



## Park Profile – Guatemala Yaxhá, Nakum, Naranjo Natural Monument

**Date of the last field evaluation:** August 2002  
**Publication Date:** October 2002  
**Location:** Petén Department, in the Maya Biosphere Reserve  
**Year Created:** 1999  
**Area:** 37,160 ha  
**Ecoregion:** Tehuantepec humid forest  
**Habitat:** Wetlands, tall and short broadleaf tropical forest



### Summary

#### Description

Yaxhá, Nakum, Naranjo Natural Monument is in northern Guatemala, between the municipalities of Flores and Melchor de Mencos, Department of Petén. Until 1999, it was part of the Multiple Use Zone of the Maya Biosphere Reserve. In 1999, the government recategorized it as a Natural Monument. The statutes have yet to be approved by the Guatemalan Congress, however, it functions as though they had been approved. The area borders Tikal National Park. It has a set of excellent archaeological sites and it houses a complex habitat of wetlands, tall and short forests which give it its unique characteristics.

#### Biodiversity

There are many regionally endemic animals in the area, including: Morelet's crocodile (*Crocodylus moreletii*), Central American river turtle (*Dermatemys mawii*), howler monkey (*Alouatta pigra*), black-handed spider monkey (*Ateles geoffroyi*), and ocellated turkey (*Agriocharis ocellata*). Among the felines, the jaguar (*Panthera onca*), the puma (*Felis concolor*) and the margay (*Leopardus wiedii*) stand out. A number of the species in the area are found on the IUCN Red List (2001), while CONAP's Red List (2001a) considers *C. moreletii*, *A. pigra*, *A. geoffroyi*, *P. onca*, *F. concolor* y *L. Wiedii* to be in grave danger of extinction.

#### Threats

Yaxhá, Nakum, Naranjo Natural Monument is a **threatened** area that runs the risk of failing to protect biological diversity in the near future. The principle threats arise from the advancing agricultural frontier, forest fires, illegal use of forest products and illegal poaching. The limits of the biotope are not respected and human encroachment occurs, placing its conservation in danger.

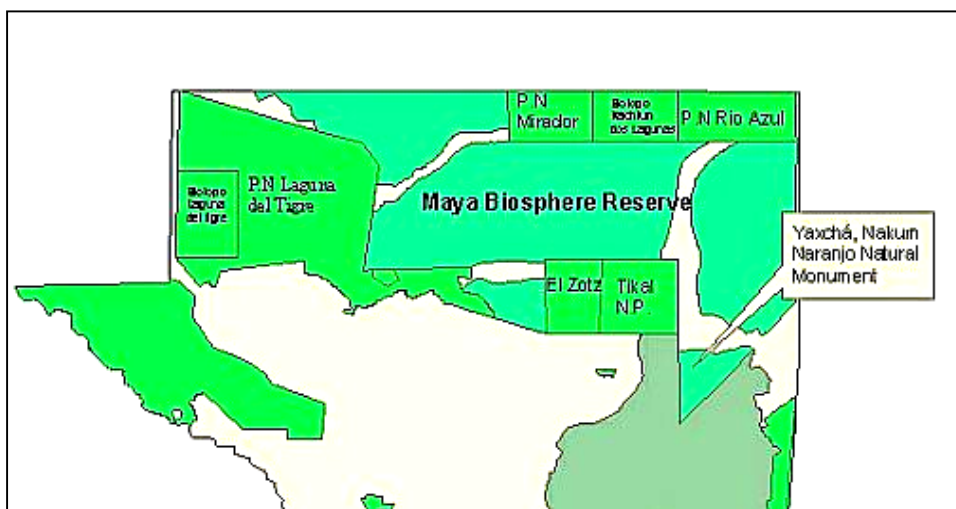


*View of the protected area from Yaxhá archeological site, Yaxhá Lagoon is seen in the background*

## **Description**

### *Physical description*

Yaxhá, Nakum, Naranjo Natural Monument is in northern Guatemala, between the municipalities of Flores and Melchor de Mencos, Department of Petén, within the Maya Biosphere Reserve (MBR). Although it still has not been legally declared, it functions as a core zone. The extent of the area is 37,160 ha. To the west, it borders Tikal National Park and part of the MBR buffer zone. To the north lies the biological corridor toward Río Azul National Park, and the community concession called Árbol Verde. It is bordered to the east and the south by MBR Multiple Use Zones. It houses some excellent archaeological sites, notably Yaxhá, Nakum, and Naranjo and it is from these that the area gets its name. The area also possesses numerous other archaeological sites of lesser importance.



(GIS Source, CONAP)

*Map of the location of the Yaxhá, Nakum, Naranjo Natural Monument*

The landscape undulates in the east and the west and two small mountain ranges cross through it. The western highlands of the protected area extend from southwest to northeast and form part of the same elevations that extend to the south of the Tikal National Park. The landscape in the remaining area is much flatter, with permanent wetlands and areas that flood temporarily. The highest altitudes are found in the west at 450m (1475ft). The lower elevations are around the Yaxhá and Sacnab lagoons in the south at 150m (490ft)

(CEMEC/CONAP 2001). The organic superficial soil is not very deep; its subsoil has an argillaceous texture and rests upon limestone. Its susceptibility to erosion is 30% (CONAP). The climate in the area is predominately hot and humid with a well-defined dry season. The average maximum temperature reaches about 39.7° C (103° F) and the minimum is 11° C (52° F). The average annual temperature is 25.3° C (78° F). It rains, on average, 180 days a year, with a total of 1,800mm (71 in) of precipitation.

One outstanding feature of the natural monument is the numerous bodies of water. Yaxhá Lagoon, found in the natural monument, is the largest body of water in the Maya Biosphere Reserve. There are also other lakes, lagoons, brooks, and seasonal and permanent wetlands, which add very special characteristics. CONAP (1999) showed interest in including the natural monument in the List of Wetlands of International Importance of the Ramsar Convention.



*In the photo's foreground, a squatting community to the south of the Champoxte lagoon, just within the limits of the natural monument. To the back, in the part above the mountains, the advancement of agriculture caused by the community already within the protected area.*

## ***Biodiversity***

### Flora

According to the classification by Dinerstein *et al.* (1995), the biotope is located within the ecoregion of the Tehuantepec humid forest. According to the MBR's functional landscapes map (CONAP, 2001b), the present habitats in the protected area are tall broadleaf forest in the highlands, tall broadleaf forest in the plains, short forest, and permanent wetlands.

According to the Rapid Ecological Evaluation of the MBR (APESA, 1993) the central area of the natural monument, between the Holmul River and Yaxhá Lagoon, is a forest with moderately diverse trees with no more than 200 species per hectare. The presence of the mountain ranges to the northeast and southeast in the area cause a variation in the vegetation determined by the drainage of the soil. In the floodplain, characteristic formations of dry savannahs are found.

### Tall and medium broadleaf forest in the highlands

These forests grow in the highest elevations within the protected area, above 450m (1475 ft). They are found in both the east and the west, and on a fringe that extends to the north of the protected area above 300m (984 ft) (CONAP 1999). Because the soil is not very deep and is made up of porous material, it drains quickly. In some areas, the canopy is not very dense and some of the trees lose their leaves in the dry season. The species present are associated with Ramon (*Brosimum alicastrum*) Yellow Genip (*Talisia olivaeformis*), Carapanaúba Preta (*Aspidosperma megalocarpon*), Black Olive (*Bucida buceras*), and Manchiche (*Lonchocarpus castilloi*) among others (CONAP 1999).



*A detail of the tall forest in the protected area*

### Tall and medium broadleaf forest in the plains

This forest develops in flat lands with well-drained soil. It is one of the habitats that is largely representative of the area (CONAP 2001b). The canopy can reach heights of 40m (130 ft), however it is quite variable. Ramon (*Brosimum alicastrum*) and plants from the Sapodilla Family (*Sapotaceae*) and the Mahogany Family (*Meliaceae*) dominate the floristic composition of the tall forest. In places where the forest is shorter, species such as the allspice (*Pimenta dioica*) appear.



*View of the medium forest in the protected area*

### Short Forest

This type of forest is abundant in the central and northeastern parts of the protected area. It flourishes in areas with heavy, sticky, and deep soil that floods during the rainy season and dries and cracks in the dry season. It is found in ravines or small to medium depressions. The soil does not drain well and there is standing water during the rainy season. Depending on the drainage capability of the land, it remains more or less flooded, which influences the floristic composition. Dominant species include logwood (*Haematoxylum campechianum*), Black Olive (*Bucida buceras*), and Chaperno (*Lonchocarpus guatemalensis*). The canopy height does not exceed 11m (36ft) (Lundell 1937). The swamps are found in the lowest areas. In the driest places, the xerophytic shrubs flourish in formations characteristic of

savannahs, with Acacias (*Acacia* sp.) and thorny plants (CONAP1999). In other areas, gramineous plants like the *Chrysophila argentea* and palms like the Texas Palm (*Sabal mexicana*) are abundant.

### Permanent Wetlands

Different types of wetlands are found in the protected area, from rivers and permanent and seasonal streams to permanent interior deltas. The large bodies of water, like Yaxhá Lagoon, are among the most outstanding features. The largest bodies of water have typical vegetation, such as the cattail (*Typha* sp.) and others.

### *Fauna*

Twenty-two species of fish have been identified in the natural monument, some of which are regionally endemic such as the Petén Cichlid (*Petenia splendida*). Forty-five species of reptiles have been found, which represent 25% of the total species in Guatemala (CONAP1999), and more than forty species of mammals can be found as well. Yaxhá is one of the few places in Guatemala where the reproduction of the Baird's Tapir (*Tapirus bairdii*) has been confirmed. The existing population, however, is unknown. According to the 1997 IDAEH reports cited in Yaxhá's master plan, Yaxhá Lagoon harbors the largest population of Morelet's crocodile (*Crocodylus moreletii*) in Guatemala.

*C. Moreletii* is a regionally endemic animal included on the CONAP Red List (2001a), other important species are the Central American River Turtle (*Dermatemys mawii*), catalogued as an endangered species by the IUCN Red List (1994 & 2001), the howler monkey (*Alouatta pigra*), Baird's Tapir (*Tapirus bairdii*), red brocket deer (*Mazama americana*), jaguar (*Panthera onca*) and other felines. *P. onca*, *A. pigra*, and *M. Americana* are also found on the IUCN Red List. The Fauna Red List (CONAP 2000a) lists various felines and other some of the other mammals present in the area as being in great danger of extinction. The CONAP Flora Red List (2001c) believes many of the species present in the area could be in danger of extinction if commerce is not strictly regulated. The wetland system is very important for the avifauna, among which is the jaribu (*Jabiru mycteria*).



*A Peten Cichlid (Petenia splendida) regionally endemic and abundant in the area. Recently caught by a fisherman. He allowed us to take this photo on the condition that we did not show his face because it is illegal to catch these fish. The photo was taken at the Champoxte Lagoon.*

## Management

The area where the natural monument actually sits was originally included in the Multiple Use Zone of the Maya Biosphere Reserve in the 1990 Decree 5-90 (the decree that established the Maya Biosphere Reserve). During 1998, CONAP initiated a technical study to recategorize the area more or less delimited by Yaxhá, Nakum, and Naranjo – the three important archaeological sites - and Yaxhá Lagoon. The area was considered a high-priority due to the importance of its bodies of water as habitat for wild fauna, its proximity to Tikal National Park, as well as the presence of first-class archaeological sites. In 1999, the study was authorized and a petition was presented the Congress of the Republic to recategorize it as a natural monument. As of today, Congress has not issued any decree, nevertheless, Yaxhá functions as a natural monument in fact. In June 2002, CONAP signed a joint administration accord for the protected area with a recently founded organization called Asociación Tercer Milenio (A3K).



*Archaeological site: one of the pyramids of the archaeological site, still unexcavated.*

CONAP acts as the representative of the state in the area, while Asociación Tercer Milenio is in charge of the management and pursuit of the administrative programs. Twenty-two forest guards work directly in the area, two cooks, a support technician, and an administrator. They also count on support personnel provided by both A3K and CONAP. The Institute of Anthropology and History (IDEAH) is responsible for Guatemala's cultural heritage, according to Decree 425 of the Congress of the Republic. Yaxhá Natural Monument has two encampments on the site, one in Yaxhá and the other in Nakum. The forest guards have alternate shifts of twenty-two days of work and eight days of rest. They are stationed at the control posts in the area.

The area counts on a 10-year master plan (1994-2004). The plan is quite complete, divided into seven programs: 1) administration, 2) protection and control, 3) resource management, 4) investigating and monitoring, 5) public use, 6) assistance and community participation, and 7) territorial ordering (land titling). Each of these programs is divided into subprograms. The programs and subprograms establish concrete strategies and action plans in all aspects related to the administration of the natural monument.

The master plan establishes six different zones in the area:

1. **Intangible Zone**, has the objective of conserving the natural ecosystems, ecological processes, and the archaeological and cultural artifacts with minimum human intervention. Most of the protected area's territory is part of the Intangible Zone, including the short forest areas, the area that reaches the Naranjo Archaeological Site, and the west, Bajo de Santa Fe until the borders of the Tikal National Park. Within the limits of this area lies the northern part of the Yaxhá and Sacnab Lagoons' river basin.

2. **Archaeological Protection Zone**, has the objective of maintaining natural environments and the most important archaeological sites with a minimum impact, to offer controlled access for research, environmental education and primitive tourist development. It extends

along the route from Yaxhá to Nakum, includes Nakum itself and the Poza Maya and Pichitoca sites, as well as the area of influence in the surrounding areas.

3. **Public Use Zone**, has the objective of promoting public use activities around the attractive landscapes, natural and archaeological resources of the zone, and to contain the infrastructure that is required for administration, research, and protection of the area. It consists of the south part of the protected area, including Yaxhá Lagoon, the entrance to the park where CONAP's encampment is located, part of IDAEH's encampment to the north of the Yaxhá Lagoon, the archaeological sites of Yaxhá, Topoxté, and the Sombrero hotel that borders the lagoon.

4. **Special Use Zone**, is where harvesting of non-timber forest products occurs and there are various xate and chicle camps. Created to avoid conflicts with the local settlers, temporary maintenance is anticipated of this zone – during five years – and is supposed to reduce gradually. Its objective is to guarantee sustainable and rational extraction of non-timber forest products. It lies in the west of the area, adjacent to Tikal National Park. It is contiguous to the south with the recovery zone, and to the north with the intangible zone and the Holmul River.

5. **Recovery Zone**, is established in locations altered by human activities. Its objective is to halt natural resource degradation and recoup the areas that are presently degraded by agricultural; it includes two areas. The first is to the north and east of Sacnab Lagoon to the edge of the Naranjo Archaeological Site, to the southern border of the protected area. The second zone lies in the extreme southeast of the protected area, including everything from Tikal National Park to the Yaxhá Lagoon in the west. These areas try to stop the advancing agricultural frontier; farming is gradually prohibited to allow the natural ecosystems to recover.

6. **Zone of Influence**, consists of the peripheral area around the natural monument, it is similar to a buffer zone, but this area has been placed under another classification. Its objective is to attenuate the possible negative environmental impacts, risks or harms to the protected area. It consists of four different zones. To the south and east lies a strip 10 to 12 km wide in the outskirts of the protected area in the Multiple Use Zone of the Maya Biosphere Reserve. To the southeast, it lies in part of the MBR's Buffer Zone south of Tikal. To the northeast, it is within the biological corridor to Río Azul National Park, and to the north and northeast the Árbol Verde community concession and the Pilar Cultural Monument. The objective is to promote development of activities that tend to diminish the pressure on the protected area's natural resources and to halt the advancing agricultural frontier, and to maintain connectivity between Yaxhá, Tikal, and Río Azul.

The infrastructure to protect the area is better than in other areas in Petén. IDAEH has an encampment, a museum and a place for camping, for technical personnel and other workers in the archaeological site Yaxhá. Nakum also has minimum facilities for personnel. CONAP has two control posts, one in the north and one in the south. The control point in the south is located in Yaxhá, which is the principal entrance to the protected area. It houses a very complete encampment and is the administrative seat of the area. The control point in the north is found in Paso del Carmen. It is integrated with CONAP employees and previously received support from the army. It was installed after 20 families were relocated outside the area. Actually there was the foresight to install three additional control posts, one at the Champoxté Lake in the southeast, another in Naranjo in the east, and the third at a site called Arroyón in the west where the area meets with the southeastern corner of Tikal. At the archaeological sites, there is a minimum control infrastructure, rooms for the personnel, a

kitchen and other necessary facilities. Just like the forest guards, the archaeological sites security officers have equipment to complete their job, including three all-terrain vehicles and a speedboat to patrol the lagoons.



*CONAP's main facilities in the area*



*IDAEH's facility in the Yaxhá archaeological site. The Museum was constructed on this site.*

For 2002-2003, the budget for the protected area is slightly greater than US \$145,000<sup>1</sup> (Calderón 2002, Calderón pers. comm), of which US \$122,500 is for personnel wages, project funding, and the purchase of equipment and supplies. The remaining amount is set aside for a fundraising campaign to assure long term funding and for public relations activities. This funding implicitly values the area at about US \$3.90 per hectare<sup>2</sup>. This represents a budget greater than the average allocated by CONAP for the other protected areas in Petén, which is approximately US \$1.55 per hectare (ParksWatch 2001).

### *Human Influence*

The protected area is accessible from various routes. To arrive at Yaxhá Lagoon, the Flores to Melchor de Mencos highway is used, passing through the village of La Maquina. The lagoon lies 11 km (7 mi) to the north. This highway is accessible throughout the year. There are also other ways to access the area from the west by a route called el Caoba, which crosses the natural monument from west to east passing through the Naranjo Archaeological Site. The road is difficult to traverse during the rainy season.

Various communities in the vicinity put a good deal of pressure on the natural monument, principally in the southern part, from the east to the west. The CEMEC/CONAP satellite photographs (2000c) demonstrate that the southeastern area has lost a good part of the forest, from the Yaxhá Lagoon right up near to the limits of Tikal National Park. The pressure on the area arises from a number of activities. First, there are landuse changes such as subsistence agriculture and ranching activities, and second, from the extraction of forest products, like wood, xate, pepper, and chicle, as well as hunting and fishing. Despite the fact that none of these activities are legal, there are ten extraction encampments in the interior of the area (CONAP 1999).

---

<sup>1</sup> The budget is 1,125,000 quetzales, the amount in US dollars is based on the exchange rate of Q. 7.75 for US \$1.

<sup>2</sup> Discounting the promotion and fundraising expenses it would be worth US \$3.30 per hectare.





*A fisherman, member of a nearby community, in one of Yaxhá's lagoons. Although fishing is prohibited in the area, the nearby inhabitants do it anyway.*

The natural monument has invasion problems, mainly in the lagoon area in the north. There have been efforts to relocate some of the invaders, it resulted, however, in many difficulties and conflicts. The invaders have relied on the support of organized groups who advise them, making it more difficult for the authorities.

Yaxhá is a tourist destination of relative importance with great potential. The entrance registry reported that in 1996 the area received 2,796 visitors, of which 68% were national tourists. Some of these visitors come in groups organized by hotel chains, travel agencies, guides from Petén, or from Belize. At the banks of the Yaxhá Lagoon there is a hotel, as well as facilities constructed by the Guatemalan Tourism Institute. The archaeological sites visited rely on certain infrastructure, especially Yaxhá, which has cabins and other tourist facilities on the banks of the lagoon.



*Tourists camping in the IDAEH facilities in the Yaxhá archaeological site.*



*IDAEH and CONAP security guards talking in the IDAEH encampment in the Yaxhá archaeological site.*

## *Conservation and research*

The area does not currently have on any permanent research projects. In the past, there have been various research projects on fruit eating bats (Lara *et al.* 2001), inventories of reptiles and amphibians (herpetofauna), and birds.

## **Threats**

Yaxhá, Nakum, Naranjo, Natural Monument is a threatened area that, if the present conditions continue, may fail to protect the biological diversity in the near future. The principal problems arise from the invasions, the advance of the agricultural frontier, forest fires, illegal use of forest products, poaching, and lack of personnel and low budget. The strategy introduced in the master plan to confront the use of non-timber products is potentially dangerous for the area. For if it fails in its ability to reduce this problem gradually, the area will find itself in the situation where the extraction of these products will be perceived as an acquired right and will be very difficult to control in the future. All of the southern part of the protected area is critical zone due to the magnitude of the threats there.

## ***Actual Threats***

### *Conflicts with the Master Plan*

The master plan is quite complete and it proposes directed programs to solve the majority of the problems the protected area faces. However, it includes a resource management program that, although is aimed at ending the indiscriminate use of forest products, could be potential source of future conflicts. The problem is that in the short term, it tolerates extractive activities even though according to the area's category of protection, this should not be permitted.

Tolerating illegal resource use is a common practice that occurs in the majority of the core zones of the Maya Biosphere Reserve, and one that could cause the erosion of the ability of the protected areas to succeed in conserving biodiversity. Although the master plan mandates a strategy to regulate these extractive activities and to bring an eventual end to the activities, there are no guarantees that this strategy will work and that forest resource usage will actually stop. This program brings with it the danger of creating a situation in which the users interpret the regulation as the acquisition of the right to extract the products of Yaxhá. The law actually prohibits extractive activities within a natural monument, and therefore, the master plan is in violation of the law.

### ***Lack of Personnel***

Twenty-two forest guards are organized in two shifts of eleven that work twenty-two days and then have eight days off. In the best case scenario –that is when no one is on vacation or no other laborer is missing, which sometimes occurs– each of the control posts in Yaxhá has five or six guards on duty at any one time to care for the area. Under this scenario, for each forest guard working there is a corresponding area of more than 3,000 ha. Considering the large amount of conflict in the southern parts, there are actually very few people in charge of control and monitoring patrols. In interviews with members of the bordering communities and in the field visits, control of illegal activities is shown to be minimum and sporadic. If new control posts are instituted in the area without having the necessary additional personnel it will only aggravate the problem. The Yaxhá forest guards claim that control is more

effective when they receive support from the Tourism Police, although their support has been sporadic because they do not have necessary equipment or adequate budget to patrol the area.

### ***The advancing agricultural frontier***

The advance of the agricultural frontier is a problem that principally affects the southeast third of the protected area. According to the analysis on deforestation data of the natural monument, Imbach et al. (1999) and CEMEC/CONAP (2000a), the loss of forest cover between 1986 and 1999 represents approximately 0.75% of the total area of the natural monument. However, the area that has been fragmented due to the advancing agricultural frontier is in reality much greater. Calculations done by ParksWatch from satellite photographs indicate that the fragmentation in the southeast affects nearly 6,000 ha, which is around 16% of the natural monument. Through field visits, we have verified that the deforestation continues to clear land for farming and there is no control over this problem. The Ramonal community, situated on the banks of the Champoxté Lagoon in the south, utilizes the protected area for agriculture and is planning to begin to raise cattle. In the southwest, the situation is not any better. Farmers are encroaching on the area, using slash and burn techniques with no one to prevent them. Because this is the present situation, it is probable that landuse change will become more and more important in Yaxhá in the future.



*View from the southern limit of the natural monument where the agriculture and ranching activity can be seen in the foreground, which reaches the limits of the protected area, which is in the background.*



*Felled Trees: the advance of the agricultural frontier is a large problem for the area. In the photo, a recently burned parcel in the southeast of Yaxhá is shown, within the protected area.*

### ***Forest Fires***

Forest fires are a substantial problem in the natural monument. In 1998 nearly 2,000 ha in the southwest burned (CEMEC/CONAP 1999). The problem has been recurring for a long time, although with less intensity. According to the fire maps from past years of CEMEC/CONAP (1999 and 2000b), the problem is intimately related to the advancing agricultural frontier and forest fragmentation. During our field visits, we could see burning parcels within the protected area. Moreover, none of the farmers were controlling the fires and none of the local authorities were present.

### ***Harvesting of Forest Products***

Similar to other areas of the Maya Biosphere Reserve, the problem of harvesting of forest products is difficult to control due to easy access and multiple entrances to the protected area,

which facilitates access without any regulation. Xate (*Chamaedorea* sp.) is the forest product most used, and its extraction is probably reducing its wild populations. During interviews with the local settlers many mentioned that the species is becoming more and more difficult to find. Unregulated harvesting continues, and in the southeast people dedicated to harvesting and their camps are observed relatively easily. There is evidence of illegal xate harvesting in some of the northeastern zones, though they do not appear to be recent. Although the area is not as impacted by the extraction of the sap of the chicle tree (*Manilkara achras*), in the field visits we observed trees that had been harvested recently. We think it is significant that although the surrounding settlers recognize that the area is protected, they do not show respect and do not show signs that they will stop extracting. According to studies done in the Maya Biosphere Reserve, extraction is related to hunting (Balas 2002, pers. comm.), which aggravates the impact on the biodiversity.



*Cutting in the park: detail of one of the numerous pieces of evidence of illegal cutting in the southeast of Yahxá.*



*Chicozapote: A chicozapote tree (*Manilkara achras*) recently cut in the protected area.*



*One of the xatero camps that we found within the southwest region of the protected area.*

## *Poaching*

Although there have been no studies specifically on the impacts of poaching in the natural monument, the master plan suggests that fauna degradation could be great. Just as with the extractions, the hunters use the area's multiple accesses to hunt all types of species. The master plan aims to restrain this activity with urgency. However, if illegal harvesting is not confronted with the same decisiveness, it would likely fail in its objective because the extraction and hunting are related activities; many of the extractors hunt while they are camping in the area. It would be difficult to fight against one if the other is not confronted as well.



*Guard and Baird's Tapir: one of CONAP's guards with the skull of a Baird's Tapir (Tapirus bairdii) that furtive hunters had killed.*

## *Human Encroachment*

The human encroachment problem is not as severe as it is in other protected areas of Petén. However, it potentially could become a very serious problem in the near future. On different occasions, families squatting in the area have been relocated. In 1998 illegal settlers were removed in a place in the north called Paso del Carmen, where in collaboration with the army, a control point was established to prevent new entrants. In August of 2000, an establishment called Benediction was relocated to the south, but because there was no guard post, new invaders were able to enter; they were eventually removed from the area again in August 2002. Within the protected area north of the Champoxté Lagoon, some houses can be found, while in Alboray, west of Sacnab Lagoon, there are five families. Access for the invaders is facilitated by the Caoba road in the western part as well as by a network of paths that access the area west of Yaxhá Lagoon. The families that are squatting in the area employ slash and burn techniques and destroy the forest rapidly. They do this so it will appear that they are old inhabitants of the area, in the hopes of receiving greater compensation if ousted. To a certain extent CONAP's ousting policies, including giving construction equipment, economic compensation, or land outside of the area, have served as an incentive for new invaders to settle in the area. The occupation of the protected areas is a source of great conflict in Petén. The squatters often form groups that receive support from unions and religious leaders. Removing squatters can be a delicate situation. In August 2002, CONAP's regional director in Petén was dismissed in an unfortunate presidential decision that could greatly fortify the encroachment movement in protected areas. CONAP authorities officially say he was "transferred" from his position.



*An illegal establishment within the protected area North of the Champoxté Lagoon.*



*One of the doors installed to impede encroachment discarded by the occupants that were removed from the Benediction, in the south of the protected area.*

### ***Future Threats***

The future of the park rests on whether the present activities intensify. If this were to occur, the natural monument would be critically threatened. Also, if a highway were constructed through the protected area, the problems would be exacerbated.

### ***Highway Construction Projects***

Although the available information is limited, on several occasions highway construction through the protected area has been proposed. Apparently, the two projects considered would cross the area from north to south and east to west, to offer better access to Nakum and Naranjo archaeological sites. We have very little information, although some civil employees have indicated that the projects could still be carried out; the area's future remains uncertain. Highway construction through Yaxhá, Nakum, and Naranjo Natural Monument would greatly increase the human influence on the area, placing it under tremendous pressure. Such pressure could cause it to disappear entirely.

### **Recommended Solutions**

#### ***Conflicts with the Master Plan***

The lack of political will to definitively face illegal activities is the main problem. It is relatively easy to solve on paper, but it requires great compromise by the administrators. Retaliation from the people currently using forest products is a real fear for administrators. Where attempts to stop the illegal forest use have occurred in the past, there have been problems. This was, however, largely due to insufficient force employed by a weak administrator. In Tikal, where there is a bigger budget and more personnel, local hostilities are faced decisively and the results are successful. Yaxhá's master plan should have included a control program instead of an extraction regulation program. For such a program, it is necessary to increase the personnel and the budget, as recommended below. The solution to the illegal extraction threat should rely on a specific plan that includes well-defined objectives during the operation period of the plan, as well as reliable evaluation methods to measure the effectiveness of the results.

### ***Lack of Personnel***

The interviews we held with forest guards and other with experience in the area indicate that the natural monument needs at least thirty-three more people. They are needed for three new control posts. They are needed at the Champoxté Lagoon, at the border with Tikal, and at Naranjo, with ten forest guards and one cook in each. With this expansion, minimum patrolling in the high-risk areas would be covered, but some areas would still be vulnerable. To cover the additional expenses, for the salaries and the necessary equipment, more fundraising would be needed. It would also be necessary to secure the permanent participation of the police for the high-risk areas and to help cover the added costs.

### ***The Advancing Agricultural Frontier and Forest Fires***

This issue requires swift action attacking the problem from several angles. The administrators have already begun to initiate activities with the bordering communities. From the experiences in Laguna del Tigre, Sierra del Lacandón, and Tikal National Parks we have learned that while establishing community projects is important, reinforcing the regulations and coordinating projects with other institutions is as important or even more so. In the west the problem could be addressed successfully if activities are coordinated with Tikal's administration. By doing joint projects with the communities, sharing control posts, and cooperating in the patrols they increase their effectiveness and keep costs down. Further, a long-term agreement with the corresponding authorities would be necessary to assure constant police participation at the control posts and on patrols. It is important to establish specific terms and goals in a way that allows the effectiveness to be evaluated and changes to be made. Control posts are greatly needed at the Champoxté Lagoon and the Caoba road, so that access to the area may be better controlled and to quickly evaluate any fire threat in the area.

### ***Harvesting of Forest Products and Poaching***

The protected area's master plan is dangerously permissive of extractive activities. Even though hunting has been shown to erode the wildlife populations, the relationship between hunting and harvesting had not been recognized. Regulating illegal harvesting and prohibiting hunting, as proposed in the master plan, is more an illusion than an achievable goal. The solution to both problems requires the will to enforce the law and determination to effectively carry out control and monitoring activities. The previously proposed increase of controls and personnel would greatly relieve pressure on the area.

### ***Human Encroachment***

With the increase of vigilance and control, and the establishment of the control posts recommended above, the pressure on the most troubled areas would be mitigated. The fundamental problem with the encroachment is that CONAP's authorities do not have sufficient force to strictly enforce the law. Article 82 of the Protected Areas Law (as amended) establishes penalties of four to eight years in prison as punishment for those encroaching and those promoting encroachment. However, CONAP has faced this problem by means of negotiations, without support from any law enforcement. Despite the fact that at least two of the leaders promoting encroachment are well known in Petén, nothing has been done to bring them to justice. If definite punishment existed, the squatters would be less likely to engage in illegal activity. AK3 has begun a lobbying campaign to pressure the authorities so that they begin to pursue and prosecute, in agreement with the law, those usurping the protected area.

## ***Highway Construction Projects***

Due to the negative impacts that highways would have on the Maya Biosphere Reserve, it is completely inadvisable to construct a highway in the zone. When the declaration of the natural monument was approved, highway construction was expressly denied, as it would be incompatible with the anticipated objectives for the zone from the Protected Areas Law and its regulation. It is advisable for the administrators to exercise all the possible force to achieve the approved declaration.

## **Conclusions**

Yaxhá, Nakum, Naranjo Natural Monument is an area of great importance for the preservation of the last great tropical forest refuge in Guatemala: the Maya Biosphere Reserve. Although the area is seriously threatened from human activity taking place within it and its environs, evidence suggests that it is currently able to conserve its biological diversity; reports confirm the existence of large felines, as well as many of the regional endemic species of the Mayan Forest.

Still, the natural monument could become critically threatened in the near future if the current situation continues. The new co-administrator between the park and AK3 presents new opportunities for Yaxhá. It is now a critical moment; the current situation is still reversible. If, however, immediate measures are not taken, it could begin to fail to protect its biological diversity.

ParksWatch's field visits indicated that the pressures in the south and the west are considerable and need urgent attention. Three threats stand out: the expansion of the agricultural frontier, human encroachment, and deforestation and poaching. These problems will be alleviated with the establishment of new control posts, the hiring of more personnel, and coordinating activities with the police and the local administrators. Once the controls are established, leaders who are promoting the encroachment in the natural monument need to be prosecuted.

The intent to regulate and normalize the extraction activities proposes an additional burden for the administrators. It is within their control to easily avoid this duty, as has occurred in other areas. Regulating the extraction of xate and other non-timber products does not address the root of the problem nor does it help to encourage respect for the area's borders. The master plan's strategy needs to be reformulated, in order to make some form of regulation, to establish goals and clear terms to end the illegal use of the non-timber products.

Facing the advance of the agricultural frontier is also a top priority. The three aforementioned problems will require a strong will to enforce the law, requiring great force, but it is the only way to ensure the protection of the area. Yaxhá, Nakum, Naranjo Natural Monument is part of a strictly protected area of more than 150,000 ha, formed by Tikal National Park, San Miguel la Palotada (el Zotz) Protected Biotope, and the biological corridor to Mirador-Río Azul National Park making it enormously important. The recent entrance of AK3 as joint administrator of the area presents great opportunity for Yaxhá. If the association succeeds in efficiently coordinating efforts with Tikal administrators and makes use of its extensive capacity, to face the area's problems and also to advise others, the natural monument's future and its area of influence could improve making it a model for other protected areas in Guatemala.



## Bibliografía

- APESA, 1993. *Evaluación Ecológica Rápida de la Reserva de la Biosfera Maya, Guatemala*. APESA / TNC / PBM-USAID.
- Balas, R., 2002. *Entrevista personal*. Director de WCS en Guatemala.
- Calderón, 2002. *Entrevista personal*. Directora Ejecutiva de A3K.
- CEMEC / CONAP, 1999. *Mapa de incendios forestales en el departamento de Petén en 1998*. Centro de Monitoreo y Evaluación del Consejo Nacional de Áreas Protegidas. Guatemala.
- CEMEC / CONAP, 2000a. *Cambios en la cobertura boscosa de la Reserva de la Biosfera Maya de 1986 a 2000*. Centro de Monitoreo y Evaluación del Consejo Nacional de Áreas Protegidas. Guatemala.
- CEMEC / CONAP, 2000b. *Mapa de incendios forestales en el departamento de Petén en 1998*. Centro de Monitoreo y Evaluación del Consejo Nacional de Áreas Protegidas. Guatemala.
- CEMEC / CONAP, 2000c. *Monumento Natural Yaxhá, Nakum, Naranjo y Monumento Cultural el Pilar. LANDSAT7 y TM, año 2000*. Centro de Monitoreo y Evaluación del Consejo Nacional de Áreas Protegidas. Guatemala.
- CEMEC/CONAP, 2001. *Mapa de elevaciones del Monumento Natural Yaxhá, Nakum, Naranjo*. Centro de Monitoreo y Evaluación del Consejo Nacional de Áreas Protegidas.
- CONAP, 1999. *Plan Maestro Monumento Natural Yaxhá, Nakum, Naranjo*. Consejo Nacional de Áreas Protegidas. Guatemala
- CONAP, 2000a. *Fauna de Guatemala en peligro de extinción*. Consejo Nacional de áreas Protegidas, Dirección de la Zona de Uso Múltiple de la RBM.
- CONAP, 2001a. *Listado de especies de fauna silvestre amenazadas de extinción (lista Roja de Fauna)*. Resolución ALC 032-99 del Consejo Nacional de Áreas Protegidas. Guatemala.
- CONAP, 2001b. *Plan Maestro de la Reserva de la Biosfera Maya 2001-2006*. Consejo Nacional de Áreas Protegidas, The Nature Conservancy, USAID. Serie coediciones técnicas número 30. Guatemala.
- CONAP, 2001c. *Listado de especies de flora silvestre amenazadas de extinción (Lista Roja de Flora)*. Resolución ALC 028-2001 del Consejo Nacional de Áreas Protegidas. Guatemala.
- Decreto 5-90, 1990. *Declaratoria de la Reserva de la Biosfera Maya*. Congreso de la República de Guatemala. Guatemala.
- Dinerstein, E.; D. Olson; D. Graham; A. Webster; S. Primm; M. Bookbinder; G. Ledec, 1995. *Una evaluación del estado de conservación de las eco-regiones terrestres de América Latina y el Caribe*. Banco Mundial y Fondo Mundial para la Naturaleza. Washington.

ParksWatch, 2001. *Perfil del Parque Nacional el Mirador-Río Azul*. ParksWatch Guatemala / Trópico Verde. Guatemala.

UICN, 1994. *Red List of threatened species. 1994 Categories and criteria*. International Union for Conservation of Nature and Natural Resources. En <http://www.redlist.org>

UICN, 2001. *Red List of threatened species. Species information*. . International Union for Conservation of Nature and Natural Resources. En <http://www.redlist.org>