IUCN Conservation Outlook Assessment 2017 **(archived)**
Finalised on 10 November 2017

Please note: this is an archived Conservation Outlook Assessment for Sian Ka'an. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Sian Ka'an

SITE INFORMATION

Country:
Mexico
Inscribed in: 1987
Criteria:
(vii) (x)

Site description:
In the language of the Mayan peoples who once inhabited this region, Sian Ka'an means 'Origin of the Sky'. Located on the east coast of the Yucatán peninsula, this biosphere reserve contains tropical forests, mangroves and marshes, as well as a large marine section intersected by a barrier reef. It provides a habitat for a remarkably rich flora and a fauna comprising more than 300 species of birds, as well as a large number of the region's characteristic terrestrial vertebrates, which cohabit in the diverse environment formed by its complex hydrological system.
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SUMMARY

2017 Conservation Outlook

Good with some concerns

Even though some of the threats to Sian Ka'an are buffered by the large size of the property and many encouraging management efforts the long list of current threats is of concern. Among the key concerns on land are the direct and indirect impacts of mass tourism development, such as infrastructure, excessive freshwater use, contamination and waste. However, the challenges are well understood and appear manageable. In the medium and longer term, widespread rural poverty is likely to take its toll on the natural resources. The conservation outlook for the marine and coastal environments is even more challenging in terms of management due to the combination of local factors and factors beyond the control of site management. Namely, increased sea levels and temperatures and related ocean acidification due and the invasion of Lionfish will require responses beyond Sian Ka'an.

Current state and trend of VALUES

Low Concern
Trend: Deteriorating

Due to its large size and relatively difficult access, large parts of the property continue to be in a good state of conservation. Despite an overall good state of the World Heritage values related to natural beauty, there is a concern with respect to the coastal zone, which is affected by uncontrolled development and plastic debris. Key concerns in terms of overall trends are the depletion and contamination of freshwater resources and the uncontrolled use of certain marine and terrestrial species, however restoration activities have led to the elimination of 41000 casuarinas.

Overall THREATS

High Threat

Out of the large number of current threats coastal development, mostly related to tourism, stands out as a major concern with multiple direct and indirect impacts on land and in the sea, including pressure on species, disturbance, depletion of freshwater and sewage and waste. There are clear indications that the marine and coastal environments may be severely affected by expected sea level rise and the effects of anticipated temperature increases and related ocean acidification on reefs and other marine ecosystems.

Overall PROTECTION and MANAGEMENT

Some Concern

The establishment of Sian Ka'an has made a marked difference on a coastline massively transformed since the arrival of mass tourism. At the same time, the property is not immune to the direct and indirect impacts of such broader developments and management has little influence on such developments. However, the challenges are well understood and significant efforts are being undertaking to overcome them.

FULL ASSESSMENT

Description of values

Values

World Heritage values

▶ **Scenic beauty of mosaic of landscape elements**
Criterion:(vii)

The aesthetics and beauty of Sian Ka´an derive from the relatively undisturbed interface of sea and land along a comparatively well-conserved coastline. The mosaic of landscape elements is diverse in shapes, forms and colours allowing intriguing views and impressions. Noteworthy and rare natural phenomena include the "Cenotes", water-filled natural sinkholes hosting specialised communities of life and the "Petenes", tree islands emerging from the swamps (SoOUV, 2013).

▶ **Fascinating variety of life forms**
Criterion:(x)

The scale and conservation status of Sian Ka'an and its ecosystem diversity, including 17 different vegetation types, support a fascinating range of life forms. Over 850 vascular plants, including 120 woody species, have been confirmed in what is assumed to be a still incomplete inventory. In terms of fauna, noteworthy representatives among the more than 100 documented mammals include endangered species like Black-handed Spider Monkey, Yucatan Black Howler Monkey and the Central American Tapir. A small population of the vulnerable West Indian Manatee occurs in the coastal waters. Some 330 bird species have been recorded, 219 of them breeding in Sian Ka'an. Amphibians and reptiles are represented by more than 40 recorded species, among them the vulnerable American Crocodile and four of

the six turtle species found along the Mexican coast, all reproducing within the property. The isolation of some of the "Cenotes" led to the evolution of several species which are locally endemic to single sinkholes. With some 80 recorded species of reef-building coral the portion of the Mesoamerican Reef within the property is one of the richest in Mexico. Jointly with the many other aquatic habitats it harbours more than 400 species of fish and a wealth of other marine life (SoOUV, 2013).

Other important biodiversity values

- **Integral component of the system of mangroves, seagrass beds and coral reefs of Mesoamerica**

  It deserves to be noted that Sian Ka'an belongs to an important and relatively intact part of the Mesoamerican Reef, a marine area of global conservation significance. The reef has attracted a lot of national and international attention. It is functionally and ecologically linked with the coastal mangroves and the seagrass beds. In this context, it is noteworthy that the property is part of a larger conservation complex which is contiguous with two additional protected areas, "Área de Protección de Flora y Fauna Uaymil" and "Reserva de la Biosfera Arrecifes de Sian Ka’an". Despite the slightly confusing identical name the latter protected area established to conserve the coral reefs is not part of Sian Ka'an Biosphere Reserve and also not included in the World Heritage property.

- **Ecological connectivity**

  Sian Ka'an area is an important biological corridor for bird species. Mangroves play a functional role in connecting with other ecosystems such as seagrasses, low flood forests and coral reefs.

- **Hydrological system**

  The Sian Ka'an Complex has an underground water system which interconnects cenotes and petenes and is unique in the Peninsula of Yucatan and in the world. (Management programme, 2014)

Assessment information

Threats

Current Threats

High Threat

The greatest current threats are a combination of the direct and indirect impacts of tourism and inadequate use of natural resources both on land and in the sea. In the region, coastal zone is the main target of tourism development and recreational use (extension of the Cancun-Tulum tourist corridor). However, the depletion of freshwater aquifers, sewage and waste are equally worrisome. In the marine realm, the combination of overuse of several species, alien invasive species, destructive harvesting practices, land and seaborne pollution and worrying broader trends in the Mesoamerican Reef in terms of bleaching and acidification have changed the ecosystem and are likely to induce further damage if unaddressed.

▶ Fishing / Harvesting Aquatic Resources, Poaching

High Threat
Inside site
Outside site

Overfishing is well documented in the entire reef and aggravated by competition with and predation from the invasive Lionfish (Healthy Reefs for Healthy People, 2012; Con Pro, 2011; CONANP, 2007). Despite encouraging management improvements, the high demand for Spiny Lobster puts major pressure on this species. In some areas harvesting techniques continue to be destructive. In response to population declines of Queen Conch, harvesting of that species has been banned but continues illegally. On land, illegal hunting affects wildlife populations near settled areas (Con Pro, 2011; CONANP, 2007).

► Water Pollution

High Threat
Inside site
Outside site

High levels of chemicals and heavy metals have been detected in the coastal marine environment and brackish water wetlands. Garbage piled up on the coast, in particular plastic debris, is suspected to come from coastal shipping and poor waste management but also appears to stem from remote sources (Con Pro, 2011; CONANP, 2007). Household sewage and waste water are not being disposed of properly and are polluting freshwater, brackish water, and marine environments (Con Pro, 2011; CONANP, 2007).

► Crops

High Threat
Inside site, extent of threat not known
Outside site

Watersheds are being degraded by conversion of land for agriculture, forestry, tourism and excessive use of agrochemicals (Con Pro, 2011; CONANP, 2007). Traditional use of fire for weed control outside the property presents a high risk of spreading (Management programme, 2014).

► Invasive Non-Native/ Alien Species

Very High Threat
Inside site, extent of threat not known
Outside site

To date, 36 exotic species have been identified in Sian Ka’an, with some invasives, such as Casuarina equisetifolia and coconut palms in the coastal area, threatening native flora (Con Pro, 2011; CONANP, 2007). Massive invasion by Lionfish in the marine realm (NOAA, 2012) is of concern. Control and eradication programs are limited to some species and require increased efforts.

► Tourism/ Recreation Areas

High Threat

Inside site, extent of threat not known
Outside site

Poorly planned and inadequately controlled tourism and development of related infrastructure, such as roads and highways, fishing lodges, clubs, small hotels, vacation homes, cabins and trailer parks, negatively impact natural habitats, especially in the coastal zone, by fragmenting mangrove and vegetation of coastal dunes. Although still scarce in the property, inappropriate recreational activities include hunting, fishing and harvesting, as well as use of off-road vehicles, resulting in disturbance and physical. Damage to reefs is caused by inexperienced divers (Con Pro, 2011; CONANP, 2007). Mass tourism in the vicinity of Tulum and Cancun, two of Yucatan’s major tourist attractions and associated coastal urbanisation with well-documented water, garbage and sewage problems, require monitoring and management responses. The water demands outstrip the capacity of the freshwater aquifer, thereby causing its depletion and affecting the delicate water composition of the coastal lagoons (Con Pro, 2011; CONANP, 2007). No cruise ships have been arriving at the Sian Ka’an Biosphere Reserve so far. Nevertheless, cruise ship tourism is increasing at Majahual (located at the southern edge of the property); which could cause an increase of visitor’s numbers at the southern coast in the medium and long term.

► Storms/Flooding

High Threat
Inside site, throughout(>50%)
Outside site

The property is affected on a regular basis (mostly between July and November) by severe tropical storms, that can have a wide range of impacts on coastal ecosystems. Anthropogenic modifications in the coastal area increase these impacts on mangroves and adjacent ecosystems, potentially altering biotic structure in reefs and nutrient cycling (Con Pro, 2010; CONANP, 2007). Reef and mangrove protection are the best investment in reducing the vulnerability, risks and costs. Increases in temperatures and droughts are increasing the occurrence and severity of fires (SoOUV, 2013; Con Pro, 2011; CONANP, 2007, IPCC 2014).

Potential Threats

High Threat

There is a fine line between current and potential threats in the marine and coastal environments due to cumulative effects. The most severe potential threats on land are likely to stem from expected sea level rise, while higher temperatures are likely to increase the presence of invasive species and aggravate ocean acidification.

▶ Ocean acidification, Temperature extremes

High Threat
Inside site, throughout(>50%)
Outside site

Sian Ka’an is on the “hotlist” of 12 biodiversity World Heritage sites projected to be most impacted by climate change; in the case of Sian Ka’an due to anticipated sea level rise. Increased water temperatures and ocean acidification are expected to have devastating effects on coral reefs and all calcifying organisms (IUCN, 2011; Con Pro, 2011, CONANP, 2007, IPCC 2014). In the adjacent marine area after the 2005 hurricanes, coral bleaching occurred.

Protection and management

Assessing Protection and Management

▶ Relationships with local people

Some Concern

A total of 1500 persons live within the reserve, in majority fishermen based in Punta Allen. Good relations have been established with organized groups such as fishing and lobster harvesting cooperatives and several small-scale tourism operators. Relationships with marginalized and not formally organized residents and resource users continue to be difficult, and they have been generally been left out of management processes (Brenner and Vargas, 2010; Brenner and Job, 2012). It is estimated that 80% of the

population surrounding Sian Ka’an has never visited the protected area due to extreme poverty in this region (Connecting Practices Report, 2015).

► Legal framework

Mostly Effective

Sian Ka’an has been declared as a Biosphere Reserve by a Presidential decree on 20 January 1986. 99% of its area (528,147.66 ha) is owned by the federal government (Management plan 2014).

► Enforcement

Some Concern

Between 2001 and 2004, four State of Conservation Reports on this property were presented to the World Heritage Committee, raising concerns about urban pressure and its impacts on the property (housing, ground transport infrastructures and tourism). In response, the State Party launched a project to implement Environmental Land Use system at regional level. The management plan has been updated in 2014 as requested by the WHC in 2003 (27 COM 7B.26).

► Integration into regional and national planning systems

Some Concern

The management of the property is partially integrated into planning for the national system of protected areas (CONANP, 2007). While there is good coordination in terms of the contiguous "Arrecifes de Sian Ka'an Biosphere Reserve and the "Área de Protección de Flora y Fauna Uaymil" (1994, IUCN category VI) coordination with other sectors, such as archaeology and culture, and other marine and terrestrial protected areas nearby leaves much room for improvement.

► Management system

Mostly Effective

The Reserve is managed by CONANP based on an updated Management Program outlined in 2014, and Annual Operations Plans. Activities are coordinated with international and local NGOs, other national and state management agencies, and national and foreign academic institutions (Con

Pro, 2010; CONANP, 2014).

▶ Management effectiveness

Data Deficient

The updated management plan (2014) provides for an evaluation process of management effectiveness, to be implemented. Indicators of trends in threat levels in the marine and terrestrial environments, and of the condition of conservation targets seem to demonstrate that management has been improving in recent years (World Heritage Centre, 2001; Weinig, 2009).

▶ Implementation of Committee decisions and recommendations

Some Concern

The State Party has responded to Committee decisions of 2002 with respect to regulation of tourism development, though it did not submit a full State of Conservation Report as requested in 2004. (whc.unesco.org).

▶ Boundaries

Some Concern

The boundaries of the property follow natural features as much as possible and are relatively well known by local communities (CONANP, 2007). However, the fact that the contiguous "Arrecifes de Sian Ka'an Biosphere Reserve" is not inscribed as part of the World Heritage is little known and creates confusion.

▶ Sustainable finance

Mostly Effective

Multiple donors support Sian Ka’an, one of best-known reserves in Mexico. Fundings for management of the property are provided by regular government budgets the national protected area fund, national and local projects (Sian Ka’an Biosphere Reserve is eligible for the national fund for natural protected areas which supported two conservation projects). Due to its global importance, Sian Ka’an also attracted considerable attention from international NGOs and agencies (GEF/UNDP). A Trust Fund for protected areas of Quintana Roo State is being developed (Con Pro, 2010; CONANP,

2007).

▶ Staff training and development

Data Deficient

Capacity building for management agencies and personnel is part of the current Conservation and Management Program (Con Pro, 2010, CONANP, 2014). The updated management plan (2014) aims to increase capacity of administrative and operational personnel without mentioning the priority areas. Data is deficient on the degree to which it has been implemented.

▶ Sustainable use

Serious Concern

Sustainable use is inherent to the biosphere reserve concept and being promoted by multiple projects and management activities (Con Pro, 2010, CONANP, 2007). Despite progress, for example as regards the management of Spiny Lobster, population declines of target species indicate inappropriate harvesting levels. But illegal fishing and extraction of non-timber forest resources in a non sustainable way by local communities are common and have negative impacts which need to be addressed.

▶ Education and interpretation programs

Some Concern

Environmental education programs are part of the current Conservation and Management Program. NGO « Los amigos de Sian Ka’an » runs education programs to raise awareness in conserving Quintana Roo aquifer.

▶ Tourism and visitation management

Serious Concern

Tourism management and the development of interpretive materials are part of the current Conservation and Management Program (Con Pro, 2010, CONANP, 2014). There are encouraging efforts to establish local tour operators to capture niche markets, in particular from the NGO « Los amigos de Sian Ka’an » which aims to brand the biosphere reserve as a major ecotouristic destination (Maya Ka’an), with the support of the Inter-American Development Bank. But overall data is deficient on tourism impacts and

despite the continuing growth in tourism over the last three decades, there is no visitor management programme.

► Monitoring

Data Deficient

Monitoring of indicators of threat reduction and the state of conservation targets is on-going in the framework of the updated management place (2014). A monitoring system for activities outlined in the Conservation and Management Program has been proposed, but to date, data is deficient on the degree to which it has been implemented (Con Pro, 2010, CONANP, 2007).

► Research

Mostly Effective

There is a strong potential for scientific research on both natural and cultural heritage. Considerable research has been undertaken in the Reserve on wildlife, terrestrial and marine ecology, geology and hydrology over many years, with an emphasis on its application to management and conservation. Data from 2008 indicate that 31 different research projects were underway on fisheries, tourism, fauna, forests, coral reefs, reserve governance, and fresh water fish which involved local, national, and foreign academic institutions (WDPA, 2011; Lasch, 2009). As an example, Florida International University has conducted a comparative study with the Everglades National Park, which has similar ecological characteristics (Nasa Waterscapes project). This study, which focused on the interaction between the hydrologic cycle and vegetation dynamics

Overall assessment of protection and management

Some Concern

The establishment of Sian Ka'an has made a marked difference on a coastline massively transformed since the arrival of mass tourism. At the same time, the property is not immune to the direct and indirect impacts of such broader developments and management has little influence on such developments. However, the challenges are well understood and significant efforts are being

undertaking to overcome them.

▶ **Assessment of the effectiveness of protection and management in addressing threats outside the site**
Some Concern

Threats outside the site are those related to deforestation for subsistence agriculture and livestock, and it is proposed in the Conservation and Management Plan that these threats be addressed (Con Pro, 2010, CONANP, 2014). However, data is deficient on the degree to which these activities have been implemented.

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **Scenic beauty of mosaic of landscape elements**
Low Concern
Trend:Deteriorating

While overall there is low concern for the state of natural phenomena, there is high concern with respect to scenic beauty because of uncontrolled coastal development (ConPro, 2010; CONANP, 2007).

▶ **Fascinating variety of life forms**
Low Concern
Trend:Deteriorating

Overall, there is concern for the state and trend of biological diversity and threatened species, though the rating is somewhat different among conservation targets. The rating for freshwater and brackish water wetlands, bays and seagrass beds, and terrestrial apex predators pumas and jaguars is good. There is relatively low concern for tropical forests, while there is high concern for coral reefs, beaches and coastal dunes (Healthy Reefs for Healthy People, 2012; Con Pro, 2010; CONANP, 2007).
From 2000 to 2012, Sian Ka’an lost 1.1% of its forest cover, mostly in the

coastal zones, due to expansion of the Cancun-Tulum tourist corridor. Mangrove loss was limited around 2% during 1981-2005 period and 1% between 2005 and 2010 (GEF, 2015)

Summary of the Values

▶ **Assessment of the current state and trend of World Heritage values**

Low Concern

Trend: Deteriorating

Due to its large size and relatively difficult access, large parts of the property continue to be in a good state of conservation. Despite an overall good state of the World Heritage values related to natural beauty, there is a concern with respect to the coastal zone, which is affected by uncontrolled development and plastic debris. Key concerns in terms of overall trends are the depletion and contamination of freshwater resources and the uncontrolled use of certain marine and terrestrial species, however restoration activities have led to the elimination of 41000 casuarinas.

Additional information

Benefits

Understanding Benefits

▶ **Outdoor recreation and tourism**

Tourism is a driver of the local and national economy and largely based on the natural resources of the coast.

▶ **Importance for research**

As a biosphere reserve, the site is of great importance for developing and transmitting knowledge of conservation and sustainable use; and the Maya civilization that has been inhabiting and continues to inhabit the area and

continues to use the natural resources of the property and its surroundings.

- **Legal subsistence hunting of wild game, Collection of wild plants and mushrooms, Fishing areas and conservation of fish stocks**

  The natural and cultural resources of the property provide the basis for the development of livelihoods of a significant portion of inhabitants. Hosting areas of breeding and reproduction of fishes and crustaceans with commercial relevance, Sian Ka’an is important for the maintenance of local fisheries. Within the area, fishing communities of Punta Allen, Maria Elena and Punta Herrero have rights
  granted for lobster catch (Palinurus argus). A study indicates that reef-related fisheries in the Mesoamerican Caribbean Reef System, including the Sian Ka'an Biosphere Reserve in Quintana Roo, represent a potential annual value of between US $ 150 and US $ 1,500 per hectare. In peripherical areas, Maya communities produce gum extraction and beekeeping with native bees (Melipona), in addition to traditional agriculture and forest uses. But alternative incomes generated by international programmes are unbalanced, as they disproportionately benefited a group of approximately 40 families members of the first fishers cooperative established in the area in the mid-1980s (GEF).

Summary of benefits

At the national and global levels, the benefits of Sian Ka' an most valued are conservation and the generation of knowledge, while at the local level the property is most valued as a provider of livelihoods for local communities and a key resource for tourism development.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Centro Ecológico Sian Ka’an		A small ecotourism and education center, it serves as a model for sustainable development in sensitive tropical ecosystems. The revenue generated through tours, fishing, beautiful accommodations, and various on-site activities is used to fund conservation and education programs.
2	The Nature Conservancy, The Gillette Company, the United Nations Foundation and Amigos de Sian Ka’an (ASK) are working together through the International Corporate Wetlands Restoration Project (ICWRP)		Together these organizations are developing a project to protect critically important wetlands in the Sian Ka’an World Heritage site. The project is implemented by Mexican conservation organization Amigos de Sian Ka’an, which seeks to promote the protection of critical coastal habitats and ensure the viability of the region’s freshwater system by: • Implementing an easement and conservation land buyer program targeting the coastal areas of the Reserve; • Promoting the implementation of the existing land use and zoning plan with landowners and government agencies; • Enabling the acquisition of a key tract of land that strategically protects the only access to an extensive wetland system; • Mapping priority water catchment areas important to the Sian Ka’an wetlands and analyzing sources of contamination in freshwater system; • Promoting best practices for wastewater management to communities, local hotels, and property owners.
3	The Nature Conservancy and Amigos de Sian Ka’an (ASK)		These organizations are undertaking a project to address the growing threat of development outside the reserve, the Conservancy and ASK have engaged the private sector, working with local landowners to establish conservation easements and acquire critically threatened, privately owned lands. The Conservancy and ASK are also working with local communities in and around the reserve to promote sustainable resource use and best practices for land use and development
4	UNDP/GEF/SGP/COMPACT		Sian Ka'an is one of several global sites supported by a specialized programme under the GEF Small Grants Programme named COMPACT. COMPACT is implemented by UNDP and focuses on landscape approaches working with community-based organizations on the ground.

№	Organization/ individuals	Project duration	Brief description of Active Projects
5	Cooperative Society of Fishing Production Cozumel		Program for the control and eradication of lionfish in the Sian Ka'an Biosphere Reserve.
6	UNDP / CONANP	From: 2014 To: 2020	Optimizing the effectiveness of Protected Areas in Mexico to contribute to the conservation of endangered species
7	Los amigos de Sian Ka'an		Building sustainable recreational experiences in the Sian Ka'an Biosphere Reserve and its surrounding areas.

Compilation of potential site needs

№	Site need title	Brief description of potential site needs	Support needed for following years
1	N.A.	Existing efforts to coordinate and cooperate with neighboring Belize or even at the regional level to conserve and manage the shared marine and terrestrial resources deserve to be consolidated.	
2	N.A.	The property is part of a much larger contiguous conservation complex comprised of three protected areas. This raises the question of management coherence and, possibly, the question of an extension of the existing property.	

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