



Siting and Design of Hotels and Resorts

Principles and Case Studies for Biodiversity Conservation



Ministère chargé de l'Outre-mer

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Principles and Case Studies for Biodiversity Conservation



Acknowledgments

Biodiversity is the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.

- *Convention on Biological Diversity*

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Part I Hotel and Resort Development and Biodiversity: Risks and Opportunities



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Integrating biodiversity considerations into siting and design decisions for hotel and resort developments is important not only for the continued viability and conservation of the ecosystems, but also for the long-term financial success of the hotels and resorts. The tourism industry, including the hospitality sector, depends strongly on healthy ecosystems, because those ecosystems – and the wildlife, habitats, landscapes and natural attractions that comprise them – are often the very thing that draws tourists to the destination in the first place.

Biodiversity is essential for human life. It provides human society with many important benefits and services: for instance, insects pollinate our crops, birds disperse seeds, and fungi, worms and micro-organisms produce nutrients and fertile soils. Interactions between organisms and the physical environment influence our climate, water supplies and air quality, and help protect us from extreme weather, including mitigation of natural disasters. These benefits are collectively known as ecosystem services (The Millennium Ecosystem Assessment, <http://www.millenniumassessment.org>).

It is therefore not surprising that biodiversity plays an important role in the day-to-day life of a hotel: from the food in the restaurant and wood in furniture and fittings, to the amenities in the spa, the products of biodiversity are everywhere inside hotels. Outside, plants and animals make a hotel's public areas and gardens attractive for guests, while beyond the hotel gate, national parks, green spaces, coasts and natural habitats provide guests with opportunities for recreation and enjoyment.

The biodiversity footprint of hotels and resorts

Despite their dependence on and interconnectedness with biodiversity, hotels and resorts can have significant negative impacts on ecosystems and natural resources. A hotel impacts biodiversity at each stage of its life cycle, from planning through to closure:

- At the **planning stage**, the most important issue in determining the level of impact that a hotel will have relates to choices about its siting and design. Choices about the materials that will be used to construct the hotel, where those materials will come

from and the total physical footprint of the hotel will also influence how significant its impacts will be in the operational stage.

- At the **construction stage**, impact is determined by the size and location of the area cleared for development and where construction activities are taking place; the choice of construction methods; the sources and amount and type of materials, water and energy used to build the hotel; the location of temporary camps for construction workers; inadequate storage facilities for construction materials; the amount of construction waste that has to be disposed of; and other types of damage, such as surface soil erosion or compaction caused by construction activities or disruption of natural water flows and drainage patterns.
- In the **operational stage**, a hotel's impact comes mainly from the energy, water, food and other resources that are consumed in running the hotel; by the solid and liquid wastes it produces; by the way its grounds are managed and by the direct impacts of its guests. In addition, regular renovation and replacement of furniture, appliances and facilities can cause impacts through purchasing choices and increased waste generation. Using energy and water more efficiently; using organic and sustainably produced food; reducing, treating and disposing of waste appropriately; making sustainable purchasing decisions and managing gardens with natural-style plantings can all help a hotel to reduce its adverse impacts on biodiversity. Similarly, a hotel's relationship with host communities not only affects the sustainable operations of the hotel but also the use of environmental resources by communities themselves.
- At the **closure stage**, a hotel's impacts come from the disposal of materials removed from the hotel to refurbish it, convert it for other uses, or demolish it, and from the work involved in these activities. It may be possible to reuse and recycle some materials,

but there may also be some toxic materials, particularly from older buildings, which will require careful handling and management. A responsible hotel operator should also foresee supporting activities of ecological restoration as required.

Biodiversity issues should be a part of decision-making from the very beginning of any planning phase through to the end of closure.

While this document focuses mainly on the first two stages, planning and construction, siting and design decisions also influence the impact a hotel will have during its operation: a hotel that is designed to use resources efficiently and blend in with its surroundings will be much more sustainable to operate, and the site will be easier to restore at closure.

Biodiversity impacts associated with the siting, design and construction of hotels and resorts

Impacts of land clearing and landscape modification

Changes in local land use and cover is, according to the Millennium Ecosystem Assessment, one of the main drivers affecting biodiversity and the ability of ecosystems to provide ecosystem goods and services. Thus, the land-clearing and landscape modifications occurring during the construction phase can potentially have significant impacts on biodiversity, unless properly managed.

Removal of vegetation to make way for accommodations and access roads can lead to flooding, increased erosion, landslides, loss of soil fertility, lowering of the water table and siltation of rivers, lakes and other water bodies. The loss of critical habitats as a result of land clearing can severely impact plant and animal species, some of which may be endemic to the area (i.e. found nowhere else on Earth). In relatively undeveloped areas, opening up access to a development site (with roads or other rights of way) can catalyze further damage by facilitating migration to previously inaccessible areas. An increase in human population in a previously undeveloped area can put

significant pressure on natural resources and threaten biodiversity.

In coastal areas, the removal of dunes, wetlands and other natural habitats to provide land for development or to allow for better views or better access to beaches, can threaten nesting, breeding and feeding grounds of birds, fish, and mammals. Filling of wetlands and salt ponds reduces water circulation and the flow of nutrients to coastal areas. The removal of coastal vegetation from land and beach areas for construction also causes the runoff of mud and sediment, leading to siltation of beaches and nearshore habitats, such as seagrass beds and coral reefs, which do not thrive in turbid water conditions. Runoff is worst during construction, but will almost inevitably continue after the construction phase.

When hotel and resort developments include marinas and the installation of jetties, excavation activities, such as dredging, are required to create the necessary depth for boats to bring in construction materials and

create marina channels and jetties. Dredging causes disruption to the nearshore and marine habitat, because of the removal of substratum, the creation of anoxic sediment, changes to the biological community and significant increases in water turbidity. This can harm nearshore marine environments such as seagrass beds and coral reefs. In addition, when hotels are built close to the shore, developers often include shoreline protection features, such as seawalls, groynes, moles and bulkheads. Yet, while these structures may protect the hotel, they can also prevent natural erosion and coastline changes. In the long run, they can alter coastal processes such as sediment flow, and lead to accelerated erosion, siltation and flooding.

Impacts of materials choices and architectural and landscape decisions

In addition to making responsible decisions in terms of where they site their hotels and resorts, developers should also take biodiversity issues into consideration when making choices on the materials they use and the architectural and landscape design styles they will



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use. For example, using timber from primary rainforests leads to land clearing, habitat degradation and species loss. In coastal areas, using sand to make concrete can lead to the erosion and sometimes disappearance of beaches, while the use of coral or coral rock can seriously degrade marine habitats.

Architectural and landscape design choices can also influence a hotel's level of impact on biodiversity. For instance, concrete high rises may require more energy for cooling and lighting than more traditional architectural styles. Choices about the fixtures in the hotel, for example types of lighting, may have a negative impact on local wildlife areas, such as the nesting grounds of sea turtles.

When designing gardens and hotel grounds, the use of non-native plants and increased modification of the landscape will require more maintenance and more use of water and chemical fertilizers, pesticides and herbicides, posing a threat to biodiversity. The use of native species in gardens and on hotel grounds is also important to avoid the introduction of potentially invasive alien species. Non-native species introduced accidentally or deliberately (for example by using exotic species for gardening) into an ecosystem can cause major damage to ecosystem functions and populations of indigenous species through predation or by competition for key resources such as food, water or nesting sites.

At the time of planning the siting and design of a hotel or resort development, it is also critical that developers pay attention to operational issues that can have a negative impact on biodiversity. Decisions made during planning regarding sources of energy, water management, wastewater processing systems, chemical use, waste management and purchasing will all influence how sustainable the development is in the long run and what kind of impact it will have on biodiversity.

From risks to opportunities: managing biodiversity impacts

To specifically address the biodiversity risks associated with the development of hotels and resorts, IUCN has developed the *Biodiversity Principles for siting and design of hotels and resorts* (page 10). These Principles aim at promoting the integration of biodiversity considerations into decision-making on the planning, siting and design of hotels and resorts. The Principles are supported and illustrated by *case studies collected from a variety of tourism destinations worldwide* (page 16).



Part II Biodiversity Principles for Siting and Design of Hotels and Resorts



The Biodiversity Principles for siting and design of hotels and resorts focus on how biodiversity and associated social impacts can be better addressed in hotel and resort development.

The Principles seek to provide guidance in the planning and construction stages of the hotel life cycle. They are targeted at all relevant stakeholders, including planning authorities, tourism development agencies, developers, investors, hotel managers and management companies, project managers and consultants, architects and construction firms. It is also expected that these Principles will be integrated into relevant policy and planning processes, including Environmental Impact Assessment (EIA) procedures, National Biodiversity Strategies and Action Plans (NBSAP), national and local management plans, tourism development plans, and the environmental management strategies of hotel corporations and developers.

The Principles have been developed based on the findings of an analysis conducted by IUCN of the current threats to biodiversity in the Caribbean linked to the siting and design of hotels and other vacation accommodation (*Impacts of hotel siting and design on biodiversity in the insular Caribbean: A situation analysis*, IUCN, 2011, not

in print). The study generated evidence of biodiversity impacts resulting from the siting and design of hotels and identified examples of positive relationships.

The Five Principles

The IUCN Biodiversity Principles for Siting and Design of Hotels and Resorts are as follows:

- 1 Adopt an ecosystem-based approach in tourism development planning
- 2 Manage impacts on biodiversity from hotel development and attempt to achieve an overall positive contribution
- 3 Design with nature and adopt nature-based solutions
- 4 Respect, involve and support local communities
- 5 Build collaboration among stakeholders

Principle 1

Adopt an ecosystem-based approach in tourism development planning

Hotel and resort planners and governmental agencies consider the dynamics of ecosystems, their services and interconnectivity when developing new hotels and resorts, and take into account the impacts that the development(s) could have on all components of the ecosystems concerned.

Tourism planning adopts ecosystem-based approaches in order to maintain the integrity and essential values and services of ecosystems. An ecosystem-based approach helps identify and address cumulative and multi-source impacts of hotels and resorts. An ecosystem-based approach also calls for inter-sectoral cooperation between tourism, finance, land-use planning, academic institutions, and natural resource management departments and agencies in decision making.

Land-use plans always guide hotel planning and development decisions. Their formulation and implementation is supported by an ecosystem-based approach. These plans integrate existing data and knowledge, such as National Biodiversity Strategy and Action Plans (NBSAP), protected area system plans, endangered species listings and distribution maps and, where available, management and recovery plans, biodiversity inventories, and watercourse maps and inventories, among others.

Environmental impact assessments (EIAs) of hotel developments are carried out by qualified and independent individuals and companies, using an exhaustive baseline and before any agreements are made to permit construction. Where baseline data do not exist, a study of species and habitats is carried out beforehand to ensure that critical natural habitats or areas that provide local livelihoods are conserved. To

the maximum extent possible, planners and developers use scientific advice and expertise, especially from local academic and professional institutions.

Monitoring and impact indicators at all stages of the hotel life cycle (planning, construction, operation and closure) are integral to an ecosystem-based approach. Planning authorities employ adequate measures to monitor hotel construction practices and adherence to conditions of the development permit process. In addition, hotel construction is likely to generate or encourage other activities with potential impacts on biodiversity, such as the temporary settlement of workers at the vicinity of an isolated site or the transportation of construction materials, as well as the potential increase in visitation in areas surrounding the new hotel development during its operation. The EIA process takes these potential impacts into account, and it is the shared responsibility of developers and planners to monitor and manage them.

Areas of critical natural habitat should be highlighted in land-use plans and include relevant planning controls to prevent development in areas of highly vulnerable and irreplaceable biodiversity. Where developments are already planned near sites of known high irreplaceability or vulnerability, the highest level of design and operational standards, due diligence, monitoring and enforcement controls must be applied, and competent specialized expertise must be sought to assist at the planning and implementation stages.

The following three case studies illustrate Principle 1 in the next section:

- *Q-Station, Australia*
- *Tres Rios, Mexico*
- *Chumbe Island, Tanzania*



Principle 2

Manage impacts on biodiversity from hotel development and attempt to achieve an overall positive contribution

Hotel and resort developers make all efforts to avoid negative impacts on biodiversity and associated livelihoods from siting, design and construction. When impacts are unavoidable, efforts are made to avoid the areas of greatest biodiversity value, minimise the extent of development impacts, restore affected ecosystems and biodiversity to the greatest extent possible, and invest in additional conservation actions within the vicinity of the development. Hotel and resort developers should aim to achieve a demonstrable, overall positive contribution to the conservation of local biodiversity.

Developers and relevant government agencies should employ a clear sequencing of mitigation actions at the earliest planning stages to manage biodiversity risk from hotel and resort developments.

The first step is to avoid any harmful impacts to habitats and ecosystems. In critical habitats in particular, where highly vulnerable and irreplaceable biodiversity components are present, development takes place only if there are no negative impacts that would affect the populations or functioning of ecosystems. Impacts on highly irreplaceable and vulnerable biodiversity cannot be restored nor compensated; sites of high irreplaceability and high vulnerability have the highest conservation urgency.

Where negative impacts are unavoidable, developers, in order of priority, minimise harmful impacts, rehabilitate and restore areas of disturbance caused by the hotel and its infrastructure and, if possible, invest in additional conservation actions that contribute to the long-term integrity and conservation of the ecosystem within which the development is located. As a result, developers must plan for mitigation and other similar investments

to accommodate alternative designs, changes to construction schedules, and any offset activities.

Consideration of suitable mitigation measures is given the utmost attention by developers, under the supervision of appropriate governmental agencies, and with support from scientists and other experts. Where development is permitted in sensitive areas, strict rules and guidelines are applied and enforced to minimise negative impacts. If roads and utilities are not already on site, land-use plans identify where such infrastructure will be laid prior to the approval of any construction, to minimise habitat disturbance and disruption to ecosystem services. Conservative setback limits that reflect the damage likely to be caused to the beach and backshore environment during a major storm, and that take into consideration beach and backshore characteristics, are defined and enforced along all sandy beaches.

Developers employ comprehensive waste disposal mechanisms. On-site construction practices are carefully monitored to ensure that pollution and land contamination is avoided. Debris, sand, cement, plastic bags, wastewater, fertilizers and other hazardous chemicals washed into the sea can cause serious damage to coral reefs and other marine life and negatively affect water quality. Known hazardous materials are not used in construction.

To minimise erosion and runoff, the period of time spent in construction is as short as possible, and erosion control techniques, such as silt curtains and filter cloth must be employed. Construction is restricted to the dry season to minimise harmful runoff. Building sites are kept clean and, at the very least, the leeward side of the site screened to avoid unwanted debris blowing or running off into the sea.

Rehabilitation of areas where impacts have occurred is a key responsibility of the developer. Strategies to provide incentives, including financial incentives for good practice, are formulated and introduced by governments and tourism management bodies to encourage net positive impacts to biodiversity from the

design of hotels and resorts. In addition, governments give preference to developers and investors who have a good track record of achieving a positive impact to biodiversity from their developments.

In order to achieve a positive impact on biodiversity, biodiversity offsets are designed to compensate for any residual impact on biodiversity from the development of the hotel or resort.

The following three case studies illustrate Principle 2 in the next section:

- *North Island, Seychelles*
- *Isla Palenque, Panama*
- *Fairmont Mayakoba, Mexico*

Principle ③

Design with nature and adopt nature-based solutions

Where possible, hotels and resorts blend into their natural landscape, enhance it, and use nature as a source of inspiration in design and in operations.

Hotel and resort developments aim to blend into the landscape and become integrated into the ecosystem. Building design, height, orientation and density is guided by the natural setting and local architectural style, in order to reduce visual impact and intrusion while maximizing natural solutions and optimizing cultural integration and identity, especially at more sensitive sites. The use of non-threatened species and natural, sustainably sourced and harvested materials is maximized in construction, and consideration is given to durability and the recyclable nature of all materials used in construction and furnishings.

Furthermore, it is at the design stage that many of the impacts that could occur at the operational stage can be avoided. Operational facilities such as tertiary-level wastewater treatment systems, hotel and beachfront

lighting, renewable energy systems and other measures to limit energy and water consumption are considered to avoid biodiversity and ecosystem impacts during the operational phases. In addition, consideration is given to the potential impacts of increased visitation to the surrounding area during the operation of the hotel.

To the maximum extent possible, native or naturalized plant and animal species are used in landscaping and gardening. One of the major threats to biodiversity is the use of non-native species: when introduced to a site, they can propagate quickly and overwhelm, and in some cases even eliminate, native wild species. The net effect is the destabilization of ecosystems and direct threats to local species, with resulting environmental and economic consequences. Indigenous (native) vegetation is the most cost-effective landscaping approach, because it is adapted to the climatic conditions, uses local knowledge and is culturally appropriate.

The following three case studies illustrate Principle 3 in the next section:

- [Bay of Fires, Australia](#)
- [Soneva Fushi, Maldives](#)
- [Maho Bay and Concordia, US Virgin Islands](#)



Principle 4

Respect, involve and support local communities

Hotel and resort developments contribute positively to local community development, respect land rights and land-use rights of local stakeholders and involve them in decision making.

There are many examples of local communities being marginalized from their traditional uses, occupations and enjoyment of land and resources as a result of hotel and resort development. Beginning at the earliest planning stages, and continuing through all phases of the development, developers assess social impacts on neighbouring communities; this is not only a matter of good corporate citizenship but also vital to ensure a social license to operate.

The principle of Free, Prior and Informed Consent (FPIC) recognizes a community's inherent and prior right to the land and resources and respects its legitimate authority, requiring that any third party enter into an equal and respectful relationship with the community. Therefore, communities are informed about and consulted on any proposed hotel or resort, provided with information on its likely impacts and involved in meaningful participatory planning processes from the earliest planning stages and during the development process.

Governments are transparent in their decision-making process and establish clear procedures and sufficient time for stakeholder participation. Local stakeholders are involved in assessing and identifying alternatives and in natural resource management decisions, such as through multi-stakeholder bodies that include local stakeholder representation.

The following two case studies illustrate Principle 4 in the next section:

- [Misool Ecoresort, Indonesia](#)
- [Campi ya Kanzi, Kenya](#)



Principle 5

Build collaboration among stakeholders

Reconciling hotel and resort development and biodiversity conservation can only be achieved with the participation of all parties concerned. Tourism development practitioners and national government authorities develop mechanisms – ad hoc and long-term – to support collaborative efforts that mobilize and foster the knowledge and capacities of all stakeholders.

Collaborative approaches are encouraged and facilitated at all levels. Governments, private developers, investors and contractors, financial institutions, tourism and hotel associations, architect associations, civil society organizations, communities and academic institutions all have a role to play in the search for forms of hotel and resort development that do not threaten, but instead enhance, biodiversity. Development planning is therefore approached as a participatory process, and institutional arrangements facilitate such participation, with key

stakeholders such as tourism professional bodies and conservation organizations effectively represented in relevant structures.

Existing bodies dedicated to the promotion of tourism development are strengthened and encouraged to support ecosystem-based tourism development planning. The sharing of information, positive examples, data, methods and skills; the establishment of standards for biodiversity impacts; training of EIA practitioners and public and private sector planners; and the development of stronger links with academic institutions and conservation bodies are some of the mechanisms that are used to support cooperation towards the integration of biodiversity into hotel and tourism planning and development.

The following two case studies illustrate Principle 5 in the next section:

- *El Nido and Taytay, Philippines*
- *Northeast Brazil, Brazil*

Part III Implementing the Biodiversity Principles for Siting and Design of Hotels and Resorts: Case Studies



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About the case studies

The case studies presented here have been carefully selected and researched to illustrate the principles on sustainable siting and design of hotels and resorts presented in this publication.

The challenge in gathering these stories was that information about the development history and approach of hotels and resorts tends to be less well-documented and publicised than information about their operations. Most good practice examples or awards relating to sustainability concentrate on what a company or enterprise is doing at the current moment, rather than on its past development history.

In order to find good examples for these case studies, many organisations, companies and experts with experience in sustainable tourism development were asked to suggest ideas that might illustrate the principles. This initial request resulted in a long list of 76

locations, which was then narrowed down to 32, based on the amount and nature of information that was available. The final selection of case studies reflected the need to cover all the principles, as well as a desire to provide a good geographic spread and a wide range of hotel and resort sizes.

These case studies are nearly all about hotels and resorts in coastal locations. Coastal ecosystems tend to be very varied and sensitive, and it is often in such locations that issues relating to tourism development and biodiversity are most evident. Nevertheless, the principles and the approaches illustrated in the case studies are not dependent on the type of ecosystem and location, but rather are universally relevant to hotel and resort development around the world.

The case studies are arranged according to the principles that they illustrate. They are not intended to



be fully comprehensive and, in all cases, there is much more that could have been written about all the positive approaches that have been and are being taken by these hotel and resort developments.

While the information in each case study has not been externally verified, it is based on material that has been supplied by each of the projects and subsequently reviewed by them before publication.

THE CASE STUDIES

Principle 1 p. 18

Adopt an ecosystem-based approach in tourism development planning

- Q-Station, Australia
- Tres Rios, Mexico
- Chumbe Island, Tanzania

Principle 2 p. 28

Manage impacts on biodiversity from hotel development and attempt to achieve an overall positive contribution

- North Island, Seychelles
- Isla Palenque, Panama
- Fairmont Mayakoba, Mexico

Principle 3 p. 35

Design with nature and adopt nature-based solutions

- Bay of Fires, Australia
- Soneva Fushi, Maldives
- Maho Bay and Concordia, US Virgin Islands

Principle 4 p. 42

Respect, involve and support local communities

- Misool Ecoresort, Indonesia
- Campi ya Kanzi, Kenya

Principle 5 p. 47

Build collaboration among stakeholders

- El Nido and Taytay, Philippines
- Northeast Brazil, Brazil

Principle 1 Case Study

Q-Station, Australia

Incorporating ecosystem considerations into development approval and control

Application of an ecosystems approach in assessing proposals for a hotel project in a sensitive area, leading to a detailed plan with conditions on the development and requirements for extensive monitoring and reporting.

Situated at the entrance to Sydney Harbour, the North Head promontory is an area of some 200 ha, containing natural scrubland surrounded by rugged sandstone cliffs and secluded sandy beaches. It is home to many plants and animals that are specially adapted to live in the Sydney coastal environment.

North Head is one of several fragmented areas that make up the Sydney Harbour National Park, an IUCN Category V protected area. Part of the marine environment adjacent to North Head is within the North (Sydney) Harbour Aquatic Reserve, which includes sheltered bays and inlets providing seagrass and algal habitats.

North Head is known for its significant cultural and historic heritage. Originally occupied by the Guringai people, the area has a strong spiritual significance, as well as some of the best remnants of Aboriginal

Name of hotel/resort	Q-Station
Scale	73 guestrooms and six cottages
Date of development	2006-2008
Location	North Head, Sydney, Australia
The area context	The North Head promontory, which forms part of Sydney Harbour National Park

occupation in Sydney. In more recent times, North Head was home to a quarantine station, which was established in 1827 and operated as an isolation facility for immigrants and residents until 1984. There is a large collection of historic buildings from the quarantine station on a 36 ha site in one corner of the promontory, within the protected area.

In 2001, the Mawland Group, a private developer, proposed to lease the quarantine station site from the New South Wales (NSW) National Parks and Wildlife Service (NPWS). The developer wanted to convert the buildings into a high-end hotel, thereby helping to secure and conserve the structures, which are an important part of Australia's heritage.



Guidance from an ecosystem-based conservation management plan

The development of this project has followed a very detailed and systematic process, reflecting an ecosystem-based approach to the planning, development and management of the site within the context of the whole North Head protected area.

The quarantine station site is part of a wider ecosystem, and particular species that are present on the site depend on being able to move freely across the wider area, for territory, feeding range, access to habitat for specialist purposes such as nesting, and maintenance of genetic diversity. Some species, including the Little Penguin and the Long-nosed Bandicoot, are under threat, with populations barely large enough to sustain themselves in the area.

From the beginning, the proposal for the hotel development was guided by a thorough Conservation Management Plan, which had been prepared for the quarantine station site on behalf of Sydney Harbour National Park in 2000. This Plan, which was based on a significant body of published scientific studies on the flora, fauna and vegetation of North Head, took an ecosystem-based approach, with full consideration of the biodiversity situation and pressures across an extended area of water and sea-bed, as well as neighbouring lands on North Head. The cultural and historic heritage of the site added further layers of complexity.

Detailed assessment of impacts, subject to public scrutiny

Guided by the Plan, an extensive and transparent public process was undertaken to assess and then address the possible environmental impacts of the development proposal. This process began with an Environmental Impact Assessment, as required by legislation. The resulting Environmental Impact Statement (EIS) documented how the proposed development might positively or adversely impact



© Richard Denman

upon a range of elements, including: flora and fauna (such as bandicoots and penguins); the marine environment, particularly seagrass; stormwater; water supply and sewage; and land use in the region. It also discussed the development's potential contribution to cumulative impacts in the area. The EIS was made publicly available.

Next, in response to the huge public interest that was shown in the development, an independent Commission of Inquiry was held to ensure that the EIS covered all aspects of potential impacts. The EIS and Commission of Inquiry resulted in significant amendments to the proposal, including eliminating three car parks, moving the restaurant, shifting the outdoor eating area back from the beach and reducing the EIS Approval period.

The revised proposal was granted final approval, subject to about 230 conditions, by the Determining Authorities, which included the NSW Department of Environment and Conservation (DEC).

Additional management plans and processes to control impact

As part of the conditions for approval, additional site-wide plans were prepared, signed off on by DEC and placed in the public domain.



© Q Station

One of these plans was a Visitor Management Plan, which dealt with arrangements for visitor access, site capacity and control of vehicle and pedestrian movements, in order to minimise impacts on sensitive areas and key species. Components of this plan include:

- Designing infrastructure to encourage access by water and public transport, with car parking restricted and supported by a shuttle bus. Restriction of vehicle movement was deemed especially important to minimize the threat to bandicoots.
- Restricting access to certain areas. For example, the main beach is fenced at either end, so that visitors cannot access penguin habitat, while boat access routes are clearly marked to avoid the main seagrass area.
- Avoiding other intrusion, for example by fencing the outdoor eating area to screen sound and light from the surrounding area.

Another of these additional plans, the Erosion and Sedimentation Control Plan, covered management of threats arising from site construction and operation, including arrangements for stormwater drainage. Special requirements for the construction phase included installing silt fences, keeping surface disturbance to a minimum, avoiding excavation beneath tree crowns, staging vegetation removal,

promptly re-establishing ground cover and placing fences so as not to limit the general movement of fauna around the site.

Implementing an Integrated Monitoring and Adaptive Management System

A key feature of the Q-Station project has been a requirement that the developers prepare and follow an agreed Integrated Monitoring and Adaptive Management System (IMAMS) for the conservation and adaptive re-use of the site. This system, which was published by Mawland as a final draft shortly after signing the lease and submitted for approval by the DEC, includes all of the issues and concerns identified in the EIA. Three elements of the process include:

- A programme of formal and systematic monitoring, featuring approximately 150 specific indicators, each with a pre-set benchmark, acceptable range, monitoring method and potential responses should the result be outside the acceptable range. An example of a biodiversity indicator is the number of deaths of Long-nosed Bandicoots attributable to vehicles, which requires prescribed management measures to be taken should the number be exceeded. The indicators are not only environmental but also cover social and economic issues, such as employment and visitor spending. Responsibility for monitoring is shared between



Mawland and the DEC, now known as the Office of Environment and Heritage, and clearly specified for each indicator.

- An annual Environment Report on the condition of the site, which is made publicly available.
- A five-yearly independent Environmental Audit. Mawland and the DEC engaged independent consultants to prepare the first Environmental Audit to assess compliance with the Conditions of Approval; the audit was approved by the Minister for Planning in 2008. A second Environmental Audit is currently underway and is due for completion in May 2012.

In accordance with the Planning Approval, all site-wide plans, including IMAMS, are currently under review.

The resulting development

The Mawland Group's lease on the site began in 2006, and work started on the development, conservation and adaptation of the site, with a budget of about AUS\$18 million. No new buildings were built, but an extensive programme of conservation works was carried out on 65 existing buildings, a wharf, roads and pathways, as well as an electrical and communications upgrade and enhancements to the natural and cultural landscape. The largest outdoor works were the creation of two car parks in formerly

cleared areas and a stairway to replace an existing funicular railway connecting the wharf to the site. In addition to overnight accommodation, the site includes a harbourside restaurant, visitor interpretation centre, conference facilities and thematic tours.

The extensive conditions attached to approval of the development established one of the most challenging operating environments for any tourism development in Australia. Despite these challenges, feedback on the first environmental audit was extremely favourable and, since the first guests were finally welcomed to Q-Station in 2008, visitor numbers have grown to 100,000 per year.

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Principle 1 Case Study

Tres Rios, Mexico

Master planning for an integrated resort area

Systematic planning of a sizeable site, treated as a single ecosystem and following a staged process, from detailed scientific assessment to area zoning and the establishment of criteria to guide the development and construction process.

Tres Rios is a privately owned single estate, located in a spot where three natural rivers converge on the coast in the heart of Mexico's Riviera Maya. As rapid tourism growth in the area has been accompanied by associated pressure on natural resources, the Mexican family that owned the estate wished to pursue a careful approach to the development of their land for tourism.

Name of hotel/resort	Hacienda Tres Rios
Scale	First hotel with 273 rooms Eventually will be five hotels on the site with more than 1,700 rooms and suites
Date of development	2006-2008 and ongoing
Location	Riviera Maya, Mexico
The area context	A site of 132 hectares with three main habitats: jungle, mangrove forest and coastal dune

At the outset, Tres Rios established a Sustainable Development Mission, channeling all its actions towards the rational use of resources, the conservation of biodiversity, the implementation of good environmental practices, the creation of high-quality experiences for visitors, and the strengthening of its social responsibility.

This approach has involved viewing the whole site, including the rivers that flow through it and their egress to the sea, as a single ecosystem; and pursuing a staged process in understanding the site and preparing a master plan that indicates zoning and guides the construction process.

Tres Rios is a large-scale, long-term project that includes plans to eventually establish five hotels, with their associated infrastructure and services, while maintaining half of the site as a reserve.

Scientific investigation and creation of a master plan

The first step in the development process involved a series of studies to identify the environmental characteristics of the site, looking at a number of components and including a biodiversity assessment. A team of scientists was assembled, including specialists in the ecology and management of coastal zones and reefs, fauna, mangroves, and other types of vegetation. The team initially identified 90 different



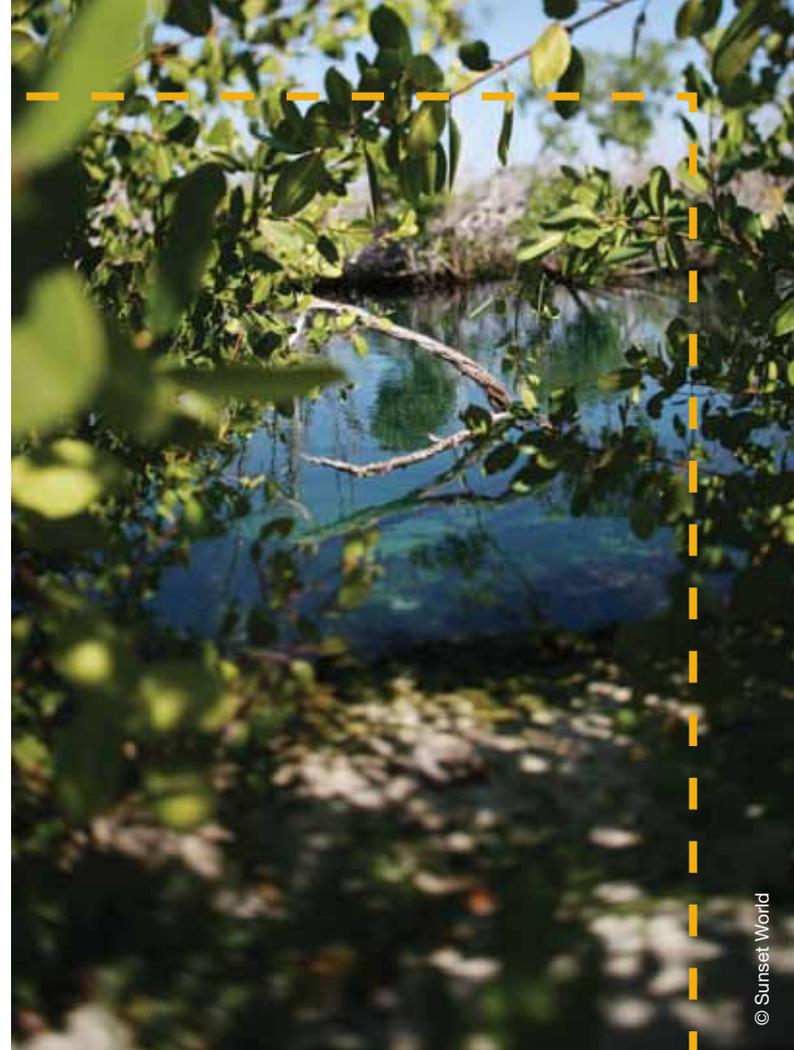
species of terrestrial animals and 120 plant species. Detailed geo-hydrological studies determined patterns of water flow, above and below ground, and a series of digital models was created in order to manage the supply of water to the mangroves.

This information was brought together with topographical data, aerial photography and field studies into a Geographical Information System, which enabled identification of natural units of land, types and condition of vegetation, current ecosystem impacts, and legal and environmental restrictions on the land and maritime zone. Through this process, the scientific team identified 12 natural and distinctively different land areas and 11 natural coastal sections, and developed a zoning system that, as far as possible, maintains ecosystem integrity. This zoning system formed the basis for the drafting of the Tres Rios Master Plan and will govern all future development, with areas of high environmental value designated as conservation areas.

Water planning for healthy ecosystems

At the same time that the zoning system was being developed, a number of specific and thematic studies and plans were also carried out to refine and strengthen the Master Plan. One such study concerned water planning and management, a critical issue for various ecosystems, including mangrove forests.

Detailed geo-hydrological studies determined the precise depths from which drinking water should be extracted and the depths to which residual and treated waters – from the water treatment plant and the reverse-osmosis plant – should be injected, to avoid contaminating the aquifer, the land and the marine ecosystem. Roads and pathways were routed to avoid affecting the flow of surface water, with drain pipes placed deep under the roads to allow the natural flow of water, nutrients and fauna between



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ecosystems. A central canal, designed to take advantage of the natural flow of underground rivers, represents the first stage of a canal system that will be designed and constructed for self-maintenance, with low salinity and a high rate of water exchange to ensure the proper balance of nutrients and oxygen for healthy plant and water life. This system will eventually create new underwater and shoreline mangrove habitats.

Construction and design criteria for hotels and infrastructure

A further stage of the process included establishing criteria to guide the future design and construction of the hotels and other infrastructure. These included criteria for set-backs from natural features within the broad zones allocated for development, as well as construction techniques to be used in certain circumstances.

The zoning system and these more specific criteria have been followed in the development of the first hotel – Hacienda Tres Rios. The entire structure was placed in an area of lower environmental value to minimise impact on the environment and prevent destruction of local ecosystems. Design solutions

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were developed and the best available technologies identified in order to meet the criteria.

All permanent infrastructure has been placed at least 50m from the shoreline to minimise impacts on coastal and dune ecosystems. Permanent facilities are at least 20m from the natural freshwater springs (known locally as *cenotes*), which are an important feature of the site, and 10m from the three rivers.

To maintain the natural surface water flow in the mangrove zones, buildings have been constructed on more than 780 stilts, measuring from 5m to 30m and erected on a permeable rock base. The ground floor of all buildings is 3m above the water level, ensuring the natural flow of water under the structures.

Before construction was allowed to begin, the Environmental Management and Supervision Team marked out the areas where infrastructure was to be sited and implemented Flora and Fauna Management Plans, designed to relocate protected and endangered species. During this process, 1,200 plants were temporarily moved to the plant nursery, to await replanting in the Hacienda's gardens and natural conservation areas. The developers significantly reduced the potential impacts of construction waste, dust and the presence of large teams of workers by using parts that were prefabricated outside the area and assembled on site using efficient cranes.

Additional conservation work, monitoring and reporting

Other work to restore and improve natural habitat on the site included reforestation over 10,000m² of mangrove, planting more than 50,000 mangrove trees and rehabilitating over 20,000m² of mangrove damaged by Hurricane Wilma. In one year alone, the site nursery produced 50,000 red, white and buttonwood mangrove trees.

Based on an Environmental Management System, ongoing monitoring is carried out by the resident biologist and environmental supervision team. Through quarterly and annual reports, Tres Rios informs SEMARNAT (the Mexican Environmental Ministry) and PROFEPA (Mexico's Federal Environmental Enforcement Agency) about progress on the project. Strict compliance with all environmental regulations is overseen by periodic PROFEPA inspections.

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Principle 1 Case Study

Chumbe Island, Tanzania

Developer-led planning and management for a whole ecosystem

A comprehensive ecosystem-based approach to the planning and development of a tourism facility and the conservation of the surrounding island and marine habitats, through the establishment of management agreements.

Chumbe Island is a small, formerly uninhabited island of just 25 hectares, with high biodiversity in both its reef and forest habitats. The bedrock of the island is a substrate of fossilized coral, and most of its land is densely covered with one of the last remaining pristine 'coral rag' forests in Zanzibar. Amongst its rare and endangered species are the Aders' Duiker (*Cephalophus adersi*), the coconut crab (*Birgus latro*), which is abundant on Chumbe Island, and the migrant Roseate Tern (*Sterna dougallii*), which bred in 1994 and 2007 on the island. Chumbe's reef is believed to host 90 percent of East Africa's hard coral species and 424 species of fish. Intertidal seagrass meadows are also present.

In 1991, a private individual prepared a business plan and sought a lease to establish and showcase Chumbe Island as a privately managed Marine Protected Area (MPA), financed through ecotourism. The plan was presented to the Government of Zanzibar, which has autonomy over its natural resource management and foreign direct investment. In 1992, the Chumbe Island Coral Park Ltd. (CHICOP) management company was formed and registered in Zanzibar, and the following year, the government agreed to lease 2.44 ha of previously cleared land on the island to CHICOP for a period of 33 years.

Underpinning an ecosystems approach with a regulatory and management framework

From the beginning, CHICOP recognised the need for a comprehensive biodiversity conservation policy and plan, not only for the small development site, but also for the whole of the surrounding terrestrial and maritime ecosystems. In the absence at that time of government regulatory and management capacity to develop

Name of hotel/resort	Chumbe Ecolodge
Scale	Seven guest bungalows and associated facilities
Date of development	1993-1998
Location	Chumbe Island, Zanzibar, Tanzania
The area context	Small island 12 km southwest of Zanzibar, with rich forest, coastal and marine biodiversity

such a policy and plan, CHICOP itself took the lead in discussions with the government to establish the necessary regulatory framework and agreements.

As a first step, a number of conditions were agreed for inclusion in the lease for the small development site. These included clauses relating to the protection of the environment of the site and its associated terrestrial and marine ecosystems; minimising interference with indigenous flora and fauna; siting of any structures at least 2m inland from the current base of the overhanging cliff; prohibiting the cutting of mature trees; restricting the cutting of other vegetation to the space required for construction work; sourcing building material from outside Chumbe, with the exception of rocks excavated for the purpose of laying foundations; banning the introduction of exotic plant species; and leaving a particular tidal pool in its natural form. There was also a specific requirement that no sewage, treated or otherwise, was to be discharged to the sea. A further condition of the lease was that CHICOP should report annually on the state of the wider marine and terrestrial environment, including reference to problems encountered and steps taken to resolve them.

In the next two years, CHICOP worked with the government to designate two new protected areas and establish management arrangements for these areas. In 1994, CHICOP signed an agreement with the now Ministry of Agriculture, Land and Environment (MALE) declaring the reef to the west of the island as the Chumbe Reef Sanctuary and giving CHICOP



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responsibility for its conservation and for controlling and managing it as a no-take zone (the original lease specifically protected the activity of local fisherman on the eastern side of the island). The following year, a similar agreement was signed which declared the 22 hectares of Chumbe Island that had not been included in the original lease to CHICOP as a Closed Forest Habitat, with management entrusted to CHICOP for a period of 33 years.

Chumbe Island became the first Marine Protected Area (MPA) in Tanzania; in subsequent years, the government established several more MPAs in other locations.

A management plan and monitoring arrangements covering the whole area

The project provides an excellent example of ongoing public-private collaboration on biodiversity conservation. In 1995, CHICOP prepared a ten-year management plan, covering the MPA and the whole island; this plan was updated together with a thorough evaluation in 2006. On both occasions, approval was granted by an Advisory Committee of stakeholders, including representatives from the government, a university, local communities and CHICOP. High-priority actions included establishment of a species conservation strategy and monitoring protocol for all notable species found in the Chumbe MPA. Appropriate research and response measures are triggered by a significant fall in the population of any notable species.

In addition to biodiversity management, CHICOP is required to stay up-to-date with new innovations and technologies in its tourism operations, ensuring, for example, that rainwater collection systems are adequate to meet demands on water resources and that greywater facilities and composting toilet systems are monitored to ensure no leakage of pollutants into the environment.

Monitoring of the designated reef sanctuary and forest habitat is undertaken by the park rangers employed by CHICOP, with the help of volunteers and visiting researchers. With some external funding, work has been conducted since 1993 on baseline surveys and species lists of the island's flora and fauna. In 2006, a new monitoring manual was produced that focused the process on a restricted number of indicators that were capable of being monitored to predetermined accuracy by the CHICOP rangers. Monitoring is considered to be important to assess whether management objectives are being achieved, to highlight issues where the reserve needs support, and to provide early warnings of stress to the reef. It is also designed to support reporting, with results analysed and compiled annually and sent to the Department of Fisheries and Marine Resources (DFMR). A comprehensive Conservation Status Report was compiled in 2010 and made available on the CHICOP website.

Relating the design and investment to the conservation ethos and goals

While the Chumbe Island development story is a good example of an ecosystem-based approach to development of a tourism facility within the conservation needs and management of an entire area, the project also demonstrates other good practices.

Designs for accommodation took full account of the requirements of the lease for close-to-zero impact on the sensitive marine and terrestrial environment. The developers very effectively used innovative construction and environmental technology, with siting limited to the area previously cleared for the lighthouse and keeper's house, and each unit placed carefully into natural clearings in the coral rag forest. A simple, distinctive geometric form was chosen for the accommodation units, making full use of traditional construction methods, available materials and the capabilities of local labour. Materials were sourced



from Zanzibar Island and brought across by sailing dhow on a high tide to avoid damage to the coral reef. Casuarina poles were used for the main structural components, formed into shell-like roof shapes to facilitate rainwater collection and covered with palm thatch (*makuti*).

Chumbe Island has no source of fresh water other than rain, so each building functions as a self-sufficient unit, using state-of-the-art eco-technology to generate its own water and energy through rainwater harvesting and filtration, solar water heating and photovoltaic electricity. Each *banda* was placed near the edge of the forest, facing the sea, with a raised ground floor that optimizes views and also houses the rainwater cisterns. Sensitive coral communities have been protected from sewage run off and pollution with dry composting toilets, which avoid flush water, and thus sewage, and recycle human and organic waste. No trees were removed during construction and the only trees planted were coconut trees to replace old trees. In addition, non-invasive plants that are heavy consumers of nutrients were planted in small garden plots to which filtered greywater from showers and the restaurant kitchen is directed. To protect nocturnal wildlife from light pollution, there is no artificial illumination of the walkways, nature trails and beaches, and guests are given solar-powered torches.

The former lighthouse keeper's house has been incorporated within the striking structure of the visitor centre. The traditional mosque is maintained for use by staff, with visitor access by invitation only.

Of the total investment of US\$1.2 million, 39 percent was directed to tourism infrastructure, with the remainder spent on preparatory research and capacity building for conservation, park management and environmental education programs for local schools and other groups. One-third of the 43 staff members are directly involved in conservation management and education. Commercial operations began in 1998, and revenue generated has risen steadily. By 2000, it was possible to fully fund management of the MPA and conservation and education programmes. As yet, no capital repayments have been made; CHICOP is taxed like any other tourism operation and profits are re-invested.

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Principle 2 Case Study

North Island, Seychelles

Minimum impact and positive restoration of biodiversity

An initiative not only to minimise the environmental footprint of a hotel, but also to restore the island's habitat and endemic species, led by an investor and backed up by relevant government standards and checking processes.

For nearly 200 years, North Island, a small granitic island in the Seychelles, was farmed for coconuts, which required the clearance of native vegetation. Following the collapse of the copra industry in the 1970s, the island was abandoned. The black rat, which had reached the island before the farmers, increased uncontrollably in numbers, whilst feral farm animals and alien weeds also thrived, resulting in the disappearance over time of most of the remaining native animals and plant species.

In 1997, the whole island was purchased by Wilderness Safaris, an international company operating 70 lodges and camps in seven African countries. The company's sustainability strategy is encapsulated in its concept of the '4Cs' – conservation, community, culture and commerce. Wilderness Safaris focuses on two elements of conservation:

- Environmental management systems (building and operating in the most eco-friendly way possible to ensure the lowest possible carbon footprint); and
- Biodiversity conservation (understanding, managing and protecting the wildlife and ecosystems with which they are involved).

Wilderness Safaris' vision for North Island was to create a sanctuary for the reintroduction of some of the Seychelles' (and indeed the world's) most endangered animals and plants. This vision would be facilitated by the development of an exclusive hotel on the island.

North Island Resort is one of an elite group of Wilderness Safaris products included in the Wilderness Collection, a carefully selected portfolio of properties dedicated to sustainable luxury and exceptional guest

Name of hotel/resort	North Island
Scale	11 villas
Date of development	2002
Location	North Island, Seychelles
The area context	A small island of 201 ha, lying in the northern part of the Seychelles archipelago

experiences. The hotel and the island share a name and occupy the same area, with integrated management of the hotel and the island itself.

Initial assessment and planning

Before development could start, a number of international specialists and representatives of local conservation NGOs were brought in to carry out studies of flora and fauna, concentrating on birds, *Chelonia* (tortoises and turtles), and the overall vegetation. These experts had considerable knowledge of biodiversity in the Seychelles, including familiarity with historical records and comparable sites.

This initial study was followed by a series of thorough environmental impact studies, which included:

- plans for the eradication of invasive alien species, with the least negative impact on non-target species and the soil and water;
- a vegetation management plan, which covered control of exotic and invasive plants, multiplication and planting of indigenous species, experimentation around rehabilitation techniques and ongoing monitoring of vegetation;
- a hydrological study to calculate the daily quantities of fresh water that could be withdrawn without negative impact on the freshwater aquifer;
- an investigation of potential impacts of infrastructure location and design on turtle populations (sites to be avoided, setback from beaches, turtle-friendly lighting etc.); and
- an assessment of sources of construction materials, including identification of species of island trees that



could and could not be used, and what would need to be imported.

Avoiding and minimizing impacts on biodiversity

The developers considered measures to avoid negative impacts where possible – and to minimise those that might still occur – in their approach to building construction, in technology for processes such as the treatment of wastewater, and in the planning and provision of access to the island.

Great care was taken in siting and designing the 11 private luxury villas, to ensure that they had minimal environmental impact. Ten of the villas were placed in the tree-line, facing Anse Cimetière Beach, with the eleventh tucked into the hillside in the Takamaka forest, with spectacular views. The main construction materials were wood, local stone, glass and thatched roofs. Many materials were recycled from the removal of alien species on the island. Felled alien trees were used in the building.

Careful management of wastewater is essential to the island's ability to support biodiversity. Avoidance of impact has been pursued through best available technologies and management practices. Wastewater is handled by a Sewpac system, a three-stage modular

sewage plant that treats waste anaerobically to a high standard. The resulting effluent is passed via two sand filters to a chlorine dosing tank, before being pumped to storage tanks and then used for irrigation. There is no discharge to the marine environment. The effectiveness of these avoidance measures is monitored through regular testing of water quality and of effluent, which is a requirement for government renewal of the hotel licence.

Access to the island by boat has been carefully planned to minimise environmental risk. Early on, it was decided that a jetty should not be built, in order to avoid influencing the natural seasonal movement of sand around the island. This decision was also supported by the need to minimise the risk of inadvertent re-introduction of rodents from incoming boats tying up at a jetty. As beach access required an approach channel capable of handling sizeable vessels, the developers sought permission from the Ministry of Environment to widen and extend an existing channel. The Ministry conducted an on-site assessment of the status of the coral reef in the area and the probable impact of dredging on the marine environment. This assessment found that the fringing reef consisted mainly of old reef, with an extremely low percentage of living hard coral and other benthic organisms, so permission was granted. Subsequent permission was granted to



remove calcareous rock that had been posing a danger to incoming container barges, with recommended measures to avoid future impacts on the beach.

Eradication, rehabilitation and restoration programme

In addition to the above avoidance and minimization measures, Wilderness Safaris has implemented an extensive programme of positive conservation and restoration of the island's biodiversity. This programme has proceeded systematically, carefully and rigorously, with funding provided by both the income from the lodges and the Wilderness Safaris Wildlife Trust, an NGO founded by Wilderness Safaris to support its community and conservation projects. About 21 percent of the island's surface has already received some level of vegetation rehabilitation.

With the support of Island Conservation Society (ICS), a local NGO, and as part of a national project funded by Fond Français pour l'Environnement Mondial (FFEM), North Island successfully completed a programme of black rat eradication in 2005, making it the largest tropical island in the world to successfully do so. A set of stringent avoidance procedures was set in place to ensure that no re-invasion would occur via cargo landings from the rodent-infested main island, Mahé. These procedures were implemented in 2005 and were reviewed by an independent expert in 2010.

The state and condition of much of the native vegetation has been restored to a point where it could support the introduction or re-introduction of endemic species, especially birds, from elsewhere in the Seychelles. Government approval must be sought prior to each

introduction of any Critically Endangered endemic species, and requires extensive expert research to confirm food availability and sufficient restoration of suitable habitat on the island, as well as research by NGOs and the Ministry of Environment on the mother population. The Seychelles White-eye (*Zosterops modestus*), a small passerine bird, was successfully introduced in 2007, assisting its down-listing to Endangered status on the IUCN Red List; and the black mud turtle, a species of terrapin, was introduced in 2008 and 2009.

Working with government on future protection

The measures outlined in this case study to protect and enhance the biodiversity of the island have been instigated and pursued by Wilderness Safaris. However, in order to provide further security for biodiversity on the island, Wilderness Safaris is supporting current efforts to seek legal protection for North Island's marine and terrestrial areas through participation in a national project, funded by the Global Environment Facility (GEF), that is reviewing the incorporation of private islands into the national protected area system.

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Principle 2 Case Study

Isla Palenque, Panama

Using land wisely to minimise the development footprint

A tourism development project that is taking considerable care to avoid and minimise disturbance to indigenous forest vegetation and other habitats and to make efficient and creative use of land to supply its needs.

Isla Palenque, a small island off the coast of Panama, has a range of habitats, including primary forest, mangrove and marshes, and is edged by twelve sandy beaches. About 20 percent of the island was cleared by previous owners over several generations for small-scale cattle farming. In 2008, the island was purchased by tourism developer Amble Resorts for inclusion in their portfolio of ecologically sensitive and culturally authentic resorts. Construction work has begun, and the first facility, a 16-room hotel consisting of ten jungle suites and six villa suites, is scheduled to open in 2012.

Amble Resorts' approach to conservation is voluntary and driven by a desire to create a particular type of travel experience. A master plan, which draws on a number of sources for environmental information and cultural inspiration, sets out a framework for coastal access, transport, development, energy, open space and conservation. Under this plan, more than 50 percent of the island is protected as a nature sanctuary, consisting of fragile forests, lagoons and mangroves. This is significantly more than the requirement in Panamanian law that 15 percent of all zoned land be designated for park and open spaces. The full development, which will be phased over ten years, will ultimately include about 200 vacation homes and 50 hotel rooms.

Avoidance and minimisation of disturbance in building construction

The developers have helped minimise damage and disturbance to biodiversity during construction by locating new buildings on land with limited biodiversity value. Development is concentrated in previously cleared areas along coastlines, while a central service facility is located on a flat area where the forest floor is

Name of hotel/resort	Isla Palenque resort
Scale	16-room hotel, phased to grow to 200 vacation homes and 50 hotel rooms in 10 years
Date of development	2009 – ongoing
Location	Isla Palenque, Gulf of Chiriqui, Panama
The area context	An island of 176 hectares lying off the Pacific coast of Panama, just outside the boundary of the Parque Nacional Marino Golfo de Chiriqui

relatively bare. Ridgelines have been preserved, and structures will be nestled into the landscape to reduce visual impact.

Development of infrastructure has been staged over time, enabling sites to be used sequentially and minimising the spread of activity to new sites. Accommodation for construction workers has been carefully sited to meet specific needs for each phase of the work.

To minimise disturbance during the actual construction, particularly close to tree root systems, concrete piers or caissons going down to bedrock have been used to provide support for the buildings through a post-and-beam structural system, rather than traditional footings and foundation walls.

Buildings have been sited and angled in order to clear as little land as possible, keeping all old growth trees in place, and to gain advantage from prevailing breezes and natural shade. This has been achieved by physically staking out selected sites and making final adjustments on the ground. Village-like clusters of *casitas* will be built into the hillside, and the modular kit form of larger villas can be arranged to preserve naturally existing boulders and old-growth trees. Elevated canopy homes, connected by a series of raised boardwalks, offer ocean views while preserving slopes and vegetation.



Minimising the impact of transport infrastructure

In order to have transport infrastructure with minimal environmental impact, Amble Resorts sought special approval from the Panamanian government for a 50-percent reduction in its normal requirement for road width. This is the first known project to gain such approval. These narrower roads, which will result in a significant decrease in site disturbance and clearance of vegetation, are feasible because motorised transportation on the island will be limited to a fleet of small electric cars. Such vehicles also require less grading and levelling of the route. Utilities will be laid under the roadways, again to minimise disturbance to vegetation. A process of roughly staking out the routes has also been adopted here, enabling them to be reworked in detail on the ground to retain significant tree specimens that are rare, mature or important to the ecosystem.

Gaining positive benefit from a local supply programme

Amble has also designed an agriculture and forestry programme, managed with biodiversity in mind, to reduce the need to import food and building materials. Plans have been drawn up for an organic orchard, an edible forest garden and the scattered planting of fruit trees. Sections of the previously deforested areas will be restored through the practice of permaculture, maximising productive use of the various layers of a multi-storeyed forest, from understory to canopy. Use of native plants will reduce dependence on irrigation, while on-site wastewater treatment and cisterns provide water for irrigation during the dry season. Deforested lands are also being used to grow building materials, including palm leaves for thatch and bamboo for furnishings.

Careful design benefiting resource management

The Isla Palenque development also illustrates other aspects of good design and management to benefit the environment and biodiversity. The terraces of suites are planted rather than paved, to reduce ground temperatures, and bodies of water placed immediately outside openings help pre-cool air as it enters the houses. Rainwater harvesting techniques reduce dependence on extracted water by collecting rainwater during the wet summer season; inverted roofs, collection cisterns and towers are incorporated into the architecture for this purpose. A significant portion of the energy needs of the planned development will be generated by on-site solar and wind power. Public and residential buildings are being designed to a standard that is intended to achieve the U.S. Green Building Council's LEED® Platinum certification.

Panama's beaches are home to five different types of sea turtle, and it is not uncommon for them to come ashore at Isla Palenque. To encourage such occurrences and, if possible, to increase their frequency, the use of bright lights is being limited in areas near the island's beaches, and no artificial barriers have been built along the shoreline. Water quality is also being protected, with all wastewater treated through sequencing batch reactors, which convert the water to a state that is suitable for irrigation around the hotel and the organic farm.

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Principle 2 Case Study

Fairmont Mayakoba, Mexico

Minimising impacts from a major development

An international hotel company adopting a range of measures to avoid and minimise the impact of a sizeable resort and golf course development on coastal ecosystems, including mangroves and water channels.

Over the last century, Fairmont Hotels and Resorts has built a global collection of more than 60 properties around the world. As part of a more recent expansion, the company has sought to diversify its historic portfolio of heritage and city centre properties with hotels and resorts located in more pristine, natural environments.

The Fairmont Mayakoba is one such resort. This sizeable hotel was developed by Fairmont on a 19-hectare site in the Mexican Riviera Maya that is part of a larger estate containing two other hotels operated by other companies. An earlier master plan for the estate, which involved thorough and careful environmental assessment of the geology, hydrology and ecology of the area, provided a guiding framework for Fairmont to design and construct its own hotel, avoiding identified sensitive sites and minimising impacts where possible.

Name of hotel/resort	Fairmont Mayakoba
Scale	401 rooms and suites
Date of development	Opened in 2006
Location	Quintana Roo, Mexico
The area context	A site with mangrove and other coastal habitats close to a significant resort area

Avoiding impacts on the mangroves

The first concern in the siting and design of the hotel was the avoidance of impact on the extensive area of mangrove forest that covers parts of the site. Mangroves play a significant role in stabilising soils, protecting the shoreline, maintaining and improving water quality and providing nursery habitat for a diverse community of fish and other animals. Along the Riviera Maya, mangroves also make an important contribution to protecting the health of the northerly parts of the Mesoamerican Reef system, the largest stretch of coral reef in the western hemisphere.

In order to protect this sensitive and endangered ecosystem, more than 90 percent of the rooms at Fairmont Mayakoba, and the majority of the central services, are located behind the mangrove line. Just 34 rooms are situated near to the beach. This arrangement distributes the weight of the development around the property in such a way that it allows a natural flow of water in the underground river system that feeds the mangroves.

A system of waterways was designed to integrate with, and support, the mangrove forest. Man-made canals and lagoons incorporate natural rivers to provide a network of corridors for guests to travel around the site from their waterfront *casitas*, using *lanchas*, electric-powered, covered boats. New aquatic habitats were created around the mangroves to serve as shelter, rest and feeding areas for many species of birds, fish, crustaceans and molluscs.

To minimise stress on water systems, only indigenous, drought-tolerant plants have been used around the





site. Such plants conserve water, as they are highly adapted to local weather conditions and do not require extensive irrigation.

The potential impact of access routes to the beach through the mangrove systems and dunes has been minimised by the use of a simple short pathway.

Relocating species and restoring areas of disturbance or habitat loss

During construction, protection of the natural jungle and its native flora and fauna was governed by an Environmental Management System that identified species of high environmental value and specified actions for their rescue, handling, propagation and relocation to a nursery or to areas of reforestation, including mangrove forest.

A vegetation rescue project has relocated more than 1,500 trees and 10,000 smaller plants. An ancient Maya technique called *socolo* was used to prune and replant many of these trees and plants. A specialist on-site nursery was developed to not only receive relocated plants for temporary periods but also to propagate indigenous species for planting around the site.

Special measures were taken for the relocation of more than 40 species of fauna identified as occupying, or otherwise dependent on, sites due for development. This programme was designed by specialists and validated by the Ministry of Environment.

Designing the golf course

The 18-hole, El Camaleón golf course was designed to thread its way for 7km through the distinct landscapes of mangrove forest, limestone canals and shoreline,

completely enclosing the site of Fairmont Mayakoba. Rather than removing natural features, many were incorporated along the way. For example, a *cenote* (a particular type of spring characteristic of the area) was kept within the fairway of one hole, and the course includes many rocky areas inhabited by native iguanas. Any tree that dies is left standing, to provide a home for small animals and birds.

The golf course is irrigated by greywater from the hotel's wastewater treatment plant. Although the mangroves are known to take up excess nutrients from water that has been used on the golf course, the process requires careful management. Measures to manage water quality include the regular testing of irrigation water and limits set on the amount of water that is allowed to run off into the canals.

Since 2006, the El Camaleón Golf Course has been certified as an Audubon International Co-operative Sanctuary.

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Principle ③ Case Study

Bay of Fires, Australia

A complete nature-based experience

Development and operation of a holistic visitor product, involving not only carefully and creatively designed accommodation, but also an inclusive package offering access to the neighbouring protected area.

The Bay of Fires Lodge, the only building located in 20km of outstanding coastal wilderness in the northeast corner of Tasmania, takes its name from its location in the Bay of Fires. The Tasmania Parks and Wildlife Service (TPWS) has management responsibility for most of this much larger coastal area, known for its white sandy beaches and granite headlands: the northern section lies within Mount William National Park and the southern section is a Conservation Area. The National Park is an important area for the conservation of Tasmania's coastal heathlands and specialised dry sclerophyll plants. The Lodge is located on a small area of private land (34ha) that falls outside the protected area, while still being virtually surrounded by protected lands.

Name of hotel/resort	Bay of Fires Lodge and walkers' camp
Scale	Accommodation capacity for 20 people
Date of development	2000
Location	Ansons Bay, Tasmania, Australia
The area context	A wilderness area in the northeast of Tasmania, with a coastal lodge surrounded by a National Park

A concept that meets the sensitivity of the area

Based on their experience developing a successful nature-based tourism operation elsewhere in Tasmania, the site owners put forward a proposal to create a walking experience through the park, for groups of up to ten people led by knowledgeable guides. The walk would include a night spent in a remote camp within the park itself and end with two nights at a newly constructed lodge on the development site. A permanent development within the park would not have been allowed. The whole concept, including access arrangements, the camp and the architecture and construction of the lodge, was designed to resonate with the wilderness environment.

In 1999, the developers submitted an application to Break O'Day Council, the local authority with responsibility for development control, for a simple but up-market lodge accommodation. At the same time, they submitted an application to establish and operate a standing camp within Mount William National Park and sought approval from TPWS to conduct guided walks on beaches or existing tracks along a 25km stretch of the park's coastline. In the absence of a management plan for the National Park, very detailed site plans for the standing camp were required from the developer. Out of respect for local sacred Aboriginal sites, which are found throughout the area and much of Tasmania, the developers also sought approval from the Aboriginal Land Council. Approval was granted in all cases, as the authorities concluded that the product would offer a



© Bay of Fires

unique, environmentally sustainable way of experiencing the dramatic landscape of Mount William National Park.

A design that combines simplicity with creativity

The Bay of Fires Lodge is located on a small knoll overlooking the Bay of Fires with its beaches of pale sand flanked by granite boulders and steep slopes of dry sclerophyll scrub, rich with Aboriginal middens. The beaches are backed by densely vegetated dunes. Access is primarily on foot, with guests walking in as part of the programme. Vehicle access is available where necessary for some groups and services, but the private vehicle track stops about 200m away from the property.

The building was built into the site with great care, to create minimal disturbance while maximizing the visual connection with the surrounding vegetation and the ocean beyond. Siting took full advantage of the natural clearing; only three trees were removed to construct

the building. Rather than scattering individual cabins across the site, all the facilities were centralized into one complex, consisting of two parallel linear pavilions of timber and glass to create an extraordinarily simple space, involving an 18m-long core and offset extensions at either end to provide, respectively, an entrance and a deck. This design and positioning also takes advantage of cross ventilation and penetration of the winter sun.

The building is not orientated parallel to the beach but is rather sited end-on to the sea, below the summit of a small but prominent knoll. This positioning provides shelter from coastal winds and limits the visual impact on the surroundings. At one end, the gables and deck project out of the trees above the small beach, splaying out to reveal a view across the bay. The slope of the two steeply pitched, single-surface roofs (skillion roofs, known in Australia as shed roofs) has been designed to maximize exposure to the winter sun and mirrors



the form of the trees, which have been shaped by the prevailing wind.

Light materials and low-impact technology using natural processes

The design of the building is based on minimal components, simple and lightweight, which enabled all materials to be delivered by air or walked in, causing minimal disturbance to vegetation. Construction materials were brought by truck to a point 6km away, where they were divided into 500kg loads for delivery by helicopter. The rooms and facilities are striking but simple. There is no mains power, mains water or sewage connection, so all basic services were provided on site. Light and power are provided by north-facing solar collectors, projecting from the roof. Extensive use has been made of glass louvres to allow for sunlight penetration and cross ventilation, shielded from direct summer sun by roof eaves. There is a wood combustion stove in the living area.

Rainwater is collected from the roofs into five 22,000-litre storage tanks, complemented by water-saving measures including water flow restrictors, with guests' hand-pumping water for showers and basins to a header tank. All sewage and organic kitchen waste is treated on site using a dry composting system. Wastewater is removed from the system, passed through a digester, and filtered before direction to a transpiration trench where it evaporates; kitchen wastewater is taken through a three-stage grease trap before it joins the digester. All service equipment and rainwater collection tanks have been grouped together on one side of the building.

The camp – designed to suit the site and the requirements of the National Park

As no permanent accommodation structure was permitted in this location within the National Park, the standing camp was developed as a demountable structure. The development conformed to TPWS policy



to locate standing camps at least 3km from road heads in National Parks. The chosen site was located within a closed swale, with surrounding dunes stabilized by continuous plantings of boobyalla, and a short covering of bracken fern on the floor of the swale. The camp is not visible from the beach or surrounding area. Waste management procedures were carefully planned, including use of a composting toilet, blackwater and greywater treatment, and removal of solid waste from the site.

The proposal for development of the camp was supported by a TPWS Environmental Impact Assessment. Additional conditions were attached to the planning approval. For example, to facilitate pedestrian access over the dune systems while limiting the effect of trampling and erosion, sand ladders were provided. To prevent the spread of phytophthora, facilities were required at the beginning of the walk for washing footwear.

In 2006, in order to avoid unchecked gradual development of remote areas within reserved land, Tasmania Parks and Wildlife Service introduced a Standing Camp Policy that has formalized guidelines for the approval and operation of standing camps on land managed by the TPWS.

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Principle ③ Case Study

Soneva Fushi, Maldives

Blending with nature to reduce impact

A luxury development that follows corporate sustainability policy towards design and construction, blending the resort into the natural landscape and using nature as a source of inspiration, as well as minimising environmental impact at the construction stage and in the future operation of the resort.

Even though it has an area of only 140 ha, Kunfanadhoo is one of the biggest islands in the Maldives. It is a densely vegetated tropical island in Baa Atoll, surrounded by a house reef teeming with marine life. In 1995, Soneva Fushi resort, which now comprises 65 villas, was opened on the island by the Sonevas, a resort management and development company.

The Sonevas, which operates in the Maldives and Thailand, is committed to sustainable development, with environmental responsibility a fundamental core value for their business. The company, whose brand position is 'intelligent luxury', has a set of core policies for resort development. Among these policies are two sets of principles, one for the design stage and one for the construction stage, that are detailed in their Social and Environment Programme:

- The design-stage principles cover legal requirements, the local environment, environmental/geographical risks, building design, energy management, water supply and wastewater.
- The construction stage principles cover waste management during construction, groundwater protection, mitigation measures and the establishment of an environmental monitoring programme prior to construction on sensitive sites.

The development of Soneva Fushi, the company's first resort development, reflects this corporate approach.

Blending with nature, through siting, design and materials

At the start of the project, the decision was made to develop at low density, beginning with 45 villas and

Name of hotel/resort	Soneva Fushi
Scale	65 villas
Date of development	1995
Location	Kunfanadhoo Island, Baa Atoll, Maldives
The area context	A tropical island in a marine environment that has recently been designated a UNESCO World Biosphere Reserve

later expanding to 65. Infrastructure was designed to encourage walking and cycling around the island. All of the villas were built 30-40m back from the beach and hidden by vegetation to minimise their visibility from the sea, and their size, layout and location were planned to integrate native vegetation into manmade structures. For example, the Jungle Reserve Villa was built around a coconut palm tree, which grows dramatically through two levels of the villa. Tree removal has proved necessary on a very small number of occasions; in these instances, trees were transplanted into a similar habitat elsewhere on the island. Natural materials were used wherever possible, including fallen and recycled timber, as well as teak, cedar, pine, acacia, eucalyptus, coconut palm and bamboo from sustainably managed and certified sources. Other building materials, such as the palm thatch for the roofs, were locally grown. Guest villas were designed and positioned to take full advantage of natural ventilation and lighting; the design of the most recent accommodation incorporates a double-level roof with louvres to provide cross ventilation.

Design challenges in addressing water and energy management

Although options for water and energy supply on a small island were quite limited in 1995 when Soneva Fushi was first developed, with improvements in technology, new alternatives to the original designs are becoming available. Maintaining a potable water supply has presented a challenge, especially as a borehole is not permitted on Kunfanadhoo. A small rainwater harvesting



system is in place, but the majority of available water is produced by desalination. Although not ideal, the resulting saline brine is discharged to the ocean. Steps are taken to reduce salinity prior to discharge, by mixing with treated wastewater, and care has been taken to ensure that discharges are made beyond the reef.

Private saltwater swimming pools, a feature of many villas, reduce demands on freshwater supplies and also save on energy and carbon costs.

While the resort was originally dependent on diesel generators, in 2009 they took the first step towards achieving their commitment to a net zero carbon footprint with a pilot project to introduce a 70kw solar photovoltaic system. This is the largest solar renewable energy plant currently operating in the Maldives, but it will still require substantial expansion before renewables can make a significant contribution to energy requirements on the island and support the carbon reduction goals of the Maldives government. A second phase is planned for 2012.

Using native flora and planning for low-impact cultivation

Natural vegetation cover, including coconut trees and halophyte shrubs, has been left undisturbed over large parts of the island, providing cooling fresh air and shade for guests and a lush, dense forest supporting populations of birds and other wildlife. Old plant matter is left to decompose and great care has been taken not to introduce any ornamental or non-native species.

A resident expert has employed a number of techniques, based on the principles of permaculture, to maximize the productive capacity of the island while reducing demands on natural resources. Native salt- and drought-tolerant plants have been used to reduce the need for irrigation. Green waste, arising from maintenance of pathways and around the villas, is shredded and

used as a mulch to retain moisture, reduce erosion, provide nutrients and suppress weed growth and unwanted seed germination around the gardens and the natural vegetation. 'Mop-cropping' is used to reduce the amount of pollutants entering precious fresh groundwater, with bamboo, banana, papaya and moringa plants taking up nutrients from water from the overflow of ponds and rainwater harvesting.

Over time, soil content has been improved. Biocharcoal, produced by treating woody waste in a retort biochar oven has been used to enhance soil fertility, enabling the majority of herbs and vegetables to be grown on the island. Capacity for food production will be further increased through the introduction of an aquaponic system, currently under trial. Through the symbiotic cultivation of plants and aquatic animals, this aquaponic system is expected to provide the island with sustainably harvested vegetables and fish.

International recognition

Soneva Fushi's marine biologist has been working closely with local government and neighbouring resorts to gain official protection for the surrounding marine environment. The UNDP Atoll Ecosystem Conservation project has proposed international designation of Baa Atoll, in recognition of its outstanding natural values and the commitments being made by local communities and resorts. In June 2011, Baa Atoll was declared a UNESCO World Biosphere Reserve.

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Principle ③ Case Study

Maho Bay and Concordia, US Virgin Islands

Pioneering use of low impact design

A longstanding example of tourism accommodation development designed to have minimal impact on ground vegetation, through use of platforms and walkways, as well as low-impact materials and technologies.

St John, with its mountains and secluded beaches, is the smallest and most pristine of the three best known islands in the U.S. Virgin Islands. The island contains one of the largest wilderness areas in the Caribbean, with mountain peaks shelving steeply to secluded beaches and mangrove shoreline. About two-thirds of the island, 3,000 hectares, is designated as a National Park, which also includes a further 2,000 hectares of submerged lands including coral gardens. St John is only accessible by boat.

The pioneering development at Maho Bay began in 1976 in the national park, with 18 tent cottages on a six-hectare hillside site above its own beach. Increasing demand has seen Maho Bay Resorts grow to 114 tent cottages, with an additional twelve rooms added further up the hill at Harmony Studios. In 1993, a sister resort, Concordia Estate, opened in a more remote corner of the island, just outside the national park. Also with a mix of tent cabins and studios, Concordia now offers 42 accommodation units with a high level of eco-efficiency.

Using hillside settings and connecting walkways to blend with nature

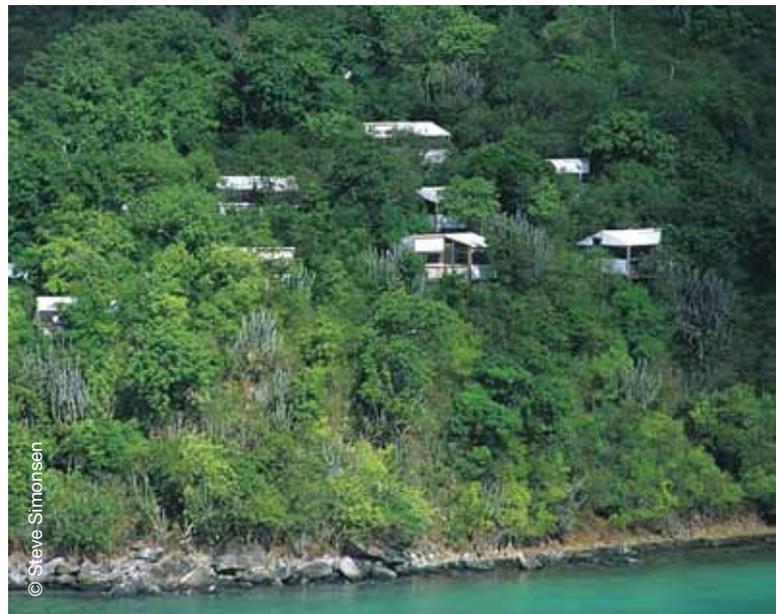
Right from the start, tent-cabins at Maho Bay Resorts were built on raised 5m square platforms using hand construction techniques that left the natural environment virtually undisturbed. As new cabins and studios have been added, siting and design have broadly followed the same approach. Tent cabins and studios are tucked away into the hillside within the vegetation, avoiding visual intrusion and offering privacy to guests. Sites for the cabins, studios and the central service facilities have been chosen to minimise environmental damage.

The units are connected together by raised wooden walkways and stairs, which have been designed to have

Name of hotel/resort	Maho Bay and Concordia Eco-resort
Scale	126 units at Maho Bay and 42 at Concordia
Date of development	First units built in 1976
Location	St John, U.S. Virgin Islands
The area context	Two hillside sites, each with beach access, with one located within the Virgin Islands National Park

the lowest possible impact on vegetation. The walkways avoid soil erosion, which could threaten the beach and fragile coral reef, and prevent vegetation from being trampled. They are often routed around trees and rocks, and space has been allowed to provide growing room for trees. Ground cover and other plant and animal life continues undisturbed beneath the cabin platforms and raised walkways, while shade is provided for guests by undisturbed vegetation above the walkway. At both Maho Bay and Concordia, stairways provide guests with access to a sandy beach below. The network of walkways and stairs stretches a total of about 5km at Maho Bay alone.

Car parking has been separated from the tent cabins and studios, keeping the footprint of each



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accommodation unit to a minimum. Visual intrusion from power lines and water pipes has been avoided by attaching them to the underside of boardwalks or, where this is not possible, running them along the ground.

Careful material selection and use of design

The tent cabins at Maho Bay Resorts have been designed with screened windows and open air terraces to allow natural cooling from the island tradewinds and translucent fabric on wooden frames to take advantage of natural light. Extensive use has been made of recycled and environmentally sound materials for building. Wood polymer composite lumber, made from recycled plastic and sawdust, was employed in building Harmony Studios and Concordia Eco-Tents. Structural framing for hip rafters and floor girders at Harmony Studios were manufactured from composite wood products made from waste and farmed trees.

Units at Concordia were constructed with the high-tech fabrics, which provide great strength and come

in colours that blend into the landscape, while super-reflective roof fabrics are used to regulate temperature. Vents have been placed in the walls of the restaurant and kitchen to allow air to circulate freely.

Incorporating technologies to manage the use and supply of energy and water

Over time, new technologies have increasingly been incorporated into accommodation units as they have been constructed. Energy consumption is limited through use of timers and sensors. The 25 units at Concordia eco-resort are self-sufficient in energy, making full use of renewable technologies, including solar-powered water heaters.

The availability of water is limited by lack of aquifers and permanent surface water supply on St John. Rainwater harvesting on almost every building diverts more than 1,500 m³ of rainwater a year into collecting cisterns, which supply water for laundry, housekeeping and bathhouses. Cisterns are strategically located in the hilly environment so that water can flow using gravity, without the need for energy-consuming pumps. Water consumption is minimised through spring-action faucets and showers. Clean and odour-free waterless urinals have been introduced in Concordia eco-resort. An anaerobic system is used to treat greywater, which is subsequently recycled and carried through lateral pipes to irrigate orchards, gardens and surrounding vegetation.



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Principle 4 Case Study

Misool Ecoresort, Indonesia

Securing community engagement in development and marine conservation

Development of a resort and No-Take Zone based on extensive consultation and engagement with the local community, respecting local rights and traditions and benefitting local livelihoods through involvement with the tourism operation.

Misool Eco Resort (MER) is located on the island of Batbitim, within the Raja Ampat group of islands that lie off the western coast of Papua, the Indonesian half of the island of New Guinea. Lying at the heart of what is known as the Coral Triangle, Raja Ampat has abundant coral reefs, home to more than 700 species of molluscs and 1,397 species of fish. Batbitim offers some of the best and most pristine diving in Raja Ampat.

MER seeks to provide exceptional and enriching diving experiences in a sustainable environment. The first eight guest cottages were opened in 2008, and three deluxe villas have since been added.

MER started out as the vision of one man and is now owned by its shareholders, a dedicated group of divers and conservationists. In 2005, MER entered into a 25-year lease agreement with members of the local community for exclusive rights to Batbitim and Jef Galyu Islands, including hills, forests, coconut trees, water, animals and the surrounding lagoon. An integral part of the lease was the designation of approximately 200km² of surrounding sea as a Marine Protected Area (MPA) and No-Take Zone (NTZ), in order to conserve the marine environment and also its interest for divers.

The need to involve the local community was recognised as critical to the whole project, not only in securing the lease but also in ensuring their broad consent and support for the resort and the MPA/NTZ, so that it could be effectively secured and sustained. This required careful communication with the local community, based on understanding and

Name of hotel/resort	Misool Eco Resort
Scale	11 villas/cottages
Date of development	2006-8
Location	Raja Ampat, Papua, Indonesia
The area context	The remote southern part of the Raja Ampat islands, an area rich in reefs and dive sites

respect, and the provision of alternative livelihoods through the resort.

Determining ownership rights and negotiating the lease

The lease agreement between the community and MER was founded on principles supported by Papuan law or Hak Adat, which is recognized and formalized under Indonesian law. Under Papuan law, people can own not just islands but the beaches, reefs and waters that surround them. This gives local community owners the opportunity to assign a lease that includes rights to the marine as well as terrestrial environment.

An important first step was to fully clarify the existing ownership rights, in order to minimise the risk of disputes at a later date. A local Adat committee had to confirm the rightful owners of the area. To gain an in-depth understanding, MER went to great lengths to meet with local administrators and community leaders. The ability to speak proficient Bahasa Indonesia proved essential to getting to the heart of their needs and concerns, as well as for establishing mutual trust and respect. The owners were identified as the village of Yellu, 22km to the northwest of Batbitim. Local administrators facilitated the first meeting with the village, and others followed. Before the lease was signed, the Village Secretary recommended a final meeting with the village to make certain they were very clear that they would no longer be able to fish in the NTZ.



© Eleanor Carter

Securing the No-Take Zone

Having secured all rights to control the land, water and living organisms within the area of the lease, MER was empowered to take the steps necessary to enforce the 'no-take' provisions of the agreement.

The approach that they took provides an excellent example of achieving community support by addressing mutual interests and engendering partnership. Key elements included:

- Making the agreement apply to everyone, including MER. As lessee, MER could have exercised its own right to take marine products, corals, turtles, sharks, rays and fish. However, they felt that it was important to abide by the same provisions as required of the community as lessor.
- Building on local traditions. The concept of 'no-take' is understood in established local practice. The region has a long tradition of open and closed fishing seasons (*sasi*), which local villages declare in their area and which surrounding villages respect. The *sasi* model was used to make one exception to the NTZ: members of Yellu village are allowed to collect certain shellfish (without the use

of air compressors or dive equipment) for a period of two weeks, once every two years.

- Demonstrating local benefit from the restrictions. The agreement excluded outside fishing fleets and their destructive fishing practices.
- Meeting local needs by limiting the area of restriction. The need to avoid removing local access to too many of the traditional fishing areas was recognised and respected.
- Promoting good practice. All boats are required to practice reef-safe anchoring.

Strengthening local livelihoods through the resort

From the outset, the local community was keen to bring tourism into the area. In fact, the resort was of much greater interest to them than the NTZ. Whereas the NTZ required that they give up some of their traditional fishing areas, they saw the resort as offering the prospect of long-term employment and income for the villagers. For MER, the two go absolutely hand-in-hand.

The Yellu owners are benefitting in a number of ways from the whole arrangement. The MER pays a lease fee to the community every five years. Under



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the terms of their agreement, MER has agreed to give preference to local communities in the village of Yellu and surrounding area when recruiting non-skilled staff, including for construction, maintenance, resort services, dive services and NTZ rangers. MER currently employs 75 staff, with 45 coming from Yellu, and all are paid above the wage rate set by government. Three senior managers, the Community Liaison Officer and Ranger, the Head of Security and Ranger, and the Community Co-ordinator for the Ranger Patrol, come from Yellu.

Building ongoing trust and understanding

The Community Liaison Officer has been instrumental in helping MER to understand the culture in which they are operating and in conveying their intentions and ideas to the village of Yellu.

As a private resort, MER is in a strong position at the heart of this conservation initiative. Their local staff helped to strengthen relationships with the whole village community, and local leaders visit the resort and the NTZ and see for themselves the conservation practices in action. They trust MER to adhere to the covenants of the NTZ lease and to protect it from outside intruders.

By fully embracing, without compromise, the highest environmental standards in the design and construction of their resort, MER is sending a clear and visible message to the local community that they really do what they say they do when it comes to protecting the environment.

Throughout the development, MER has been completely committed to design and construction methods with the highest ecological and environmental integrity. Careful attention was paid to the location of the cottages and main facilities, avoiding negative impacts by locating them behind reefs that had been previously damaged by dynamite fishing and initiating an active programme of reef conservation and reef building.

In October 2010, a second concession area was created to include the islands of Daram, increasing the total NTZ to 1,220km². The Nature Conservancy, Conservation International and Worldwide Fund for Nature have been working together with the regional and local governments in Raja Ampat to establish a series of Marine Protected Areas, and are eager to place private resorts such as MER at the heart of their strategy.

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Principle ④ Case Study

Campi ya Kanzi, Kenya

A partnership with traditional community owners

Development of a lodge on tribal lands as a carefully negotiated partnership arrangement with the community, providing benefits for local people and the investors and refocussing land management on conservation.

Kuku Group Ranch is located within a wildlife corridor that connects Amboseli and Tsavo National Parks in Kenya. It covers 117,000 ha and stretches from the Chyulu Hills to the base of Mt Kilimanjaro, in a landscape derived from past volcanic activity. The woodland savannah, giving way to grasslands and forest mosaic on higher ground, is rich in wildlife.

The area is also the traditional home of the Maasai people. The Maasai are one of very few Kenyan tribes to have retained most of their traditions, lifestyle and lore. Their semi-nomadic, pastoral lifestyle, based on herding cattle and goats, requires access to large tracts of land. Traditionally, humans and wildlife have co-existed in Maasai land. The most visited National Parks in East Africa are on Maasai land, and 90 percent of the game population of Amboseli National Park live on private Maasai land for part of the year. To secure thriving wildlife populations, it is therefore crucial that Maasai landlords can gain economic benefit from protecting the wilderness status of their land.

The main goal of Campi ya Kanzi, which translates from Kiswahili as 'camp of the hidden treasure', is to protect the Kuku Group Ranch, in order to enable the Maasai community to keep living in accordance with their traditions, if they so wish.

The project originated with an individual, who became familiar with the area, its people and the opportunities for sustainable development based on wildlife as a renewable resource. It was clear from the outset that the long-term sustainability of the proposition depended on establishing a genuine partnership with the Maasai community, based on trust, transparency and rights.

Name of hotel/resort	Campi ya Kanzi
Scale	26 beds
Date of development	1996
Location	Kuku Group Ranch, southeastern Kenya
The area context	A very large area of land under traditional community ownership and with abundant wildlife

Reaching agreement through careful, informed discussion

Following a personal introduction and careful preparation, the idea for Campi ya Kanzi was presented by the investors to the community of Kuku Group Ranch. The proposition was to develop a lodge at Campi ya Kanzi that would be owned by the community, and built with them, on their own land. The objective was to prove to the Maasai landlords that an economic resource for the community could be created by changing the management of their lands to wilderness with thriving wildlife. Operational staff would be recruited from the local community. The investors were prepared to finance construction of the lodge and to hold a management contract for the land on which it would be built. The community would limit grazing near the lodge.

The investors were keen to convey that they were prepared to guarantee a long and genuine partnership, with no hidden conditions, that would ensure that the land where the local Maasai had lived for generations would be protected for years to come.

Some important aspects of the approach included:

- Involvement of everyone with influence. Community chiefs and elders as well as the set of elected officials who are responsible for the Group Ranch were all involved in discussions.
- Taking time to build trust, which was won slowly through a series of meetings held over a period of six months.



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- Understanding and communicating the balance of risks and gains. As lessees and operators, the investors would be taking the risks and accepting the liabilities associated with development of the lodge and its operation. For their part, the Maasai had to consider the effect on their future of accepting, and hopefully welcoming, strangers and of changing their grazing policies.

The discussions ultimately led to the establishment of a partnership. A 20-year management contract was awarded to the investors, while ownership resides with members of the Kuku Group Ranch.

Delivering community benefits and supporting conservation

From the outset, the community has been involved and seen economic benefit from the development. All the buildings were constructed by local Maasai.

Campi ya Kanzi has an operational staff of 65 Kenyans, 90 percent of whom are local Maasai, including all the guides, trackers, maids and waiters. In 2000, the commitment to the local community was extended through the creation of the Maasai Wilderness Conservation Trust (MWCT). MWCT is an advocate for the community and works with other conservation organizations to ensure sustainable conservation of the wilderness, wildlife and cultural heritage of the Tsavo-Amboseli ecosystem. The President of the Trust is a local Maasai leader, and elected members of the community sit on the Advisory Board.

Fifteen percent of the income of the Trust comes from a conservation fee that is collected from guests for every day spent at Campi ya Kanzi. In this way, funds are available to run 'Wildlife Pays', a program that compensates the Maasai landlords for genuine livestock losses caused by wildlife. Fundraising provides the remainder of the Trust's income. The Trust employs more than 200 local people, running conservation, education and health programs. Quarterly meetings are held with

the community to ensure that the Trust is aware of their priorities and continues to meet their needs.

Campi ya Kanzi is also at the forefront of a land conservancies initiative, which aims to create a network of conservancies, identifying land of the highest conservation value. To date, nearly 5,000ha of land have been secured as conservation zones that will showcase best practice in environmental stewardship, land tenure and sustainable income generation for communities.

Design and construction that minimises impact on local resources

In addition to effective community engagement, Campi ya Kanzi provides examples of other aspects of good practice. At the heart of the lodge is the thatched roof clubhouse, built of lava rocks and native timber harvested from sustainable sources. The six tented cottages and two suites are constructed of stone, canvas and wood and finished to a high standard of luxury using the best available technologies to minimise impact on the environment. Recently, a private villa for 10 guests was added. Landscaping was avoided; no soil was removed and no trees were cut. The camp uses solar power, treats greywater and blackwater using anaerobic reaction and filtration, and uses only water that is harvested from rainwater. A rainwater catchment system covering an area of 7,000m² is complemented by a roof harvesting system that collects water in storage tanks with a capacity of 1.3m litres. Campi ya Kanzi is entirely independent of community sources of water.

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Principle ⑤ Case Study

El Nido and Taytay, Philippines

Local stakeholder partnership for tourism and conservation

Establishment of a collaborative approach in the destination, bringing together government, private sector developers, NGOs and local communities, working together over time on the management of the area for conservation and tourism through the use of various engagement and support mechanisms.

The two municipalities of El Nido and Taytay lie at the north end of the long island of Palawan, in the Philippines. Compared to other regions of the country, the terrestrial and aquatic ecosystems of Palawan have remained relatively intact; the island's coastal and marine ecosystems are home to 379 species of reef-building corals, 13 species of seagrasses and 31 species of mangrove plants. El Nido municipality is also a nesting area for three species of endangered sea turtles and an important area for more than 100 species of birds on their major migration route between summer breeding grounds as far away as Siberia and winter feeding grounds in the tropics.

Forming a stakeholder partnership

The evolving story of stakeholder collaboration in El Nido and Tayay has involved many groups working together with the aim of strengthening conservation supported by sustainable tourism development. Since the 1980s, there has been a close working relationship among the public, private and voluntary sectors in this area, which have recognised their common interest in conservation and improving local livelihoods. These stakeholders include:

- The national Department of Environment and Natural Resources, which applies national legislation and provides international linkages;
- The provincial government of Palawan, notably through the Palawan Council for Sustainable Development, which oversees the implementation of the Strategic Environmental Plan and supports various projects;
- The two municipalities of El Nido and Taytay, with responsibilities for local administration including land and resource use plans;

Name of hotel/resort	El Nido resorts
Scale	Four resorts with 192 accommodation units
Date of development	From before 1990 to present
Location	Palawan, Philippines
The area context	Two adjacent municipalities on Palawan, including a number of off-shore islands

- A number of *barangays* (village councils), representing local communities;
- Ten Knots Development Corporation, the owners of El Nido Resorts, the main developer and employer in the area, which provides tourism expertise; and
- Conservation NGOs, in particular WWF-Philippines, who have provided conservation expertise and support.

El Nido Resorts was an important catalyst for this collaboration, recognising the importance of conserving the marine environment surrounding its resorts and of benefitting the local community economically and socially through sustainable tourism. One mechanism that the company has used for delivering support has been the establishment of a separate El Nido Foundation, to carry out social and environmental activities with the aim of improving the quality of life of El Nido residents while at the same time conserving the natural environment of the area.

Working together on the extension and management of the protected area

In 1991, the Government of the Philippines proclaimed one part of the coast, Bacuit Bay, as a marine reserve. This move was seen as an opportunity by the stakeholders, who realised that by working together they could use the reserve more effectively for local benefit. Over the next few years, the stakeholders worked together to seek an extension to the designated protected area. In 1998, this led to the declaration by the Philippines Government of the El Nido-Taytay Managed Resource



Protected Area (MRPA). This declaration represented a significant expansion of the original reserve to include areas around Taytay, covering a total of more than 36,000 hectares of land and 54,000 hectares of marine waters. The whole area includes a range of interrelated landscapes and ecosystems, with towering limestone cliffs, beaches, mangroves, clear waters, unique forests and farmland. The area has been also included in the UNESCO World Heritage Site Tentative List.

An important aspect of the collaborative approach has been the composition of the Management Board for the MPRA, which includes representatives of all the stakeholders identified in the previous section.

The Management Board worked together in the preparation of a Management Plan that was informed by baseline studies prepared between 1999 and 2000 by WWF-Philippines. The resulting plan has identified zoning for various uses, including for restricted tourism development.

A new commercial structure to support communities and NGOs

In order to facilitate action and drive projects forward, a new mechanism was introduced to support sustainable development through commercial activity. Following discussions between El Nido Resorts, WWF and a number of other interested parties, a role was identified for a holding company specifically aimed at building a bridge between private sector investment and biodiversity conservation, with an initial focus on responsible tourism. In 2001, the Asian Conservation Company (ACC) was formed and became the majority shareholder in Ten Knots Development Corporation, and thus owners of El Nido Resorts.

The constitution of ACC formally recognises three objectives:

- Acceptable financial return for shareholders;

- Environmental conservation through a sustainable financing model; and
- Corporate social responsibility through rural employment and educational opportunities.

The ACC was designed to be a financially viable and robust operation that also provides employment and educational opportunities for local communities, thus encouraging these communities to become more willing to protect natural resources in the area. Profits from the company help provide a sustainable source of finance for NGOs with expertise to oversee a long-term programme of biodiversity conservation.

In El Nido/Taytay, this model has enabled more funding to be channelled from the for-profit business to the El Nido Foundation, in order to expand conservation and livelihood projects with the community. It has also enabled the area to secure additional funding, as described below.

A new plan and capacity building programme

In 2002, the El Nido Foundation worked with civil partners to prepare a Comprehensive Land and Water Use Plan (CLWUP) for the El Nido municipality; the plan was subsequently endorsed by Palawan province. By leveraging its private equity investment, ACC helped to secure funding in 2004 from the Global Environment Facility (GEF) for a six-year, multi-stakeholder collaborative approach to implement aspects of the plan, focusing on coastal/marine resource management. ACC committed to working with the El Nido Foundation on executing the GEF grant and with WWF-Philippines for additional technical advice.

Work within the local community has strengthened local awareness of the opportunity for tourism development as well as understanding of the need



for development to be sustainable and respect the local environment. This community engagement has included educational programmes, support for ecotourism initiatives, working with boat operators and the restaurant association, supporting handicraft production, and links between local agriculture and tourism operations. A specific, parallel, initiative focused on training the community in local enforcement and guarding work in the protected area.

The partnership between El Nido Resorts, the local community and the El Nido Foundation has also included practical work on marine habitats, such as the installation of 626 artificial reef modules in Tres Marias, a former dive site that had been devastated by illegal fishing, coral bleaching and typhoons. This was only the second place in the world to use the ceramic modules, which were purchased with a grant to the Foundation from a U.S. non-profit organization. El Nido Resorts contributed to the installation by providing boats, fuel, manpower and provisions.

Controlling planning and development of the resorts

In parallel with their engagement with stakeholders, El Nido resorts themselves have been developed and managed in a sustainable manner, in line with the requirements of the Management Plan of the MRPA.

A recent and substantial investment programme has seen the addition of two new resorts on Apulit Island and Pangulasian Island. Before proceeding with development in a protected area, each resort was required to obtain an Environmental Compliance Certificate (ECC) from the Department of Environment and Natural Resources, which in turn required an Environmental Impact Assessment (EIA) to have been carried out. To monitor compliance with statutory and company policies, two

full time Environmental Officers were deployed to the construction sites.

Environmental impacts have been minimised by incorporating sustainable construction and materials, and carefully positioning individual units around coves and beaches against the spectacular backdrop of sheer karst limestone cliffs. The design and layout varies with the physical properties of each site. Resorts on the islands of Lagen, Miniloc and Apulit have water cottages on stilts, built on sand, because the beaches are very narrow and space to build is in very short supply. Pangulasian Island Resort has been able to take advantage of its wider beach to allow setback of the development, with building taking place behind the coconut tree line. Buildings combine traditional Filipino architecture with contemporary design.

In part due to the long-term commitments made by El Nido Resorts and its partners, there is evidence of extensive and varied marine life in the MRPA. Research scientists hosted by El Nido Resorts over the past four years have found 855 species of coral reef fish in El Nido and 403 species in Taytay Bay, and have identified several new species.

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Principle 5 Case Study

Northeast Brazil, Brazil

Regional programmes for sustainable tourism development

Implementation of sizeable, sequential regional programmes for sustainable tourism development, integrating resort development and biodiversity protection, and supporting extensive stakeholder engagement at all levels.

Of the five regions of Brazil, the Northeast has traditionally been seen by the government as a low-income region in need of economic diversification and growth. Although a wealth of natural resources, including the coastline, offers great potential for tourism, access to the region has been impeded by its geography. In the early 1990s, tourism was identified as a key economic sector, with the ability to create direct jobs boosted by a multiplier effect. Improvements in the public infrastructure required for tourism growth were also seen as contributing to the quality of life of the local population. At the same time, the Brazilian Northeast is home to some of the most biodiverse ecosystems on the planet, including the Atlantic Rainforest with up to 460 tree species per hectare and Atlantic coral reefs.

In 1994, the Inter-American Development Bank (IADB) agreed to support socioeconomic development in the region through a US\$700 million tourism development program, PRODETUR I/NE, of which US\$400 million was financed by the Bank. The Banco do Nordeste (BN) was appointed as executive agency, with responsibility for reviewing and evaluating project proposals and supervising their implementation.

Bringing stakeholders together around sustainable development objectives

The objective of PRODETUR I was to 'contribute to the socioeconomic development of the region generating new employment opportunities, higher per capita income, and increased state revenues'. Although driven by the need for growth, this was to be a sustainable approach to tourism development. The aims of the approach included:

Name of hotel/resort	PRODETUR I and II
Scale	Large region with extensive development of hotels and resorts
Date of development	1994 – 2012
Location	Northeast Region, Brazil
The area context	A region comprising nine states and containing extensive areas of Atlantic rainforest

- promoting sustainable development, balanced between the interests of the environment, urban populations and tourism;
- valuing natural resources and attractions, respecting the carrying capacity of each area; and
- stimulating private sector investment.

In order to achieve these goals, a ten-year programme was designed with three main components: institutional development, basic infrastructure and public services (roads, drinking water, sewage, waste management), and airport improvement in the region. These actions were to be complemented by investment to protect natural and historic attractions.





It was clear from the outset that delivering this complex set of components while maintaining a balanced approach would require the involvement of a wide range of stakeholders operating at all levels (national, regional and state), including the banks (IADB and BN), a range of government and public sector agencies, municipalities, private sector tourism interests and NGOs involved with conservation of the region's natural resources.

Each of the nine states was responsible for preparing a Tourist Development Strategy to guide its own programme of priorities for investment, based around identifying zones with strong potential for tourism.

Integrating stakeholder engagement in biodiversity protection

The state of Bahia provides a good example of a strategy with a strong component of environmental resource planning. In Bahia, protection of natural resource areas was of particular interest, especially in the southern parts of the state that contain precious remnants of tropical humid forest. These remnants constitute a small part of the extensive Mata Atlantica Biosphere Reserve, designated in 1993, and harbour an exceptionally high level of species diversity and endemism. PRODETUR I presented an opportunity

for stakeholders, including conservation interests with a strong presence in the area, to work together to negotiate a set of priorities for Bahia state that increased the opportunities for tourism while at the same time increasing the protection of natural areas. A number of resort areas along the coast were identified for growth, with access opened up via a new airport at Porto Seguro and a 65km highway from Ilheus to Itacaré. At the same time, investment was approved for six conservation areas across the state, two of them in the immediate vicinity of a coastal resort area focused on Itacaré on the Costa do Cacau.

Here, aspects of the approach included:

- conserving areas of primary forest and their associated biodiversity;
- protecting water quality in river systems flowing to the sea – a key measure in supporting tourism along the coast;
- supporting the development of a Management Plan in a previously designated Environmental Protection Area (Itacaré-Serra Grande);
- establishing more effective categories of protection – after significant mobilization from NGOs and specialists and with support from PRODETUR I,

Bahia's first State Park, Parque Estadual do Conduru, was established in a second area in 1997; and

- holding participatory tourism workshops in Itacaré-Serra Grande that were run by IESB, a local social and environmental NGO, and Conservation International.

Private sector investment was attracted to the region, including new resort developments with a sustainable approach to tourism, such as the low density Txai Resort, which opened in 2000 along the coast from Itacaré.

A new programme focusing on local stakeholders

A thorough evaluation of PRODETUR I, including an Environmental Impact Assessment of the programme, led to the approval of a second loan by IADB in 2002 for PRODETUR II. While demonstrating the success of PRODETUR I in stimulating investment, employment and tourism growth, the evaluation identified the need for PRODETUR II to improve mechanisms designed to expand stakeholder involvement and enhance the control of environmental impacts.

While continuing the general direction of PRODETUR I, the new programme built on lessons learned and included an increased focus on stakeholder engagement, capacity building (including increasing availability of environmental expertise) and integrated planning. Participating states were required to identify one or more tourism development 'poles' – a cluster of municipalities scheduled for tourism investment. For each of these poles, a range of stakeholders were to be engaged in a participatory process to develop a Plan for the Integrated Development of Sustainable Tourism (PDITS), while at the same time facilitating the creation and operation of multi-stakeholder destination management organizations.

'Pólo Litoral Sul', one of four poles identified by Bahia State, provides an example of how the tourism

pole approach has brought together stakeholders concerned with development, tourism and biodiversity. It consists of two coastal resort areas, Costa do Dênde and Costa do Cacao. Led by Fundação Getulio Vargas, a national higher education institution, a full range of stakeholders was drawn together from the public, private and NGO sectors to engage in developing a PDITS. The plan was published in 2004 and adopted by BN and the Ministry of Tourism for the state of Bahia. A programme of action was specified for each administrative level or partner, including the pole itself, the two resort areas, individual municipalities and the protected areas.

For example, one outcome has been adding focus to the Itacaré-Serra Grande Management Plan by identifying six ecological zone types that offer varying levels of protection to carefully selected areas, including beaches, headlands, river systems and areas of primary forest. Remaining areas are zoned for economic activity, including four zones for different intensities of tourism development and activity.

PRODETUR II comes to a close in March 2012. The ex-post evaluation will reveal more about the legacy of this sustained and collaborative approach to planning for, and investing in, sustainable tourism development in Northeast Brazil.

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Conclusions

The point at which a hotel or resort development is conceived, designed and approved is absolutely critical to its short- and long-term impact on biodiversity. Mistakes made at this stage can be irreversible, whilst proactive investments in sustainability and biodiversity conservation can lead to considerable benefits in the future.

Tensions between the development of holiday accommodation and biodiversity conservation are inevitable, and careful and effective management is therefore critical. In the quest for the perfect setting, hotel and resort projects are increasingly choosing remote areas away from the main tourist zone. On busy hotel strips, the negative impacts on biodiversity and ecosystems are not generated by one hotel property alone, but by the cumulative effects of all the properties. The complexity of the hotel development value chain means there is usually no coherent or explicit strategy for all the firms involved in the development process, and it can be difficult to assign responsibility for the loss of biodiversity when it occurs.

Several hotel corporate policies include an intention to minimise habitat loss and destruction, but there is often a gap between policy and practice, or an inability on the part of 'the brand' to control or influence the practices of the developer. Guidelines and certification schemes show promise to improve practice, but the voluntary nature of these tools is a limiting factor in their effectiveness. Governments have a critical role to play in ensuring that the national development planning process provides controls on developers and includes instruments that help minimise impacts on biodiversity. Environmental Impact Assessments, for example, are a key tool for anticipating potential effects of hotel and resort development and for establishing a set of requirements that must then be monitored throughout the development process.

Planning authorities, tourism development agencies, developers, investors, hotel managers and management companies, project managers and consultants, architects and construction firms can all contribute to mitigating the biodiversity footprint of new hotels and resorts, by implementing the five Biodiversity

Principles presented in this report. The Principles provide a holistic approach to integrating biodiversity considerations into the planning and development stages of new hotels and resorts, whilst emphasizing the importance of stakeholder involvement. Other sustainability aspects will also need to be addressed during these critical initial stages of a new development.

The case studies presented in this report serve to illustrate some of the measures that can be adopted to implement the Principles. The case studies provide examples where a positive investment in the conservation and restoration of habitat, within the site of the development or the surrounding area, has been enabled and supported by the developer. Many of the investors have been taking a positive approach to conservation, because they are personally motivated and committed to it. Equally, they and others also see the benefit to their tourism enterprises from maintaining an attractive environment rich in wildlife, as this is often the very thing that attracts visitors in the first place.

To mainstream these biodiversity-friendly approaches, greater awareness about biodiversity impacts from poor siting and design choices needs to be promoted within the hotel sector, among architects and designers and within the wider construction sector. The implications of such choices for the prosperity of the sector also need to be made clear. Furthermore, governments need to promote a clear and explicit vision of sustainable development that informs appropriate tourism and hotel development choices. Hotel management and development companies can then be guided by a long-term vision that incorporates ecosystem and biodiversity impact.

Ultimately, the continued prosperity of the hotel and tourism sector depends on the conservation and health of local biodiversity and ecosystems. As such, nature should be recognized as a key element of the tourism attraction and resources conserved to benefit the tourism and hotel sectors. It is thus in the interest of all players to take the necessary actions to ensure that biodiversity is included in decision making at all stages in the life cycle of a hotel or resort.



Glossary

Biodiversity is the variability among living organisms from all sources, including, 'inter alia' terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems. Source: www.cbd.int

Biodiversity hotspots, developed by Norman Myers in 1988, are characterized both by exceptional levels of plant endemism and by serious levels of habitat loss. They have been promoted by Conservation International to identify those regions of the world where attention is needed to address biodiversity loss and to guide investments in conservation. Currently, 34 biodiversity hotspots have been identified, most of which occur in tropical forests and on islands. Between them, they contain about 50 percent of the world's endemic plant species and 42 percent of all terrestrial vertebrates, but have collectively lost about 86 percent of their original habitat. Source: www.biodiversityhotspots.org

Critical natural habitats are habitats (ecological or environmental areas inhabited by particular species) which are legally protected, officially proposed for protection, or unprotected but of known high conservation value. Source: www.worldbank.org

An **Ecosystem** is a dynamic complex of plants, animals, humans, microbes and physical environmental features that all interact with one another. Ecosystems can be understood as ecological communities that vary in size and in the elements that constitute them, each being a functioning unit of nature. Source: www.cbd.int

An **Ecosystem-based approach** aims to manage the ecosystem based on the multiple functions that the ecosystem performs and the multiple uses that are made of these functions. The ecosystem-based approach aims to optimize the use of an ecosystem without damaging it, based on the view that the ecosystem is a living landscape. Source: www.cbd.int

Ecosystem services are the benefits that humans obtain from ecosystems, and they are produced by interactions within the ecosystem. Ecosystems like forests, grasslands, lakes, rivers, coral reefs and mangroves provide different services to society, including provisioning, regulating and cultural services that directly affect people. They also include supporting services needed to maintain all other services. Some ecosystem services are local (presence of pollinator species), others are regional (flood control or water purification) and still others are global (climate regulation). Ecosystem services are crucial for human well-being and all its components, including basic material needs such as food and shelter, individual health, security, good social relations, and freedom of choice and action. Source: www.millenniumassessment.org/en/index.html

Free prior and informed consent (FPIC) is the principle that a community has the right to give or withhold its consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use. Source: www.forestpeoples.org/guiding-principles/free-prior-and-informed-consent-fpic

Key biodiversity areas (KBAs) represent the most important sites for biodiversity conservation worldwide. They are identified nationally using simple, standard criteria, based on their importance in maintaining species populations or ecosystems. Their conservation helps maintain effective ecological networks and are the starting points for conservation planning at the landscape level. Source: www.biodiversitya-z.org

About this project: Integrating Biodiversity into the Caribbean Hotel Sector

As noted in IUCN's *A Situation Analysis for the Wider Caribbean* (IUCN, 2007), tourism development, '... driven by trends towards bigger, more all-inclusive resorts and mega-cruise ships', remains among the main drivers for environmental change, and specifically biodiversity loss. To respond to this specific challenge, IUCN, with the generous support of the French Ministry for Sustainable Development and the French Overseas Territories Ministry, has developed a programme of activities aiming at supporting tourism decision-makers in the private and public space to more effectively integrate biodiversity priorities into the planning, development and operation of hotels and resorts.

As part of this project, IUCN developed the Biodiversity Principles for siting and design of hotels and resorts and the Case Studies on the implementation of the Biodiversity Principles for siting and design of hotels and resorts.

IUCN

IUCN, International Union for Conservation of Nature, helps the world find pragmatic solutions to our most pressing environment and development challenges.

IUCN works on biodiversity, climate change, energy, human livelihoods and greening the world economy by supporting scientific research, managing field projects all over the world, and bringing governments, NGOs, the UN and companies together to develop policy, laws and best practice.

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