ORNITOLOGIA NEOTROPICAL 15: 447–482, 2004

AVIAN DIVERSITY IN THE MOSKITIA REGION OF HONDURAS

David L. Anderson[1,4], David A. Wiedenfeld[2], Marc J. Bechard[1], & Stephen J. Novak[3]

[1]Raptor Research Center, Department of Biology, Boise State University, Boise, ID 83725, USA.

[2]Charles Darwin Research Station, Puerto Ayora, Galapagos, Ecuador.

[3]Department of Biology, Boise State University, Boise, ID 83725, USA.

Resumen. – Avifauna de la región de la Moskitia en Honduras. – La Moskitia al noreste de Honduras es considerada una región de alta diversidad en especies de aves, supuestamente por su inmensidad de hábitat natural y la poca intervención humana. Reportamos 358 especies de aves en la Moskitia de acuerdo a estudios hechos recientemente y datos históricos, el doble de la cantidad de especies ya reportadas. Sesenta y cinco especies habitan exclusivamente en bosques latifoliados lluviosos donde sus poblaciones son afectadas por la deforestación en Centro América. Cinco especies están en peligro de extinción a nivel mundial y otra está restringida (endémica) a la región. Incluimos una lista de todas las especies reportadas por categoría de residencia, estado de peligro, frecuencia de observación, y forma de documentación. Además, incluimos una segunda lista de 145 especies que no han sido reportadas en la Moskitia pero que tienen altas posibilidades de encontrarse en la región. En conclusión, la Moskitia hondureña es notablemente importante para la conservación de la biodiversidad a nivel nacional y regional. Mientras tanto, es necesario realizar trabajos del campo adicionales para mejor entender el estado, la distribución, y la abundancia de aves en el noreste del país.

Abstract. – The Moskitia region of northeastern Honduras has long been suspected of supporting high avian diversity, due to the diversity and large expanse of habitats, some with little or no known history of large-scale human disturbance. We have drawn on recent field studies combined with historic data to report on 358 species for this region, more than twice the number of species previously reported. This number represents half the total number of bird species found in Honduras. A total of 65 species are restricted to mature lowland broadleaf forest and susceptible to habitat loss throughout Central America. Five species are recognized as deserving conservation concern and one is regionally range-restricted (endemic). We include a complete list of reported species giving the residency status, threatened status, frequency of observation, and method of substantiation. A second list includes 145 species that likely occur in the Honduran Moskitia but have not yet been reported. We conclude that the Honduran Moskitia is especially important for conserving regional biodiversity. Meanwhile, much additional fieldwork is needed to understand the status and abundance of birds in northeastern Honduras. *Accepted 31 July 2004*.

Key words: Birds, avifauna, diversity, Moskitia, Honduras.

INTRODUCTION

With an area of 112,090 km^2, Honduras is the second largest country in Central America. Within its boundaries is a diverse mosaic of habitats that range in elevation from 0 to 2880 m and include mountainous highlands interspersed with arid valleys, 120 km of Pacific and 650 km of Caribbean coastlines with associated coastal plains, mangrove swamps and estuaries, freshwater lagoons,

[4]*Current address:* Museum of Natural Science, 119 Foster Hall, Louisiana State University, Baton Rouge, LA 70803, USA. *E-mail:* birds@birdinghonduras.com

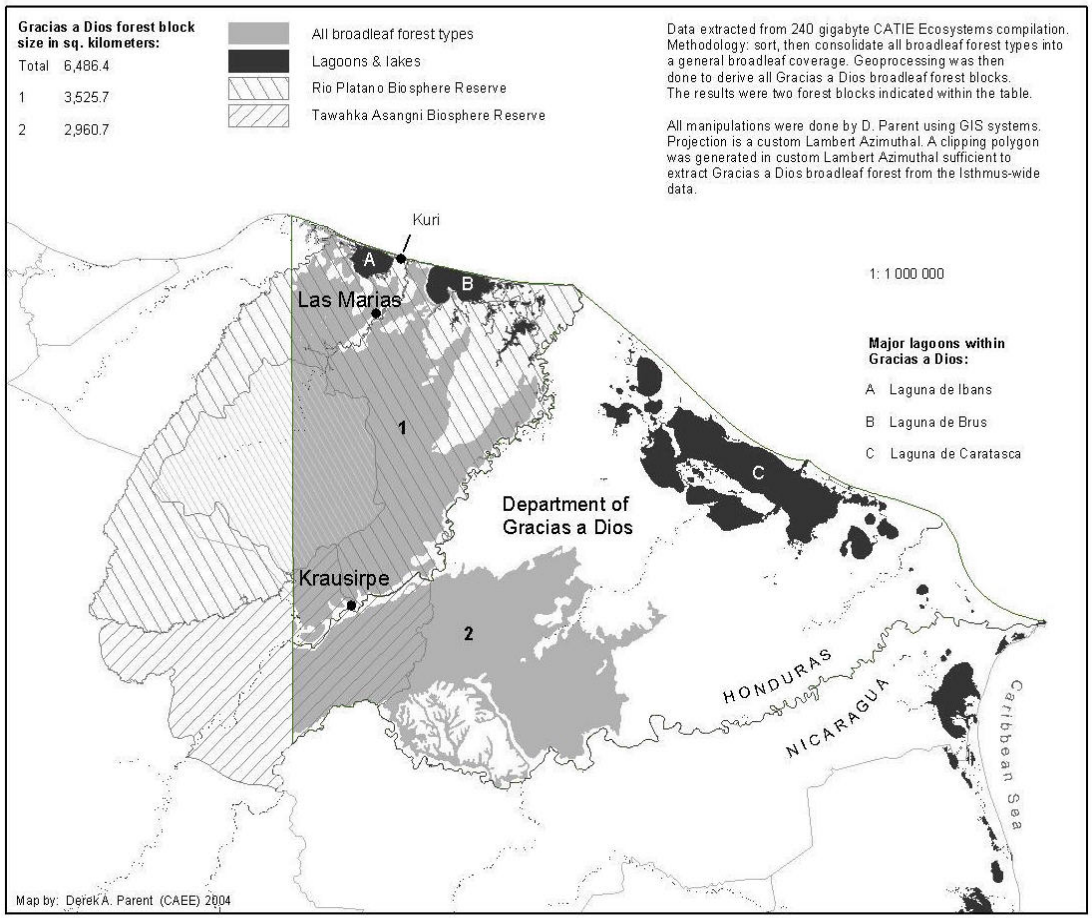

FIG. 1. Gracias a Dios department in Honduras, with protected areas and forest coverage.

humid and dry tropical forests, cloud forests, pine and oak forests, and offshore islands and cays. Owing partly to its habitat diversity, Honduras supports a high diversity of some 701 recorded bird species (Bonta & Anderson 2002). Of this total, 16 species are regional endemics confined to northern Central America, one species is found only in Honduras, and various species are in danger of extinction at the national, regional, and global levels, such as the Honduran Emerald (*Amazilia luciae*), Harpy Eagle (*Harpia harpyja*), and Golden-cheeked Warbler (*Dendroica chrysoparia*), among others (BirdLife International 2000, Bonta & Anderson 2002).

The lowland rain forests of northeastern Honduras have long been believed to support high bird species diversity, owing to their large size and pristine condition. Although museum collectors visited Honduras in the 19th and 20th centuries, and the country's avifauna was addressed in an early ornithological monograph (Monroe 1968), there have been extremely few ornithological studies undertaken in eastern Honduras (Marcus 1983, Marcus 1984, Frederick *et al.* 1997, Anderson 1998, Anderson *et al.* 1998, Anderson 2000). To date, an accurate assessment of the Moskitia avifauna has remained elusive.

Our objectives in this paper are to describe the avian diversity of the Honduran Moskitia, point out species of conservation concern, and estimate the number of bird species present but as yet undetected in the study area.

STUDY AREA AND METHODS

Study area. The region known as the Moskitia includes land in both eastern Honduras and northern Nicaragua. Because the Moskitia straddles the boundary of Honduras and Nicaragua, it is difficult to accurately determine the size and geographic boundary of the region, which is loosely defined by biological and cultural characteristics. The lowland broadleaf forests of northeastern Honduras and northern Nicaragua measure more than 33,900 km^2, with approximately half of the forest found in each country. (D. Parent unpubl.). Pine savanna totals another 17,500 km^2. These combined forests constitute one of the largest remaining forest blocks in Central America. The ecosystems of the Moskitia more closely approximate their pre-industrial state than any similar-sized areas in the Central American isthmus. For this reason, 34,655 km^2 of land have been set aside in four national and international protected areas (O. Munguía pers. com). In Honduras, the lowland broadleaf forests in the northeastern part of the country lie in four departments: Colón, El Paraíso, Olancho, and Gracias a Dios. The latter possesses the greatest extent of forest and the lowest human population densities in Honduras, and comprises the large majority of the area called the Moskitia in Honduras. We will therefore use the departmental limits of Gracias a Dios (hereafter "the Honduran Moskitia") to delimit the geographic area from which our data are derived.

Gracias a Dios measures 16,630 km^2, ranges in elevation from 0 to 1356 m, and has a human population density of approximately 2.2 persons/km^2 (Turner 2004). Lowland broadleaf rain forests in this department alone total 6500 km^2, with pine savanna encompassing approximately the same area (Fig. 1). The physiography of the Moskitia is characterized by north-south transverse mountain ranges descending onto the broad littoral plain of the Río Patuca and Río Segovia. Pronounced dry (January–May) and wet (June–December) seasons occur, with an annual precipitation of 2700 mm recorded on the Caribbean coast at Belén (Dodds 1994). Primary lowland rain forests are comprised of broadleaf evergreen trees (e.g., *Swietenia macrophylla*, *Pterocarpus officinalis*) with occasional deciduous species (*Tabebuia chrysantha*, *Ceiba pendantra*; Hardy &

Sutherland 1986). The dense canopy is typically 25–35 m high, and epiphytes are abundant.

Field observations. Our observations of birds in the Moskitia are derived from three principal time periods. DLA lived in the Río Plátano Biosphere Reserve in the village of Las Marías from January to June 1996 and 1997, and in the Tawahka Asagni Biosphere Reserve in the village of Krausirpe from January to May 1999. DAW worked in gallery forest and pine savanna in the area of the Río Plátano eastward to the Nicaraguan border from February to March and from August to October of 1992.

Frequency status. We assigned a frequency of observation status to species based on our observations. The frequency classifications we used were: common, at least one individual detected every day in the field; fairly common, at least one individual detected every week in the field; uncommon, at least one individual detected during a season (three months); rare, for species we observed on fewer than six occasions. For species we did not directly observe, we ascertained a frequency status based on primary sources (Monroe 1968, Marcus 1983, Frederick *et al.* 1997).

Habitat use classification. We assigned species to a maximum of three out of eight habitat categories. We based designations on our observations of species encountered on more than five occasions. For species we observed fewer than six times, the assignment of habitat use was based on the literature (Monroe 1968, Marcus 1983, Frederick *et al.* 1997). The eight habitat categories we used were: mature forest (forest showing no signs of human disturbance); young forest (secondary forest, brush, and edge); pine savanna; freshwater (including islands in rivers, riparian vegetation, and other marshy or swampy areas); coastal habitats and mangroves; open habitats, usually highly altered by human activity, including agriculture; aerial, for swifts only; all, for species found in all habitats. As with all studies of tropical birds, assigning species to a habitat category can be problematic and the result of generalizations. Our intent was to provide a framework for understanding the distribution of birds within habitats in the Honduran Moskitia and point future researchers toward meaningful studies of bird species distribution in the Moskitia.

Residency status classification. We classified bird species into five categories of residency status: permanent resident, Nearctic migrant, partial migrant, intratropical migrant, and transient. All resident, nonmigratory species were classified as "permanent residents" and included species for which breeding was either known or presumed. "Nearctic migrants" were species that spent an extended period (generally many months) of the year in the Honduran Moskitia before returning to breeding areas. "Partial migrants" were species with both permanent resident and migrant (non-breeding) populations. "Intratropical migrants" were species that migrated between regions in Central and South America. Migrant species suspected of occurring only during spring and fall migration were classified as "transients." For all of the above, residency status was generally taken from published sources for Central America, and is therefore not specific to the Honduran Moskitia.

Substantiation. We classified each species according to the manner in which its occurrence in the Honduran Moskitia had been documented. Species reported in published literature are thus identified by the year of publication of the respective source(s). Species not identified by year of publication are

TABLE 1. Distribution of habitat specialist bird species in the Honduran Moskitia.

Habitats	Number of species	Percent of total avifauna
Forests		
Mature forest	65	18
Mature and young forest	111	31
Young forest	16	4
Forest subtotal	192	54
Transitional habitats		
Pine savanna	27	8
Non-forest habitats		
Freshwater	53	15
Coastal habitats	14	4
Open habitats	34	9
Aerial	3	1
Non-forest subtotal	104	29
Habitat specialist total	323	

new records for the Moskitia from our observations. We further indicate those species documented through specimens or photographs. Any species not listed under these criteria was substantiated solely on the basis of observation or auditory records.

Specimen data were obtained from the U.S. National Museum of Natural History (USNM), the Louisiana State University Museum of Natural Science (LSUMNS), and the Western Foundation for Vertebrate Zoology (WFVZ). The only persons we know to have collected birds in the Honduran Moskitia (C. H. Townsend 1887, W. D. Strong 1933, B. Monroe 1963, M. Marcus 1980, D. Anderson 1996, 1997) deposited their specimens in these three collections.

Expected species. We derived the list of species likely to be present in the Moskitia based on published species accounts (Monroe 1968, Howell 1971, Marcus 1983) and distribution maps (Howell & Webb 1995). All species listed are described in at least one source as occurring on the eastern Atlantic coast of Honduras and occupying habitats found in the Honduran Moskitia, or as being found in the neighboring Nicaraguan Moskitia in habitats contiguous with Honduras.

RESULTS

We list 358 species that have been reliably reported for the Honduran Moskitia, increasing by 192 species the number previously reported in the literature (Appendix 1). Sixty families and 258 genera are represented.

Habitat use. Forest specialists dominated the avifauna of the Honduran Moskitia, with nearly twice as many species being restricted to forested habitats (192) than were restricted to non-forest habitats (104; Table 1). More species were restricted to mature forest than any other singular habitat, followed by freshwater and open habitats, respectively. Fewer species were restricted to young forests and coastal habitats than to any other habitats.

Residency status. A total of 238 (66%) nonmigratory species were classified as permanent residents. Nearctic migrants accounted for an additional 49 (14%) species (Table 2). Five species (*Elanoides forficatus*, *Ictinia plumbea*, *Chordeiles minor*, *Myiodynastes luteiventris*, *Procnias tricarunculata*) were classified as intratropical migrants. All of these with the exception of *P. tricaranculata* are known to breed in Honduras. The latter is known to breed in neighboring Nicaragua, and suspected to breed in Olancho department in Honduras (Bonta 2003). Eleven species (3%) that visit Honduras in spring or fall but which spend the northern winter elsewhere were classified as transients. Nine species were considered partial migrants, with both permanent resident and migratory populations. Forty-five breeding residents are

TABLE 2. Status and documentation of birds reported in the Honduran Moskitia.

	Number of species	Percent of total
Permanent residents	238	66
Nearctic migrants	49	14
Intratropical migrants	5	1
Partial migrants	9	3
Transients	11	3
Status uncertain	1	<1
Total number of species reported	358	100
Species previously reported in published literature	166	46
Species newly reported in this paper	192	54
Species represented by specimens	135	38

at the northern limits of their ranges in the Honduran Moskitia.

Substantiation. Of the 358 species we listed, 166 had been previously reported in the published literature, and 192 are here being reported for the first time (Table 2). Three species collected in 1980 in the Río Plátano by M. Marcus (S. Cardiff pers. com.) were never reported in the ornithological literature: *Sclerurus guatemalensis*, *Platyrinchus coronatus*, and *Terenotriccus erythrurus.*

Specimens exist for 135 (38%) of the 358 species reported, for a total of 323 specimens. Only 18 species were represented by ≥ 5 specimens, and no tissue specimens are known to have been collected in the Moskitia. We found photo documentation for four species for which no specimens existed (*Morphnus guia-nensis*, *Harpia harpyja*, *Ortalis cinereiceps,* and *Nyctiphrynus ocellatus*).

Expected species. We estimate that as many as 145 additional species are likely to occur in the Honduran Moskitia (Appendix 2). Of these, 123 have been observed elsewhere in Honduras, and 23 species, not yet observed in Honduras, are known to exist in Nicaragua in habitats that span the border between the two countries.

SPECIES ACCOUNTS

Five bird species of conservation concern (BirdLife International 2000) are discussed below. We also provide new or significant information for an additional seven species that are poorly known from the Honduran Moskitia and whose inclusion below highlights the importance of the Moskitia for preserving regional biodiversity.

Crested Eagle (Morphnus guianensis). One juvenile bird perched in the top of a snag next to Crique Kahkatingi 1–2 km from the Río Patuca was photographed on 26 June 1999 by Russell Thorstrom (R. Thorstrom pers. com.). The snag was located in a flooded riverine forest surrounded by primary rain forest. Little is known of the species in Honduras, with the only other two records being specimens collected in 1890 and 1902, both outside the Moskitia (Monroe 1968). This species is listed as near-threatened by BirdLife International (2000).

Harpy Eagle (Harpia harpyja). There are four verifiable reports of Harpy Eagles for Honduras, two of which are from the Honduran Moskitia (Monroe 1968, Anderson *et al.* 1998). Locals living along both the Río Patuca

and Río Plátano are familiar with the species and are able to give perfect descriptions of this bird. Residents of Las Marías and Krausirpe tell stories of shooting this species and other large raptors, some accounts of which we were able to verify (D. Anderson unpubl.). This species is listed as near-threatened by BirdLife International (2000), partly because of such human persecution. The vast uninhabited forests of the Honduran Moskitia provide a refuge from conflict with humans.

Black-and-white Hawk-Eagle (Spizastur melanoleucus). DLA observed the species on two occasions in the Río Plátano area and twice along the Río Patuca. One bird was seen soaring over a mosaic of agricultural plots and mature forest, and three birds were seen in mature rain forest. On 25 January 1999, two adults flew into a nest located in a 40-m tall *Metoxylon balsamum* tree on a 140-m high ridge, 1.5 km northwest of Krausirpe. The nest was constructed of fine twigs somewhat smaller in diameter than those in *Spizaetus ornatus* nests in the region (D. Anderson pers. obs.). The nest appeared to be 1–1.5 m wide and ≤1 m tall. The nest was built in the very top of the tree, and the tree canopy was an open crown of spreading branches of equal diameter. Only one bird was seen to enter the cup of the nest. An overflight of the nest by Peregrine Fund biologists on 25 June revealed the nest to be vacant of eggs and nestlings (R. Thorstrom pers. com.). This appears to be only the second nest reported for this species (Thiollay 1994).

Great Green Macaw (Ara ambigua). The Great Green Macaw is a common inhabitant of lowland rain forests in the Moskitia (Marcus 1984). DLA observed the species daily in the Río Plátano area in flocks of more than 10 individuals, and almost daily in the Río Patuca area, usually in pairs. DAW recorded this species as well on the Río Patuca at Pimienta upstream from Wampusirpe, in August 1992. The species is heavily trafficked for the pet trade in Honduras, and this might explain the lower frequency of observation near the more heavily traveled and populated Río Patuca. This species is listed as vulnerable by BirdLife International (2000).

Wedge-tailed Sabrewing (Campylopterus curvipennis). DLA observed the Wedge-tailed Sabrewing frequently in the Sierra de Warunta south of the Río Patuca in 1999. Between 23 and 27 April, from one to three individuals were encountered on each of four trips to the limestone cliffs that characterize the face of this low (800 m) mountain range. Individuals were typically seen feeding at brightly colored bromeliads and other flowers growing in mature forest at the tops of the cliffs. Previously, this species was known from Honduras only on the basis of four specimens collected in central Olancho department, 140 km to the east, and had not been reliably reported for Honduras since 1962 (Monroe 1968). The Honduran population is believed to be separated by 500 km from the next nearest known locality in Belize, a supposition that warrants further investigation.

Keel-billed Motmot (Electron carinatum). DLA observed the species frequently in humid forests in both the Plátano and Patuca regions. The species could be observed on most days by searching and listening for its distinct call, a nasal "*kowhng-kowhng*", slightly deeper than that of the similar Broad-billed Motmot (*Electron platyrhynchum*). The species has been considered as "very rare" by some authors (Collar *et al.* 1988) and threatened by forest destruction over its rather limited range, hence its status as "vulnerable." We agree with Howell & Webb (1995) that the species is more common than previously thought, at least in the humid forests of Honduras' Atlantic slope. We propose that the broadleaf forests of the

Honduran Moskitia be recognized as a stronghold for this species (*sensu* BirdLife International 2001, Snow 2001)

Gray-headed Piprites (Piprites griseiceps). DLA observed one or two individuals in an area known locally as Batiltuk, 2 km southwest of Las Marías on the Río Plátano, on 5 February 1996. The species was observed twice in humid secondary forest while feeding at the periphery of mixed species flocks consisting mostly of Golden-hooded Tanagers (*Tangara larvata*) and migrant parulid warblers. The individual(s) was (were) observed sally-gleaning at 5–7 m in the forest canopy on one occasion, and 1–2 m high in forest undergrowth on the second occasion.

Three-wattled Bellbird (Procnias tricarunculata). DLA observed a minimum of 3 males singing from 18 February to 7 March 1999 on a ridge 165 m a.s.l., 3.5 km northwest of Krausirpe on the Río Patuca. The birds frequented the top of the ridge where the forest had been thinned by a fire. The surrounding forest was mature rain forest. No birds were found after 7 March, raising the question if the individuals observed nested in the region or were migrants from a breeding population in northern Nicaragua, as suggested by Howell & Webb (1995). Skutch (1969) observed the species in Costa Rica below 1515 m a.s.l. from January to March during the non-breeding season, during which time they also vocalized. The dates of our observations combined with the subsequent disappearance of the birds lead us to believe that they were migrating to higher elevations outside the Moskitia to breed. Further investigation is needed to determine the migration routes and breeding areas of this species here at the northern limit of its range. This species is listed as vulnerable by BirdLife International (2000). This is the first reported sighting for the Honduran Moskitia.

Purple Martin (Progne subis). At Kuri, from approximately 17:15 to 18:20 h on 21 August 1992, DAW observed an enormous but loose flock of Purple Martins and Barn Swallows (*Hirundo rustica*; see account below) migrating eastward parallel to the shore, over both land and sea. The flock moved steadily eastward, and a count of the number passing per minute produced an estimate of 53,000 martins passing in that hour. The largest flock previously reported for this species in Honduras was 100 individuals (Monroe 1968). Our observations are the first report of mass migration of the species through Honduras.

Barn Swallow (Hirundo rustica). See species account for Purple Martin. Based on the technique described above, the number of Barn Swallows estimated in the flock on 21 August 1992 at Kuri was 21,000 individuals. Our observation constitutes the first report of mass migration through Honduras.

American Dipper (Cinclus mexicanus). The American Dipper is a fairly common resident of the region, occurring in rocky rapids of major rivers and smaller streams. DLA observed nests and adults carrying food in their bills on the Río Plátano in 1993, 1996, and 1997, at elevations of approximately 50 m a.s.l. elevation. Monroe (1968) included the species for Honduras on the basis of a single specimen collected in Francisco Morazán department in 1951, and described its habitat in Honduras as "swift-flowing mountain streams in heavily forested regions." Although the species is now known from the Sierra de Agalta in Central Olancho department (Bonta & Anderson 2002), this constitutes the first report for the species from Honduras' Atlantic slope and from the Honduran Moskitia.

Olive Tanager (Chlorothraupis carmioli). T. Jenner observed a group of eight individuals in a single-species flock in the foothills out-

TABLE 3. Avifauna and geographical context of three Central American regions.

	El Salvador	Belize	Honduran Moskitia
Total area (km^2)	20,746	22,965	16,630
Broadleaf forest coverage (km^2)	3,204	19,620	6,500
Total species	522	566	358
Broadleaf forest specialists[1]	47	68	65

[1]Forest specialists for El Salvador are species restricted to lowland broadleaf forests; for Belize and the Honduran Moskitia, data include species of lowland forests that may or may not occur in montane forests.

side Las Marías on 25 December 2002 (Jones 2003). Jenner observed another two individuals in a mixed-species flock 2 km distant at Cerro Baltimore the following day. The observations were substantiated with detailed field notes, including identifying marks, similar species, and by comparing the birds' vocalizations with recordings from Costa Rica. This is the first report for the species in Honduras.

DISCUSSION

Although assessment of the avifauna of the Honduran Moskitia is still preliminary, the region seems to support a rich avifauna as previously suspected. Its 358 known species and 65 specialists of lowland broadleaf forests approach or exceed the species richness of similar regions in Central America and could increase substantially with the discovery of some of the 145 anticipated species. Comparisons with the avifaunas of other regions in Central America are tentative, but still informative. Two areas of similar size are El Salvador and Belize. Both countries possess a greater number of species than the Moskitia, while the number of forest specialist birds (species occurring only in broadleaf forests) for the Moskitia is greater than El Salvador and nearly equal to Belize (Table 3; Komar & Dominguez 2001). Differences in both total number of species and number of forest specialists between these countries and the Moskitia are attributable to greater habitat diversity in El Salvador and Belize, greater extent of forest cover in Belize, and the fact that the avifaunas of Belize and El Salvador have been studied in greater depth than that of the Moskitia. The total number of species as well as the number of forest species is expected to increase for the Moskitia with further study. Finally, the known 358 species represents half of the total number of species known for Honduras (Bonta & Anderson 2002).

Species warranting conservation concern are perhaps a more important characteristic of the Moskitia avifauna than numbers of species alone. At a time when bird species are being extirpated or at risk of national extinction throughout Central America, no species are known or suspected to have been lost from the Moskitia. The vast and mostly undisturbed lowland forests of the Moskitia constitute a refugium for these and other forest interior and canopy species in decline regionally. It is likely that the Moskitia serves as a source habitat of forest bird species essential for recolonization into more marginal habitats in the region. If so, the presence of both threatened habitats and threatened wildlife species underscores the conservation value of the Moskitia rain forests, which form an integral part of the Mesoamerican Biological Corridor linking habitats throughout Central America (Kaiser 2001).

Two factors influencing avian diversity in the Honduran Moskitia warrant discussion:

habitat diversity and the Moskitia's biogeographic keystone position between North and South America. Habitat diversity across the Moskitia certainly contributes to the region's avifaunal diversity. Coastal lagoons, pine savanna, lowland rain forests, and abundant riverine habitats contribute to the relative avian richness of this region. Comparison of avian diversity between regions containing dissimilar habitats would not be especially meaningful. Instead, useful comparisons require that future studies not just report total number of species, but also include a description of the bird communities within specific habitats. More important is the preponderance of species found in, or restricted to, mature forest. The Moskitia remains a place where undisturbed forests dominate the landscape, an unusual situation in Central America.

The Moskitia's biogeographic keystone position between North and South America is a second factor that influences the region's avifauna. The avifauna of Honduras's lowland Caribbean slope is largely derived from species whose center of distribution or whose evolutionary origins are in South America (Monroe 1968). Forty-six species are at their extreme northern range limits in the Honduran Moskitia, and not found in similar forests farther west and north in Honduras, Guatemala, or Mexico (Anderson 2000, this paper). Likewise, at least 13 species that nest in the Moskitia pine savannas are more characteristic of conifer forests and open spaces of North America. These species distinguish the Moskitia avifauna from forest sites farther south. An additional 49 species are migrants from North America. Finally, the Moskitia avifauna is characterized by species with origins in, or which are endemic to, Central America, namely Momotidae with four species represented.

The Moskitia may be the most biologically understudied region in Central America. Access to most areas is extremely difficult, human habitation is widely scattered, and few ornithologists have ever entered the interior. Even with our limited field work in the interior, this paper more than doubles the number of bird species known from the Moskitia. Still, our list of 145 expected, but as yet unreported, species shows that much remains to be learned. The importance of predicting expected species should not be underestimated. In recent decades, several species have been discovered in Honduras that previously were unknown north of Costa Rica (Marcus 1983, Anderson *et al.* 1998, R. Gallardo pers. com.). Some of these are now known to be quite common in Honduras. Furthermore, new species for Honduras are discovered in the Moskitia almost annually (Bonta & Anderson 2002, Jones 2003, R. Gallardo pers. com.). The continued discovery of new species bolsters our view of the importance of the Moskitia to avian species conservation and indicates that the preservation of this region and its inhabitants should be a priority.

Our limited knowledge of the Moskitia avifauna is further highlighted by an underrepresentation in the scientific literature and in natural history museums. We know of only six papers on the birds of the Honduran Moskitia published since 1968. Specimens exist for fewer than half of the species known, only 18 species are represented by ≥ 5 specimens, and no tissue specimens exist. In short, the specimen record from the Moskitia is completely insufficient for modern taxonomic investigations involving phylogeny, molecular genetics, and a host of other sub-disciplines of ornithology.

The Honduran Moskitia offers a heretofore underutilized opportunity for studies in Neotropical biology. The region possesses large tracts of primary forest and provides the chance to investigate an intact ecosystem with all the historically occurring organisms pre-

sumably still present. Such an opportunity is not easily found elsewhere in Central America. Detailed biological investigations are urgently needed to contribute to our knowledge of the Moskitia, and to conserve its biological resources before the chance to do so is lost.

ACKNOWLEDGMENTS

C. Ludwig (USNM), S. Cardiff (LSUMNS), R. Corado (WFVZ), and R. Thorstrom and R. Watson (The Peregrine Fund) shared valuable data. D. Parent (Central America Ecology and Environment) generously and quickly provided geographical data for forest coverage in Central America. O. Komar, L. Kiff, A. Dufty, J. Smith, S. Wong, and an anonymous reviewer made valuable comments on earlier drafts of the manuscript. Funding and material support were provided by The American Bird Conservancy, Lincoln Park Zoological Society Scott Neotropic Fund, Hawk Mountain Sanctuary-Zeiss Award, The Peregrine Fund, Conejo Valley Chapter of The Audubon Society, and the Bill Supri Foundation. Corporación Hondureña de Desarrollo Forestal (COHDEFOR) granted permission to DLA and to DAW throughout the Moskitia. Z. Guevara, B. Martinez, G. Suanzin, S. Harris, and D. Medina provided valuable field assistance in Las Marías. S. Romero, A. Rivens, A. Herrera, and B. López provided support and field assistance to DAW, and P. Thorn provided logistical support and discussion of Honduran bird biology and distribution.

REFERENCES

American Ornithologists' Union. 1998. Check-list of North American birds. 7 th ed. American Ornithologists' Union, Washington, DC.

Anderson, D. L. 1998. Avian diversity in the Río Plátano Biosphere Reserve, Honduras: The influence of indigenous agricultural practices. M.Sc. thesis, Boise State Univ., Boise, Idaho.

Anderson, D. L. 2000. Notes on the breeding, distribution, and taxonomy of the Ocellated Poorwill (*Nyctiphrynus ocellatus*) in Honduras. Ornitol. Neotrop. 11: 233–238.

Anderson, D. L., M. Bonta, & P. Thorn. 1998. New and noteworthy bird records from Honduras. Bull. Br. Ornithol. Club 118: 178–183.

BirdLife International. 2000. Threatened birds of the world. Lynx Edicions and BirdLife International, Barcelona, Spain, and Cambridge, UK.

Bonta, M. 2003. Seven names for the bellbird: Conservation geography in Honduras. Texas A&M Univ. Press, College Station, Texas.

Bonta, M., & D. L. Anderson. 2002. Birding Honduras: A checklist and guide. Ecoarte, Tegucigalpa, Honduras.

Collar, N. J., M. J. Crosby, & A. J. Stattersfield. 1994. Birds to watch 2: The world list of threatened birds. Conservation Series No. 4, BirdLife International, Cambridge, UK.

Collar, N. J., & P. Andrew. 1988. Birds to watch: The ICBP world checklist of threatened birds. ICBP Technical Publication No. 8, Smithsonian Institution Press, Washington, DC.

Dodds, D. J. 1994. The ecological and social sustainability of Miskito subsistence in the Río Plátano Biosphere Reserve, Honduras: The cultural ecology of swidden horticulturists in a protected area. Ph.D. diss., Univ. of California, Los Angeles, California.

Frederick, P., J. C. Sandoval, C. Luthin, & M. Spalding. 1997. The importance of the Caribbean coastal wetlands of Nicaragua and Honduras to Central American populations of waterbirds and Jabiru Storks (*Jabiru mycteria*). J. Field Ornithol. 68: 287–295.

Hardy, C., & N. Sutherland. 1986. Plantas comunes de Honduras. Editorial Universitaria, Tegucigalpa, Honduras.

Howell, T. R. 1971. An ecological study of the birds of the lowland pine savanna and adjacent rain forest in northeastern Nicaragua. Living Bird 10: 185–242.

Howell, S. N. G., & S. Webb. 1995. A guide to the birds of Mexico and northern Central America. Oxford Univ. Press, London, UK.

Jones, H. L. 2003. Central America report. N. Am. Birds 57: 270–271.

Jones, H. L., & A. C. Vallely. 2001. Annotated checklist of the birds of Belize. Lynx Edicions, Barcelona, Spain.

Kaiser, J. 2001. Bold corridor project confronts political reality. Science 293: 2196–2199.

Komar, O. 1998. Avian diversity in El Salvador. Wilson Bull. 110: 511–533.

Komar, O., & J. P. Domínguez. 2001. Lista de aves de El Salvador. Fundación Ecológica de El Salvador, San Salvador, El Salvador.

Marcus, M. J. 1983. Additions to the avifauna of Honduras. Auk 100: 621–629.

Marcus, M. J. 1984. Notes on the Great Green Macaw (*Ara ambigua*) in Honduras. Ceiba 25: 151–155.

Monroe, B. L., Jr. 1968. A distributional survey of the birds of Honduras. Ornithol. Monogr. 7: 1–458.

Skutch, A. F. 1969. Life histories of Central American birds. Volume 3. Pacific Coast Avifauna 35, Cooper Ornithological Society, Berkeley, California.

Snow, D. W. 2001. Family Momotidae (Motmots). Pp. 264–284 *in* del Hoyo, J., A. Elliott, & J. Sargatal (eds). Handbook of the birds of the world. Volume 6: Mousebirds to hornbills. Lynx Edicions, Barcelona, Spain.

Thiollay, J. M. 1994. Family Accipitridae (Hawks and eagles). Pp. 52–205 *in* del Hoyo, J., A. Elliott, & J. Sargatal (eds). Handbook of the birds of the world. Volume 2: New World vultures to guineafowl. Lynx Edicions, Barcelona, Spain.

Turner, B. 2004. The statesman's yearbook: The politics, cultures and economies of the world. Palgrave Macmillan, New York, New York.

APPENDIX 1. Status and distribition of all documented bird species observed in the Honduran Moskitia. Avian taxonomy follows the classification of the American Ornithologists' Union (1998) check-list of North American birds and supplements.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Tinamidae								
Great Tinamou	*Tinamus major*		C	MF, YF	PR			1992, 1998, 1999
Little Tinamou	*Crypturellus soui*		C	MF, YF	PR			1992, 1998, 1999
Slaty-breasted Tinamou	*Crypturellus boucardi*		FC	MF, YF	PR			1998, 1999
Anatidae								
Black-bellied Whistling-Duck	*Dendrocygna autumnalis*	1997	FC	FW	PR			1992, 1998; Río Plátano and Laguna Ibans
Fulvous Whistling-Duck	*Dendrocygna bicolor*	1997	UC	FW	PR			
Muscovy Duck	*Cairina moschata*	1997	UC	FW	PR			1992, 1998
Blue-winged Teal	*Anas discors*	1997	FC	FW	NM			1992, 1998, 1999
Cracidae								
Gray-headed Chachalaca	*Ortalis cinereiceps*	1983	FC	MF, YF	PR		Y	1998, 1999
Crested Guan	*Penelope purpurascens*		C	MF, YF	PR		Y	1998, 1999
Great Curassow	*Crax rubra*		FC	MF, YF	PR		Y	1998, 1999
Odontophoridae								
Black-throated Bobwhite	*Colinus nigrogularis*	1968	FC	PS	PR	6		
Black-eared Wood-Quail	*Odontophorus melanotis*		C	MF, YF	PRn			1998, 1999
Tawny-faced Quail	*Rhynchortyx cinctus*		R	MF	PRn			8 March 1996, 1 pair in mature forest, 3 km N Las Marías
Podicipedidae								
Pied-billed Grebe	*Podilymbus podiceps*		UC	FW, C	PR			20 at Pto. Lempira, 21 Feb. 1992; 4 on Laguna Tansin, 24 Feb. 1992, and 2 on Laguna Guarunta on 7 March 1992. Probably occur regularly in season
Pelecanidae								
Brown Pelican	*Pelecanus occidentalis*		C	C	NM			1992, 1998

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Phalacrocoracidae								
Neotropic Cormorant	*Phalacrocorax brasilianus*		C	FW	PR			1992, 1998, 1999
Anhingidae								
Anhinga	*Anhinga anhinga*	1997	C	FW	PR			1992, 1998
Fregatidae								
Magnificent Frigatebird	*Fregata magnificens*		C	C	NM			1992, 1998
Ardeidae								
Rufescent Tiger-Heron	*Tigrisoma lineatum*	1968, 1983	R	FW	PRn	1	Y	
Bare-throated Tiger-Heron	*Tigrisoma mexicanum*		FC	FW	PR			1992, 1998
Great Blue Heron	*Ardea herodias*	1997	C	FW	NM			1992, 1998, 1999
Great Egret	*Ardea alba*	1997	C	FW	PM			1992, 1998
Snowy Egret	*Egretta thula*		C	FW	PM			1992, 1998, 1999
Little Blue Heron	*Egretta caerulea*		C	FW	PR			1992, 1998, 1999
Tricolored Heron	*Egretta tricolor*		FC	C, FW	PM			1992, 1998
Cattle Egret	*Bubulcus ibis*		C	OP	PM			1992, 1998, 1999; common where livestock are found
Green Heron	*Butorides virescens*		FC	FW	PR			1992, 1998, 1999
Yellow-crowned Night-Heron	*Nyctanassa violaceus*		FC	FW	PR			1992, 1998
Boat-billed Heron	*Cochlearius cochlearius*		FC	FW	PR			1992, 1998, 1999
Threskiornithidae								
White Ibis	*Eudocimus albus*	1997	UC	FW	NM			1998
Green Ibis	*Mesembrinibis cayennensis*	1983	FC	FW	PRn			1992, 1998, 1999
Roseate Spoonbill	*Platalea ajaja*	1968, 1997	FC	FW	PR	1		1992, 1998
Ciconiidae								
Jabiru	*Jabiru mycteria*	1968, 1997	UC	FW	PR			nests in coastal wetlands
Wood Stork	*Mycteria americana*	1968, 1997	C	C, MF, YF	PR	1		1992, 1998, 1999; common in coastal wetlands and flying over humid forest

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Cathartidae								
Black Vulture	*Coragyps atratus*		C	ALL	PR			1992, 1998, 1999
Turkey Vulture	*Cathartes aura*		C	ALL	PM			1992, 1998, 1999
Lesser Yellow-headed Vulture	*Cathartes burrovianus*	1968	C	PS	PR	2		1998; common in pine savanna
King Vulture	*Sarcoramphus papa*		C	MF, YF, OP	PR			1992, 1998, 1999; common in mature forest
Accipitridae								
Osprey	*Pandion haliaetus*		C	FW, C	NM			1992, 1998, 1999
Gray-headed Kite	*Leptodon cayanensis*		UC	MF	PR			1998, 1999
Hook-billed Kite	*Chondrohierax uncinatus*		UC	MF	PR			1998
Swallow-tailed Kite	*Elanoides forficatus*	1968	FC	MF, YF	IM	1		1992, 1998, 1999
White-tailed Kite	*Elanus leucurus*		UC	OP	PR			Gualpacaiquira on 27 Feb. 1992; near Mocorón on 28 Feb. 1992; Bil Almuk on 31 Aug. 1992; 2 at Waxma on 2 Sep. 1992.
Plumbeous Kite	*Ictinia plumbea*		C	MF, YF	IM			1998, 1999
Black-collared Hawk	*Busarellus nigricollis*		R	MF	PR			22 Jan. 1997, 1 circling over small stream and mature forest, 1 km SW Las Marías
Bicolored Hawk	*Accipiter bicolor*		R	MF, YF	PR			20 Jan. 1996, 1 immature in secondary forest, Las Marías; 2 March 1999, 1 female, Valle Sutawala, 12 km SW Krausirpe
Crane Hawk	*Geranospiza caerulescens*		UC	MF	PR			1992, 1998
Semiplumbeous Hawk	*Leucopternis semiplumbea*	1968, 1983, 1998	UC	MF	PRn	1		1998
White Hawk	*Leucopternis albicollis*	1968	FC	MF	PR			1992, 1998, 1999

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Common Black-Hawk	*Buteogallus anthracinus*	1968	FC	MF, YF, FW	PR	1		1998, 1999
Great Black-Hawk	*Buteogallus urubitinga*	1968	UC	MF	PR	1		1992, 1998, 1999
Roadside Hawk	*Buteo magnirostris*	1968	C	MF, YF	PR			1992, 1998, 1999
Short-tailed Hawk	*Buteo brachyurus*	1968	UC	PS	PR	1		2 March 1996, 1 individual, 9 km SW Las Marías, mature forest; 20 Feb. 1997, pair soaring over farm plots at Las Marías
White-tailed Hawk	*Buteo albicaudatus*	1968	UC	MF, YF	PR	1		1992, 1998
Red-tailed Hawk	*Buteo jamaicencis*		R	PS	PR			1 at Rus-Rus on 1 March 1992
Crested Eagle	*Morphnus guianensis*		R	MF	PR		Y	26 Jun. 1999, 1 fledgeling in flooded forest, Quebrada Kahkatingni, Río Patuca
Harpy Eagle	*Harpia harpyja*	1998	R	MF	PR		Y	1991, pair in Valle Sutawala, SW Krausirpe; 12 April 1996, Río Plátano, 12 km SW Las Marías
Black-and-white Hawk-Eagle	*Spizastur melanoleucus*	1998	UC	MF	PR			1998, 1999
Black Hawk-Eagle	*Spizaetus tyrannus*		C	MF	PR			1998, 1999
Ornate Hawk-Eagle	*Spizaetus ornatus*		FC	MF	PR			1992, 1998, 1999
Falconidae								
Barred Forest-Falcon	*Micrastur ruficollis*		UC	MF	PR			1998
Collared Forest-Falcon	*Micrastur semitorquatus*		C	MF	PR			1992, 1998
Red-throated Caracara	*Ibycter americanus*		R		PR?			18 Feb. 2003, Krautara, 2 individuals, A. Narish and T. Jenner, in review
Crested Caracara	*Caracara cheriway*		C	PS	PR			1992, 1998
Laughing Falcon	*Herpetotheres cachinnans*		C	MF, YF	PR			1992, 1998, 1999
American Kestrel	*Falco sparverius*	1968	FC	PS	PM	1		

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Aplomado Falcon	*Falco femoralis*	1983	R	PS	PR			
Bat Falcon	*Falco rufigularis*	1968	C	MF, YF	PR			1992, 1998, 1999
Rallidae								
Ruddy Crake	*Laterallus ruber*	1968	FC	FW	PR	1		1992
White-throated Crake	*Laterallus albigularis*	1968, 1998	C	FW	PRn	1		1992, 1998
Gray-breasted Crake	*Laterallus exilis*	1968	R	FW	PR	1		
Gray-necked Wood-Rail	*Aramides cajanea*	1968	C	MF, YF	PR			1992, 1998, 1999
Uniform Crake	*Amaurolimnas concolor*		C	MF, YF	PR			1998, 1999; common in humid forest and riparian areas with high water table and moist soil
Purple Gallinule	*Porphyrio martinica*		C	FW	PR			1992, 1998; common in margins of coastal lagoons and waterways
Common Moorhen	*Gallinula chloropus*		R	FW	PR			10 on lagoon at Pto. Lempira on 21 Feb. 1992; 10 on Laguna de Guarunta, 7 March 1992
American Coot	*Fulica americana*		R	FW	PM			12 on Laguna de Guarunta on 7 March 1992; 10 at Samil on 8 March 1992
Heliornithidae								
Sungrebe	*Heliornis fulica*	1968	FC	FW	PR	1		1992, 1998, 1999
Eurypygidae								
Sunbittern	*Eurypygia helias*		FC	FW	PR			1998, 1999
Aramidae								
Limpkin	*Aramus guarauna*		UC	FW	PR			1992
Charadriidae								
Black-bellied Plover	*Pluvialis squatarola*		C	C	NM			1992, 1998
Collared Plover	*Charadrius collaris*		C	FW	PR			1998, 1999
Semipalmated Plover	*Charadrius semipalmatus*		FC	C	NM			1998

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Killdeer	*Charadrius vociferus*		FC	FW	NM			1992, 1999
Jacanidae								
Northern Jacana	*Jacana spinosa*		C	FW	PR			1992, 1998
Scolopacidae								
Greater Yellowlegs	*Tringa melanoleuca*		R		NM			1 on Laguna de Guarunta on 7 March 1992
Lesser Yellowlegs	*Tringa flavipes*		FC	FW	NM			1992, 1998
Willet	*Catoptrophorus semipalmatus*		C	C	NM			1998
Spotted Sandpiper	*Actitis macularius*		C	FW	NM			1992, 1998, 1999
Whimbrel	*Numenius phaeopus*		FC	C	NM			1998
Semipalmated Sandpiper	*Calidris pusilla*	1968	UC	C	NM	2		
Western Sandpiper	*Calidris mauri*	1968	UC	C	NM	1		
Least Sandpiper	*Calidris minutilla*	1968	FC	C	NM	1		
Laridae								
Laughing Gull	*Larus atricilla*		C	C	NM			1998
Royal Tern	*Sterna maxima*		FC	C	NM			1992, 1998
Black Tern	*Chlidonias niger*	1968	UC	C	T			
Columbidae								
Rock Pigeon	*Columba livia*		C	OP	PR			1992, 1999; small flocks in Puerto Lempira and Krausirpe
Pale-vented Pigeon	*Patagioenas cayennensis*		UC	MF	PR			1992, 1998
Scaled Pigeon	*Patagioenas speciosa*		FC	MF	PR			1992, 1998, 1999
Red-billed Pigeon	*Patagioenas flavirostris*		UC	MF, YF	PR			1992
Short-billed Pigeon	*Patagioenas nigrirostris*	1968	C	MF, YF	PR			1998, 1999
Common Ground-Dove	*Columbina passerina*	1968	FC	OP	PR	3		1992
Blue Ground-Dove	*Claravis pretiosa*		C	OP	PR			1992, 1998, 1999
Gray-fronted Dove	*Leptotila rufaxilla*		FC	MF, YF	PR			1999
Gray-chested Dove	*Leptotila cassini*		C	MF, YF	PR			1998, 1999

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Ruddy Quail-Dove	*Geotrygon montana*		FC	MF	PR			1998
Psittacidae								
Olive-throated Parakeet	*Aratinga nana*	1968	FC	MF, YF	PR	2		1992, 1998, 1999
Great Green Macaw	*Ara ambiguus*	1968, 1983, 1984	FC	MF	PRn	1		1992, 1998, 1999
Scarlet Macaw	*Ara macao*	1968	C	MF, YF, PS	PR	2		1992, 1998, 1999
Brown-hooded Parrot	*Pionopsitta haematotis*	1968	FC	MF, YF	PR	3		1992, 1998, 1999
White-crowned Parrot	*Pionus senilis*	1968	FC	MF, YF	PR	2		1992, 1998, 1999
Red-lored Parrot	*Amazona autumnalis*	1968	C	MF, YF	PR			1992, 1998, 1999
Mealy Parrot	*Amazona farinosa*		C	MF, YF	PR			1998, 1999
Yellow-naped Parrot	*Amazona auropalliata*	1968	C	YF, PS, C	PR	1		1992, 1998
Cuculidae								
Squirrel Cuckoo	*Piaya cayana*	1968	C	MF, YF	PR	2		1992, 1998, 1999
Striped Cuckoo	*Tapera naevia*		FC	YF	PR			1998, 1999
Groove-billed Ani	*Crotophaga sulcirostris*	1968	C	OP	PR			1992, 1998, 1999
Tytonidae								
Barn Owl	*Tyto alba*		FC	OP	PR			1999; Krausirpe only
Strigidae								
Vermiculated Screech-Owl	*Megascops guatemalae*		C	MF, YF	PR			1998, 1999
Spectacled Owl	*Pulsatrix perspicillata*		FC	MF, YF	PR			1998, 1999
Ferruginous Pygmy-Owl	*Glaucidium brasilianum*	1968	C	MF, YF	PR	3		1998, 1999
Mottled Owl	*Ciccaba virgata*		FC	MF, YF	PR			1998, 1999
Caprimulgidae								
Common Nighthawk	*Chordeiles minor*		FC	FW, PS	IM			1992, 1999
Common Pauraque	*Nyctidromus albicollis*	1968	C	MF, YF, OP	PR			1992, 1998, 1999
Ocellated Poorwill	*Nyctiphrynus ocellatus*	1998, 2000	C	MF	PR			1998, 1999
Apodidae								
White-collared Swift	*Streptoprocne zonaris*		FC	A	PR			1992, 1998, 1999
Vaux's Swift	*Chaetura vauxi*		C	A	PR			1998, 1999

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Lesser Swallow-tailed Swift	*Panyptila cayennensis*		UC	A	PR			1998, 1999
Trochilidae								
Bronzy Hermit	*Glaucis aeneus*	1998	C	MF, YF	PRn	1		1992, 1998, 1999; specimen consists of tail feathers only
Long-billed Hermit	*Phaethornis longirostris*		C	MF, YF	PR	1		1998, 1999
Stripe-throated Hermit	*Phaethornis striigularis*	1968	C	MF, YF	PR	4		1992, 1998, 1999
Scaly-breasted Hummingbird	*Phaeochroa cuvieri*		R	OP	PR			26 April 1999, 1 individual at flowering *Inga* tree in Krausirpe
Wedge-tailed Sabrewing	*Campylopterus curvipennis*		C	MF	PR			1999; common in mature forest, Sierra de Warunta, 3 km S Krausirpe
Violet Sabrewing	*Campylopterus hemileucurus*		UC	MF, YF	PR			1998, 1999
White-necked Jacobin	*Florisuga mellivora*		C	MF, YF, OP	PR			1992, 1998, 1999; common at flowering *Inga* trees
Green-breasted Mango	*Anthracothorax prevostii*		UC	MF, YF, OP	PR			1992, 1999; uncommon at flowering *Inga* trees and open habitats of Río Patuca
Canivet's [Fork-tailed] Emerald	*Chlorostilbon canivetii*	1968	FC	OP	PR	3		
Violet-crowned Woodnymph	*Thalurania colombica*	1968	C	MF, YF	PR	6		1998, 1999
Blue-throated Goldentail	*Hylocharis eliciae*	1968	UC	MF, YF	PR	2		1998
Azure-crowned Hummingbird	*Amazilia cyanocephala*	1968	UC	PS	PR	2		1992
Rufous-tailed Hummingbird	*Amazilia tzacatl*		C	YF	PR			1992, 1998, 1999
Cinnamon Hummingbird	*Amazilia rutila*	1968	C	PS	PR	6		
Bronze-tailed Plumeleteer	*Chalybura urochrysia*	1983	FC	MF, YF	PRn	2		1998, 1999
Purple-crowned Fairy	*Heliothryx barroti*		C	MF, YF	PR			1998, 1999
Long-billed Starthroat	*Heliomaster longirostris*		R	MF, YF	PR			1 in mist net 3 km SW of Las Marías on 18 Aug. 1992; 1 at Las Marías 19 Aug. 1992

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Trogonidae								
Black-headed Trogon	*Trogon melanocephalus*	1968	C	OP	PR	1		1992, 1998
Violaceous Trogon	*Trogon violaceus*		C	OP	PR			1992, 1998, 1999
Black-throated Trogon	*Trogon rufus*	1968	C	OP	PRn	1		1998, 1999
Slaty-tailed Trogon	*Trogon massena*	1968	FC	MF	PR			1992, 1998, 1999
Momotidae								
Blue-crowned Motmot	*Momotus momota*	1968	C	OP	PR	2		1998, 1999
Rufous Motmot	*Baryphthengus martii*	1983	FC	MF	PRn	2		1998, 1999
Keel-billed Motmot	*Electron carinatum*	1968	UC	MF	PR			1998
Broad-billed Motmot	*Electron platyrhynchum*		FC	MF	PRn			1998, 1999
Alcedinidae								
Ringed Kingfisher	*Ceryle torquatus*	1968	C	FW, C	PR	1		1992, 1998, 1999
Amazon Kingfisher	*Chloroceryle amazona*		C	FW	PR			1992, 1998, 1999
Green Kingfisher	*Chloroceryle americana*	1968	C	FW	PR	1		1992, 1998, 1999
Green-and-rufous Kingfisher	*Chloroceryle inda*	1998	UC	FW	PRn			1992, 1998, 1999
American Pygmy Kingfisher	*Chloroceryle aenea*		FC	FW	PR			1998; Río Platano only
Bucconidae								
White-necked Puffbird	*Notharchus macrorhynchos*		UC	MF	PR			1992, 1998, 1999
White-whiskered Puffbird	*Malacoptila panamensis*		R	YF	PR	2		15 Feb. 1996, 1 individual in secondary forest, Las Marías
White-fronted Nunbird	*Monasa morphoeus*		FC	MF	PRn			1998, 1999
Galbulidae								
Rufous-tailed Jacamar	*Galbula ruficauda*	1968	C	MF, YF	PR			1992, 1998, 1999
Ramphastidae								
Collared Aracari	*Pteroglossus torquatus*	1968	C	MF, YF	PR	2		1992, 1998, 1999
Keel-billed Toucan	*Ramphastos sulfuratus*		C	MF, YF	PR			1992, 1998, 1999
Chestnut-mandibled Toucan	*Ramphastos swainsonii*	1968, 1983	C	MF, YF	PRn	4		1992, 1998, 1999
Picidae								
Olivaceous Piculet	*Picumnus olivaceus*		FC	MF, YF	PR			1992, 1998

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Acorn Woodpecker	*Melanerpes formicivorus*	1968	UC	PS	PR	5		1992
Black-cheeked Woodpecker	*Melanerpes pucherani*	1968	FC	MF, YF	PR	4		1992, 1998, 1999
Ladder-backed Woodpecker	*Picoides scalaris*		R	PS	PR			3 near Pranza on 3 March 1992; 2 at Pranza on 4 March 1992; probably not uncommon in its habitat
Smoky-brown Woodpecker	*Veniliornis fumigatus*		R	MF	PR			16 March 1999, 1 individual in mature forest at Cerro El Salto, 4 km NW Krausirpe
Golden-olive Woodpecker	*Piculus rubiginosus*	1968	FC	PS	PR	5		
Chestnut-colored Woodpecker	*Celeus castaneus*	1968	FC	MF, YF	PR	1		1992
Lineated Woodpecker	*Dryocopus lineatus*		FC	MF, YF	PR			1992, 1998
Pale-billed Woodpecker	*Campephilus guatemalensis*	1968	FC	MF, YF	PR	2		1998, 1999
Furnariidae								
Slaty Spinetail	*Synallaxis brachyura*	1968	UC	YF	PRn	2		
Scaly-throated Foliage-gleaner	*Anabacerthia variegaticeps*		FC	MF	PR			1998; Río Plátano only
Buff-throated Foliage-gleaner	*Automolus ochrolaemus*		UC	MF	PR			1998
Plain Xenops	*Xenops minutus*	1968	UC	MF	PR	1		1998, 1999
Scaly-throated Leaftosser	*Sclerurus guatemalensis*		R	MF, YF	PR	1		1 collected by M. Marcus, 25 km SW Las Maras, 9 Nov. 1980
Dendrocolaptidae								
Plain-brown Woodcreeper	*Dendrocincla fuliginosa*	1968	R		PRn	1		
Tawny-winged Woodcreeper	*Dendrocincla anabatina*	1968	UC	MF	PR	2		1999; Rio Patuca only
Ruddy Woodcreeper	*Dendrocincla homochroa*		C	MF	PR			1998, 1999
Wedge-billed Woodcreeper	*Glyphorynchus spirurus*	1968	UC	MF, YF	PR	5		1998, 1999
Northern Barred-Woodcreeper	*Dendrocolaptes sanctithomae*	1968	FC	MF, YF	PR	1		
Cocoa Woodcreeper	*Xiphorhynchus susurrans*	1968	C	MF, YF	PR	1		1998
Streak-headed Woodcreeper	*Lepidocolaptes souleyetii*	1968	C	MF, YF	PR	1		1992, 1998, 1999

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Thamnophilidae								
Fasciated Antshrike	*Cymbilaimus lineatus*		R	MF, YF	PRn			27 Feb. 1997, 1 pair in forest edge, male carrying nesting material
Great Antshrike	*Taraba major*		R	YF	PR			1 at Rus-Rus on 2 March 1992
Barred Antshrike	*Thamnophilus doliatus*		R	YF, OP	PR			2 at Daraguatla, 23 Feb. 1992; 1 at Samil, 8 March 1992; 3 at Wapniyari and Liwaraya, 20 Aug. 1992
Western Slaty-Antshrike	*Thamnophilus atrinucha*	1968	C	MF, YF	PR	1		1998, 1999
Streak-crowned Antvireo	*Dysithamnus striaticeps*		R	MF	PRn			9 April 1999, 1 individual in mature forest, Cordillera Winpi, 1 km S Krausirpe
			UC	MF	PRn			
Checker-throated Antwren	*Myrmotherula fulviventris*	1968, 1983	UC	MF	PRn	1		1998, 1999
White-flanked Antwren	*Myrmotherula axillaris*	1968, 1983	C	MF, YF	PR	2		1998
Dot-winged Antwren	*Microrhopias quixensis*		FC	YF	PR			1998, 1999
Dusky Antbird	*Cercomacra tyrannina*		FC	MF	PR			1998
Bare-crowned Antbird	*Gymnocichla nudiceps*		FC	MF	PRn	1		1998
Spotted Antbird	*Hylophylax naevioides*	1983	FC	MF	PRn	4		1998, 1999
Bicolored Antbird	*Gymnopithys leucaspis*					3		1998, 1999
Ocellated Antbird	*Phaenostictus mcleannani*	1983	R	MF	PRn	5		15 March 1999, 1 individual at Cerro Winpi, 1 km S Krausirpe
Formicariidae								
Black-faced Antthrush	*Formicarius analis*		C	MF, YF	PRn			1998, 1999
Streak-chested Antpitta	*Hylopezus perspicillatus*	1983	R	YF, MF	PRn	1		9 April 1999, 1 individual at Cerro Winpi, 1 km S Krausirpe
Thicket Antpitta	*Hylopezus dives*		C	MF, YF	PRn	6		1992, 1998, 1999

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Tyrannidae								
Yellow-bellied Tyrannulet	*Ornithion semiflavum*		R	MF	PR			27 March 1999, Crique Unawás, 5 km NW Krausirpe
Northern Beardless-Tyrannulet	*Camptostoma imberbe*	1968	FC	OP	PR	2		
Yellow-bellied Elaenia	*Elaenia flavogaster*		R	OP	PR	3		1 near Mistruck, 10 March 1992; 1 at Vuelta de Culebras on 11 March 1992; at Campamento Pure Oil on 12 March 1992; 30 March 1999, village of Krausirpe
Ochre-bellied Flycatcher	*Mionectes oleagineus*		C	MF, YF	PR	2		1998, 1999
Northern Bentbill	*Oncostoma cinereigulare*		C	MF, YF	PR			1998, 1999
Common Tody-Flycatcher	*Todirostrum cinereum*		FC	OP	PR	3		1992, 1998
Eye-ringed Flatbill	*Rhynchocyclus brevirostris*		R	MF	PR			24 April 1999, 1 individual in mature forest, Cerro Winpi, 1 km S Krausirpe
Yellow-olive Flycatcher	*Tolmomyias sulphurescens*		C	OP	PR			1998
Stub-tailed Spadebill	*Platyrinchus cancrominus*		R	MF	PR			22 April 1999, 2 birds in mature forest at Cerro Sipul, 3 km E Krausirpe
Golden-crowned Spadebill	*Platyrinchus coronatus*		R	MF	PR	2		1 collected by M. Marcus, 25 km SW Las MarÌas, 9 Nov. 1980; 1 collected by M. Marcus, 9 km SW Las Marías, 26 Jan. 1981
Ruddy-tailed Flycatcher	*Terenotriccus erythrurus*		R	MF, YF	PR	1		1 collected by M. Marcus, 4 km N Las Marías, 28 Oct. 1980
Sulphur-rumped Flycatcher	*Myiobius sulphureipygius*	1968	FC	FW	PR	2		1998, 1999

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Eastern Wood-Pewee	*Contopus virens*	1968	C	OP	T	1		
Tropical Pewee	*Contopus cinereus*	1968	C	MF, YF	PR	3		1998, 1999
Black Phoebe	*Sayornis nigricans*		C	FW	PR			1998, 1999
Vermilion Flycatcher	*Pyrocephalus rubinus*	1968	FC	PS	PR	6		1992
Long-tailed Tyrant	*Colonia colonus*	1968, 1983	C	MF	PRn	2	Y	1992, 1998, 1999
Bright-rumped Attila	*Attila spadiceus*		C	MF	PR			1998, 1999
Rufous Mourner	*Rhytipterna holerythra*		C	MF	PR			1998, 1999
Dusky-capped Flycatcher	*Myiarchus tuberculifer*	1968	C	MF, YF	PR	3		1992, 1998
Great-crested Flycatcher	*Myiarchus crinitus*		C	MF, YF	NM			1998, 1999
Brown-crested Flycatcher	*Myiarchus tyrannulus*		R	YF, OP	PR			2 at Rus-Rus on 2 March 1992; 2 at Mistruck on 10 March 1992; 2 at Vuelta de Culebras on 11 March 1992
Great Kiskadee	*Pitangus sulphuratus*		C	MF, YF	PR	1		1992, 1998, 1999
Boat-billed Flycatcher	*Megarynchus pitangua*	1968	C	MF, YF	PR	1		1998, 1999
Social Flycatcher	*Myiozetetes similis*	1968	C	FW, MF, YF	PR	2		1992, 1998, 1999
Gray-capped Flycatcher	*Myiozetetes granadensis*	1983	C	YF	PRn			1998
White-ringed Flycatcher	*Conopias albovittatus*	1983	C	FW	PRn			1998
Sulphur-bellied Flycatcher	*Myiodynastes luteiventris*	1968	C	MF, YF	IM	1		
Tropical Kingbird	*Tyrannus melancholicus*	1968	C	MF, YF	PR	4		1992, 1998, 1999
Cassin's Kingbird	*Tyrannus vociferans*		UC	MF, YF	NM			1998, 1999
Eastern Kingbird	*Tyrannus tyrannus*		UC	MF, YF	T			1992, 1998; uncommon in humid forest; migratory flocks along coast number in tens of thousands
Fork-tailed Flycatcher	*Tyrannus savana*	1968	FC	PS	PR	1		1992, 1998
Thrushlike Schiffornis	*Schiffornis turdina*		C	MF	PR	2		1998, 1999
Gray-headed Piprites	*Piprites griseiceps*		R	YF	PR			5 Feb. 1996, 1 or 2 birds in secondary forest, Las Marías

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Rufous Piha	*Lipaugus unirufus*		C	MF				1998, 1999
Speckled Mourner	*Laniocera rufescens*	1968	R	MF	1			17 Feb. 1999, 3 birds (2 singing), Cerro Krautara, 4 km SW Krausirpe
					2			
					2			
Cinnamon Becard	*Pachyramphus cinnamomeus*	1968	FC	MF, YF	1			1998, 1999
Masked Tityra	*Tityra semifasciata*	1968	C	MF, YF				1992, 1998, 1999
Black-crowned Tityra	*Tityra inquisitor*	1968	FC	MF, YF				1992, 1998
Cotingidae								
Snowy Cotinga	*Carpodectes nitidus*		UC	MF				1998, 1999
Three-wattled Bellbird	*Procnias tricarunculatus*		R	YF				18 Feb. - 7 March 1999, 3-5 males singing, Cerro El Salto, 3.5 km NW Krausirpe
Pipridae								
White-collared Manakin	*Manacus candei*	1968	FC	MF, YF	2			1992, 1998, 1999
White-ruffed Manakin	*Corapipo altera*		R	MF				9 April 1999, multiple birds at lek in mature forest, Cordillera Winpi, 1 km S Krausirpe
Red-capped Manakin	*Pipra mentalis*		C	MF, YF	2			1998, 1999
Vireonidae		1968						
Mangrove Vireo	*Vireo pallens*		C	C	5			1992, 1998
Warbling Vireo	*Vireo gilvus*		FC	YF				1998
Red-eyed Vireo	*Vireo olivaceus*	1968	FC	MF, YF				1998, 1999
Tawny-crowned Greenlet	*Hylophilus ochraceiceps*		R	MF				9 April 1999, 1 individual in mature forest, Cordillera Winpi, 1 km S Krausirpe
Lesser Greenlet	*Hylophilus decurtatus*		FC	MF				1998, 1999
Corvidae		1968						
Brown Jay	*Cyanocorax morio*		C	ALL	1			1992, 1998, 1999

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Hirundinidae								
Purple Martin	*Progne subis*	1968	FC	ALL	T	1		1992
Gray-breasted Martin	*Progne chalybea*		C	OP	PR			1998, 1999; common in Las Marías
Violet-green Swallow	*Tachycineta bicolor*		R	FW, A	NM	1		1 on the Río Mocorón just above Mocorón, 29 Feb. 1992; 4 at Rus-rus, 2 March 1992
Mangrove Swallow	*Tachycineta albilinea*	1968	C	FW	PR	1		1992, 1998, 1999
Tree Swallow	*Tachycineta thalassina*	1968	UC	C	NM	1		
Southern Rough-winged Swallow	*Stelgidopteryx ruficollis*		C	FW	PRn			4 near Ilsilpi, 22 Feb. 1992; 15 April 1999, small flocks of 3-15 birds, Krausirpe
Barn Swallow	*Hirundo rustica*		C	FW, C	T			1992, 1998, 1999; common during migration in open situations
Troglodytidae								
Spot-breasted Wren	*Thryothorus maculipectus*	1968	FC	MF, YF	PR			1999
Plain wren	*Thryothorus modestus*	1968	FC	YF	PR	2		
House Wren	*Troglodytes aedon*	1968	C	OP	PR			1992, 1998, 1999; found in human settlements only
Sedge Wren	*Cistothorus platensis*	1968	C	PS	PR	5		
White-breasted Wood-Wren	*Henicorhina leucosticta*	1968	C	MF, YF	PR	1		1998, 1999
Song Wren	*Cyphorhinus phaeocephalus*	1968, 1983	FC	MF	PRn	1		1999
Cinclidae								
American Dipper	*Cinclus mexicanus*		FC	FW	PR			1998; Río Plátano above Las Marías
Sylviidae								
Long-billed Gnatwren	*Ramphocaenus melanurus*		FC	MF, YF	PR			1998
Tropical Gnatcatcher	*Polioptila plumbea*	1968	FC	MF, YF	PR	1		1998, 1999

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Turdidae								
Eastern Bluebird	*Sialia sialis*	1968	FC	PS	PR	1		1992
Swainson's Thrush	*Catharus ustulatus*		FC	FW	T			1992, 1998; Río Plátano only
Clay-colored Robin	*Turdus grayi*	1968	C	OP	PR			1992, 1998
Mimidae								
Gray Catbird	*Dumetella carolinensis*		FC	OP, YF	NM			1992, 1998, 1999
Parulidae								
Blue-winged Warbler	*Vermivora pinus*	1968	FC	MF, YF	NM	1		1992, 1998
Golden-winged Warbler	*Vermivora chrysoptera*		FC	MF, YF	NM			1998; Río Plátano only
Tennessee Warbler	*Vermivora peregrina*		UC	MF, YF	NM			1998, 1999; Río Plátano only
Northern Parula	*Parula americana*		FC	MF, YF	NM			1998; Río Plátano only
Yellow Warbler	*Dendroica petechia*	1968	FC	C, MF, YF	PM	2		1992, 1998, 1999
Chestnut-sided Warbler	*Dendroica pensylvanica*		C	MF, YF	NM			1992, 1998, 1999
Magnolia Warbler	*Dendroica magnolia*		C	MF, YF	NM			1992, 1998, 1999
Yellow-rumped Warbler	*Dendroica coronata*		FC	MF, YF	NM			1998, 1999
Black-throated Green Warbler	*Dendroica virens*		FC	MF, YF	NM			1998
Yellow-throated Warbler	*Dendroica dominica*		C	MF, YF	NM			1998
Grace's Warbler	*Dendroica graciae*	1968	C	PS	PR	12		1992; common in its habitat
Palm Warbler	*Dendroica palmarum*	1968	FC	PS	NM	3		1992
Bay-breasted Warbler	*Dendroica castanea*		C	MF, YF	T			1998
Black-and-white Warbler	*Mniotilta varia*		FC	MF, YF	NM			1998, 1999
American Redstart	*Setophaga ruticilla*		FC	MF, YF	NM			1992, 1998
Prothonotary Warbler	*Protonotaria citrea*		C	FW, C	M			1992, 1998, 1999; common along watercourses and lagoon margins
Worm-eating Warbler	*Helmitheros vermivorum*		R	FW	NM			1 at Daraguatla on 23 Feb. 1992
Ovenbird	*Seiurus aurocapilla*		FC	FW	NM			1998; Río Plátano only
Northern Waterthrush	*Seiurus noveboracensis*		FC	FW	NM	1		1998; Río Plátano only

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Louisiana Waterthrush	*Seiurus motacilla*		UC	FW	NM			1992, 1998
Common Yellowthroat	*Geothlypis trichas*		C	FW	PR			1998; Río Plátano only
Olive-crowned Yellowthroat	*Geothlypis semiflava*	1968	R	OP, PS	PRn	1		1992, 1999
Gray-crowned Yellowthroat	*Geothlypis poliocephala*	1968	FC	OP, PS	PR	3		
Hooded Warbler	*Wilsonia citrina*		UC	MF, YF	NM			1992, 1998
Wilson's Warbler	*Wilsonia pusilla*		FC	C, OP	NM			1998; fairly common in open habitats along the coast
Golden-crowned Warbler	*Basileuterus culicivorus*		FC	MF	PR			1999
Buff-rumped Warbler	*Phaeothlypis fulvicauda*	1968	UC	FW	PRn	2		1992
Yellow-breasted Chat	*Icteria virens*		FC	OP	NM			1992, 1998
Coerebidae								
Bananaquit	*Coereba flaveola*		R	MF, YF	PR			1 at Cocotal, Río Ibantara, 21 Feb. 1992
Thraupidae								
Olive Tanager	*Chlorothraupis carmioli*	2003	UC	MF	PR	3		
Gray-headed Tanager	*Eucometis penicillata*		FC	MF	PR	3		1998
White-throated Shrike-Tanager	*Lanio leucothorax*		R	MF	PRn			2 March 1999, pair in Valle Sutawala, 12 km SW Krausirpe; 9 April 1999, 1 individual, 1 km S Krausirpe
White-shouldered Tanager	*Tachyphonus luctuosus*	1968	UC	MF	PRn	1		1998, 1999
Tawny-crested Tanager	*Tachyphonus delatrii*	1983	R	MF	PRn			18 March 1999, 1 individual, Crique Winpi, 3 km S Krausirpe
Red-crowned Ant-Tanager	*Habia rubica*		C	MF, YF	PR			1998, 1999
Red-throated Ant-Tanager	*Habia fuscicauda*	1968	C	MF, YF	PR	6		1998, 1999
Hepatic Tanager	*Piranga flava*	1968	FC	PS	NM	1		1992
Summer Tanager	*Piranga rubra*		C	MF, YF	T			1992, 1998, 1999
Scarlet Tanager	*Piranga olivacea*		C	MF, YF	PR			1998

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Crimson-collared Tanager	*Ramphocelus sanguinolentus*	1968	FC	FW, YF	PR			1992, 1998, 1999
Passerini's Tanager	*Ramphocelus passerinii*	1968	C	FW, YF	PR	1		1992, 1998, 1999
Yellow-winged Tanager	*Thraupis abbas*	1968	FC	YF	PR			1992, 1998, 1999
Blue-gray Tanager	*Thraupis episcopus*	1968	FC	YF	PR			1992, 1998, 1999
Rufous-winged Tanager	*Tangara lavinia*		R	MF	PRn			24 April 1999, 1 individual in mature forest, Cerro Winpi, 1 km S Krausirpe
Golden-hooded Tanager	*Tangara larvata*	1968	C	MF, YF	PR			1992, 1998, 1999
Blue Dacnis	*Dacnis cayana*	1983	FC	MF, YF	PRn			1998, 1999
Green Honeycreeper	*Chlorophanes spiza*		FC	MF, YF	PR			1992, 1998, 1999
Shining Honeycreeper	*Cyanerpes lucidus*		FC	MF	PR			1998, 1999
Red-legged Honeycreeper	*Cyanerpes cyaneus*		FC	MF, YF	PR			1998, 1999
Emberizidae								
Blue-black Grassquit	*Volatinia jacarina*		FC	OP	PR			1999
Variable Seedeater	*Sporophila americana*	1968	FC	OP	PR			1992, 1998
White-collared Seedeater	*Sporophila torqueola*	1968	FC	OP	PR	2		1992
Thick-billed Seed-Finch	*Oryzoborus funereus*	1968	UC	OP	PR	2		1992
Grassland Yellow-Finch	*Sicalis luteola*	1968	C	PS	PR	6		1992
Orange-billed Sparrow	*Arremon aurantiirostris*	1968	UC	MF, YF	PR	3		1998, 1999
Black-striped Sparrow	*Arremonops conirostris*	1968	C	OP	PRn	8		1992, 1998, 1999
Botteri's Sparrow	*Aimophila botterii*	1968	UC	PS	PR	3		1992
Rusty Sparrow	*Aimophila rufescens*	1968	FC	PS	PR	8		1992
Chipping Sparrow	*Spizella passerina*	1968	FC	PS	PR			1992
Grasshopper Sparrow	*Ammodramus savannarum*	1968	C	PS	PM	15		
Cardinalidae								
Grayish Saltator	*Saltator coerulescens*	1968	FC	YF	PR	1		1992
Buff-throated Saltator	*Saltator maximus*	1968	C	FW, YF	PR	2		1992, 1998, 1999
Black-headed Saltator	*Saltator atriceps*	1968	C	FW	PR	1		1998, 1999
Slate-colored Grosbeak	*Saltator grossus*	1983	R	MF	PRn			

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Black-faced Grosbeak	*Caryothraustes poliogaster*	1968	C	MF, YF	PR	3		1992
Rose-breasted Grosbeak	*Pheucticus ludovicianus*		R	MF	NM			16 March 1999, 1 male in mature forest at Cerro El Salto, 4 km NW Krausirpe
Blue-black Grosbeak	*Cyanocompsa cyanoides*	1968	FC	OP	PR	1		1998, 1999
Blue Grosbeak	*Passerina caerulea*		R	OP	NM			1 near Ahuasbila, 1 March 1992
Indigo Bunting	*Passerina cyanea*		R	OP	NM			1 near Ilsilpi, 22 Feb. 1992, and 1 at Mocorón on 29 Feb. 1992
Dickcissel	*Spiza americana*		R	OP	T			11 April 96, 1 individual, Las Marías
Icteridae								
Red-winged Blackbird	*Agelaius phoeniceus*		C	FW	PR			1992, 1998, 1999
Eastern Meadowlark	*Sturnella magna*	1968	C	PS	PR	9		1992
Melodious Blackbird	*Dives dives*		C	OP	PR			1992, 1998, 1999
Great-tailed Grackle	*Quiscalus mexicanus*		C	OP	PR			1992, 1998, 1999
Giant Cowbird	*Molothrus oryzivorus*		FC	FW	PR			1992, 1998, 1999
Black-cowled Oriole	*Icterus prosthemelas*	1968	FC	YF	PR	2		1998, 1999
Orchard Oriole	*Icterus spurius*		FC	MF, YF	T			1992, 1998, 1999
Yellow-backed Oriole	*Icterus chrysater*	1968	C	PS	PR	3		1992
Baltimore Oriole	*Icterus galbula*		FC	MF, YF	PR			1992, 1998, 1999
Yellow-billed Cacique	*Amblycercus holosericeus*	1968	FC	MF, YF	PR			1992, 1998, 1999
Scarlet-rumped Cacique	*Cacicus uropygialis*	1983	FC	MF, YF	PRn			1998, 1999
Chestnut-headed Oropendola	*Psarocolius wagleri*		C	MF, YF	PR			1998, 1999
Montezuma Oropendola	*Psarocolius montezuma*		C	MF, YF	PR			1992, 1998, 1999
Fringillidae								
Scrub Euphonia	*Euphonia affinis*		R	OP	PR			3 April 1997, 1 pair in farm plot, 10 km SW Las Marías

APPENDIX 1. Continued.

Common names & Families	Scientific names	Source[a]	Frequency[b]	Habitat[c]	Status[d]	Specimen	Photo	Comments and sources of sight records[e]
Yellow-throated Euphonia	*Euphonia hirundinacea*	1968	UC	YF				1992, 1998
Olive-backed Euphonia	*Euphonia gouldi*	1968	FC	MF, YF	PR			1992, 1998, 1999
Black-headed Siskin	*Carduelis notata*		R	PS	PR			6 at Dursuna on 26 Feb. 1992; 2 near Ahuasbila on 1 March 1992; 2 near Pranza, 3 March 1992; 2 more on 4 March 1992; 2 at Vuelta de Culebras on 11 March 1992

[a]Sources: 1968 = Monroe (1968), 1983 = Marcus (1983), 1984 = Marcus (1984), 1997 = Frederick et al. (1997), 1998 = Anderson et al. (1998), 2000 = Anderson (2000), 2003 = Jones (2003).

[b]Key to frequency codes: C = Common, at least one individual detectable every day in the field; FC = Fairly common, at least one individual detectable during a week in the field; UC = Uncommon, at least one individual detected during a season (3 months); R = Rare, observed < 6 times by authors.

[c]Key to habitat codes: MF = Mature forest; YF = Young forest (secondary forests and edge); FW = Freshwater, islands in rivers, and associated riparian vegetation; C = Coastal habitats and mangroves; PS = Pine savanna; OP = Open habitats, usually anthropogenic, includes agriculture; A = Aerial; All = All habitats.

[d]Key to status codes: PR = permanent resident; PRn = species at northern range limit; NM = Nearctic migrant; PM = partial migrant; IM = Intratropical migrant; T = Transient.

[e]Comments and sources for sight records: 1992 = DAW field notes; 1998 = DLA M.Sc. thesis; 1999 = DLA field notes.

APPENDIX 2. Bird species likely to occur in the Honduran Moskitia but not yet reliably reported. An asterisk (*) indicates species that have been reported, but with insufficient data to be considered reliable.

Common names	Scientific names	Source[a]
Lesser Scaup	*Aythya affinis*	1968
Least Grebe*	*Tachybaptus dominicus*	1968
Least Bittern	*Ixobrychus exilis*	1995
Reddish Egret*	*Egretta rufescens*	1995
Agami Heron*	*Agamia agami*	1968
Black-crowned Night-Heron	*Nycticorax nycticorax*	1968
Northern Pintail	*Anas acuta*	1995
Double-toothed Kite	*Harpagus bidentatus*	1995
Mississippi Kite	*Ictinia mississippiensis*	1995
Northern Harrier	*Circus cyaneus*	1995
Tiny Hawk	*Accipiter superciliosus*	1983
Gray Hawk	*Asturina nitida*	1995
Broad-winged Hawk	*Buteo platypterus*	1968
Merlin	*Falco columbarius*	1995
Orange-breasted Falcon	*Falco deiroleucus*	1968
Peregrine Falcon*	*Falco peregrinus*	1968
American Golden-Plover	*Pluvialis dominica*	1995
Snowy Plover	*Charadrius alexandrinus*	1995
Wilson's Plover	*Charadrius wilsonia*	1968
American Oystercatcher	*Haematopus palliatus*	1968
Black-necked Stilt	*Himantopus mexicanus*	1968
Solitary Sandpiper	*Tringa solitaria*	1995
Upland Sandpiper	*Bartramia longicauda*	1995
Ruddy Turnstone	*Arenaria interpres*	1968
Red Knot	*Calidris canutus*	1995
Sanderling	*Calidris alba*	1968
White-rumped Sandpiper	*Calidris fuscicollis*	1968
Baird's Sandpiper	*Calidris bairdii*	1995
Pectoral Sandpiper	*Calidris melanotos*	1968
Stilt Sandpiper	*Calidris himantopus*	1995
Buff-breasted Sandpiper	*Tryngites subruficollis*	1968
Short-billed Dowitcher	*Limnodromus griseus*	1968
Wilson's Snipe	*Gallinago delicata*	1968
Wilson's Phalarope	*Phalaropus tricolor*	1995
Herring Gull	*Larus argentatus*	1995
Gull-billed Tern	*Sterna nilotica*	1968
Caspian Tern	*Sterna caspia*	1968
Sandwich Tern	*Sterna sandvicensis*	1995
Sooty Tern	*Sterna fuscata*	1968
Black Skimmer	*Rynchops niger*	1995
Mourning Dove	*Zenaida macroura*	1995
Plain-breasted Ground-Dove	*Columbina minuta*	1971
Ruddy Ground-Dove	*Columbina talpacoti*	1995
Violaceous Quail-Dove	*Geotrygon violacea*	1983

APPENDIX 2. Continued.

Common names	Scientific names	Source[a]
Crimson-fronted Parakeet	*Aratinga finschi*	1983
Yellow-billed Cuckoo*	*Coccyzus americanus*	1968
Mangrove Cuckoo*	*Coccyzus minor*	1968
Rufous-vented Ground-Cuckoo	*Neomorphus geoffroyi*	1983
Crested Owl	*Lophostrix cristata*	1995
Great Horned Owl	*Bubo virginianus*	1971
Central American Pygmy-Owl	*Glaucidium griseiceps*	1968
Black-and-white Owl*	*Ciccaba nigrolineata*	1995
Stygian Owl*	*Asio stygius*	1968
Short-tailed Nighthawk	*Lurocalis semitorquatus*	1995
Lesser Nighthawk	*Chordeiles acutipennis*	1995
Chuck-will's-widow	*Caprimulgus carolinensis*	1995
Whip-poor-will	*Caprimulgus vociferus*	1995
Spot-tailed Nightjar	*Caprimulgus maculicaudus*	1971
Great Potoo*	*Nyctibius grandis*	1968
Common Potoo*	*Nyctibius griseus*	1971
White-chinned Swift	*Cypseloides cryptus*	1995
Chimney Swift	*Chaetura pelagica*	1995
Band-tailed Barbthroat	*Threnetes ruckeri*	1968
Brown Violet-ear	*Colibri delphinae*	1968
Black-crested Coquette	*Lophornis helenae*	1968
Gray-rumped Swift	*Chaetura cinereiventris*	1983
Violet-headed Hummingbird	*Klais guimeti*	1968
White-bellied Emerald	*Amazilia candida*	1968
Blue-chested Hummingbird*	*Amazilia amabilis*	1983
Snowcap*	*Microchera albocoronata*	1968
Ruby-throated Hummingbird	*Archilochus colubris*	1995
Collared Trogon	*Trogon collaris*	1968
Tody Motmot	*Hylomanes momotula*	1968
Belted Kingfisher	*Ceryle alcyon*	1968
Yellow-eared Toucanet	*Selenidera spectabilis*	1968
Yellow-bellied Sapsucker	*Sphyrapicus varius*	1971
Rufous-winged Woodpecker	*Piculus simplex*	1968
Scaly-throated Leaftosser	*Sclerurus guatemalensis*	1968
Olivaceous Woodcreeper	*Sittasomus griseicapillus*	1968
Long-tailed Woodcreeper	*Deconychura longicauda*	1968
Black-striped Woodcreeper	*Xiphorhynchus lachrymosus*	1983
Russet Antshrike	*Thamnistes anabatinus*	1968
Slaty Antwren	*Myrmotherula schisticolor*	1968
Cinnamon Woodpecker	*Celeus loricatus*	1983
Striped Woodhaunter	*Hyloctistes subulatus*	1983
Chestnut-backed Antbird	*Myrmeciza exsul*	1983
Wing-banded Antbird	*Myrmornis torquata*	1983
Yellow Tyrannulet	*Capsiempis flaveola*	1983
Greenish Elaenia	*Myiopagis viridicata*	1995

APPENDIX 2. Continued.

Common names	Scientific names	Source[a]
Sepia-capped Flycatcher	*Leptopogon amaurocephalus*	1968
Paltry Tyrannulet	*Zimmerius vilissimus*	1995
Scale-breasted Pygmy-Tyrant	*Lophotriccus pileatus*	1983
Slate-headed Tody-Flycatcher	*Poecilotriccus sylvia*	1968
Golden-crowned Spadebill	*Platyrinchus coronatus*	1968
Royal Flycatcher	*Onychorhynchus coronatus*	1968
Ruddy-tailed Flycatcher	*Terenotriccus erythrurus*	1968
Tawny-chested Flycatcher	*Aphanotriccus capitalis*	1983
Olive-sided Flycatcher	*Contopus cooperi*	1995
Western Wood-Pewee	*Contopus sordidulus*	1995
Yellow-bellied Flycatcher	*Empidonax flaviventris*	1968
Acadian Flycatcher	*Empidonax virescens*	1995
Alder Flycatcher	*Empidonax alnorum*	1995
Willow Flycatcher	*Empidonax traillii*	1968
White-throated Flycatcher	*Empidonax albigularis*	1995
Least Flycatcher	*Empidonax minimus*	1968
Streaked Flycatcher	*Myiodynastes maculatus*	1995
Piratic Flycatcher*	*Legatus leucophaius*	1968
White-winged Becard	*Pachyramphus polychopterus*	1968
Rose-throated Becard*	*Pachyramphus aglaiae*	1968
Lovely Cotinga	*Cotinga amabilis*	1968
White-eyed Vireo	*Vireo griseus*	1968
Yellow-throated Vireo	*Vireo flavifrons*	1995
Philadelphia Vireo	*Vireo philadelphicus*	1968
Yellow-green Vireo	*Vireo flavoviridis*	1968
Green Shrike-Vireo	*Vireolanius pulchellus*	1968
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	1995
Bank Swallow	*Riparia riparia*	1995
Cliff Swallow	*Petrochelidon pyrrhonota*	1995
Band-backed Wren	*Campylorhynchus zonatus*	1968
Nightingale Wren	*Microcerculus philomela*	1968
Black-throated wren	*Thryothorus atrogularis*	1983
Bay Wren	*Thryothorus nigricapillus*	1983
Stripe-breasted Wren	*Thryothorus thoracicus*	1983
Tawny-faced Gnatwren	*Microbates cinereiventris*	1983
Veery	*Catharus fuscescens*	1995
Gray-cheeked Thrush	*Catharus minimus*	1995
Wood Thrush	*Hylocichla mustelina*	1968
Cedar Waxwing	*Bombycilla cedrorum*	1968
Cape May Warbler	*Dendroica tigrina*	1995
Black-throated Blue Warbler	*Dendroica caerulescens*	1995
Blackburnian Warbler	*Dendroica fusca*	1995
Prairie Warbler	*Dendroica discolor*	1995
Cerulean Warbler	*Dendroica cerulea*	1995
Kentucky Warbler	*Oporornis formosus*	1968

APPENDIX 2. Continued.

Common names	Scientific names	Source[a]
Mourning Warbler	*Oporornis philadelphia*	1995
Canada Warbler*	*Wilsonia canadensis*	1995
Slate-colored Seedeater	*Sporophila schistacea*	1995
Blue Seedeater	*Amaurospiza concolor*	1968
Painted Bunting	*Passerina ciris*	1968
Bronzed Cowbird	*Molothrus aeneus*	1968
Yellow-tailed Oriole	*Icterus mesomelas*	1968
Spot-breasted Oriole	*Icterus pectoralis*	1968
Yellow-crowned Euphonia*	*Euphonia luteicapilla*	1968
White-vented Euphonia	*Euphonia minuta*	1995
Red Crossbill*	*Loxia curvirostra*	1968

[a]Sources: 1968 = Monroe (1968), 1971 = Howell (1971), 1983 = Marcus (1983), 1995 = Howell & Webb (1995).