the increased needs of tourists. Funding for such activities may be raised as a condition of development (impact fees) or from increased taxes on tourism operations.
- Require developers to take soil erosion and runoff control measures during construction to reduce erosion and sedimentation.
- Require large resort developers to connect to or construct a centralized sewage treatment plant, and small developers to use adequately maintained septic tank systems, or other on-site facilities. In Mauritius, the government requires hotels with more than 75 rooms to install water and sewage treatment plants. Hotels with fewer than 75 rooms are allowed to use septic tanks that have been approved by the Ministry of Health.
- For solid waste, require each development to provide proper garbage containers and collection, and require each development to make arrangements to dispose of wastes at environmentally sound facilities approved by national or local authorities.
- Place restrictions on the amount of water that developers can pump from aquifers, and require them to install water recycling and/or rainwater catchment systems. In extreme cases of water depletion, require developers to construct facilities to provide adequate fresh water for the tourists they attract. In the Virgin Islands, some developers must construct desalinization plants to provide fresh water.
- Require developers to provide beach and coastal access to local residents.
- Promote and encourage environmentally sound hotel and resort buildings and areas. Environmental design measures, such as use of permeable surfaces where possible, should be incorporated in development projects.
- Encourage small scale facilities such as guesthouses.
- Establish a permitting process to track and regulate coastal development projects. Follow up permitting activities with adequate monitoring and inspections.

### 3.1.2 *Marina Development*

#### Associated Environmental Problems:

- Marina development is often accompanied by dredging, filling, breakwaters, and increased boating which increase turbidity in the water and can be detrimental to marine life.
- Dredging and filling also can result in local flooding or restricted access to water.
- Various wastes that are abundant at marinas, such as fish wastes, solid waste, sewage, and fuel wastes, are deposited in the water.
- Anti-fouling and other chemicals containing metals and toxic compounds can accumulate in local waters, harming shellfish and other marine life.

#### Control Methods and Examples:

- Establish restrictions on floodplain development to minimize fluctuations in water levels.
- Require turbidity-reduction measures, such as hopper dredging, or silt fences when dredging to prevent sediment loading on reefs and other habitats.
- Site and design marinas to promote flushing of local waters.
- Designate proper areas where dredge materials can be deposited.
- Require marinas to install pump-out facilities for both human waste and oil, and install other on-site facilities to handle fish wastes and sewage (e.g. restrooms).
- Use ecological studies and sound construction techniques to ensure that each marina is developed at sites that minimize impacts on coastal erosion. In the Maldives, boat piers are designed on pilings, to minimize beach erosion and deposition.
- Limit the total number of slips and moorings in an area, so that the number of boats does not exceed the environmental carrying capacity.
- Design docks to keep gasoline spillage to a minimum.
- Require gasoline vendors to install vapor-catching devices on their pumps.
- Restrict boat maintenance to approved areas and ban harmful anti-fouling paints.

### 3.1.3 *Boating and Use of Cruise Ships*

#### Associated Environmental Problems:

- Oil seeps into the ocean or bay.
- Exhaust fumes harm air quality.
- Anchors are often dropped or dragged on coral, sea grass beds, or other fragile habitats.
- Wakes from boats can cause shoreline erosion.
- Sediment disturbance and settling from larger boats can harm coral and other marine life.
- Raw sewage, plastics, and other wastes are discharged directly into oceans or bays.

#### Control Methods and Examples:

- Designate “no anchoring” areas in fragile habitat areas, and require large boats (especially cruise ships) to stay out of shallow areas to prevent sediment disturbance. Bonaire, a Caribbean island with scenic reefs, has developed an underwater park to prevent damage from boats and allow low-impact visitation. The park charges divers an annual fee.
- Require tourism operators to place stable mooring buoys in reef/lagoon areas, so that reefs will not be harmed by anchors. Saba, an island of the Netherlands Antilles, employs such a mooring buoy system.
- Print and distribute maps and educational materials on proper anchoring and mooring of boats.
- Impose penalties for violating boating and anchoring rules.
- Limit the number of marinas, boats, and cruises in the tourism area.

- Require boats to have waste holding tanks and use marina pump-out and trash disposal facilities on a regular schedule.

#### 3.1.4 *Sightseeing/Wildlife Watching*

##### Associated Environmental Problems:

- Litter.
- Hiking through fragile habitats can cause loss of vegetation and dune erosion.
- Fires started by campers can cause large vegetative and habitat losses.
- Sightseers can disrupt the natural habits of wildlife.

##### Control Methods and Examples:

- Restrict access and designate specific areas for hiking.
- Ban the use of disposable plastics in the marine environment.
- Develop management plans for both heavily used, biologically sensitive areas and species.
- See camping/hiking in the section below, titled “Environmental Problems and Control Options for Inland/Natural Area Tourism” for other examples.

#### 3.1.5 *Sport Fishing*

##### Associated Environmental Problems:

- Excessive recreational fishing can deplete fisheries.
- Fishing equipment often is deposited in waters. Some of this equipment, such as lead sinkers and tangled line, can be harmful to wildlife.
- See Boating above for other problems and controls related to fishing.

##### Control Methods and Examples:

- Design a permit/license program for sport fishermen. The number of licenses can be limited to sustainable harvest levels or license fees could be set high enough to reduce the number of fishermen and pay for enforcement and fisheries enhancement programs.
- Set catch restrictions based on fish size, number, species, or season.
- Enact gear restrictions that limit the types of fishing tackle that can be used. For example, require the use of barbless hooks, which allow more fish to escape than do barbed hooks.
- Limit the number of deep-sea fishing charter operators or boats.
- Develop a “catch and release” program for some fishing operations.

#### 3.1.6 *Diving/Wading/Souvenir Shop Sales*

##### Associated Environmental Problems:

- Wading on reefs at low tide severely damages coral.
- Divers can damage coral by touching or brushing it with equipment.
- Divers take coral souvenirs or disrupt the activities of marine life.
- The tourism industry and souvenir shops create an incentive for divers and local entrepreneurs to take coral and other marine “valuables” for resale.

### Control Methods and Examples:

- Prohibit coral, shell, and wildlife collecting and sales, or limit collection to sustainable levels, with stiff penalties for violations and incentives for reporting violations. For example, in the Maldives, the display and sale of stuffed turtles and tortoises is prohibited in stores. Also, in the Philippines, the sale and export of coral and shell has been banned since the 1980s.
- Prohibit the touching of coral by divers and snorkelers.
- Educate tour operators and tourists on how to observe, but not harm, wildlife.
- Educate operators of souvenir stores (especially locals) to sell non-threatened items. Involve local people in the management of conservation and ecologically sensitive areas.
- Develop management plans for both heavily used, biologically sensitive areas and species.
- Develop community-based ranger and volunteer programs.

### *3.1.7 Off-Road Vehicle Use*

#### Associated Environmental Problems:

- Vehicle use on beaches and dunes can destroy stabilizing vegetation and cause erosion.
- Vehicle use in wildlife habitats can destroy both plants and animals.

#### Control Methods and Examples:

- Restrict access to areas that can sustain off-road use with minimal environmental harm.
- See trail use in the section below, titled “Environmental Problems and Control Options for Inland/ Natural Area Tourism” for other examples.

### *3.1.8 Overburdening of Infrastructure*

#### Associated Environmental Problems:

- Construction of airports and other infrastructure to accommodate tourists can cause many of the same problems as resort development.
- High-volume traffic can cause air quality problems, damage roads and bridges, and increase maintenance costs.
- Increases in the levels of noise and light pollution arise from development, airplanes, and tourist facilities.
- Roadways and other impervious surfaces can generate runoff and combined stormwater-sewer overflow problems.

#### Control Methods and Examples:

- Promote off-season tourism and de-emphasize peak-season tourism through restrictions on the number of hotel rooms or peak-season tourist taxes.
- Limit cruise ship arrivals and weekend cruise calls.
- Set overall capacity limits for tourists, vehicles, and development.
- Use peak season tourist taxes to finance infrastructure improvements.

## 3.2 Environmental Problems and Control Options for Alpine Tourism

### 3.2.1 *Ski Resort Development and Operation*

#### Associated Environmental Problems:

- Construction and development of resorts can cause impacts similar to those caused by development in the coastal zone. See development of hotels and resorts in the section above, titled “Environmental Problems and Control Options for Coastal and Marine Tourism” for more examples.
- Sewage from resorts can pollute rivers and streams, injuring fish and wildlife and creating health hazards.
- Water removed from streams to accommodate resort visitors to make snow for skiing can reduce fish and wildlife habitat.
- Construction of ski trails destroy vegetation, reduce wildlife habitat, and force animals to relocate.
- Building structures, roads, and parking lots in fragile alpine environments depletes rare habitats and degrades aesthetic scenery.

#### Control Methods and Examples:

- Construct or upgrade sewage treatment plants for on-site treatment. Such treatment plants can remove pathogens and wildlife-disturbing chemicals from wastewater and restore water quality. In the Rio Hondo Watershed of New Mexico, USA, upgrades to a sewage treatment plant at a ski resort resulted in reduced nutrient loading and improved biological conditions in the Rio Hondo.
- Limit the number of skiers allowed to use a particular ski area by using a reservation system. If the number of skiers is fixed below the carrying capacity of the infrastructure, then no large-scale pollution/sewage problems should occur.
- Enact zoning laws that prohibit development in fragile ecosystems. In Cortina d’Ampezzo, an Italian ski resort area, the town adopted legislation to prevent construction at an altitude above 1,600 meters. This law helps to protect delicate areas and preserves the beauty of the area.
- Require resorts to use water recycling techniques. In many ski resorts of the western USA, gray water (all wastewater except toilet water), is recycled into toilets, toilet water is collected, treated, mixed, and diluted with snowmelt in a basin, and the dilute treated water is then used to make snow, which disperses and further dilutes the treated water.
- See development of hotels and resorts in the section above, titled “Environmental Problems and Control Options for Coastal and Marine Tourism” for other examples.

### 3.2.2 *Roadway and Parking Lot Construction*

#### Associated Environmental Problems:

- Animal migration between “alpine life zones” is interrupted by roads, traffic and parking lots. The term “life zones” refers to small alpine areas that are marked by distinct micro-climate conditions. These small areas are very susceptible to harm because they are contained within geographically narrow altitude ranges of several hundred meters. Animals must migrate to other life zones or other areas of the same life zone when resources are low in their current area.
- Road and parking lot construction can cause sediment to run off into streams, damaging water quality.
- Construction can destroy or degrade fragile habitats and wildlife.
- Road construction can reduce or restrict the flow and use of surface and groundwater.
- Construction of roads and parking lots can attract higher volumes of traffic. See automotive touring in the section below, titled “Environmental Problems and Control Options for Inland/Natural Area Tourism” for more information.

#### Control Methods and Examples:

- Build and maintain animal passageways and crossing zones. Passageways, including elevated roads and tunnels, should be included in initial road design.
- Design and locate roads to minimize erosion.
- Revegetate areas adjacent to roads.
- Use landscaping, mulching, and hydroseeding to prevent soil erosion and sedimentation.
- Establish frequent public transportation and limit access and parking to reduce construction of roads and parking lots. Sun Valley, Idaho, USA has no parking at ski areas, and Sun Mountain, Alberta, Canada has no private auto access up the mountain to the ski area.
- Design proper drainage and culvert systems to limit the impacts of road construction on watersheds and aquifers.
- Use permeable surfaces for parking lots to promote groundwater recharge and reduce erosion and downstream sedimentation.

#### 3.2.3 *Hiking, Camping, Climbing, and Snowmobiling*

Associated Environmental Problems (for hiking and camping problems that are not specific to alpine tourism, see Hiking and Camping in the section below, titled “Environmental Problems and Control Options for Inland/Natural Area Tourism”):

- Trails of litter can accumulate along mountaineering routes.
- Hiking and rock climbing can increase erosion and cause landslides.
- Snowmobiling and other outdoor activities cause compaction of tundra and can disturb wildlife habitat.

#### Control Methods and Examples:

- Require hikers to pack and dispose of their own garbage; establish fines for littering.
- Limit the number of mountaineers by using licensing, reservation programs, and fees for using mountain routes; use fees to finance trail maintenance.
- See hiking and camping in the section below, titled “Environmental Problems and Control Options for Inland/Natural Area Tourism” for other examples.

### **3.3 Environmental Problems and Control Options for Inland/Natural Area Tourism**

#### 3.3.1 *Hiking and Camping*

##### Associated Environmental Problems:

- Off-trail trampling can cause erosion, eliminate ground cover, and thereby stress wildlife.
- Hikers and campers often discard litter.
- Human wastes can add pathogens to the soil and water.
- Campfires built by campers increase the risk of forest fires and deplete wood resources.
- Weeds and foreign plant species can be introduced into ecosystems by man-made hiking trails.

##### Control Methods and Examples:

- Require wilderness campers to obtain permits and learn park rules. In Shenandoah National Park in Virginia (USA), campers must obtain a permit (which comes with a list of park rules) in order to camp. The National Park Service fines people camping without a permit. The permit is currently free, but a fee could be charged to limit the number of campers if necessary.
- Provide well-marked trash disposal bins, along with collection services so that mountaineers have a

place to discard trash.

- Place signs that communicate park rules. Along stretches of the Appalachian Trail in the eastern United States, signs warn against making fires.
- Construct trails, so that hiking is concentrated along one route. Forcing hikers to stay on trails prevents trampling of vegetation and localizes damage. Paved trails can be constructed in areas that are burdened with large numbers of hikers.
- Place physical barriers around fragile areas to limit access and prevent damage.
- Ban firewood collection and campfires, and assess penalties for violations.
- Build hut systems along trails and charge fees for hikers to stay in the huts. In the White Mountains of New England (USA), such a hut system is used to localize damage caused by hiking and camping.
- Restrict camping to certain areas.
- Use sterilized building materials such as gravel for trail and amenity construction. Sterilization ensures that no foreign plants will overtake natural vegetation.

### 3.3.2 *Automotive Touring*

#### Associated Environmental Problems:

- Automotive exhaust degrades air quality.
- Vehicles often strike and injure or kill animals on roads.
- Sediment, oil residues, road salts, and other harmful substances that wash from roads into streams and rivers can degrade water quality and threaten fish and other aquatic resources.
- Traffic congestion causes visual and noise pollution, which can be detrimental to the natural habitat, and the tourist experience.

#### Control Methods and Examples:

- Provide and promote public transportation, so that fewer vehicles use park roads. Denali National Park, Alaska, USA, limits access to buses in most areas of the park.
- Grant or auction off rights to drive on certain roads in parks to one or a few tour operators and ban private autos from the roads. In Grand Canyon National Park in Arizona (USA), West Rim Drive, which is the only viewing road along a scenic portion of the canyon, is closed to private vehicles in the summer.
- Prevent bus and auto idling in scenic areas. Mexico has a law that prohibits bus idling.
- Limit park entry by setting maximum numbers of vehicles allowed into parks, raising park entry fees, and limiting parking accommodations.
- Limit the use of road salts.
- Reduce speed limits and enforce them with fines.
- Strategically place signs that warn of animal crossings.
- Set up barriers and crossing zones for animals.

### 3.3.3 *Boating and Use of Inland Waters*

#### Associated Environmental Problems:

- Boating and anchoring can damage submerged aquatic vegetation and underwater habitats.
- Human and boating wastes can reduce water quality.
- Shoreline development and boating can cause shoreline erosion.
- See boating and use of cruise ships, marina development, sport fishing, and development of hotels and resorts in the section above, titled “Environmental Problems and Control Options for Coastal and Marine Tourism” for other examples.

#### Control Methods and Examples:

- Require boaters to take a class on proper boating operation to protect habitats and submerged aquatic vegetation.
- See boating and use of cruise ships, marina development, sport fishing, and development of hotels and resorts in the section above, titled “Environmental Problems and Control Options for Coastal and Marine Tourism” for additional controls.

#### 3.3.4 *Trail Riding (Off-Road Vehicles, Bikes, and Horses)*

##### Associated Environmental Problems:

- Vehicles and horses can destroy vegetation and wetlands.
- Heavy, intensive use of trails can result in soil erosion and, subsequently, sedimentation of streams.
- Noise, trampling, and other activities disturb wildlife.
- Horse manure can introduce bacteria and other harmful elements into water courses.

#### Control Methods and Examples:

- Designate uses suitable to the environment; e.g., permit off-road vehicles only in the least sensitive areas.
- Ban trail riding where necessary, for example, to protect an endangered species.
- Require permits and fees for trail riding to limit the number of riders.
- Require owners to clean up by using bags and dispose of horse droppings.

#### 3.3.5 *Safaris*

##### Associated Environmental Problems:

- Hunting and poaching depletes wildlife and reduces the attractiveness to tourists.
- Vehicles that roam around safari lands can destroy soils and vegetation.
- Noise and commotion from tourists chasing animals in trucks and aircraft interfere with animals’ habits and routines. Some animals, such as cheetahs in Kenya, have become so disturbed at times that they do not feed, mate, or raise their young.
- Large numbers of people have recently chosen safaris for vacations, causing sizable increases in demand on tourist facilities and development of new facilities, encroaching on and threatening the very wildlife that attracts tourists and sustains local inhabitants.
- Protected animals from safari parks interfere with the lives of local people. Park animals roam on private lands, competing for food and water with people and domestic animals, which causes locals to build fences and shoot wildlife.

#### Control Methods and Examples:

- Establish national parks or wildlife conservation areas that are designed to protect natural beauty and wildlife. Different areas can be set aside for special purposes. For instance, in Kenya, eight percent of the territory has been protected at 52 national parks and preserves; some parks allow concentrated animal viewing with mini-bus tours, some charge high fees to camp in isolated areas, and some are off-limits to tourists.
- Make national parks partially responsible for their own income and expenditures. Parks should establish fees and use revenues to hire well-trained and equipped personnel to enforce environmentally sound park regulations. Tourist revenues also can pay for wilderness (non-tourist) area management.
- Charge high entrance fees to keep parks from being overcrowded, and charge higher rates for foreigners than for locals. This practice allows local people to enjoy their natural heritage and may support

a sense of local pride that increases park and wildlife protection.

- Involve local people in the management of parks and tourist facilities, and allow them to receive a fair share of tourism revenues.
- Educate tour operators and tourists to be respectful of local customs and well-mannered in dealings with local people.
- When overcrowding is occurring in parks, ban development of additional tourist accommodations and expansions of existing ones.
- Ban the trade of endangered wildlife products such as ivory.
- Set minimum flight altitudes for aircraft that are used to view animals and landscapes (airplanes, hot air balloons, etc.) to avoid interference with animals.
- Carefully place roads for viewing in vehicle-oriented parks. Although building roads can damage the natural environment, often it is less damaging than allowing vehicles to roam freely.

#### **4. PLANNING, MONITORING, ENFORCEMENT AND COMPLIANCE APPROACHES**

Careful planning is required to ensure that tourism is sustainable and does not exceed the carrying capacity of its environment or deplete natural tourist attractions. Planning is particularly important in countries where tourism is a new phenomenon, and the environment is still relatively undisturbed. In such cases planning and cautious tourism development can prevent costly mistakes. Planning for environmentally sustainable tourism can occur at the international, national, regional, and local levels. The major components of integrated tourism planning at any level include:

- Land use plans.
- Environmental impact assessments.
- Legislative, regulatory, and enforcement measures.
- Research and monitoring.
- Training and education
- Local participation

##### **4.1 Land Use Plans**

Land use planning and regulation is used to concentrate development and use in appropriate locations and preserve high-valued or unique ecosystems such as wetlands or coastal regions. Land use planning involves establishing desired goals; evaluating the land's potential; identifying alternatives for achieving goals based on this potential; and controlling the amount, type, and timing of development based on environmental and economic characteristics of the land. Land use restrictions can be used to regulate indirectly the number of tourists by limiting facilities.

##### **4.2 Environmental Impact Assessments**

Environmental impact assessments identify potential impacts of development and propose actions that avoid, reduce, or mitigate them. Environmental impact assessments can help policy makers and land use planners judge the suitability of tourism development projects before they begin. Because environmental impact assessments are performed before projects are begun, they can be used to suggest changes in project design to prevent costly environmental degradation.

Typically, environmental impact assessments include three main sequential analytical functions: identification, prediction, and evaluation. Identification involves describing the pre-project environmental status (geology, hydrology, habitat, etc.), as well as the parts of the project that may affect different environmental media (air, soil, water, wildlife, etc.). Prediction involves estimating (quantifying) the impacts of the proposed development. Evaluation involves measuring the consequences for people who will be influenced by the development, and assessing the need for alternative actions or remedial measures. A thorough environmental impact assessment should provide decision makers with enough information to make a decision as to whether a tourism project should be initiated in its proposed format, balancing environmental considerations with the economic and social benefits of the project, or whether certain restrictions or design changes could reduce environmental impacts without unreasonable changes in tourism benefits.

### **4.3 Legislative, Regulatory, and Enforcement Measures**

Tourism is rarely singled out in legislation. Environmental management measures relevant to tourism are usually found in laws and regulations that are aimed at reducing environmental damage caused by all forms of development. Such environmental legislation, regulation, and enforcement should typically address the problems associated with tourism, such as water quality, sewage treatment, wildlife protection, and pollution prevention.

Lawmakers, regulators, and enforcement agents can use several different methods to encourage developers, citizens, and tourists to observe sound environmental practices. Some of these methods include performance standards, deadlines for compliance with standards, penalties for environmental damage, and economic instruments (i.e. fee systems, subsidies, deposit-refund systems, and market simulations). In applying these methods to control environmental damage, lawmakers, regulators, and enforcement agents generally prefer to keep regulations, permit systems, and penalty procedures as simple as possible to facilitate enforcement actions.

### **4.4 Training and Education**

All stakeholders involved with tourism can benefit from either formal training or some education on the environmental and social effects of tourism. Training allows suppliers and users of tourist services to implement environmentally sound tourism practices. Suppliers of tourist services can sensitize tourists and the public to environmental problems by educating them with, for example, a code of environmentally appropriate conduct, or advertising materials.

### **4.5 Research and Monitoring**

Research often is useful to survey natural resources and to determine both the carrying capacity and desired rate of tourism growth for a tourism destination. Monitoring should identify environmental damage and lead to changes when a project is not meeting environmental standards. Regular data collection can identify trends in environmental improvement and deterioration.

### **4.6 Local Participation**

Local input and involvement are essential for the long-term economic and environmental stability of tourism. Informed residents can foster environmentally compatible tourism practices. In addition, residents employed in the tourism industry have a stake in ensuring that tourism is sustainable. Local participation can

be especially important in rural natural areas. In such areas, local populations often depend on the land for economic sustenance. Many people in such areas make their living from farming, logging, or hunting. If these areas evolve into tourist destinations and the resource base receives a “protected” status, then the livelihoods of local populations may be jeopardized. If however local populations consent to and are a part of tourist operations and accrue benefits from tourism, then the goals of the locals, tourism operators, and conservationists can be met.

## **5. APPENDICES**

### **5.1 APPENDIX 1: Sample Laws and Regulations**

#### *5.1.1 Sample Outline of an Environmental Assessment Report*

An environmental assessment report is the final product of an environmental impact assessment. Such reports are usually concise, limited to significant environmental issues, and aimed at project designers and project decision-makers. The level of detail corresponds to the degree of potential impacts. The report often includes the following sections:

1. *Executive summary:* A summary of significant findings and recommended actions.
2. *Environmental regulations:* The policy, legal, and administrative framework related to the project. This is especially important in the case of co-financed projects when the requirements of many organizations must be accommodated.
3. *Project description:* A detailed description of the project, including its technical, geographic, ecological, economic, and social context. The description includes any off-site investments required as part of the project, for example, pipelines, roads, power plants, water supply, housing, and storage facilities.
4. *Baseline data:* The study area’s dimensions and a description of relevant physical, biological, and socio-economic conditions, including any changes anticipated before the project commences.
5. *Analysis of alternatives:* Alternatives to the proposed project, including the “no action” option. This section examines the potential environmental impacts, capital and recurrent costs, institutional capacities, training, and monitoring requirements for all design, site, technology, and operational alternatives.
6. *Environmental impacts:* The positive and negative impacts likely to result from the proposed project, and comparison with alternatives. This section reviews the extent and quality of available data, identifies key gaps in data, estimates uncertainties associated with predictions, and specifies topics that do not require further attention.
7. *Mitigation plan:* Feasible, cost-effective mitigation measures that may reduce adverse impacts on the environment to acceptable levels. The plan can consider compensatory measures if mitigation cannot be implemented effectively.
8. *Monitoring plan:* This section recommends a monitoring plan, including implementation by a designated monitoring agency or individual, cost estimates and other pertinent information such as training.
9. Appendices:
  - Personnel and organizations involved in the environmental assessment.
  - Persons and organizations contacted, including addresses and telephone numbers.
  - References to all written materials used in study preparation. This is especially important given the large amount of unpublished documentation often used.
  - Record of interagency/forum meetings. This includes lists of both those invited and those that actually attended, as well as a summary of the discussions.

#### *5.1.2 Sample U.S. Laws Covering Specific Environmental Media*

Because tourism encompasses such a wide range of activities, nations generally do not have laws that deal directly with tourism-caused environmental damage. While some countries have enacted laws and regulations related to specific tourism activities, such as building ski resorts (see examples presented in *Section 3, Principal Tourism-Related Environmental Problems, And Associated Pollution Prevention and Control Options* in the text above), comprehensive environmental tourism laws are not commonly enacted. Instead, nations use laws that are specific to environmental media to regulate environmental degradation that can be caused by tourism or other activities. Examples of such U.S. laws are presented below:

#### National Environmental Policy Act

The National Environmental Policy Act (NEPA) was passed to encourage harmony between people and the environment, promote efforts to prevent environmental damage, enrich national understanding of ecological systems and natural resources, and establish a Council on Environmental Quality. The law requires that an environmental impact statement be completed for every federal action that affects the environment.

#### Clean Water Act

The Clean Water Act was passed to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The act established the following goals: 1. eliminate the discharge of pollutants into navigable waters, 2. maintain water quality that protects fish and wildlife and allows for recreation, 3. prohibit the discharge of large quantities of toxic substances, 4. construct public waste treatment facilities with federal financial assistance, 5. establish waste treatment management plans within each state, 6. establish technology to eliminate the discharge of pollutants, and 7. implement programs for the control of nonpoint sources of pollution. The Clean Water Act directs the Environmental Protection Agency (EPA) to set effluent limits, and also mandates the issue of permits for activities that may result in pollution discharges into water sources.

#### Marine Protection, Research, and Sanctuaries Act

The Marine Protection, Research, and Sanctuaries Act was passed to regulate the dumping of all types of materials into oceans and to designate certain areas of the ocean waters as sanctuaries (conservation areas). The act requires EPA to issue permits for the dumping of materials into the ocean. EPA must consider criteria such as the need for dumping, the human health effects, the ecological effects, the staying-power of the dumped materials, alternatives to dumping, etc. before issuing a permit. In addition, the Secretary of the Army is responsible for the transportation and disposal of dredged material in ocean waters.

#### Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) was passed to balance preservation and development activities in the coastal zone. The act establishes a voluntary state/federal partnership dedicated to comprehensive management of the nation's coastal resources. In order to receive federal approval and funding, states are required to develop coastal zone management (CZM) programs based upon state authorities that are in accordance with the guidelines articulated in the CZMA. Development and implementation of the state CZM programs is supported with state and federal matching funds. Approved CZM programs establish coastal zone boundaries, permissible land and water uses, areas of particular concern, a planning process for public access to the shoreline, and control of shoreline erosion impacts. The CZM programs are currently developing coastal nonpoint pollution control programs.

#### Endangered Species Act

The Endangered Species Act was passed to conserve endangered and threatened species. The act requires the Fish and Wildlife Service to compose a list of endangered and threatened species and designate critical habitats for those species. In addition, the act directs federal agencies to protect such habitats from activities that may have adverse effects on the endangered species.

## **5.2 APPENDIX 2: Annotated Bibliography**

### *5.2.1 Texts, Books, & Reports*

*Ambiguous Alternative: Tourism in Small Developing Countries*, ed. Stephen Britton and William C. Clarke, The University of the South Pacific, Suva, Fiji: 1987.

*This book contains documents that use case studies to illustrate the problems associated with tourism in small developing countries. Some of the case studies are appropriate for inspecting environmental problems, while others focus on different aspects of tourism.*

Larry W. Canter and Robert C. Knox, *Septic Tank System Effects on Ground Water Quality*, Lewis Publishers, Inc., 121 South Main Street, Chelsea, MI 48118 USA: 1986.

*This text summarizes the types and mechanisms of groundwater pollution from septic tank systems, and provides information of methods for evaluating the potential of groundwater pollution from such systems. Chapter 2 describes engineering design, placement, operations, and maintenance for septic tank systems. Chapter 3 discusses pollutants and mechanisms of groundwater contamination. Chapter 4 evaluates the effects of septic tank systems on groundwater quality.*

Centre for Tourism Policy and Research, Simon Fraser University, *Tourism, Technology and the Environment*.

*This brief book presents information about the influence that technology associated with tourism development has on the environment. It covers the topics of technology's importance in areas such as land use planning, landscaping, regional development, environmental analysis, and direct tourism planning. Canadian and Asian-Pacific perspectives are used as examples.*

Coastal Resources Center, University of Rhode Island, *Case Studies of Coastal Management: Experience from the United States*, 1991.

*This book provides examples of how to manage the impacts of a wide range activities that humans undertake in the coastal zone. Specific U.S. case studies present information on the results of various management approaches.*

Joseph D. Fridgen, *Dimensions of Tourism*, The Educational Institute, East Lansing, MI, USA: 1991.

*Chapter 7 of this book provides brief, summary-level information about the environmental dimensions of tourism. The book also contains information on tourism planning, but does not list specific environmental planning methods.*

Rao V. Kolluru, *Environmental Strategies Handbook*, McGraw-Hill, Inc., USA: 1994.

*This text is a general guide to methods of environmental protection. It includes summaries of environmental legislation and implementation of legislation in the United States.*

Rein Laak, *Wastewater Engineering Design for Unsewered Areas*, Technomic Publishing Company, Inc., 851 New Holland Avenue, Box 3535, Lancaster, PA 17604 USA: 1986.

*This text outlines engineering steps for low-cost on-site wastewater disposal systems. The book includes chapters on site investigation, characteristics and quantity of wastewater, pretreatment methods, subsurface soil systems, septage disposal, and design examples.*

John Lea, *Tourism and Development in the Third World*, Routledge, Chapman and Hall, Inc., 29 West 35th Street, New York, NY 10001 USA: 1988.

*Chapter 5 of this book contains information about the environmental impacts of tourism in developing countries. It lists general problems that arise from tourism, relationships between tourism activities and the environment, and presents brief case study on Amboseli National Park in Kenya. The book also contains sections about other tourism issues.*

Alister Mathieson and Geoffrey Wall, *Tourism: Economic, Physical, and Social Impacts*, Longman Scientific and Technical, Singapore: 1988.

*Chapter 4, Physical Impacts, provides information on tourism's relationship to both the natural and the built environment. Other topics in the book include economic and social impacts of tourism.*

Zbigniew Mieczkowski, *World Trends in Tourism and Recreation*, Peter Lang Publishing, Inc., New York, NY, USA: 1990.

*This book is a summary of the logistics involved with the tourism industry. Topics include terminology, history, prerequisites for modern tourism, transportation, demand, and supply. The chapter on supply contains information*

*about environmental systems (such as the seashore and alpine systems) and aspects of national parks.*

Mohan Munasinghe, *Water Supply and Environmental Management: Developing World Applications*, Westview Press, Inc., 5500 Central Avenue, Boulder, Colorado 80301-2877 USA: 1992.

*Chapter 13 of this book presents information on the management of groundwater depletion and saline intrusion, using the Philippines as a case study. The chapter points out policy options, technical measures, and controls and regulations.*

National Park Service, *Guiding Principles of Sustainable Design*, Denver, Colorado USA: September 1993.

*This book introduces the concept of sustainability and describes applications of sustainable design. Major topics include natural resources, cultural resources, site design, building design, energy management, water supply, and waste prevention.*

*Nature Tourism: Managing for the Environment*, ed. Tensie Whelan, Island Press, Suite 300, 1718 Connecticut Avenue, NW, Washington, DC 20009 USA: 1991.

*This book is a collection of papers on planning for and management of areas that experience nature-oriented tourism. Chapter 2 discusses management practices in Kenya's wildlife reserves, chapter 3 addresses ecotourism in Costa Rica, chapter 4 presents information on management practices in and around Yellowstone National Park in the United States, and chapter 9 is a nature tourism guide which offers specific planning and development advice to make ecotourism sustainable.*

Organization of American States, *Reference Guidelines for Enhancing the Positive Socio-Cultural and Environmental Impacts of Tourism*, vol. 5, *Enhancing the Positive Impact of Tourism on the Built and Natural Environment*, International Trade and Tourism Division, Department of Economic Affairs, Executive Secretariat for Economic and Social Affairs, Washington, DC, USA: 1984.

*The Organization of American States published a series of guides about tourism in the Caribbean, and its effects on socio-cultural and environmental conditions. The guides are designed to be used by policy makers and tourism planners. Volume 5 deals with environmental impacts and management options for problems specific to Caribbean island nations.*

*Proceedings of the 1990 Congress on Coastal and Marine Tourism: A Symposium and Workshop on Balancing Conservation and Economic Development*, ed. Marc L. Miller and Jan Auyong, National Coastal Resources Research and Development Institute, Hatfield Marine Science Center, 2030 S. Marine Science Drive, Newport, OR 97365 USA: 1990; telephone (503) 867-0131.

*This source is a comprehensive two-volume set of documents from a conference on balancing development and environmental aspects of coastal tourism. The numerous documents are arranged into 23 subject categories and present all sorts of information on various environmental problems and solutions related to coastal tourism.*

Sven-Olof Ryding, *Environmental Management Handbook*, Lewis Publishers, Inc., 2000 Corporate Blvd., NW, Boca Raton, FL 33431 USA: 1992.

*This text is a general guide to managing environmental issues. It includes information about both remedial and planning actions that can be taken to protect the natural environment.*

S.C. Shah, *Planning and Management of Natural and Human Resources in the Mountains*, Yatan Publications 278, Defence Colony, New Delhi, India: 1986.

*This book discusses the depletion of natural resources in the Himalayas and presents methodologies for striking a balance between human population and natural resources. Nine chapters in the book cover topics such as biotic pressure, natural resource planning, problems and management in forests, water resources, and others.*

United Nations, *The Water Resources of Latin America and the Caribbean- Planning, Hazards and Pollution*, Economic Commission for Latin America and the Caribbean, Santiago, Chile: 1990.

*This source is divided into three major sections: 1. The formulation of water resource management plans, 2. Water-related natural hazards, and 3. Water pollution. Within each section, the text provides details, figures, and examples of water resource planning from Latin American and Caribbean nations.*

United States Environmental Protection Agency, *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*, EPA/840-B-92-002, Office of Water, Washington, DC 20460 USA: January 1993.

*This source provides guidance on how to implement the requirements of the United States legislation, the Coastal Zone Act Reauthorization Amendments of 1990. It includes information on marinas, shoreline protection, and urban runoff control strategies.*

United States Environmental Protection Agency, *Protecting Coastal and Wetlands Resources: A Guide for Local Governments*, Office of Water, Office of Wetlands, Oceans and Watersheds and Office of Policy, Planning and Evaluation, Washington, DC 20460 USA: October 1992.

*This report suggests steps that local governments can take to protect wetlands and coastal areas. Topics covered include the use of zoning and other regulatory measures, acquisition of wetlands and coastal areas, and the use of financial and economic tools for protection of coastal resources.*

United States Environmental Protection Agency, *Saving Bays and Estuaries: A Primer for Establishing and Managing Estuary Projects*, Office of Marine and Estuarine Protection, Washington, DC 20460 USA: August 1989.

*This source provides information on the National Estuary Program in the United States. It focuses on controlling pollution in coastal areas and managing coastal resources, such as bays and estuaries.*

United States Environmental Protection Agency, *Septage Treatment and Disposal*, EPA/625/6-84/009, Municipal Environmental Research Laboratory, Center for Environmental Research Information, Cincinnati, OH 45268 USA: October 1984.

*This report reviews design performance, operation, cost, energy information, and environmental effects pertaining to receiving, treating, and disposing of septage (the liquid and solid material pumped from a septic tank when it is cleaned).*

United States Environmental Protection Agency, *Technologies for Upgrading Existing or Designing New Drinking Water Treatment Facilities*, EPA/625/4-89/023, Office of Drinking Water, Center for Environmental Research Information, Cincinnati, OH 45268 USA: March 1990.

*This report discusses drinking water treatment technologies and contamination. It contains chapters on selecting and evaluating treatment processes, pre-filtration treatment elements, filtration technologies, disinfection and disinfection by-products, treatments of organic contaminants, treatments of inorganic contaminants, current and emerging research, and references. Case studies are also presented in appendices.*

United States Environmental Protection Agency, *Wellhead Protection: A Guide for Small Communities*, EPA/625/R93/002, Office of Research and Development, Office of Water, Washington, DC 20460 USA: February 1993.

*This report discusses techniques of wellhead protection, the management of a land area around a groundwater source to prevent contamination. The text includes chapters on groundwater fundamentals, groundwater contamination, the five-step process for wellhead protection, case studies, and resources for additional information.*

Wendy Whitlock, Kevin Van Romer, and Robert H. Becker, *Nature Based Tourism: An Annotated Bibliography*, Regional Development Group of the Strom Thurmond Institute, USA: 1991.

*This annotated bibliography contains 313 references on nature-based tourism, which is defined as all forms of tourism that rely on the natural environment.*

Stephen F. Witt, Michael Z. Brooke, and Peter J. Buckley, *The Management of International Tourism*, Unwin Hyman Ltd., London: 1991.

*The first chapter of this book provides statistics on tourism destinations and receipts for countries around the world.*

World Tourism Organization and United Nations Environment Programme, *Guidelines: Development of National Parks and Protected Areas for Tourism*," Madrid, Spain: 1992.

*This book presents practical working guidelines for use by those concerned with management of national parks and other protected areas. The book emphasizes costs and benefits of tourism in protected areas, selection of areas for national parks, carrying capacity, tourism planning, tourist facilities, hunting, and provision of educational programs.*

World Tourism Organization and United Nations Environment Programme, *Industry and Environment: "Development of National Parks and Protected Areas for Tourism,"* 1992.

*The U.S. Environmental Protection Agency recommends this text as a source of information on the use of parks to manage areas of interest to tourists.*

World Tourism Organization and United Nations Environment Programme, *Workshop on Environmental Tourism*, Madrid, Spain: 1983, reprinted 1988.

*This report provides a comprehensive overview of the impacts of tourism on various types of environments, including coastal, alpine, island, inland, and wilderness zones. The text discusses many types of problems and explains a broad methodology for sustainable tourism planning. In addition, a case study on tourism in Sri Lanka is included.*

*World Travel and Tourism Review: Indicators, Trends and Issues*, J.R. Brent Ritchie and Donald E. Hawkins, ed., CAB International, vol. 3, 1993.

*This report provides statistics on the global tourism industry, including tourist arrivals to various regions and nations of the world. The report also provides forecasts of growth in the tourism industry for the decade of the 1990s.*

## 5.2.2 Journals and Publications

*Annals of Tourism Research*, Pergammon Press, Inc., 660 White Plains Road, Tarrytown, NY 10591-5153.

*This social sciences journal focuses on academic (both theoretical and applicable) perspectives of tourism. It is multidisciplinary, and environmental topics are covered in some issues.*

*Enviro, Special Issue: Tourism and Environment*, Swedish Environmental Protection Agency, no. 17, June 1994.

*Enviro is published semiannually by the Swedish Environmental Protection Agency to disseminate news and views on transboundary pollution and other international environmental issues. The special issue on tourism and environment focuses on ecotourism and sustainability in Sweden.*

*The Journal of Tourism Studies*, The National Centre for Studies in Travel and Tourism, James Cook University, Townsville, Queensland 4811 Australia; tel. (077) 81 4750.

*This scholarly semiannual journal prints articles on various international tourism topics from the following fields: economics, biological and physical sciences, commerce, and social sciences.*

*The Journal of Water Resources Planning and Management*, American Society of Civil Engineers, 345 East 47th Street, New York, NY 10017-2398 USA.

*This bimonthly journal publishes papers that examine social, economic, environmental, and administrative concerns relating to the use and conservation of water.*

*Tourism Management*, Turpin Distribution Services Ltd., Blackhorse Road, Letchworth, Herts SG6 1 HN, UK; telephone +44 (0) 462 672555.

*This journal, published six times per year, prints documents on research, policies, and practices of management in the tourism industry. Environmental topics are covered in some issues.*

*Tourism Recreation Research*, Centre for Tourism Research and Development, A-965/6, Indira Nagar, Lucknow-226016 India; telephone 91 (0522) 381586.

*This semiannual journal publishes scholarly articles on a variety of tourism issues. Issues of this journal are often devoted to one particular theme, such as nature-based tourism or alpine tourism.*

*Travel and Tourism Analyst*, The Economist Intelligence Unit, The Economist Building, 111 West 57th Street, New York, NY 10019 USA; telephone (212) 554-0600.

*This scholarly journal prints business-oriented tourism articles that can include discussions of environmental issues.*

*UNEP Industry and Environment*, United Nations Environment Programme, Industry and Environment Programme Activity Centre (UNEP IE/PAC), Tour Mirabeau, 39-43 quai Andre Citroen, 75739 Paris Cedex 15, France.

*This journal released a special issue (vol. 15, no. 3-4, July-December 1992) that published case studies with policy recommendations for sustainable tourism development.*

### 5.2.3 *Articles and Papers*

Robert Aukerman, "The Effectiveness of Signing, Pamphlets and Restoration in Reducing Off-Trampling," *Tourism Recreation Research*, vol. 10, no. 2, pp. 35-38, 1985.

*This article measures the effectiveness of a combination of signs, pamphlets, and trail restoration in reducing off-trail trampling, and examines options for improving the effectiveness of regulating the behavior of visitors to parks.*

Ralf Buckley and John Pannell, "Environmental Impacts of Tourism and Recreation in National Parks and Conservation Reserves," *The Journal of Tourism Studies*, Vol. 1, No. 1, pp. 24-30, May 1990.

*This article uses data collected from Australian national parks to summarize the negative environmental impacts of tourism on the parks, and to briefly report on methods of successful management.*

Robert S. Dille, "Roads and Traffic in the English Lake District National Park: Problems and Planning Options," *Tourism Recreation Research*, vol. 18, no. 1, pp. 33-37, 1993.

*This article describes options to relieve traffic congestion in one of Britain's most popular national parks.*

Joy E. Douglas, "Ecotourism: The Future for the Caribbean," *UNEP Industry and Environment*, vol. 15, no. 3-4, July-December 1992.

*This article reviews environmental impacts of tourism and considers policies for successful ecotourism in Caribbean nations.*

Jonathan R. Edwards, "The UK Heritage Coasts: An Assessment of the Ecological Impacts of Tourism," *Annals of Tourism Research*, vol. 14, pp. 71-87, 1987.

*This article presents a summary of an investigation into the nature and extent of ecological impacts of tourism on the*

*Heritage Coasts in England and Wales. The text also discusses management techniques used to address these impacts.*

Mel Gajraj, "A Regional Approach to Environmentally sound Tourism Development," *Tourism Recreation Research*, vol. 13, no. 2, pp. 5-9, 1988.

*This article stresses the urgency and value of regional planning for tourism development in coastal areas. It also points out the United Nations Environmental Programme as a source for finding practical methods of environmentally sound coastal tourism development.*

Adriana Galvani, "Mountain Tourism in Cortina D'Ampezzo: Sustainability and Saturation," *Tourism and Recreation Research*, vol 18, no. 1, pp. 27-32, 1993.

*This article describes the successful, environmentally sound tourism development that has taken place in an Italian winter sports area.*

Jean S. Holder, "Pattern and Impact of Tourism on the Environment of the Caribbean," *Tourism Management*, pp. 120-127, June 1988.

*This article presents research on both the positive and negative effects of tourism on the Caribbean environment. The text also makes recommendations for long-term tourism policies, based on economic benefits and environmental considerations.*

Edward Inskip, "Environmental Planning for Tourism," *Annals of Tourism Research*, Vol. 14, pp. 118-135, 1987.

*This article reviews the planning approach of conducting comprehensive environmental analysis. It addresses determination of carrying capacities, regional strategies, basic planning principles for tourist facilities, and monitoring.*

Edward Inskip, "Sustainable Tourism Development in the Maldives and Bhutan," *UNEP Industry and Environment*, vol. 15, no. 3-4, July-December 1992.

*This article presents case studies of sustainable tourism development approaches in two contrasting but equally fragile environments.*

R.M. Martinson, "Wastewater and Solid Waste Management in the National Parks of the Canadian Parks Service Western Region," *UNEP Industry and Environment*, vol. 15, no. 3-4, July-December 1992.

*This article outlines the great advancement of sewage treatment and solid waste disposal that has occurred in the national parks of Western Canada.*

Philip Ohta, "Development in Hawaii: Management of a Major Resort Development (Kaanapali)," *Case studies of Coastal Management: Experience from the United States*, Coastal Resources Center, University of Rhode Island, pp. 97-106, 1991.

*This article discusses how passage of Hawaii's Coastal Zone Management Program has affected and the development of a major resort. Both the Management Program and its environmental successes are described.*

Femi Olokesusi, "Assessment of the Yankari Game Reserve, Nigeria: Problems and Prospects," *Tourism Management*, pp. 153-163, June 1990.

*This article presents a case study that examines interrelationships between tourism and the environment, including social factors. The text discusses waste management and wildlife and vegetation protection.*

Sen Ramsamy, "Tourism development and the Environment at Island Destinations: The Example of Mauritius," *UNEP Industry and Environment*, vol. 15, no. 3-4, July-December 1992.

*This article describes comprehensive planning techniques that are used in Mauritius to prevent deterioration of the environment as well as the quality of the tourism product.*

Sylvia Rodriguez, "Impact of the Ski Industry on the Rio Hondo Watershed," *Annals of Tourism Research*, vol. 14, pp. 88-103, 1987.

*This article examines the impacts of ski resort development on river water quality and biota and on the quantity of water downstream from development.*

Caroline Rogers, "Efforts to Balance Marine-based Tourism with Protection of Reefs and Seagrass Beds in a Caribbean Park," *Case studies of Coastal Management: Experience from the United States*, Coastal Resources Center, University of Rhode Island, pp. 71-82, 1991.

*This article presents information on the negative environmental impacts of tourism in coastal and marine areas, including impacts of boating, snorkeling, diving, and fishing. Discussion centers on managing these impacts within the Virgin Islands National Park, with special attention paid to reducing anchor damage to reefs and seagrass beds.*

Michael Romeril, "Tourism and the Environment- Accord or Discord?" *Tourism Management*, pp. 204-208, September 1989.

*This article presents general information on planning for sustainable tourism, and emphasizes environmental impact assessments, nature tourism, and other policies to control the impacts of the growing tourism industry.*

Mahmuda Shafi, "Tourism Planning in Developing Economies," *Tourism Recreation Research*, vol. 11, no. 2, pp. 99-101, 1986.

*This short article outlines the importance of tourism planning for developing countries. Topics discussed include planning needs, the scope of tourism planning, the stages of planning, and steps for planning.*

Arianthe C. Stettner, "Community or Commodity? Sustainable Development in Mountain Resorts," *Tourism and Recreation Research*, vol. 18, no. 1, pp. 3-10, 1993.

*This article defines the concepts of sustainable development, growth, commodity, and carrying capacity, and discusses the criteria necessary for sustainable tourism development.*

Nico Visser and Steven Njuguna, "Environmental Impacts of Tourism on the Kenya Coast," *UNEP Industry and Environment*, vol. 15, no. 3-4 July-December 1992.

*This article presents brief summaries of the increasing environmental impacts from Kenya's coastal tourism trade, including overuse of resources, sewage and oil pollution, depletion of fresh water supplies, solid waste pollution, deforestation, air pollution, and siltation. The text also provides summaries of both affected ecosystems and management techniques.*

#### 5.2.4 Information Centers

*World Tourism Organization*, Capitan Haya, 42-28020- Madrid, Spain; telephone 34(1) 571 06 28.

*Centre for Tourism Research and Development*, A-965/6, Indira Nagar, Lucknow- 226016 India; telephone 91 (0522) 381586.

*The National Centre for Studies in Travel and Tourism*, The National Centre for Studies in Travel and Tourism, James Cook University, Townsville, Queensland 4811 Australia; telephone (077) 81 4750.

*United Nations Environment Programme*, 2 U.N. Plaza, Room 803, New York, NY 10017 USA; telephone (212) 963-8139.

*United Nations Environment Programme, Industry and Environment Programme Activity Centre*, Tour Mirabeau, 39-43 quai Andre Citroen, 75739 Paris Cedex 15, France; telephone 33(1) 40 58 88 50.

*Centre for Tourism Policy and Research, Simon Fraser University, Burnaby, British Columbia, Canada.*

*International Institute of Tourism Studies, George Washington University, Washington, DC USA.*

*Centre for Tourism Research and Innovation, Bermuda College.*

*World Travel and Tourism Environment Research Centre, Oxford Brookes University.*

*National Coastal Resources Research and Development Institute, Hatsfield Marine Science Center, 2030 S. Marine Science Drive, Newport, OR 97365 USA; telephone (503) 867-0131.*

*US Environmental Protection Agency, Washington, DC USA; telephone (202) 260-2090.*

*US National Park Service, Washington, DC USA; telephone (202) 208-3100.*

*US Department of Commerce, Travel and Tourism Administration, 14th St. and Constitution Ave., Room 1860, Washington, DC 20230 USA; telephone (202) 482-4904.*