Special Issue

We Thought We Wanted a Reserve: One Community's Disillusionment with Government Conservation Management

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Abstract: *A protected area near Cancún was the first in Mexico initiated by local communities. In 1994, three communities placed their lands in the federal category of an Area for the Protection of Flora and Fauna. Ethnographic research in one of the communities (2003-2004), documented local perceptions that the director of the protected area was not allowing local residents to participate in decision making concerning the major tourist attraction, a nesting colony of seabirds. Previously, an advisory council ceased to function, and a local conservation organisation of young people was disbanded. The latter had built observation facilities, provided services to nature tourists and protected the colony. The director was perceived as undermining this organisation and refusing to heed community requests for reforestation of the nesting habitats. Cumulative damage to vegetation from hurricanes eventually resulted in the complete disappearance of these birds (2005-2006). This created a decline in small-scale tourism, reduction of local livelihoods, and increased pressure on the reserve's director to allow the community to sell its*

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commons, including beach frontage. If the community sells its lands, the buyers officially will be obligated to operate within the regulations of the protected area. The regulations allow 'eco-development', gated housing projects that include 2–5 acres of land per house. These homes are for the very wealthy, for vacations or retirement. Eco-hotels are also being built to serve an international elite. All of these developments exclude the previous residents.

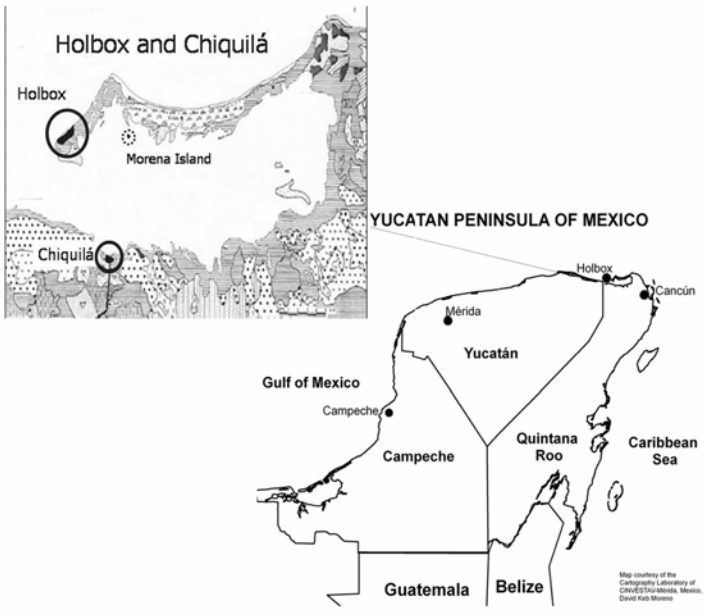
Keywords: Maya communities, conservation, reserve management, protected area, nesting colony, seabirds, tourism, participation

INTRODUCTION

THIS ARTICLE FOCUSES on a nesting colony of seabirds that once occupied an islet in northern Quintana Roo, Mexico, and is gradually returning (see Figure 1). The local name of the islet is Morena Island, known to tourists as Bird Island, or Isla Pájaros. It forms part of the historical landscape of the *mestizo* community of Holbox, founded in the early 1800s on a neighbouring large is-

Figure 1

Map of Holbox and Chiquilá, relative to the Yucatan Peninsula of Mexico



land. Both Holbox and Morena Island are now part of the Yum Balam Protected Area for Flora and Fauna, locally referred to as "The Reserve". The history of local use, prior conservation efforts, and the establishment of the reserve in 1994, provide context for the analysis of the first 11 years of professional management ending in the abandonment of the nesting island. Tourism, conservation activities and hurricanes have played a major role, impacting both the bird populations and the human community.

Conflicts developed over conservation and control of tourism to the nesting colony. Stakeholders overtly involved in these conflicts include reserve authorities, tourism cooperatives, elected community authorities and a local conservation organisation. The other local residents also have opinions on this subject. Since the late 1980s, hurricanes have eroded more than a third of Morena Island and seriously damaged the vegetation. The latest, Hurricane Wilma, destroyed the remaining tall trees used for nesting. Prior to this, local people had clearly expressed their concerns that the nesting island was in danger and a local conservation organisation attempted reforestation. However, the reserve's director prohibited this. A questionnaire survey in 2004 documented the majority opinion that the reserve authorities should take action to restore the habitat of the nesting colony (see Appendices 2 and 3 in Berlanga 2005, for detailed results of this questionnaire). At stake were both a valued part of their cultural landscape and a source of income from tourism.

The reserve's director was respected for his honesty and dedication to conservation. He apparently understood the international policies to include non-interference with natural processes in protected areas. While he treated local people with respect, he did not allow them to participate in decision making. Local people resented his valuing of international conservation policies over their experience and knowledge. Historical documents and interview data clearly illustrate that when Holbox and two neighbouring communities voluntarily agreed to put their communal lands in a protected area, they expected to be included in decision making as full partners. Throughout the period of preparation they had collaborated with scientists from two research centres based in Mérida: the regional Centro de Investigaciones Científicas de Yucatán (CICY) and a local campus of the federal Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (CINVESTAV-IPN). By 2003, a process of selling lots within the village to outside eco-developers had begun. By 2007, there was an airport (with flights to Cancún and Mexico City) and a luxury hotel advertising rooms for $100–200 US dollars a night.

This experience is reflective of government practices in the peninsula known as "Yucatán", where more than 20 per cent of the land has recently been converted to protected areas (see Smardon & Faust 2006 for a review of the process). Much of this land is still legally owned by local communities and nearly all of it has been traditionally used by them for lumber extraction, hunting, fishing and gathering, as well as shifting cultivation. These communal lands placed in Mexican reserves have not been bought from their collec-

tive owners nor have affected communities received monetary compensation for the new restrictions on their traditional use of resources in the neighbouring areas legally designated as national lands. An increasingly popular recourse for owners is to sell the land to eco-developers for tourist facilities and vacation/retirement homes (Berlanga 2005 and later observations in Holbox) or to conservation organisations that are willing to buy land (The Nature Conservancy and Pronatura-Yucatán are among those buying land for conservation).

Bio-physical Description of the Study Area

Holbox Island is in the northern part of the State of Quintana Roo and is a long, narrow sand bar divided at several points by canals that unite the sea with Lagoon Yalahau. Its official geographical coordinates (centre of town) are 21°31′24″ northern latitude and 87°22′42″ western longitude. The inhabited portion stretches along the coast and measures about 10 km in length and 800–1000 m in width; the remainder of the island extends an additional 30 km west to the point known as Cabo Catoche. One reaches the island by means of Federal Highway 180 that connects the city of Merida with Cancún, departing this highway at the community known as 'El Ideal' for a 174-km trip to Chiquilá, where there is a ferry to Holbox Island.

From Holbox Morena Island is 4 km by boat. This island has the form of an irregular triangle with a surface of about 2 hectares. According to local oral histories, it maintained a dense community of nesting seabirds for more than 150 years. Berlanga (2005: 66) found 3500–4000 birds occupying the island when he did inventories in the early 1990s. He registered fifty-two species of birds, of which thirty-one are migratory (Berlanga 2005, see also section titled 'methods'). Nine species nested on the island, including double-crested cormorants (*Phalacrocorax auritus*), brown pelicans (*Pelecanus occidentalis*) and frigate birds (*Fregata magnificens*). The island suffered erosion of more than a third of its area from Hurricane Gilbert (1988) and vegetation losses from both Gilbert and Isidro (2002). Finally Hurricane Wilma (2005) destroyed the last of the nesting habitat and the birds subsequently abandoned the island completely for more than a year, although a few returned in the spring of 2007.

Fortunately, the islet is not the only tourist attraction in the reserve, which includes 1,54,052 hectares of land, sea, wetlands, lagoon and forests, with many species of interest to researchers and tourists alike. Of all species registered in inventories for the state, 80 per cent have been found living in this area. The low and medium tropical forests are among the most northern of such forests and include a number of endemic species of plants. The geology includes an important aquifer, although surface water is scarce due to the karst topography (Gómez-Pompa et al. 1995).

Social History of the Region

Historically, the peninsula of Yucatán was the homeland of the Classic Maya Civilisation, a regional variant of the Mesoamerican complex, and one of the five original centres of urban civilisation. The Maya developed a system of hieroglyphs with which they wrote many books. They also had a complex mathematical system, advanced knowledge of astronomy, impressive public architecture and fine art work in sculpture, murals, fine jewellery and ritual performances. Less well known is their management of water and intensive agriculture in an area with very little available ground water, a 6 month dry season and frequent hurricanes. Houses and public buildings constructed in typical Maya style have been dated to approximately 3000 years before the present. By 300 years before the Common Era (or B.C.), massive hydraulic works were constructed in the Maya metropolis of Edzná. The ninth century collapse of a region of city-states in the central and southern area has led to hypotheses concerning overshoot, and population growth beyond carrying capacity followed by a population collapse, perhaps due to soil exhaustion combined with prolonged drought. However, other Maya cities survived and new ones were begun so that the Spanish encountered armed resistance from various city states in the first-half of the sixteenth century.

After a long period of resistance by the Maya, the Spanish were eventually able to establish control over the major cities by 1542, 20 years after their relatively rapid conquest of the Aztecs. The Yucatán constituted an administrative unit within New Spain, although its coasts were subject to repeated pirate attacks emanating from the Caribbean from the 1600s into the 1800s. Coastal areas were abandoned by both the Maya and the Spaniards with the exception of a few heavily guarded port cities (Campeche, Chetumal, Bacalar and Merida's smaller port of Sisal, later replaced by Progreso). Thus, the origins of Holbox as a coastal community founded by pirates is not unusual in this region, nor is the interior location of the Maya communities of this county.

With independence from Spain in 1821, this peninsula became the Mexican State of Yucatán. In 1847, the eastern Maya led the most successful, long-term revolt by indigenous peoples in the Americas, the Caste War of Yucatán. This resulted in the formation of the Territory of Quintana Roo in the southeast of the peninsula, where the Maya enjoyed autonomy for several generations (Villa Rojas 1945; Reed 1964; Bricker 1981; Dumond 1997). In 1901, a peace treaty was finally signed; however, government presence was quite limited until the establishment of Cancún as a major tourist site in the 1970s.

In the 1860s, there was another war of rebellion against the political leadership of the State of Yucatán but it was led by non-Maya elites of Campeche City and resulted in the formation of the new state of Campeche in the southwest of the peninsula. However, outside of privately controlled haciendas, small communities of refuge in the interiors of both Campeche and Quintana

Roo experienced little attention or control by either federal or state governments until the hacienda system was abolished in the 1920s by federal troops, following the Mexican Revolution. Public elementary schools and communal land titles were later provided both to communities formed by former peons of haciendas and to 'free communities' (including those of Quintana Roo).

The Territory of Quintana Roo had maintained much of its autonomy even after signing the peace treaty in 1901. Maya leadership was in charge of political organisation, religious institutions, regional commerce and (unofficially) relationships with the British Honduras, from whence they historically had purchased the guns and ammunition to defend their independence. Schools and land titles were welcomed, sales of *chicle* extracted from the chicozapote tree (*Manilkara zapota*) for chewing gum were negotiated as were logging concessions to exporters. This Maya territory did not become a Mexican State until 1970, when the government began to develop the massive tourism site of Cancun on the lands of a former fishing village. Immigration from Mexico City and other areas of the country has been massive, and the state government is largely under the control of non-Mayas, who dominate the coast and its massive tourism development from Cancun south to the Biosphere Reserve of Sian Ka'an.

In the present three states of Yucatan, 30 per cent of the population still speaks Mayan (the only criteria for being classified as indigenous by the Mexican census). Most are bilingual and literate in Spanish. The Maya are still less educated and earn less than non-Mayas throughout the region, and are rarely represented by any one of their own ethnicity in the three state legislatures, although increasingly they occupy positions in town halls, *ejido* offices and universities, as well as being medical doctors, accountants, engineers and entrepreneurs of small businesses. (For a more complete summary of the social history see Smardon & Faust 2006.)

Methods

Berlanga was employed in 1990 as a biologist to do the inventory of birds, reptiles and amphibians for the proposed protected area by the regional non-governmental organisation (NGO), Pronatura-Yucatán. The inventory is cited in Snedeaker et al. (1991). This prior experience and later ones giving workshops to local residents has been useful in locating documents, formulating appropriate interview and survey questions and selecting local consultants (key informants). In 2003, he resided in the community for 3 months, doing participant observation, collecting oral histories and supervising the application of a questionnaire. He returned for shorter visits in 2004 to clarify issues for his Master's thesis in Human Ecology, supervised by cultural ecologist Faust and an interdisciplinary committee (including two biologists, Eric Castañares and Liliana Porter-Bolland, and a human ecologist, Federico Dickinson). The study included observation of interactions between the residents

of one of the communities (Holbox) and reserve authorities. Participant observation included documentation of visits to the dock where tourists arrived by ferry to contract nature tours. Berlanga also travelled with tourists on the tour boats, watched tourists interact with local people in the community, listened to spontaneous comments and attended meetings between reserve authorities and the local community. Perceptions of local people were collected through application of a questionnaire (using a Likert scale) to 253 persons (out of a fluctuating population of between 500 and 600 adults). Semi-open interviews were conducted with forty-six local consultants including members of tourism and fishing cooperatives, a local conservation NGO, eighteen elders of the community and the Director of the Reserve and the Director of Projects for the Reserve (a woman biologist who is a native of Holbox).

History of Resource Uses and Conservation Activities on Morena Island Prior to the Establishment of the Protected Area

According to local legend, the settlement was founded sometime before 1850 by pirates (possibly British), who decided to settle down with some local companions of Spanish and Maya descent. After destruction by a hurricane in the 1850s, the federal government helped the survivors relocate on a more sheltered location on the same island. The present Holbox was officially established in 1854 (Tomás Jiménez, interview cited in Almanza 2000: 83). According to interviews with local inhabitants, it was always the case that fish in the local diet was supplemented by the consumption of seabirds. The most commonly eaten birds were cormorants, but both herons and flamingos were occasionally consumed, as were sea turtles and manatees (Berlanga 2005: 138).

Within the experience of the eldest generation, the lifestyle of this community has changed as it interacted in various ways with international markets. During the 1920s, for instance, local entrepreneurs, based in the city of Merida, began to buy heron plumes for fashionable ladies' hats (Berlanga 2005: 60). This participation in international trade was of a scale important to the local economy, providing cash for the purchase of manufactured goods. Holbox and Morena Islands are part of the only nesting area of a rare white heron, now identified as a subspecies of the 'great blue' heron (*Ardea herodias occidentalis*). The market for these feathers disappeared before the birds became rare. In fact, this species still nests in the area.

It was not until the end of the 1940s that the first federal prohibitions against the use of wild species for food or sale began to be implemented locally. The extraction of eggs from seabirds and sea turtles was prohibited, along with the killing of these species and manatees, all of which were highly prized delicacies in the local diet. According to the elders interviewed, the most commonly used species of those prohibited was the cormorant. They insist that it became scarce only *after* these government prohibitions, resulting

in confusion: after decades of increasingly intense conservation efforts by the government, there were far fewer cormorants in the area rather than more—even before Hurricane Wilma. This paradox has resulted in doubts concerning the government's conservation efforts, as can be seen in the following excerpt from an interv.iew with an elder.

> *'I say that this is a pure bull-shit lie! Long ago we killed hundreds of animals (cormorants) and there were many. Now who is killing them? And there are fewer. Who is killing them? Who kills them?…Before they were selling cormorants here, selling them there and everywhere they were selling cormorants. I tell you, live ones. Of course (they were) in cages. And you went (to Morena Island) and you saw them in bunches, sitting on the branches of trees. Now, go and see (that now there are practically none). Who is killing them, eh? Eh?'* Don Saturnine Coral, 67 years old, 22 September 2003: 7, interview transcription by Berlanga, translation by Faust.[1]

While there are numerous other probable causes for this apparent paradox, local perceptions that it has been caused by administrative failure are strong and have doubtless been strengthened by subsequent experiences with the Reserve.

As previously mentioned, a contributing factor in this decline was Hurricane Gilbert that both damaged habitat and killed a significant number of birds, according to observations by local people. Berlanga first visited the nesting colony in 1981 (Berlanga 2005: 67) and noted a substantial reduction in numbers when he returned to do the inventory of birds for Pronatura in 1990 (reported in Snedeaker et al. 1991). It is impossible to be more precise concerning population numbers as no bird counts were done by professional biologists before Berlanga's 1990 inventory.

The erosion of the island is easier to document. More than one-third of the island was eroded by Hurricane Gilbert in 1988. Only trunks of dead trees mark a portion of its previous extent. In addition, this hurricane and two later ones reduced the specific type of vegetation preferred for many nesting activities—relatively dense stands of the higher bushes and trees (Figure 2).

Another factor contributing to the decline in the seabird populations was the government's promotion of commercial fishing, combined with a policy aiding the migration of former *henequen* workers to the coast. Fishing cooperatives were formed and provided with boats, motors, nets, refrigeration facilities and access to buyers (Paré & Fraga 1994). The population of fishermen grew and began to capture more fish per person than previously, when only hand lines were used. The newly introduced nets resulted not only in greater harvest, but also in substantial 'by-catch', a term used by the Food and Agriculture Organization (FAO) for the inadvertent capture and killing of unwanted species, or sizes, which are dumped overboard. Worldwide, by-

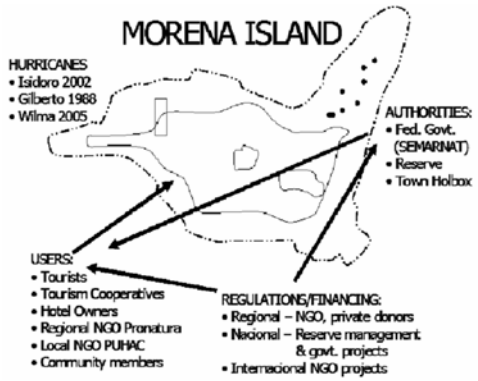
catch is substantial in commercial fishing operations (FAO 1994a); in Campeche it is five to ten times greater than what is brought to shore by shrimp trawlers (FAO 1994b). These trawlers have also disturbed the sea bottom throughout the Gulf of Mexico (Watling & Norse 1998; Pauley et al. 2002; Van Houtan & Pauley 2007). These increases in human impacts may be assumed to have reduced the food supply of seabirds.

It is also possible that federal prohibitions beginning in the 1940s may have produced an over-population of birds. The accumulation of bird excrement would have caused a gradual degradation of the soil's capacity to maintain relatively tall trees, which these birds select for nesting. Thus, they may have begun to migrate in response to these changed conditions. Indeed, empirically derived local knowledge indicates that local use prior to Federal regulations was probably sustainable by virtue of its important culling function. As one local elder explained:

> *'It seems that they lay three eggs and as they (the chicks) are growing, the two bigger siblings are going to kill the smallest, this with the intention of getting more food. While the pair of siblings continues growing, the parents are working hard all day looking for fish to feed them. These two do nothing more than eat and rapidly digest their food and then they want another meal. Thus, the father goes and the mother comes, continually they do this. Then the two siblings begin to fight also, in order to get more of the food. They fight until one kills the other and is left alone, at the end. This produces a population that will survive.'* Gilberth Correa, interview 20 July 2003: 5, transcription by Berlanga, translated by Faust.

Figure 2

Map of Morena Island showing damage from Hurricane Gilbert



Human predation of eggs would have reduced the number of birds killed by siblings; the killing of adult birds would have further limited population growth. The reduction of human predation of seabirds coincided with a simultaneous reduction in the island's reptile populations, especially boas, which were sold to circuses, and iguanas, which people ate and also sold (Berlanga 2005: 121). Both these reptiles previously ate sick or dead birds, eggs, and even the fish remains that are regurgitated by the birds as part of their normal digestive process (Berlanga 2005: 8, 94, 121). The habitat of nesting islands is known to deteriorate with time and result in migration to other islands (Bouton & Frederick 2003). The vanishing of reptile populations on Morena Island may have combined with the reduction of human predation to create a situation in which bird populations exceeded the carrying capacity of the island's habitat, resulting in some migration even before the island suffered erosion and vegetation losses from the last three hurricanes.

Thus, there are multiple possible explanations of the inverse correlation of *decreasing* bird populations with *increasing* government conservation activities, rather than with use of a communally owned resource. In the absence of outside information, local history would seem to indicate a contradiction of the pattern described as 'the tragedy of the commons' by Garrett Hardin (1968). This pattern is one in which each of the communal owners seek to maximise individual benefits with the inexorable result being over-use and deterioration of the commons. In the specific historical case analysed by Hardin, the number of sheep pastured exceeded the carrying capacity of communal pasture lands in England, resulting in the deterioration of both vegetation and soils. The contemporary Mexican variant of the English commons is the '*ejido*', which includes individual use rights, communal title and federal oversight. It is an extension and modification of a prior system of communally shared rights to resources. Until the middle of the twentieth century, Morena Island belonged to everyone in Holbox and to no one, so that anyone could extract meat and eggs for use or local sale (Berlanga 2005: 57–59). The community's demand for these food items is reported to have been constant and high, but this did not result in extinction or even in perceptible diminution of the species most used—contrary to the model proposed by Hardin.

The Establishment of the Protected Area

The Yum Balam Area for the Protection of Flora and Fauna (Area de Protección de Flora y Fauna Yum Balam) was publicly declared a protected area in 1994, although efforts to protect the area began in 1990 with biological inventories done by the two regional research institutions CICY and CINVESTAV along with some independent biologists. Initial funding came primarily from a regional NGO Pronatura-Yucatán working with a local one, Yum Balam, Asociación Civil (AC, a type of grassroots NGO with legal recognition in Mexico).

The establishment of this reserve was preceded by the creation of other protected natural areas throughout the country during the administration of President Salinas (1989–1994), in response to international initiatives that provided significant financial incentives. Prior to this, Mexico had established protected areas in the interests of the public good and in particular emphasised the dependence of municipal water supplies and agricultural soils on nature's services (see Quevedo (1902) for the origins of this policy).

Declaring the protected area of Yum Balam meant legally restricting the use of lands, without having to purchase them. Fifty per cent of the land is communal property (*ejido* land). The other 50 per cent of the land included in the Yum Balam Protected Area is composed of federal and private lands (Gómez-Pompa et al. 1995). The reserve was established because it is an area unusually rich in biodiversity and contiguous with the previously established Biosphere Reserve of Ría Lagartos, a large estuary system that had previously been designated as a world heritage site (Decreto Presidencial de la Área de Protección de Flora y Fauna Yum Balam, August 30, 1994).

Until the devastation of Hurricane Wilma in 2005, the birds of Morena Island were important both for conservationists and as tourist attractions. These birds were part of the wildlife that officially belonged to the nation and that had been protected from local consumption since the 1940s by federal law. With the establishment of the reserve, they were reincorporated into local use as 'natural resources' under a new federal regimen associated with the promotion of tourism and the attempts to apply the new concept of 'sustainable development', based on an ethical principle of concern for future generations. Mexican federal policy began to include a category of protected natural areas that allows for non-consumptive human use, as in tourism. It also allows for 'sustainable' consumption of some species associated with breeding farms or protection of reproductive areas, through Unidades de Manejo Ambiental (UMAs, Units of Environmental Management). The original plan for the reserve included butterfly, crocodile and deer 'farms'. These species would be grown for sale and/or release into natural habitats.

One of the founding members of Yum Balam AC, gave his recollection of how the Reserve began:

> *'How did the (Reserve of) Yum Balam begin? It was born of a vision. Almost all of us who formed the strategy had previous experience with protected areas. Paco (Remolina) came from working in Chacahua. We came from Sian Ka'an (a Biosphere Reserve in the south of the state); Sebastián Poot from the County Government of Lázaro Cárdenas; Ingrid (Olmstead, botanist from CICY) was the godmother of the process as she assisted with her own money. Also there was Rafael Durán (botanist from CICY) and people who did research on fisheries here in the CRIP (Centro Regional de Investigaciones Pesqueras). Thus, there was a group of interested people. We all knew each other. We had in*

> *common that we knew almost all the actors in conservation here in Quintana Roo.'*
>
> *But it (the reserve) also resulted from a situation of political responsiveness. It was not only a vision of conservation, per se, but also there were political opportunities…Sebastián (Poot, of Yum Balam AC) was able to find a way, using his political vision, saying, 'Well, if we are going to make a project, it is important that it have transcendence and continuity. It is worthless to begin something of one or two years because now we have a friend in the county government'. Sebastián was the Secretary of the County Government and besides he was part of the PRI (the party that dominated Mexican politics for 70 years, until 2000). Now, we are talking about around 1992… . There were great areas of tropical forest in good condition, large areas without human population. There also was the possibility of including a marine area…. It was also the last tourism frontier of the state. Already they were talking about "The Maya Coast''.* Interview with O. Canul González, 8 December 2003, Appendix 4 in Berlanga 2005: 194, transcript translated by Faust.

Another key actor in the process was Manuel Correa, then head of the Ecology Department of the County. He recalled clearly that community development was to be included in the plans for the protected area

> *'I was involved in these things, in everything…in fact, when…when they said that it was going to happen (that the reserve would be legally decreed), Julia Carabias[2] came here with Mario Villanueva[3]. …We did it here… the Area of Yum Balam… It was my responsibility to be the speaker, because it was seen as important that local people wanted to participate in this protected area (and) that it was not going to cause problems in any way with the development of the people, this custom of a protected area…with all that comes with it, of course. And that then was the spirit of the reserve, I tell you.'* Manuel Correa. 16 November 2003:3, transcript by Berlanga, transcript by Faust.

The meetings to form the reserve began in the county seat, Kantunilkin, with five communities participating: Solferino, Chiquilá, San Angel, Holbox and Kantunilkin. The wording of the Kantunilkin Declaration contains references to the area as part of Maya heritage, to be shared with all humanity, but also announced their intention to continue using the flora, fauna, and fish in the traditional manners, to manage the reserve themselves and to guard it, with technical advice from the researchers who had helped them do the inventories of species and the scientific descriptions of ecosystems. Management would be in the hands of a council formed by the *ejidos* and town governments, the

local NGO Yum Balam AC, and the Supreme Maya Council. This document was signed by the governor of the state, local mayors, the representatives of a fishing cooperative and a newly formed tourism cooperative, as well as the principal of the local technical high school (Declaración de Kantunilkin, 11 April 1994).

When this petition reached the local representative of the federal agency SEDESOL, who had the responsibility of writing the formal decree for the President of the Republic to sign, he unilaterally changed the name of the reserve to the Area de Protección de Flora y Fauna, Yum Balam and deleted any reference to local management, although Maya archaeological sites and customs are mentioned (Decreto Presidencial de la Área de Protección de Flora y Fauna Yum Balam, August 30, 1994). The change in name occurred in the same year that Zedillo took over as President and started the first federal agency devoted only to conservation, SEMARNAP removing this activity from its various prior locations, embedded within departments of social development, fisheries, agriculture and water management (Berlanga 2005: 150–151).

Apparently in response to the name change, the two predominantly Maya communities, Kantunilkin and Solferino, removed themselves from official participation in the reserve, although they are in the area of influence and thus receive some funding for conservation projects. They also continued to participate in Yum Balam AC. The coastal communities of Holbox, Chiquilá and San Angel continued in the reserve. The fact that they are predominantly *mestizo* may have made them more inclined to trust government control than the Mayas in Kantunilkin and Solferino. The *mestizo* communities were on the coast and aware of the spread of government managed tourism out of Cancún; thus, they may have thought that becoming a protected area would protect their lands from confiscation for tourism development. The interior Maya communities had a long history of defending themselves and their lands and do not easily relinquish control to outsiders.

After the Decree: The Great Lapse or a Political Space?

The three participating communities and their scientific advisors met several times during the first year after the protected area was officially established. After this, the reserve was largely in the hands of one unpaid representative of the original group of advisors, Francisco Remolina, who periodically consulted informally with some of the other advisors, as well as with the leaders of Yum Balam AC, and other local users in the search for continued funding. He travelled repeatedly with his wife and three children from their home in Puerto Morelos to Kantunilkin, supporting his family with his work as a veterinarian and putting in many hours of unpaid work trying to raise funds for the reserve. There was no money to pay either staff or director. Finally, after 6 long years, the government provided funding in 2000 for the operation of the

reserve, including a paid position for Remolina as director. In the interim there was confusion and a deep sense of disappointment among the network that had worked hard to create this protected area.

Correa, who had fondly recalled his role in the founding of the reserve, described his disappointment with the lack of action afterwards:

> *'There was no participation. Well, no participation by the communities, for whom the Project (of sustainable development) would supposedly arrive… . No one came, they did not have meetings, the councils did not function… . The Council of Advisors had two or three meetings in the four or five years. These were held in the county seat, Kantunilkin (more than forty miles from Chiquilá where the ferry arrives from Holbox). There was one meeting to which various federal authorities arrived together in order to solve the problems of all the communities in the protected area… . They made a magnificent event in Kantunilkin, where they all said that there really was going to be a protected area (functioning). This was at the end of 1996…the cream of the federal government arrived and it was for nothing, it was useless, the same as everything else they did.'* Manuel Correa 16 November 2003:6, transcript by Berlanga, translation by Faust.

Tourism continued during this period in the absence of paid reserve authorities. In 1995, funding was obtained from PRONATURA for a course on local birds for boat drivers (taught by Berlanga). The information was useful for guiding bird watchers on boat trips to Morena Island. This first course was attended by various residents in addition to the boat drivers, including some young people who in 1998 created an official civil association, PUHAC (Protejamos Unidos a Holbox, Asociación Civil, Let's Protect Holbox Together). One tourism cooperative of boat drivers was formed in Holbox in the same year, and four others were formed subsequently, two in Holbox and two in Chiquilá. They were formed according to federal guidelines in order to obtain from the government exclusive rights to transport tourists to see the birds, paralleling the prior system in which exclusive rights to fish particular species in designated areas were given to legally constituted fishing cooperatives.

Observation towers were constructed in 1994-1995 on the islet in a project designed by the then 'honorary' director of the reserve. He wrote the project and obtained the funds, without consulting with anyone in Holbox. He hired people to work in this project who were from another town that had not put its lands in the protected area. Various persons from Holbox, especially the boat drivers and tour guides, insisted that the towers should not have been built on the islet because this location made it easy for tourists to leave the towers and walk among the nests, picking up eggs and chicks, a practice which causes the parent birds to abandon their nests.

In 1999, PUHAC reported to SEMARNAT some observed problems on the islet related to activities of the Tourism Department. In the same year, PUHAC presented a new proposal to construct towers offshore from the islet, which received funding from SEMARNAT of $115,000 pesos, money obtained through a fine levied against a hotel in Holbox for not properly disposing its garbage (Berlanga 2005: 89–100). It was PUHAC that reported the violation and was allowed to use the money for its project. This funding was obtained without the support of the 'honorary director'. His approval had not been sought in part because the project was implicitly a criticism of the towers he had previously built.

The boat drivers initially left to PUHAC both the conservation activities and the provision of information, binoculars, and souvenirs to tourists on the observation platforms. Both PUHAC and the tourism cooperatives were actively involved with the tourists and in the search for funding. They understood the basics for protecting the island and were jointly managing the tourists and each other in the absence of professional staff.

During this period, the reserve functioned with financial assistance from private donations of members of the advisory council, volunteer work by PUHAC, and some project funding from government agencies and international organisations given to PUHAC and the two regional NGOs, Yum Balam AC y Pronatura Península de Yucatán. In fact, in 1996 Yum Balam AC had more money in its annual budget than the entire surrounding county (Berlanga 2005: 196). Remolina functioned at times as a kind of honorary director, looking for funding opportunities, keeping people involved, getting the area recognised as a tourism destination, and trying to hold the local coalition together. Yum Balam and Pronatura managed their own projects, as did PUHAC.

Canul commented on a lack of involvement by local people that began even before the reserve was established, saying that most local people were focused on their own survival needs and their traditional ways. Many of them saw the reserve simply as a way to get more money and resources from the government, rather than an opportunity to initiate something that would benefit local people in the long term. The small group of organisers (including town authorities, Yum Balam AC, a few of the academic advisors, and the leaders of PUHAC) apparently reached common ground, worked together well and found resources, but did not maintain good communication with other residents nor a sense of their own limits, as indicated in the following quote:

> *'What was missing in the process? What was lacking, why was it that Yum Balam with all the impetus with which it began could not stay the course? This is what you are asking me, okay. 'Why did the cooperatives leave, why some other organisations, why the* ejidos *(of Kantunilkin and Solferino)? In the first place, I feel that Sebastian moved too fast. It was too early to enter the political process (of forming the*

> *reserve). He was the one to initiate this, at the local level. Then, instead of forming alliances (with local people), we made enemies. Even when our advisor, let's say it straight, they advised us that we did not have experience in something that is called analysis of context. We were too ingenuous and impulsive. Yes, we were swallowing the world in pieces. And that is what it was, a decisive factor in the process, a break in the equilibrium (of local society). Or one could say we were lacking social management experience. Even when we had some workshops on participative planning, we did not understand the process from the inside. We were too busy, and that was an error in that moment, an administrative one in the end. More than the relationship with the people, (it was an error in) understanding clearly what was going on (with them). We were too busy with the work of maintaining the Association and keeping the projects of the Association functioning. Finally the moment came in which only one element had to see about five projects at the same time. They were projects with government financing, from SEDESOL, SEDUE, and PRODEFOR, at one time. My part was to keep an eye on reforestation planning. And, see about the bathrooms. Yes, I believe that (pause) we also committed a little of the sin of pride. Rather, I believe that we did so quite a bit. I think when you form part of a civil group, you have to do an analysis of your level of awareness first, and do it with balls!!! An analysis of your (real) possibilities. And I believe also that some of us were a little sick. Yes, there was a process, and we were thinking that we could do many things, when our possibilities were actually limited. Not only limited with respect to the lack of human resources to develop things, but also through the lack of a theoretical process, an intellectual analysis of what was happening around us…a capacity to analyse (social) reality. Even when we met and had discussions, it seems to me that they were too superficial, and always, at the end, the analysis was not deep enough.'* O. Canul González, 16 November 2003: 6, in Berlanga 2005, Appendix 4, translation of the transcript by Faust.

One could perhaps gloss this as ingenuous enthusiasm, leaders getting out too far in front of their community. The next stage was retrenchment, followed by a slower, more careful process of learning how to maintain community cohesion while initiating change.

Federal Funding Finally Begins

When federal funding for the salary of a director finally became available in 2000, the position was given to Remolina. Local people approved this appointment as they viewed him in positive terms at that time. As one respondent told Berlanga: 'Paco, he would arrive driving his car right through the

middle of a f***ing storm to get here! He would go home to Puerto Morelos Sundays at night, in the middle of the night, with all his children. He would end up there, but still be working…. He came repeatedly, breaking his car (on the bad roads) (Oscar Canul González, interview on 8 December 2003: 1–15, transcription by Berlanga, translation by Faust)'. Unfortunately, these positive impressions of the director deteriorated significantly after the arrival of federal funding.

The new government support was accompanied by regulations and evaluations. Decisions over management were transformed from the previous participative process to increasingly unilateral management. The director's budget and agenda are largely structured by a bureaucracy of superiors in the country's capital, who are in turn influenced by international models for protected areas (see Escobar 1999 and Brulle 2000 for analysis of the negative outcomes on the local level of national and international control of conservation funding and policies). Working with these communities also become more complicated as a market for real estate developed due to rapidly growing coastal tourism and growing awareness of the new government policy which allows division and sale of communal lands (Article 27 of the Mexican Constitution).

A local biologist, native of Holbox and the Director of Projects for the Reserve in 2003 recalled some of the conflicts over attempts to reach consensus on a management plan and other proposals. She felt that the market for beachfront properties affected negotiations concerning an acceptable management plan for the reserve:

> *'(I understand that) there were no problems (at first), because there was no interest in the land. Or rather, it was something that had not yet occurred, the economic interests. The sale of land did not exist then. And everyone saw conservation as something very good, keeping everything the way it had been. The problem, I feel, well, the area was decreed protected and it seems to me that not many people were informed that they were inside a reserve. Information was not widely diffused and, well, it continued that way. And at the moment that the Administration (of the reserve) was established and the meetings began in order to discuss the management plan (2000), conflicts began because by then there were economic interests.'* Norma Betancourt. 16 October 2003: 9, transcript by Berlanga, translation by Faust.

She also reported that,

> *'The Management Plan is also on hold because there was a change in CONANP (the federal agency in charge of protected areas) so that now it is not a Management Plan. Now it is called…a Conservation Pro-*

> *gramme.'* Norma Betancourt, interview 16 October 2003: 2, transcript by Berlanga, translation by Faust.

This change echoes the former change of title for the reserve from one emphasising Maya traditions and management to one focused on protection of flora and fauna. These changes in wording reflect changes in policy, from an emphasis on sustainable uses and participatory decision making to one on protection. This policy shift reflects increased concerns among some conservation biologists (e.g. Terborgh 1999 and Soulé and Orians 2001, whom ethnozoologists such as Hunn et al. (2003) have referred to as 'extreme conservationists').

By November of 2003, the 12-year relationship between the Reserve's director and the community of Holbox had deteriorated to the point that various interviewees from different sectors of the community (including the *ejido*, PUHAC and various tourism cooperatives and local businesses) shared the perception of a 'situation of revenge' in which mutual dislike was exacerbated by a number of events that involved control of access to funding and the application of federally mandated sanctions for violations of environmental regulations. Communication between the Director and local communities was described as being in a 'continuous short circuit'.

Battles for Control

The original incentives to form a reserve had included local participation in decision making as well as the formation of local 'tourism cooperatives', groups that currently provide services to tourist visitors, both national and international. Previous to the arrival of competition from outsiders in the new, whale shark tourism, the discourse of conservation did not appear to generate much action by the boat drivers nor interest in improving the information services on their tours. They were content to leave these matters to PUHAC. In the absence of either threats to their income or possibilities for increasing it, they did not participate in efforts to conserve the ecosystem of the islet even after PUHAC disbanded. This is a predictable outcome according to Olson's (1965) analysis of conditions under which collective action occurs, namely that the benefits can be kept away from free riders and that the group is small enough that the effects of individual participation are noticeable. There were well over a hundred participants in the tourism cooperatives while PUHAC's membership was a dozen or less.

In interviews, the members of the cooperatives often expressed the feeling that the islet had become something foreign to them, a part of the Reserve and not a part of their community patrimony (Berlanga 2005: 143). This is related to the sense of identity with the cultural landscape that can generate institutional rules mandating behaviour that will contribute to its future well being and use by future generations (see Ostrom 1990; Ewen 1994; Bookchin 1996;

Sarkar 2005). However, if an area is not under the control of a local community, there is not much incentive for them to work to protect it.

While local people were not involved in co-management, top-down administration was not possible either, due to lack of funds for hiring park rangers or guards. Local users were simply expected to follow the rules imposed from above. Only one of the professionals employed by the reserve resides in the protected area, the Director of Projects. However, it is not her responsibility to enforce regulations. The Director, Subdirector and office staff are all working in an office in Cancún, two and a half hours drive from Chiquilá. There are also three local persons who have received training in workshops and extension courses and receive income from projects. None of these individuals live in Holbox. The employees who work in the Cancún office 'manage' the Reserve by making rules and getting project money from government agencies and/or NGOs. Consequently, the Reserve meets neither the conditions for local community management nor those for government management.

The basic conditions for community management include the authority to sanction members who violate communally agreed upon rules, the enforceable right to keep outsiders form using the resources, the possibility of monitoring and guarding the resource or territory, and recourse to government authorities who can enforce the rules and handle emerging problems with powerful outsiders, including commercial interests (McCay & Acheson 1987; Ostrom 1990; Pinkerton 1994; Anderson 1996).

PUHAC's conservation activities had sporadically received financial and technical assistance from SEDESOL (an agency for social development) and SEDUE (later replaced by SEMARNAP, both having conservation responsibilities). Their applications for project funding did not have to be approved by the Reserve's director until 2001, when federal regulations changed, requiring such approval. The now official Director of the Reserve refused to approve PUHAC projects for reasons unknown. He also forbade their activities selling souvenirs or charging for tourist services on the observation platforms that they had built. The tourism cooperatives refused to give PUHAC a portion of the fees they charged tourists for the boat ride to the observation towers. At the same time the members of PUHAC had greater needs for cash income than before because they were starting families. They did not feel they could afford to continue working as volunteers. The group disbanded. However, it had provided its members with experience and training that later enabled them to enter the private tourist sector, which has become big business in Holbox. During their time with PUHAC, members learned new skills and information through their contacts with tourists, their training in conservation, and their experiences with managing collective resources. A number have parlayed these abilities into new activities in the tourism industry. Some have found employment with hotels or are owners of small restaurants, some sell beachfront properties in town or handle rentals and others are tour guides. One lives in Italy, and another has a crafts shop.

The Protected Area of Yum Balam has been cited as a paradigmatic example of how the local formation and management of a reserve can be an important contribution to the struggle for empowerment of indigenous peoples (Gómez-Pompa et al. 1995; Bartra 2000). Unfortunately, as we have discovered, the communities of Maya origin were only present in the beginnings of the formation of the Reserve of Yum Balam although they continue to have an affiliation with the NGO of the same name. This regional NGO, like Holbox's PUHAC, has increasingly separated from activities and projects associated with the reserve. Its leadership has pursued other avenues for community and personal empowerment. More recently Murray (2005) has reported the political negotiations involved in the formation of two new protected areas in Quintana Roo, Puerto Morelos and Punta Laguna. He reminds conservationists that, 'any protected area represents a socially constructed compromise between stakeholders' (p. 890) and recommends that such areas be considered 'foundations' for conservation activities, which in order to be successful in the long term will need to take into account the complex motivations of local actors, and thus include 'multifaceted measures of success' if they are to avoid the high costs of a 'fortress mentality' (pp. 902–903).

The New Tourism

Independent tourists (locally referred to as 'back packers') had been arriving in increasing numbers for a decade prior to the establishment of the reserve. More recently, however, they have been joined by agency-managed tour groups. The Federal Government has supported the development of ecotourism agencies in the region and both national and foreign investment in tourist facilities. Then in 2001, hotel owners and tourism agencies began to hire their own guides and the tourism cooperatives complained to the director of the Reserve, who negotiated a solution in which these employers could decide who in the cooperative to hire, but could not employ persons who were not members of the cooperatives (Berlanga 2005: 85). A few members of the cooperatives attended another course on nature tourism and conservation in 2001, to better compete for hotel jobs.

As the tourist market continued expanding, however, the competitive advantage of local tour guides began to deteriorate. In 2003, tours began that included swimming with the whale shark (*Rhincodon typus*), a large plankton eater that spends part of the year in the waters near Holbox Island (Berlanga 2005: 99). The government began to require special licensing of tour guides for this activity. The previous policy of giving exclusive rights to cooperatives was not followed due to changes in government policy in favour of free market competition. A local elite of licensed whale shark tour guides has developed and competes with professionals coming in from other areas.

When the nesting colony of seabirds was destroyed in 2005, members of the tourism cooperatives suffered abrupt declines in their income. They told

Berlanga (who opened a consulting agency in Holbox after finishing his thesis) that they hoped to find a way to re-establish Morena Island as a tourist attraction. Tourists still come to Holbox to enjoy the beautiful setting, open-air seafood restaurants, boat tours of the coast and increasingly luxurious hotel accommodations. Fishing continues to be the major occupation, supplying restaurants, the family table and the international market. However, the major tourist attraction accessible to most boat drivers was the nesting colony of seabirds on Morena Island, and the income from this activity is sorely missed.

The Market for Land

Lots in town have always been private property and have periodically been sold to newcomers, some of whom have been and are developers of hotels and restaurants. Outside town is the *ejido* land, formerly inalienable. However, 1992 change in the Mexican Constitution made it possible to divide this land into private lots owned by community members, who may in turn sell them. The community's *ejido* members (generally the older generation of men, each of which may be replaced by only one son after his death) can vote to keep part of the land in common and divide the rest; they can also decide to sell a part of their land to outside developers, or divide all of it among themselves and prohibit individuals from selling to anyone from outside the community. Foreigners are officially prohibited from owning land in counties within 50 km of the coast; however, they may make legally binding arrangements similar to ownership through administrative procedures sanctioned by the government. These include the formation of Mexican real estate corporations, partnerships with Mexican businesses, and private lease of land under an individual trust agreement with a Mexican bank. The latter allows the owner of the 'lease' to sell the property outright to a Mexican national or to extend the lease and even to include children and other relatives as members of the trust with full inheritance rights. Thus, the legal rights of such tenancy are similar to ownership and are regulated by national law.

The new right to divide and sell *ejido* lands combines with Mexican procedures for establishing parks without purchasing the land. The owners receive no compensation for loss of livelihood other than a few sporadic and experimental sustainable development projects. The money spent on such projects goes primarily to NGOs created to provide technical advice and training, rather than to the communities themselves. In a recent evaluation of forty-five projects funded by the United Nations in the area of the Biosphere Reserve Sian Ka'an, less than 19 per cent of the project funding actually went to the communities (Faust 2007). The remainder went to the NGOs providing 'workshops', 'technical advice' and 'training' of various types. NGOs often use project money to construct their own offices in cities, buying air conditioners, computers and office furniture. They also pay the salaries of their staff from these project moneys. The actual monetary transfer to poor, rural communities

communities that are the supposed beneficiaries of these projects is very small, consisting of minimum wage pay for constructing tourism facilities or working in reforestation projects. Very seldom is there any analysis of the market for the goods that have been 'sustainably produced' such as sea shell jewellery, Maya 'idols' carved from local wood, napkins embroidered with local flowers, or ointments made of medicinal plants—none of which can be eaten should sales not materialise. Time invested in making these things is time taken away from subsistence agriculture. If they make enough money from sales then they can use it to buy food plus manufactured goods. However, when markets fail they are left with products that they cannot eat and with no money to buy food. Government assistance is generally only available for farmers whose crops have failed, not people making products to sell to tourists. The old system nearly always left them with food. They produced more than they needed to eat. In a bad year they would still harvest enough to feed their family, but not have enough surplus to sell. Only in exceptional times of severe drought or flooding would the entire crop be lost. Thus, relatively sustainable local practices that dependably fed local communities and had not resulted in the extinction of any local species in the past three millennia are replaced by experiments conceived by conservation biologists with little or no experience in community development, microeconomics or marketing. This situation produces strong incentives to sell communal land to speculators in the booming eco-real estate business within protected areas. The environmental impact of their proposed development projects is assessed by biologists whom they hire and whose employment depends on recommendations within a small circle of developers. The power of reserve authorities to oversee and evaluate this type of eco-development is far less than their power to arrest a hunter found in the reserve, although the impact of the latter is likely to be much smaller than that of the eco-developers. Transportation, sewage treatment and disposal of trash from hundreds of vacation/retirement homes will be a challenge on coastal lands underlain by a porous karstic platform.

Implications for International Conservation Efforts

The prevailing discourse in conservation policy in Mexico and many other Latin American countries has frequently presented protected areas as benefiting local communities. It has been claimed that these communities are privileged in receiving programmes for combining economic development with conservation of natural resources, as part of the policy of 'sustainable development' recommended by the Convention for Biodiversity in 1992 (Ponce 1996a, b; SEMARNAP 2000). Unfortunately, however, our findings do not accord with these claims. To the contrary, we discovered that external actors with economic power (commercial tour agencies, eco-developers and hotel owners) are in the process of becoming the primary beneficiaries of this reserve.

Nevertheless, both oral histories and archival materials indicate that, for its time, the Reserve of Yum Balam did include more local participation in its formation and in the period immediately after its official establishment than some others (such as Ría Lagartos and Sian Ka'an). It was formed in a time of increasing environmental preoccupation, during which significant incentives and assistance were provided from external donors. However, the collaborations established during that period did not continue once the director and his staff were in official control, as part of a federal system of reserves responding to international policies that included project funding. Local conservation capacity was further eroded by neoliberal economic policies that increasingly result in land sales to outside investors attracted to the area's growing tourist opportunities.

Many critics of sustainable development and of the dominant discourse on conservation have affirmed that it will not be possible to combat the problems caused by externally driven development with more externally driven development (Escobar 1997, 1999; Ghimire & Pimbert 1997; Gómez-Pompa 2003; Toledo et al. in press). Unfortunately, this is what continues to happen in Holbox and throughout the Third World. Simultaneously, and ironically, conservation policies in the Third World, in tropical areas of high diversity and endemism, may be returning to the original stance of defining local residents as destroyers of the National Parks (see Stevens (1997) for a critique of this literature), and now of the Heritage of Humanity. National conservationists in the developing world are backed by a growing movement among biologists from the industrialised world (Glowka et al. 1996; Terborgh 1999; Soulé & Orians 2001), which demands more forceful protection of remaining global biodiversity from 'destructive activities' by local communities, and which simultaneously and ironically benefits outside interests that present a 'green' façade.

Certainly the traditional, indirect, subtle tactics of resistance to control by outsiders (Scott 1985) do not make it easy for reserve managers to allow community participation in decision making and management. The keeping of records, the accounting for moneys distributed, the sharing of responsibilities for maintenance of tourist facilities, the protection against poachers, loggers and polluters, are all activities that will require local residents to learn new skills. The process could be made more efficient through the incorporation of social scientists. The quick solution is unilateral management, but the money then required to pay for guards to protect reserves against resident human communities is not easily obtained and the implementation of such arrangements may be politically impossible, as well as possibly being a violation of human rights since the vast majority of these areas are not wilderness but the homes of indigenous and *mestizo* peoples (Chapin 1992, 2003; Toledo 2001, 2005).

The rules of the game, the international policies that structure discourse and the financing of conservation activities, have changed over the history of this

reserve. It was constituted in a slow process involving multiple efforts at consensus building and mutual accommodations. Thirteen years after the reserve was legally established, local participants are involved in a third attempt to elaborate a management plan, but so far have not been able to agree on one. Today Holbox appears to be following a path towards the neoliberal development style characteristic of the eastern coast of the peninsula. This is a tourism zone officially baptised as 'The Maya Riviera', but without Maya participation in its design, implementation, evaluation or division of benefits. This is a process in which local communities that were until recently relatively isolated are incorporated, one after another, in a government managed, international tourism market. Recently, Murray (2005) has described a participative process in which two other protected areas have been initiated: Puerto Morelos and Punta Laguna. He points to the necessity of using multiple criteria for the evaluation of such protected areas which depend on local participation not only for their establishment but also for their continuing survival. Participation needs to be included in project planning, implementation and evaluation as originally recommended by Faust (1991a, b & c), in the first international conference on ecotourism. The continuing exclusion of the legal owners from real participation in decision making violates the spirit of local participation mandated by international organisations that fund reserves (e.g. UNESCO 1984, 1995).

Half of the protected area of Yum Balam still legally includes the commons of Holbox and two other local communities. Local communities and organisations offered to guard this reserve in the 1994 Declaration of Kantunilkin that stated expectations of local control backed by government assistance. Such participation could become a model for other rural and coastal communities, strikingly different from the patterns found in Cancún and the Maya Riviera.

In Holbox, the desire to divide and sell the community lands is growing, as the prices offered by developers rise. Thus, the original dream of maintaining traditional uses for future generations with the assistance of academic advisors has become a dream of becoming 'rich' through the sale of the land to wealthy eco-developers. If this occurs, the reserve's director shall have to enforce conservation regulations against wealthy developers, backed by 'friendly' politicians. Whether or not such uses will prove more destructive of the local environment and endangered species than the original uses by local peoples, is a subject for future research.

EPILOGUE

A few double-crested cormorants began to return to the island and form nests by June of 2006. At the time of writing, March 2007, three additional species have returned: the brown pelican (*P. occidentalis)*, reddish egret (*Egretta rufescens*) and tri-coloured egret (*Egretta tricolor*). In 2006, the reserve's di-

rector provided funding to assist three cooperatives in a preliminary reforestation project. He opened competition for access to more funding in 2007, through submission of proposals from the three communities within the Reserve and the two neighbour communities, thereby establishing a competitive process that may give rise to serious conflicts in a situation of poverty and limited alternatives.

The reserve's director is presently seeking to incorporate another 100,000 hectares of wetlands and marine areas within the protected area and have all of it declared a biosphere reserve. This appears to include portions of the *ejidal* lands of the community Isla Mujeres.

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Notes

1. All interview quotes in this article are from the research done by Berlanga in 2003. These and other selections are available in the original Spanish in Berlanga's thesis, available on the website www.mda.cinvestav.mx.
2. Then Secretary of the Agency for the Environment, Natural Resources, and Fisheries (SEMARNAP).
3. Then governor of the State of Quintana Roo.

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