The Handbook on Sustainable Tourism Management in Conservation, Fragile and Protected Areas

APEC Tourism Working Group
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Preface

The Department of Tourism, Ministry of Tourism and Sports, Thailand, is honored to present *The Handbook on Sustainable Tourism Management in Conservation, Fragile and Protected Areas*, developed under the APEC Tourism Working Group framework. This handbook is a collective result of knowledge sharing and collaboration among experts, practitioners, and stakeholders across APEC member economies, united by a shared vision of promoting sustainable tourism that safeguards our invaluable nature.

Conservation, fragile and protected areas are not only treasures of biodiversity and ecosystem services but also irreplaceable assets for tourism. However, increased tourism activities—particularly in the post-pandemic era—have presented new challenges, including environmental degradation, overtourism, and climate vulnerability. These challenges call for a strategic, inclusive, and adaptive approach to tourism management that balances conservation priorities with visitor experience and community well-being.

This handbook serves as a practical guide for those entrusted with managing tourism in conservation, fragile, and protected areas. Drawing from a range of tools, strategies, and case studies, it offers pathways to strengthen policy planning, visitor management, community partnerships, tourism product development, and climate-responsive strategies. We believe the knowledge shared in the handbook will benefit government agencies, park managers, communities, and tourism-related stakeholders.

On behalf of the Department of Tourism, I would like to extend my sincere appreciation to the Asia-Pacific Economic Cooperation (APEC), co-sponsoring economies, all contributors, and workshop participants who made this project possible. I also thank the consultant, led by Asst. Prof. Dr. Dachanee Emphandhu, for her unwavering dedication and exceptional expertise.

As we look forward, let all of us continue to work together to ensure that tourism in conservation, fragile and protected areas is not only sustainable, but also enriching—for people, for nature, and for generations to come.

Mr. Jaturon Phakdeewanit

Director-General

Department of Tourism, Thailand

Acknowledgements

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Sustainable tourism is a challenging yet achievable practice. Eleven case studies in the handbook demonstrate its feasibility in various contexts, with five of them sourced from the APEC Workshop on Beyond Carrying Capacity: Best Practice in Sustainable Tourism Management in Conservation, Fragile and Protected Areas. Special acknowledgment goes to Prof. Bruce Prideaux and Prof. Bob McKercher from Australia, Ms. Jin Wenjia from China, Mr. Ary S. Suhandi from Indonesia, Mr. Masaru Takayama from Japan, Mr. Te Ngaehe o te rangi Ranginui Wanikau and Ms. Catherine Wilson from New Zealand for their contributions through these case studies and input throughout the handbook.

Special thanks to all workshop participants for their untiring efforts in communicating across diverse languages and cultures. Their shared tourism challenges and management practices in various geopolitical contexts are invaluable resources for this handbook. I am also very thankful to Assistant Professor Renuka Klabsuk and Ms. Peeranuch Dulkul Kappelle for their tireless help on notes and group moderator during the workshop.

Appreciation is extended to Assistant Professor Dr. Usaradee Phumalee, Faculty of Forestry Kasetsart University, Ms. Jakwida Chantanawarangkul School of Architecture, Art, and Design - King Mongkut's Institute of Technology Ladkrabang, and Mr. Panudet Jindawong for their extra help on design of the handbook, as well as Dr. Patchanuch Wongwattana Foster and Mr. Suthat Wannalert for their valuable suggestions on case studies.

Lastly, I would like to convey my sincere appreciation to the Department of Tourism, Ministry of Tourism and Sports, Thailand, for acknowledging the significance of sustainable tourism in protected and fragile areas. Furthermore, I extend my gratitude to Mr. Kritsadakorn Pinthong, the Department of Tourism's Chief of International Cooperation Section, and Ms. Wisarak Poonsombat, the project overseer, for their extra ordinary efforts in proposal development, workshop arrangement and useful suggestions during handbook development.

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Executive Summary

Sustainable tourism in protected areas requires a symbiotic relationship between tourism and conservation efforts. The primary goal is to ensure that tourism activities support biodiversity conservation, minimize environmental impact, and enhance the visitor experience while contributing positively to the local economy for poverty reduction.

At the APEC Workshop on "Beyond carrying capacity: Best Practice in sustainable tourism management in conservation, fragile and protected areas" held in Bangkok, Thailand, in July 2024, participants discussed trends and challenges in park tourism, especially post-COVID-19 visitor increases and environmental impacts. They recommended advanced tools and, strategies, and four key areas of interest were identified for managing tourism in conservation and protected areas: policy and planning, visitor management, community participation and partnerships, tourism product development and tourism standard. This handbook offers guidelines for sustainable tourism within these domains.

These guidelines provide guidance on key issues to help managers achieve sustainable tourism in protected areas that is appropriate, well-managed, and supportive of conservation objectives. This handbook does not intend to be a comprehensive textbook but aims to give an overview of various topics relevant to tourism management in protected or fragile areas. Each topic introduces concepts, identifying issues, and outlining steps or approaches to managing them.

1. Policies, Strategy and Plan Development for Protected Area Tourism

Protected area management policy is a document guiding organizations responsible for managing protected areas, providing frameworks to operate effectively, to reduce compliance issues, and to ensure clear role expectations. Tourism policies are part of the overall management policies, balancing resource management and recreational goals. Examples include the U.S. National Park Service and New Zealand's national park policies.

In the context of tourism strategy development for protected or fragile areas, three essential steps should be addressed: 1) the development of the tourism strategy/plan, 2) the implementation of the strategy, and 3) monitoring (Figure 1).

Two case studies illustrate the "how to develop" tourism strategies: one in Thailand addressing over-tourism at Similan National Park, and one in Indonesia involving the creation of a destination management plan (DMP) for sustainable tourism in protected and fragile areas.

2. Visitor Management

Tourism in protected areas depends on natural and cultural heritage. Even minimal use can have negative impacts. Tourism offers benefits such as income and local welfare but must not threaten core values. Setting impact thresholds, managing actions, and monitoring visitor impacts are keys to sustainable tourism. Visitor management balances the park visitation and quality using tools such as nature interpretation, dispersing visitors, rotation, and carrying capacity management. Strategies depend on legislation, policy, and resources.

Figure 1 Guidelines of tourism strategy development in protected or fragile areas

During the 1970s, carrying capacity was employed to regulate visitor numbers in sensitive areas through ecological and social analyses. However, this approach had limitations as visitor behavior and site protection were often more critical than sheer numbers. To address these limitations, advanced frameworks have been developed, including Limits of Acceptable Change (LAC), Visitor Impact Management (VIM), Visitor Experience and Resource Protection (VERP), Visitor Activity Management Process (VAMP), Recreation Opportunity Spectrum (ROS), and Tourism Optimization Management Model (TOMM).

This handbook introduces recreation carrying capacity and LAC as guidelines for visitor management in protected areas due to its broad acceptance. LAC steps include identifying area concerns, defining tourism opportunities, selecting impact indicators, and setting standards. Indicators measure visitor impacts on natural resources and social conditions. Baseline conditions must be determined before setting standards. Strategies to address impacts include managing supply, demand, resource capabilities, and use impacts. Monitoring and adapting management practices are essential. Visitor Management at Tongariro Alpine Crossing, New Zealand and Visitor Use Management at Zion National Park, The United States are two highlighted case studies.

3. Guidelines for Partnerships with Community, Businesses, and Organizations

Community engagement in sustainable tourism planning and management serves as an effective tool by enabling local communities to actively participate in protected area tourism management. This approach aims to achieve the dual objectives of biodiversity conservation within protected areas and the equitable distribution of socio-economic benefits derived from tourism to local communities. Many frameworks for community participation in tourism development in protected areas have been proposed and widely used but there are common elements in these frameworks including: settings of the

participation process, resource accessibility, community capitals, representativeness and independence, influence and power, transparency, and decision-making structure.

The seven stages adapted from UNESCO World Heritage Sustainable Tourism Online Toolkit (2025) provide guidance on collaborating with local communities and businesses in protected area tourism, as shown in Figure 2. In this handbook, some selected tools and techniques used in the community participation process are presented. Literature on more tools and techniques are available from different sources. Three case studies are presented from Indonesia and Thailand: Partnership in Tourism Management at Clungup Mangrove Conservation Tiga Warna, Indonesia, Wildlife Tourism initiative for Human-Wildlife Conflict Solution in Kui Buri National Park, Thailand: and Private Company Partnership in Sustainable Tourism Development, Thailand.

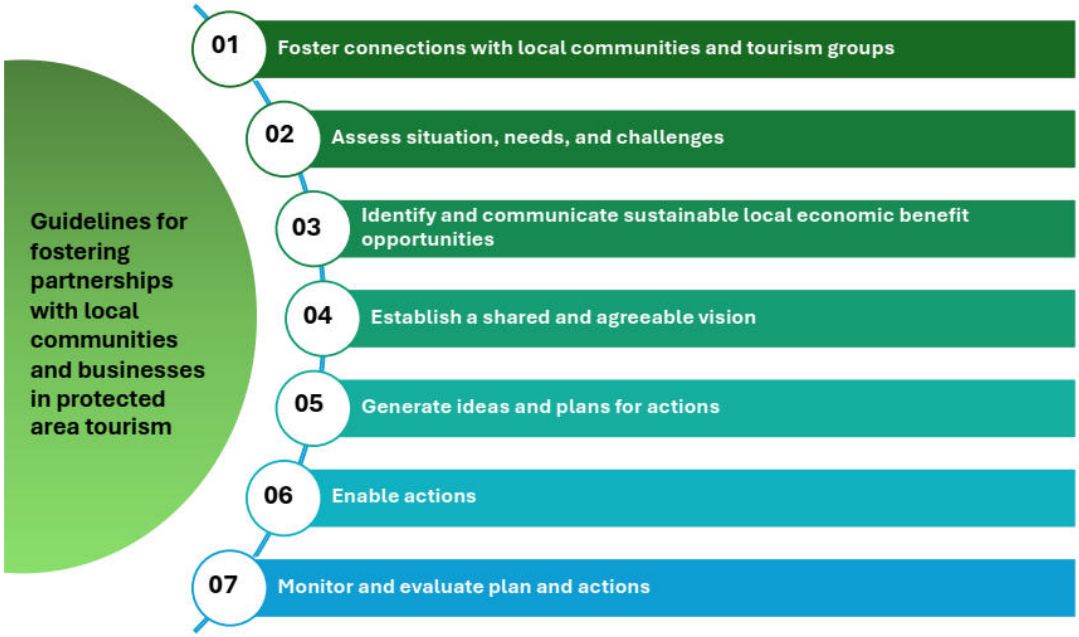

Figure 2 Guidelines for fostering partnerships with local communities and businesses in protected area tourism

4. Tourism Products: Design and Development

Tourism products and services in protected and fragile areas must be developed sustainably while supporting conservation efforts and local communities. For protected area managers, businesses, and entrepreneurs, creating tourism experiences requires meticulous product design that harmonizes visitors' needs with environmental sustainability. This handbook presents guidelines on designing tourism products that meet sustainable tourism development requirements in protected areas.

Although various forms of tourism can potentially be developed in protected areas, such as mainstream nature-based tourism, ecotourism, adventure tourism, and health tourism, the following guidelines will focus mainly on the development of ecotourism products. Ecotourism aligns with the objectives of protected area tourism by emphasizing the protection of the natural environment, providing opportunities for the local community to benefit from tourism, and ensuring that visitors have positive experiences while becoming aware of the importance of protected areas. Ecotourism products function as a conservation tool, allowing visitors to participate in or contribute to conservation activities as part of their experience.

Steps in the tourism product development process include assessing and identifying tourism resources and attractions, conducting market research, identifying key stakeholders/ partnerships, product design and packaging, site planning and design, and product life cycle management (Figure 3).

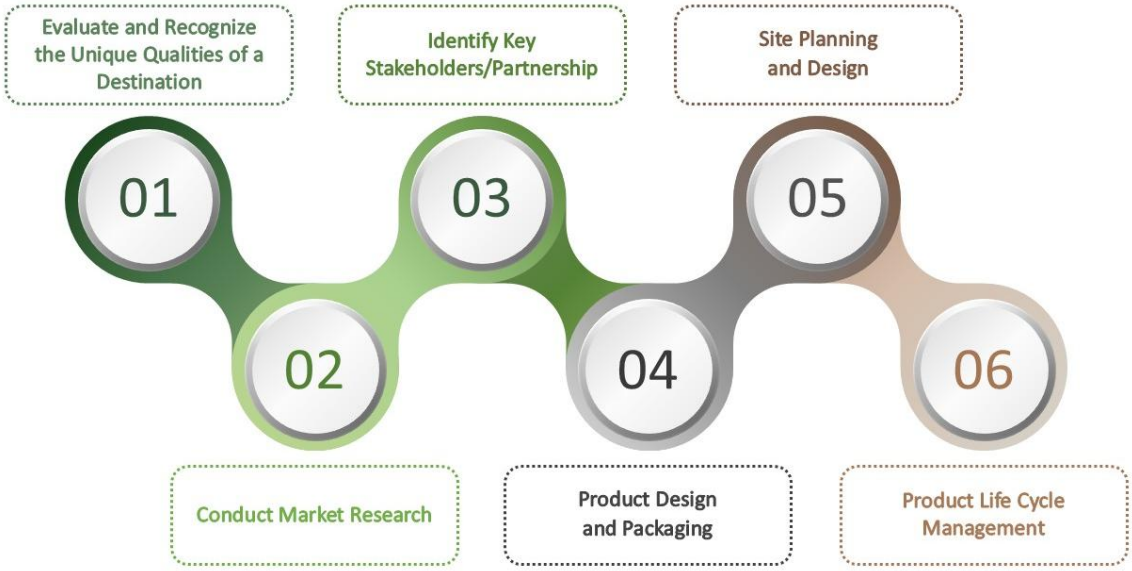

Figure 3 Guidelines for tourism product development

Tourism Management under Climate Change

The tourism sector is vulnerable to climate change and contributes to greenhouse gas emissions, leading to global warming. Impacts include extreme weather events, rising sea levels, biodiversity loss, and damage to attractions. Adopting the sustainable practices listed below is crucial to reduce environmental harm and build resilience.

- *Carbon Footprint Reduction:* Use energy-efficient technologies, renewable energy, waste reduction, low-carbon transportation, and carbon offset programs.
- *Sustainable Resource Use:* Water conservation, waste management, and sustainable sourcing.
- *Eco-Friendly Infrastructure:* Utilize sustainable infrastructure with certifications like LEED.
- *Community Involvement:* Engage local communities in tourism planning and provide training on sustainable practices.
- *Monitoring:* Monitor environmental and social impacts with transparent reporting.
- *Innovation:* Implement smart sensors, blockchain, and virtual reality for sustainability.

Effective adaptation involves upgrading infrastructure, protecting ecosystems, and adopting sustainable practices. Mitigating tourism's impact requires reducing carbon emissions through renewable energy, advanced technologies, and sustainable practices. Collaboration among governments, tourism operators, and communities is essential. Consumer demand for eco-friendly travel drives sustainable tourism.

A case study of Quintana Roo, Mexico, highlights strategies to alleviate impacts from sea level rise.

Tourism Standards

Tourism standards are essential for the sustainable management of protected and fragile areas. They ensure that tourism contributes positively to the conservation of these valuable environments, supports local communities, and provides enriching experiences for visitors. By adhering to these standards, we can safeguard the natural and cultural heritage of these areas for future generations to enjoy.

This handbook presents two recognized international standards: The IUCN Green List and The Global Sustainable Tourism Council Standard (GSTC) with two case studies of the IUCN Green List in the Mount Huangshan Scenic Area, China and Arakwal National Park in Australia and two cases of GSTC Certified Destinations in Ixtapa, Mexico and Aspen in The United States.

Go Forwards

Implementing the principles of protected area tourism into practice requires collaborative approaches. By developing tourism strategies, tourism management plans and monitoring, engaging local communities, fostering stakeholders' partnerships, and promoting sustainable tourism products, we can ensure that tourism in protected and fragile areas is managed sustainably. Through these efforts, we can preserve the invaluable natural and cultural heritage of these areas for future generations while providing meaningful and enriching experiences for tourists. It is our collective responsibility to strike a balance between tourism development and conservation, ensuring that protected areas continue to thrive and inspire for years to come.

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List of Acronyms

AMMER system	Assessment, Monitoring, Management, Evaluation, Reassessment
APEC	Asia-Pacific Economic Cooperation
CBD	Convention on Biological Diversity
CBT	Community-Based Tourism
CCF	Community Capital Framework
DMO	The Destination Management Organization
DMP	The Destination Management Plan
ECC	Ecological or Environmental Carrying Capacity
FCC	Facility Carrying capacity
GHG	greenhouse gas
GSTC	The Global Sustainable Tourism Council Standard
Indonesia-STD	Indonesia Sustainable Tourism Destination Standard
IUCN	The International Union for Conservation of Nature
IVUMC	Interagency Visitor Use Management Council
JSTS-D	Japan Sustainable Tourism Standard for Destinations
LAC	Limits of Acceptable Change
LEED	Leadership in Energy and Environmental Design
MCC	Managerial Carrying Capacity
MRCC	Management Resource Carrying Capacity
PA	Protected Area
PAOT	People At One Time
PCC	Physical Carrying Capacity
PsCC	Psychological Carrying Capacity
RCC	Recreation Carrying Capacity
ROS	Recreation Opportunity Spectrum
SCBD	The Secretariate of the Convention of Biological Diversity Sustainable
SDG	Development Goals
SF-MST	Statistical Framework for Measuring the Sustainability of Tourism
SMART objectives	Specific, Measurable, Attainable, Realistic, Time-bound
SWOT	Strength, Weakness, Opportunity, Threat
TOMM	Tourism Optimization Management Model
U.S. NPS	U.S. National Park Service
UD	Universal Design
UNWTO	The World Tourism Organization
UNDP	The United Nations Development Programme
UNEP	The United Nations Environmental Programme

UNESCO	The United Nations Educational, Scientific and Cultural Organization
USP	Unique Selling Proposition
VAMP	Visitor Activity Management Process
VERP	Visitor Experience and Resource Protection
VIM	Visitor Impact Management
VUM	Visitor Use Management
WCPA	IUCN World Commission on Protected Areas

Glossary

Adventure tourists	Travelers who participate in strenuous, outdoor vacation travel, typically to remote places renowned for their natural beauty and physical attributes, involving hazardous activities (Eagles, 1995)
Branding	The use of an image, theme, design, or other identifying element (or a combination thereof) to symbolize a protected area for the purpose of promoting tourism (Leung, *et al.,* 2018).
Ecotourism	Responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education (TIES, 2015).
Entrance fees	Charges to visitors to enter the protected area for recreational purposes.
Indicators and quality standards	Measurable aspects of the natural and social environment can be defined in terms of lesser or greater quality, thus enabling monitoring of changes in that standard of quality. Indicators of quality reflect the essence of the management objectives; they can be thought of as quantifiable proxies of management objectives. Standards of quality define the minimum acceptable condition of indicator variables (Leung, *et al.,* 2018).
Interpretation	A communication process that forges emotional and intellectual connections between the audience and the meanings inherent in the resource (Leung, *et al.,* 2018).
Limits of Acceptable Change (LAC)	A framework used in environmental management to define the threshold levels of acceptable environmental change resulting from human activities. It involves identifying desired conditions for a natural area and setting measurable indicators to monitor and manage the impact of recreational activities. The LAC process includes public involvement, goal setting, impact assessment, and ongoing monitoring to ensure that the ecological integrity and visitor experience are maintained within acceptable bounds.
Local community	The community or communities of residents living near or within a protected area.
Management zone	A portion of a protected area that is managed for a specific objective. Typically, protected areas have a strict nature reserve zone and primitive zone with restrictions on human activity to promote nature protection, outdoor recreation zone allowing recreation activities, and intensive use zone or service zone allowing infrastructure and facilities development.
Protected area	An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means (IUCN, 1994).

Recreation Carrying Capacity (RCC)	The maximum number of visitors that a natural area can accommodate without causing unacceptable changes to the environment and the quality of the visitor experience. It involves assessing and managing the impact of recreational activities to ensure that both ecological integrity and visitor satisfaction are maintained over time.
Recreation Opportunity Spectrum (ROS)	A management framework for understanding the range of relationships and interactions between visitors, settings, and desired experiences (Clark and Stankey, 1979).
Sustainable tourism development	Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities (The UNEP and UN Tourism, 2005).
Tourism	Tourism is a social, cultural and economic phenomenon related to the movement of people to places outside their usual place of residence, pleasure being the usual motivation for not more than one consecutive year for leisure, business, and other purposes (UNWTO, 1997, 2024).
Tourism carrying capacity	The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction (Leung, *et al.,* 2018).
Tourism products	A combination of tangible and intangible elements, such as natural, cultural and man-made resources, attractions, facilities, services and activities around a specific center of interest which represents the core of the destination marketing mix and creates an overall visitor experience including emotional aspects for the potential customers. A tourism product is priced and sold through distribution channels, and it has a life cycle (UN Tourism, 2025).
Unique Selling Proposition (USP)	The distinct and compelling advantage that sets a tourism product or service apart from its competitors (Wolfgang *et. al*., 2002).
Wilderness travelers	Those who travel to areas where management objectives feature protection of the natural processes that have shaped the physical-biological character of the setting. Mechanized access is prohibited or greatly restricted, as are resource exploitation activities. Recreation is a legitimate use, yet subordinated to the goal of environmental preservation (Eagles, 1995).

1 Introduction

The International Union for Conservation of Nature (IUCN) defines a protected area as “an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.” (IUCN, 1994). Protected areas are recognized as fragile areas due to their vital role in conserving biodiversity and maintaining ecosystem processes and services. These areas help preserve the integrity and health of natural ecosystems, which can be valuable for various sustainable uses, including tourism.

The categories of protected areas advocated by IUCN since 1994 are:

- Ia Strict Nature Reserve: Protected area managed mainly for science.
- Ib Wilderness Area: Protected area managed mainly for wilderness.
- II National Park: Protected area managed mainly for ecosystem protection and recreation.
- III Natural Monument: Protected area managed mainly for conservation of specific natural features.
- IV Habitat/Species Management Area: Protected area managed mainly for conservation through management intervention.
- V Protected Landscape/Seascape: Protected area managed mainly for landscape/seascape conservation and recreation.
- VI Managed Resource Protected Area: Protected area managed mainly for the sustainable use of natural ecosystems.

Tourism and recreation are primary objectives for Categories II, III, and V. Category Ib permits tourism as a secondary objective and Category IV may allow tourism depending on government decision (Table 1.1).

Table 1.1 Protected area management objectives and IUCN categories

Management objectives	Ia	Ib	II	III	IV	V	VI
Science	1	3	2	2	2	2	3
Wilderness	2	1	2	3	3	-	2
Biodiversity protection	1	2	1	1	1	2	1
Environmental services	2	1	1	-	1	2	1
Natural/cultural features	-	-	2	1	3	1	3
Tourism and recreation	-	2	1	1	3	1	3
Education	-	-	2	2	2	2	3
Sustainable use	-	3	3	-	2	2	1
Cultural attributes	-	-	-	-	-	1	2

1= Primary objective; 2= Secondary objective; 3= Potentially applicable objective; - Not applicable

Source: IUCN (1994)

Protected areas, particularly national parks, are popular destinations for both domestic and international visitors and play significant roles in three key dimensions: environmental, socio-cultural, and economic. These three elements are essential for the sustainable development of APEC economies. Nevertheless, protected areas are sensitive areas where biodiversity conservation must be prioritized, while also catering to tourists' needs and providing valuable tourism experiences. Balancing these demands makes the management of tourism in these fragile areas particularly challenging.

Some of the current challenges facing tourism in protected areas of APEC regions include:

- Overcrowding and overuse of fragile areas, where tourism resources are more vulnerable compared to others.
- Lack of recognition of the conservation value of protected areas, combined with site mismanagement and the careless or deviant behavior of visitors, often leads to adverse impacts on natural resources and contributes to biodiversity loss.
- Environmental degradation in sensitive regions such as coral reefs and high mountains due to high visitor numbers and inadequate management.
- Insufficient attractions in some protected areas (PAs), impacting their economic viability and benefits to the local economy.
- Minimal financial support for PAs due to low usage fees or improper allocation of these fees by PA administrations.
- Inadequate involvement from local communities and other key stakeholders.
- Lack of environmental awareness and prioritization of conservation needs.
- Insufficient knowledge of site planning and facility design that integrates with the surrounding environment.
- Insufficient knowledge on how to develop value-added tourism products to attract target markets.
- Insignificant or unevenly distributed local benefits, including the importation of skilled labor and the lack of integration with the local economy.
- Absence of comprehensive and professional planning and management.
- Limited coordination among stakeholders, particularly between conservation agencies, local communities, and the private sector.

This handbook aims to share existing experiences and best practices for sustainable tourism in fragile areas among APEC regions. It addresses challenges to ensure that tourism remains sustainable in these areas. The guidelines detail how to plan and manage tourism in fragile and/or protected areas sustainably. They illustrate how to apply effective tools and strategies, including visitor and resource management, community involvement and partnerships, and tourism product development to tourism management. The handbook also focuses on creating better visitor experiences, improving the livelihoods of local people, and enhancing overall socio-economic development through tourism in protected areas.

These guidelines provide guidance on key issues to help managers achieve sustainable tourism in protected areas. The goal is to ensure it is appropriate, well-managed, and contributes to conservation objectives. This handbook does not intend to be a comprehensive textbook but aims to give an overview of various topics relevant to tourism management in protected or fragile areas. Each topic will introduce concepts, identify issues, and outline steps or approaches to managing them.

The handbook is divided into four chapters. Chapter 1 provides an overview of the background, objectives, and structure of the handbook. Chapter 2 presents sustainable tourism development concepts within protected and fragile areas. Chapter 3 outlines the primary tools and methods for implementing sustainable tourism practices in protected areas. This chapter includes guidelines on creating and monitoring a tourism strategy and destination management plan. It also discusses visitor management techniques to address visitor impacts, community participation and stakeholder partnerships, and tourism product development. Additionally, it covers strategies for addressing climate change and meeting tourism standards. Chapter 4 concludes the handbook by detailing the requirements to implement the guidelines successfully.

2 Sustainable Tourism in Protected and Fragile Areas

2.1 Sustainable Tourism Principles and Concepts

Tourism in protected and fragile areas underscores the importance of conserving valuable and delicate ecosystems where tourism is developed. The objectives of tourism should include the conservation of natural/cultural resources and biodiversity, the enhancement or support of the quality of life for local communities, and the improvement of tourism products, services, and experiences for visitors (Ceballos-Lascurain, H., 1996). It also emphasizes three pillars of sustainable development: environmental protection, social well-being, and economic growth which serve as key foundations for tourism development. In protected and fragile areas, preferred tourism types including ecotourism, health tourism, adventure tourism, and nature-based tourism, all of which rely on natural resources as the main inspiration for tourism. All must be managed towards sustainable tourism.

The UN Tourism (2005) defined sustainable tourism development as “Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities” (UN-WTO, 2025). This approach envisions the management of all resources in such a manner that economic, social, and aesthetic needs can be met while maintaining cultural integrity, essential ecological processes, biological diversity, and life-support systems. It encompasses:

- Making optimal use of environmental resources that constitutes a key element in tourism development, maintaining essential ecological processes, and aiding the conservation of natural heritage and biodiversity.
- Respecting the socio-cultural authenticity of host communities, conserving their built and living cultural heritage and traditional values, and contributing to inter-cultural understanding and tolerance.
- Ensuring viable, long-term economic operations, providing socio-economic benefits to all stakeholders which are fairly distributed, including stable employment and income-earning opportunities, and social services to host communities, thereby contributing to poverty alleviation.
- Involving all relevant stakeholders and providing political leadership to ensure broad participation and consensus building.
- Continuously monitoring impacts and implementing necessary preventive and corrective measures as needed, since achieving sustainable tourism is an ongoing process.

2.2 Sustainable Tourism and SDGs

Tourism, and the Sustainable Development Goals – Journey to 2030' is a collaborative initiative by UNWTO, UNDP, and other partners. It aims to inform and inspire tourism stakeholders to promote a more sustainable tourism sector by aligning policies, business practices, and investments with the SDGs. Figure 2.1 illustrates how tourism relates to the 17 SDGs.

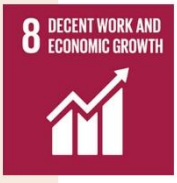
Public policy	Companies and CSR actions
SDG 1 - End poverty in all its forms everywhere Tourism provides income through job creation at local and community levels. It can be linked with national poverty reduction strategies and entrepreneurship. Low skill requirements and local recruitment can empower less favored groups, particularly youth and women.	 On-going staff training; Partnerships for education; Diversity management; Complementary benefits; In-kind donations for education, poverty, and human rights; Responsible investment and local recruitment; Local purchases and fair trade.
SDG 2 - End hunger, achieve food security and nutrition, promote sustainable agriculture Tourism can spur sustainable agriculture by promoting the production and supplies to hotels, and sale of local products to tourists. Agro-tourism can generate additional income while enhancing the value of the tourism experience.	 Local and green purchases (food/ agriculture); Local suppliers and fair trade; Host community involvement; Wildlife and ecosystem protection; Offsetting actions.
SDG 3 - Ensure healthy lives and promote well-being for all at all ages Tax income generated from tourism can be reinvested in healthcare and services, improving maternal health, reducing child mortality, and preventing diseases. Visitor fees collected in protected areas can also contribute to healthcare services.	 Health prevention programs; Fight against sex tourism, health and disease awareness and donations; Customer security and health - prevention and facilities.
SDG 4 - Ensure inclusive and equitable quality education and promote lifelong learning for all Tourism has the potential to promote inclusiveness. A skillful workforce is crucial for tourism to prosper. The tourism sector provides opportunities for direct and indirect jobs for youth, women, and those with special needs, who should benefit through educational means.	 Professional development and training; Partnerships for education; Diversity management; Education for culture and heritage; In-kind donations for education; Ongoing staff training; Information facilities, ; Host community involvement.
SDG 5 - Achieve gender equality and empower all women and girls Tourism can empower women, particularly through the provision of direct jobs and income generation from SMEs in tourism and hospitality-related enterprises. Tourism can be a tool for women to become fully engaged and lead in every aspect of society.	 Diversity management; Awareness campaigns and in-kind donations towards fight against sex tourism and human rights; Non-discrimination values in staff recruitment and training.
SDG 6 - Ensure availability and sustainable management of water and sanitation for all Tourism investment requirement for providing utilities can play a critical role in achieving water access and security, as well as hygiene and sanitation for all. The efficient use of water in tourism, pollution control and technology efficiency can be key to safeguarding our most precious resource.	 New equipment and technologies; Prevention programs for security and health; Standards and certifications; Community involvement
SDG 7 - Ensure access to affordable, reliable, sustainable, and modern energy for all. As a sector, tourism can accelerate the shift toward increased renewable energy share in the global energy mix. By promoting investments in clean energy sources, tourism can help reduce greenhouse gases, mitigate climate change, and contribute to access to energy for all.	 New equipment and technologies; Standards and certifications; Promoting investment in clean and renewable energies; Energy use efficiency; Community involvement
SDG 8 - Promote sustained, inclusive and sustainable economic growth, employment and decent work for all Tourism, as service trade, is one of the top four export earners globally, currently providing one in ten jobs worldwide. Decent work opportunities in tourism, particularly for youth and women, and policies that favour better diversification through tourism value chains can enhance tourism positive socio-economic impacts.	 Training for professional development; Diversity management and local recruitment; Performance incentives - complementary benefits; Responsible investment and local purchases; Community involvement.
SDG 9 - Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. Tourism development relies on good public and private infrastructure. The sector can influence public policy for infrastructure upgrade and retrofit, making them more sustainable, innovative, and resource-efficient, and moving towards low-carbon growth, thus attracting tourists and other sources of foreign investment.	 Eco-design; New equipment and technologies in energy and water resources; Renewable energies; Equipment, materials and infrastructure for recycling and waste management; Ongoing staff training.

Figure 2.1 Sustainable tourism context in the SDGs

Source: UNWTO and UNDP (2017)

Public policy	Companies and CSR actions
SDG 10 - Reduce inequality within and among economies Tourism can be a powerful tool for reducing inequalities if it engages local populations and all key stakeholders in its development. Tourism can contribute to urban renewal and rural development by giving people the opportunity to prosper in their place of origin. Tourism is an effective means for economic integration and diversification.	 Diversity management; Local enterprise investment; Responsible purchases; Non-discrimination values in staff recruitment and training; Community involvement
SDG 11 - Make cities and human settlements inclusive, safe, resilient and sustainable Tourism can advance urban infrastructure and accessibility, promote regeneration, and preserve cultural and natural heritage–assets on which tourism depends. Investment in green infrastructure (more efficient transport, reduced air pollution) should result in smarter and greener cities for not only residents but also tourists.	 Certifications; Partnerships; Awareness campaigns, In-kind donations for culture and heritage sites; Host community involvement; Clean energy; Resource efficiency; Biodiversity conservation initiatives
SDG 12 – Ensure sustainable consumption and production patterns The tourism sector needs to adopt sustainable consumption and production (SCP) models, accelerating the shift towards sustainability. Tools to monitor sustainable development impacts for tourism, including those related to energy, water, waste, biodiversity, and job creation, will result in enhanced economic, social, and environmental outcomes.	 Efficient technologies for energy and water; Renewable energies; Recycling and waste treatment; Pollution reduction; Local purchases and enterprises; Local suppliers; Community involvement; Responsible investment; Guest involvement
SDG 13 – Take urgent action to combat climate change and its impacts Tourism contributes to, and is affected by, climate change. Tourism stakeholders should play a leading role in the global response to climate change. By reducing its carbon footprint in the transport and accommodation sectors, tourism can benefit from low-carbon growth and help tackle one of the most pressing challenges of our time.	 Eco-design; New equipment and technologies; Renewable energies; Recycling and waste treatment; Wildlife and ecosystems - landscape protection; Pollution reduction; Offsetting actions; Awareness campaign and in-kind donations for disasters
SDG 14 – Conserve and sustainably use the oceans, seas, and marine resources for sustainable development Coastal and maritime tourism relies on healthy marine ecosystems. Tourism development must be a part of Integrated Coastal Zone Management in order to help conserve and preserve fragile marine ecosystems and serve as a vehicle to promote a blue economy, contributing to the sustainable use of marine resources.	 Wildlife and ecosystem protection; Pollution reduction; Waste treatment; Offsetting actions; Green purchases; Information for customers and staff; Community involvement
SDG 15 – Protect, restore and promote sustainable use of terrestrial ecosystems and halt biodiversity loss Rich biodiversity and natural heritage are often the main reasons why tourists visit a destination. Tourism can play a major role if sustainably managed in fragile zones, not only in conserving and preserving biodiversity, but also in generating revenue as an alternative livelihood for local communities.	 Wildlife and ecosystem protection; Pollution reduction; Waste treatment; Offsetting actions; Green purchases; Information for customers and staff; Community involvement
SDG 16 – Promote peaceful and inclusive societies, provide access to justice for all and build inclusive institutions As tourism revolves around billions of encounters between people of diverse cultural backgrounds, the sector can foster multicultural and inter-faith tolerance and understanding, laying the foundation for more peaceful societies. Tourism that benefits and engages local communities can also help consolidate peace in post-conflict societies.	 Human rights awareness; In-kind donations; Local enterprises - responsible investment; Local recruitment and purchases; Diversity and respect policy; Anti-corruption and money laundering; Client relationships; Host community involvement
SDG 17 – Strengthen the means of implementation and revitalize the global partnership for sustainable development Due to its cross-sectoral nature, tourism has the ability to strengthen private/public partnerships and engage multiple stakeholders–international, national, regional, and local–to work together to achieve the SDGs and other common goals. Public policy and innovative financing are at the core of achieving the 2030 Agenda.	 Professional development; Partnerships for education; Wildlife and ecosystem protection; Offsetting actions; Supplier and customer involvement; Client relationships; Staff involvement and relationships; Community involvement

Figure 2.1 Continues

For instance, regarding how tourism management can support SDG Goal 15 Life on Land, target 15.1 emphasizes the conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems and their services, particularly forests, wetlands, mountains, and drylands, in accordance with international agreements.

Rare flora and fauna, as well as unique ecosystems, serve as significant attractions for tourists. The growth of niche tourism, which focuses on visiting fragile sites to observe or study these species and ecosystems, enhances environmental learning and raises awareness of ecosystem risks. Pristine sites and natural areas are often considered valuable, leading to the creation of parks and wildlife conservation areas to preserve their ecological integrity and attractiveness. Tourism's contribution to this target is evident through global efforts and international agreements that protect ecological treasures amid growing visitor demand.

2.3 Sustainable Tourism Management Principles in Protected and Fragile Areas

Sustainable tourism management in protected or fragile areas aims to balance tourism with biodiversity conservation and benefiting both.

- The primary goal of protected areas is to conserve biodiversity, natural resources, and landscapes. Many protected areas manage tourism to offer visitors educational and enjoyable experiences and collaborating with local communities to foster trust and economic prosperity.
- Protected areas in APEC are expected to provide various tourism products for visitors while generating economic benefits locally and domestically and achieving conservation objectives.
- Each protected area category prioritizes biodiversity conservation within APEC's legal, political, and economic frameworks, as well as ecological considerations. These factors determine the flexibility of visitor and resource management tools to conserve biodiversity effectively while maintaining visitor satisfaction.
- Collaboration between conservation managers and other tourism industry sectors is important for developing sustainable tourism products and management strategies in protected or sensitive areas.

Below are four main principles of sustainable tourism management in protected and fragile areas.

1. Environmental Sustainability

Maintaining a healthy environment and the integrity of natural ecosystems and resources are crucial for tourism in protected areas, as these elements provide essential tourism opportunities. Forests, mountains, marine and coastal resources serve as major attractions enabling nature-based activities such as forest hiking, wildlife watching, cliff climbing, scuba diving, and snorkeling. Without these natural resources, tourism in national parks would not be viable. Therefore, managing natural resources and ecosystems in tourism destinations safely and optimally is an underlying concept for nature-based tourism and ecotourism.

Minimize and manage environmental impact: Tourism activities should be planned and executed in a manner that minimizes their impact on the environment. This involves adhering to guidelines that prevent pollution, habitat destruction, and resource depletion.

Due to the dual objectives of any national park: ensuring biodiversity conservation and resource protection while providing opportunities for outdoor recreation, tourism, and nature education, tourism management must support the protection and conservation of fragile and valuable resources of natural areas, ecosystems, habitats, and wildlife. Preventive measures against over-tourism should be implemented in all popular national park destinations. Tourism must be managed to minimize damage to biodiversity and natural resources to ensure that negative tourism impacts are not harmful.

To reduce negative tourism impacts on natural resources, visitor experience, and local communities adjacent to national parks, two frequent concepts in visitor management are applied:

- **Tourism carrying capacity:** Refers to the ability of the biophysical and social environment to support tourist activity and development. It defines the maximum level of visitor use and infrastructure that the area can sustain without causing adverse impact. If exceeded, resource deterioration and diminishing visitor satisfaction will occur, leading to adverse impacts on society, economy, culture, and natural environment. Tourism carrying capacity has four types: physical, ecological or environmental, psychological, and managerial carrying capacity. Over-tourism often relates to the concept of carrying capacity, reflecting situations where visitor or tourist use exceeds the area's capacity on physical, environmental, psychological, and/or managerial aspects.
- **Limits of Acceptable Change (LAC):** Developed by Stankey and others (Stankey *et al.*, 1985), this improves the carrying capacity concept by focusing on establishing measurable limits to human-induced changes in natural and social settings and identifying appropriate management strategies to maintain desired conditions. (McCool and Stankey, 1992).

Be resource and energy efficient: Energy efficiency involves technology to minimize the amount of energy used for providing the same or better energy services. Tourism management in national parks should reduce the use of scarce and non-renewable resources in the development of facilities and services. Actions like installing energy-efficient lights and transitioning from fossil fuels to cleaner energy are recommended to mitigate climate change impacts.

Creating a clean environment: Tourism management in national parks must minimize pollution of air, water, soil, and landscape, and reduce waste generated from tourism activities. Waste management measures such as reducing, reusing, and recycling are beneficial for less energy consumption and environmental conservation. Public transportation or non-motorized vehicle routes can resolve traffic congestion and reduce fossil fuel use.

Promote conservation: Tourism should actively contribute to the conservation of biodiversity and ecosystems. This can be achieved by supporting conservation projects, funding research, and raising awareness about the importance of protecting natural habitats.

Tourism in protected areas can serve as a conservation tool. For example, in Thailand, wildlife tourism has been introduced to mitigate human-elephant conflicts at Kui Buri National Park. Community-based tourism initiatives have been developed at Ban Pha Mon and Ban Mae Klang Luang within Doi Inthanon National Park, fostering positive relationships between local communities and park officials. Scuba divers assisting in removing sea debris from coral reefs in marine national parks, implementing payment for ecosystem services concepts with appropriate management, or generating park revenue from visitor use fees can significantly support conservation and resource protection activities.

Tourism and climate action: The tourism sector is vulnerable to climate change and contributes to greenhouse gas emissions. Climate action refers to efforts to measure and reduce emissions and strengthen adaptive capacity to withstand climate-induced impacts.

2. Cultural Integrity

Respect local culture: Tourism should respect and preserve the cultural heritage of local communities. This includes supporting traditional practices, customs, and ways of life, and ensuring that tourism activities do not disrupt or negatively impact cultural sites.

Encourage cultural exchange: Tourism should facilitate meaningful interaction between visitors and local communities, fostering mutual understanding and appreciation of cultural diversity.

3. Economic Viability

Tourism in national parks can bring socio-economic benefits, particularly in rural areas, by creating employment, improving quality of life, developing infrastructure, and providing opportunities for skill improvement. Local communities should participate in the tourism development process to support social and economic development without compromising biodiversity and natural resources.

Ensure fair distribution of benefits: Tourism should provide equitable economic benefits to local communities, create job opportunities, support local businesses, and improve livelihoods.

Promoting local entrepreneurship: Encouraging local entrepreneurship in tourism-related activities can enhance the economic viability of protected areas. This includes supporting local crafts, food production, and eco-friendly accommodations.

4. Social Responsibility

Engage local communities: Tourism development should involve local communities in decision-making processes, ensuring that their voices are heard, and their needs are addressed.

Ensure high quality of visitor experiences: Tourism activities in national parks should focus on nature-based experiences highlighting biodiversity and ecosystems. Activities should align with the park's characteristics and be confined to designated zones to avoid disturbing wildlife and sensitive areas. Effective interpretation and well-designed programs can enhance visitor experiences and promote conservation.

Raise conservation and environmental awareness: Nature interpretation is a visitor management mechanism for connecting people to learn and appreciate natural resources and biodiversity conservation. Its fundamental concept is understanding national park resources leads to appreciation, which can foster conservation awareness and responsibility. Tourism has the potential to raise environmental awareness among local people and visitors through appropriate information, interpretation, and education programs. Effective nature interpretation programs can provide meaningful experiences and inform visitors about the importance of resources and biodiversity conservation.

Promote responsible behavior: Tourists should be educated and encouraged to practice responsible behavior that respects local customs, wildlife, and their environment. This includes following regulations and guidelines, reducing waste, and minimizing their ecological footprint.

Turning these principles into actionable practices requires professional skills and expertise to ensure that sustainable tourism activities promote environmental awareness, conserve and protect the environment, respect biodiversity, ecosystems, and cultural heritage, and enhance the welfare and livelihoods of local communities while providing quality visitor experiences in accordance with the appropriate protected area categories. Through appropriate policies, socio-economic context, and proper management, national parks can contribute to sustainable development objectives without compromising their primary function of conserving biodiversity.

2.4 Tourism Management and Planning Context in Brief

1. Tourism Planning

Tourism planning is crucial for the development and management of tourism in protected and fragile areas. Typically, tourism planning in these areas focuses on balancing biodiversity and the conservation of natural resources with the socio-economic needs of host or adjacent communities while meeting visitors' experiences and expectations. Sustainable tourism, which represents three pillars of sustainability, serves as both a means and an end in tourism development within protected areas. To achieve this sustainability, the planning involves a decision-making process to identify goals or objectives and strategic approaches. It should aim to optimize economic benefits, minimize negative impacts on biodiversity, environment, culture, and local communities, and provide meaningful visitor experiences. Effective tourism planning necessitates active stakeholder involvement from the beginning and throughout the process.

2. Tourism Management Cycle

Tourism management in protected areas encompasses all aspects of tourism developed within the areas. The management of tourism is a continuous cycle that includes multi-disciplinary knowledge, appropriate actions, and stakeholder commitment to adapt and respond to changing circumstances in natural resources and tourism dynamics. Effective tourism management in protected areas relies on stakeholder participation at every step, from developing a plan, implementing, monitoring, reviewing situations, and adapting to emerging issues. Effective communication among stakeholders should be maintained throughout the cycle. It is also essential to develop a strategic plan to ensure that all stakeholders are committed and aligned with the common objectives of sustainable tourism and ecosystem management.

Tourism management in protected and fragile areas involves a cycle of five steps: plan, act, monitor, review, and adapt (Figure 2.2).

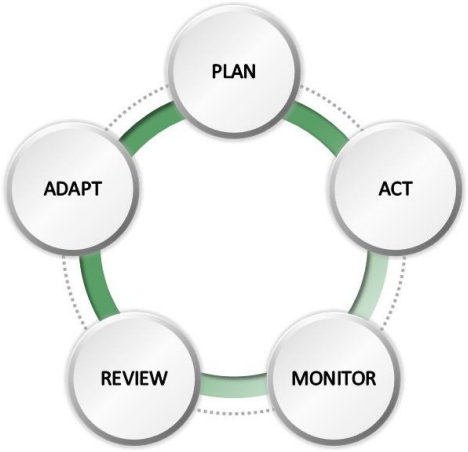


Figure 2.2 A tourism management cycle

Step 1: Plan

A plan is a written document produced through a systematic planning process. The plan outlines anticipated actions or strategies aimed at achieving objectives within a specific timeframe. Stakeholder engagement should be incorporated at an early stage of the process to facilitate partnerships and collaboration. The planning process involves analyzing the current tourism situation and the destination area, setting clear and attainable objectives, and developing a strategic plan. Effective communication should be established at this stage to ensure that all stakeholders understand the concept of sustainable tourism and sustainability.

- *Situation analysis:* An analysis should be conducted on the current state of tourism, visitors/tourists and market segments, infrastructure, resources, and local communities within and/or adjacent to the protected areas, as well as biodiversity and natural resources within the protected areas. SWOT analysis is commonly used for this purpose.

- *Setting objectives:* The SMART (specific, measurable, achievable, relevant, and time-bound) technique is utilized to identify clear and attainable objectives with desired outcomes for tourism in protected areas. The objectives should cover all aspects of sustainable tourism including biodiversity and natural resources, cultural

resources, local socio-economic improvement, visitor management, and visitor experiences.

- *Strategy development:* This stage involves outlining anticipated actions to achieve defined objectives. The strategies should specify what (actions/activities), where (sites), when (time), who (responsible partners), and how (methods/resources/technology). The strategies should remain flexible to adapt to changes or unexpected outcomes in the destination areas.

Governments are crucial in tourism planning for protected areas which usually are under their authority. They set policies, regulations, infrastructure, and safety measures. Managed by government entities, these areas require collaboration with stakeholders to promote tourism.

Another approach to strategic tourism planning is the "destination management plan (DMP)," which highlights the appeal of tourist destinations to attract tourists while preserving their natural and cultural heritage. Destination planning focuses on identifying target markets, improving tourist facilities, and ensuring sustainability. Effective destination planning can attract tourists from target market segments and enhance their experiences to encourage repeat visits (VisitBritain, 2012).

Step 2: Act

This step involves the implementation of planned strategies. Coordination among stakeholders, effective communication, and proper resource allocation are essential for the successful execution of the plan. Timelines and prioritization allow the management team to undertake strategic actions to achieve the desired objectives. The implementation should also leverage new technologies to help manage visitors and resources.

Step 3: Monitoring

The success of tourism management in protected areas is determined by assessing whether the desired objectives and/or outcomes are achieved. Monitoring employs scientific knowledge and sets of indicators to measure the effectiveness of tourism management regarding visitors' experiences, and the impacts of tourism on environmental, social, and economic dimensions of the protected areas and local communities. Key Performance Indicators (KPIs) are defined to measure the progress of the strategic plan. KPIs should be clear, computable, and comparable. Examples of KPIs, extracted from the final draft of UNWTO (2024) Statistical Framework for Measuring the Sustainability of Tourism (SF-MST), are developed primarily for use at the domestic level but can also apply to the site level of protected areas to measure situations, changes, and impacts for each dimension.

- *Environmental dimension* emphasizes the impacts of tourism activities on environmental components, ecosystems, and biodiversity, as well as changes in the quality and quantity of environmental systems as a result. Indicators for impacts and changes include pollution and emissions from the tourism industry, solid waste generated by tourism activities, water and energy consumption, pollution in water, air, and soil, greenhouse gas (GHG) emissions, loss of key species, biodiversity, habitats, and changes in the quality of ecosystem services.

- *Economic dimension* addresses economic benefits to local communities and protected areas' revenues. Tourism expenditure, number and trends of visitors,

number of employment opportunities, tourism business-related ownership, and distribution of economic benefits are among indicators used.

- *Social dimension* examines different perspectives from actors in the tourism industry. The visitor's perspective focuses on their satisfaction and appreciation of visiting destination areas and participating in tourism activities, as well as local culture and event participation. The local community's perspective measures the impacts of tourism on residents' livelihoods, crime, and public safety, living costs, land use changes, relocation, and alteration of identity or culture.

Monitoring should be conducted regularly and repeatedly and should be flexible enough to accommodate changing conditions. Regular and repeated monitoring results will show patterns of changes and trends over time, as well as new issues not included in the original plan. Reporting results in a common language should be presented and disseminated among stakeholders.

Step 4: Review

A review of the tourism plan allows stakeholders to revisit the initial plan with updated perspectives based on monitoring results and current conditions. The review can be conducted annually to address immediate concerns, while the end-of-plan review evaluates the overall management effectiveness of the plan.

Step 5: Adapt

This step goes hand in hand with the review process. Added information gathered from the review allows stakeholders to formulate new desired objectives or outcomes for tourism management in protected areas. Adaptation responds to new trends and dynamics of tourism situations while maintaining the objectives of sustainable tourism in protected areas.

3 Guidelines for Sustainable Tourism Management in Protected and Fragile Areas

3.1 Balance Protection and Tourism

Sustainable tourism in protected areas requires a symbiotic relationship between tourism and conservation efforts. The primary goal is to ensure that tourism activities support biodiversity conservation, minimize environmental impact, and enhance the visitor experience while also contributing positively to the local economy and supporting poverty reduction (Figure 3.1).

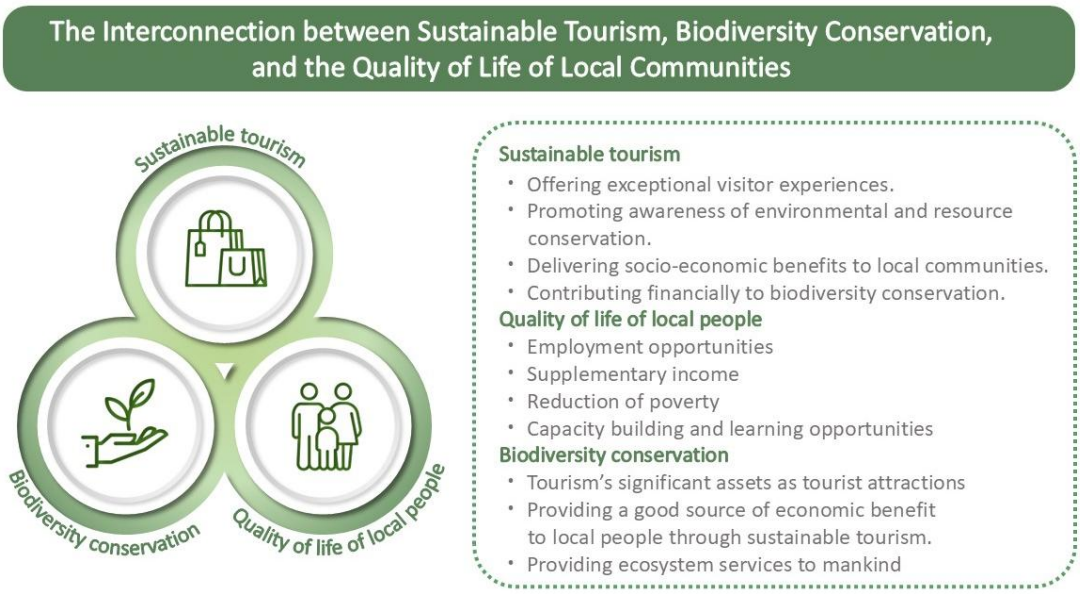


Figure 3.1 The interconnection between sustainable tourism, biodiversity conservation, and the quality of life of local communities

Common trends and challenges to park tourism that emerge from the overview and particularly in the context of the APEC economies retrieved from the APEC Workshop on "Beyond Carrying Capacity: Best Practice in Sustainable Tourism Management in Conservation, Fragile, and Protected Areas" held at The Westin Grande Sukhumvit, Bangkok, Thailand on 30 – 31 July 2024 highlighted the increase in visitors during the post-COVID-19. Overview of tourism management and its challenges in protected areas of the APEC economies was presented in the background paper of the workshop prepared by Emphandhu (2024). The associated environmental impacts, such as waste management issues and wildlife disturbances, were addressed. This advocates the use of advanced tools and strategies, such as visitor management and community involvement, to address these challenges and ensure that tourism in these areas remains sustainable. During the workshop, four key areas of interest were identified regarding tourism management in conservation, fragile, and protected areas: (1) policy and planning, (2) resource and visitor management, (3) community participation and partnership, and (4) tourism product development and standard (Figure 3.2). Thus, this handbook presents guidelines for sustainable tourism management in conservation, fragile, and protected areas into the four areas of interest.

Figure 3.2 Info-graphic wrap up from the APEC Workshop on "Beyond Carrying Capacity: Best Practice in Sustainable Tourism Management in Conservation, Fragile, and Protected Areas" in Bangkok, Thailand on 30 – 31 July 2024
Source: Muangasame and Iemamnuay (2024)

3.2 Guidelines for Policy and Plan Development

Policies, strategies, and plans establish the direction for development and outline an institutional framework. The planning process enables various stakeholders to align on shared values and objectives. Monitoring and statistical processes offer feedback on the performance of management agencies in achieving their goals.

3.2.1 Management Policy of Protected Areas

Management policy is a guide for the organization responsible for managing its protected areas or fragile areas. Every organization needs appropriate policy frameworks to operate effectively. Policies are essentially the guidelines employees must follow to align with protected area goals and reduce potential compliance issues. Policies establish a unified point of reference on how organizations must operate and what they must do to achieve their goals. Employees can refer to these policies to understand their responsibilities and the type of work they must deliver to meet organizational standards. When employees understand their responsibilities clearly, it translates into efficient usage of organizational resources and higher productivity. Since everyone has clear expectations of their roles, overall waste can be minimized. As a result, organizations can have more time to pursue various creative tasks.

Policy guides management decisions, whether general or specific. It may outline decision processes, actions, or desired results. Policies can emerge rapidly in response to urgent issues or evolve slowly as the organization learns more about a problem. Occasionally, policies are influenced by external stakeholders interested in park management. Typically, policy development involves teamwork, field reviews, senior manager consultations, and public feedback.

All policies must be written, approved by an authorized official, and made publicly accessible. Unwritten or informal policies are not considered official.

Below, Box 3.1 is the example of park management policy principles and how policy develops and works for the U.S. National Park Service in guiding decision in national park management.

Box 3.1 Park management policy principles and how it develops

The National Park Service adhered to several principles in preparing the 2006 edition of Management Policies. The key principles were that the policies must:

- comply with current laws, regulations, and executive orders.
- prevent impairment of park resources and values.
- ensure that conservation will be predominant when there is a conflict between the protection of resources and their use.
- maintain National Park Service responsibility for making decisions and for exercising key authorities.
- emphasize consultation and cooperation with local/state/tribal/federal entities.
- support pursuit of the best contemporary business practices and sustainability.
- encourage consistency across the system - "one national park system."
- reflect National Park Service goals and a commitment to cooperative conservation and civic engagement.
- employ a tone that leaves no room for misunderstanding the National Park Service's commitment to the public's appropriate use and enjoyment, including education and interpretation, of park resources, while preventing unacceptable impacts.
- pass on to future generations natural, cultural, and physical resources that meet desired conditions better than they do today, along with improved opportunities for enjoyment.

Once the laws governing the parks are enacted, authority for interpreting and implementing them is delegated to appropriate levels of government. In carrying out this function, the organization develops a policy to interpret the ambiguities of the law and to fill in the details left unaddressed.

In the United States economy, management policies are well understood that "adherence to policy is mandatory unless specifically waived or modified by the Secretary, the Assistant Secretary, or the Director."

Source: National Park Service, U.S. Department of Interior (2006)

Tourism Policy in Protected Areas and Fragile Areas

In protected areas where tourism is permitted by law, tourism policy is typically part of the area's overall policy. For instance, the U.S. National Park Service includes tourism under visitor use in its 2006 management policies. New Zealand's national park policies integrate conservation management with tourism and recreation, balancing natural resource management with heritage and recreational goals. Similarly, Canada's national parks have guiding principles that incorporate tourism and recreation to enhance public understanding, appreciation, and enjoyment.

The Challenges

Policies and plans serve as management tools for both protected areas and the tourism sector. In national parks, tourism often coexists with biodiversity conservation, however, it can be challenging to manage all the policies effectively. At the Bangkok APEC workshop, representatives noted that destinations struggle to follow domestic policies on tourism carrying capacity due to over-tourism. Additionally, the policy response to tourism is inadequate for the climate crisis, increasing the risk to fragile tourism areas and causing the tourism sector to fall behind.

How to Address the Issues

To manage the policies effectively, policy management may be a choice for consideration. This is how to make the policy work best for sustainable tourism in fragile areas. Figure 3.3 offers a guide to address the policy issue.

1. **Involve stakeholders**

   Policy management is not a one-person process. All stakeholders who engaged in policy creation must collaborate to ensure seamless policy management. This approach helps you align your policies with your organization's goals, environment, and culture. Most importantly, a team-based approach will make developing, reviewing, revising, and retiring your policies and procedures easy.

2. **Use external groups to examine your policies**

   While internal players are essential in terms of creating and reviewing policies, external groups can also provide you with a unique perspective in creating transparent policies as well. These external players could include tourism peers, regulatory authorities, third-party service providers, experts, and legal personnel.

3. **Communicate policies effectively**

   Once you have created your policies, you must communicate them effectively to all those affected by the policy implementation. You need to create a plan to share your policies with all the appropriate groups in your organization. Some policies can be communicated via email, but critical policies need more detailed communication to ensure understanding.

4. **Review policies and plans often**

   Since policies play a significant role in an organization's success, you must review them regularly. Policies are prone to changes based on new regulations or evolving organization's goals. These updates should be made periodically to maintain the correct policy workflow. Reviewing policies help identify and update these gaps before outdated policies start causing issues in your operations.

A guide to address the policy issue

1 The written policies comply with laws, management policy, principles, and organization goals

The key principles the policies must possess:

1. Comply with current laws, regulations, and executive orders.
2. Prevent impairment of park resources and values.
3. Ensure that conservation will be predominant when there is a conflict between the protection of resources and their use.
4. Maintain National Park Service responsibility for making decisions and for exercising key authorities.
5. Emphasize consultation and cooperation with local/state/tribal/federal entities.
6. Support pursuit of the best contemporary business practices and sustainability.
7. Encourage consistency across the system -"one national park system".
8. Reflect National Park Service goals and a commitment to cooperative conservation and civic engagement.
9. Employ a tone that leaves no room for misunderstanding the National Park Service's commitment to the public's appropriate use and enjoyment, including education and interpretation of park resources, while preventing unacceptable impacts.
10. Pass on to future generations natural, cultural, and physical resources that meet desired conditions better than they do today, along with improved opportunities for enjoyment.

NPS Management policies (2006)

2 Policies are properly and effectively managed.

Effective policy management

1. Involve stakeholders.
2. Use external groups to examine your policies.
3. Communicate policies effectively.
4. Review policies and plans often.

3 Tourism management strategy, tourism plan, or other relevant plans contains projects/ activities to support the policy.

Check the content of tourism plan

1. Tourism plan (objectives, activities, output) response to the policy.
2. Support from stakeholders and public.

4 Obstacles during implementation

Check the obstacles of plan implementation

1. Adequate knowledge and technology to implement tourism plan effectively.
2. Adequate management resources for implementation (men, time, materials, equipment, money, methods, market).
3. Support from stakeholders and public.
4. Check if any conflicts prevail.

5 Organization management limitation and interests

Check the political environment

1. The policy reflects urgent agenda of the organization or the economy.
2. Limitations of organization's management resources.
3. The economy's interest of the policy.
4. World/regional recognition of issues and the response policy.

Figure 3.3 A guide to address the policy issue

3.2.2 Tourism Strategy and Plan for Protected and Fragile Areas

Tourism in protected or fragile areas should focus on ecosystem conservation, enhancing tourism products and services, and benefiting local communities. Key stakeholders must participate in creating tourism strategies or management plans to ensure these goals are balanced. To maintain each park's value for future generations, it must balance use and preservation.

A tourism strategy for protected areas can be part of or separate from a protected area management plan. The tourism management plan typically presents three requirements: how to effectively manage protected area resources, how to provide appropriate visitor use and interpretation, and how to benefit local welfare. It is strongly advised that tourism strategies should be aligned with management policies.

In the context of tourism strategies for protected and fragile areas, three essential steps should be addressed: 1) the development of the tourism strategy/plan, 2) the implementation of the strategy, and 3) monitoring.

A. Tourism Strategy Development Guideline

The tourism strategy development process includes the following steps:

- Gather information to understand the issue or situation, adapting strategies as more information emerges.
- Engage key stakeholders by explaining the planning process, their role, and expected outcomes, focusing on inclusivity and respect.
- Identify and prioritize issues.
- Develop a sustainable tourism strategy.
- Publish and circulate the strategy document.
- Periodically evaluate and adapt the strategy during implementation, as necessary.

Local businesses consultation at Tham Luang Khun Nam Nang Non National Park, Thailand, to ensure sustainable business operations (food, beverage, and souvenir services) at the park entrance gate.

Photo credit: Emphandhu, D.

01 Gather information and comprehend the circumstances

Good data is a key for success

1 Understand tourism at your fragile site

Accurate data is crucial for monitoring threats to the site or host community and ensuring interventions are appropriately targeted.

Gaining insights into tourism is essential for managing your site effectively.

- Who are the tourists/visitors?
- What are the tourists' objectives for visiting this site and why?
- What are the suitable types of tourism?
- What issues are affecting the balance between use and preservation?

2 Understand the protected area's outstanding values and their fragility

Understanding values and their fragility is crucial.

- What and where are these fragile, valuable resources?
- Why are they important?
- How do they relate to tourism (tourist inspiration, activities, development)?
- How have they been used and managed?
- Can we improve their management progressively?

3 Understand community's needs and concerns

A key principle of sustainable tourism is to involve host communities in shaping tourism processes. Consider their needs and concerns from the start, not after decisions are made.

Gaining insights into community needs, concerns, and aspirations through effective communication and engagement in the planning process.

- What are the characteristics of the communities, and how do they relate to tourism?
- What are the community's needs and concerns regarding tourism development in fragile areas?
- What are the potential positive and negative impacts that tourism may have on the community and their intangible cultural heritage?
- Do they have an opportunity to voice their needs?

4 Understand tourism impacts

Understanding potential socio-economic and ecological impacts is essential to address negative consequences and enhance positive outcomes.

- What are the current and potential ecological impacts of tourism?
- What are the current and potential social impacts of tourism?
- What are the current and potential economic impacts of tourism?
- How does the responsible organization manage these impacts?

02 Identify key stakeholders

- Start by listing the key stakeholders of the fragile sites. This includes the tourism sector, conservation experts, community representatives, the advisory protected area committee, and others concerning individuals or groups involved in the protection, social, and economic activity of the area.
- Then, conduct a mapping analysis of stakeholders' roles, responsibilities, their concerns, and resources (Analyze their roles, responsibilities, concerns, and resources by grouping them accordingly and drawing connections).
- Next, prioritize the list to target your resources from the start of the planning process. This step is crucial to strategy development. Building relationships with stakeholders should focus on inclusivity, respect, and listening.

03 Identify key issues and validate them with stakeholders

- Exchange ideas with key stakeholders and community representatives. This can be done through one-on-one in-depth interviews, forums, meetings, or group interviews.
- Identify the concerns, interests, opportunities, challenges, roles, and available resources of different stakeholders. This step might take some time, but it is essential. It can be achieved without high costs, but it must be sincere and open-minded. Inclusivity, respect, and listening are crucial. Constructive ideas and mutual understanding of the issues will emerge from this step.

This step is important for broadening understanding, allowing opportunities for feedback, and ensuring transparency and accountability.

- Organize a workshop for key stakeholders to develop a simple SWOT analysis and answer these questions: What are the key stakeholders' concerns? What are the key risks or threats? What are the main management weaknesses and the best management capacities? What are the opportunities to overcome the threats and improve practices?
- Explain and validate the SWOT results, issues, and proposed strategies to the participants.
- Finally, try to reach an agreement on priorities for sustainable tourism in fragile areas.

04 Develop a sustainable tourism strategy

- Draft a working document on tourism strategy. Initially, a planning team may assist in drafting the strategy before it is reviewed during workshops or meetings.
- The strategy should clearly articulate who, what, when, where, why, and how to achieve the desired changes or conditions. It must be based on core issues identified through research on impacts and opportunities, as well as stakeholder consultation.
- The strategy should encompass a clear vision that reflects stakeholder aspirations, including the protection of key aspects of the destination, enhancement of visitor experiences, and effective delivery of outcomes beneficial to the host community and businesses. It should consider environmental, economic, social, cultural, quality, health and safety, aesthetic, and tourism-related issues.
- The strategy development should also include consideration of future scenarios and analysis of the costs and benefits of pursuing different objectives.
- The strategy should identify:
    - The top 3-5 issues affecting the site.
    - Opportunities for improvement.
    - Location of tourism development and appropriate management zones.
    - Current capacity and potential resources for solutions.
    - Steps required to implement future solutions.
    - Priority of the activities.
- Evaluate necessary actions to achieve the tourism strategy. This includes identifying tasks, required skills, responsible parties for each task, timelines, and financing methods.
- Individuals involved in the fragile tourism destination should understand their roles and the benefits of supporting the strategy.
- In a very fragile or sensitive area, there must be a public hearing of the tourism strategy before it is published and implemented. If stakeholders are not involved in the process, they may doubt the inclusiveness and openness of the process.

05 Publish and distribute the sustainable tourism strategy document

- Incorporate the tourism strategy into a protected area management plan to ensure its implementation. This also aids in verifying consistency with other projects and activities within the management plan.
- Publish the tourism strategy and circulate it to potential sources of finance and responsible organizations as well as other interested parties. Typically, it will be posted on the official website of the organization for public viewing.
- Find effective ways and methods to persuade stakeholders that supporting and implementing this strategy will benefit the destination, businesses, and communities.
- Communicate key messages and inspire action. Innovate in how you present your strategy; it does not have to be an ordinary document. Consider using a short film, presentation, speech, cartoon, or poster. Many strategies fail due to poor involvement and communication, so ensure your strategy is noticed, understood, and respected by your audience.
- After developing a tourism strategy, the next step is its implementation. Monitoring and reviewing the implementation are crucial. If goals are not met, adapt the strategy as needed.

06 Reassess the strategy regularly

- During your initial analysis and strategy development, it is imperative to identify appropriate benchmarks and milestones to ensure that:
  - The tourism management objectives for protected or fragile areas align with the policies of the managing organization,
  - The significant value of the site is preserved,
  - The condition and state of conservation are assessable,
  - Any outstanding issues are acknowledged in the tourism strategy and addressed accordingly.
- The strategy should be continually evaluated for effectiveness and resource allocation.
- Annually, stakeholders must review progress and incorporate new evidence.
- Tourism needs to adapt as situations change. Flexibility in strategy and governance is crucial. Strategies are ongoing and must evolve with destination challenges.

B. Implementation of Tourism Strategies Guideline

The implementation of the tourism strategy involves the following steps:

- Develop a Destination Management Plan (DMP)
- Seek support for the plan's implementation
- Set up management tools and resources
- Action and monitoring success

01 | Develop Destination Management Plan (DMP)

To implement the tourism strategy, a destination management plan (DMP) should be collaboratively developed with stakeholders, encompassing programs and actions that facilitate the realization of each objective outlined in the tourism strategy. Destination Plans are site or destination specific and describe a future state and process to achieve a desired vision.

The DMP must detail the tasks to be completed, specifying the timeline, responsible parties, and associated costs. Objectives should adhere to the SMART criteria (specific, measurable, attainable, realistic, and time-bound), ensuring they are clearly defined to determine when they have been accomplished. The SMART guidelines for successful tourism planning objectives in protected areas are enumerated in Table 3.1 below. The ecological zoning and land-use development plans are often included in tourism DMPs.

The Destination Management Plan (DMP) includes the following elements (Secretariat of the CBD, WTO, and the UNEP, 2009):

- Inventory of attractions, equipment, and factors influencing the destination.
- Examination of circumstances shaping future development.
- Strategic analysis of strengths, weaknesses, opportunities, and threats compared to competitors.
- Review of market trends and local community needs/expectations.
- Assessment of current and future human resource requirements.
- Proposed design guidelines for future development, including site priorities, building requirements, design principles, infrastructure needs, and marketing plans.
- Evaluation of social, economic, and environmental impacts from tourism with mitigation strategies.
- Consideration of mechanisms for maintaining or restoring ecosystem services.

Once destination plans are finalized, sub-components of the plan may be organized into specific projects. This strategy assists in fundraising, effective management, and evaluation. It is essential to establish a governance structure for each project as part of the overall plan, considering the mandates, capacities, and interests of the various agencies and stakeholders involved.

Table 3.1 SMART guidelines for objectives development in the tourism DMP

Characteristics of objectives	Guidelines	Examples
Specific	• Objectives deal with the results or accomplishments of an activity. They describe what is to be accomplished but not how. • Objectives should provide all parties with a clear vision of what is to be accomplished • Once stakeholders agree to the objective, they are all clear as to its meaning, and all become accountable for their role in achieving the objective.	Within five years, visitors will be reduced to a limit of 3,000 visitors with a world-class wildlife viewing opportunity. 1) The time frame is fixed 2) This indicates that the number of visitors must be measured at least once a year, to monitor the progress and evaluate if the objective can be attained. 3) Five years is considered the realistic and attainable time frame for implementation.
Measurable	Measurable objectives provide a clear basis for evaluating progress. It allows managers to determine where efforts need to be made in the future. It indicates what elements in the protected areas need to be monitored, where, and with what frequency.	Within five years, providing 3,000 visitors annually with a world-class wildlife viewing opportunity.
Attainable	• Objectives represent a compromise between an idealistic vision (e.g., without impairment of park resources) and the reality of the impact of tourism. • Attainable objectives provide motivation for action. • Be focusing on desired, rather than existing conditions, objectives point towards an improvement in conditions.	
Realistic	• Objectives must be realistic over the time frame of the tourism plan. • Objectives must be realistic about the available management resources such as funding and staffing resources.	
Time-bound	Goals and objectives should maintain or move toward a desirable future condition. A time frame for an objective should be specified. Time-bound objectives provide the direction needed to develop the appropriate management actions and require accountability.	

Source: Eagles, Paul F.J., McCool, Stephen F. and Haynes, Christopher D.A. (2002)

02 | Seek support for plan implementation

- Go back to the stakeholder list prepared during the strategy development, review and update the list.
- Organize a public meeting or Destination Management Planning (DMP) forum to explain the strategy and focus of the DMP. This step is important for broadening understanding, allowing opportunities for feedback, and gaining support.
- Utilize the DMP Forum to establish fundamental priorities for sustainable tourism within the destination. Given that different cultures employ varied methods to achieve consensus, there is no universal approach for this process. However, it is essential to recognize the mutual understanding that the destination requires management, possesses limited resources, and should concentrate on specific activities rather than attempting to address all potential activities simultaneously.
- Everyone involved in the destination should be able to understand their expectations and how they can benefit from supporting the plan.
- Successful tourist destinations need organizations or partnerships with the ability, knowledge, skills, and dedication to drive positive change. Effective management and leadership should ensure governance or partnerships that attract support, resources, and authority to implement the DMP.

03 | Set up management tools and resources and go for actions

Several management tools, approaches, and options can be selected for the implementation of sustainable tourism strategies and Destination Management Plans (DMP). These can be grouped into 9 categories:

- **Legal and normative tools**: These instruments allow governments to maintain strict control over development and operations through laws and regulations, such as Environmental Impact Assessment (EIA), licensing, and zoning.
- **Visitor management tools**: This client-oriented approach for planning and service delivery considers visitors' needs, expectations, and satisfaction. It focuses on managing park visitation at levels and quality that justify intervention. Visitor management tools include various strategies to enhance visitor experience and manage their impact such as nature interpretation, dispersing visitors, visitor rotation, and visitor limitation/carrying capacity management.
- **Resource management tools**: These tools help manage natural resources sustainably for tourism. They may include resource protection measures like zoning, impact assessments, monitoring, site planning, site hardening, closing damaged areas, and limiting use based on acceptable impacts.
- **Economic tools**: These tools influence behavior and impact financially by sending market signals, such as increasing fees, payments for ecosystem services, conservation efforts, carbon footprint taxes, and carbon offsets.

- **Participatory methods and tools**: Participation is a crucial element for sustainable tourism development. Tools include meeting forums, workshops, and focus group interviews during implementation. These tools help identify roles and responsibilities and how resources and efforts can be contributed to tourism development in sensitive areas. Participation tools also involve partnerships with stakeholders such as private enterprises, local communities, and government agencies.
- **Voluntary tools**: These tools encourage individuals to voluntarily support sustainable practices and adhere to sustainable approaches. Examples include visitor codes of conduct, voluntary certifications, contributions to carbon offset programs, payments for ecosystem services, and visitor activities contributing to conservation efforts.
- **Communication tools**: Effective communication can drive behavior change towards sustainability by sharing information. Tools like social media reach a wide audience, while publications, magazines, posters, and brochures target specific groups to promote sustainable tourism.
- **Marketing tools**: These tools are intended for sustainability marketing purposes, focusing on understanding market needs, designing more sustainable products, and identifying effective communication methods to promote behavioral change. Tools such as market development aim to increase sustainability-driven consumerism by promoting highly sustainable products. The product development approach focuses on designing and marketing incrementally more sustainable products. Pricing and advertising are also common marketing tools used in tourism management.
- **Research and measurement tools**: Research is essential for understanding tourism's impact on fragile areas. Surveys and measurements of resources and visitor changes are necessary during tourism development. Research aids adaptive management, allowing new data to inform adjustments. Research and development (R&D) efforts help improve products and services, as well as management.

Other management resources should align with the activities in the strategy and DMP, along with the management tools and methods mentioned earlier. It is essential to identify responsible organizations and individuals, ensuring that qualified personnel are adequately assigned to their respective roles. This may require capacity building and up-skilling of relevant stakeholders. Securing project financing, including both financial sources and the necessary funds, is imperative. Furthermore, the required equipment, materials, and machinery must be ready for deployment.

C. Monitoring of Tourism Strategies Guideline

A strategy should be a working document, updated regularly to reflect changes in the destination, tourism economy, conservation status, and community needs. Key components include sustained monitoring of conditions, evaluating management actions, and making necessary adjustments. The strategy must undergo regular review for effectiveness, ensuring resources are prioritized effectively. Annually, stakeholders should compare progress with objectives and incorporate new evidence. A strategy is an on-going process; it evolves continuously to address emerging challenges.

A successful monitoring program needs a solid design, carefully chosen indicators and measurements, and long-term support for funding, staffing, equipment, and infrastructure (Miller & Twining-Ward, 2005; Gitzen, *et al.,* 2012). The following questions can guide the design of an effective tourism strategy monitoring program.

1. Purpose of Monitoring: Is the objective of monitoring to identify long-term resources or use trends (often referred to as 'ambient monitoring'), to support a management framework, or to evaluate the short-term effectiveness of a management strategy (commonly called 'effectiveness monitoring')?

2. Indicators for Monitoring: Which indicators are directly linked to the values of protected or fragile areas, or are relevant to management decisions? What type of impact (e.g., environmental, economic, social, cultural) is most critical? When comparing input indicators (e.g., number of visitors, tourist behavior) with output/outcome indicators (e.g., economic impacts, visitor experience, or ecological impacts), which is the most essential for managers to track if it is not feasible to monitor all?

3. Locations and Timing for Monitoring: Should monitoring be conducted in the most sensitive habitats or in areas exhibiting rapid change? Should it occur only during sensitive seasons (e.g., bird breeding season) or throughout the year to assess seasonal variations? What indicators should be monitored most frequently, and what circumstances would warrant a change in monitoring frequency?

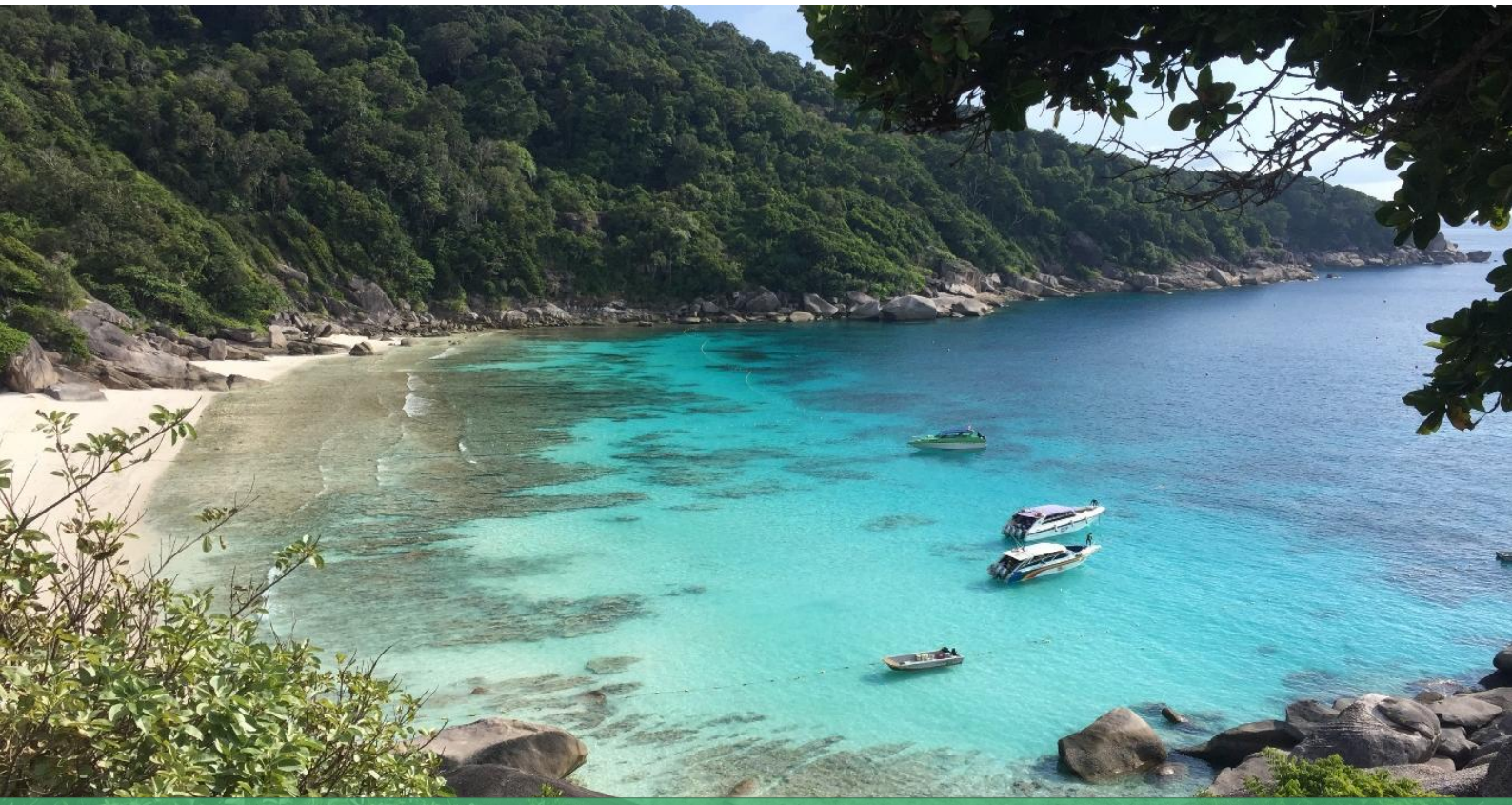
4. Data Collection Responsibility: Who should be responsible for data collection? Managers such as wardens or rangers, academic researchers, or volunteers? Can some or all aspects of a monitoring program be managed by the local community? How can a protected area leverage agency and community capacities to support a sustainable monitoring program? What level of training is necessary to ensure data quality? Can tour or concession operators collect the data?

5. Data Analysis: Who will analyze the monitoring results—protected area managers, academic researchers, or a combination of both?

6.Data Utilization: How will the results be incorporated and utilized by managers?

There are various guidelines and handbooks that offer examples of methodologies and programs for tourism-oriented monitoring, such as those by Hornback & Eagles (1999), UNWTO (2004), and Miller & Twining-Ward (2005).

3.2.3 Case Studies



Case study 1

Tourism Strategy Development Addressing Over-tourism at Similan National Park, Thailand

Learn how to create a tourism strategy for Similan National Park, Thailand that balances the tourism needs of a fragile site with sustainable tourism practices.

General information

Established as a national park in 1982, the Similan Islands are an archipelago of 11 islands located in the Andaman Sea, 70 km off the coast of Phang Nga Province. The park encompasses an area of 140 km^2, of which 26 km^2 is the land area.

The Similan Islands have a diverse marine ecosystem that includes hard and soft coral reefs, clear waters, and white beaches. These features make the islands notable diving sites. The islands are characterized by large rock formations, shallow waters, and dense tropical forests.

The park is open from October 15th to May 15th and closed during the rainy season. Diving and snorkeling are popular activities in the Similan Islands, with the best time for diving being December to April.

The issues

The islands are facing severe issues due to excessive tourism. In 2018, visitor numbers soared to 7,000 per day. Despite capacity limits set in 2012 and periodic reviews, enforcement is lacking. Tourism has led to beach erosion, excessive wastewater discharge, coral reef loss, and garbage buildup.

Tourism strategy development for addressing over-tourism issues

The Department of National Parks, Wildlife, and Plant Conservation, with Kasetsart University, employed a Participatory Action Research (PAR) to update the recreation carrying capacity (RCC) and create tourism strategies for improving tourism management at Similan National Park.

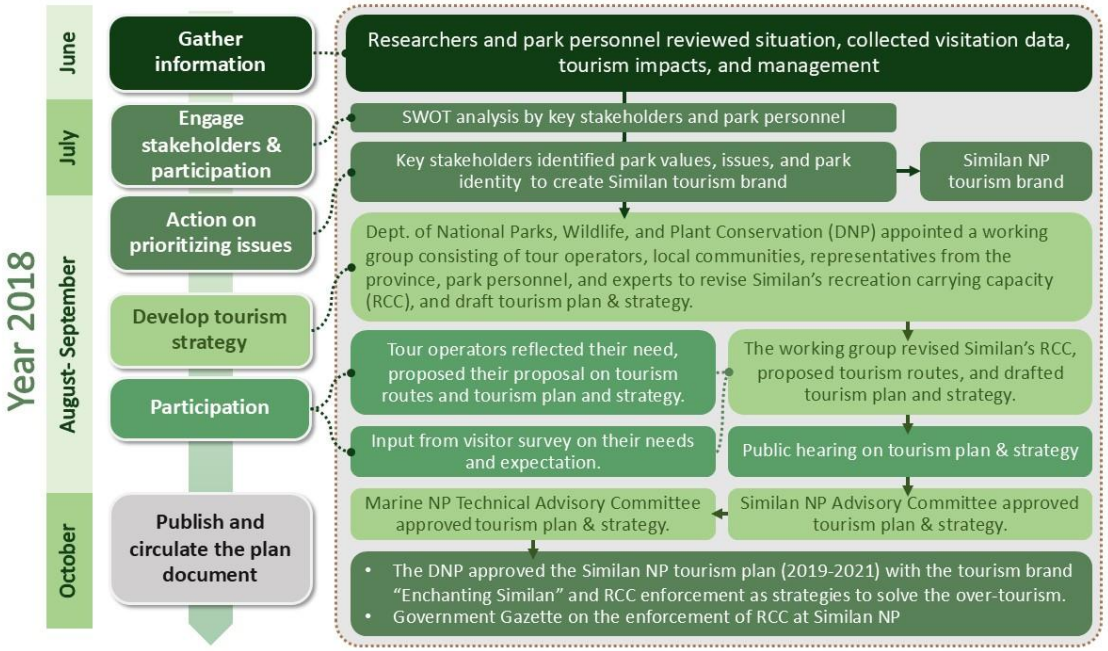
The project aimed to develop a tourism plan by establishing a brand that highlights the site's values and fragility.

The result was a strategic plan for Similan National Park to reduce over-tourism. This included raising public awareness through branding and limiting tourists to 3.850 per day using visitor management methods.

The tourism strategy development process is detailed below.

The key points of the best practice on tourism strategy development

- Utilizing Similan National Park identity to create a brand as part of the tourism strategy for promoting public awareness of the park's significant values and encouraging sustainable behavior changes.
- Implementing plans to reduce tourism impacts by not only limiting the number of visitors but also applying visitor management methods to mitigate impacts, such as e-tickets and reservation system,access control and checkpoints, provision of buoys and tourist boat parking areas, walking trails with signage, and improving the efficiency of sewage and garbage management.
- The Participatory Action Research (PAR) enhanced the working group's planning mission by emphasizing scientific data collection, involving key stakeholders, and implementing required actions. This methods yields active and viable solutions to address over-tourism at Similan.

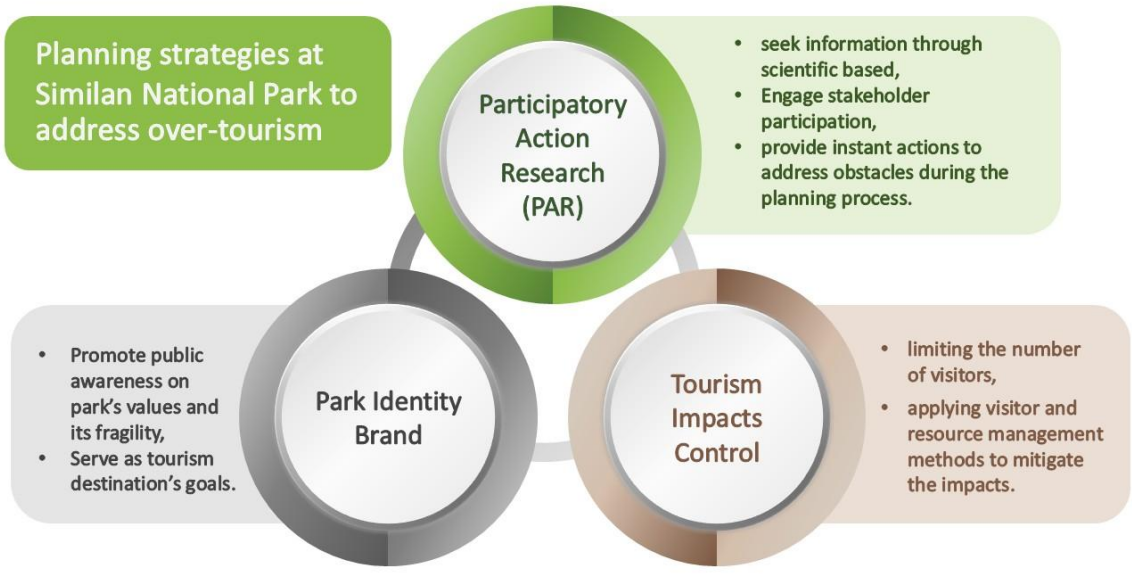


The tourism plans were developed in two stages: the urgent plan (2018) and the 3-year plan (2019-2021), which includes 41 projects across 7 programs:

- Resource protection and restoration
- Sustainable physical development
- Interpretation and tourism services
- Environmental and sanitary measures
- Research and monitoring
- Capacity building and partnership establishment
- Public relations and promotion of the Similan identity brand

The highlights

The key points of the best practice on tourism strategy development are summarized below.



The strategy implementation has achieved favorable results. The number of visitors has been limited to 3,825 individuals daily since fiscal year 2018, leading to a decrease in the monthly number of visitors as shown in Figure 1. Visitor feedback at Similan National Park indicates approval of the less crowded environment and the more tranquil experiences during their visits. Additionally, over the past three years, management has focused on enhancing the efficiency of sewage and wastewater treatment in service zones, applying the "garbage in, garbage out" concept, and reducing unnecessary materials from food preparation and single-use plastic food containers. Regulations such as parking boats with buoys at designated spots and restricting cigarette remnants and smoking to specific areas have been strictly enforced.

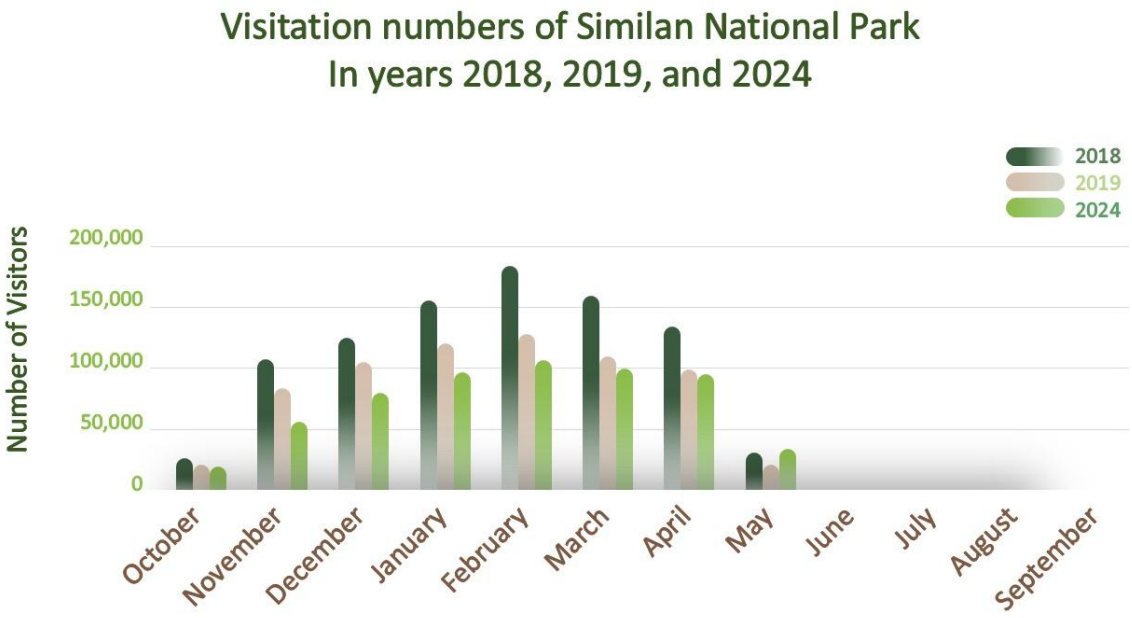


Figure 3.4 Visitor numbers at Similan National Park before and after implementing the tourism strategy to address over-tourism

Information source: Emphandhu, *et. al.* (2019) and National Park Office (2025)

Case study 2

Indonesia's Destination Management Organization Model (DMO)

Learn how Indonesia develops DMO and plan for sustainable tourism management in fragile destinations.

General information

Indonesia's tourism law supports sustainable tourism, enabling social and economic benefits without harming the environment or local cultures. A Destination Management Organization (DMO) in Indonesia involves coordinated management of tourism areas through innovative and systematic planning, implementation, and control. It integrates community participation, associations, industries, academicians, and government to improve management quality, increase tourist visits, length of stay, expenditures, and benefits for the local community.

The issue: why DMO?

DMO is needed because:

- Complexity of tourism management (multi-sectoral, multi-disciplinary, multi-stakeholders and multi-actors)
- Borderless tourism
- Destination Management System (Linkage and Value-chain – Tourism System)
- Travel experience as a whole (arrival to departure)
- Coordination and integration in tourism management and development
- Weak tourism destination management scheme
- Increased competitiveness

The key messages of the DMO development model

- It is an effective institutional tool for sustainable tourism development that works well not only in fragile destinations.
- The DMO works well if there is a legal support or appeared in the tourism policy of the economy like Indonesia.
- Key principles of the DMO are participation, collaboration, and integration towards sustainability while the implementation approach emphasizes planning, controlling, monitoring, marketing, and funding at site level. These principles act accordingly toward the sustainable environmental, economic, and socio-cultural targets
- Pangandaran, West Java is a good case study of time and money investment on capacity building such as training and workshop which leads to the establishment of mitigation programs, adaptive management actions, and joint venture.

The DMO guideline

- The DMO strategies encompass coordination, stakeholder involvement, partnerships, shared interests and objectives, and performance indicators. These strategies are based on DMO principles, approaches, and legal foundations. The management of institutional functions and operational phases, along with the establishment of core activities and success indicators, are crucial in strategy development. DMO achievement targets include economic, environmental, social-cultural goals, and the destination management quality target (Figure 3.5).
- Participatory, collaborative integration, and sustainability are key principles of the DMO (Figure 3.6).

Figure 3.5 DMO guideline

Figure 3.6 DMO principles

- The Indonesian DMO operational phase includes planning, implementation, controlling and monitoring, marketing, and funding. The planning phase identifies issues and current problems. Implementation involves relevant stakeholders such as communities, field supervision teams, and other parties. The third phase is controlling and monitoring to ensure compliance with implementation of applicable regulations to achieve objectives and targets effectively and efficiently. When the destination matures and is ready, the DMO promotes tourism through integrated marketing involving communities and other stakeholders. The funding is managed by responsible stakeholders independently.
- Core activities are divided into 4 stages, each lasting 1-2 years as shown in Table 3.2 below.

Table 3.2 DMO stages and their core activities

DMO stage		Core activities
Stage 1	Stakeholders' collective awareness movement	**Stakeholder awareness** 1. Stakeholders' mapping 2. Baseline assessment 3. Ownership and involvement
Stage 2	Destination management development	**Intervention** 1. Tourism master plan 2. Destination management and revitalization facilities, accessibility, community 3. Capacity building
Stage 3	Business development	**Business focus** 1. Business and industry capacity building, 2. Entrepreneurship 3. Business plan and networking 4. Development of creative economy 5. Promotion & marketing 6. Backward and forward linkage
Stage 4	Institutional and organizational establishment & enforcement	**Legal & institutional arrangement** 1. Organization structure improvement 2. Good governance implementation 3. Corporate Social Responsibility (CSR) & Corporate Shared Value (CSV) implementation 4. Financial sustainability

Figure 3.7 shows the planned DMOs to cover 15 DMO destinations within 5 years (2010-2014). Figure 3.8 shows examples of highlight destinations.

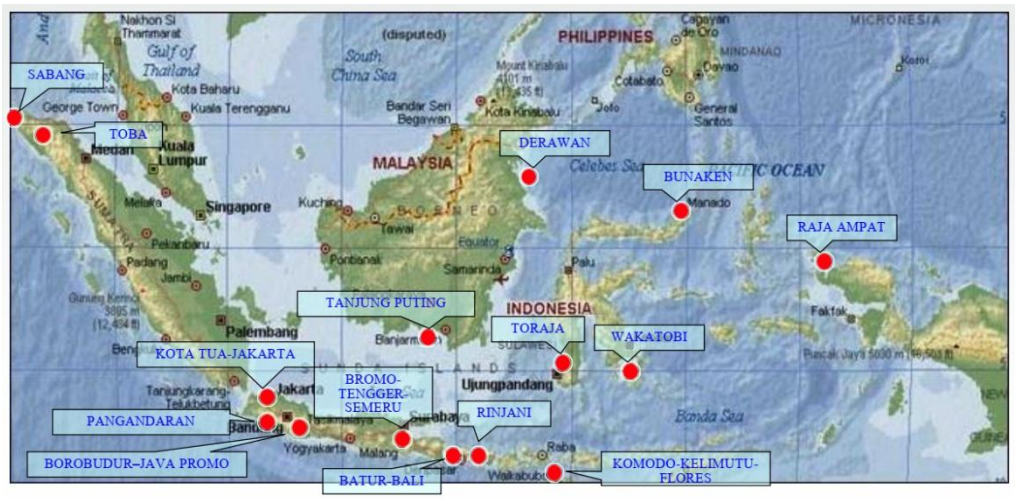


Figure 3.7 The planned DMOs covering 15 DMO destinations within 5 years (2010-2014)

DMO RAJA AMPAT

Coral Reef Protection: Misool Eco-resort
- No take zone to preserve coral reef and marine life

Kayak Conservation
- 100% income from tourism activities goes to local Papuan people and for conservation purpose

Raja Ampat as Marine Wildlife Reserved by Ministerial Decree of Forestry
- Preserving the sustainability of biodiversity in the islands

NGOs and other project related to conservation
- Raja Ampat Research & Conservation Center:
  - involving indigenous communities in tourism sector
  - providing assistances in dive guides, plane, boats and tourist map
- Green Turtle Research

DMO KOMODO ISLAND FLORES

Komodo National Park:
- To protect its biodiversity
- Cross-sector enforcement of regulation in and outside national park
- 25 year management plan and zoning

Destination Management Organization programs:
- Coaching and training related to conservation
- Development of Lhasa Island as the zone for commerce & cultural center
- Development of rural tourism
- Waste management undertaken by Swisscontact with Local Government of West Manggarai started in 2012

Figure 3.8 Examples of highlighted DMO destinations

Information source: SAPTA NIRWANDAR, Ph.D., Vice Minister, Ministry of Tourism and Creative Economy, Republic of Indonesia

3.3 Guidelines for Visitor Management

Tourism in protected areas and fragile areas relies on the quality of natural and cultural resources. Managing, directing, and mitigating the impacts of visitation on these resources is crucial. Even minimal recreational use can have negative effects. While tourism benefits such as income generation, local welfare development as well as the provision of visitor experiences in protected or fragile areas may be desirable, visitor use in protected areas or other fragile areas must not threaten the essential natural and associated cultural and spiritual values. An acceptable threshold for certain levels of impact to protect the resources must be set. Then, management actions, including visitor management, are required to maintain impacts at an acceptable level. The ***monitoring*** and ***managing*** of visitor impacts are fundamental to sustainable tourism management strategies.

A protected area manager should understand the capacity for tourism at the site.
If tourism intensity surpasses acceptable impact levels, the manager must take measures.
Determining these thresholds and detecting when they are exceeded is crucial.

Visitor management or visitor use management: This client-oriented approach focuses on managing park visitation at levels and a quality that justify intervention. Visitor management tools include various strategies to enhance visitor experiences and manage their impact such as nature interpretation, dispersing visitors, visitor rotation, and visitor limitation/carrying capacity management. Managers of the protected areas or fragile areas have a wide array of strategies to manage the impact of park tourism. Their choice will be determined by any restrictions that legislation or agency policy places upon them, by the efficiency and appropriateness of the management strategy, and the resource implications.

3.3.1 Guiding Principles of Visitor Management

Guiding principles for visitor impact management are the following:

1.	**Objectives are essential for guiding effective management.**
	Measurable and specific objectives establish a clear framework for appropriate management actions, define acceptable resource and social conditions, and assess the progress and success of management efforts. This enables managers to identify the necessary initiatives.
2.	**Diversity and resilience of resources and social conditions in protected or fragile areas influence visitor management.**
	Diverse natural resources cause varying types and degrees of impact. Environmental factors like topography, vegetation, and access influence visitor use and impact levels. Managers should assess these variables to determine desirable conditions and guide visitor management actions.
3.	**Impact on resources and social conditions is an inevitable consequence of human use, including recreation and management action.**
	All human activities can impact the site, even minimal recreational use can cause significant biophysical or social effects. Managers must evaluate what level of impact is acceptable or desirable. This evaluation is important for visitor planning and management. Appropriate actions should be taken to achieve and manage this acceptable impact level, determining the most effective measures to influence the amount, type, and location of changes.

4. Impact may be temporary, spatially discontinuous, or accumulated.

Visitor use and/or management activities can impact areas outside the protected zone, sometimes with delayed effects. For example, inadequate wastewater treatment at a tourism site can lead to downstream water pollution. Planners must understand the relationships between use and impacts to make accurate predictions over different scales and time periods.

5. Many variables influence use or impact.

Many impacts may not be caused by the number of visitors. Therefore, limiting uses is not the only management option to deal with the impact. Many factors besides usage level affect the use-impact relationship in protected areas, such as visitor behavior, travel methods, group size, season, and biophysical conditions. Along with usage limits, management strategies like education, information programs, and regulations may be needed. Additionally, other land uses can impact natural resources in fragile areas. Managers and planners must identify cause-and-effect relationships to design proper mitigation actions.

Management issues related to human use density often have straightforward technological solutions (e.g., facilities, water supply), but their relationship to use is not always linear. Similarly, social conditions like visitor satisfaction are not always linked to density. A small number of visitors can produce a significant impact if their behavior is poor.

Source: Adapted from Eagles *et al.* (2002)

3.3.2 Recreation Carrying Capacity

During the 1970s, carrying capacity was advanced as a technique for managing tourism in sensitive environments. This encouraged managers to try to solve visitor use problems merely by setting limits to numbers based upon a pre-determined level, derived from ecological, social, and other analyses.

Guideline for recreation or tourism carrying capacity determination

Recreation carrying capacity is a fundamental concept for managing and maintaining the sustainability of natural and recreational areas. It refers to the maximum number of people who can use a site without causing unacceptable changes to the environment, the experience of visitors, and the resources available. Determining this capacity requires a multi-faceted approach that considers environmental, social, and managerial factors.

This guide provides a framework for understanding the key elements and processes involved in determining recreation carrying capacity, ultimately contributing to the sustainability and enjoyment of these valuable areas. Recreation carrying capacity is often divided into four interrelated types:

- **Physical Carrying Capacity (PCC):** The maximum number of visitors which the available space for recreational use can accommodate.
- **Psychological Carrying Capacity (PsCC):** The number of users beyond which the quality of recreational experience diminishes.
- **Managerial Carrying Capacity (MCC):** The ability of an organization to manage a tourism site, accommodating visitors without compromising experience quality or the environment.

- **Environmental or Ecological Carrying Capacity (ECC):** The maximum number of visitors or the level of recreational use without causing unacceptable changes to the environment and the resources.

Determining recreation carrying capacity involves several key steps as shown in Figure 3.9

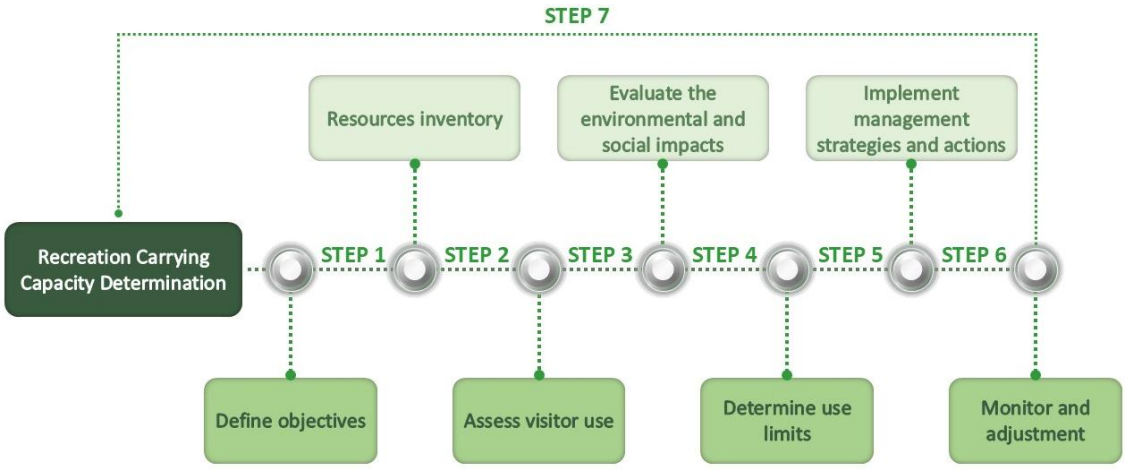


Figure 3.9 Key steps of recreation carrying capacity determination

01 Define objectives

The first step is to define clear objectives for the recreational area. Objectives may include preserving environmental quality, ensuring visitor satisfaction, and maintaining the site's cultural or historical significance. The vision of certain visitors' experience in the destination may be guided by the Recreation Opportunity Spectrum (ROS) approach.

02 Resources inventory

Conduct a thorough inventory of the site's natural, cultural, and managerial resources. This includes identifying sensitive areas, wildlife habitats, water sources, historical sites, and existing infrastructure.

03 Assess visitor use

Understanding visitor behavior and patterns is crucial for determining carrying capacity. This involves analyzing current and projected visitor use patterns by collecting data on visitor numbers, activities, duration of stay and spatial distribution within the recreational area. Methods for collecting this data include:

Visitor survey: Visitor surveys are a vital tool for understanding the needs, preferences, and behaviors of visitors and help managers make informed decisions to enhance recreational experience. Steps to conduct a visitor survey present in Box 3.2.

Box 3.2 Steps to conduct an effective visitor survey

1. Design the Survey:

- Define Objectives: Clearly outline what information you wish to gather. This could include visitor demographics, satisfaction levels, activity preferences, and suggestions for improvements.
- Questionnaire Development: Create a mix of open and closed-ended questions. Ensure questions are concise, relevant, and easy to understand. Include sections on visitor experiences, preferences, and demographics.
- Pilot Testing: Test the survey with a small group of visitors to identify any issues with question clarity or survey length.

2. Select the Survey Method:

- On-site Surveys: Conduct face-to-face interviews or distribute paper questionnaires at key locations within the recreational area.
- Online Surveys: Use digital platforms to reach a broader audience. Provide QR codes or links at entry points, visitor centers, and on the area's website.
- Telephone Surveys: Collect data via phone calls, especially for follow-up questions or more in-depth interviews.

3. Sampling Strategy:

- Random Sampling: Ensure a representative sample by randomly selecting participants. This avoids bias and ensures the data reflects the overall visitor population.
- Stratified Sampling: Divide visitors into sub-groups (e.g., by age, activity type) and sample from each group to ensure diverse perspectives are captured.

4. Data Collection:

- Training Surveyors: Train staff or volunteers on how to approach visitors, administer the survey, and record responses accurately.
- Timing: Conduct surveys at different times of the day, week, and seasons to capture variations in visitor patterns.

5. Data Analysis:

- Compile Results: Input data into a database or spreadsheet for analysis. Use software tools for statistical analysis to identify trends and patterns.
- Interpret Findings: Analyze the data to understand visitor behaviors, preferences, and satisfaction levels. Identify areas for improvement and potential issues.

6. Reporting and Utilization:

- Report Findings: Summarize the findings in a report, highlighting key insights and recommendations.
- Implement Changes: Use the survey results to inform management decisions, improve visitor experiences, and address any identified issues.

Visitor counts: Using counters at entry points and key locations can provide accurate data on the number of visitors. This can be supplemented with surveys and observation to gain insights into visitor demographics and behaviors.

Activity monitoring: Monitoring the types of activities visitors engage in can help identify high-impact activities and areas of concern. This can be done through direct observation, surveys, and data from permits or reservations.

Spatial analysis: Spatial analysis techniques, such as GIS mapping and heat maps, can help visualize visitor distribution and identify areas of high use. This information can be used to direct visitors away from sensitive areas and distribute use more evenly.

04 Evaluate the environmental and social impacts

Evaluating the environmental impact of recreational activities, including factors such as soil erosion, vegetation damage, water quality, wildlife disturbance, and other indicators of ecological health. Environmental impact assessments and monitoring programs can provide valuable insights into the condition of ecosystems or the environment. Additionally, consider the social impact on visitor experience, particularly regarding visitor crowding and satisfaction.

05 Determine use limits

Utilizing the collected environmental and social data, this phase determines acceptable usage limits for the site. These limits may encompass visitor numbers, group sizes, frequency of use, and activity types, and are defined by the threshold of acceptable impacts. Each recreation carrying capacity has methods or techniques for determining use limits.

Physical Carrying Capacity (PCC):

1) *Define the usable area for recreation activities*

Start by clearly identifying the recreation area and determining the recreation activities and types of experiences visitors should have while engaging in recreational activities there. The Recreation Opportunity Spectrum (ROS) is a useful approach for this. For example, some areas may be designated for high-intensity recreational activities, while others may be reserved for low-intensity use due to their ecological significance or the preferred visitor experience emphasizing a peaceful and natural setting.

2) *Assess the area's resources*

Conduct a thorough assessment of the area's natural and infrastructural resources. This includes evaluating the existing condition of trails, facilities, water sources, vegetation, wildlife habitats, and any other relevant resources.

3) *Establish criteria for acceptable limit*

Establish criteria for acceptable limits of change based on the area's resources and potential impacts. These criteria should be informed by scientific research, management objectives, and stakeholder input.

For physical carrying capacity, the acceptable limit is **the space standard for recreational activity** which is defined as an area a visitor will require to be able to perform recreational activity. The space required per visitor can vary depending on the type of activity, the specific conditions of the site, and the recreation opportunity experiences (ROS).

For example, beaches designated for natural conservation or located in protected areas often require larger space standards to reduce human impact on the environment. For these beaches, a greater space allocation per visitor is necessary to preserve delicate ecosystems, flora, and fauna. A standard of 20 square meters per person is generally recommended to help maintain the natural habitat. Additionally, the number of visitors may be further restricted by the allocation of open spaces or no-use areas to protect sensitive areas and maintain their tranquility.

In contrast, high-density beaches, which are designed to accommodate larger crowds, have different space standards. These beaches typically have enhanced infrastructure and amenities to support a higher volume of visitors. The space standard might be reduced to around 5 to 10 square meters per person, depending on beach activities, allowing more people to enjoy the beach simultaneously. However, it is crucial to implement rigorous management practices to prevent overcrowding and maintain a pleasant and safe environment for all visitors.

As mentioned earlier, the space requirements for beach activities can vary. For high-density or near urban beaches with general sunbathing and relaxation, a common space standard is approximately 10 square meters per person. This provides enough room for individuals to place their towels, set up umbrellas, and have personal space without overcrowding. More active beach activities, such as beach volleyball or sandcastle building, may need more space. For example, a standard beach volleyball court measures 16 by 8 meters, accommodating up to 12 players comfortably, which translates to roughly 10.6 square meters per player. Sandcastle building might require a similar allocation, depending on the complexity and size of the structures being created.

4) *Calculate the Carry capacity*

Physical carrying capacity is determined by considering the space available, the type of activities permitted, and space standards of recreation activities. This involves using formulas or models to estimate the number of visitors that can be accommodated without exceeding the established criteria. Two different approaches are available:

- *Space-Based Calculation:* Determine the amount of space available for each activity and divide it by the space required per visitor or activity. For example, if a trail can accommodate one hiker every 10 square meters, and the trail is 1,000 square meters, the trail can accommodate 100 hikers at a time.
- *Time-Based Calculation:* Consider the duration of activities and the time available for their completion. For example, if a scenic viewpoint can accommodate 20 visitors at a time and the average visit lasts 15 minutes, the viewpoint can accommodate 80 visitors per hour.

For Space-Based Calculation, the formula for physical carrying capacity is shown in equation (1).

$$\text{Physical CC PAOT} = \left(\frac{A}{a}\right)\left(\frac{100-OP}{100}\right) \quad \text{..... (1)}$$

A = Space available for recreation activity (Unit: square meters)

a = An area a visitor physically requires to perform recreational activity (Unit: square meters per person)

OP = Open space (Unit: %)

In calculating the physical carrying capacity of protected or fragile areas, the formula generally incorporates the "OP" factor. This factor considers the additional no-use of green space necessary to maintain the natural environment and tranquil atmosphere, as well as areas with established trees and facilities that are not available for other uses.

For time-based calculation, the formula incorporates the usage time as indicated in the equation (2).

$$\text{Physical CC per day} = \left[\left(\frac{A}{a}\right)\left(\frac{100-OP}{100}\right)\right] * Rf \quad \text{..... (2)}$$

Rf = Rotation factor where

$$Rf = \mathrm{T/t}$$

T = Opening period of a day (Unit: hours)

t = An average time a visitor spends at the site to complete his/her activity (Unit: hours or minutes)

Therefore, physical carrying capacity per day can be calculated by the equation (3).

$$\text{Physical CC per day} = \left[\left(\frac{A}{a}\right)\left(\frac{100-OP}{100}\right)\right]\left[\frac{T}{t}\right]$$

Psychological Carrying Capacity (PsCC)

There are four key factors that can be used to determine the use limit regarding psychological carrying capacity. They are visitor satisfaction, perception of crowding, quality of experience, and stress indicators.

- *Visitor satisfaction* is a primary indicator of psychological carrying capacity. Surveys and questionnaires can be used to gauge visitors' experiences, including their perceptions of crowding, amenities, and overall enjoyment.
- *Perception of crowding* can significantly impact visitors' experiences. Methods to assess crowding perceptions include:
  - On-site observations to estimate crowd density
  - Visitor interviews or questionnaires to understand their feelings about the crowd levels
  - Use of photographic or visual aids to help visitors express their perceptions
- *The quality of the visitor experience* can be influenced by several factors, such as wait times, availability of facilities, and interaction with staff. To measure this, consider:
  - Visitor feedback surveys
  - Direct observations of visitor activities and interactions
  - Analysis of social media reviews and comments
- *High levels of stress among visitors* can indicate that the psychological carrying capacity is being exceeded. Stress indicators can be measured through:
  - Physiological measures, such as heart rate monitoring
  - Self-reported stress levels through surveys
  - Behavioral observations, such as signs of frustration or agitation.

Steps to determine psychological carrying capacity are as follows.

1) Data collection

Data collection includes an option or the combination of (1) conducting regular feedback surveys and questionnaires. It helps gather quantitative and qualitative data on visitor experiences. Questions should cover aspects like satisfaction, perceived crowding, and stress levels. (2) Observation involves systematically watching and recording visitor behavior and interactions. This method provides insights into real-time experiences and can highlight areas needing improvement. (3) Engaging visitors in interviews or focus groups allows for in-depth understanding of their experiences and perceptions. This qualitative data can complement the findings from surveys and observations.

The acceptable limit for visitor experiences, in terms of crowding perception, can be evaluated on a scale ranging from very low, low, moderate, high, to extremely high crowded. Typically, the appropriate level for a site or use limit is determined to be moderately crowded or below. Utilizing the Likert Scale measurement, these crowding perceptions can be represented by numbers ranging from 1 to 5, corresponding to very low to extremely high, respectively (Figure 3.10). Furthermore, it may be considered acceptable if 80 percent or more of visitors express satisfaction with their activities and the number of other visitors they encounter. It is also crucial to consult key stakeholders before finalizing use limits and making decisions.

Figure 3.10 Example of crowding perception levels

2) Analyzing and interpreting data

(1) Employ statistical methods to examine survey and observational data. Identify trends, correlations, and patterns indicative of psychological carrying capacity limits. For instance, if over 80% of respondents report a high perception of crowding at a particular destination, this suggests that the number of visitors at the time of survey completion exceeds the PsCC.

(2) Analyze interview and focus group transcripts to identify common themes and insights. This can provide a deeper understanding of visitor experiences and potential stressors.

Managerial Carrying Capacity (MCC)

Managerial capacity concerning the ability of an organization to manage a tourism site, accommodating visitors without compromising experience quality or the environment. It includes facility capacities and management resources. Steps to determine MCC are the following.

1)Facility carrying capacity (FCC):

Facility carrying capacity refers to the maximum number of visitors or users that a facility can accommodate without resulting in a significant decline in the quality of the environment or the visitor experience. Measuring this capacity is important for facility managers to ensure sustainable use and maintain a high standard of service.

Before calculating the facility capacity, it is necessary to have an appropriate facility and site plan. In creating these plans, factors such as physical, environmental, and visitor experiences must be considered. This process determines the types, sizes, and locations of facilities by taking into account the environmental and visitor experience impacts from developing facilities within the destination. Once the types, numbers, and locations of facilities are appropriately set, the calculation of FCC can proceed.

Facility capacity is calculated by determining the maximum number of visitors or users it can accommodate without a significant decline in environmental quality or visitor experience. For example, in a day-use recreation area within a national park, there are two restrooms for men and four for women. Therefore, the restroom facility can accommodate a total of six people at a time. If the average female spends 10 minutes in the restroom and the average male spends 5 minutes, then the six restrooms can accommodate approximately 24 women and 24 men per hour.

2)Management resource carrying capacity (MRCC)

It refers to the ability of staff and the availability of resources to effectively manage and regulate visitor activities. This includes providing necessary services, ensuring safety, and addressing visitor concerns. To assess this managerial capacity, data must be collected on available management resources in relation to the number of visitors that can be accommodated while maintaining adequate services, safety, and attention to visitor concerns. Visitor satisfaction survey on park services can be employed for MRCC determination.

To manage the managerial carrying capacity of a fragile area, several factors should be considered:

- Infrastructure and amenities: The presence of facilities such as restrooms, concessions, and lifeguard stations directly impact the number of visitors a location can support.
- Staff and management practices: Effective management practices, including monitoring and regulating visitor numbers, deploying sufficient staff, and maintaining facilities, are crucial.
- Environmental sensitivity: The environmental resilience of the area, including its ability to withstand human impact, plays a significant role.
- Visitor behavior: Educating visitors on responsible behavior and enforcing rules helps maintain the site's quality and safety.

Environmental or Ecological Carrying Capacity (ECC)

The ecological capacity for recreation refers to the maximum number of visitors that a natural area can support without causing significant ecological degradation or unacceptable impacts. To determine this capacity, managers must assess the potential effects of recreational activities on the environment. This evaluation involves analyzing factors such as soil erosion, vegetation damage, water quality, and wildlife disturbance. Acceptable impacts are established based on environmental or ecological thresholds that prevent harm to the ecosystem. Setting usage limits (limits on visitor numbers) may be one among other strategies to deal with ecological impacts.

Various methods are available to evaluate these impacts:

1) Soil erosion

Regular monitoring of soil erosion is essential for identifying areas susceptible to degradation. Techniques such as soil sampling, erosion pins, and remote sensing can yield valuable data on erosion rates and patterns. Defining use limits involves determining an acceptable level of erosion impact that does not lead to ecosystem degradation. Thus, monitoring is crucial to develop strategies to maintain erosion within acceptable levels.

2) Vegetation survey

Conducting vegetation surveys allows managers to monitor changes in plant communities over time. This helps in identifying areas where recreational activities may be affecting vegetation, enabling appropriate management measures. The usage limits must align with acceptable vegetation impacts. For instance, if maintaining natural ground cover above 80% of the total area is deemed acceptable, then visitor numbers might be limited to ensure this threshold is not breached. Alternatively, other management strategies such as boardwalks or warning signs could be implemented to maintain acceptable impact levels.

3) Water quality monitoring

Regular water quality testing can help detect changes in water chemistry and biophysical properties and identify sources of pollution. Parameters such as pH, turbidity, nutrient levels, coliform bacteria, and the presence of contaminants should be monitored to ensure the health of aquatic ecosystems.

4) Wildlife observation

Monitoring wildlife populations and behaviors can reveal the effects of recreational activities on various species. Methods like camera traps, bird surveys, and tracking can detect disturbances and guide management strategies. As with vegetation, water quality, and soil erosion, usage limits should match the acceptable impacts on wildlife and habitats.

Finally, to determine a site's overall recreation carrying capacity (RCC), select the lowest value among PCC, PsCC, MCC, and ECC. For example, if a tourism site's PCC is 500 PAOT, PsCC is 400 PAOT, MCC is 250 PAOT, and ECC is 200 PAOT, then the RCC is 200 PAOT. Setting it higher would exceed limits and degrade visitor experience and site condition.

06 Implement management strategies and actions

Develop and implement management strategies to ensure that use limits are adhered to. Strategies may include zoning, permits, visitor education, infrastructure development, and enforcement measures. More detail, please refer to Table 3.3.

Table 3.3 A list of possible strategies and options for managing visitor numbers and impacts.

Strategies	Management tactics and techniques
1. Reduce use of the problem area	1. Limit number of visitors in problem areas
	2. Limit length of stay
	3. Encourage/require a stay limit in problem areas
	4. Encourage use of other areas
	5. Require certain skills and/or equipment
	6. Establish different skill/equipment requirements
	7. Charge differential visitor fees
	8. Make access more difficult in all fragile areas
	9. Make access harder/easier to areas
	10. Inform about problem areas and alternative areas
	11. Discourage or prohibit use of problem area
	12. Eliminate facilities/attractions in problem areas, improve facilities/attractions in alternative areas
2. Modify the location of use within problem areas	1. Discourage/prohibit impact activity
	2. Encourage/permit impact activity in certain areas
	3. Locate facilities on durable sites
	4. Concentrate use through facility design and site planning
	5. Discourage/prohibit off-trail travel
	6. Segregate different types of visitors
3. Modify the timing of use	1. Encourage use outside of peak use periods
	2. Discourage/ban use when impact potential high
	3. Close the problem site
	4. Fees in periods of high use/high impact potential
4. Modify the type of use and visitor behavior	1. Discourage/ban damaging practices/ equipment
	2. Encourage/require behavior, skills, equipment
	3. Teach a wilderness ethic
	4. Encourage/require a party size and/or limit on number of horses

Strategies	Management tactics and techniques
	5. Discourage/prohibit overnight use
	6. Discourage/prohibit pets
5. Modify visitor expectations	1. Inform visitors about appropriate wilderness/PA uses
	2. Inform about potential conditions in fragile areas
6. Increase the resistance of the resource	1. Shield the site from impact
	2. Strengthen the site
7. Maintain/rehabilitate resource	1. Remove problems
	2. Maintain/rehabilitate impacted locations

Source: Manning (1986); Cole *et al.* (1987)

07 Implement management strategies and actions

Regularly monitor the site to assess the effectiveness of management strategies and the actual use levels. Use this data to adjust as needed to ensure that the carrying capacity is not exceeded.

Key considerations in recreation carrying capacity determination

While following the steps above, several key considerations must be kept in mind:

Stakeholder involvement: Engage stakeholders, including local communities, visitors, conservation groups, and government agencies, in the decision-making process. Their input and support are crucial for developing effective and acceptable management strategies.

Adaptive management: Adopt an adaptive management approach that allows for flexibility and adjustments based on monitoring results. Recreation carrying capacity is not a fixed number but a dynamic concept that can change over time with variations in environmental conditions, visitor preferences, and management practices.

Utilize modern technology: Modern technologies such as Geographic Information Systems (GIS), remote sensing, and visitor tracking applications should be considered to enhance data collection, analysis, and decision-making processes.

Balancing use and conservation: Strive to balance recreational use with conservation objectives. While recreational activities can provide economic and social benefits, they should not compromise the ecological integrity and long-term sustainability of the site.

This RCC approach, however, has some limitations. It is basically a restrictive concept, founded on limits and constraints. ***What visitors do, when and where they do it, how they behave, and protective measures at the site itself are frequently more important in determining visitor impacts than simply the number of visitors.***

As the limitations of an earlier approach became apparent, several advanced frameworks were developed to structure the management of protected area visitation and tourism. Notable frameworks implemented globally include:

1) Limits of Acceptable Change (LAC),

2) Visitor Impact Management (VIM),

3) Visitor Experience and Resource Protection (VERP),

4) Visitor Activity Management Process (VAMP),

5) Recreation Opportunity Spectrum (ROS),

6) Tourism Optimization Management Model (TOMM).

For further information on these frameworks, please refer to Leung, Yu-Fai *et al.* (2018). It must be noted that using these approaches presents some challenges: they need staffing, funding, and time; there are often gaps in scientific knowledge about visitor impacts, requiring subjective judgments; and necessary actions are not always taken due to limited staff or reluctance to make tough decisions. Nevertheless, this handbook employs the LAC technique for its wide acceptance and extensive resources to help new users.

3.3.3 Guideline for Visitor Impact Management Based on LAC

Leung, Yu-Fai *et al*. (2018) describe Limits of Acceptable Change (LAC) as a tourism and visitor management framework. LAC can be used as a framework to determine the acceptable degree of impact. LAC sets measurable limits for human-induced changes in protected areas to maintain or restore acceptable conditions. It combines rational planning, quality management, and public involvement to monitor environmental quality. This is an 'indic*ators*-based' or 'stan*dards*-based' framework *(*Leung, Yu-Fai *et al*., 2008; McCool *et al.*, 2007; Manning *et al.*, 2011).

The LAC approach is based on three major assumptions:

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

Dealing with tourism impacts is mandatory at fragile sites. The planning and management options for sustainable tourism are aimed at reducing impacts to the acceptable level and suggesting visitor management tools. How to apply these tools and techniques is aligned with the objectives of the site management. Identifying the major impacts and mitigating them in the early stages of tourism development would make major contributions to the achievement of sustainable development.

LAC recognizes that change is inevitable but sets limits on what degree an acceptable change is. Protected area managers must consult stakeholders to establish a site's acceptable conditions, set indicators and standards for unacceptable change, and monitor tourism's impact on these standards.

If an indicator exceeds the acceptable threshold, management must act to reduce negative impacts. ***The LAC approach compels managers to engage deeply with management details beyond simple carrying capacity numbers.*** By setting limits of acceptable change with many stakeholders, managers have more credibility when proposing or mandating management adjustments that impact others, such as tour operators, guides,

and community members. Guideline for visitor management applying the Limits of Acceptable Change process for protected / fragile areas are as follows.

01 Identify concerns and issues of the area

Engage stakeholders in a discussion about the site's values, attractions, opportunities, threats, and problems.

This step involves understanding the issue or situation. Initially, information may be incomplete. Set up a database that can be periodically updated with new information. This will help monitor and analyze changes over time, allowing for adaptable plans and management options. General information required to understand tourism issues includes:

- Characteristics of the tourism site: This includes location, physical and biological characteristics, land uses, tourist attractions, along with their fragility and resilience.
- Visitor metrics: This encompasses the number of visitors, their behavior, expectations, and satisfaction levels.
- Tourism programs, activities, and services provision.
- Key stakeholders such as park authority, entrepreneurs, and local community members.
- Current management activities: These include regulation, zoning, facility development, public information dissemination about the tourism site, etc.
- Issues and concerns related to visitor impacts.

During the information-gathering process, it is advisable to involve key stakeholders. Key stakeholders are individuals who may be related to the impacts (those causing the impacts, those receiving the impacts, and those managing or controlling them) and/or capable of directly supporting visitor impact management.

Engage with key stakeholders from the outset with specific objectives to gain support in various areas they can assist, including information provision, technical assistance, financial backing, and management support throughout the impact management process. Ensure active participation by securing access and opportunities for involvement, scheduling appropriate times when key stakeholders are likely available. Facilitate a timely participation process with two-way communication, allowing participants to share ideas and experiences and discuss issues and solutions.

02 Define and describe opportunities for tourism

Consider the various activities that sustainable tourism could encompass. The identified activities should be allocated to specific sites or zones. For example, identify areas where tourists could dive, trek, fish, interact with local communities, etc. The Recreation Opportunity Spectrum (ROS) technique can help identify tourism activities, site development, and services should be provided in each opportunity class. More details of the ROS examples are available in Clark and Stankey (1979).

03 Select indicators

To manage visitor impact, it is important to identify the type and extent of the impact, the location of the impact source, and its effect on the tourism site and potentially beyond its boundaries, as well as visitor experiences. Then, indicators are selected to measure and monitor the impact on natural resources and social conditions, along with the

development of criteria based on site objectives and the seriousness of the impacts. The impacts from tourism development and activities should be assessed both in actual and anticipated terms.

Indicators and standards of quality

Indicators of quality represent management objectives as measurable proxies, while *standards of quality* define their minimum acceptable conditions. For instance, studies suggest wilderness visitors prefer fewer than six group encounters per day on trails and wish to camp away from others (Manning, 2011). Therefore, using "a maximum of five encounters with other groups on trails and no other groups camped within sight or sound" is a suitable standard for managing some wilderness areas. Quantitative indicators and standards are also essential in visitor management. More examples are available in the UNWTO indicators guidebook (UNWTO, 2004).

Selecting indicators that reflect the most important parameters at a given site is advisable. These indicators should be directly related to visitor activities that can be managed. Consider these questions and the following criteria when identifying indicators:

- Does the indicator tell us what we need to know? What question are we answering?
- Is it directly related to an important resource, social or economic condition?
- Is it easy and inexpensive to measure?
- Can it alert managers to deterioration before it becomes unacceptable?
- Can it be measured without affecting visitors' experiences?
- Is the information worth the time and cost to obtain?
- Who will conduct the necessary monitoring?

The criteria for determining impact indicators and impact assessment methods

- Focus should be on measuring results from tourism development, such as the proportion of areas affected by tourism activities in fragile areas over time.
- Indicators should be easy to measure and comparable across different periods and locations.
- Monitoring and evaluation indicators should remain simple and manageable within available resources.
- Assessment methods must be academically accepted, accurate, and reliable.
- Prioritize monitoring in areas with intense tourism development, ecologically vulnerable habitats, or rapidly changing environment. Newly developed or heavily used areas and lacking data should also receive attention.
- Start assessing impacts early in tourism development to gather continuous information for managing or preventing damage.
- Involve not only researchers and park authorities but also local communities, tourists, and entrepreneurs in monitoring to foster cooperation and awareness of tourism impacts.

Table 3.4 lists the possible issues related to visitor impacts on natural resources, visitor experiences, and local communities, along with examples of indicators and measurement methods. At any site, indicators can include biological, physical, and social measures.

Examples:

- Breeding success of seabird or marine mammal colonies
- Presence or absence of certain key species within the protected areas
- Beach erosion
- Water quality
- Noise
- Crime rates
- Traffic accidents related to tourism
- Number of local people employed in tourism-related jobs
- Satisfaction of local people.
- Satisfaction of tourists

The indicator selection and impact assessment should follow the IUCN's guidance on sustainable tourism development including the importance of ensuring broad participation of all stakeholders, use of the best available science and other information, and application of an adaptive management approach (IUCN-WCPA, 2007).

Table 3.4 Key issues, visitor impact indicators, and methods of measurement and evaluation

Visitor Impacts	Indicators	Measurement Methods
Impacts on soil		
Soil compaction and erosion can be observed in the tent camping area, as well as on walking paths and other tourist attractions.	Soil compaction	- Measure soil density. - Measure water absorption rate.
	Soil erosion	- Calculating the proportion of areas exhibiting soil erosion relative to the total area where tourism activities occur, expressed as a percentage. - Assessing the rate of soil erosion by measuring the annual soil loss height on sloping trails that display evidence of erosion.
Impacts on water		
The quality of water has declined because of tourism activities and development in and around the water body. In addition to water quality issues, there may be a water shortage at the tourism site due to excessive use and inadequate water conservation measures, which could negatively impact the surrounding local communities.	Water quality	- Collect water samples to analyze water quality parameters such as coliform bacteria, BOD, DO, sediment, turbidity, color, smell, garbage, solids, and plastics in water bodies impacted by tourism.
	Water supply	- The amount of water use compared to the available water supply. - Water conservation measures

Visitor Impacts	Indicators	Measurement Methods
Impacts on plants		
Degradation of both plant community and species levels poses significant concerns. The development of facilities and the damage to vegetation through trampling or picking plant parts may threaten important and rare plant communities and species. Additionally, the introduction of exotic species jeopardizes native species and ecosystems in fragile areas.	Species diversity	Species and their quantities were measured in sample plots and calculated for Diversity Index.
	Tree growth rate	Measure the tree diameter and height annually to calculate the growth rate.
	Plant regeneration rate	Measure the number of seedlings annually
	Tree damage by human	Assess the visible signs of damage, including nails, bullet marks, graffiti, trimming for fuel, etc.
	Percentage of developed areas to the total area	Calculate the percentage of the area that has been developed.
	Illegal forest encroachment for development of tourist accommodation and services	The area of forest destroyed each year is measured and analyzed by ground surveys, satellite image or aerial photo interpretation methods.
Impacts on wild animals		
Wild animals disturbances, and their habitats are threatened by visitors and tourism development, which leads to changes in wildlife behavior. Wildlife disruptions include feeding wildlife, approaching wild animals too closely, and excessive noise from vehicles and visitors. Habitat degradation and loss occur due to the development of tourism facilities and activities. Furthermore, there is a risk of disease transmission between humans and wild animals.	Population of important/endangered species	Conducting systematic surveys and counting animal sightings and traces in each season to assess the change impact.
	Reproduction rate	Count the number of juvenile or newly born animals of key species.
	Wild animal behavior	Survey on species and the number of wild animals whose behavior is affected by tourism.
	Illegal wildlife hunting	- Number and frequency of illegal human hunting traces. - Court cases of wildlife hunting.

Visitor Impacts	Indicators	Measurement Methods
Over-tourism		
Over-tourism refers to the high intensity, frequency, and impact of visitor use exceeding the carrying capacity. It can harm the fragile site's natural condition and diminish the visitor experience due to crowding.	Use Intensity	Count tourists per area during peak times (number of people/area).
	Visitors use level	Measure the number of tourists at designated time intervals, such as daily, monthly, or annually, to analyze these figures in relation to their environmental impacts
	Behavior of visitors at tourist attractions	- Observing tourist behavior - Tourist survey on the behavior of encountered tourists or guides
Management actions		
Measures and management actions to regulate the use of tourism resources to minimize impact.	Visitor impact control measures and actions	Assess the implementation and effectiveness of measures or management actions designed to regulate tourism activities, influence tourist behavior, and enforce these regulations.
Appropriate visitor knowledge and behavior can ensure that the environment is not harmed and result in a positive impact on the environment.	Visitor awareness of appropriate behavior in sensitive tourism areas	A questionnaire to assess tourists' knowledge and understanding of how to appropriately behave in tourist attractions
Control of development in tourist attractions	Review and follow-up of various development projects in tourist attractions	Monitoring plans and operations to ensure tourism developments align with established objectives.
	Development area as a proportion of total area	Calculate the ratio of developed land to the land that remains in its natural state.
Utilize planning as a management tool to define the content and direction of tourism and visitor impact management.	Tourism management strategy and plan	Monitor and measure the implementation of the tourism management plan and its effectiveness in achieving sustainable tourism goals. Identify any obstacles to the plan's implementation.

Visitor Impacts	Indicators	Measurement Methods
Impact on visitor experiences		
Tourist satisfaction is influenced by various factors, including the quality of resources and attractions, the facilities and services provided, conservation efforts, site management, and visitor management.	Tourist satisfaction towards tourism resources, conservation efforts, facility & services, and visitor management,	Tourist questionnaire survey
The travel experience is diminished when tourists feel the congestion at tourist attractions and are unable to engage in their activities.	Tourist's crowding perception	A tourist questionnaire survey assessing crowding perception measured by the perceived crowding level related to the number of tourists encountered.
	Tourists' satisfaction with the number of encounters	A tourist questionnaire survey assessing the satisfaction of tourists based on the number of other tourists they encounter.
Travel is less enjoyable when other tourists misbehave.	Tourists' satisfaction with the behavior of other tourists	A questionnaire survey of tourists' opinions to measure their satisfaction with the behavior of other tourists.
Impact on local community quality of life		
Impacts on the quality of life of local communities can be both positive and negative. Positive effects include increased income, employment opportunities, and improved infrastructure. On the other hand, negative impacts may involve cultural changes, environmental impacts, and economic fluctuations. Most indicators in this table highlight the measurement of negative impacts to aid in visitor management and address potential issues.	Community empowerment and participation	Organize interviews, focus groups, workshops, or forums for community members to share their views on empowerment and participation in tourism management affecting their livelihoods.
	Tourism impact on cultural change	Measure the unacceptable cultural change Measure the ability and outcome of preservation of cultural heritage
	Tourism impact on community resources and environments	Measure tourism's impact on community resources and environments, including water shortages, destruction of wildlife habitat, waste, and pollution.

Visitor Impacts	Indicators	Measurement Methods
	Tourism impact on local economy: - employment in the tourism sector - local business opportunities - dependency on tourism - direct and indirect tourist spending - economic leakage - land ownership changes - economic barriers	- Questionnaire and interview on tourism impact such as tourism income generation, local business opportunity, direct and indirect tourist spending, economic leakage, land ownership changes, living cost, and economic barriers related to tourism management/ regulation.

04 Assess current conditions of the site for each indicator

It is essential to identify the baseline or the existing condition before setting change standards. For example, if an indicator is "number of Gurney's Pitta at breeding site," it is necessary to determine the current number of Gurney's Pitta breeding at the site. Additionally, it is important to evaluate roughly whether the current conditions are satisfactory, or whether they tend to have impacts.

05 Establish standard for each indicator

Set acceptable limits for change.

After selecting the indicators, the difficult task of visitor impact assessment is determining the acceptable degree of impact. Although informed by scientific data, these decisions ultimately involve value judgments regarding the trade-offs between environmental damage and the benefits derived from park tourism. Considerations include the extent of damage to the natural environment that is justifiable given the positive outcomes from tourism. Limits of Acceptable Changes have been applied as a guide for determining the acceptable degree of visitor impact.

Managers must define tolerance levels before adjusting management practices. Assign quantitative values to indicators: e.g., 2% annual soil erosion; 90% visitor satisfaction; 90% local resident approval of tourism activities. These values set the thresholds; less than 90% visitor satisfaction, less than 90% local resident satisfaction, or over 2% soil erosion are unacceptable and require corrective action from managers.

Involve various stakeholders when setting indicator standards to ensure consensus and commitment. Select standards and indicators for each visitor environment, usually based on the management plan's zoning system or recreation opportunity setting (ROS), if available. Visitor environments range from high-use sites with many visitors and impacts to primitive or wilderness areas with desired isolation and lower visitor impact.

When choosing standards and indicators, consider the availability of baseline information. Without such data, setting realistic standards becomes guesswork. Initially, if information is insufficient, use adaptive management to set provisional standards and adjust them

when having more information. Consulting specialists, like biologists familiar with relevant species, can aid in decision-making.

06 Determine actions

If carrying capacity or LAC thresholds are exceeded, there are several general management strategies that managers can choose to address visitor use impacts: There are four strategic approaches to manage the impact of visitors on protected areas (Eagles *et al.*, 2002):

- *Managing the supply of tourism or visitor opportunities*, such as by increasing the available space or time to accommodate more visitors.
- *Managing the demand for visitation* by reducing visitor uses, modifying the character of uses or behaviors, and changing visitor attitudes and expectations.
- *Managing the resource capabilities* to handle use, such as by hardening the site or specific locations, or developing facilities.
- *Managing the impact of use*, such as by modifying the type of use or dispersing or concentrating use.

Table 3.3 on page 51, showing a list of possible strategies and options for managing visitor numbers and coping with high levels of use and impacts, can also be applied here.

07 Monitor conditions and implement actions

Implement and regularly monitor the impact situation, level of use and visitor use character, the effectiveness of management intervention, and the tourism impacts. Then, adapt the plan and management options during implementation, as necessary.

In conclusion, to manage visitors effectively, we need to understand the impacts and establish acceptable impact levels. The results of impact assessments whether exceeding, approaching, or below acceptable levels, along with impact causes and locations—will guide our visitor management actions and monitoring (see Box 3.3).

Box 3.3 Guiding questions for visitor management at fragile sites

Analysis of tourism opportunity at protected areas or fragile sites:
Set tourism and conservation goals

- Is there tourism opportunity at the fragile site?
- What are they?
- What are their desired conditions to meet the benefit of visitor experience, local communities, and conservation?

Analysis of visitor impacts:
Are there any visitor impacts that need management actions?

- What types of impacts are observed, and to what extent do they occur?
- Where do the tourism impacts take place?
- What are the relevant impact indicators and standard quality criteria?
- Do the impacts exceed acceptable levels?

Analysis of causes of impacts:
What are the significant causes of the impacts? (Quantity, quality of tourism, the management or all of them)

- What is the use level at the problem site?
- Who are visitors/tourists of the problem site?
- How do they contribute to visitor impact? (by number or by character/behavior?)
- How do the site management contribute to visitor impact?

Analysis of management options:
Visitor management options, plan, and monitoring

- What are available management techniques/ tools?
- Who will implement the management options? And How?
- What are required management resources (staff, knowledge, budget, time, etc.)? Do they sufficiently support the actions necessary for visitor impact management?

3.3.4 Case Studies

Case study 3

Visitor Management at Tongariro Alpine Crossing, New Zealand

General information

The Tongariro Alpine Crossing, a site recognized for both its environmental and cultural significance, is in New Zealand's Tongariro National Park, a dual UNESCO World Heritage Site. The trail is one of the top 10-day hikes globally. The popular one-day hike, from Mangatepopo to Ketetahi Hot Springs, takes around seven hours to complete in good weather. Hikers pass volcanic craters, mountain springs, alpine lakes, Mount Tongariro, and Mount Ngauruhoe.

The issues

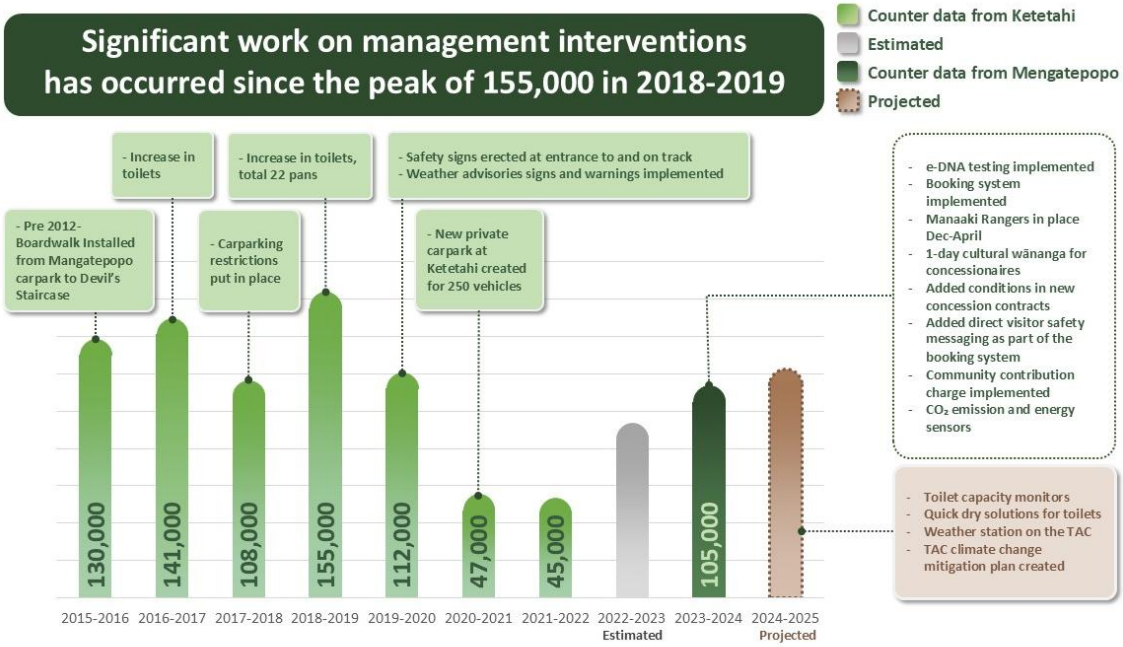
The Tongariro Alpine Crossing, one of the top 10-day hikes globally, attracts nearly 150,000 visitors annually. However, this popularity has led to challenges such as human waste, congestion at key points, and a general lack of cultural appreciation among visitors.

Visitor Management

The management and preservation efforts surrounding the Tongariro Alpine Crossing in New Zealand, emphasized the partnership between New Zealand's Department of Conservation and Ngāti Hikairo ki Tongariro, which has been instrumental in balancing the high visitor demand with the need to protect the natural and cultural heritage of the area.

To address these issues, the adaptive management approach has been implemented in three phases. Phase 1, running from 2023 to 2025, involves applying current tools to manage visitor impact, such as the introduction of New Zealand's first booking system for a day walk. Phase 2, from 2026 to 2028, will involve assessing the need for any legislative or statutory changes, while Phase 3, beginning in 2029, aims to shift towards providing a higher value experience for visitors. These phases are part of a broader strategy to ensure that the cultural significance of the area is respected, while also maintaining environmental and social sustainability.

Managing the carrying capacity of the Tongariro Alpine Crossing is crucial to preserving its natural and cultural resources. Their efforts aim to balance the economic benefits of tourism with the need to protect the environment and uphold the cultural values of the indigenous communities associated with the land. The collaborative approach between the Department of Conservation and Ngāti Hikairo ki Tongariro is a model of how cultural and environmental stewardship can coexist with tourism in a way that benefits both the land, and the people connected to it.



APPROXIMATE ACTIVITY LEVELS

There are several key interventions as part of the first phase of their management strategy. These include the establishment of a booking system to regulate visitor numbers and new conditions for concessions to ensure that tourism businesses align with the conservation goals of the area. Furthermore, efforts are being made to reduce the carbon footprint associated with visitor transport and waste management, reflecting the broader commitment to sustainability.

The visibility of cultural significance is being actively promoted through initiatives such as the Manaaki Rangers program, which aims to enhance the visitor experience by embedding cultural narratives and practices into their journey. Wānanga (educational workshops) for partners and stakeholders are also being conducted to ensure that all those involved in the management and use of the Tongariro Alpine Crossing are aligned with the cultural and environmental objectives set by the Ngāti Hikairo ki Tongariro and the Department of Conservation.

In sum, the ultimate goal is to foster a deep respect and understanding among visitors for the cultural heritage of the area while ensuring that the natural environment is preserved for future generations. Their collaborative approach serves as an example of how indigenous knowledge and modern conservation practices can be integrated to create a sustainable tourism model that honors both the past and the future.

Information source: Catherine Wilson and Te Ngaehe Wanikau (2024)

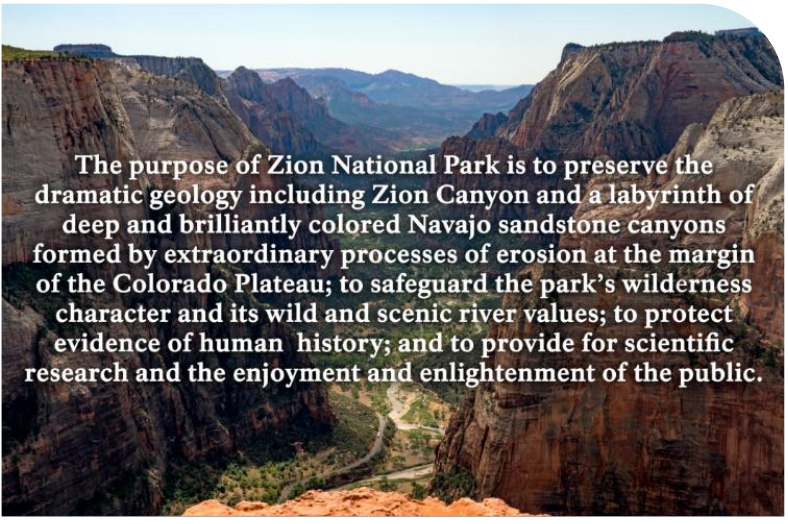
Case study 4

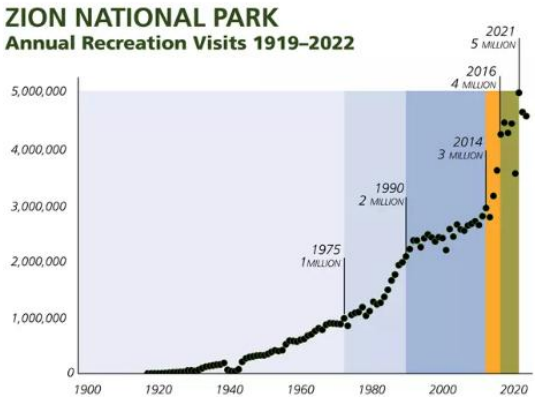
Planning for Visitor Use Management at Zion National Park, The United States

General Information

As one of the top U.S. national parks, Zion National Park is famous for its stunning landscapes, including the towering sandstone walls along Zion Canyon Scenic Drive, the Virgin River, and the Zion–Mt. Carmel tunnel.

Hikers can enjoy the park's iconic trails like the 5-mile-long Angels Landing, or family-friendly options like the Lower Emerald Pool and Weeping Rock trails. Adventure seekers can wade through the Virgin River via The Narrows. For a quieter experience, visit Kolob Canyons with its separate visitor center and scenic drive.



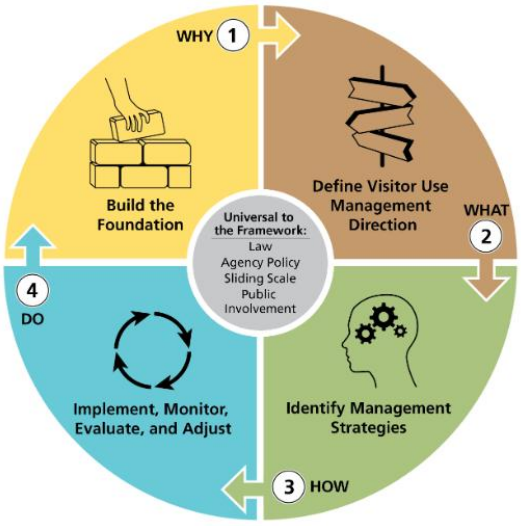


The issues

Increased visitation results in longer shuttle wait times, crowded trails, and parking challenges. High visitor numbers also affect natural resources and visitor experiences, placing demands on park sta and infrastructure. The park has a USD69.1 million backlog in deferred maintenance, which raises concerns for public health and safety

Visitor Use Management (VUM)

Visitor use management (VUM) is a term used by land management agencies like the National Park Service (NPS) to describe the administration of the number, type, timing, and distribution of visitors throughout a park. VUM uses various strategies and tools to achieve the NPS mission of protecting landscapes, plants, animals, and human history (collectively referred to as resources) and providing high-quality visitor experiences.



Visitor use management at Zion follows best practices from the Interagency Visitor Use Management Council's (IVUMC) Visitor Use Management Framework (Visitor Use Management Framework, A Guide to Providing Sustainable Outdoor Recreation, Edition One, July 2016 (nps.gov)). This framework outlines clear steps for effective planning, implementation, and monitoring of visitor use and meets legal requirements to identify visitor capacity as specified in the National Parks and Recreation Act of 1978. All parks within the NPS, as well as public lands managed by five other federal agencies, adhere to this process to guide visitor use management.

VUM Success at Zion

Since its establishment by Congress in 1919, the National Park Service (NPS) has undertaken numerous initiatives to enhance visitor experiences at Zion National Park. These efforts have included both infrastructure development and modifications to visitor access within the park. Over the past 25 years, notable improvements include:

- Adoption of the Wilderness Permit Program to manage backcountry camping, canyoneering, and other uses of the park's wilderness and backcountry areas (1998)
- Establishment of the Zion Canyon Shuttle System (2000)
- Pa'Rus multimodal trail improvement project (circa 2000)
- Reconfiguration of the South Entrance Fee Station to increase efficiency and improve traffic flow (2017)
- Expansion of parking facilities at Zion Canyon Visitor Center (2016 & 2018)
- Implementation of campsite reservation systems at Watchman, South, and Lava Point Campgrounds (2000, 2018, & 2021, respectively)
- Introduction of the Angels Landing Pilot Permit Program (2022)
- Construction of new, accessible restrooms at the Grotto and the Zion Human History Museum (2016 & 2022, respectively)
- Enlargement and enhancement of accessibility of restrooms at Kolob Canyons Visitor Center (2023)
- Rehabilitation of South Campground (2024-2025)
- Introduction of a new electric shuttle bus fleet (current and ongoing)

Visitor Use Management Plan Development

The National Park Service (NPS) is developing a Visitor Use Management Plan (draft VUM Plan), analyzed under the National Environmental Policy Act (NEPA) through an environmental assessment (EA). This plan aims to improve visitor access and experiences, protect park resources, and ensure safety.

The draft VUM Plan will introduce strategies for managing visitor recreation. Public input is crucial, and the drafts will be open for feedback.

The four elements of a visitor use management plan: providing visitor access, improving visitor experiences, protecting park resources, and promoting staff and visitor safety.

The draft Visitor Use Management (VUM) Plan will enhance and extend the strategies and management actions that Zion National Park has employed to support high-quality visitor experiences and resource protection. This plan will build on over a century of infrastructure development and maintenance, educational programming, scientific research, and innovative transportation solutions that the National Park Service (NPS) has utilized to conserve Zion National Park's unique resources while providing visitors with sustainable opportunities to enjoy them. The planning steps are:

Steps in a visitor use management plan.

NPS initiated the development of the Zion Visitor Use Management (VUM) Plan in 2016. Since then, staff have gathered input from the public and stakeholders, collaborated with cooperating agencies and tribal partners, and collected data to inform the planning process. Below is an overview of key research, monitoring efforts, temporary or pilot projects conducted at Zion, and developing strategies.

1. **Research and Monitoring**

Zion began investing in visitor use-related data collection in 2013. NPS staff continue to collect data and collaborate with researchers and partners on targeted studies. During initial scoping for the plan, data needs were identified to better understand trends, patterns, and visitor expectations. Since 2016, NPS staff have monitored conditions in the park and gathered crucial information through:

Transportation Studies: Data on traffic volume, dwell time in parking areas, shuttle boardings and wait times, and vehicle types (e.g., passenger, RVs, commercial buses) are collected. This data provides insights into when and how visitors travel to and within the park.

Trail Use Studies: Studies on specific trails, such as Angels Landing and the Narrows, have helped the NPS understand visitor use volumes, patterns, and experiences, and quantify relationships between overall trail use and key destination points along trails.

Trail Use Monitoring: NPS staff estimate the volume of hikers on different trails through monitoring activities. This data helps staff understand the visitor experience at these destinations.

Visitor Surveys: The NPS gathers information about visitors' preferred recreational opportunities, the experiences they seek, and their perceptions of the quality of those experiences through surveys. Respondents can also provide demographic data and input on future management actions.

2. **Temporary and Pilot Programs**

Recent events and changes in visitation have prompted the NPS to temporarily implement or pilot visitor use management strategies throughout the National Park System, including at Zion. These efforts inform our current work on the draft VUM Plan. Some of the actions taken at Zion include:

Temporary Shuttle Ticket System:

Following the suspension of the Zion shuttle system due to the COVID-19 pandemic, shuttle service resumed on July 1, 2020, with a reduced passenger load per trip to meet public health transportation guidelines. NPS collaborated with Recreation.gov to provide timed tickets for the shuttle, reducing lines, crowding, and congestion while providing greater access certainty for visitors. The temporary reservation system concluded in May 2021 when public health guidelines changed. This system provided valuable insights into effectively implementing a managed access system, particularly involving timed entry.

Time Entry Pilots in Other National Parks:

Zion staff are working with NPS personnel across the National Park System, including Arches, Rocky Mountain, and Glacier National Parks, to learn how timed entry and other visitor use management strategies can improve visitor access. Staff will continue consulting with other parks to learn how they succeed in conserving park resources while providing high-quality visitor experiences.

Angels Landing Pilot Permit Program:

In 2022, NPS began issuing permits for hikes to Angels Landing. The goal of this pilot program is to reduce trail crowding, address visitors' concerns about crowding and safety, and facilitate easier visit planning. The pilot was informed by studies that

examined the number of hikers on the trail, their travel patterns, perceptions of conditions along the trail, and preferred experiences. Nearly 400,000 permits to hike to Angels Landing were issued across 2022 and 2023.

3. Strategies Development

NPS employs various tactics for visitor use management nationwide, as outlined below. They are assessing if these strategies could improve visitor use management at Zion. The draft VUM Plan and EA may include these or other approaches such as seasonality. The best system will allow NPS flexibility to respond to changing visitor use patterns and to implement NPS best practices for visitor use management.

Strategy	Description
Parkwide Reservations	Reservations could provide park access and be managed at key access points such as entrance stations.
Timed-Entry	Reservations could have a timing component, where visitors would enter the park within a specific time window.
Trip Planning	Multiple time frames for booking reservations could be provided to allow visitors flexibility for trip planning, including longer-term and near-term options.
Existing Permits and Reservations	Existing permits (e.g., wilderness permits) or reservations (e.g., campgrounds) currently in place would continue to be required and would generally provide access to the park. Implementing additional site-specific permits, including at Angels Landing, may be considered.
New Permits	Implementing additional site-specific permits, including Angels Landing, would be considered.
Scenic and Thru Driving	Opportunities for scenic and thru driving without reservation on the Kolob Terrace Road and the Zion-Mt. Carmel Highway could be provided. Commuter access through Zion (e.g., along Kolob Terrace Rd or Zion-Mt. Carmel Highway would continue as currently provided).
Non-reservation periods	There could be hours or times of the year, particularly in the winter months, when a reservation would not be required to enter the park.
Commercial Services	Opportunities for new commercial scenic tours could be considered.
Communications	Clear and consistent communications for trip planning and arrival to the Park will be key to any new strategy. Park staff would provide visitors with guidance and orientation to any new system. Park partners, cooperators, and stakeholders will help the park share accurate and timely information with park visitors.
Future Infrastructure Adjustments	After initial implementation, the potential for targeted infrastructure adjustments or additions would be limited but future improvements could be identified as needed.
Resource Monitoring	Monitoring key indicators for resource conditions and visitor experience to stay within acceptable limits will be part of any new system. Periodic condition assessments will be used to monitor infrastructure related to public health and safety.
System Monitoring and Adjustment	Monitoring would allow managers to adjust any systems that are implemented. Monitoring would include trends such as no-show rates, visitor arrival times, demand, and changing visitor use patterns. Adjustments to reservation periods, purchase lead times, entry windows and other aspects of the system could then be made.

NPS is currently developing the draft VUM Plan and EA and anticipates sharing the draft plan with the public this coming winter (2025). The park will continue to collaborate with tribes and cooperating agencies during plan development.

Public engagement is an important part of this decision process. When the NPS solicits public comment, they will propose several different strategies (including an NPS -preferred option) and invite members of the public to share feedback. When the draft VUM Plan and EA is released, information will be shared online and at public meetings to provide opportunities to comment. Public comments will be considered as the NPS refines and finalizes the VUM Plan.

Depending on the final VUM Plan adopted, NPS will take appropriate next steps to continue communicating with prospective visitors, neighbors, elected officials, tribes, and other stakeholders.

Information source: National Park Service, U.S. Department of Interior
https://www.nps.gov/zion/learn/management/visitor-use-research-and-planning.htm
Photo and images credited to NPS

3.4 Guidelines for Partnerships with Community, Businesses, and Organizations

Protected area or fragile area managers should be open-minded to develop ways of collaborating with communities and businesses. This involves seeking, listening to, and acting on feedback. An open agenda fosters proactive thinking. Building trust, though time-consuming, is essential. Once trust is established, collaboration flourishes with more innovative projects and ideas. Working across boundaries encourages boldness and reveals new opportunities.

3.4.1 The Challenges

Protected area tourism has been advocated to foster connections between biodiversity conservation and community livelihoods, based on the premise that both conservation and development can be simultaneously achieved. Protected area tourism can significantly enhance local prosperity by generating additional income, expanding employment opportunities, and improving the quality of life for local communities. Additionally, it raises awareness about the importance of protected areas and their valuable resources, thereby encouraging conservation efforts and allowing local communities in the APEC economies and others to benefit from tourism. For example, the lower Mekong region Cambodia; Laos; Thailand and Viet Nam has some of the largest protected areas linked to sustainable tourism efforts and is recognized as a regional engine for sustainable rural development.

Although tourism has the potential to foster positive relationships between protected areas and local communities, many initiatives have experienced limited success. This often results from inadequate management practices that fail to sustain community engagement and empowerment, and do not adequately address the livelihood concerns of the community. It is frequently observed that economic benefits are received by only a few wealthy and politically influential individuals, while most locals continue to face hardships. Additionally, community engagement and knowledge gaps present major challenges. Many local communities lack the knowledge and resources for sustainable tourism, and their efforts are often undervalued. There is also a widespread lack of awareness about the importance of protecting natural areas among tourists and locals. Bridging this gap

requires active involvement, educational programs, awareness campaigns, and fostering a deeper respect for conservation efforts.

Therefore, to ensure the long-term viability of protected area tourism, it is crucial to properly involve local communities in management and address their livelihood concerns effectively.

Management practices for community engagement are based on the understanding of the social system, community capitals, participation process, and communication skills that require time and effort to develop. However, when done well, community engagement can lead to significant improvement in sustainable tourism development of the protected areas.

Wānanga (educational workshops) for partners and stakeholders are being conducted to ensure that everyone involved in the management and use of the Tongariro Alpine Crossing is aligned with the cultural and environmental objectives set by the Ngāti Hikairo ki Tongariro and the Department of Conservation of New Zealand. *(Credit: Te Ngaehe Wanikau)*

3.4.2 The Community Engagement Framework

Community engagement in sustainable tourism planning and management serves as an effective tool by enabling local communities to actively participate in protected area tourism management. This approach aims to achieve the dual objectives of biodiversity conservation within protected areas and the equitable distribution of socio-economic benefits derived from tourism to local communities.

Participation implies a process by which people are enabled to become actively and genuinely involved in defining the issues of concern to them, in making decisions about factors that affect their lives, in formulating and implementing policies, in planning, developing and delivering services and in taking action to achieve change.

By involving the community, sustainable tourism management is enhanced not only through the final outcomes but also through the participatory process itself, which can foster positive relationships among the communities, park authorities, and other stakeholders involved. Furthermore, this engagement helps build trust and empowers local communities in various aspects, including confidence, self-esteem, knowledge acquisition, decision-making, and economic strength.

Many frameworks for community participation in tourism development in protected areas have been proposed and widely used but there are common elements in these frameworks including:

1) *Settings of the participation process.* Local communities should be involved early in the planning and management process. Choosing an appropriate time for participation is crucial for successful engagement. Ensure that key local representatives and stakeholders are available in a timely manner for participation. The location of the meeting should be convenient for participants and minimize any discomfort, allowing community representatives to speak or act freely.

2) *Resource accessibility.* Participants need access to financial, informational, human, and material resources for effective participation in tourism planning or

management. Assessment and preparation of the availability of participation resources for communities should be done before the participation process begins.

3) *Community capitals*. The success of community participation in protected area tourism relies heavily on community capital, through either the wise use of community capital in sustainable tourism development or the improvement of such capital by tourism. Capital is defined as "a resource or asset that can be used, invested, or exchanged to create new resources" (Flora and Flora, & Fey, 2004). There are seven types of capital: social, human, natural, financial, physical, cultural, and political (Box 3.4).

   The Community Capital Framework (CCF) is a tool for analyzing community functions and capitals. It evaluates community engagement in tourism by assessing various community capitals, offering a multi-indicator analysis of tourism's impact on conservation and development. Methods such as community asset mapping, interviews, and secondary data collection are used to assess these capitals. The effects of tourism before and after its adoption can be compared. Positive impacts encourage active community engagement in tourism within protected areas.

Box 3.4 Types of community capitals

- *Social capital* refers to social interactions, trust, and reciprocity that facilitate collective outcomes, including community bonds, organizational networks, trust, and a sense of belonging.
- *Human capital* refers to knowledge, skills, and attributes that boost economic activity. Education and training help individuals from underprivileged backgrounds improve their productivity and earnings.
- *Natural capital* includes natural resources like land, water, forests, wildlife, and landscapes.
- *Financial capital* involves accessing funds through banks, investments, microfinance, financial linkages, and partnerships, related to money, funding, wealth, charitable giving, and grants.
- *Physical capital* is man-made assets for production and includes infrastructure such as schools, businesses, communication systems, roads, transportation, water supply, and sector-specific infrastructure.
- *Cultural capital* pertains to cultural resources like dances, local stories, heritage, food, traditions, language, and values.
- *Political capital* represents connections to people with power and the ability to engage in actions benefiting the community, built through connections with political and community leaders.

Full participation in protected area tourism can be undermined if capital within communities is inadequate. This issue can be addressed through joint venture agreements or partnerships between communities and private investors. Tourism joint ventures, which are an emerging trend in developing economies, involve contractual partnerships where a community collaborates with private investors. These arrangements are often initiated to facilitate the transfer of skills from private companies to the community. One successful example is the partnership between Ban Mae Klang Luang and the EGGO Electrical Generator Company, which has

increased community capital and participation in tourism activities within Doi Inthanon National Park, Thailand.

Monitoring changes in community capital is crucial because ecosystems and social systems are dynamic. This helps tourism planners, practitioners, and park managers assess changes and develop sustainable interventions.

4) *Representativeness and independence*. It is essential that local communities are represented by legitimate individuals who are recognized by the local population. Furthermore, the independence of these representatives must be ensured, meaning they should not have any affiliations with any sponsoring body.

5) *Influence and power*. Local communities should be able to gain influence over aspects of the tourism planning process. This is achieved when local communities are empowered and regarded as partners in the process. Choosing appropriate participatory techniques that encourage community empowerment, listening to community input, and providing opportunities for local communities to express their ideas and concerns are essential.

6) *Transparency*. The tourism planning process and management actions should be transparent to allow local communities around protected areas to observe the progress and decision-making processes. This transparency can help minimize suspicions about the intentions of the planning authorities or other stakeholders and reduce potential conflicts.

7) *The decision-making structure*. To ensure effective participation of local communities in planning processes, it is crucial to establish appropriate mechanisms for structuring the decision-making process. This includes defining how decisions will be made and by whom. The authority responsible for making decisions must be clearly identified to avoid misunderstandings regarding the roles of stakeholders and the local community in protected area tourism.

3.4.3 Guideline for Community and Business Collaboration and Participation in Protected Area Tourism

The seven stages below guide collaboration with local communities and businesses in protected area tourism.

01 Build relationships with the community and tourism organizations

Good relationships can help protected area managers communicate with local people and businesses. Explaining the intentions of destination development that offers them opportunities, then there should be a willingness to work with. If there is an existing tourism DMO and strategic planning process, then this would be the obvious starting point. Set up a friendly and transparent environment to work and communicate with the local communities and related organizations.

02 Assess situations, needs, and challenges

This step should commence with the identification of key participants. It is crucial that local communities are represented by legitimate individuals who are acknowledged by the local population. Furthermore, it is imperative to ensure the independence of these representatives. Stakeholders associated with protected area tourism should also be identified and invited to participate in the process if the issues have any impact on them.

Involving communities in assessing their needs and assets is essential, as it enhances understanding for both professionals and the community, leading to improved service delivery and less conflict. Ensure that the aspirations and challenges of the local community and local businesses are acknowledged in the destination strategy. This does not mean that all desires can be fulfilled, but realistic, appropriate, and valuable aspirations should be seriously considered and integrated into future planning. Many destinations overly focus on the visitor experience and neglecting the importance of local livelihood. The perspectives of local communities should be regularly monitored, documented, and publicly reported to guard against inappropriate developments or activities.

Furthermore, the assessment of community capital is crucial for the success of community participation. The Community Capital Framework (CCF), a tool designed to analyze community functions and capitals, evaluates community engagement in tourism by assessing various community capitals. It offers a multi-indicator analysis of tourism's impact on conservation and development, enabling the comparison of tourism effects before and after its adoption.

03 Identify and communicate sustainable local economic benefit opportunities

Evaluate ways in which local communities and businesses can gain more benefits from tourism in protected areas. This outcome does not occur automatically and requires efforts and investment to identify and achieve. Opportunities may include new transport, accommodation, food and beverage services, retail, leisure activities, nature guiding, and interpretation. List and prioritize three actions that can economically empower local communities and businesses sustainably and work towards making them a reality. Consider how changes to the destination may impact local communities and businesses, and fragile areas. For instance, if an electrical cable car is introduced into the tourism area, assess whether it could negatively or positively affect the local community.

04 Establish a shared and agreeable vision

Sustainable tourism underscores the significance of reaching a consensus on a shared vision among local communities and other stakeholders regarding the future environmental, social, and economic dimensions of protected area tourism. This collective vision should guide strategic planning efforts.

05 Generate ideas and plans for action

Community and business involvement plays a key role in producing practical ideas and converting these ideas into effective, sustainable action plans. Ensure that local business investment benefits both the protected areas and the local community's livelihood to the greatest extent possible.

Engage with local businesses and prospective entrepreneurs to discuss the barriers to entry they encounter in the marketplace for services, products, and experiences. Some of these challenges may require capital, which can be addressed through fundraising or an investment strategy. Others may necessitate understanding what visitors might desire and are willing to pay for at the destination. Partnering with private entrepreneurs who possess relevant skills and knowledge may be a beneficial option for local community businesses.

06 Enable actions

Sustainable protected area tourism prioritizes actionable steps and focuses on setting priorities that facilitate the meaningful implementation of plans. Actions are typically based on the agreed-upon objectives and strategies. Communities can actively engage in management initiatives if they receive appropriate encouragement.

Creating opportunities for local community and businesses to engage in the implementation of these actions is essential. To develop collaborative ways of working that include communities and businesses, protected area managers need to be open-minded. This means actively seeking feedback, listening to it, and then acting on it. Having an “open” agenda and process will help shift thinking from “reactive” to “proactive.” Trust must be established, and this can take time and effort. The positive side is that, once trust is established across organizations, a lot of projects and ideas start to flow, becoming more active, and more opportunities.

Sustainable tourism necessitates conveying both the significance of natural resources and the cultural and community aspects of the locality. Visitors should understand the historical and contemporary contexts of their destination, as well as respect and engage with these narratives. This is a crucial step in fostering respect and trust between park authorities and local communities residing near or within ecologically sensitive areas. It communicates to the local community that they are acknowledged and valued.

An exemplary case is the management of the Tongariro Alpine Crossing, which underscores the significance of cultural visibility. The integration of Ngāti Hikairo ki Tongariro's principles of Kaitiakitanga (guardianship) and Manaakitanga (hospitality and respect) into management practices encompasses educational initiatives and behavior change campaigns designed to enhance visitor comprehension and respect for the site's cultural heritage. Cultural significance is actively promoted through programs such as the Manaaki Rangers, which aim to enrich the visitor experience by incorporating cultural narratives and practices into their journey. Additionally, Wānanga (educational workshops) are conducted for partners and stakeholders to ensure that all parties involved in the management and utilization of the Tongariro Alpine Crossing are aligned with the cultural and environmental objectives established by Ngāti Hikairo ki Tongariro and the Department of Conservation of New Zealand.

Secure resources and investments from the tourism sector or visitors to fulfill community aspirations. Communities and local businesses may remain cautious until they observe financial support or efforts being directed towards their concerns or improvements in their quality of life. Establish *Community Development Funds* that attract investments and donations from the tourism industry and visitors, dedicated to funding projects that empower local communities.

Establish and uphold laws to safeguard all community members and natural resources in sensitive areas from tourism-related exploitation. *Communicate broadly and effectively that exploitation is not acceptable*. Develop precise rules and regulations outlining the expectations for the host community and businesses. In many destinations, businesses seek clarity on permissible actions.

Encourage, celebrate, and reward responsible tourism businesses. Highlight accommodation, transport, and food options that involve local people, investing in development or education, or using sustainable products. This incentivizes businesses to be sustainable, giving them an advantage over less responsible competitors.

Collaborating with schools and educational organizations ensures that everyone in the host community understands the site's values, creating future guardians and ambassadors.

Collaborating with local tour operators and local guides. Guiding is a professional activity of paramount importance in fragile areas and should be managed with a comprehensive system of training, accreditation, certification, and regulations to safeguard both visitors and guides from unqualified individuals, undermining the standards. Utilize the local community effectively and provide opportunities for those interested in becoming guides to undergo the proper process without discrimination based on race, religion, class, ethnicity, or gender.

In Thailand, there is a noteworthy example of the Tour Operators' Initiative for Sustainable Tourism Development (TOI) in the Andaman Sea Eco-region,

particularly in Phuket, Khao Lak, and Krabi. TOI and WWF are committed to enhancing wastewater treatment, providing training for hotel and resort staff, and protecting fragile areas and endangered species such as turtles. The collaboration with tour operators and the UNWTO Consulting Unit on Biodiversity and Tourism Development aims to proactively mitigate potential negative impacts of mass tourism and diversify offerings to encourage longer tourist stays (UNWTO, 2009). Additionally, the Reef Guardian initiative in Satun Province exemplifies local tour operator efforts in coral reef protection and restoration within Tarutao National Park and the Satun sea.

It is not beneficial for the local people or visitor experience if the products, services, and experiences offered are provided entirely by external or foreign businesses. Destinations should create opportunities for local people to establish their own businesses and enter the marketplace.

07 Monitor and evaluate the plan and actions

The processes of monitoring and evaluation are critical components of the overall planning cycle, allowing participants to reflect on and assess plans and actions to ensure that lessons learned are integrated into future planning efforts.

Source: 1. UNESCO World Heritage Sustainable Tourism Online Toolkit Guide 4: Engaging local communities and businesses (2025): https://whc.unesco.org/en/tourismtoolkit
2. Stone & Nyaupane (2015), and Bello (2021).

3.4.4 A Toolbox of Community Participation Techniques and Methods

Stakeholder involvement in tourism development can take different forms. Table 3.5 describes the various levels ranging from limited to intensive involvement of stakeholders. High stakeholder involvement takes more time and resources but eventually leads to better results, particularly in stakeholder satisfaction and the long-term success of tourism development.

It should be noted that the tools and techniques described here represent just a small selection of the techniques used in the community participation process. Literature on more tools and techniques is available from different sources.

Community participation techniques refer to methods and approaches employed to engage and involve community members in decision-making processes, problem-solving, and collective action. These techniques are designed to promote collaboration, inclusiveness, and active participation from individuals within a community.

A Checklist for Choosing Appropriate Techniques and Methods

Before applying techniques and methods in Table 3.5, it is helpful to use a checklist of questions to guide individuals and organizations in selecting the most suitable options for their specific situation.

1. **What is the motivation and focus of community participation? Why are you engaging in community participation?**

   Are you viewing participation as a means or an end? If it is a means, what is your focus? Do you seek to gather stakeholders' views on a specific planning proposal or concerning a particular issue? Are you aiming to review service delivery processes? Alternatively, do you intend to identify community concerns and develop a comprehensive action plan for sustainable development?

2. **Who is the community? What is the nature of the community itself?**

   Consider if your focus is a specific geographical neighborhood, a particular population group, the entire local authority population, or various stakeholders affected by a planned development. Different methods are suited to different sizes and types of community. For example, methods that rely on written questionnaires or complex discussions may not be as effective for engaging community members who may have varying levels of articulation, education, or confidence. On the other hand, methods that use arts media (such as video, drama, or drawing), modelling, simulations, or diagrams may be more accessible to a wider range of people.

3. **What is the appropriate level of participation?**

   Community participation functions on various levels. The appropriate level and specific techniques may vary depending on the composition of the community, the reasons for participation, and the laws governing the protected areas.

4. **How important are quantity and quality?**

   Some techniques focus on involving a relatively small number of representative community members as stakeholders in the participation process. In contrast, others derive their legitimacy from engaging a large proportion of the community. Understanding the distinction between stakeholder engagement and broader public participation and determining the relative importance of quantity and quality of involvement, can guide the selection of appropriate techniques.

5. **How much time and how many resources have you got?**

   It is important to note that community participation tends to be resource-intensive and long-term. The available time and resources will influence the selection of techniques and methods.

Selecting methods or techniques depends on specific objectives, community type and size, participant characteristics, level of participation, preference of quantity or quality of participation output, and available management resources. In planning and implementation, multiple techniques may be used together to involve local communities in protected area tourism for sustainability.

Table 3.5 A toolbox of community participation techniques/methods

Community Participation Tools/ Techniques	Description
Community Meetings	Schedule regular meetings for community members to convene, discuss issues, share ideas, and make collective decisions. These gatherings serve as a platform for open dialogue and foster active community participation.
Focus Groups	Organize small groups of participants with varied perspectives to collect feedback and insights on particular topics or projects. Focus groups facilitate detailed discussions and the exploration of different viewpoints.
Surveys and Questionnaires	Conduct surveys and questionnaires to collect opinions, preferences, and feedback from community members. This method enables large-scale data collection and offers a structured format for capturing community input. The results are typically quantified.
Workshops and Training Sessions	Organize workshops and training sessions to build community capacity and empower individuals. These interactive sessions encourage active participation and learning.
Participatory Mapping	Involve community members in mapping activities to identify important resources, challenges, and opportunities within the community. Participatory mapping provides a spatial representation of community knowledge and aids collective decision-making.
Community Action Groups	Create community action groups or committees to address specific issues. These groups allow community members to plan, implement, and monitor projects that meet their needs.
Online Platforms and Social Media	Online platforms and social media channels can be used to engage community members in discussions, gather feedback, and share information. These digital tools offer accessible and convenient means of participation, particularly for diverse or geographically dispersed communities.
Participatory Budgeting	Involve community members in the allocation of public funds by allowing them to participate in the decision-making process. Participatory budgeting fosters transparency, accountability, and community ownership of resource allocation.
Community-led Initiatives	Community-led initiatives involve individuals or groups taking the lead in identifying and addressing community challenges. This approach allows community members to have a role in developing solutions and aims to promote sustainable development.
Collaborative Partnerships	Establish partnerships among community members, organizations, and local authorities to utilize collective resources, knowledge, and expertise. Such collaborative partnerships promote shared decision-making and facilitate opportunities for community involvement in wider initiatives.

Source: Community participation approaches and techniques https://www.ecomms.agency/single-post/2019/07/05/community-participation-approaches-and-techniques

3.4.5 Case Studies

Case study 5

Partnership in Tourism Management at Clungup Mangrove Conservation Tiga Warna, Indonesia

Key messages

Even though it has been managed by the local Sendang Biru community, the management of sustainable tourism in fragile areas such as CMC Tiga Warna Conservation depends much on collaboration of a network of partnerships from various sources, including government authorities, NGOs, communities, academia, private enterprises, and public media. They help on sharing information, thinking, planning, implementing and monitoring visitor management including reservations, guided tours, waste management, and limiting tourists per beach.

General Information

Clungup Mangrove Conservation Tiga Warna (CMC Tiga Warna) is in Tambakrejo village, Sumbermanjing Wetan District, Malang Regency, East Java. Spanning 117 hectares, it includes 71 hectares of mangroves, 10 hectares of coral reefs, and 36 hectares of protected forest. Since 2012, it has been managed by the local Sendang Biru community, involving 110 people directly.

The issues

The CMC Tica Warna has been popular and received increased visitor numbers since 2016. Over-tourism was reported with complaints about the crowding and insufficient waste management. The management body of CMC Tica Warna convened to resolve the issues. The network of partnerships was formed to support the management of CMC.

Good practices include managing reservations, guided tours, waste management, and limiting tourists per beach.

The Partnership Model

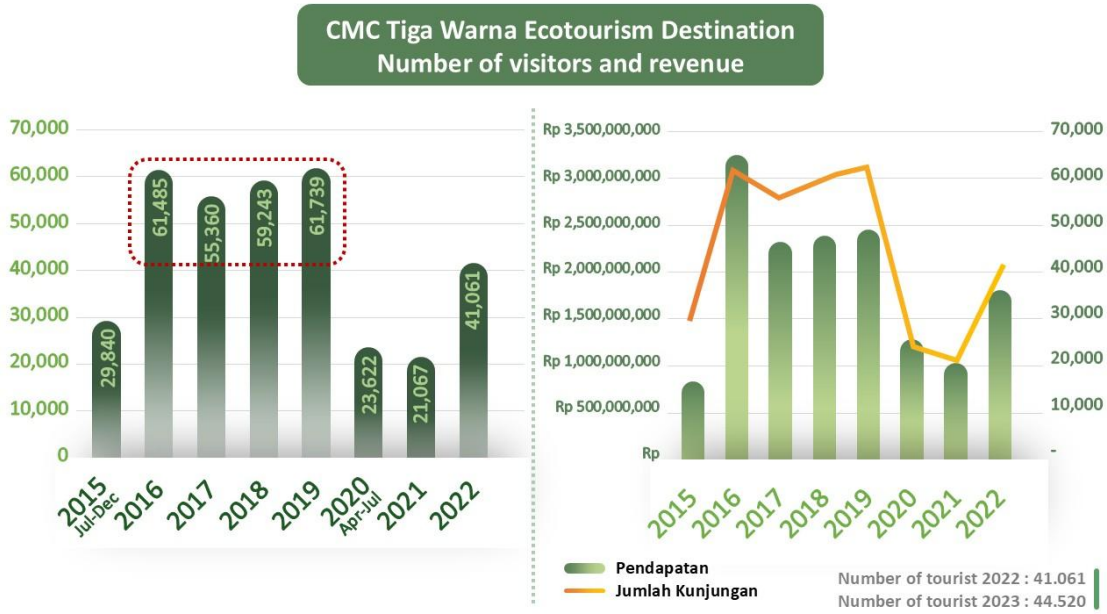
This practice focuses on partnership, which is crucial for the success of sustainable tourism at CMC Tica Warna. The collaboration involves forming a network of partnerships from various sources, including government authorities, NGOs, communities, academia, private enterprises, and public media.

Good visitor management was also designed and agreed to put into action to cope with over-tourism and tourism impacts.

Tourism Management System at CMC Tiga Warna

. Reservation system and quota for visitors for each beach
. Manage visitor flow
. Implement a waste "check list" before entering and leaving the area.
. Guided educational tour
. Closed every Thursday.
. Closed every H-+3 of the start of fasting and every D-+3 of Eid al-Fitr; and December 24 to January 4.

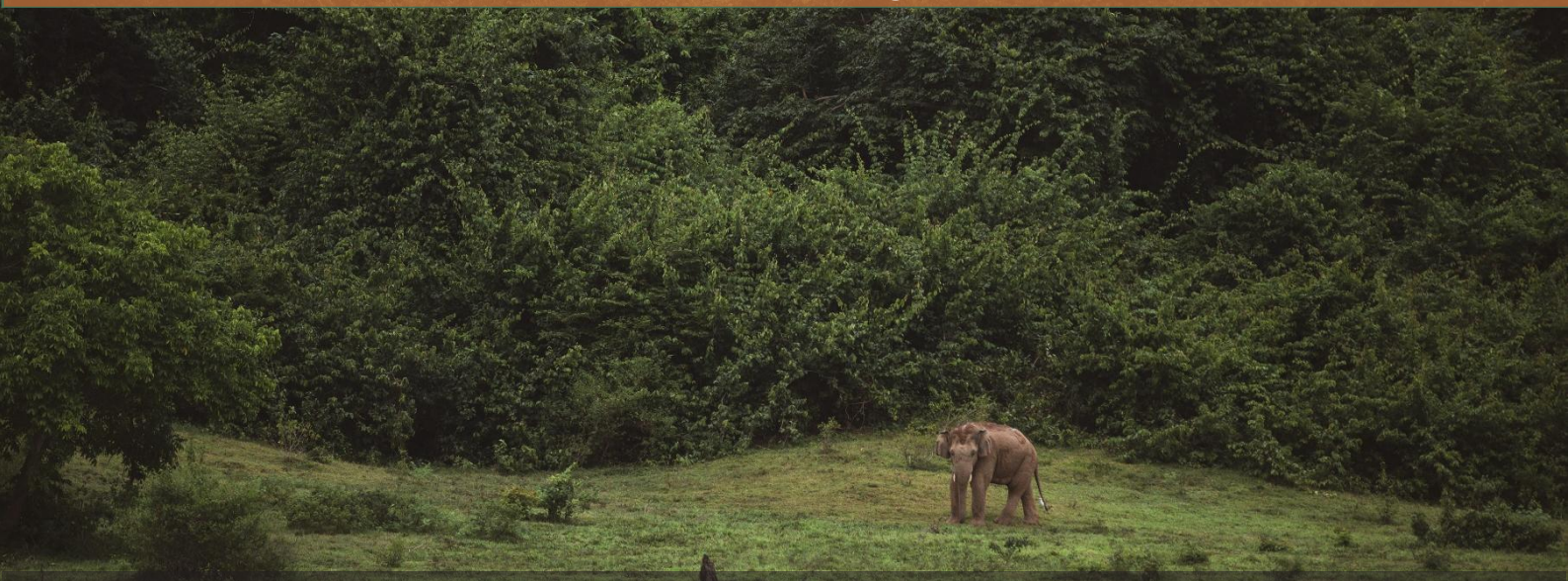
The Impacts and Lessons learned



Indicators of success show that limiting the number of visitors was effective, with visitor numbers in 2022 almost 20,000 less than in 2019 (41,061 and 61,739, respectively). However, this resulted in a decrease in revenue from approximately IDR2,500,000,000 to IDR1,800,000,000. Tourist feedback on the CMC management such as rubbish control, visitor quota, and overall visit expectations reported high satisfaction.

Information source and Photo credit: Suhandi, Ari (2024)

Case study 6



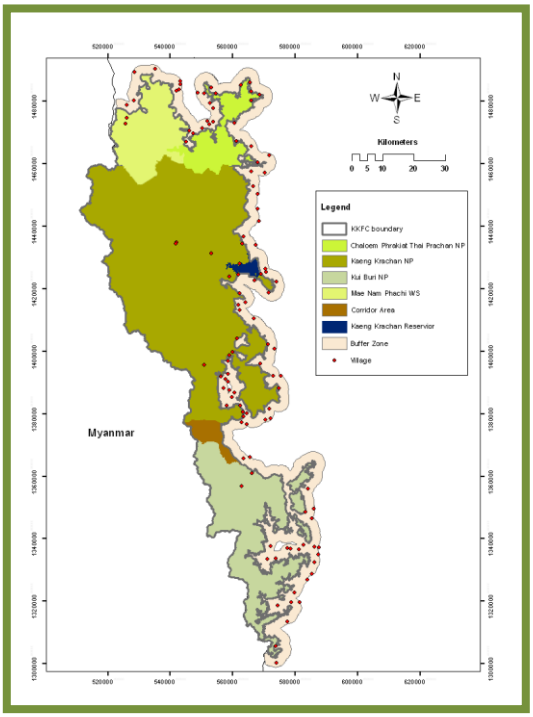
Wildlife Tourism Initiative for Human-Wildlife Conflict Solution in Kui Buri National Park, Thailand

Key messages

- Conservation initiatives: Kui buri Model of wildlife tourism as a solution for human- elephant conflict
- Wildlife tourism at Kui buri National Park has been successful due to strong and active stakeholders' participation and POWER of Kui buri Partnership

General Information

Located in Prachuab Kirikhan Province, Kui Buri National Park was established in 1999 with an area of over 969 km^2. Kui Buri National Park, along with three other protected areas collectively known as the Kaeng Krachan Forest Complex, was nominated as a Natural World Heritage site in 2021.



The national park comprises almost 97% of forest, with agriculture and water resources constituting the remainder. There are three main forest types: dry evergreen forest (62.02%), moist evergreen forest (28.87%), mixed deciduous forest (6.19%), and secondary forest (2.92%).

Kui Buri National Park serves as a significant reservoir for wildlife, hosting at least 250 species, including 48 species of mammals, 145 species of birds, 23 species of reptiles, 15 species of amphibians, and 19 species of fish. It is known for housing over 230 wild elephants.

Currently, Kui Buri National Park is visited for its wild elephants, gaurs, and bantengs around the National Park Guard Station 1 (Pa Yang) and Station 5 (Huay Leuk). The wildlife viewing activity is available daily from 14:00-18:00 hrs. In 2023 and 2024, the park received 20,060 and 20,080 visitors, respectively, with approximately 70% being foreign tourists.

The Issues

In 1977, forest land at Kui Buri was converted to pineapple cultivation. The Provincial Administration Organization rented forest land from the Royal Forestry Department for Ban Ruam Thai village, and villagers saw 1-3 elephants nearby.

By 1982-1985, pineapple plantations encroached on forest land and reached the edge of Kui Buri National Forest. When pineapple prices fell, plantations were abandoned, attracting wild elephants almost daily and creating conflicts between humans and elephants.

Since 1994, tensions between elephants and villagers have escalated. Elephants' habitats turned into pineapple plantations, leading to frequent raids by elephants and numerous conflicts with farmers, resulting in severe outcomes for both sides.

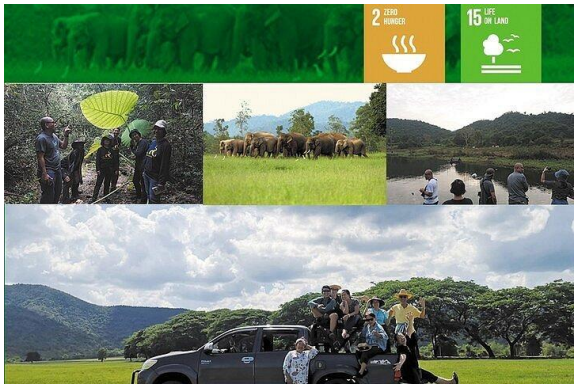
Objectives

- Reduce human-elephant conflict through wildlife tourism.
- Provide locals with supplementary jobs and income from tourism.
- Foster a positive relationship between the community and elephants.

Community Engagement in Wildlife Tourism

- In 1997, a project under the Royal initiation of the late King Bhumibol Adulyadej known as “the conservation and restoration of Kui Buri National Forest” was established to conserve wild elephants and other wildlife. Forests were restored to provide habitats and food sources for elephants and other wildlife.
- Kui Buri National Park was established in 1999 to protect forest land for wildlife habitats.
- From 1999 to 2006, Kui Buri National Park, the local community, and WWF Thailand developed a model to address human-elephant conflict through collaborative planning and stakeholder participation.
- The model promoted active involvement by creating a management plan for wild elephants, referred to as the “energetic plan.”
- Farmers employed alternative methods to deter elephants and received support from both private and government sectors.
- Wildlife tourism was introduced as a way to reduce conflicts between farmers and elephants, leading to the establishment of the "Kui Buri Wild Elephant Ecotourism Club." Some villagers who previously experienced conflicts with elephants became local tour guides, providing transportation for visitors to see the elephants, which generated income for local communities and encouraged elephant conservation.
- Tourism helps mitigate human-elephant conflict by providing an additional source of income for local farmers. After completing their farm routines, farmers work as tour guides or drivers in the late afternoon, taking visitors to observe wildlife in Kui Buri NP. Community members affected by elephant invasions receive annual local guide training. Guides earn THB170 per trip, while drivers earn THB500 baht per trip.

- The increasing popularity of wildlife viewing activities has led the Park and the Ecotourism club to address issues of over-tourism, tourism impacts, and the quality of tourism services. They collaborate on sustainable tourism management planning.
- During the COVID-19 pandemic, the park and the "Kui Buri Wild Elephant Ecotourism Club" determined the appropriate carrying capacity for wildlife viewing activities in Kui Buri NP.



https://www.tripadvisor.com/AttractionProductReview-g293916-d19198948-Kuiburi_Wildlife_Watching_Cookery_with_Host-Bangkok.html

- Recently, community-based tourism at Ban Ruam Thai has been developed to accommodate visitors. Local products and visitor-participated activities, such as making paper from elephant dung, collecting honey from beehives, and making biodegradable soap, have attracted many tourists. These activities increase tourist spending within the community, enhancing economic gains for local communities who previously experienced elephant conflicts.

The Impacts

1. The elephant population has increased, with 10-20 elephants with ivory being observed. Elephants are distributed in small groups of 10-20, resulting in a total of 140 elephants roaming forest lands, valleys, and water resources.

2. Local farmers have gained additional income by serving as local guides and providing transportation for tourists to view wildlife in the national park.

3. In November 2015, WWF-International recognized Kui Buri National Park as one of the Best Practices in Asia for Human-Elephant Conflict Mitigation. Research indicates that no elephants have been poached in Kui Buri since 2010, and elephant mortality rates have significantly declined in recent years. There have been only four elephant deaths from 2006 to the present, compared to 11 deaths from 1997 to 2005. Incidents of human-elephant conflict have also dramatically decreased, with 332 incidents recorded in 2005, 274 in 2013, and 146 in 2014.

4. Recently, DNP selected Kui Buri National Park as one of the top three protected areas with the best practices in Thailand. The park also received an award for its efforts in expanding participatory governance from the Office of the Public Sector Development Commission (OPDC) for its active involvement of local communities.

Lessons Learned

1. Human–elephant conflict in the Ban Ruam Thai Community arises from the conversion of forest areas into residential and plantation zones. This change prompts wild elephants to leave the forest and shift their behavior from migrating within the forest to foraging near plantation areas. The impact on natural capital includes damage to agricultural products, which affects financial capital as these crops are the source of income for local farmers. Human capital is also impacted, both physically and mentally, as local farmers must stay up at night to protect their fields, leading to fatigue, exhaustion, paranoia, and anxiety, thus affecting daily life in the community.

2. Collaborative efforts to address this issue began with participatory processes initiated by relevant agencies/organizations and villagers. These steps included: 1) Identifying problems and analyzing impacts along with resources and operational issues, 2) Planning additional livelihoods such as participation in wildlife tourism activities, training, and setting rules for local guides and drivers, 3) Operationalizing by establishing and managing the Kui Buri wildlife conservation tourism club and tourist services, including assisting the Park in conserving natural resources and wildlife, 4) Sharing benefits, including compensation for working with agencies and assistance during serious incidents, and 5) Assessing progress by sharing information with agencies and gathering feedback for future improvements.

3. The level of community participation is at a "real and active" stage, contributing to effective collaboration in resolving human-elephant conflict.

4. Tourism was introduced as an economic incentive to reduce conflict levels, providing benefits to local farmers. Conservation awareness improved through effective two-way communication among stakeholders.

5. Critical success factors for sustainable tourism in Kui Buri rely on capacity building and community engagement. Providing locals and entrepreneurs with skills and knowledge through short courses that incorporate design thinking and transformational learning enables communities to develop innovative, sustainable tourism activities that attract nature-loving tourists and foster economic growth.

6. The integration of sustainable development principles into tourism activities ensures long-term environmental and economic benefits. Training locals to calculate carbon emissions and reduce the carbon footprint of tourism activities promotes environmental sustainability and attracts eco-conscious tourists.

7. Implementing sustainable tourism management tools and techniques is essential, including tourism potential assessment, carrying capacity evaluation, visitor, and impact management, and encouraging community and stakeholder participation.

8. Economic incentives such as payments for ecosystem services and carbon-neutral tourism support sustainability goals. Comprehensive guidelines for planning, executing, and monitoring tourism strategies ensure that tourism development does not compromise the integrity of conservation areas.

Management system development to promote and improve environmentally friendly tourism behaviors in the Kaeng Krachan Natural World Heritage Site

This comprehensive program delves into the intricacies of low-carbon, environmentally-conscious tourism. Emphasizing the design and development of landscapes and structures aligned with green principles equips participants to create sustainable and eco-friendly tourism activities.

The dividends extend beyond a mere skill set, encompassing a positive mindset toward green tourism and sustainable development. Aligned with Thailand's development goals, the curriculum is poised to attract environmentally conscious tourists. The innovative tourism products that emerge, such as the envisioned Green Tourism Sandbox, contribute to the sustainable growth of Kaeng Krachan National Park.

Information source and Photo credit:

1. Kuiburi Wildlife Watching & Cookery with Host. https://www.tripadvisor.com/AttractionProductReview-g293916-d19198948-Kuiburi_Wildlife_Watching_Cookery_with_Host-Bangkok.html
2. Pumalee, Usaradee. 2024. *Development of Management system to promote and improve environmentally friendly tourism behaviors in Kaeng Krachan Natural World Heritage Site*. Final Research Report for the Program Management Unit for Competitiveness (PMUC).
3. Waranya, Yimyam. 2022. Community participation in solving human -elephant conflict: case study of wildlife tourism in Kuiburi National Park. Master Thesis Chulalongkorn University.

Case study 7

https://www.chiangmaitraveller.com/kew-mae-pan-nature-trail-chiang-mai/

Private Company Partnership in Sustainable Tourism Development, Thailand

Key message

- Partnership initiative can benefit sustainable tourism in national parks through several ways - receiving external management resources from partners, learning from partners, and working together to build good relationship and partnership in resource conservation.

General Information

For more than 20 years, Thai Rak Pa Foundation (Thai Forest Conservation Foundation), established and operated by the EGCO Group - the Electricity Generating Company, Ltd., has fostered partnerships with local communities and Thai national parks. These efforts have continuously contributed to natural resource conservation and sustainable tourism development in Doi Inthanon, Doi Suthep-Pui, and Khao Luang National Parks.

The Issue

Developing partnerships with national parks is challenging due to governmental authority barriers, strict regulations, and the attitudes of national park authorities towards external entities in conservation matters. The Thai Rak Pa Foundation has worked diligently to earn the trust of national parks. By maintaining collaboration since 2008, mutual understanding of each other's capabilities has been achieved, leading to the formation of partnerships and friendships along the way.

The Objectives

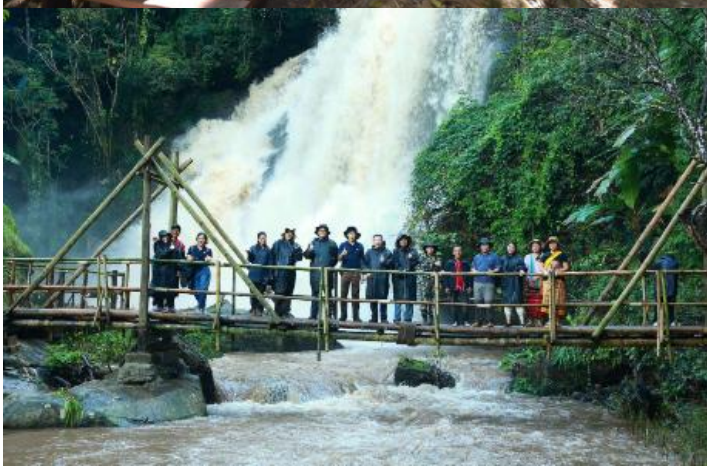
Through the Thai Rak Pa Foundation, Private Electricity Generating Company (EGCO) has established partnerships and collaborations with national parks and adjacent local communities to enhance the quality of nature trails, provide interpretation and capacity-building for sustainable tourism within the parks, and promote awareness of environmental and natural resource conservation.

The Model

• Thai Rak Pa Foundation addresses national park challenges in providing interpretive facilities, crucial for conservation awareness and quality visitor experience on nature trails.

• The Foundation provided experts to help national parks develop these facilities, investing in trail restoration and local guide training. It has created 9 interpretive trails in three national parks: Doi Inthanon (summit trail 2018, Kew Mae Pan 2019, Ang Ka 2021, Pha Dok Siew 2024), Doi Suthep-Pui (Monthathan waterfall 2015), and Khao Luang (Promloak, Karom, Aie Keaw waterfalls 2017, Krung Ching waterfall 2022).

• From 2022-2024, in partnership with DNP, a 2.6 km Pha Dok Siew nature trail was developed in Doi Inthanon, featuring Siew trees, the Pha Dok Siew waterfall, and Karen people's rice terraces. The trail includes 14 interpretive signs and renovations incorporating Karen wisdom.



The Impacts

• Since 2008, The DNP has been partnering with ECGO group through four Memorandums of Mutual Understanding. They recognize Thai Rak Pa Foundation as a model for private sector engagement in forest conservation and sustainable tourism. The Foundation also supports local communities through guide training and eco-friendly tourism services.

Lessons Learned

Collaboration and partnerships strengthen sustainability efforts. Knowledge transfer and capacity building from experts are crucial. Long-term commitments based on trust and shared responsibility enhance partnership effectiveness.

Information sources and photo credits:

1. Thai Rak Pa Foundation (Thai Forest Conservation Foundation) (2024)
2. Thai Post (2023)
3. Energy News Center (2023)
4. SARAKADEE LITE (2025)

3.5 Guidelines for Tourism Product Development

3.5.1 Tourism Products: Design and Development

A tourism product is defined as *"a combination of tangible and intangible elements, such as natural, cultural and man-made resources, attractions, facilities, services and activities around a specific center of interest which represents the core of the destination marketing mix and creates an overall visitor experience including emotional aspects for the potential customers. A tourism product is priced and sold through distribution channels, and it has a life cycle"* (UN Tourism, 2025).

To implement tourism in protected areas professionally, appropriate tourism products need to be defined, developed, and marketed. The overall goals to be pursued must be clear. A thorough analysis of the area's tourism potential is necessary. This analysis should include not only the area itself (attractions, current tourism offerings), but also the potential markets, competing destinations, and general conditions outside the area. The Ecotourism Training Manual for Protected Area Managers (Wolfgang *et al.*, 2002) outlines the following key elements:

- Identification of target markets
- Development of a core product centered around the area's unique or otherwise prominent features
- Product diversification: creation of supplementary or specialized products
- Packaging (integration of experiences, activities, transportation, services, accommodation, and catering)
- Product quality and pricing (ranging from mass-market to upscale or specialized products)
- Integration with other regional or domestic tourism products

Tourism products and services in protected and fragile areas must be developed sustainably while supporting conservation efforts and local communities. For protected area managers, businesses, and entrepreneurs, creating tourism experiences requires careful product design that combines the needs of visitors with environmental sustainability. This handbook will present guidelines on how to design tourism products that meet the requirements of sustainable tourism development in protected and fragile areas.

Although various forms of tourism can be developed in protected areas, such as mainstream nature-based tourism, ecotourism, adventure tourism, and health tourism, the following guideline will focus mainly on the development of ecotourism products. Ecotourism aligns with the objectives of protected area tourism by emphasizing the protection of the natural environment, providing opportunities for the local community to benefit from tourism, and ensuring that visitors have positive experiences while becoming aware of the importance of protected areas. Ecotourism products function as a conservation tool, allowing visitors to participate in or contribute to conservation activities as part of their experience.

> Ecotourism is defined as “responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education” (TIES, 2015). Education is meant to be inclusive of both staff and guests.

Ecotourism characteristics include:

- Minimize physical, social, behavioral, and psychological impacts.
- Build environmental and cultural awareness and respect.
- Provide positive experiences for visitors and hosts.
- Offer financial benefits for conservation.
- Generate income for local communities and private industry.
- Create memorable experiences that raise awareness of political, environmental, and social issues.
- Design and operate low-impact facilities.
- Respect indigenous rights and beliefs, partnering with them for empowerment.

Source: The International Ecotourism Society (2025). https://ecotourism.org/what-is-ecotourism/

Designing an ecotourism product involves creating a unique experience that connects travelers with nature while preserving the ecological integrity of the destination. It starts with identifying what makes a destination special. These are the main core and supporting attractions that will form the basis of the protected area tourism product. The goal is to offer authentic and sustainable experiences while meeting visitors' expectations. A successful ecotourism product considers both tangible and intangible elements. It involves not only identifying attractions but also packaging, marketing, and delivering them in a way that appeals to eco-conscious travelers.

01 Assess and Identify What Makes a Destination Special

1.1 Ecotourism resource assessment

The first step in tourism product development is to identify and assess the destination's resources, including natural elements, cultural assets, or artificial attractions, to determine their value, significance, and limitations in utilization. This assessment will inform development decisions, such as prioritizing high-potential tourist attractions for development or identifying constraints to further development. Knowing these resources also helps in finding opportunities for new products or improvements. Engaging local communities and tour operators is essential for evaluating ecotourism potential. This inclusion helps protected area managers during development and fosters a sense of ownership and social sustainability.

An ecotourism resources assessment should consider:

- Resource availability in suitable zones within protected areas.
- Ecotourism potential of natural resources (e.g., uniqueness, attractiveness, popularity, biodiversity, wildlife viewing opportunity, scenic quality, local climate, connection to other tourism sites).
- Sensitivity of natural resources and culture and possible impacts.
- Accessibility without significant alterations.
- Visitor safety from potential natural disasters.

1.2 Identify key attractions

After assessing tourism resources, ecotourism product development identifies key attractions, which are categorized as core and supporting attractions.

Core attractions serve as the primary reasons for travelers to visit a destination. The core benefit represents the essential motive for choosing an ecotourism product. In protected

and fragile areas, this often involves the connection with nature and the opportunity to experience an unspoiled environment. For instance, a trekking tour in a national park provides the core benefits of adventure and immersion in nature.

In the context of protected area ecotourism, these typically include:

- Natural landscapes: Mountains, forests, rivers, islands, and coastlines are significant draws for ecotourism.
- Wildlife experiences: Opportunities to observe wildlife in their natural habitats, such as birdwatching, safari tours, and marine life encounters.
- Unique ecosystems: Rainforests, wetlands, and coral reefs frequently form the central aspects of ecotourism experiences.

Supporting attractions enhance the visitor experience and add value to the trip. Although they are not typically the primary motivation for travel, they contribute to making the overall product more appealing and memorable:

- Cultural experiences: Visits to local communities, engagement in traditional crafts, and participation in culinary experiences.
- Adventure activities: Activities such as trekking, kayaking, and nature walks that complement the core attractions.
- Wellness experiences: Offerings such as hotspring bath, yoga retreats, forest bath, meditation in natural settings, and various wellness treatments.

02 Conduct Market Research

Thorough market research is crucial before developing a tourism product. Study travel industry trends, tourist demographics, and competitors to understand what tourists want. This research guides decisions on product offerings and target markets, ensuring appeal and profitability.

Market research provides valuable insights into tourist preferences and behaviors, aiding in the identification of target markets and assessment of demand. For example: ecotourism attracts individuals interested in exploring and learning about natural environments; adventure tourism appeals to younger, thrill-seeking demographics; and cultural tourism engages older travelers with a penchant for cultural experiences.

Market research helps identify target markets, as different tourists have varying motivations (Box 3.5). Align key attractions with these target markets.

Box 3.5 Motivation of various types of visitors/tourists in protected/ fragile areas

- *Ecotourism* involves travel for the purpose of discovering and learning about natural environments. Ecotourism focuses on improving and gaining knowledge through studying, documenting, and understanding nature. Commitment to nature conservation is another essential motivation.

- *Wilderness travel* involves recreation through exploring natural environments with minimal human disturbance. It provides psychological and physical benefits by experiencing wild areas with minimal development influences. Nature is experienced free from modern influences. Wilderness enthusiasts seek solitude, usually with a small group of friends. The motives for recreation are personal, and other people's presence is acceptable if they share the same goal of self-development through wilderness exploration. Large groups of people are generally avoided.

- *Adventure travel* focuses on personal accomplishment through engaging with challenging environments. Adventure tourism is based on seeking thrills and excitement. The challenge is chosen within nature's constraints, but some technological aids are allowed within limits. The aim is to gain a sense of achievement and excitement. Adventure travel includes strenuous outdoor activities in remote places known for their natural beauty and physical attributes, involving risky activities such as mountain climbing, white-water rafting, and deep-sea diving.

- After the pandemic of COVID-19, tourists in protected areas and other natural areas seem to have changed their interest in tourism activities participation, and their behavior. After the crisis, tourists may have increased requirements for safety, hygiene, and quality service, with a preference for less interaction with others. It is anticipated that the recovery of nature and the awareness of crisis causes and phenomena could influence tourist attitudes and behaviors in a positive manner.

Source: Eagles (1995), Eagles *et al.* (1992), and Kusumaningrum and Wachyumi (2020)

03 Identify Key Stakeholders/ Partnerships in Ecotourism Product Development

- Identify ways to involve relevant stakeholders. Collaboration is vital for creating sustainable tourism through win-win partnerships.
- The stakeholders involved in tourism product development should align with the objectives of protected area tourism development, such as enhancing local community benefits and focusing on eco-products that contribute to environmental conservation. These stakeholders should be willing to operate within these criteria and guidelines. Typically, they include local community members, green entrepreneurs, academics or experts in tourism product development and marketing, and local tourism-related businesses.
- The level of participation, techniques, approaches, and processes should be determined in advance to effectively work with these stakeholders.

04 Product Design and Packaging

Once the resources and market demand are understood, the next step is designing the tourism product. This involves creating a unique selling proposition (USP), product branding, product packaging, pricing, and marketing.

4.1 Creating a unique selling proposition (USP)

A unique selling proposition (USP) refers to the distinct and compelling advantage that differentiates a product or service from its competitors. It highlights the unique benefits and features that attract customers and make the product stand out in the marketplace. The USP is essential in marketing and branding, as it communicates to potential customers why they should choose one product over another. In the context of ecotourism product development, the USP may emphasize aspects such as environmental sustainability, cultural preservation, or unique local experiences that cannot be found elsewhere.

There are key considerations in the USP ecotourism product development:

1. Environmental Protection

In fragile areas, it is important to minimize environmental impact. This involves planning and designing tourism infrastructure and activities in ways that do not harm local ecosystems. Developers should use eco-friendly materials, renewable energy sources, and sustainable waste management practices. Additionally, controlling the number of visitors can help reduce the pressure on natural resources. Tourism services in these areas should adopt eco-friendly practices such as providing carbon-neutral transportation, supporting local communities, and using sustainable materials for accommodations.

Incorporating sustainability practices into the design of tourism products can help protect the destination and attract eco-conscious visitors. Products designed with sustainability considerations may resonate well with today's tourist market. It can compel the advantage that sets a product or service in protected or fragile areas apart from other destinations. Ecological sensitivity is an important factor that could influence the future of protected area tourism.

2. Cultural Preservation

Respecting and preserving local culture are crucial in ecotourism. Engaging with indigenous and local communities and incorporating their knowledge and traditions into the tourism experience can create a more authentic and respectful interaction. Education programs for tourists about the cultural significance of the area can foster appreciation and support for preservation efforts.

To design a tourism product that respects local culture, consider these factors:

- Authenticity: Preserve cultural authenticity while making the experience attractive to tourists. For instance, create festivals rooted in community history, live interpretations about culture and traditions of local communities, and local food preparation.
- Local involvement: Engage the local community in all stages, involving artisans, performers, chefs, ethnomedicine doctors, and storytellers to enrich and benefit the culture.

- Respect and awareness: Respect cultural boundaries to avoid misrepresentation or in-appropriation, which can harm both the destination's image and the community.

3. Community Involvement

Local communities should be active participants in ecotourism development. This includes involving them in decision-making processes, offering fair employment opportunities, and supporting local businesses. Community engagement helps ensure that the benefits of tourism are shared equitably, and that development aligns with local needs and values.

A tourism product that addresses community needs and meets tourist expectations is more sustainable. Local communities can be part of tourism products. Local communities offer valuable insights into history, culture, and resources, contributing to an authentic experience. Community input can enhance appeal, such as community-led tours, local accommodations, and regional food. Involving locals ensures they are invested in the product's success, spreading tourism benefits throughout the area.

4. Infrastructure Development

Adequate infrastructure but not over-development is necessary to support tourism while protecting the environment. This includes transportation facilities, accommodation, and communication networks. Infrastructure should be designed to blend with the natural surroundings and use sustainable technologies. For instance, eco-lodges made from natural materials and renewable energy sources can offer comfortable accommodation without compromising the environment.

Developing USP ecotourist products requires exceptional design that meets visitors' needs and reflects nature's harmony in protected areas.

5. Creating Unique Value Propositions

The USP ecotourism products need differentiation by offering something unique. This could include exclusive wildlife experiences, retreats in remote eco-lodges, or customized itineraries that blend adventure, culture, and wellness.

6. Ensuring Safety and Comfort

While focus is on nature, safety and reasonable comfort should remain priorities. Providing clear guidelines, proper equipment, and trained staff ensures a secure and enjoyable experience.

7. Focus on Interpretation and Education

Ecotourism emphasizes learning and discovery. Incorporating interpretive elements into products, such as guided nature walks with conservation experts or interactive sessions on local biodiversity, can enrich visitors' understanding and foster deeper connections with nature. Box 3.6 describes interpretation in more detail.

8. Quality Management and Service Delivery

High quality service is essential for a successful ecotourism product. This involves training staff to provide excellent customer service and to educate tourists about sustainable practices. Implementing customer feedback systems and continuous improvement processes can help maintain high standards and adapt to changing needs.

Box 3.6 Understanding interpretation in protected area tourism

Interpretation in tourism aims to inform, educate, and engage visitors by creating an emotional connection and deeper understanding of a destination. It uses tools like guided tours, signs, exhibitions, and digital experiences to highlight the cultural, historical, and natural significance of places. The goal is to turn a visit into an enriching experience that remains memorable. Interpretation in tourism offers several benefits:

- **Enhances visitor experiences:** Interpretation enriches visitors' understanding of a place, making their visit more meaningful. This deeper insight creates lasting memories and turns visitors into brand ambassadors who share positive recommendations, boosting long-term tourism.
- **Promotes cultural and environmental respect:** Educative programs foster respect for local customs and environments, encouraging responsible behavior. Interpretation plays a vital role in promoting responsible and sustainable tourism.
- **Manages visitor behavior:** By educating visitors on the environmental and cultural importance of certain sites, interpreters encourage tourists to behave in a way that minimizes their impact on the destination. For example, visitors might be taught about the fragile nature of coral reefs and encouraged to follow guidelines that conserve it for future generations.
- **Increases visitor engagement:** Engaging interpretation leads to longer stays, exploration, and repeat visits.
- **Promoting community engagement:** Interpretation bridges gaps between tourists and local communities by displaying history, culture, and traditions. It helps tourists appreciate the places they visits and sometimes involves locals sharing their stories, creating authentic experiences, and fostering community pride.

4.2 Branding and image management

Branding is essential in developing tourism products. A strong brand sets the product apart and draws the right audience. The process involves creating a name, logo, slogan, and marketing materials that appeal to the target market. Maintaining the brand's image requires ongoing efforts, including regular customer communication, feedback monitoring, and adjustments to ensure a positive image and repeat business.

An example of successful brand marketing in protected/fragile areas is the World Heritage logo. It is represented by a picture frame encasing a central circle, symbolizing cultural and natural sites recognized by UNESCO for their universal value. The World Heritage brand assists in promoting these sites by indicating quality and authenticity. It attracts tourists interested in unique experiences. Using the World Heritage brand in tourism marketing can enhance the credibility of a site and increase awareness and support for the conservation of global heritage.

4.3 Product packaging

Tourism business partners of protected areas should consider product packaging when marketing protected area tourism products. Strategic partners combine various elements into a seamless travel package to enhance the USP and visitors' convenience, including return airfares, transfers, accommodations, tours, experiences, and meals at a special price. It can also be a combination with other regional or domestic tourism products.

4.4 Pricing and marketing

Determining the price for an ecotourism product involves several factors. First, the costs of providing the service must be considered, including expenses for accommodation, transportation, meals, activities, and contribution to conservation efforts. Additionally, pricing should reflect the value of the unique experiences offered, such as exclusive wildlife encounters or expert-led tours. Market research is crucial to understanding what similar offerings in the region are priced at and to gauge customers' willingness to pay.

In protected and fragile areas, entrance fees are normally charged. These fees help control visitation, finance nature conservation, and support community projects. According to the user-pays principle, these fees are a fair way to fund biodiversity protection. People generally accept these fees if they are used locally rather than going to domestic budgets. The protected area manager must transparently manage revenues to improve tourists' experiences. In very fragile or unique areas, additional charges may apply for specific activities, like scuba diving in Thailand's national parks.

Setting a competitive price that aligns with the target market's expectations while ensuring profitability is essential. Offering tiered pricing or packages can cater to different budgets and increase accessibility. For instance, a basic package may include essential services, while premium options could offer additional benefits such as private guides or luxury accommodations outside the protected areas.

Strategic partnerships with local businesses can also influence pricing by bundling services at a special rate, providing more value to the customer while supporting the local economy. It is important to communicate the added value of sustainable practices and conservation efforts to justify the price and appeal to eco-conscious travelers.

Once tourism products are developed, marketing is crucial to their success. Effective promotion of tourism products involves establishing a robust brand identity, highlighting unique selling points (USPs), and targeting the appropriate audience. Digital platforms offer powerful tools for reaching global audiences. Social media, travel blogs, and influencer collaborations effectively highlight the destination's attractions and experiences. Additionally, virtual tours, drone footage, and user-generated content create engaging and shareable material.

The followings provide guidelines on tourism product development for ecotourism, adventure tourism, and beach and island tourism.

Ecotourism

To design effective and sustainable ecotourism products, it is important to understand the ecological significance of the areas involved and ensure that tourism development does not harm these sensitive habitats. Ecotourism development should be approached cautiously to prevent the exploitation or destruction of ecosystems.

1. Conservation-focused Products

The main principle of ecotourism is conservation. Tourism products should aim to raise awareness about biodiversity and environmental protection. This can be achieved through guided tours by trained naturalists, educational talks on local flora and fauna, and participation in wildlife monitoring or rehabilitation efforts. Promoting wildlife conservation programs allows tourists to contribute to preserving ecosystems.

2. Eco-friendly Accommodations and Practices

Eco-lodges and sustainable accommodations are key components of ecotourism products. These accommodations should be designed to minimize environmental impact, using sustainable materials and practices such as solar power, water conservation, and waste management. Involving local communities in the tourism sector can enhance the success of ecotourism while providing economic benefits to the area.

3. Promoting Local Culture and Sustainable Livelihoods

For ecotourism to be sustainable, local communities need to be integrated into the tourism process. This includes creating opportunities for local guides, artisans, and farmers to benefit from tourism revenue. Promoting cultural tourism alongside wildlife experiences, such as village tours or traditional craft workshops, can enrich the visitor experience while supporting the local economy and preserving cultural heritage.

4. Developing Responsible Marketing Strategies

Marketing ecotourism products should emphasize their sustainability, conservation efforts, and unique wildlife experiences. It is important to highlight the importance of responsible travel and the impact of tourism on ecosystems. This can be achieved through educational content, collaboration with conservation organizations, and using social media platforms to raise awareness about environmental issues.

Adventure Tourism

1. The design of core or principal activity

At the core of any adventure tourism product lies the principal activity. This central event defines the entire experience. Examples include forest trekking, white-water rafting, cave exploration, and skiing. This primary activity attracts tourists by offering a unique adventure that they may not encounter in their daily lives. Consider a hiking adventure as an example. The main activity might involve trekking to a scenic. However, product design extends beyond this. Ancillary activities such as cultural experiences (e.g., visiting a local village), wildlife spotting with an expert guide, or enjoying a traditional meal prepared by locals can add significant value, transforming the product into more than just a hike.

2. Various skill levels and experiences

Adventure tourism frequently attracts participants with varying levels of experience and skill. Addressing this diversity is crucial for effective product design. Offering a one-size-fits-all package can lead to dissatisfaction; beginners might feel overwhelmed, while experienced adventurers may find the experience insufficiently challenging. Designing products with flexibility to accommodate various skill levels within the same experience is key.

3. Safety protocols

While adventure tourism emphasizes pushing boundaries, safety is essential components in designing any adventure product. Given the inherent risks of adventure activities, addressing these in the design process is vital for guest safety and business reputation. This includes ensuring equipment meets safety standards, having well-trained guides, and offering proper insurance for participants. It is imperative to provide clear guidelines for tourists such as weather conditions, clothing suggestion, what to expect during the adventure, qualified instructors, or guides for each group to add security and confidence for participants.

4. Sustainability

Finally, tourists now seek experiences that minimize environmental impact and contribute positively to local communities. Incorporating sustainable practices into adventure product designs helps preserve natural environments and respects regional cultural heritage.

Once core activities, ancillary experiences, skill-level options, safety protocols, and sustainability features are established, focusing on details that make an adventure tourism product memorable becomes paramount. Personalization, exceptional service, and thoughtful touches enrich the overall experience. For instance, scuba diving could provide ecofriendly live-aboard offering zero waste management and/or partnering with local conservation groups for reef clean-ups.




Beaches and Islands as Tourism Products

Beaches and islands are significant tourism products that offer a wide range of experiences tailored to different traveler preferences. These destinations cater to a diverse audience, including adventure seekers, honeymooners, and family vacationers. Successfully transforming a beach or island into a tourism product necessitates the integration of several key elements:

Natural Attractions: The primary appeal of these destinations is their natural beauty, including beaches, coral reefs, lagoons, and lush greenery.

Desired Recreational Activities: Beaches and islands offer many recreational opportunities for tourists. Notable activities include *water sports*: scuba diving, snorkeling, kayaking, and surfing for adventurers, *nature-based experiences*: hiking, birdwatching, and exploring marine life attract eco-tourists and cultural experiences: local festivals, cuisine, and crafts provide insights into local culture.

Infrastructural Facilities: The development of infrastructure such as accommodation, transport, and recreational facilities enhances the overall tourist experience.

- Accommodation: For fragile and protected areas, accommodation must be planned and designed with conservation goals in mind, such as eco-lodges and homestays.
- Transport and Accessibility: Easy access to the destination is a fundamental aspect of successful beach and island tourism. Airports, ferry services, and well-maintained roads ensure smooth travel for visitors. For islands, boat and cruise services often add an adventurous element to the journey, making it part of the overall experience.
- Recreational facilities and services: Islands and beaches should have well-designed recreation facilities such as buoys, platoons, boat docks, toilets and outdoor showers, and safeguard towers to support tourist activities.

Safety and Security: Safety is a critical component of any tourism product. Ensuring a safe environment through lifeguard services, disaster preparedness, and health facilities is essential for creating a positive tourist experience. Clear communication about potential risks and safety measures builds trust and confidence among visitors.

Environmental Sustainability: Responsible development is necessary for preserving the environment while fostering tourism growth.

Marketing and Promotion: Strategic marketing campaigns are crucial in creating a strong destination image and attracting target audiences.

Designing sustainable beach and island tourism products in fragile areas requires a focus on sustainable development of these destinations. As the demand for beach and island tourism increases rapidly, so do environmental degradation, overcrowding, and resource depletion. Key strategies for sustainable tourism development include environmental conservation, community involvement, sustainable infrastructure, and visitor management.

Protecting the natural environment is essential for the long-term success of beach and island tourism. Initiatives such as coral reef conservation, beach clean-ups, and waste management programs help preserve the destination's beauty and biodiversity. Engaging local communities in tourism development ensures economic benefits while preserving cultural heritage. This can be achieved by promoting local businesses, employing residents in tourism-related jobs, and supporting traditional crafts and cultural practices. Eco-friendly infrastructure, such as solar-powered resorts, rainwater harvesting systems, and minimal-impact construction, reduces the environmental footprint of tourism developments. Sustainable building practices not only protect the environment but also attract environmentally conscious travelers. For visitor management, managing tourist numbers is necessary to prevent overcrowding and minimize environmental impact. Measures such as visitor quotas, ticketed access to sensitive areas, and promoting lesser-known destinations can help distribute tourist traffic more evenly.

05 Site Planning and Design

Site planning is one of the most important stages in tourism product development. This involves choosing the right location, designing the infrastructure, and ensuring the site is accessible and sustainable. The design should take into consideration factors such as:

- **Management zones:** Ensuring that the site is within the designated management zones of the protected area. Tourism products and activities can be conducted in outdoor recreation areas, while most facilities and services are provided in service zones (Box 3.7).

Box 3.7 Protected area management zones

Protected area management zones play a crucial role in balancing conservation efforts with tourism activities and other uses. These zones are typically divided into different sections, each with specific guidelines and permitted activities to ensure minimal impact on the environment. The zones related to tourism includes:

Outdoor recreation zone is designated for various types of tourist activities, such as hiking, bird watching, and educational tours. These areas are carefully selected to provide visitors with immersive nature experiences while protecting the more sensitive regions of the park.

Service zone is the hubs where most facilities and amenities are located, including visitor centers, restrooms, and picnic areas. These zones are strategically planned to handle the influx of tourists and provide essential services without encroaching on the natural habitats.

Primitive or Wilderness Zones are areas where natural processes dominate. Roads and infrastructure are excluded, and manipulative management techniques are typically prohibited. Generally, only trails and a few basic temporary campsites are allowed, and these must be strictly controlled. These zones are primarily for protecting wildlife habitats and watershed heads rather than for tourism.

By clearly defining these management zones, protected area managers can implement effective conservation strategies, monitor human impact, and offer a range of recreational opportunities that align with the principles of sustainability and environmental stewardship.

Source: Lee and Middleton (2003)

- **Accessibility:** Making sure the site is accessible to all types of tourists, including those with disabilities.

  Universal Design (UD) should be considered providing access for all as much as possible. UD is "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design." Characteristics of any UD practice or product are that it is accessible, usable, and inclusive (Box 3.8).

- **Environmental impact:** Minimizing damage to the natural surroundings by using sustainable materials and low impact building techniques.

Box 3.8 Universal Design

The 7 Principles of Universal Design were developed by a team at the Center for Universal Design at North Carolina State University, first published in 1997. This group was led by Ronald Mace, an architect who was instrumental in advocating design that could be used by everyone, regardless of their abilities.

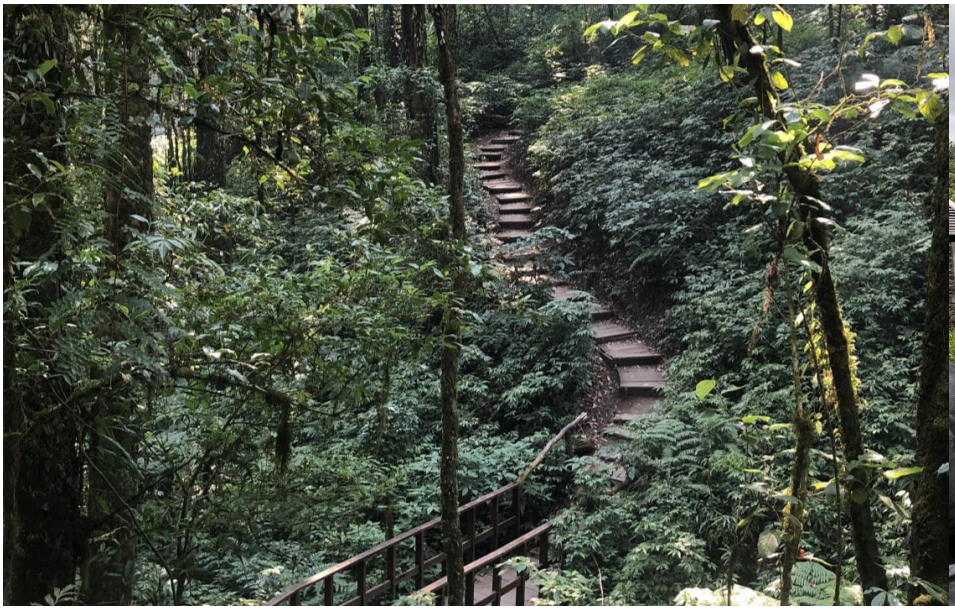
1. Equitable Use: The design is useful and marketable to people with diverse abilities. It should:
    - Provide the same means of use for all users: identical whenever possible; equivalent when not.
    - Avoid segregating or stigmatizing any users.
    - Make provisions for privacy, security, and safety equally available to all users.
2. Flexibility in Use: The design accommodates a wide range of individual preferences and abilities. It should:
    - Provide choice in methods of use.
    - Accommodate right- or left-handed access and use.
    - Facilitate the user's accuracy and precision.
    - Provide adaptability to the user's pace.
3. Simple and Intuitive Use: Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level. It should:
    - Eliminate unnecessary complexity.
    - Be consistent with user expectations and intuition.
    - Accommodate a wide range of literacy and language skills.
4. Perceptible Information: The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities. It should:
    - Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
    - Provide adequate contrast between essential information and its surroundings.
    - Maximize "legibility" of essential information.
5. Tolerance for Error: The design minimizes hazards and the adverse consequences of accidental or unintended actions. It should:
    - Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
    - Provide warnings of hazards and errors.
    - Provide fail-safe features.
6. Low Physical Effort: The design can be used efficiently and comfortably with a minimum of fatigue. It should:
    - Allow user to maintain a neutral body position.
    - Use reasonable operating forces.
    - Minimize repetitive actions.
    - Minimize sustained physical effort.
7. Size and Space for Approach and Use: Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility. It should:
    - Provide a clear line of sight to important elements for any seated or standing user.
    - Make reach to all components comfortable for any seated or standing user.
    - Accommodate variations in hand and grip size.

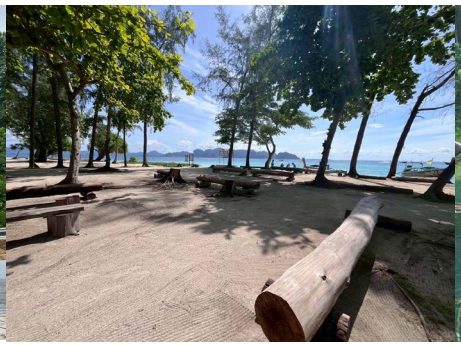
Source: The UD Project. https://universaldesign.org/definition

Tourist facilities and programs within protected areas should set standards for environmentally sensitive design and operations. Effective design and thoughtful operations can help increase local and visitors' awareness of key park values and demonstrate the protected area management's commitment to environmental protection. This can be achieved by:

- Minimizing the environmental impact of visitor support services.
- Creating an environment where visitors feel they are in a special place.
- Demonstrating environmentally sensitive design and operation practices to educate and show the value and practicality of sustainable solutions.
- Applying the Recreation Opportunity Spectrum (ROS) in protected areas helps protect the environment and offers diverse experiences, from untouched wilderness to well-developed zones with more infrastructure.

The planning and design requirements vary by situation. The guidelines for environmentally and culturally sensitive park tourism planning and design presented in Box 3.9 below are adapted from Eagles *et al.* (2002), The Tourism Council of Australia (1998), and the National Park Service of the United States. (1993).





Box 3.9 Guidelines for environmentally and culturally sensitive planning and design for park tourism

Environmental impact assessments:

- Determine if an environmental assessment is needed, covering ecological, social, cultural, and economic aspects.
- Develop a mitigation plan if required.

Landscape and site design:

- Prepare a context plan analyzing the surrounding area and community.
- Create a management plan addressing zoning, access, and relationship with nearby protected areas.
- Design a detailed site plan to reduce disturbance and intrusion.
- Consider Universal Design to provide access for all people in society.
- Consider tree retention, relocation, or replacement.
- Plant native vegetation to support wildlife habitats.
- Incorporate cultural features.
- Ensure connectivity with land use, human circulation, trails, facilities, etc.

Built facilities:

- Match height and mass with existing vegetation and topography.
- Include historical, cultural, and indigenous design elements.
- Construct facilities for energy efficiency, using renewable energy when possible.

Resource conservation and consumption:

- Minimize use and production of water, energy, waste, and emissions.
- Promote renewable energy sources.
- Use permaculture to turn waste into resources.

Materials

- Use local, low-maintenance, sustainable, or recycled materials.
- Ensure no waste during construction; use all materials brought to the site.
- Use certified products to ensure legal compliance and sustainability.
- Minimize carbon emissions by sourcing materials locally.

New and Low Impact Technologies

- Employ cost-effective, practical new technologies without causing negative impacts elsewhere.

Services

- Develop service standards for stakeholders including visitors, agencies, private sector, and staff.

Quality Control

- Adhere to protected area agency guidelines.
- Maintain baseline data to monitor construction and operation impacts.
- Set conditions allowing for investment in quality and visitor satisfaction.
- Hold regular meetings with managers and operators for issue resolution.

Green Practices

- Develop green purchasing policies and use biodegradable products.
- Implement water-saving practices like mulching and composting.
- Use bulk or re-usable storage containers.
- Create pest management plans and use reusable containers.
- Maintain equipment efficiently and encourage carpooling.
- Use environmentally sensitive marketing materials and electronic communications.

Programming

- Reward staff creativity and green practices
- Involve visitors in developing ongoing improvements.
- Consider partnerships with others.
- Develop high staff-to-client ratios.
- Incorporate monitoring into activities.

Relationship with the Local Community

- Consult with locals before development or changes.
- Maximize local employment opportunities.
- Buy local and encourage green products/services.
- Support local causes and organizations, allocate profits, and help visitors spend more time locally.
- Offer local work experience and upskill training.

Source: Eagles, *et al.* (2002); The Tourism Council of Australia (1998), and the US. National Park Service (1993)

06 Product life cycle management

Tourism products, like any other product, follow a life cycle that includes introduction, growth, maturity, and decline stages. It is important to monitor the product at each stage and implement strategies to keep it current and attractive. Innovation is particularly important during the product's maturity phase as market trends and customer preferences change over time. Regular updates, new experiences, or seasonal offerings can help maintain interest in the product.

Designing and developing a tourism product involves several considerations. These include ensuring sustainability, cultural authenticity, and adaptability in a changing market. By focusing on the local community, incorporating innovation, and responding to market trends, tourism products can stay relevant and appeal to both tourists and locals. A well-designed tourism product not only provides an excellent experience for travelers but also supports the sustainability and growth of the destination.

Final Notes

To develop tourism in protected areas, start by evaluating resources and their potential. Identify suitable markets that align with conservation goals. Plan tourism products, sites, and facilities with input from local communities, businesses, and stakeholders. Lastly, promote to attract visitors who focus on the conservation of sensitive elements.

Thailand tourism emphasizes community collaboration and environmental preservation by offering high-quality products and services that meet the needs of environmentally conscious tourists. Examples include organizing trekking tours, learning local lifestyles, and investing in sustainable infrastructure such as eco-lodges that use renewable energy and minimizing resource consumption (Tassanaipitukkul, 2024).

3.5.2 Tourism Management under Climate Change

The tourism sector and national parks are highly vulnerable to climate change (Table 3.6). Tourism at the same time contributes to the emission of greenhouse gases (GHG), which cause global warming. Threats to the sector are diverse, including direct and indirect impacts such as more extreme weather events, rise of sea level and coastline changes, increasing insurance costs and safety concerns, water shortages, biodiversity loss and damage to assets and attractions at destinations, among others.

In many Asia-Pacific economies, where tourism in the parks depends on beaches and other coastal resources are now facing the impact of rising sea levels (Crotts and Gay, 2023). The Asia-Pacific region accounts for over 70% of the world's natural disasters, such as frequent typhoons, record-breaking rainfall events, and sea level rise, all attributable to climate change.

Table 3.6 The effect of global climate change on park tourism and the contribution of tourism to climate change

Trends	Related issues/obstacles/ challenges	Leading questions to get answers for the issues
1. Impact of climate change on tourism resources and tourism activities	- Forest fires - PM 2.5 / air pollution - Coral bleaching - Shifted season of flower blooming - Water supply shortage - Less water in waterfalls, streams, lakes, and reservoirs affecting tourism activities - Frequent storms and heavy rains - Shift in tourism season	How to mitigate the climate impact on tourism in national parks? What are adaptation measures to cope with climate change?
2. Tourism impacts on climate change - Transportation - Food waste and other consumption leading to carbon footprints	- Using automobiles, consuming products, and creating biowaste during their stay creates carbon emissions - Knowledge gap on carbon emission measurement and tracking, mitigations, and offsetting methods - Marketing on low carbon and carbon neutrality tourism in national parks	How to measure carbon emissions and invent appropriate mitigation such as carbon offsetting? How do visitors change behavior regarding carbon emission? How to promote and actively perform low carbon tourism and finally carbon neutrality tourism? How do we do the marketing on low carbon and carbon neutrality tourisms?

Sustainable Tourism Management Practices Towards Climate Change

As climate change impacts fragile tourism areas, adopting sustainable practices is crucial to reduce environmental harm and build resilience.

1) *Carbon Footprint Reduction Strategies:* Reducing carbon emissions involves energy-efficient technologies, renewable energy, waste reduction, low-carbon transportation, and carbon offset programs.
2) *Sustainable Resource Use:* Water conservation, waste management, and sustainable sourcing minimize ecological impact while enhancing visitor experiences.
3) *Eco-Friendly Infrastructure Development:* Sustainable infrastructure, guided by certifications like LEED, includes natural ventilation, energy-efficient lighting, and sustainable materials for accommodation, and visitor centers.
4) *Community Involvement and Capacity Building:* Engaging local communities in tourism planning and providing training on sustainable practices promotes adaptation and mitigation efforts.
5) *Monitoring and Reporting:* Effective implementation requires monitoring, KPIs, data analytics, and transparent reporting of environmental and social impacts, building trust with stakeholders.
6) *Innovation and Technology Integration:* Adopting innovative technologies like smart sensors, blockchain, and virtual reality enhances sustainability, operational efficiency, and responsible travel experiences.

Sustainable tourism management is crucial for tackling climate change. Prideaux (2024) proposes an AMMER system—Assessment, Monitoring, Management, Evaluation, and Reassessment—to enhance traditional methods (Annex 1). The scope includes a case study of the Great Barrier Reef and Wet Tropics Queensland World Heritage Areas.

Adaptation Strategies for Tourism

As climate change impacts fragile area tourism, effective a daptation i s c rucial. Rising temperatures, extreme weather, and sea levels threaten natural attractions and infrastructure. Key strategies include upgrading infrastructure to withstand extreme weather, protecting ecosystems like coral reefs and wetlands, and adopting sustainable practices.

Successful examples include Australia's Great Barrier Reef by implementing comprehensive coral restoration programs and reducing local pollution to improve water quality. Effective a daptation r equires s upportive p olicies a nd a ctive community engagement. Governments must support sustainable practices and fund projects.

The case study of Quintana Roo, Mexico is an example of strategies provided in protected areas to alleviate impacts from sea rise.

Climate Change Mitigation in Tourism

Climate change mitigation in tourism aims to reduce the sector's carbon footprint and overall environmental impact. As a significant global industry, tourism has a role in addressing climate change through strategies that minimize greenhouse gas emissions, improve energy efficiency, and promote sustainability in all areas of the tourism value chain. Tourism contributes to climate change primarily through transportation, accommodation, and recreational activities, each generating carbon emissions.

Mitigating these emissions requires an integrated approach using renewable energy sources, advanced technologies, and sustainable practices. Innovations such as energy-efficient transportation options, green building standards for accommodation, and low-impact recreational activities are key components of this effort. Additionally, the fragile area tourism should adopt carbon offset programs and Sustainability Certifications to show its commitment to environmental stewardship.

Effective mitigation requires baseline data and measurement of carbon emissions. It involves collaboration among government agencies, tourism operators, and local communities. Policies promoting sustainable practices and green technologies are essential for systematic change. Consumer awareness and demand for eco-friendly travel options are driving more sustainable tourism offerings.

Mitigating tourism's impact on climate change is necessary for the sustainability and viability of tourism in sensitive areas. Implementing comprehensive mitigation measures can help the tourism sector in protected and fragile areas contribute to global climate objectives and enhance its resilience and sustainability.

3.5.3 Tourism Standards

The Importance of Tourism Standards

Protected areas and fragile ecosystems are of immense value to biodiversity, ecological balance, and the cultural heritage of regions. However, these areas are often vulnerable to environmental degradation, especially when exposed to unregulated tourism. The implementation of tourism standards plays a crucial role in protecting these areas while enabling sustainable tourism practices.

Preserving biodiversity and fragile ecosystems: Tourism standards ensure that the activities of tourists and tourism operators do not disturb the delicate balance of these environments. By regulating visitor numbers, creating designated pathways, and enforcing environmental guidelines, tourism standards help protect the flora and fauna unique to these areas. This is vital for maintaining the biodiversity that these ecosystems support, preventing habitat loss and protecting endangered species.

Promoting sustainable tourism practices: Sustainable tourism practices, guided by well-established standards, contribute to the longevity of protected and fragile areas. Standards encourage the adoption of eco-friendly practices such as waste management, energy conservation, and the use of sustainable materials. These measures minimize the negative impact of tourism activities on the environment, ensuring that the natural beauty and resources of these areas are preserved for future generations.

Enhancing visitor experiences and education: Tourism standards not only protect the environment but also enhance the visitor experience. By providing clear guidelines and educational programs, tourists become more aware of the significance of the areas they visit. This fosters a deeper connection and appreciation for nature, encouraging responsible behavior. Interpretive trails, informative signage, and guided tours are some ways standards can enrich visitor experiences while promoting conservation awareness.

Supporting local communities: Protected and fragile areas often coexist with local communities whose livelihoods can be significantly impacted by tourism. Tourism standards ensure that these communities benefit from tourism in a sustainable manner. By promoting community involvement and fair economic practices, standards help generate income while preserving cultural heritage. Local communities can offer unique

experiences to tourists, such as cultural tours and traditional crafts, creating a mutually beneficial relationship between tourism and local development.

Ensuring long term conservation goals: The ultimate goal of tourism standards in protected and fragile areas is to ensure long-term conservation. By aligning tourism activities with conservation objectives, these standards help maintain the ecological integrity of these areas. Tourism becomes a tool for conservation rather than a threat, as revenues generated through tourism can be reinvested into conservation initiatives. Additionally, standards help build political and public support for conservation efforts, emphasizing the importance of protecting these areas.

Partnerships: Tourism standard typically involve partnerships, as achieving the standards alone can be quite difficult. Japan is a good example of collaborating stakeholders for greener destination towards sustainable tourism (Takayama, 2024). Figure 3.11 shows the leading stakeholders in sustainable tourism development under the Global Sustainable Tourism Council Criteria (GSTC) for green destinations in Japan.

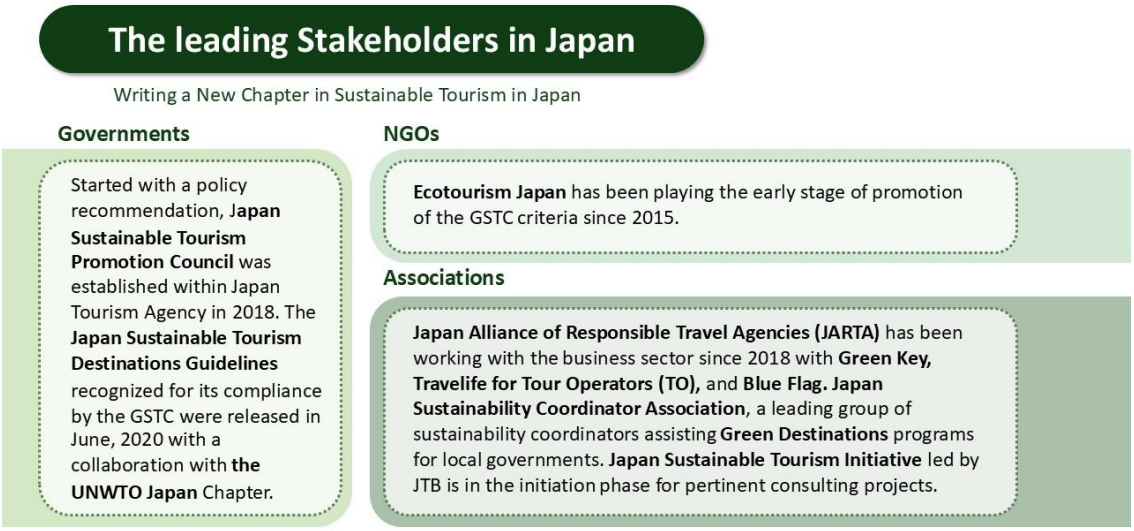


Figure 3.11 The leading stakeholders in sustainable tourism development under the Global Sustainable Tourism Council Criteria (GSTC) for green destinations in Japan

International recognition and collaboration: Adopting recognized tourism standards can enhance the international profile of protected and fragile areas. This can attract funding, expertise, and partnerships from global conservation and tourism organizations. International recognition also fosters collaboration between economies, leading to the sharing of best practices and innovative solutions for sustainable tourism and conservation.

This handbook presents two recognized international standards: The IUCN Green List and The Global Sustainable Tourism Council Standard (GSTC).

The IUCN Green List

The IUCN Green List is a certification program for effectively well-managed, and fairly governed protected and conserved areas.

The IUCN Green List, launched at the 2014 World Parks Congress in Sydney, is a tool to benchmark the performance of Protected Areas (PAs) and certify sites. It is an internationally applicable standard. Joining the Green List connects an area to a global community of protected and conserved areas, gaining global recognition for successful management. By committing to the IUCN Green List of Protected and Conserved Areas Standard, site managers must demonstrate and maintain performance and deliver tangible conservation results. Successful parks, like Australia's Arakwal National Park, China's Mount Huangshan World Heritage Area, and Colombia's Gorgona National Park, have been recognized for their management and engagement with local communities and conservation.

The IUCN Green List Standard comprises four components essential for nature conservation in protected and conserved areas: Good Governance, Sound Design and Planning, Effective Management, and Successful Conservation Outcomes. There are seventeen criteria covering these components that collectively describe the efforts needed for achieving the global sustainability standard.

Areas aiming for IUCN Green List status must demonstrate adherence to the standard through a three-step process: entering the Application Phase with a self-assessment,

progressing through phases evaluated by a technical Expert Assessment Group for the Green List (EAGL), and impartial review. Stakeholder views and consensus inform ongoing performance. The IUCN Green List User Manual outlines implementation procedures to ensure consistency and objectivity.

Sites on the IUCN Green List are certified as effectively managed and governed with long-term positive impacts on people and nature. They are evaluated every five years against demanding criteria defined by the IUCN Green List Standard.

The IUCN Green List Concept

The Green List focuses on the good management of sites rather than their significance. Discussed at global forums of protected area leaders, it stems from the management effectiveness work of the WCPA.

The process monitors and rewards protected areas meeting international standards and demonstrating successful biodiversity conservation outcomes, effective management, and equitable governance. Practices are documented by the responsible agency, assessed by an independent domestic reference group, and endorsed by IUCN. Reference groups include experts in areas such as protected area management, biodiversity conservation, science, NGOs, communities, and tourism. Nominations follow the Green List Protected Area assurance procedure and are reviewed by independent assessors. The program is led by the IUCN's Global Protected Areas Program, with regional staff and the World Commission on Protected Areas driving the process.

Nominated protected areas must meet standards for conservation objectives, legitimate establishment, effective management, governance, and visitor experience before listing. Focusing on management levels, it is more substantive than systems concentrating only on processes.

IUCN Green List and Tourism

The IUCN Green List certified system recognizes the need for global standards in protected area management. Although not focused solely on tourism, it considers visitor management where relevant. Tourism and protected areas are natural partners; parks rely on visitors and tourism for support. Public advocacy is vital for maintaining political support and funding for protected areas. Visitor fees and tourism operations can significantly contribute to park income, fostering awareness and appreciation of nature's plight. Increasingly, tourism's role in protected areas presents opportunities for conservation-focused tourism operators to partner with protected areas, providing high-value experiences and sustainable income for conservation. Local communities can also collaborate with tourism and conservation bodies to expand development opportunities. The IUCN Green List aims to enhance tourism quality within sites, ensuring real conservation impacts that benefit people, economies, and the environment (Box 3.10).

Box 3.10 Benefits of The IUCN Green List in protected area tourism

- Promotes effective and equitable management of protected areas.
- Supports biodiversity conservation and sustainable tourism practices.
- Enhances international recognition and political support for protected areas.
- Acknowledges the efforts of park staff.
- Improves tourism quality and conservation outcomes.
- Fosters public awareness and financial support for conservation initiatives.
- Encourages sustainable income for local communities through tourism partnerships.

The Global Sustainable Tourism Council Standard (GSTC)

The Global Sustainable Tourism Council is setting leading standards specifically for tourism. The standard is complementary, with one addressing tourism management and the other focusing on criteria that value and conserve nature. While ensuring global consistency, the criteria provide flexibility to address specific contexts through detailed indicators. Together with the Green List standard, a comprehensive approach to managing tourism within protected areas can now be facilitated with clear guidelines and mechanisms for action.

There are two sets of GSTC Criteria: Destination Criteria (GSTC-D) and Hotel & Tour Operator Criteria (GSTC-H&TO). These criteria represent guiding principles and minimum requirements that any tourism business or destination should aspire to achieve to protect and sustain the world's natural and cultural resources, while ensuring that tourism meets its potential as a tool for conservation and poverty alleviation. Sustainability is imperative for all tourism stakeholders and must translate words into actions (GSTC, 2025).

The GSTC Criteria are the first and most substantive global set of standards for sustainable tourism. They are the result of a worldwide effort to develop a common language about sustainability in tourism. Focusing on social and environmental responsibility, as well as the positive and negative economic and cultural impacts of tourism, the criteria are organized into four topics:

- Sustainable management
- Socioeconomic impacts
- Cultural impacts
- Environmental impacts (including consumption of resources, reducing pollution, and conserving biodiversity and landscapes)

GSTC evaluates the standards of other organizations through the Integrity Program, based on analysis by the GSTC's independent, objective, and neutral Accreditation Panel. There are three such marks: GSTC Recognized, GSTC Approved, and GSTC Accredited. The Criteria are the minimum, not the maximum, which businesses and destinations should achieve to approach social, environmental, cultural, and economic sustainability. Since tourism destinations each have their own culture, environment, customs, and laws, the criteria are designed to be adapted to local conditions and supplemented by additional criteria specific to the location and activity (GSTC, 2025).

How to Become a Certified Destination

GSTC can assist destinations in their early stages towards sustainability before they are ready to apply for certification. Please see the GSTC Destination Program for more details. To become certified, tourist destinations must:

- Compare and select a Certification Body from a list of "Certification Bodies" that are Accredited or "Certification Schemes" committed to partnering exclusively with accredited Certification Bodies.
- Register and/or contract with a Certification Body.
- Submit application/documentary evidence to the Certification Body.
- Undergo an onsite audit.
- Receive certification.

The Certification Bodies listed below have been accredited by GSTC to certify destinations. These bodies and their certificate-holders are authorized to display the designated GSTC

Logo, upon completion of a licensing agreement with GSTC. To be certified by these GSTC-Accredited Certification Bodies for Destinations, visit their links below.

GSTC-Accredited Certification Bodies for Destinations		Link
EARTHCHECK	EarthCheck	Get Certified by EarthCheck
GREEN DESTINATIONS	Green Destinations	Get Certified by Green Destinations
Vireo Certifications of Sustainability	Vireo Srl	Get Certified by Vireo Srl

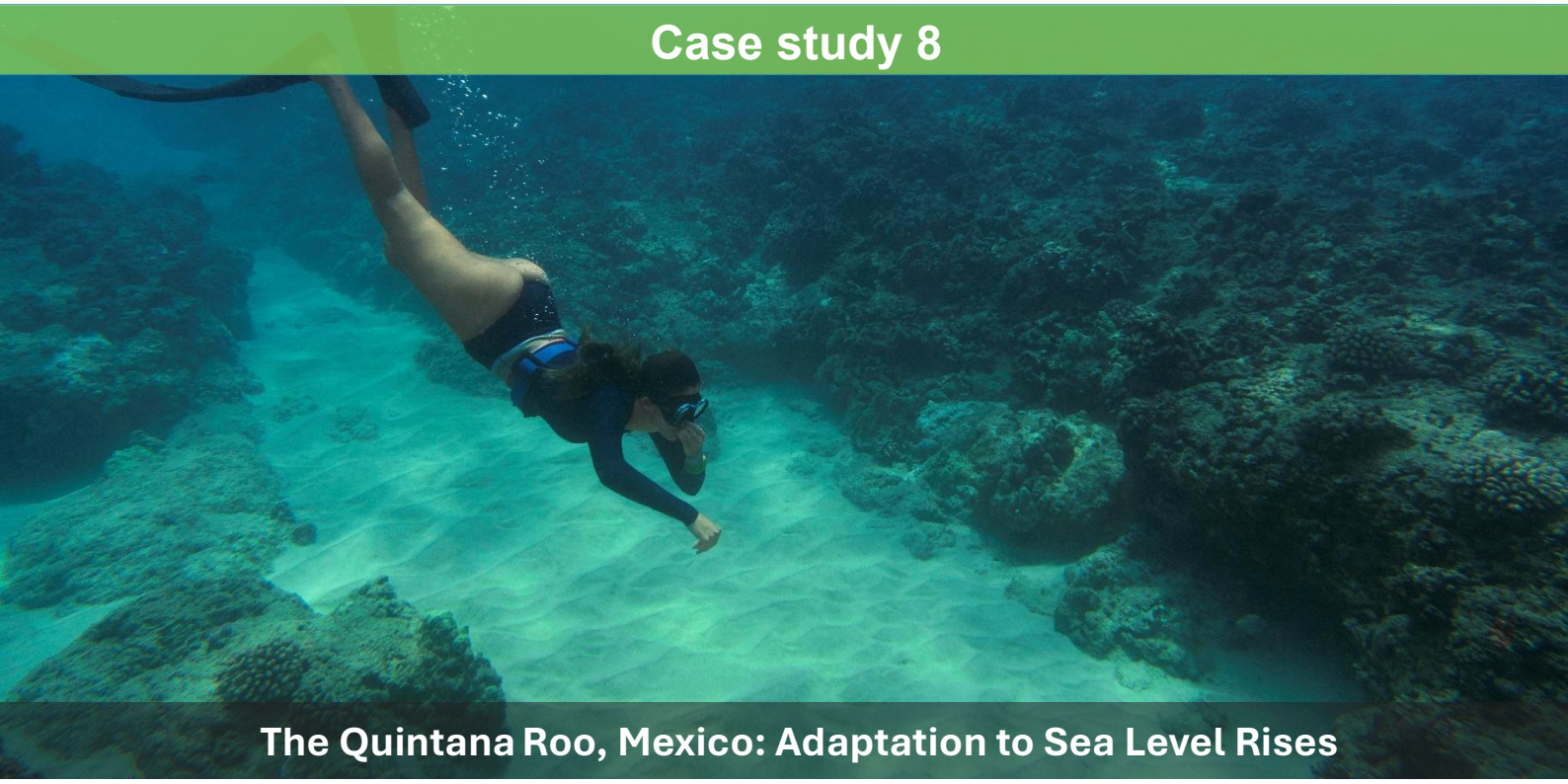
Source: GSTC https://www.gstcouncil.org/certification/become-certified-destination/

GSTC-Recognized Standards for Destinations

GSTC-Recognized Standards adhere to the GSTC Criteria, ensuring sustainable tourism practices. A standard recognized by GSTC has been reviewed and deemed equivalent to the GSTC Criteria. However, GSTC Recognition does not ensure the reliability of the certification process, but only that the set of standards includes the minimum sustainability elements. A Certifying Body using a GSTC-Recognized standard may apply for GSTC-Accreditation, indicating the quality and neutrality of their certification process. The following standards have been recognized as aligned with the GSTC Destination Criteria:

- The Cape Verdean Standard of Sustainability for Destinations
- Criteria for Thailand's Community-Based Tourism Development (CBT Thailand)
- Destination Wayfinder framework and standard
- EarthCheck Destination Standard
- Green Destination Standard (GDS)
- Green Step Sustainable Tourism Destination Standard
- Indonesia Sustainable Tourism Destination Standard (Indonesia-STD)
- Innovation Norway's Sustainable destination standard
- Japan Sustainable Tourism Standard for Destinations (JSTS-D)
- Korea Sustainable City Tourism Destination Standard
- Mountain IDEAL Destinations Standard
- Pacific Sustainable Tourism Destination Standard
- South Tyrol's Sustainable Tourism Standard
- Thailand's Sustainable Tourism Management Standard

Case study 8



The Quintana Roo, Mexico: Adaptation to Sea Level Rises

Key messages

- Environmental preservation and protection through the designation of protected areas where major construction and resource extraction are prohibited.
- Environmental restoration has primarily involved insurance-funded rebuilding of damaged coral reefs.
- Both measures have provided significant socioeconomic benefits.

General Information

Quintana Roo, a Mexican state on the Yucatán Peninsula, is famous for Cancún and the Riviera Maya. It exemplifies how tourism involving nature can thrive alongside mass tourism, showing that preserving coastal natural areas can support both environmental health and local economies. Nature-based tourism and fishing benefit from these efforts, demonstrating the dual value of environmental and economic sustainability.

The Issues:

- Rising sea levels
- Environmental preservation yielding socioeconomic benefits

The practices

1. **Environmental preservation in Quintana Roo**

Preservation by designated protected areas where construction and resource extraction are prohibited. Quintana Roo contains nineteen federally recognized protected natural areas covering 6,557 square kilometers of land and 63,837 square kilometers of marine area. These areas serve as a defense against rising sea levels, offering benefits for other coastal regions.

Protected areas in Quintana Roo absorb toxic substances in seawater and carbon dioxide in the atmosphere, prevent shoreline erosion, provide habitat for commercial fisheries and endangered species, purify water before its discharge into the ocean, absorb excess seawater from hurricanes, floods, and tsunamis, serve as research and education sites, and offer ecotourism experiences that economically benefit nearby communities.

Preserving mangrove forests is crucial as they help defend coastlines from sea-level rise. The benefits include reducing wave damage during storms, diminishing tsunami heights, lessening flooding impacts, lowering wind speed, minimizing surge impact, and binding soils to reduce erosion.

As an alternative to developing beachfront resorts, preserving nature in coastal areas avoids the need for beach replenishment, which involves hauling sand and can damage reefs vital for commercial fisheries.

2. **Partnerships**

The Amigos de Sian Ka'an organization offers technical support and training to Mayan communities engaged in ecotourism and helps the federal Secretariat of Environment and Natural Resources with resource management and environmental education.

Additionally, a public-private partnership including the Quintana Roo government, tourism representatives, Swiss Re, and The Nature Conservancy (TNC) secured an insurance policy to protect the coral reef off Puerto Morelos in the Riviera Maya. This was the first insurance policy of its kind.

Launched in 2018 by Swiss Re and The Nature Conservancy, the Quintana Roo Reef Protection policy is a parametric insurance policy designed to protect 100 miles of the Yucatan Coastline in Mexico. Unlike traditional indemnity insurance, parametric insurance pays claims immediately when specific conditions are met. For Quintana Roo, payouts are triggered when hurricane wind speeds hit pre-set levels, enabling fast funding for coral reef repairs. The Coastal Management Zone Trust bought the policy using tourism fees, property owner contributions, and government funds. This policy supports reef maintenance and financial stability for the local community.

TNC and project partners in Mexico created post-storm response teams called Reef Brigades to quickly repair storm-damaged reefs. When Hurricane Delta struck the Caribbean coast of Mexico in 2020, the Brigades stabilized large- and medium-size coral colonies and gathered over 8,000 coral fragments broken by the hurricane, planting them back in the reef to aid recovery. The insurance policy was activated. A USD 800,000 payment was made to support post-storm response and extensive repair efforts on the reef. The team stabilized 1,200 large coral colonies that had been displaced and transplanted 9,000 broken coral fragments. Smaller scale recovery efforts also took place in Cancun, Nizuc and Isla Mujeres Reef National Park.

This marked the first use of an insurance policy for reef restoration. Currently, the model has also been tested and replicated across different ecosystems such as protecting wetlands from typhoon and drought risks. Swiss Re has also worked with China Pacific Insurance Company to protect the Gross Ecosystem Product GEP value of the National Wetland Park (Hangzhou Bay). The price of the insurance policy is based on the GEP value, measured by carbon sequestration and wetland maintenance and restoration costs.

The Results

Socioeconomic Benefits of Environmental Preservation and Restoration in Quintana Roo.

In 2022, Quintana Roo received an estimated 19.6 million visitors, many attracted to Cancun and the Riviera Maya. This visitor base presents opportunities for nature-based tourism experiences. Tripadvisor lists 125 commercial tours in the state focused on such experiences, often within protected areas. Some tours include educational components, like the Síijil Noh Há ecotourism center, where visitors hear about ecological issues from a biologist, including climate change, carbon footprint, and tree carbon capture.

Environmental preservation and restoration in Quintana Roo bring significant socioeconomic benefits. Protecting natural areas offers tourists education, relaxation, inspiration, exercise, and adventure, while ensuring fishers have habitats free from silt and contaminants. Fishers benefit from tourism by selling more catches and transporting tourists to reefs and lagoons.

This symbiotic relationship between environmental preservation and sustainable development supports both commercial fishing and nature-based tourism. Preserving these natural areas maintains habitats for fisheries and attracts tourists. In turn, the income from fishing and tourism sustains local livelihoods and helps keep coastal natural areas intact.

Information sources:

1. Crotts, John C and Christina Gay. 2023.
2. Green Finance Institute. 2025. *Quintana Roo Reef Protection (Parametric Insurance)*. https://hive.greenfinanceinstitute.com/gfihive/revenues-for-nature/case-studies/quintana-roo-reef-protection-parametric-insurance/

Case study 9

The Green List: Mount Huangshan Scenic Area, China

General Information

Known as "the loveliest mountain of China," Mt. Huangshan Scenic Area is well known for its scenery, sunsets, peculiarly shaped granite peaks, Huangshan Pine trees, and views of the clouds from above.

Huangshan is a frequent subject of traditional Chinese paintings and literature, as well as modern photography. It is a UNESCO World Heritage Site, Global Geopark and Biosphere Reserve.

Since the 1970s, Huangshan has been managed by the same growing organization. It has enough support for finance, human resources, policy, and government. Huangshan has been enjoying a good reputation in China for both the scenery, protection, and management.

The Issues and Objectives

The area requires an effective tool for co-management of the MIDAs, to address issues such as conservation, good governance, community benefits, tourism development, and a certification system. This will help them understand the current situation and implement improvements as well as recognition in the international conservation community.

Key messages

- The Green List is a certification system for global standards in protected area management. It emphasizes the importance of tourism and partnerships between conservation and tourism in supporting biodiversity and responsible business practices.
- IUCN Green List offers UNESCO MIDAs (Ramsar Sites, World Heritage sites, Biosphere Reserves, and UNESCO Global Geoparks) a new tool for effective co-management.
- Over 30 years, the site has positively evolved in landscape conservation, tourist management, and developing alternative livelihoods for local communities.
- The IUCN Green List recognizes Mt Huangshan for achieving effective, equitable management that supports biodiversity conservation and sustainable tourism, highlighting their successful management, community engagement, and exceptional team efforts in meeting or exceeding all standards.

The Model

Mount Huangshan was added to the IUCN Green List in 2014 during the pilot phase of the list. It has achieved successful outcomes in biodiversity conservation, effective management, and equitable governance. The application of the Green List involves documenting evidence of these practices by the site's management agency, which is then assessed by an independent domestic reference group and endorsed by IUCN.

The program is led by the IUCN's Global Protected Areas Program via a global steering committee, which is responsible for the design of the program as well as receiving and reviewing all assessor reports. Regional protected area staff along with the World Commission on Protected Areas, in collaboration with protected area management agencies or other responsible management bodies, including private and community-managed protected areas, drive this process.

The reference groups consisted of individuals with diverse roles and expertise, including protected area management, biodiversity conservation, scientists, NGO representatives, community leaders, and tourism and visitor management professionals. Mt. Huangshan Nomination was prepared in accordance with the Green List Protected Area assurance procedure. Once approved by the reference group, nomination underwent a review by an independent assessor.

The Expert Assessment Group for the Green List (EAGL) summarized the evaluation of Mount Huangshan Scenic Area for the IUCN Green List as presented below. Certified in 2020, it is recognized for effective management and governance with long-term benefits for people and nature. It will undergo evaluation every five years based on the IUCN Green List Standard, which includes protection quality and effectiveness against threats.

A clearly defined governance structure

Mt. Huangshan has a clearly defined governance structure that conforms to domestic and regional government regulations. Its Management Committee currently has 935 employees, including 115 female managers. It has another two companies with more than 4,000 employees. There are more than 70 laws and regulations related to the management of the site.

Master plan and implementation

Mt. Huangshan's master plan was compiled and completed by the Urban Planning and Design Institute of Beijing Tsinghua University. In addition, various methods have been formulated to implement the plan and guide specific work, such as the River Chief system, the Forest Chief system work plan, forest plant quarantine inspection management methods, and the management method of prohibiting motorbikes in the south gate of the site.

Resource protection and biodiversity conservation

Mt.Huangshan main protection objectives are the landscape resources based on geomorphology which have been well conserved. Also, according to domestic policies, all forestry areas in the site are domestic key public welfare forests, and the strictest protection measures are implemented. Huangshan has done a lot of prevention and control of forestry pests (mainly pine wood nematode disease) and forest fire. Huangshan is also actively improving the conservation of biodiversity. The "Huangshan Biodiversity Conservation and Sustainable Utilization" (Huangshan GEF Project) is being carried out.

Tourism management

Mt. Huangshan is an important tourist attraction with a daily visitor flow limit of 50,000 people. During the COVID-19 outbreak, timely and strict control measures were implemented to reduce the number of visitors to 15,000 per day and to strengthen the disinfection of public areas.

Community livelihood

There are 1,225 small and medium-sized enterprises in the community. The management committee has maintained close relations with nearly 200 travel agencies and more than 300 other affiliates (transportation, hotel, shopping malls and interpretation companies), making them realize that jointly protecting Huangshan is to protect their common interests.

In 30 years, the site has experienced a very positive evolution in terms of landscape conservation, tourist management and the local community's alternative livelihoods development. It has a long-term good brand effect. It has signed a global geopark brand

sharing mechanism, joined the Scenic Spots Association, the Geological Society of China, the Geographical Society, etc., joined these associations, and actively participated in training and exchange, dedicated to protecting human and natural heritage, promoting community development, and sharing experience. Additionally, it established a prestigious school forum with universities and a scientific research practice base.

The Impacts

1. Conservation

The concept of green development has promoted resource protection and sustainable development. Despite the increase in tourist numbers, the forest coverage rate of Huangshan increased from 56% in the 1970s to 98.29% in 2019.

As a Global Geopark and Biosphere Reserve, the understanding of biodiversity has improved. Systematic protection of mountains, water, forests, and lakes has been enhanced. They are considered an entire living community in China.

The concept of equitable governance and indicators of the Green List are applied for the integrated management of UNESCO World Heritage Sites, Global Geoparks, and Biosphere Reserves.

2. Good governance

Mature legal system: Regulations and Master Plan for Huangshan Scenic Area are approved by the higher government, with detailed plans reviewed by various governmental levels.

Strong support: The committee includes 935 employees (115 female managers), and two additional companies handle tourism and marketing with over 4,000 employees. Funds come from ticket sales and government support. More details are on the Huangshan official website.

Risk and emergency management: Dedicated departments and technicians handle natural hazards, forest fires, pandemics, and tourist safety.

3. Community benefits

The sharing concept has promoted harmonious development between the protected area (PA) and the community. Approximately 150,000 people from surrounding communities are involved in heritage protection, tourist services, and product sales. The compensation for these communities amounts to around RMB3 million annually.

Agreements with community governments have been established, encompassing decision-making, cooperative mechanisms for planning and implementation, environmental education, and compensation. The increased income benefits n ot only adjacent towns but also the entire Huangshan City, owing to Huangshan's positive reputation throughout China. Huangshan contributes nearly a quarter of the city's income. In 2019, the Huangshan scenic area attracted over three million visitors, generating more than RMB3 billion in revenue and RMB400 million in taxes.

Local students and youth possess a deeper understanding of the protected area compared to previous generations. Various educational activities are conducted to enhance their knowledge, fostering pride in their hometown.

Photo credit: JIN Wenjia, IUCN China (2024)

Case study 10

The Green List: Arakwal National Park, Australia

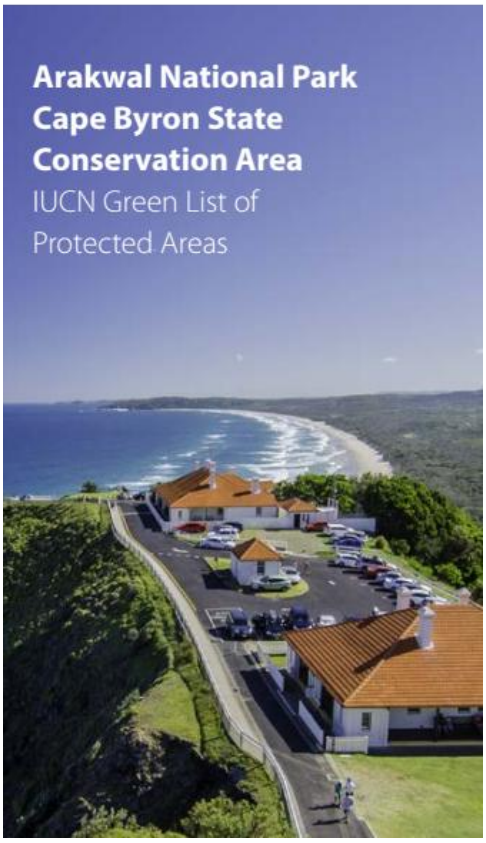
General Information

Cape Byron is situated 770 kilometers north of Sydney on the northern coast of New South Wales. It is the easternmost point of the Australian mainland. Arakwal National Park and the adjacent Cape Byron State Conservation Area cover 298 hectares of coastal heath, dunes, wetlands, and rainforest.

Despite their small size, the parks support high biodiversity and tourism. Some species and habitats are found nowhere else in the world such as the Byron Bay Graminoid Clay Heath and the Byron Bay orchid, both of which are protected and being restored using a cross-cultural conservation planning approach. In addition, Cape Byron SCA is an internationally renowned tourist destination that receives two million visitors. All revenue generated is directed back to the management of the site.

These parks are jointly managed by the NSW National Parks and Wildlife Service and the local Aboriginal Byron Bay Arakwal people, who are the traditional custodians of these lands. The parks preserve areas significant to the Arakwal people, whose cultural perspectives consider reserve boundaries as artificial concepts. The Cape Byron State Conservation Area is a globally recognized tourist attraction, known for its picturesque landscapes, the iconic Cape Byron lighthouse, and its surrounding heritage structures.

Office of Environment & Heritage
NSW National Parks & Wildlife Service



The Issues and Objectives

- Effective management is needed to address threats such as pests, weeds, and unplanned fires.
- Tourism certification with Green List standards aims to improve partnerships' viability, involving local Arakwal people, the community, and businesses in decision-making.
- Using Green List standards can attract ecotourists, increasing park income and creating jobs for local Aboriginal Byron Bay Arakwal people.

The Model

A case study of one of the initial Green Listed protected areas, Arakwal National Park in Australia, highlights the co-management with the Arakwal Indigenous people, the traditional owners of the land on which the reserve is located. The Arakwal National Park Management Committee has integrated tourism into its conservation strategy, providing biodiversity and cultural heritage education to visitors, employment opportunities for the Arakwal people, and income for the park (NPWS, 2007).

In detail, the case study illustrates effective management that meets the Green List criteria as follows.

Sound planning

Management of the reserves is guided by strategic plans including the Cape Byron State Conservation Area and Arakwal National Park plans of management, the Regional Pest Management Strategy and specific studies of species and communities that are of cultural significance or under threat. Strategic plans for conserving historic heritage assets include restoring them for tourist accommodation and development of long-term maintenance schedules.

Equitable governance

Both reserves are managed through an integrated approach involving co-management, which includes the participation of local Arakwal people, the community, and businesses in decision making. Arakwal was the first national park in Australia created under an Indigenous Land Use Agreement with the traditional owners. The Cape Byron State Conservation Area is managed by the Cape Byron Trust with equal representation by Arakwal people.

Effective management

Key threats such as pests, weeds, and unplanned fires have been strategically addressed, leading to the restoration of large areas of coastal habitat, elimination of goats from Cape Byron headland, and removal of coastal weeds like bitou bush. Efforts are being made to restore the endemic Byron Bay Graminoid Clay Heath community. The needs of over 1.2 million visitors annually are balanced with the protection of natural, Aboriginal, and historic values. The lighthouse and beachside cottages have been fully restored and are available for tourist accommodation.

Indigenous co-management

The Arakwal people have a longstanding connection with the area around Byron Bay dating back at least 22,000 years. There is substantial evidence of the Arakwal people harvesting plants and animals for food, medicine, and tools, and using fire to manage vegetation. Significant Aboriginal sites and artefacts are present, including three open camp/midden sites in Cape Byron State Conservation Area. Joint management has provided benefits for both co-managers. The Arakwal people have increased opportunities for spiritual and cultural connection to their land, employment, training, and education, while the National Parks and Wildlife Service has gained valuable knowledge of local ecosystems and their management.

The Impacts

The case study illustrates the benefits of having partnerships. Any sustainable and responsible activities that attract more visitors to protected areas will contribute to mainstreaming biodiversity and raising awareness of related issues. However, effective visitor management strategies must be implemented to ensure that visitor activities minimize stressors to environmental and cultural attractions. The IUCN Green List can draw attention to the park to meet the required standards. This approach supports tourism in and around these areas and contributes to the conservation efforts and local communities, creating a mutually beneficial model. It is expected that the Green List standards, in conjunction with tourism certification processes, will enhance the viability, benefits, and significance of these partnerships.

Successful outcomes Arakwal National Park and Cape Byron State Conservation Area are notable for effective management practices that:

- recognize and involve traditional owners in managing and working on their land
- protect nationally significant biodiversity values
- conserve important historic heritage features such as Cape Byron lighthouse
- offer educational programs and holiday accommodation
- provide recreational facilities for the local community and visitors

Information sources:

IUCN Green List. https://iucngreenlist.org/sites/arakwal-national-park/
NWS Government Environment and Heritage. https://www.environment.nsw.gov.au/research-and-publications/publications-search/arakwal-national-park-and-cape-byron-state-conservation-area-iucn-green-list-of-protected-areas

Photo credits:

1. https://www.visitnsw.com/destinations/north-coast/byron-bay-area/byron-bay/attractions/arakwal-national-park-0
2. https://panorama.solutions/en/solution/cross-cultural-conservation-planning-threathened-orchid-arakwal-national-park
3. https://iucngreenlist.org/fr/sites/arakwal-national-park/

Case study 11

GSTC Certified Destinations: Ixtapa Mexico, and Aspen Colorado, The United States

Ixtapa, Mexico

Ixtapa has joined Huatulco as one of only two EarthCheck Certified destinations in the Americas, enhancing the region's position as a leader in sustainable tourism. For over a decade, the Fondo Nacional de Fomento al Turismo (FONATUR) and EarthCheck have collaborated to strengthen the sustainable development of world-class destinations. Starting with Huatulco in 2005 and now with Ixtapa, FONATUR has achieved EarthCheck Silver Certified Status, confirming the destination's dedicated efforts towards sustainability. This process has been spearheaded by their Green Team, Equipo EcoZanca, and key tourism stakeholders such as Barceló Ixtapa Beach, Azul Ixtapa, and other EarthCheck members.

As part of their sustainability initiatives, Ixtapa aims to reduce waste through projects like the Azulita Project and has implemented strategies for efficient energy and water resource management. Additionally, environmental and social policies are in place, with ongoing community engagement in conservation efforts. In line with EarthCheck's mantra, 'you can't manage what you don't measure,' EarthCheck's benchmarking tool has provided Ixtapa with quantitative indicators to measure and monitor key sustainability aspects such as energy and water consumption, community contributions, CO2 emissions, and waste production.

EarthCheck's Standards are approved by the Global Sustainable Tourism Council (GSTC), which has enabled Ixtapa to be recognized by the GSTC. This signifies an extraordinarily strong commitment to sustainability policies and practices. This achievement clearly demonstrates how government, the private sector, and local communities can collaboratively deliver significant benefits to our world.

Information source: Eco-Business.
https://www.eco-business.com/press-releases/ixtapa-a-leading-destination-in-the-americas/

Aspen, Colorado, The United States

In August 2024, Aspen announced its Mountain IDEAL certification as a sustainable destination, achieved through collaboration among local organizations and individuals. This certification reflects Aspen's long-term commitment to environmental and sustainability programs.

Aspen has implemented over 50 sustainable practices and met more than 125 specific indicators, showcasing their dedication to responsible tourism management. The certification addresses challenges unique to mountain environments, such as water and energy use, affordable housing, collaboration with public land managers, and preserving cultural heritage.

The Aspen Destination Management Plan, launched in 2022, focuses on community resiliency and quality of life for residents while maintaining visitor appeal. Aspen has been recognized in the Green Destinations Top 100 Stories list for two consecutive years (2022 and 2023) for innovative practices.

Aspen's sustainability efforts include a goal to reduce carbon emissions by 100% by 2050 and initiatives like the Maroon Bells reservation system. Local businesses also receive sustainability training through the Colorado Green Business Network of Aspen.

In December 2023, Green Destinations assessed Aspen's sustainability practices, leading to official certification under the GSTC-Recognized Mountain IDEAL Standard in July 2024.

Information source: Aspen Defy ordinary (2025)
https://aspenchamber.org/media/press-releases/aspen-receives-mountain-ideal-certification

4 Going Forward for Sustainable Tourism in Protected and Fragile Areas

Ensure sustainability in protected/ fragile areas tourism

Protected areas, including national parks, wildlife reserves, and fragile ecosystems, are invaluable assets that harbor unique flora and fauna, cultural heritage, and pristine landscapes. These areas are vital for biodiversity conservation, scientific research, and the preservation of natural beauty. Sustainable tourism in such areas aims to conserve ecosystems, enhance the quality for local communities, and improve visitor experiences. It focuses on environmental protection as well as, social, and economic dimensions. However, the increasing demand for tourism in these areas poses significant challenges to their sustainability. Therefore, it is imperative to adopt principles of protected area tourism and implement them effectively to ensure long-term sustainability.

4.1 Principles of Protected Area Tourism

Below are 4 main principles of sustainable tourism management in protected and fragile areas.

1. Environmental Sustainability

- Maintain a healthy environment and protect natural ecosystems and resources essential for tourism activities like hiking, wildlife watching, and scuba diving. These should be managed safely and optimally for nature-based tourism.
- Minimize environmental impact by planning to prevent pollution, habitat destruction, and resource depletion. Ensure that tourism supports biodiversity conservation and outdoor recreation.
- Apply visitor management concepts such as carrying capacity and Limits of Acceptable Change (LAC) to prevent over-tourism and protect natural resources.
- Promote energy efficiency and a clean environment by reducing waste, using public transportation, and supporting renewable energy.
- Support conservation projects, research, and awareness raising initiative to protect biodiversity and ecosystems. Tourism can serve as a conservation tool, e.g., mitigating human-wildlife conflict and community-based initiatives.
- Address climate action by measuring and reducing greenhouse gas emissions and strengthening adaptive capacities.

2. Cultural Integrity

- Respect and preserve local cultural heritage, supporting traditional practices and customs.
- Promote cultural exchange to foster mutual understanding and appreciation among diverse cultures.

3. Economic Viability

- Enhance socio-economic benefits by creating employment, improving quality of life, and involving local communities in tourism development.
- Ensure fair distribution of economic benefits to local communities and support local businesses.
- Promote local entrepreneurship in areas such as crafts, food production, and eco-friendly accommodations.

4. Social Responsibility

- Engage local communities in decision-making processes and provide quality visitor experiences focused on nature-based activities.
- Raise conservation awareness through interpretation programs and educate tourists on responsible behavior to minimize ecological footprint.

Implementing these principles requires professional expertise and proper management to promote sustainable tourism, conserve the environment, respect biodiversity and cultural heritage, and enhance local welfare while providing quality visitor experiences. National parks can contribute to sustainable development without compromising biodiversity conservation.

4.2 Implementing Principles into Practices

1. Planning and Management

- *Develop tourism strategies and tourism management plans or destination management plans:* Tourism strategy and management plan should integrate sustainability principles, including environmental impact assessments, carrying capacity analysis to determine the acceptable impact level, and zoning regulations to protect natural and cultural resources.
- *Establish monitoring and evaluation systems:* Regular monitoring and evaluation of tourism activities in protected areas can help identify and address potential impacts, ensuring that management plans are effective and adaptive.

2. Visitor Management

- *Limit visitor numbers and impacts on visitor use:* Implementing visitor management strategies such as limiting the number of visitors during peak seasons can help reduce the pressure on fragile areas.
- *Create alternative attractions:* Developing alternative attractions can disperse visitor load, reducing the impact on popular sites while still providing engaging experiences for tourists.
- *Enhance visitor education programs and nature interpretation programs:* Implementing educational programs that encourage responsible behavior among tourists can significantly reduce their impact on the environment and local communities. Providing meaningful interpretation can enable tourists to appreciate the importance of fragile natural ecosystems, increase awareness, and foster positive behavior towards nature conservation.

3. Community Participation

- *Conduct regular consultations:* Engaging local communities through regular consultations can ensure that their perspectives are considered in tourism planning and development.
- Provide capacity building opportunities: Offering training and capacity building opportunities for local communities can enhance their ability to participate in and benefit from tourism activities.
- *Ensure equitable distribution of benefits:* Ensuring that tourism benefits are equitably distributed among local communities can help build support for sustainable tourism practices.

4. Stakeholder Partnerships

- *Foster partnerships:* Collaborative initiatives between government agencies, non-government organizations, private sector operators, and local communities can leverage resources, share expertise, and enhance the effectiveness of sustainable tourism practices.
- *Promote multi-stakeholder dialogue:* Encouraging dialogue and collaboration among stakeholders can help identify common goals, resolve conflicts, and develop integrated approaches to sustainable tourism management.

5. Tourism Product Development

- *Develop eco-friendly facilities:* Creating eco-friendly facilities that minimize environmental impact and support local communities can enhance the sustainability of tourism in protected areas.
- *Provide guided tours that focus on conservation:* Guided tours with local guides who share information about conservation and the significance of preserving natural and cultural heritage can encourage responsible behavior and support conservation efforts.
- *Support local crafts and products:* Promoting local crafts and products can provide economic benefits to local communities and enhance the cultural experience for tourists.

6. Tourism Standards

- *Develop and encourage tourism standards:* Developing and encouraging international tourism standards and certification programs that recognize and reward sustainable tourism practices such as IUCN Green List and GSTC standards or GSTC recognized standards and enforcing domestic tourism standards to be established and certified for sustainable tourism in protected areas can help ensure that tourism activities and destination development adhere to sustainability principles.
- *Cover aspects of environmental management, social responsibility, and economic viability:* Tourism should encompass a wide range of aspects, including environmental management, social responsibility, and economic viability, to ensure inclusive sustainability.

4.3 Protected Area Tourism Under Climate Change

The climate change crisis poses a significant threat to tourism in protected and fragile areas. Therefore, managing tourism in these areas under changing climatic conditions requires careful and urgent attention to the aspects.

4.3.1 Potential Solutions of Climate Change Impacts to Protected Area Tourism

1. Climate -Resilient Planning

Integrate climate change scenarios: Management plans should take into account future climate change scenarios and their potential impacts on protected areas. This includes assessing vulnerabilities and developing adaptation strategies to mitigate risks.

2. Ecosystem-Based Adaptation

Enhance ecosystem resilience: Implementing ecosystem-based adaptation measures, such as habitat restoration, reforestation, and wetland conservation, can enhance ecosystem's capacity to withstand the impact of climate change.

3. Monitoring and Research

Conduct climate monitoring: Regularly monitoring climate variables and their effects on protected areas can provide valuable data to inform adaptive management strategies.

Support climate research: Funding and supporting research on climate change impacts and adaptation in protected areas and tourism can help in responding effectively to emerging challenges.

4. Community Involvement

Engage local communities in climate adaptation: Involving local communities in climate adaptation planning and implementation can ensure that their knowledge and needs are considered, fostering resilience at the local level.

5. Awareness and Education

Raise climate change awareness: Promoting awareness and education about climate change impacts and adaptation strategies among tourists and local communities through education programs and interpretation can support sustainable and climate-resilient tourism practices.

4.3.2 The impact of tourism on climate change and potential solutions

1. Greenhouse Gas Emissions

Tourism significantly contributes to greenhouse gas emissions, mainly through transportation. Air travel, a major component of international tourism, generates substantial carbon dioxide emissions. Land transportation including buses, cars, and trains also increases the industry's carbon footprint. Travel to remote protected areas further contributes to these emissions.

2. Energy Consumption

Tourism infrastructure, such as hotels, resorts, and attractions, requires substantial energy for heating, cooling, lighting, and other operations. Often, this energy is sourced from fossil fuels, which contributes to greenhouse gas emissions and exacerbate climate change.

3. Resource Depletion

The increased demand for water, food, and construction materials in protected area tourist destinations can lead to resource depletion, biodiversity loss, and greater vulnerability to climate change impacts.

Addressing the impacts of tourism on climate change in protected areas requires a strategic collaborative approach. By promoting sustainable transportation, improving energy efficiency, enhancing ecosystem resilience, conducting climate research, engaging local communities, and raising awareness, we can mitigate the adverse effects of tourism on climate change.

Shutter bus, Zion National park
Photos credited to the U.S. National Park Service

4.4 Conclusion

Implementing the principles and guidelines of protected area tourism suggested in this handbook requires:

1. *Collaborative approaches*. Governments must facilitate cooperation among various stakeholders, including tourism businesses, local communities, conservation organizations, and tourists. Such collaboration ensures that sustainable tourism efforts are coherent, comprehensive, and mutually beneficial.
2. *Developing policies, regulations and enforcement mechanisms*. Governments and regulatory bodies also play a crucial role in establishing and enforcing sustainable tourism guidelines. This involves developing policies and regulations that support sustainable tourism practices, such as setting standards for environmental protection, cultural preservation, and economic sustainability, as well as providing incentives for businesses that adopt these practices. Effective enforcement of policies and regulations is essential to ensure adherence to sustainable practices, which require regular inspections, penalties for non-compliance, and support for businesses to achieve compliance.
3. *Building institutional capacity*. It is vital for the effective implementation of guidelines. Organizations should invest in training and capacity-building programs to equip staff with the necessary skills and knowledge to adopt sustainable practices. Collaboration among institutions can further enhance implementation capacity.
4. *Continuous monitoring and evaluation*. They are critical for assessing the progress and impact of guideline implementation. Establishing key performance indicators (KPIs) and regularly reviewing them can help identify areas for improvement. Feedback loops should be in place to ensure that lessons learned are incorporated into future guidelines.
5. *Integrating digital technologies*. It can enhance the implementation of guidelines. This includes utilizing data analytics, artificial intelligence, and the Internet of Things (IoT) to optimize processes and monitor environmental impact. Digital platforms can also facilitate stakeholder engagement and transparency.
6. *Research and development (R&D) approach is* crucial. Creating innovative systems that bring together researchers, entrepreneurs, and policymakers can drive technological advancements. These systems foster collaboration and the exchange of ideas, leading to the development of new technologies and sustainable solutions.

Through guidelines and additional efforts, we can preserve the invaluable natural and cultural heritage of protected areas for future generations while providing meaningful and enriching experiences for tourists. It is our collective responsibility to strike a balance between tourism development and conservation, ensuring that protected areas continue to thrive and inspire for years to come.

References

(1) Aspen Defy Ordinary. (2025). *Aspen receives mountain IDEAL certification*. Available from: https://aspenchamber.org/media/press-releases/aspen-receives-mountain-ideal-certification [accessed March 02, 2025].

(2) Bello, F. G. (2021). Community participation in tourism planning at Majete Wildlife Reserve, Malawi. *Quaestions Geographicae*. 40(4): 85-100.

(3) Ceballos-Lascurain, H. (1996). *Tourism, ecotourism and protected areas. The state of nature-based tourism around the world and guidelines for its development*. IUCN, Gland, Switzerland, and Cambridge, UK.

(4) Clark, R.N. and Stankey, G.H. (1979). *The recreation opportunity spectrum: A framework for planning, management and research*. Gen. Tech. Rep. PNW-98. Portland, OR: Northwest Forest Experiment Station, Forest Service, USDA.

(5) Cole, D. N. (1987). Research on soil and vegetation in wilderness: A state-of-knowledge review. In *Robert C. Lucas (compiler), Proceedings of the national wilderness research conference: Issues, state-of-knowledge, future Directions, USA. July 23-26, 1985* (pp.135–177), Fort Collins, Intermountain Research Station, Ogden, UT, USA.

(6) Crotts, J. C. & Gay, C. (2023). *Assessing the impact of rising sea levels on travel and tourism in APEC economies*. APEC Tourism Working Group. December 2023.

(7) Eagles, P. F. J. (1995). Understanding the market for sustainable tourism. In S. F. McCool and A. E. Watson (Compilers), *Linking tourism, the environment and sustainability. Proceedings of a special session of the annual meeting of the national recreation and parks association 1994 conference* (pp. 25–33), Minneapolis, MN, Gen. Tech. Rep. INT-GTR-323. U. S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, UT, USA.

(8) Eagles, P. F. J., McCool, S. F. & Haynes, C. D. A. (2002). *Sustainable tourism in protected areas: Guidelines for planning and management*. IUCN Gland, Switzerland and Cambridge, UK.

(9) Eco-Business. (2025). *Ixtapa – a leading destination in the Americas*. Available from: https://www.eco-business.com/press-releases/ixtapa-a-leading-destination-in-the-americas/ [accessed March 02, 2025].

(10) Emphandhu, D., Phumalee, U., Peawsa-ad, K., Cheuchom, A., Manajongprasert, R., Plang-ngan, P., Tangsermwong, O., Kappelle, D. P., Wongprom, A. & Suwanmeera, S. (2019). *Research report on Similan National Park carrying capacity and tourism plan development coping with the overtourism issue.* Final Research Report for the Program Management Unit for Competitiveness (PMUC).

(11) Emphandhu, Dachanee. (2024). *Background paper on sustainable tourism management in conservation, fragile, and protected areas*. Paper presented at the APEC Workshop on Beyond carrying capacity: Best practice in sustainable tourism management in conservation, fragile and protected areas. July 2024. Bangkok.

(12) Flora, C., Flora, J., & Fey, S. (2004). *Rural communities: Legacy and change* (2nd Ed.). Boulder, CO: Westview Press.

(13) Gitzen, R. A., Millspaugh, J. J., Cooper, A. B. & Licht, D.S. (2012). *Design and analysis of long-term ecological monitoring studies*. Cambridge, UK: Cambridge University Press. Available from: https://doi.org/10.1017/CBO9781139022422. [accessed December 14, 2024]

(14) Global Sustainable Tourism Council (GSTC). (2025). *GSTC destination criteria*. Available at: https://www.gstcouncil.org/en/gstc-criteria/criteria-for-destinations.html [accessed March 01, 2025].

(15) Green Finance Institute. (2025). *Quintana Roo reef protection (parametric insurance)*. Available from: https://hive.greenfinanceinstitute.com/gfihive/revenues-for-nature/case-studies/quintana-roo-reef-protection-parametric-insurance/ [accessed August 14, 2024].

(16) Hornback, K. E. and Eagles, P. F. J. (1999). *Guidelines for public use measurement and reporting at parks and protected Areas*. Cambridge, UK: IUCN. Available from: https://portals.iucn.org/library/node/7545. [accessed November 10, 2024].

(17) IUCN. (1994). *Guidelines for protected area management categories*. IUCN, Gland, Switzerland and Cambridge, UK.

(18) IUCN. (2025). *IUCN Green List.* Available from: https://iucngreenlist.org/sites/arakwal-national-park/ [accessed March 02, 2025].

(19) IUCN-WCPA. (2007). *Guidelines for applying the precautionary principle to biodiversity conservation and natural resource management*. As approved by the 67th meeting of the IUCN Council, 14–16 May 2007. Available from: https://docslib.org/doc/2838238/precautionary-principle-to-biodiversity-conservation-and-natural-resource-management [accessed January 20, 2025].

(20) JIN Wenjia. (2024). *PowerPoint presentation "Protected and Conserved Areas and IUCN Green List"* at the APEC Workshop on Beyond carrying capacity: Best practice in sustainable tourism management in conservation, fragile and protected areas. July 2024. Bangkok.

(21) Kusumaningrum, D. A. & Wachyumi, S. S. (2020). The shifting trends in travelling after the COVID-19 pandemic. *International Journal of Tourism & Hospitality Review.* Vol 7 (No 2): 31-40.

(22) Lee, T. & Middleton, J. (2003). *Guidelines for management planning of protected areas*. IUCN Gland, Switzerland and Cambridge, UK.

(23) Leung, Yu-Fai, Spenceley, A., Hvenegaard, G., and Buckley, R. (Eds.). (2018). *Tourism and visitor management in protected areas: Guidelines for sustainability*. *Best Practice Protected Area Guidelines Series No. 27*. Gland, Switzerland: IUCN.

(24) Manning, R. (1986). *Studies in outdoor recreation: A review and synthesis of the social science literature in outdoor recreation*. Oregon State University Press, Corvallis, OR, USA.

(25) Manning, R. (2011). *Studies in Outdoor Recreation* (3rd ed.). Corvallis: Oregon State University Press.

(26) McCool, S. F., and Stankey, G. H. (1992). *Managing for the sustainable use of protected wildlands: The limits of acceptable change framework*. In the IV World Congress on National Parks and Protected Areas, Caracas, Venezuela, February 10-21, 1992.

(27) McCool, S. F., Clark, R. N. & Stankey, G. H. (2007). *An assessment of frameworks useful for public land recreation planning*. Gen. Tech Rep. PNW-GTR-705. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

(28) Miller, G. & Twining-Ward, L. (2005). *Monitoring for a sustainable tourism transition: The challenge of developing and using indicators*. Wallingford, UK: CABI.

(29) Muangasame, K. & Iemamnuay, S. (2024). *APEC workshop report on beyond carrying capacity: Best practice in sustainable tourism management in conservation, fragile and protected areas*. July 2024. Bangkok.

(30) National Park Service. (1993). *Guiding principles for sustainable design*. National Park Service, Denver Service Centre, Denver, CO, USA.

(31) National Park Service. (2006). *Management policies 2006*. U.S. Department of the Interior, National Park Service.

(32) National Park Service. (2025). *Accessibility & universal design standards.* Available from: https://www.nps.gov/dscw/ds-accessibility-universal-design.htm [accessed February 23, 2025].

(33) NWS Government Environment and Heritage. (2025). *Arakwal National Park and Cape Byron State Conservation Area IUCN Green List*. Available from: https://www.environment.nsw.gov.au/research-and-publications/publications-search/arakwal-national-park-and-cape-byron-state-conservation-area-iucn-green-list-of-protected-areas [accessed March 02, 2025].

(34) Prideaux, B. (2024). *Great barrier reef and the wet tropics of Queensland (climate emergency).* Paper presented at the APEC Workshop on Beyond carrying capacity: Best practice in sustainable tourism management in conservation, fragile and protected areas. July 2024. Bangkok.

(35) Phumalee, Usaradee. (2024). *Development of management system to promote and improve environmentally friendly tourism behaviors in Kaeng Krachan Natural World Heritage Site*. Final Research Report for the Program Management Unit for Competitiveness (PMUC).

(36) Secretariat of the Convention on Biological Diversity, World Tourism Organization and the United Nations Environment Program. (2009). *Tourism for nature and development: A good practice guide*. Montreal, Canada.

(37) Stone, M. T. & Nyaupane, G.P. (2015). Protected areas, tourism and community livelihoods linkages: a comprehensive analysis approach. *Journal of Sustainable Tourism*. 24(5), 21 pages. Available from: https://www.researchgate.net/publication/282210804_Protected_areas_tourism_and_community_livelihoods_linkages_a_comprehensive_analysis_approach [accessed February 27, 2025].

(38) Suhandi, Ari S. (2024). PowerPoint presentation *"Community engagement & national Park"* at the APEC workshop on beyond carrying capacity: Best practice in sustainable tourism management in conservation, fragile and protected areas. July 2024. Bangkok.

(39) Takayama, Masaru. (2024). PowerPoint presentation *"Japan greener destination"* at the APEC workshop on beyond carrying capacity: Best practice in sustainable tourism management in conservation, fragile and protected areas. July 2024. Bangkok.

(40) Tassanaipitukkul, N. (2024). *ASEAN ecotourism development*. International Institute for Trade and Development (ITD) Available from: https://www.itd.or.th/en/itd-data-center/68_13en/ [accessed January 21, 2025].

(41) Thai Post. (2023). *Pha Dok Siew Nature trail: Learn about the 'Paga-geuyor' people's way of life and their spirit of forest Conservation*. December 2, 2023. Available from: https://www.thaipost.net/news-update/494779/ [accessed July 16, 2024]

(42) Thai Rak Pa Foundation (Thai Forest Conservation Foundation). (2025). *Thai Rak Pa activities*. Available from: https://thairakpa.org/ [accessed July 16, 2024].

(43) The International Ecotourism Society. (2025). *What is ecotourism?* Available from: https://ecotourism.org/what-is-ecotourism/ [accessed February 12, 2025].

(44) The UD Project. (2025). *Definition of universal design*. Available from: https://universaldesign.org/definition [accessed February 26, 2025].

(45) Trip Advisor. (2025*). Kuiburi wildlife watching & cookery with host*. Available from: https://www.tripadvisor.com/AttractionProductReview-g293916-d19198948-Kuiburi_Wildlife_Watching_Cookery_with_Host-Bangkok.html [accessed October 18, 2024].

(46) Tourism Council Australia, and CRC Tourism. (1998). *Being green keeps you out of the red*. Tourism Council Australia, Woolloomooloo, NSW, Australia.

(47) UN Tourism. (2025). *Product development*. Available from: https://www.unwto.org/tourism-development-products [accessed March 05, 2025]

(48) UN Tourism. (2025). *Sustainable tourism development definition*. Available from: https://www.unwto.org/sustainable-development [accessed March 15, 2025]

(49) UN WTO and UNDP. (2017). *Tourism and the sustainable development goals – Journey to 2030*, UNWTO, Madrid, Spain. Available from: https://www.e-unwto.org/doi/book/10.18111/9789284419401 [accessed September 05, 2024]

(50) UNEP and UN Tourism. (2005). *Making tourism more sustainable – A guide for policy makers*. UNEP, Paris, France. Available from: https://www.unep.org/resources/report/making-tourism-more-sustainable-guide-policy-makers [accessed August 28, 2024]

(51) UNESCO World Heritage. (2025). *UNESCO world heritage sustainable tourism online toolkit*. Available from: https://whc.unesco.org/en/tourismtoolkit [accessed January 12, 2025]

(52) UNWTO. (1997). Introduction to global tourism. In*: International tourism: a global perspective. 2nd edition*. WTO, Spain.

(53) UNWTO. (2004). *Indicators of sustainable development for tourism destinations: A guidebook*. Madrid, Spain.

(54) UNWTO. (2009). *Unpublished. Tour operators' initiative for sustainable tourism development (TOI)* - Mexico and Thailand.

(55) UNWTO. (2024). *Glossary of tourism terms*. Available from: https://www.unwto.org/glossary-tourism-terms [accessed March 18, 2025]

(56) UNWTO. (2024). *Statistical framework for measuring the sustainability of tourism (SF-MST): A final draft*. The 55th session of the United Nations Statistical Commission (UNSC) during 27 February – 1 March 2024. Available from: https://www.unwto.org/tourism-statistics/statistical-framework-for-measuring-the-sustainability-of-tourism [accessed February 20, 2025]

(57) VisitBritain. (2012). *Visit England: Principles for developing destination management plan*. Available from: https://www.visitbritain.org/sites/ind/files/202307/dm_plans_guiding_principles.pdf [accessed February 20, 2025]

(58) Waranya, Yimyam. (2022). *Community participation in solving human-elephant conflict: Case study of wildlife tourism in Kuiburi National Park*. Master Thesis Chulalongkorn University.

(59) Wilson Catherine & Te Ngaehe Wanikau. (2024). *PowerPoint presentation "Tongariro Alpine Crossing, New Zealand"* at APEC Workshop on Beyond carrying capacity: Best practice in sustainable tourism management in conservation, fragile and protected areas. July 2024. Bangkok.

(60) Wolfgang S., Corcoran, B. & Petermann, T. (2002). *The ecotourism training manual for protected area managers. Zschortau,* DE: German Foundation for International Development.

Annex 1

Great Barrier Reef and the Wet Tropics of Queensland

(Climate Emergency)

TWG 202 2023A

Beyond carrying capacity: Best practice in sustainable tourism management in conservation, fragile and protected areas

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Introduction

In this paper I will briefly outline some of the problems faced by protected area managers in balancing the need to manage protected areas in a manner that both maintains the biological integrity of the area and simultaneously allows visitors to use the resource. Suggestions for managing protected areas are also offered. One of the key issues in managing this 'balancing' act. between protection and use is the rapidly changing nature of the global weather system that is beginning to drive outward and inward migration of flora and fauna. Another key issue is how to manage protected areas particularly in regions where administratively imposed boundaries cannot be easily amended to meet the changing biological needs of the flora and fauna within current protected area boundaries. A third issue is understanding the factors that attract visitor interest in protected areas. A fourth issue is the meaning of sustainability which remains a contested idea open to multiple interpretations. Funding for management and scientific research is a further issue that must be addressed.

The idea that tourism should be sustainable permeates a great deal of the current debate about how protected areas should be used as a tourism resource. Support for the concept of sustainable development has emerged as the 'new normal' in many of the recent discourses on tourism management and development and in the use of protected areas. While a laudable idea, how can tourism be made sustainable while demand for travel continues to increase in parallel with global temperature increases that are affecting long-term biodiversity?

Many of the current ideas of sustainability draw their inspiration from the now famous declaration of The Brundtland Report (Our Common Future) (WCED, 1987) which defined the ideal of sustainability as '.. development is that which meets the needs of the present without compromising the ability of future generations to meet their own needs'. The ideals outlined in the Brundtland Report make an enormous amount of sense when one considers the responsibility that current generations have towards future generations hundreds if not thousands of years in the future. But achieving this goal remains elusive.

In this paper, key sustainability related issues are discussed in relation to the Great Barrier Reef World Heritage Area (GBRWHA) and the Wet Tropics Queensland World Heritage Area (WTOWHA). Both World Heritage Areas (WHA) are located in the northern tropical region of Queensland, Australia. Both WHAs are important tourism attractions, and both are under threat from a range of anthropogenic factors with climate change arguably the main threat. Both WHAs are managed by well-resourced independent management authorities and both are supported with significant. scientific research undertaken by universities, government agencies and independent research organizations. Both WHA management agencies understand the need to balance protecting the natural environment with the need to allow access by tourists as well as residents of local communities.

The Great Barrier Reef

Administration and Management

The Great Barrier Reef (GBR) was declared as a World Heritage Area in 1981. The GBRWHA is managed by a well-resourced management authority, the Great Barrier Reef Management Authority (GBRMPA) and supported by numerous research institutions including the Australian Institute for Marine Science (AIMS) and university research groups. The GBR has received extensive

Commonwealth Government support with AUD2 billion budgeted for the Reef 2050 Plan and a AUD1.2 billion Reef Protection package announced in 2022 which included AUD16161M to expand the Crown-of-thorns starfish (COTS) control program over nine years (GBRMPA, n.d.).

The GBRMPA uses a zoning scheme to control use of the GBR. The zoning scheme includes a restricted zone to protect nursery reefs, recreation zones, tourism activity zones and fishing zones. Zoning maps can be accessed at Zoning maps | gbrmpa. The GBRMPA also consults with a wide range of stakeholders including recreational boat owners, adjoining communities, traditional owners, commercial fishing operators and commercial tour operators. Zoning and limitations on the number of commercial tour boats able to access various parts of the of the GBR are important measures employed by the GBRMPA to protect the reef ecosystem while facilitating visitor access.

Key physical features of the GBR are:

- 2000 km in length
- Up to 250 km wide
- Includes over 3000 reefs and 600 continental islands

Biodiversity includes:

- Over 1/3 of all the world's soft coral and sea pen species
- 1624 fish species
- 54% of world's mangrove diversity
- Six of the world's 7 species of marine turtle; also largest green turtle breeding area in the world
- Seabird breeding islands of world significance
- 800 species of echinoderms (e.g., sea stars =13% of world's species)
- >5000 species of molluscs (e.g., shells)

Major threats to the GBR

- Climate Change - increase in water temperature and acidification
- Extreme weather events including cyclones and El Nino
- Crown-of-thorns star fish (COTS) - a coral predator
- Water quality and coastal development including onshore mining and farming
- Tourism and recreation
- Coastal urban and rural development

Tourism and recreation use

The GBR is a popular recreation boating area with over 164,000 boat users registered in communities adjacent to the reef. In addition, the GBR is an important element of the local economy contributing AUD6.4 billion a year to the domestic economy as well as providing 64,000 jobs and attracting about 2 million visitors per year (GBRMPA, n.d.). Tourism operators are licensed and their access to the reef is strictly controlled. A small entrance fee is levied on passengers visiting the GBR on commercial tourist boats. Tourism operators are also encouraged to contribute to reef education and conservation programs. One example is the Eye-on-the-reef monitoring scheme where visitors are able to participate in a reef monitoring program.

The climate change threat

In the period 2016 to 2024 four significant coral bleaching events have occurred. Surviving coral recovers slowly and is generally assisted by new recruits (coral larvae) from surrounding reefs. Where conditions are ideal, coral communities can recover within about 10 years. Other reefs that do not receive a plentiful supply of coral larvae, or are polluted or degraded, will take considerably longer to recover, perhaps decades. The composition of coral communities on a recovering reef may be different from those that were present before the reef was bleached. As global temperatures increase beyond 1.5C, bleaching will become more frequent, recovery will become more difficult and biodiversity will be reduced.

The GBRMPA has developed short and long-term strategies to protect the GBR from climate change and other adverse impacts. The Blueprint 2030 plan (Great Barrier Reef Marine Park Authority, 2024) emphases resilience, adaptation and working with traditional owners. The more long-term Reef 2050 Plan (Commonwealth of Australia, 2023) lists the five key priority action areas as: limit the impacts of climate change; reduce the impacts from land-based activities; reduce impacts from water-based activities; influence the reduction of international sources of impact; and protect, rehabilitate and restore.

Unfortunately, and despite significant funding from the Commonwealth and the Queensland state government, climate change now appears to be the most significant threat to the GBR. As water temperature increases over coming decades, coral bleaching will occur more frequent and the quality of the reef will decline in terms of biodiversity and its appeal as a tourism resource. Research by Prideaux, Carmody and Pabel (2018) and Prideaux, Thompson, Pabel, and Cassidy (2021) points to reduced visitor interest in coral reefs that have suffered from extensive and ongoing coral bleaching.

The Wet Tropics of Queensland World Heritage Area

The Wet Tropics Rainforest officially known at the Wet Tropics of Queensland World Heritage Area (WTQWHA) is a 8,940 km? area of tropical rainforest located in north Queensland. The WTOWHA runs parallel to a large part of the northern section of the GBR and is regularly visited by tourists visiting the GBR. The region received World Heritage status in 1988 based on meeting all four criteria for natural heritage listing. Many of the WTOWHA's fauna and flora species are endemic to the region which is claimed to include areas of the oldest continuing tropical rainforest on earth.

Management

The WTQWHA is managed by the Wet Tropics Management Authority (WTMA) established in 1983 and governed by an independent Board of Directors. Day-to-day operations within the park are undertaken by the Queensland Parks and Wildlife Service (OPWS). The authority works with a range of stakeholders including other government agencies, Rainforest Aboriginal Peoples, the tourism industry and local communities. The Board is advised by a statutory Scientific Advisory Group and a Community Consultive Committee.

Compared to the GBRWHA, the WTAWHA receives far less funding for administration, research and infrastructure. However, a number of universities, including James Cook University which has two campuses in the region, and Central Queensland University, support a very active research agenda into key issues affecting the WTQWHA.

The authority is guided by the Wet Tropics Strategic Plan (2020-2030) (WRMA, 2020). Key elements of the plan include responding to climate change, managing the visitor experience, community involvement and supporting Rainforest Aboriginal Peoples.

Fauna and Flora

The region has 370 species of birds (11 endemic), 107 species of mammals (11 endemic), 113 reptile species (24 endemic), and 51 species of amphibians (22 endemic). The region also has 12 of the world's 19 families of primitive flowering plants and 74 species of threatened plants.

Major Threats

Climate change is widely regarded as one of most significant threats to the long-term WTOWHA (Weber, et al, 2021). Other threats identified in The State of the Wet Topics Report 2022-2023 (WTMA, 2023) are:

- Changing fire regimes
- Extreme events (cyclones, floods, droughts)
- Invasive species (e.g., Crazy Yellow Ants)
- Clearing, fragmentation and habitat loss
- Land use change and pressure
- Fragmentation of the WHA in some areas

Tourism use

Many commercial tourism attractions are located either within or on the borders of the Wet Tropics. Access to these sites is by public roads, many of which traverse parts of the WHA. Other key natural attractions including waterfalls, beaches and walks are located within the forest. Commercial tourism operators pay a small fee to access the WHA while members of the local community and other tourist have free access.

Climate change threats

Major climate related threats include: species loss through invasives (e.g., Yellow crazy ants) displacing or disrupting existing ecosystem structures; changing climatic conditions leading to out migration and in some instances extinction of vulnerable species and: drying of the forest in some area leading to an increased threat of fire. A summary of the threats was outlined Weber et al., (2021).

Unlike the GBR, climate change does not pose an immediate threat to tourism use of the Wet. Tropics rainforest as it does with the GBR. While some species are likely to face extinction in coming decades, the overall 'look' of the forest is unlikely to exhibit dramatic change. However, as noted by the WTMA, climate change does pose a significant threat of the region's biodiversity.

The ideal of sustainability

Unfortunately, many of the ideals of the Brundtland Report continue to the be pushed to one side by the business of economies collectively managing a global economy where success is measured by the need for government and the demand by citizen to achieve year-on-year growth in Gross Domestic Product (GDP). This has resulted in little if any real concern for how this ongoing and in some cases escalating consumption of non-renewable resources will affect the ability of future generations to offer the same level of economic welfare that is available in the third decade of the 21" Century.

Examples of the problem in achieving sustainability include:

- Since 1987 international tourism arrivals have grown from 364m to 1.3b arrivals in 2023 (Statista)
- International arrivals are expected to continue to increase year-on-year well into the future with Boeing predicting a doubling of the global fleet of passenger jets by 2043 (Boeing, 2024)
- Continuing exploitation of non-renewable resources (deforestation, continued reliance on carbon-based energy, poor recycling practices)
- Global population growth - 2 billion in 1923.3 billion in 2024, 10.3 billion in 2084 (United Nations Population Division, 2024).
- Global temperatures continue to rise with June 2024 bring the 13# consecutive month with global temperatures 1.5C higher than pre-industrial revolution temperatures (Copernicus Climate Change Service, 2024)

At a protected area level, growth in demand for access continues to increase but many of the ecosystems that are attractive to visitors are increasingly vulnerable to a range of factors including development on protected area boundaries, continued urbanizations, changing patterns of weather, extreme weather events (floods, heatwaves, droughts and windstorms) invasive species and climate change.

Is sustainability possible?

On a daily basis, protected area managers and policy makers are confronted with the need to balance environmental protection with visitor use in conditions where the resource they are protecting is itself undergoing change. Obviously, not all protected areas face the same problems

and the scale of specific of problems such as the impacts of climate change will vary depending on the sensitivity of the ecosystems involved.

There are however some significant factors that are common across all protected areas. The first is understanding the ecosystem and its functions. This understanding requires a high level of ongoing scientific research. Well targeted scientific research enables a detailed understanding of the complexity of the ecological drivers operating within the protected area and enables identification of problems that may arise from external threats. External threats include climate change but also problems associated with land use patterns outside of the protected area boundaries as well as a wide range of other threats. In some areas, overtourism may become a threat particularly global arrivals continue to increase in coming decades and platforms such as TikTok flag some destinations as having a must-visit classification. Retirement travel by the Baby Boomer generation will also add to the growth in demand.

A second factor is how a protected area is used by tourists. Should access and use be governed by the level of demand or the ability of the protected area ecosystem to support visitor use at a level that does not cause long-term degrading of the protected area?? If ensuring the long-term viability of the resource is the main objective, demand for use must be governed by the ability of the resource to allow visitor access at a level that does not lead to degrading of the environment. This can be a difficult objective to achieve, particularly when the area is itself undergoing climate related change and where protected area managers lack access to scientific monitoring.

Dealing with this issue requires ongoing science-based research that can produce specific indicators able to be used to measure both visitor impacts and ecosystem impacts. Impact indicators must be dynamic and able to respond to changes in the ecosystem over time. For example, ecosystem changes driven by external factors such as climate change and in-migration of non-endemic species may require cessation or reduction of visitation in some areas while in other areas, changes may require new infrastructure or allow for an increase in visitor numbers. Science based reductions in visitor numbers will often be opposed by organizations on the supply side of the tourism industry. If protecting the natural area is an important management objective, a dynamic determination of visitor numbers based on protecting the protected areas' ecosystem is critical to ensuring that ecosystem damage is minimizes.

In parallel with the need to manage ecosystem functions with ongoing scientific monitoring, a robust system of visitor use monitoring is also required. Examples of reports emanating from a visitor monitoring system undertaken on the GBR include Coghlan and Prideaux (2010) and Coghlan and Prideaux (2012). Sibtain and Prideaux (2012) report on the findings of a similar monitoring system undertaken in the Wet tropics Rainforest.

Combined scientific and visitor monitoring can facilitate the development of a dynamic management regime where visitor use and conservation practices can be harmonized to ensure ongoing protection of the ecosystem. Dynamic management, described as informed and ongoing change, requires ecosystem and visitor monitoring as well as the use of other management tools to ensure demand for visitation is within environmental safety margins. The use of monitoring as a management tool is a well-established practice however in many protected areas both forms of monitoring continue to be patchy at best or in many instances are missing. To be effective, monitoring needs to be ongoing to build decades long data sets that can be used to identify subtle changes and respond before environmental and visitor demand tipping points are reached. Development of suitable Al tools offer a cost-effective solution to data analysis.

Current management tools used to balance the need for protection and demand for access include:

- Carrying capacity - assumes no change in the environmental condition of the site and constant status of thresholds judgement is subjective
- Limits of acceptable change - approach to overcome problems with carrying capacity model - a social construct open to interpretation, political interference and climate change driven changes in the environment
- Precautional principal -ill-defined but can encourage stakeholders to exercise precaution in long-term implications
- Life Cycle Assessment - evaluates the environmental impact of services using a through-life approach. Problem is measurement
- Ecological footprint-estimates the quantity of resources used
- Triple bottom line - looks at social, economic and ecological impacts - measurement and impact of climate change pose problems
- Indices - an attempt to place measurable thresholds on tourism activity
- Impact assessment - including Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA) - only effective if supported by science-based assessments of impacts

A new role for old management tools

Individually, each of the commonly used management tools outlined above have serious flaws. Collectively, and with some modification and harmonization, they might offer some scope to be used as part of a dynamic management systems particularly where park managers are well informed by ongoing scientific data about the condition of the protected area ecosystem, indices that provide information on impacts, monitoring of the ecosystem and visitor monitoring.

Key attributes of an effective management system can be characterized as:

Assessment

- Science based assessment of the protected area ecosystem to create an initial baseline against which to measure impacts such as climate change
- Ongoing assessment of visitor needs including the local community and tourists

Monitoring

- Scientific monitoring of change against a predetermined baseline
- Long-term visitor monitoring

Management

- Using a range of management tools including a modified and informed carrying capacity model etc., protected area managers have the opportunity to develop a dynamic visitor use model based on assessment of the strength and weaknesses of the ecosystem and how it will respond to various types of visitor use.

Evaluation

- On-going evaluation of the impacts of visitation and other stressors on the natural environment to determine if changes are required to visitor access. Evaluation should include assessments of the impact of invasive species, assessment of out-migration of

species and potential for extinctions of flora and fauna species. Assessment should also include the changing needs of the community and tourist use.

Reassessment

- Using data from each of the sources outlined above, informed changes can be made to visitor access. Changes to access may be seasonal, to total visitor numbers, restrictions on access to certain zones and use of the price mechanism.

The suggested AMMER approach will only work if protected area managers have ongoing access to well-funded research and monitoring, and the rapid nature of change to the environment is recognized. Protected area management organizations may need legislated power to amend visitor access. Changes to access must be based on ongoing scientific evaluation should also consider the impacts of change in adjacent border areas.

Prior management systems have often failed because of a poor knowledge base on which to make decisions on visitor use, political pressure, poor implementation of policies, lack of funding and failure to consider the needs of all stakeholders including nature, the community, the business sector, Indigenous peoples (where present) and the public sector.

The actual mechanics of implementation will depend on the individual characteristics and specific needs the natural area, the resources allocated to management, and visitor demand. The tools outlined above, when suitably modified, can assist in this process

Conclusion

Many protected areas are in decline with climate change likely to accelerate some aspects of biodiversity loss including extinctions. In many cases, we have scant knowledge of the rate of decline and what the long-term implications are. Sustainability is a desirable goal made increasingly difficult because of factors such as anthropogenic climate change and failure of governments to adequately manage resource use and provide protection.

Some protected areas such as coral reefs will continue to degrade rapidly in coming decades unless strategies such as transition to net zero can holt global temperatures to below the local extinction thresholds of coral species. As protected areas such as the GBRWHA decline in terms of biodiversity and visual appearance, it can be anticipated that visitor interest will wane.

Education of visitors to the threats faced by protected areas can be an effective strategy for raising public support for increased funding to mitigate the impacts of stressors such as climate change. In the WTQWHA, concern over the environmental impact of yellow crazy ants resulted in AUS30m of additional government funding. Similarly, community concern over the deteriorating condition of the GBR has led to significant government funding to support programs such as the Blueprint 2030 plan, Reef 2050 Plan and funding to control COTS.

While there continues to be scope to use previous management methods, adoption of dynamic management methods, such as the proposed science based AMMBA, offer new opportunities for management to deal with threats such as climate change, the changing demands for visitor use and how the community may react to changes in access by tourists as well as community members.

References

Boeing (2024) Commercial Market outlook 2024-2043, retrieved from Commercial Market Outlook(boeing.com)

Coghlan, A. and Prideaux, B. (2010) Reef Tourism Drivers and Trends: Synthesis Report, Marine and Tropical Sciences Research Facility, Cairns, retrieved from Microsoft Word - 486 JCU Coghlan, A.et al. 2009 Reef Tourism Competitiveness.doc (rrrc.org.au)

Coghlan, A. and Prideaux, B. (2010), Segmenting Great Barrier Reef Tourists: Chonges in Morket Demand. Marine and Tropical Sciences Research Facility, Cairns

Coghlan, A. and Prideaux, B. (2012) Reef Tourism Third Yearly Report. Patterns of reef tourism on the GBR, Tropical North Queensland and the Whitsundays. Marine and Tropical Sciences Research Facility, Cairns. Retrieved from Microsoft Word-488 6 coghlan and prideaux final 2 .doc (rrrc.org.au)

Commonwealth of Australia (2023), Reef 2050 Long-Term Sustainability Plan 2021-2025, Commonwealth of Australia, Canberr, retrieved from Reef 2050 Long-Term Sustainability Plan (dcceew.gov.au)

GBRMPA (n.d.) Reef protection through world-leading management, GBRMPA, retrieved from Reef protection through world-leading management | gbrmpa

Great Barrier Reef Marine Park Authority (2024), Great Barrier Reef Blueprint for Climate Resilience and Adaptation, Reef Authority, Townsville.

Prideaux, B., Carmody, J. and Pabel, A.(2018). Impocts of the 2016 and 2017 mass corol bleaching events on the Great Barrier Reef tourism industry and tourism-dependent coastal communities of Queensland. Report to the Reef and Rainforest Research Centre Limited, Cairns (96pp.), retrieved from Microsoft Word - RRRC Report Final Mar 2018 FINAL.docx

Prideaux, B., Thompson, M. Pabel, and Cassidy, L. (2021). Managing a climate change crisis event at the destination level, Journal of Hospitality and Tourism Management, 49, 451-459, https://doi.org/10.1016/i.ihtm.2021.10.006

Sibtain, I. and Prideaux, B. (2012) Rainforest Tourism 2009 and Final Report: January 2007 - December 2009. Patterns of Rainforest Tourism in the Wet Tropics World Heritage Area, North Queensland. Report to the Marine and Tropical Sciences Research Facility. Reef and Rainforest Research Centre Limited, Cairns. Retrieved from rainforest tourism final report RT (rrrc.org.au)

Weber, E.T., Catterall, C.P., Locke, J, Ota, Prideaux, B., Shirreffs, Talbot, L. & Gordon, l.I. (2021), Monaging a World Heritage Site in the Face of Climate Change: A Case Study of the Wet Tropics in Norther Queensland. Earth, 2, 248-271. https://doi.org/10.3390/earth202020015

Wet Tropics Management Authority (2020), Wet Tropics Strategic Plan (2020-2030), Wet Tropics Management Authority, Cairns.

WTMA (2023), State of Wet Tropics 2022-23- Rescue and recovery of threatened Wet Tropics species and ecological communities, WTMA, Cairns, retrieved from 2022-23 State of Wet Tropics Report.pdf

Annex 2

List of Participants

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