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STATUS AND CONSERVATION OF THE AVIFAUNA OF THE YAXCHILÁN NATURAL MONUMENT, CHIAPAS, MÉXICO

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Resumen. – Estatus y conservación de la avifauna del Monumento Natural Yaxchilán, Chiapas, México. – Se presenta una lista de la avifauna encontrada en el área protegida de Yaxchilán, Chiapas, México. Un total de 235 especies fue registrado en la zona, 75.7% de las cuales fueron residentes permanentes, 19.6% residentes de invierno, y 4.8% residentes de verano o pertenecientes a otras categorías estacionales. Dado el buen estado de conservación de la zona, se registran poblaciones importantes de especies catalogadas en alguna categoría de amenaza como el Águila Arpía (*Harpia harpyja*) y otras, de las cuales se hace mención. Se mencionan además registros importantes para la avifauna mexicana como un ejemplar mexicano del Fandanguero Pechiescamoso (*Phaeochroa cuvierii*) y el primer registro en México del Hormiguero Calvo (*Gymnocichla nudiceps*).

Abstract. – An avifaunal list of the Yaxchilán Natural Monument, Chiapas, Mexico, is presented. A total of 235 species was recorded, 75.7% of which were permanent residents, 19.6% winter residents, and 4.8% summer residents and of other seasonal categories. Given the pristine status of the area, populations of globally endangered species such as the Harpy Eagle (*Harpia harpyja*), among others, were recorded and are mentioned. The area provided new and interesting records for the Mexican avifauna, including a specimen of Scaly-breasted Hummingbird (*Phaeochroa cuvierii*) and the first Mexican record of Bare-crowned Antbird (*Gymnocichla nudiceps*). *Accepted 22 February 2002.*

Key words: Avifauna, Yaxchilán, Chiapas, Mexico.

INTRODUCTION

Yaxchilán, a protected area located in the State of Chiapas, México, has a great value for conservation. First because it is located in the easternmost section of the state of Chiapas, in one of the most important remains of pristine tropical vegetation of the country. Also because, as in several areas of northern Central America, some of the sites where conservation of biological systems has been possible are also very valuable for containing important archaeological Maya sites. Thus, efforts are made to preserve their biological and cultural values entirely. Yaxchilán is located in the Central Maya Lowlands, an area where Maya culture arose in the Preclassic Period, during the Olmec Empire splendor in eastern Mexico, and whose cultural influence extended south to Costa Rica (SEMARNAP-INE-CONABIO 1995).

The biological diversity found in this relativelly small area is astonishing, in spite of being relatively dryer than the adjacent rain forests of Chajul and Montes Azules (González-García 1993). Therefore, efforts

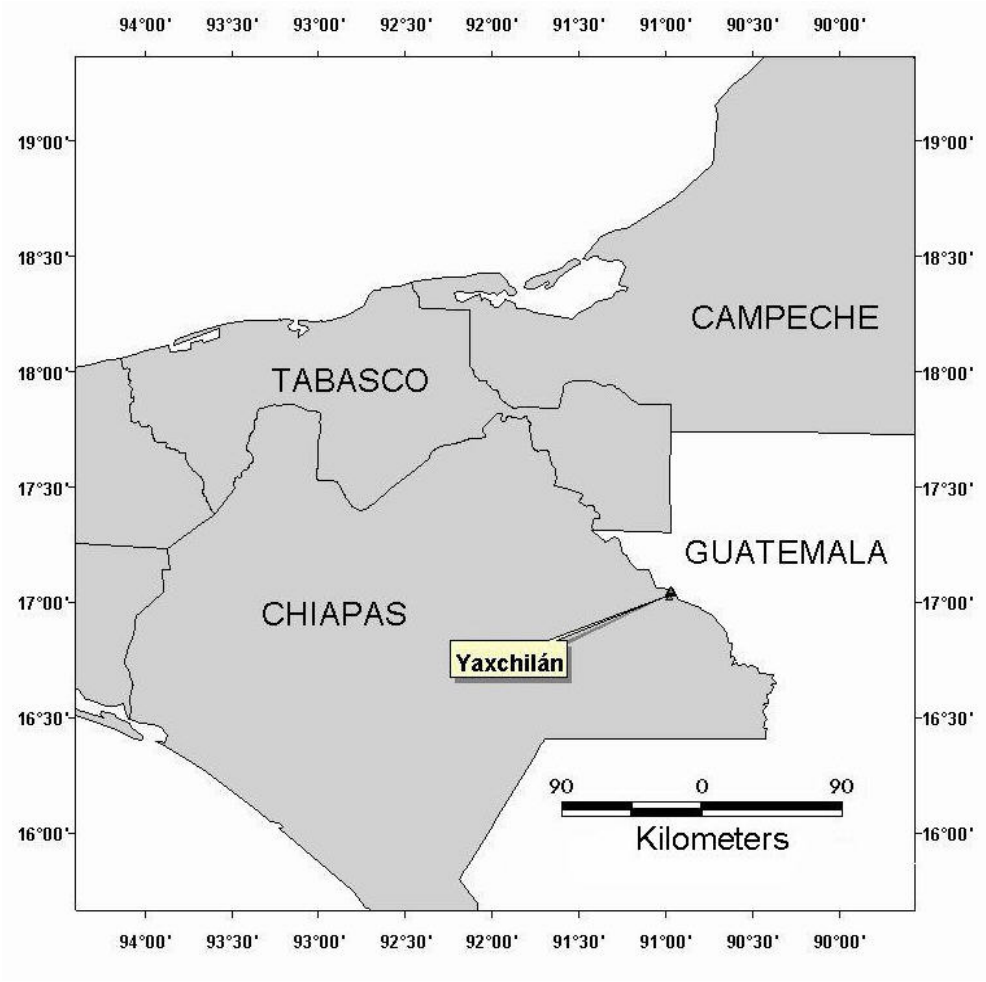

FIG. 1. Geographic location of the "Monumento Natural Yaxchilán" in Chiapas, Mexico.

should be directed to make a detailed study of the biological richness of the region, and promote its conservation and educational value.

The results presented herein are part of a major collaborative research among biologists and anthropologists to evaluate biological diversity of the area, and establish the basis for a more general conservation plan. Thus, the main objective of this contribution is to provide a list of the birds of the region, highlighting noteworthy species and adding information for future conservation strategies.

STUDY AREA AND METHODS

The Yaxchilán Natural Monument is located at a bend of the Usumacinta River (16°53'N, 90°58.60'W; Fig. 1). The official boundaries are specified in a Presidencial Ordinance of 24 August 1992 that preserved an area of 2621 hectares, most of it "ejidos" and com-

munal land, although the archaeological zone is federal property (SEMARNAP-INE-CONABIO 1995). The archaeological zone is now under care of the National Institute of Anthropology and History (INAH) and has adequate installations for housing personnel. Access to the zone is by air, or by land arriving to Palenque, and from there to the town Frontera Corozal, then by boat through the Usumacinta River to Yaxchilán.

Yaxchilán is part of the Lacandona Forest, one of the most inaccessible and biologically unknown regions from Chiapas, that has been assigned to the "Eastern Highlands" phytogeographic region of Breedlove (1970), where several low montane zones decline gradually toward the drainage of the Usumacinta River. The soils of the Lacandona region are constituted of limestones, with gritty and volcanic extrusions, and with a range of elevation from 400–1500 m. Vegetation is relatively uniform, with tropical rain forest being the most common type. However, patches of low savanna, as well as dispersed palm-tree forests, are common. The rain forest is present in the flat areas at the upper drainage of the Usumacinta. The floristic associations of this area are continuous with those of the Petén in Guatemala, both containing a large number of endemic plant species (Breedlove 1970).

At Yaxchilán, the dominant vegetation type is tropical rain forest (Meave del Castillo *et al.* in prep.), but fragments of secondary vegetation are common in areas adjacent to the archaeological zone and the camp of the INAH. The vegetation that is found along the course of the Usumacinta River is known in the zone as "jimbal," because of the presence of *Guadua* sp., and is characterized by the presence of plants similar to "carrizo". Three arboreal strata are present. The highest is composed of trees 50–60 m in height with straight and butressed trunks emergent above the canopy. A medium-height stratum forms a continuous canopy to a height of 25–40 m. The third stratum is composed of trees with branches to a height of 10–20 m. Understory shrubs and grasses are practically absent and the epiphytes are present only in the highest stratum (Breedlove 1970, Pennington & Sarukhán 1998). Some of the most common trees in the canopy are *Apidosperma megalocarpa, Brosimum alicastrum, Dialium guianense, Swietenia macrophylla, Erblichia xilocarpa, Guatteria anomalous, Manilkara achras, Poulsenia armata* and *Terminalia amazonia*. The common trees of the subcanopy are *Alchornea latifolia, Alibertia edulis, Belotia cambelli, Bumelia persimili, Cassia grandis, Blepharidium mexicanum, Bursera simaruba, Guarea excelsa, Hasseltia dioica, Licaria pekii, Orthion subsessile, Pithecelobium arboreum, Quararibea funebris, Wimmeria bartletii* and *Zuelania guidonia* (Breedlove 1970).

Field work was performed by two to five researchers every two months, from December of 1997 to February of 1999 completing a total of 70 days of fieldwork. Surveys of the avifauna were made using mist-nets (approx. 8040 mist net hours) and gathering observational and sound records from the area. Selected specimens were obtained of as many species as possible to construct a voucher collection of skins, skeletons, and frozen tissue samples, deposited at the Museo de Zoología "Alfonso L. Herrera", Facultad de Ciencias, Univ. Nacional Autónoma de México (MZFC), in Mexico City. Data for specimens and sight records were included in a database elaborated by using the BIOTICA 2.0 software of CONABIO (1997) for easy management.

An estimate of the abundance of each species during the study was obtained through a classification of the percentage of the total field days (70 for residents, 42 for migrants) in which a species was recorded. Four classes are used: Rare (1–7%), uncommon (8–29%), common (30–57%), and very common (58–100%); relative abundance

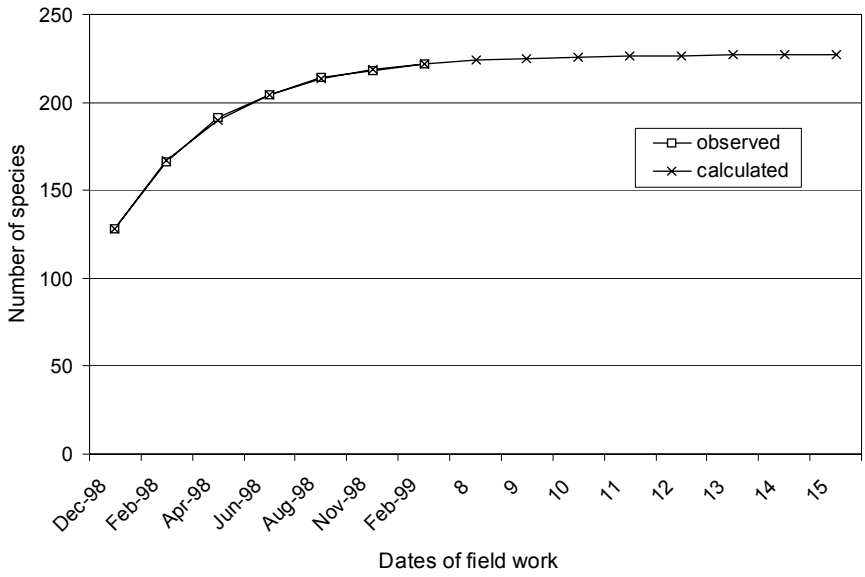

FIG. 2. Accumulation curve of species recorded and hypothetical total number of species (Gutiérrez 1984) in Yaxchilán.

assignation for each species is depicted in Appendix 1.

Additional information on the region's avifauna was obtained from Howell (1989) and the few previously collected specimens from the area. Those specimens are housed in the Canadian Museum of Nature, Ottawa, Canada (CMN, six specimens) and the National Natural History Museum in Paris, France (MNHNP, 209 specimens), all collected by the J. L. Mottron and R. Magris expeditions between 1974 and 1976 (C. Jouanin pers. com.). Taxonomy follows AOU (1998).

RESULTS

Yaxchilán is a site of high bird diversity. Of the approximately 1060 species of birds recorded in Mexico, 425 (40.1%) have been recorded in Chiapas, and 222 (20.94%) were recorded in the locality of Yaxchilán by us, plus thirteen extra species recorded only by specimens in other museums, e.g., the Black-billed Cuckoo (*Coccyzus erythrophthalmus*), the Ferruginous Pigmy Owl (*Glaucidium brasilianum*), and the Lincoln Sparrow (*Melospiza lincolnii*) in MNHNP (Appendix 1), for a total of 235 species. Thus, of the total of species recorded in Chiapas, 55% occur in the relatively small area of Yaxchilán (2621 ha) in comparison with larger nearby reserves e.g., Montes Azules (300 species in 331,200 ha), Calakmul (235 species in 723,185 ha), El Ocote (more than 350 species in 48,140 ha), or Monumento Natural Bonampak (300 species in 4357ha) (SEMARNAP-INE-CONABIO 1995).

Analysis of the accumulation curve for species recorded by dates of field work was adjusted through an exponential growth model employed to compare predicted number of species (Gutiérrez 1984). This estimate suggests that most of the avifauna that occurs at the site was recorded (Fig. 2, Appendix 1).

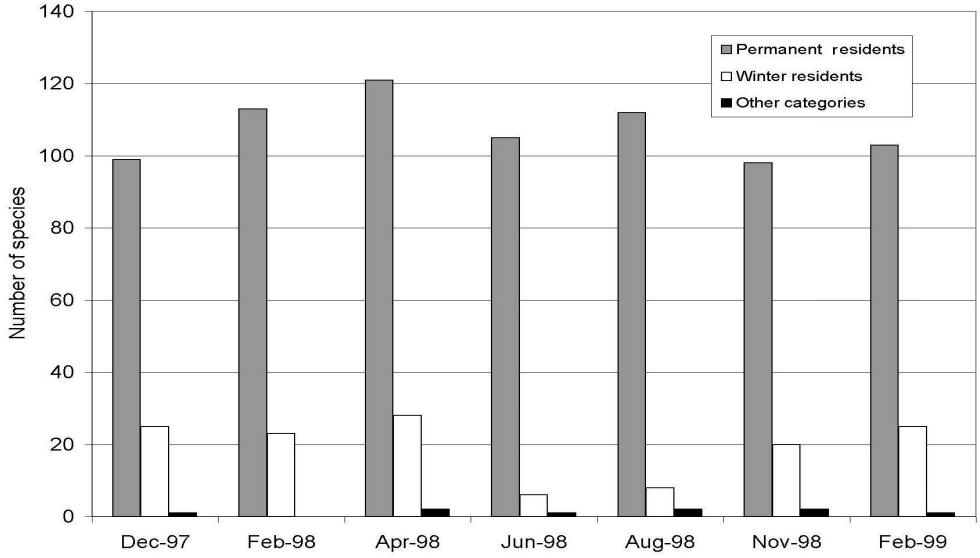

FIG. 3. Species richness by seasonal status in the different field trips.

Species recorded belong to 45 families of 17 orders of birds, 75.7% of which (178 species) are permanent residents, 19.6% (46 species) are winter residents, and 4.8% are either summer residents or accidental in the region (11 species). The Tyrannidae family shows the highest species richness (27 spp.), followed by Parulidae (20 spp.), Thraupidae (15 spp.), Icteridae (12 spp), Trochilidae (11 spp), Cardinalidae (10 spp.), Accipitridae (9 spp.), Ardeidae (8 spp.), Picidae (7 spp.), Dendrocolaptidae (7 spp.) and Columbidae (7 spp.). A voucher collection of 531 specimens from 108 species was constructed (Appendix 1).

The distribution of species richness by seasonal status through the year showed an interesting pattern. The highest richness of permanent and winter residents was recorded in February and April, while lowest values were obtained in June (Fig. 3).

Added value to the conservation of birds of the area is the presence of an important set of species that are classified as threatened either globally, [e.g., Harpy Eagle (*Harpia harpyja*) and Orange-breasted Falcon (*Falco deiroleucus*) (Collar *et al.* 1992, BirdLife International 2000)], or nationally as threatened or endangered (21 species, DOF 1994, Appendix 1).

Given the pristine status of conservation of vegetation at Yaxchilán, and the relatively poor ornithological knowledge of the area, some species are noteworthy and are present sometimes with important and healthy populations.

SPECIES ACCOUNTS

King Vulture (Sarcoramphus papa). This species is a rare resident of the area and was only recorded on 10 and 11 February 1998 in a patch of grass adjacent to the ruins, and on 20 August 1998 at the Usumacinta River.

Harpy Eagle (Harpia harpyja). On 6 and 7 April, and 26 1998 June, we observed one

individual of this highly endangered eagle soaring low over the canopy of well-preserved rain forest. This species is typically associated with pristine vegetation, and its presence indicates the good situation of the habitat. This is one of the scarce recent records of the species in Mexico (Escalante & Peterson 1993, Morales-Pérez 1998) and it is considered rare in the area.

Black Hawk Eagle (Spizaetus tyrannus). This species is a rare resident in the area and was observed on 10 February and 23 and 25 August 1998, perching at the top of a tall tree at the rain forest edge close to the ruins.

Ornate Hawk Eagle (Spizaetus ornatus). This eagle is also a rare resident in the region, only one individual was observed perching inside the canopy of well-preserved rain forest on 31 October 1998.

Orange-breasted Falcon (Falco deiroleucus). This falcon is considered an uncommon resident of tropical rain forests in Middle America. However, it is a rare resident in the locality because only one individual was observed perching in a dead tree close to the ruins on 7 February 1998. This record is the first published for Chiapas and one of few records for Mexico. Although Howell & Webb (1995) mention that the only known specimens from Mexico come from Tecolutla, Veracruz, other specimens are known from Chiapas (Ocosingo, FMNH).

Crested Guan (Penelope purpurascens). Healthy populations of this declining cracid were observed during several months of the year, flying and foraging at the medium-height stratum of the forest. In the area it is an uncommon species; however, local people informed us that it is more commonly observed during the dry season (october to may).

Great Curassow (Crax rubra). Although not recorded directly by us, locals informed us that scattered individuals are present at Yaxchilán during the dry season. The species was recorded from nearby areas in Montes Azules by González-García (1993).

Scarlet Macaw (Ara macao). Groups of 30 to 40 individuals were observed year-round flying high up the canopy. We considered this species common in the area; however, given the illegal trade in this macaw, Yaxchilán and nearby reserves in northern Chiapas and Guatemala might represent one the few refuges for this species in northern Central America (Iñigo-Elías 2000).

Short-tailed Nighthawk (Lurocalis semitorquatus). This rare and elusive nightjar was first sight recorded for Mexico by Howell (1989) at Yaxchilán, with further observations in other sites in Chiapas and in northern Central America (no specimens available yet, Howell & Webb 1995). No records of this species were obtained by us during the field work, although a special effort was devoted to locate it in suitable habitat. The seasonal and taxonomic status of the populations in Mexico, Guatemala, and Honduras remain unknown.

Scaly-breasted Hummingbird (Phaeochroa cuvierii). First recorded in Mexico by Feltner (1976) and Howell (1989) who recorded the species in breeding condition at Yaxchilán, and later by González-García (1993) in the Montes Azules Biosphere Reserve. One male (MZFC 14887) was collected on 10 February 1998, in a patch of rain-forest, constituting one of the three known Mexican specimens. The other two were collected by J. L. Mottron (Allan R. Phillips' collection) at Yaxchilán on 22 October 1974 and are deposited at the Canadian Museum of Nature, Ottawa.

Buff-bellied Hummingbird (Amazilia yucatanensis). One specimen (MZFC 14888) was collected on 3 November 1998. This record is the southernmost for the species in Mexico and expands its known distributional area south to eastern Chiapas.

Bare-crowned Antbird (Gymnocichla nudiceps). This antbird inhabits the tropical rain forests of eastern Guatemala and southern Belize to Honduras. An adult male of this species was observed and unmistakably identified at Yaxchilán in November 1996, foraging in the undergrowth of dense primary rain forest. This is the first Mexican record of the species and represent a range extension of approximately 223 km northwest of its closest known locality at the Belize-Guatemala border [based on Howell & Webb's (1995) map for the species]. The species was not observed again in subsequent visits, which suggests that it is very rare or that its presence in Mexico is accidental.

Northern Royal Flycatcher (Onychorhynchus "coronatus" mexicanus). This species is often considered as an uncommon resident of humid lowland forests, especially associated with rivers (Howell & Webb 1995). The species is an uncommon resident in the area, inhabiting the dense primary vegetation, forest edges, trails, and semiopen areas near the ruins. Specimens were obtained year round (MZFC 14725-29, Feb to Sept 1998). The population in Yaxchilán might constitute one of the most important in northern Central America because the specie is typically associated with pristine vegetation.

Lovely Cotinga (Cotinga amabilis). Individuals of this uncommon species were observed foraging on fruits of a *Ficus* tree near the ruins several times in December 1997 and August 1998.

White-browed Wren (Thryothorus albinucha). One specimen (MZFC 14633) was collected on 24 August 1998, partly filling the distributional gap depicted in Howell & Webb (1995) between northeasternmost Chiapas and Guatemala.

Green Honeycreeper (Chlorophanes spiza). Four specimens of this uncommon species were collected on 7–9 April 1998 (MZFC 14427-28) and 14–15 December 1997 (MZFC 144429-30). The individuals were foraging on fruits of a vine in a *Ficus* tree as part of a mixed-species flock in the lowest stratum of the tree canopy near the ruins. Additional specimens were collected in 1974 (MNHNP).

Blue Seedeater (Amaurospiza concolor). This is an uncommon and very local resident of the mid-elevation brushland and forests, often associated with bamboo (Howell & Webb 1995). Records of this species in Middle America are very scarce and seldom published. One adult male of this rare and elusive seedeater was obtained in a patch of jimbal (*Guadua* sp.) on 29 August 1998 (MZFC 14736). This record expands its known distribution 160 km northeast from the closest known locality in Chiapas (Socoltenango, MLZ 35253).

Blue Bunting (Cyanocompsa parellina). One specimen (MZFC 14434) was obtained on 23 June 1998, expanding the known range of the species in Mexico approximately 63 km south from the outlined distribution of Howell & Webb (1995) in eastern Tabasco.

Spot-breasted Oriole (Icterus pectoralis). Three specimens collected in 1974 by the Mottron-Magris expedition (MNHNP 1975.974-76) constitutes de northernmost records of this species in Chiapas, mainly restricted to the Pacific lowlands of Middle America and occa-

sional in the central valleys of Guatemala (Howell & Webb 1995).

DISCUSSION

The high species richness found at Yaxchilán is likely to increase as more survey effort is devoted. Although predictive models suggest that most of the avifauna has been recorded, special effort should be devoted looking for nocturnal birds (e.g. *Bubo*, *Chordeiles*), transient migrants [e.g., Swainson's Hawk (*Buteo swainsonii*), Broad-winged Hawk (*B. platypterus*), Eastern Kingbird (*Tyrannus tyrannus*), Chimney Swift (*Chaetura pelagica*), Red-eyed Vireo (*Vireo olivaceus*), and Gray-cheeked Thrush (*Catharus minimus*)], and other winter residents that must be present in the region but have been unrecorded for lack of surveying in the right season of the year. With the information available, however, it is possible to discuss the importance of the region for knowledge of Mexican birds and for conservation.

The avifauna of Yaxchilán is unique in several ways, especially because geographic location and avifaunal data suggest that it may represent the contac zone of different sets of bird faunas. First, it is characterized by small populations of species found nowhere else in Mexico [e.g., Short-tailed Nighthawk (*Lurocalis semitorquatus*), White-whiskered Puffbird (*Malacoptila panamensis*), Bare-crowned Antbird, Scaly-breasted Hummingbird], that belong to the Central American Atlantic moist forest ecoregion (Dinerstein *et al.* 1995) and might reach the easternmost Chiapas in their western distributional limit. Other species with similar distribution patterns [e.g., Crested Eagle (*Morphnus guianensis*), Olivaceous Piculet (*Picumnus olivaceus*), White-winged Becard (*Pachyramphus polychopterus*)], "hearsay" recorded in Mexico for long time, may well be present in the region as casuals. Finally, several species characteristic of the dryer semideciduous tropical forest of the Yucatan Peninsula (e.g., White-browed Wren, Buff-bellied Hummingbird) found here their southern distributional limit. Those species coexist widely with the species's rich avifauna of the rain forest of the Isthmus of Tehuantepec, and the Pacific lowlands (e.g.,Spot-breasted Oriole). Thus, from the biogeographic point of view, Yaxchilán and nearby areas are a region that deserves deeper studies involving full biotas for explaining the causes of such a complex species composition.

Yaxchilán is also unique in having healthy populations of rain-forest species considered uncommon or rare in other regions of the country [e.g., Grey-chested Dove (*Leptotila cassinii*), White-whiskered Puffbird, Northern Royal Flycatcher, Rufous-tailed Jacamar (*Galbula ruficauda*). At the same time, some healthy populations of species with a conservation status are also present [e.g., Scarlet Macaw, Harpy Eagle, Solitary Eagle (*Harpyhaliaetus solitarius*)]; see Species Accounts). It is also of interest to note the almost complete absence of human-related species like the House Sparrow (*Passer domesticus*), or cowbirds (*Molothrus* spp.), and the rarity of Great-tailed Grackles (*Quiscalus mexicanus*). These data supply important information about the good conservation status of the habitats of the region, and their importance as a key conservation area for a very particular fauna in northern Central America.

The complexity in composition, structure and function of the tropical rain forests, make them very vulnerable to human perturbation. In the last 30 years, the original area of the tropical rain forest in Mexico has been drastically reduced, with less than 10% left in good preservation condition (Flores-Villela & Gerez 1994). Habitat destruction is advancing at a very fast rate, human settlements are more numerous, and many taxa are exploited for the illegal pet trade (e.g., many of the parrot taxa found in the area). To be successful, conservation efforts in the tropics should

become a multidisciplinary issue, involving taxonomists, ecologists, anthropologists, economists, and politicians (SEMARNAP-INE-CONABIO 1995) working with local people to develop action plans and strategies for preservation and use of biological diversity.

Biological information at several levels of biodiversity studies (taxonomic, ecological, and genetic) is strongly needed for a multitude of protected areas in the world. While many efforts are devoted recently to detect, with biological criteria, priority areas for bird conservation in the world (e.g., Wege & Long 1995) and in Mexico (e.g., Arizmendi & Márquez 2000), some areas have been declared as important for conservation, although they lack a biological survey that accounts for its biological importance.

Although we presented only the results obtained in the bird survey, similar information exists for mammals, reptiles, amphibians, insects, and flora, that will be published elsewhere (Meave & Luis in prep.). This model of gathering information from different sources, and analyzing it in a broad context, has been successful in Mexico for several preserved areas, e.g., Omiltemi, Guerrero (Luna & Llorente 1993), Los Tuxtlas, Veracruz (González-Soriano *et al.* 1997), and the Sierra de la Laguna and El Vizcaíno, Baja California Sur (Arriaga & Ortega 1998, Ortega & Arriaga 1991). However, the particular situation of Yaxchilán, on the border of Mexico and Guatemala, should enhance the development of inventory and conservation efforts at a multi-national scale, improving the knowledge and conservation of natural regions across borders.

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APPENDIX 1. Systematic list of the birds of Yaxchilán. Seasonal status (SS) codes are: WR, winter resident; T, transient; O, occasional; SR, summer resident; PR, permanent resident. Conservation status (CS) codes according to the Mexican Endangered and Threatened Species List (DOF 1994) are: A, threatened; R, rare; PE, endangered; SPE, subject of special protection. Records: O (observed), C (collected and deposited at MZFC), M (other museum specimens). Abundance: R (rare), U (uncommon), C (common), V (very common).

Common names	Species	SS	CS	Records	Abundance
Great Tinamou	*Tinamus major*	PR		O	C
Little Tinamou	*Crypturellus soui*	PR		O	U
Thicket Tinamou	*Crypturellus cinnamomeus*	PR	R	O	R
Slaty-breasted Tinamou	*Crypturellus boucardi*	PR		OC	U
Brown Pelican	*Pelecanus occidentalis*	O		O	R
Neotropic Cormorant	*Phalacrocorax brasilianus*	PR		O	R
Great Blue Heron	*Ardea herodias*	WR	R	O	U
Great Egret	*Ardea alba*	WR		O	U
Snowy Egret	*Egretta thula*	WR		O	C
Little Blue Heron	*Egretta caerulea*	WR		O	U
Tricolored Heron	*Egretta tricolor*	WR		O	R
Cattle Egret	*Bubulcus ibis*	PR		O	R
Green Heron	*Butorides virescens*	PR		O	R
Black-crowned Night-Heron	*Nycticorax nycticorax*	WR		O	R
Black Vulture	*Coragyps atratus*	PR		O	C
Turkey Vulture	*Cathartes aura*	PR		O	C
King Vulture	*Sarcoramphus papa*	PR	PE	O	R
Black-bellied Whistling Duck	*Dendrocygna autumnalis*	PR		O	R
Blue-winged Teal	*Anas discors*	WR	SPE	O	R
Osprey	*Pandion haliaetus*	WR		O	U
Plumbeous Kite	*Ictinia plumbea*	WR	R	O	R
White Hawk	*Leucopternis albicollis*	PR	R	OM	U
Common Black Hawk	*Buteogallus anthracinus*	PR	A	O	R
Great Black Hawk	*Buteogallus urubitinga*	PR	A	O	R
Solitary Eagle	*Harpyhaliaetus solitarius*	PR	A	O	U
Roadside Hawk	*Buteo magnirostris*	PR	SPE	O	U
Harpy Eagle	*Harpia harpyja*	PR	PE	O	R
Black Hawk Eagle	*Spizaetus tyrannus*	PR	A	O	R
Ornate Hawk Eagle	*Spizaetus ornatus*	PR	PE	O	U
Barred Forest Falcon	*Micrastur ruficollis*	PR	R	C	R
Collared Forest Falcon	*Micrastur semitorquatus*	PR	R	M	-
Laughing Falcon	*Herpetotheres cachinnans*	PR		O	U
Bat Falcon	*Falco rufigularis*	PR	A	OM	C
Orange-breasted Falcon	*Falco deiroleucus*	PR	A	O	R
Plain Chachalaca	*Ortalis vetula*	PR		O	C
Crested Guan	*Penelope purpurascens*	PR	SPE	O	U

APPENDIX 1. Continued.

Common names	Species	SS	CS	Records	Abundance
Great Curassow	*Crax rubra*	PR	PE	O	R
Spotted Woodquail	*Odontophorus guttatus*	PR	R	O	U
Greater Yellowlegs	*Tringa melanoleuca*	T		O	R
Spotted Sandpiper	*Actitis macularia*	WR		O	U
Laughing Gull	*Larus atricilla*	WR		O	R
Short-billed Pigeon	*Columba nigrirostris*	PR	R	OC	V
Ruddy Ground Dove	*Columbina talpacoti*	PR		OC	C
Blue Ground Dove	*Claravis pretiosa*	PR	R	O	U
White-tipped Dove	*Leptotila verreauxi*	PR		OC	C
Gray-fronted Dove	*Leptotila rufaxilla*	PR	R	O	R
Gray-chested Dove	*Leptotila cassini*	PR	R	OC	R
Ruddy Quail Dove	*Geotrygon montana*	PR		OC	U
Olive-throated Parakeet	*Aratinga nana*	PR		O	C
Scarlet Macaw	*Ara macao*	PR	PE	O	C
Brown-hooded Parrot	*Pionopsitta haematotis*	PR	R	OM	U
White-crowned Parrot	*Pionus senilis*	PR	A	O	U
White-fronted Parrot	*Amazona albifrons*	PR		O	R
Mealy Parrot	*Amazona farinosa*	PR	A	O	C
Yellow-billed Cuckoo	*Coccyzus americanus*	T		OM	R
Black-billed Cuckoo	*Coccyzus erythrophthalmus*	T		M	-
Squirrel Cuckoo	*Piaya cayana*	PR		OM	U
Striped Cuckoo	*Tapera naevia*	PR		O	R
Groove-billed Ani	*Crotophaga sulcirostris*	PR		O	C
Vermiculated Screech Owl	*Otus guatemalae*	PR	R	C	R
Ferruginous Pygmy Owl	*Glaucidium brasilianum*	PR	A	M	-
Mottled Owl	*Ciccaba virgata*	PR	A	O	U
Short-tailed Nighthawk	*Lurocalis semitorquatus*[1]	PR		-	-
Common Pauraque	*Nyctidromus albicollis*	PR		OC	V
White-collared Swift	*Streptoprocne zonaris*	PR		O	R
Long-tailed Hermit	*Phaethornis superciliosus*	PR		OC	C
Little Hermit	*Phaethornis longuemareus*	PR	R	OC	U
Scaly-breasted Hummingbird	*Phaeochroa cuvierii*	PR		CM	R
White-necked Jacobin	*Florisuga mellivora*	PR	R	OC	R
Green-breasted Mango	*Anthracothorax prevostii*	PR		M	-
White-bellied Emerald	*Amazilia candida*	PR	R	OC	U
Rufous-tailed Hummingbird	*Amazilia tzacatl*	PR	R	OCM	U
Buff-bellied Hummingbird	*Amazilia yucatanensis*	PR		OC	U
Stripe-tailed Hummingbird	*Eupherusa eximia*	PR		OC	R
Purple-crowned Fairy	*Heliothryx barroti*	PR	R	OC	U
Long-billed Starthroat	*Heliomaster longirostris*	PR	R	OC	R
Black-headed Trogon	*Trogon melanocephalus*	PR		O	U
Violaceous Trogon	*Trogon violaceus*	PR	R	O	C
Slaty-tailed Trogon	*Trogon massena*	PR	R	OM	C
Tody Motmot	*Hylomanes momotula*	PR	R	OC	U
Blue-crowned Motmot	*Momotus momota*	PR	R	OC	C

APPENDIX 1. Continued.

Common names	Species	SS	CS	Records	Abundance
Ringed Kingfisher	*Ceryle torquata*	PR		O	U
Amazon Kingfisher	*Chloroceryle amazona*	PR		O	R
Green Kingfisher	*Chloroceryle americana*	PR		O	R
White-necked Puffbird	*Notharchus macrorhynchos*	PR		O	R
White-whiskered Puffbird	*Malacoptila panamensis*	PR	R	OCM	U
Rufous-tailed Jacamar	*Galbula ruficauda*	PR	R	OCM	C
Collared Aracari	*Pteroglossus torquatus*	PR	R	CM	C
Keel-billed Toucan	*Ramphastos sulfuratus*	PR	A	O	V
Black-cheeked Woodpecker	*Melanerpes pucherani*	PR	R	O	U
Golden-fronted Woodpecker	*Melanerpes aurifrons*	PR		OM	V
Smoky-brown Woodpecker	*Veniliornis fumigatus*	PR	R	OC	U
Golden-olive Woodpecker	*Piculus rubiginosus*	PR		O	R
Chestnut-colored Woodpecker	*Celeus castaneus*	PR	A	O	U
Lineated Woodpecker	*Dryocopus lineatus*	PR	R	O	U
Pale-billed Woodpecker	*Campephilus guatemalensis*	PR	R	O	C
Rufous-breasted Spinetail	*Synallaxis erythrothorax*	PR		OCM	R
Buff-throated Foliage-gleaner	*Automolus ochrolaemus*	PR	R	OC	U
Plain Xenops	*Xenops minutus*	PR	A	OCM	U
Scaly-throated Leaftosser	*Sclerurus guatemalensis*	PR	R	OC	U
Tawny-winged Woodcreeper	*Dendrocincla anabatina*	PR	A	OCM	C
Ruddy Woodcreeper	*Dendrocincla homochroa*	PR	R	OCM	U
Olivaceous Woodcreeper	*Sittasomus griseicapillus*	PR	R	OC	U
Wedge-billed Woodcreeper	*Glyphorhynchus spirurus*	PR	R	OC	U
Northern Barred Woodcreeper	*Dendrocolaptes sanctithomae*	PR	R	OC	R
Ivory-billed Woodcreeper	*Xiphorhynchus flavigaster*	PR		OCM	V
Streak-headed Woodcreeper	*Lepidocolaptes souleyetii*	PR		C	R
Great Antshrike	*Taraba major*	PR	R	OC	U
Barred Antshrike	*Thamnophilus doliatus*	PR		OM	V
Plain Antvireo	*Dysithamnus mentalis*	PR	R	OC	U
Dot-winged Antwren	*Microrhopias quixensis*	PR	R	OM	U
Dusky Antbird	*Cercomacra tyrannina*	PR	R	OCM	C
Bare-crowned Antbird	*Gymnocichla nudiceps*	O		O	R
Black-faced Antthrush	*Formicarius analis*	PR	R	OC	C
Scaled Antpitta	*Grallaria guatimalensis*	PR		OC	R
Yellow-bellied Tyrannulet	*Ornithion semiflavum*	PR	R	C	R
Greenish Elaenia	*Myiopagis viridicata*	PR		OCM	U
Ochre-bellied Flycatcher	*Mionectes oleaginous*	PR	R	OCM	U
Sepia-capped Flycatcher	*Leptopogon amaurocephalus*	PR	R	OCM	U
Slate-headed Tody Flycatcher	*Poecilotriccus sylvia*	PR	R	OC	R
Common Tody Flycatcher	*Todirostrum cinereum*	PR	R	OC	R
Yellow-olive Flycatcher	*Tolmomyias sulphurescens*	PR	R	OC	R
Stub-tailed Spadebill	*Platyrinchus cancrominus*	PR	R	OCM	V
Royal Flycatcher	*Onychorhynchus coronatus*	PR		OCM	U
Ruddy-tailed Flycatcher	*Terenotriccus erythrurus*	PR	R	C	U
Sulphur-rumped Flycatcher	*Myiobius sulphureipygius*	PR	R	OCM	C

APPENDIX 1. Continued.

Common names	Species	SS	CS	Records	Abundance
Eastern Wood Pewee	*Contopus virens*	T		O	R
Tropical Pewee	*Contopus cinereus*	PR		M	-
Yellow-bellied Flycatcher	*Empidonax flaviventris*	WR		OCM	U
Acadian Flycatcher	*Empidonax virescens*	T		C	R
Willow Flycatcher	*Empidonax traillii*	T		CM	R
Least Flycatcher	*Empidonax minimus*	WR		CM	R
Bright-rumped Attila	*Attila spadiceus*	PR	R	OC	R
Rufous Mourner	*Rhytipterna holerythra*	PR	R	O	R
Dusky-capped Flycatcher	*Myiarchus tuberculifer*	PR		OC	U
Great Crested Flycatcher	*Myiarchus crinitus*	WR		OC	R
Great Kiskadee	*Pitangus sulphuratus*	PR		OC	C
Boat-billed Flycatcher	*Megarynchus pitangua*	PR		O	R
Social Flycatcher	*Myiozetetes similis*	PR		OM	U
Sulphur-bellied Flycatcher	*Myiodynastes luteiventris*	SR		O	U
Piratic Flycatcher	*Legatus leucophaius*	SR		O	R
Tropical Kingbird	*Tyrannus melancholicus*	PR		O	R
Thrush-like Schiffornis	*Schiffornis turdinus*	PR		OCM	U
Cinnamon Becard	*Pachyramphus cinnamomeus*	PR	R	O	U
Rose-throated Becard	*Pachyramphus aglaiae*	PR		OM	R
Masked Tityra	*Tityra semifasciata*	PR		O	C
Black-crowned Tityra	*Tityra inquisitor*	PR		O	U
Rufous Piha	*Lipaugus unirufus*	PR	R	M	-
Lovely Cotinga	*Cotinga amabilis*	PR	A	O	U
White-collared Manakin	*Manacus candei*	PR	R	OCM	U
Red-capped Manakin	*Pipra mentalis*	PR		OCM	U
Loggerhead Shrike	*Lanius ludovicianus*	O		O	U
White-eyed Vireo	*Vireo griseus*	WR		OM	R
Blue-headed Vireo	*Vireo solitarius*	WR		O	R
Philadelphia Vireo	*Vireo philadelphicus*	WR		CM	R
Yellow-green Vireo	*Vireo flavoviridis*	WR		OC	U
Lesser Greenlet	*Hylophilus decurtatus*	PR	R	M	-
Tawny-crowned Greenlet	*Hylophilus ochraceiceps*	PR	R	OCM	U
Green Jay	*Cyanocorax yncas*	PR		O	C
Brown Jay	*Cyanocorax morio*	PR		OM	V
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	PR		C	C
Barn Swallow	*Hirundo rustica*	WR		O	R
Mangrove Swallow	*Tachycineta albilinea*	PR		O	C
Spot-breasted Wren	*Thryothorus maculipectus*	PR		OCM	V
White-browed Wren	*Thryothorus albinucha*	PR		OC	R
White-breasted Wood Wren	*Henicorhina leucosticta*	PR	R	OCM	C
Long-billed Gnatwren	*Ramphocaenus melanurus*	PR		OCM	U
Swainson's Thrush	*Catharus ustulatus*	WR		C	R
Wood Thrush	*Hylocichla mustelina*	WR		OCM	V
Clay-colored Robin	*Turdus grayi*	PR		OC	C
White-throated Robin	*Turdus assimilis*	PR		CM	R

APPENDIX 1. Continued.

Common names	Species	SS	CS	Records	Abundance
Gray Catbird	*Dumetella carolinensis*	WR		OCM	C
Blue-winged Warbler	*Vermivora pinus*	WR		OC	R
Tropical Parula	*Parula pitiayumi*	PR?		O	R
Yellow Warbler	*Dendroica petechia*	WR		OC	U
Chestnut-sided Warbler	*Dendroica pensylvanica*	WR		O	R
Magnolia Warbler	*Dendroica magnolia*	WR	R	OCM	U
Black-throated Green Warbler	*Dendroica virens*	WR	R	M	-
Bay-breasted Warbler	*Dendroica castanea*	WR		O	R
Black-and-white Warbler	*Mniotilta varia*	WR		OCM	C
American Redstart	*Setophaga ruticilla*	WR		OCM	V
Worm-eating Warbler	*Helmitheros vermivorus*	WR	R	OC	U
Ovenbird	*Seiurus aurocapillus*	WR	R	OCM	C
Northern Waterthrush	*Seiurus noveboracensis*	WR	R	OCM	U
Kentucky Warbler	*Oporornis formosus*	WR		OCM	C
MacGillivray's Warbler	*Oporornis tolmiei*	WR		M	-
Common Yellowthroat	*Geothlypis trichas*	WR		OM	R
Hooded Warbler	*Wilsonia citrina*	WR	A	OCM	U
Wilson's Warbler	*Wilsonia pusilla*	WR		OCM	C
Golden-crowned Warbler	*Basileuterus culicivorus*	PR	R	OCM	U
Yellow-breasted Chat	*Icteria virens*	WR		OCM	U
Gray-throated Chat	*Granatellus sallaei*	PR		O	R
Bananaquit	*Coereba flaveola*	PR		OCM	U
Gray-headed Tanager	*Eucometis penicillata*	PR	R	OCM	U
Black-throated Shrike Tanager	*Lanio aurantius*	PR	R	OM	-
Red-crowned Ant Tanager	*Habia rubica*	PR		OCM	R
Red-throated Ant Tanager	*Habia fuscicauda*	PR		OCM	V
Summer Tanager	*Piranga rubra*	WR		OCM	U
Crimson-collared Tanager	*Ramphocelus sanguinolentus*	PR		OCM	C
Passerini's Tanager	*Ramphocelus passerinii*	PR		OCM	C
Blue-gray Tanager	*Thraupis episcopus*	PR		O	U
Yellow-winged Tanager	*Thraupis abbas*	PR		OC	U
Scrub Euphonia	*Euphonia affinis*	PR		O	R
Yellow-throated Euphonia	*Euphonia hirundinacea*	PR		OC	U
Olive-backed Euphonia	*Euphonia gouldi*	PR	R	OM	U
Golden-hooded Tanager	*Tangara larvata*	PR	R	OM	U
Green Honeycreeper	*Chlorophanes spiza*	PR	R	OCM	R
Red-legged Honeycreeper	*Cyanerpes cyaneus*	PR		O	R
Variable Seedeater	*Sporophila americana*	PR		OCM	C
White-collared Seedeater	*Sporophila torqueola*	PR		OM	C
Blue Seedeater	*Amaurospiza concolor*	PR?	R	OC	R
Orange-billed Sparrow	*Arremon aurantiirostris*	PR	R	OC	C
Green-backed Sparrow	*Arremonops chloronotus*	PR		OCM	C
Lincoln's Sparrow	*Melospiza lincolnii*	WR		M	-
Grayish Saltator	*Saltator coerulescens*	PR		O	U
Buff-throated Saltator	*Saltator maximus*	PR		OC	U

APPENDIX 1. Continued.

Common names	Species	SS	CS	Records	Abundance
Black-headed Saltator	*Saltator atriceps*	PR		OC	C
Black-faced Grosbeak	*Caryothraustes poliogaster*	PR		OC	U
Yellow Grosbeak	*Pheucticus chrysopeplus*	PR		O	R
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	WR		OM	R
Blue-black Grosbeak	*Cyanocompsa cyanoides*	PR	R	OCM	U
Blue Bunting	*Cyanocompsa parellina*	PR		OC	R
Indigo Bunting	*Passerina cyanea*	WR		OCM	U
Painted Bunting	*Passerina ciris*	WR		O	R
Melodious Blackbird	*Dives dives*	PR		O	V
Great-tailed Grackle	*Quiscalus mexicanus*	PR		O	R
Black-cowled Oriole	*Icterus dominicensis*	PR		OM	R
Orchard Oriole	*Icterus spurius*	WR		O	R
Spot-breasted Oriole	*Icterus pectoralis*	PR		M	-
Hooded Oriole	*Icterus cucullatus*	PR	A	O	R
Yellow-tailed Oriole	*Icterus mesomelas*	PR		O	U
Baltimore Oriole	*Icterus galbula*	WR		OM	U
Altamira Oriole	*Icterus gularis*	PR		M	-
Yellow-billed Cacique	*Amblycercus holosericeus*	PR		OCM	C
Chestnut-headed Oropendola	*Psarocolius wagleri*	PR	A	O	U
Montezuma Oropendola	*Psarocolius montezuma*	PR	R	OM	C

[1]Only recorded by Howell (1989).