The Landbird Monitoring Programme at Lamanai, Belize: a preliminary assessment

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El Programa de Monitoreo de Aves Terrestres en Lamanai, Belize, constituye un censo a largo plazo y estudio de ecología de la comunidad, donde se utilizan redes de neblina, puntos de conteo y búsquedas de nidos, con la mayoría de los esfuerzos focalizados en las 385 ha de selva de hoja ancha de la Reserva Arqueológica Lamanai. Los objetivos a largo plazo del proyecto son estimar el tamaño de las poblaciones y las tendencias de las especies para las que se puedan obtener suficientes datos usando métodos de censado estandar, estimar parámetros demográficos para las especies con sets de datos robustos, usar los datos de hábitat para ligar dichos parámetros a las características del hábitat, estimar la dinámica de comunidades del componente aviar de un ecosistema subtropical de selva húmeda, e investigar los efectos que pueden tener el turismo y el uso de la selva por los residentes, en este componente. Después de casi un año de trabajo de campo, la lista de especies para el área de Lamanai ha crecido a 368. Aquí se presenta una lista de las especies registradas en Lamanai incluyendo datos sobre estatus y abundancia; un breve análisis de la avifauna por ambientes, estatus estacional y de nidificación, y afinidades geográficas; una comparación de la avifauna de Lamanai con aquella del vecino Hill Bank, y los datos actualmente disponibles sobre la abundancia y distribución de las especies que se discuten.

Introduction

Located along the New River Lagoon c.35 km south of Orange Walk town, the Lamanai Archaeological Reserve and surrounding area is perhaps the best-kept birding secret in Belize—368 species of birds have been recorded in the area. An abundance of diverse habitats, a well-defined study site (the archaeological reserve) and an adjacent research station make Lamanai ideal for ornithological fieldwork.

Founded in 1992, the Lamanai Field Research Center (LFRC) supports an array of biological sciences and archaeology projects. Funds for this research come from a combination of outside sources (such as grants for university-related projects) and revenue generated by the Lamanai Outpost Lodge (LOL). The lodge, also constructed in 1992, has previously served as a base of operations in the area for several bird tour companies.

In September 1998 the author arrived in Lamanai to begin the first long-term ornithology studies in the area. The purpose of this article is to introduce some of the work being undertaken at Lamanai, present some early findings and initial impressions of this bird-rich area, and foster discussion among the author and other ornithologists on the evolution of this long-term project. It is intended that this paper's format be similar to a recent analysis of the Hill Bank avifauna by Vallely & Whitman[18] for ease of comparison between these two sites. Taxonomy and nomenclature follow that of the AOU[1].

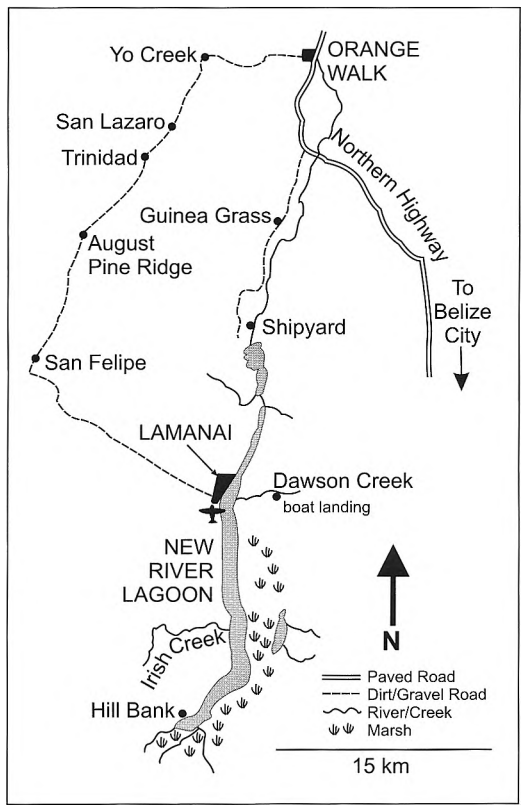

Figure 1. Map of the Lamanai region, Orange Walk District, Belize. The checklist area includes the New River and New River Lagoon from Shipyard to Irish Creek, and Dawson Creek as far east as the boat landing.

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Figure 3. The Jaguar Temple (Structure N10-9), Lamanai Archaeological Reserve, Belize. As many as 1,000 major and minor structures lie within the reserve's boundaries (M. C. England)

Figure 4. View of the New River Lagoon and broadleaf forest habitat, looking south from the top of the High Temple (Structure N10-43). The Lamanai Field Research Center is located at the largest inlet on the lagoon's shoreline in the centre of the photo (M. C.England)

Figure 5. Pine savanna, south-east of the boat landing along Dawson Creek (M. C. England)

Figure 6. Adult male White-collared Manakin *Manacus candei*. Several leks of this species and Red-capped Manakin *Pipra mentalis* are scattered throughout the reserve (M. C. England)

Figure 7. Bright-rumped Attila *Attila spadiceus*. This tyrannid is common in mid- to upper canopy levels in the Lamanai reserve (M. C. England)

Figure 8. Swainson's Warbler *Limnothlypis swainsonii* is currently considered an uncommon winter resident in broadleaf forest habitats. However, this species is secretive and often difficult to detect (M. C. England)

Site description

Access

The LFRC and the LOL are easily accessible by road (three hours from Belize City—Fig. 1), air (15 minutes), and road / river (1.5 hours from Belize City to Shipyard, 45 minutes by boat from Shipyard to Lamanai). The LFRC and LOL recommend calling or e-mailing well in advance of a visit, especially for flights to Lamanai's private airstrip and the road / river transfer which are booked directly through the lodge office.

To drive to Lamanai from Belize City, take the Northern Highway for one hour into Orange Walk town. Turn left at the sign 'Lamanai ruins 38 miles' and follow this road to a T-junction at a cemetery. Here, turn left and continue through several small villages to San Felipe. Most villages have community telephones and small stores for snacks. Just beyond San Felipe the road bears sharply left and makes several more twists before the lodge complex is reached after 20 km.

Habitats

Northern Belize is characterised by its flat topography (elevation c.30 m at the reserve) and relative dryness (c.1,500 mm of rainfall per annum). The average daily temperature is 27°C, range 18°–35° C. There is usually a distinct dry season in late January–May; however the timing and duration of this event varies from year to year.

The 385 ha Lamanai Archaeological Reserve (17°46'N 88°39'W), on the western edge of the New River Lagoon, is one of Belize's major Maya sites with an occupation spanning from 1500 BC to the 18th century (L. Howard pers. comm.). As stated in Vallely & Whitman[18], much of northern Belize may have been deforested by the Maya; however, outside the Lamanai reserve the extent of deforestation may be even greater today than it was at the peak of Maya civilisation (L. Howard pers. comm.).

Within the checklist area, upland broadleaf forest occurs in the Lamanai reserve and in small fragments near the airstrip. This area was considered to consist of three plant communities by Lambert & Arnason[10]: High bush, the most common community in the reserve, is dominated by *Guazuma ulmifolia*, *Spondias mombin*, *Stemmadenia donnell-smithii*, *Nectandra* spp., *Coccoloba belizensis* and *Ficus* spp. with a highly variable 8–25 m canopy. The dominant emergent species is *Enterolobium cyclocarpum*. Large mahogany *Swietenia macrophylla* trees—once common in the area—have been removed by logging, although several small trees can be found in the north of the reserve. Cohune ridge is found in many areas, primarily in the southern and central portions of reserve, and is dominated by cohune palm *Orbignya cohune*. These areas often appear rather devoid of birdlife, possibly because of the homogeneous nature of the vegetation. Ruin-type vegetation differs from surrounding forest and is typified by species such as *Brosimum alicastrum*, *Protium copal*, *Talisia oliviformis* and *Pimenta dioica*. This vegetation type is found in the immediate vicinity of the major Maya structures.

Both of the swamp broadleaf forest types noted in Vallely & Whitman[18] at Hill Bank also occur at Lamanai: bajo (forested swamp) and riparian forest. These forest types are found the eastern and northern edges of the reserve, separating it from the New River Lagoon and Barber Creek. Riparian forest is dominated by *Bucida buceras* covered by epiphytes and vines, while bajo is typified by sawgrass *Scleria bracteata* and thickets up to 15 m in height with occasional larger trees. Both areas are often flooded in the rainy season.

Bordering the western and southern sides of the reserve are scrub habitat, milpas and other disturbed second-growth areas surrounding the village of Indian Church. Natural (uncultivated) vegetation is dominated by grasses and various shrubs, younger trees from surrounding forested areas and the ubiquitous cecropia *Cecropia* spp.

Pine savanna, found east of New River Lagoon, is an open grassland with stands of Caribbean pine *Pinus caribaea*, oaks (*Quercus* spp.) and palmetto

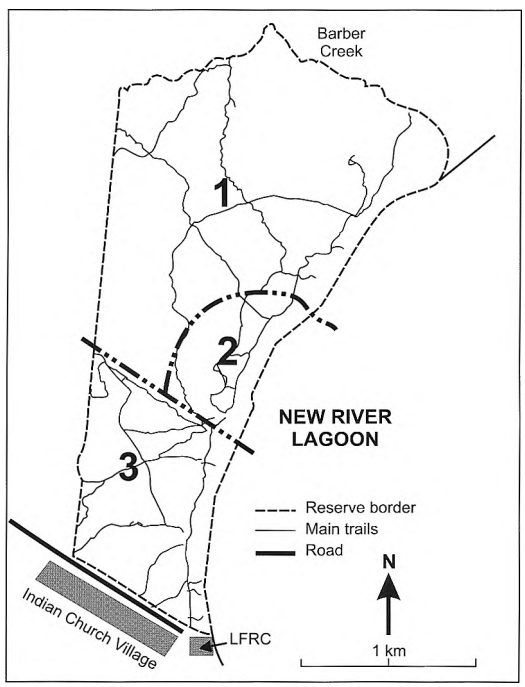

Figure 2. Map of the Lamanai Archaeological Reserve showing the trail system and regions of the reserve with: (1) scant utilisation except by researchers; (2) heavy foot traffic from ruins tourism; (3) resource utilisation by residents of Indian Church village which borders the south side of the reserve.

thickets (*Acoelorraphe wrightii*) maintained by natural and frequent man-made fires (pers. obs.). Lamanai's main access to this vegetation type is via a boat-landing c.2 km from the mouth of Dawson Creek, from where a trail heads east toward Crooked Tree Wildlife Sanctuary (c.10 km). Selective pine logging and the presence of feral horses and cattle also affect the savanna habitat in this area.

Research objectives

The Landbird Monitoring Programme is a long-term census and community ecology study utilising mist-netting, point counts and nest searches. Such work is still clearly needed in Belize as the avifauna of many, even readily accessible, areas is still poorly known[13]. The study's primary goals are to: estimate the population sizes and trends of those species for which data can be obtained using the methods outlined below; estimate the demographic parameters of species with robust data sets; use habitat data to link the above-mentioned parameters to variable habitat characteristics; assess the community dynamics of the avian component of a subtropical moist forest ecosystem; and investigate the effects that tourism and forest utilisation by local residents may have on this component.

Summary of methods

Field methods are similar to those recommended by Ralph *et al.*[17] for avian monitoring programmes, with some modifications due to the large amount of data collected per individual bird and the frequent lack of field assistance. Count data are collected on three separate routes on three successive mornings in the first week of each month. Nest searches are performed within three 4-ha plots. One route and one nest search plot each are located in areas of the reserve with either: (1) resource utilisation and other effects by local residents (primarily harvesting of wildlife, small-scale vegetation removal and presence of feral animals); (2) heavy foot traffic by tourists; or (3) little utilisation except by small numbers of researchers. The precise extent of resource utilisation by local residents is unknown. As the boundaries of these regions are indistinct, the point count routes and nest search plots are centred in these areas (Fig. 2).

Five mist-net arrays of 12 m mist-nets are operated two of every three days for a minimum of four hours per day at scattered locations within the reserve, usually at the junctions of seldom-used trails in an effort to circumvent the need to remove vegetation for mist-net rides. All mist-netted birds are colour-marked with celluloid leg bands, and detailed notes and drawings are made regarding morphology and plumage (Figs. 6–8). Small blood samples are collected from all birds over 10 g for DNA analysis in an effort to form a genetic library of most netted individuals. All samples are subject to laboratory analysis at the Department of Evolution, Ecology, and Organismal Biology at Ohio State University. Sightings and recaptures of colour-marked birds are plotted onto a map of the reserve in an effort to better understand inter- and intraspecific interactions of birds, territorial boundaries and habitat use.

Smaller and less formal studies are also underway. For example, the Lamanai Outpost Lodge's spotlight safari, which takes guests by boat for several miles nightly along the New River Lagoon and certain tributaries, allows unusual access to the normally difficult-to-study nocturnal habits of many species. The author is currently using this opportunity to obtain data on the nocturnal roosting habits of many species, as well as to census a surprisingly large population of Yucatan Nightjar *Caprimulgus badius*.

Avifaunal analysis

Below is a brief but multi-faceted analysis of the Lamanai avifauna. Knowledge of even the basic biology of many of these species is lacking, and it will take many years of future work to obtain a thorough understanding of the spatial and temporal variations in the structure of Lamanai's bird populations. Using data obtained from mist-netting, point counts, and thousands of hours of opportunistic observations, the Lamanai checklist has grown from less than 300 to 368 (Table 2) after almost one year of fieldwork. The species list is analysed by habitat and status (resident or migrant), and known and potential breeders are analysed by geographic affinities. Finally, a comparison is made between the avifaunas of Lamanai and Hill Bank.

Species richness by habitat

An investigation into the number of species occurring in a given habitat type reveals findings similar to those of Vallely & Whitman[18] for Hill Bank using the same habitat designations. Perhaps

Table 1. Total number of species per habitat type, percent unique to habitat, percent migrants, and appproximate percent field effort in each habitat within the Lamanai checklist area. Percent migrants is the total of birds designated as Neotropical migrants plus transients (Table 5).

Habitat	# species	% unique to habitat	% migrants	% of total field effort
Broadleaf forest	208	53.4	23.1	70
Scrub	159	22.6	22	10
Pine savanna	94	16	20.2	10
Marsh	107	64.5	38.3	10

unsurprisingly, the majority of these species occur in broadleaf forest (Table 1) followed by scrub, marsh and pine savanna. A ranking of habitats by percentage of migrants and percentage of unique species to a habitat is also similar to that found for Hill Bank, with the greatest percentages of both categories being found in marsh. As in the Hill Bank study, there is a large bias in effort toward broadleaf forest leaving open the possibility that the species lists for scrub, savanna and marsh habitat may increase.

Seasonal and breeding status

An analysis of currently existing nesting data would be premature. Nest searches have only recently started at Lamanai. The current data only include species found in broadleaf forest and is therefore unrepresentative of the overall Lamanai avifauna. For the purpose of this analysis, it is preferable to make conservative estimates of the number of species strongly suspected to nest in the area. These estimates are based on relative abundance, seasonal occurrence and known habitat preferences for nesting. An analysis of the avifauna by seasonal and breeding status using these criteria is presented in Table 2, with a conservative estimate of 201 species either known or strongly suspected to breed. The "higher" non-passerines (Families Columbidae to Picidae) represent the greatest number of known and probable breeding species despite being the second smallest grouping of species within the analysis.

Of the 368 species recorded at Lamanai, six are intratropical migrants known or suspected to breed at this location, 64 are sporadic visitors that breed elsewhere in Belize, 50 are regular winter residents, 22 are regular transients and 31 are currently considered irregular or sporadic vagrants. These Nearctic–Neotropical migrants are nearly absent only two months of the year (June–July) and compose c.28% of the total species list (20% if species currently considered irregular in occurrence are excluded). This percentage is similar to the 23% reported for Hill Bank[18]. Lynch[12,13] reported a mean of 37% migrants in point counts on the Yucatán Peninsula while Petit *et al.*[16] reported c.24% migrants at several sites in central Belize, and Kricher & Davis[9] reported 19.7% migrants in the vicinity of Blue Creek Village in southern Belize. These data are for comparative purposes only and should not be taken as evidence for a real north–south cline in migrant abundance, as such an analysis is confounded by variability in habitat types censused and methods used.

Geographic affinities

The breeding avifauna of Lamanai has a mix of geographic affinities (Table 3). Sixty-three percent of Lamanai breeders include South America within their breeding distribution, while 16% are widespread in South America. Some 67% have breeding ranges that extend north of the limit of moist tropical forest in southern Mexico, while 10% are widespread in North America. This is unsurprising given Belize's geographic position nearly at the mid-point of Middle America.

Lamanai is also home to several Yucatán endemics (e.g. Yellow-lored Parrot *Amazona xantholora*, Yucatan Poorwill *Nyctiphrynus yucatanicus*, Yucatan Nightjar *Caprimulgus badius*, Red-vented Woodpecker *Melanerpes pygmaeus*, Yucatan Flycatcher *Myiarchus yucatanensis* and Yucatan Jay *Cyanocorax yucatanicus*) as well as one IUCN-listed Endangered species (Yellow-headed Parrot *Amazona oratrix*) and two Near-threatened species (Agami Heron *Agamia agami* and Black Catbird *Melanoptila glabrirostris*)[2]. Another Near-threatened species, Ocellated Turkey *Meleagris ocellata*, once occurred in the area (from zooarchaeological evidence—N. Staunchley pers. comm.) but is now extirpated.

Comparison of Lamanai and Hill Bank

As expected by their proximity and habitat similarities, the reported avifaunas of Hill Bank[18] and Lamanai are not markedly different (Table 4).

Table 2. Analysis of Lamanai avifauna by seasonal and breeding status. Species with both resident and migratory populations are assigned resident status only in this analysis.

Avifauna	Large land and water birds[a]	"Higher" non-passerines[b]	Suboscine passerines[c]	Oscine passerines[d]	TOTAL
Tropical residents: Breeding in Belize					
Permanent resident, known or suspected breeding at Lamanai	46	59	39	51	195
Seasonal resident, known or suspected breeding at Lamanai	1	1	2	2	6
Total number of species known or suspected breeding	**47**	**60**	**41**	**53**	**201**
Sporadic visitor, any time of year, breeds in Belize	**20**	**12**	**17**	**15**	**64**
Long-distance migrants: Breeding in North America					
Seasonal (mostly winter) resident	13	3	3	31	50
Regular spring or fall transient	8		3	11	22
Irregular or sporadic vagrant	13	4	1	13	31
"Nearctic" component	**34**	**7**	**7**	**55**	**103**
TOTALS	**101**	**79**	**65**	**123**	**368**

[a]Tinamidae—Laridae; [b]Columbidae—Picidae; [c]Furnariidae—Pipridae; [d]Vireonidae—Icteridae

Table 3. Northern and southern breeding range limits of species known or suspected to breed at Lamanai. Range information from AOU[1].

		Northern Limits			Southern Limits		
		Widespread in NA	USA, N and C Mexico	S Mexico Guatemala, N Belize	S Belize to Panama	N and W South Am.	Widespread in SA
Large land and water birds[a]	(*N* = 47)	9	32	6	7	27	13
Higher nonpasserines[b]	(*N* = 60)	3	35	22	24	31	5
Suboscine passerines[c]	(*N* = 41)	0	17	24	12	19	10
Oscine passerines[d]	(*N* = 53)	9	29	15	32	16	5
TOTAL	**(*N* = 201)**	**21**	**113**	**67**	**75**	**93**	**33**

[a]Tinamidae—Laridae; [b]Columbidae—Picidae; [c]Furnariidae—Pipridae; [d]Vireonidae—Icteridae

A total of 310 species in 226 genera are shared between the two sites (94% of the species and genera in the Hill Bank total). Differences that do exist between the two sites cannot be easily explained. Though the total percentage of broadleaf forest is smaller in the Lamanai checklist area (less than 50% versus 70%), the number of species reported in broadleaf forest is identical at both sites (208). However, only 174 of these species are shared. Comparisons between the two sites are also confounded by the number of observers and sampling protocols used, and potentially by habitat in the immediate vicinity of the checklist area that can act as a source pool for individuals of some species. For example, the only recent records of Black Hawk-eagle *Spizaetus tyrannus*, Streak-headed Woodcreeper *Lepidocolaptes souleyetii* and Lovely Cotinga *Cotinga amabilis* within the Lamanai reserve were shortly after Hurricane Mitch in late 1998. Adverse weather conditions may have brought these birds in from other areas.

It is noteworthy that there is little similarity between Lamanai and Hill Bank when species reported by habitat type are analysed. Placement of species within a given habitat type may involve some subjectivity (for example, does a species seen in mid-successional or mixed scrub / forest areas qualify as a scrub or forest species?). Some notable inter-site differences do exist, however, and include the following: all four species of tinamous have been reported in scrub habitat at Hill Bank but not at Lamanai; Bare-throated Tiger-heron *Tigrisoma mexicanum* and Sungrebe *Heliornis fulica* are reported as broadleaf forest species at Hill Bank and as marsh species at Lamanai (despite the fact that both lists include forest-edged waterbodies in the marsh designation); and at Lamanai there appears to be no link between bajo-type habitat (considered herein as a component of broadleaf forest) and the Yucatan component of the avifauna as reported for Hill Bank[18], although this habitat has not been well explored. Such Yucatán species as *Amazona xantholora*, *Melanerpes pygmaeus*, *Myiarchus yucatanensis* and *Cyanocorax yucatanicus* are found wholly or principally within the pine savanna.

Notable species and observations

The following brief accounts are not intended as authoritative treatises on the country-wide status and distribution of the species discussed. However, the status of each species is unclear in many areas and it is hoped that the following information may add to the limited data currently available.

Jabiru *Jabiru mycteria*

Critical nesting habitat for this species falls largely outside of the existing protected areas network and, as a result, this species is at risk from habitat disturbance[14,15]. Four nests of this species in Belize were reported by the Belize Audubon Society in 1996 (Belize Audubon Society in Curson & Lowen[3]) all in the vicinity of Crooked Tree. Two active nests along the west side of the New River Lagoon (one active for three, and the other active for four years: C. Godoy pers. comm.) in 1998–1999 may be

Jabiru *Jabiru mycteria* (Charles Gambill)

Table 4. Comparison of the avifaunas of Lamanai and Hill Bank, Belize[13].

	Comparison of reported species and genera by family (number of species/number of genera). Differences are noted in bold.			Comparison of reported species in a habitat by family (species at Lamanai/species at Hill Bank/shared). Differences are noted in bold.			
	Lamanai	Hill Bank	shared	Broadleaf forest	Scrub	Pine savanna	Marsh
Tinamidae	4/3	4/3	4/3	**4/3/3**	**0/4/0**	**1/0/0**	
Podicipedidae	2/2	2/2	2/2				2/2/2
Pelecanidae	**2/1**	**1/1**	**1/1**				**2/1/1**
Phalacrocoracidae	**2/1**	**1/1**	**1/1**				**2/1/1**
Anhingidae	1/1	1/1	1/1				1/1/1
Fregatidae	1/1	1/1	1/1				1/1/1
Ardeidae	**14/11**	**12/9**	**12/9**	**0/2/0**	1/1/1		**14/10/10**
Threskiornithidae	**2/2**	**1/1**	**1/1**				**2/1/1**
Ciconiidae	2/2	2/2	2/2	**0/1/0**		**0/1/0**	2/2/2
Cathartidae	4/3	4/3	4/3	3/3/3	**3/2/2**	**4/1/1**	**0/1/0**
Anatidae	**6/3**	**4/4**	**3/3**				6/4/3
Accipitridae	**24/17**	**18/15**	**18/15**	**16/13/11**	**13/13/12**	**3/5/2**	**7/3/3**
Falconidae	**9/3**	**7/3**	**7/3**	**5/4/4**	**6/6/5**	**5/4/3**	1/1/1
Cracidae	**2/2**	**3/3**	**2/2**	**2/3/2**	1/1/1	**1/0/0**	
Phasianidae	**0/0**	**1/1**	**0/0**		**0/1/0**		
Odontophoridae	2/2	2/2	2/2	1/1/1	**1/0/0**	1/1/1	
Rallidae	**7/7**	**5/5**	**5/5**	**1/2/1**	**1/3/1**	**1/0/0**	**7/4/4**
Heliornithidae	1/1	1/1	1/1	**0/1/0**			**1/0/0**
Aramidae	1/1	1/1	1/1				1/1/1
Charadriidae	**1/1**	**2/2**	**1/1**				**1/2/1**
Recurvirostridae	1/1	1/1	1/1				1/1/1
Jacanidae	1/1	1/1	1/1				1/1/1
Scolopacidae	**7/4**	**6/4**	**5/3**				**7/6/5**
Laridae	**4/3**	**2/2**	**1/1**				**4/2/1**
Columbidae	**15/6**	**11/6**	**11/6**	**8/7/6**	**9/7/5**	**6/2/2**	**1/0/0**
Psittacidae	8/4	8/4	8/4	7/7/7	**5/7/5**	**4/2/2**	
Cuculidae	**4/4**	**4/4**	**3/3**	2/2/2	**3/3/2**	**1/0/0**	**1/0/0**
Tytonidae	1/1	1/1	1/1		1/1/1		
Strigidae	**3/3**	**4/3**	**3/3**	**3/4/3**	**0/1/0**		
Caprimulgidae	**6/4**	**4/4**	**4/4**	**1/3/1**	**3/4/2**	**2/0/0**	**6/0/0**
Nyctibiidae	1/1	1/1	1/1		**0/1/0**		**1/0/0**
Apodidae	3/3	3/3	3/3	3/3/3	3/3/3		
Trochilidae	**11/8**	**13/9**	**10/7**	**8/9/7**	**5/8/5**	2/2/2	
Trogonidae	4/1	4/1	4/1	4/4/4	2/2/2	**1/0/0**	
Momotidae	2/2	2/2	2/2	2/2/2			
Alcedinidae	5/2	5/2	5/2	**1/3/0**	1/1/1		5/5/5
Bucconidae	2/2	2/2	2/2	2/2/2	**0/1/0**		
Galbulidae	1/1	1/1	1/1	1/1/1	**1/0/0**		
Ramphastidae	**2/2**	**3/3**	**2/2**	**2/3/2**	2/2/2		
Picidae	**11/8**	**10/8**	**10/8**	**8/7/7**	**4/5/2**	**3/2/2**	
Furnariidae	**3/3**	**4/4**	**3/3**	**2/4/2**	**1/2/1**		
Dendrocolaptidae	8/7	8/7	8/7	8/8/8	**0/3/0**	**0/1/0**	
Thamnophilidae	5/5	5/5	5/5	4/4/4	**2/4/2**		
Formicariidae	1/1	1/1	1/1	1/1/1	**0/1/0**		
Tyrannidae	46/32	45/32	41/30	**31/33/26**	**27/30/25**	**17/10/9**	**7/1/1**
Cotingidae	**1/1**	**0/0**	**0/0**	**1/0/0**			
Pipridae	2/2	2/2	2/2	**2/1/1**	**0/2/0**		
Vireonidae	**10/4**	**9/4**	**9/4**	**9/8/8**	**5/6/5**	**0/1/0**	**1/0/0**
Corvidae	3/1	3/1	3/1	**2/3/2**	**1/3/1**	**3/1/1**	**2/0/0**
Hirundinidae	**6/4**	**7/5**	**6/4**		**6/7/6**	**4/1/1**	**6/5/5**
Troglodytidae	**6/5**	**4/4**	**4/4**	**5/3/3**	3/3/3	**2/0/0**	**1/0/0**
Sylviidae	**2/2**	**3/2**	**2/2**	**1/2/1**	1/1/1	1/1/1	**1/0/0**
Turdidae	4/3	4/3	4/3	4/4/4	1/1/1		
Mimidae	**3/3**	**2/2**	**2/2**	1/1/1	2/2/2	**3/1/1**	**2/0/0**
Bombycillidae	**1/1**	**0/0**	**0/0**		**1/0/0**		
Parulidae	**37/15**	**27/15**	**27/15**	**28/21/21**	**10/18/9**	**12/8/6**	**5/1/1**
Thraupidae	**14/8**	**15/8**	**14/8**	**10/12/10**	**6/11/5**	**4/1/1**	**1/0/0**
Emberizidae	**11/9**	**9/7**	**9/7**	**3/2/1**	**7/8/6**	**5/8/5**	
Cardinalidae	**12/8**	**10/8**	**10/8**	**8/5/5**	**10/9/9**	**2/2/1**	**1/0/0**
Icteridae	13/7	13/7	13/7	**4/6/4**	**11/12/10**	**6/4/4**	**2/2/1**
Fringillidae	**0/0**	**1/1**	**0/0**			**0/1/0**	
TOTALS	368/246	331/241	310/226	208/208/174	159/200/138	94/60/45	107/59/53

previously unreported in the literature. Other nests may exist near the Mexican border (C. Godoy pers. comm.). An increase in shallow wetlands in northern Belize as a result of marsh-forest clearance for rice production may result in increased foraging opportunities for this species[14].

Cooper's Hawk *Accipiter cooperii*
According to Howell & Webb[7], *A. cooperii* is uncommon to rare in northern Central America and few records exist for Belize. The author and several lodge guests observed one perched in the top of a tall tree outside of the village of Indian Church on 5 March 1999.

Great Curassow *Crax rubra*
C. rubra and *Penelope purpurascens* are both legally hunted in Belize, while *Meleagris ocellata* is taken opportunistically[14]. At Lamanai, *C. rubra* can be found in the northern part of the reserve near Barber Creek. The few recent records from the southernmost part of the reserve may be the result of birds kept for food in the village of Indian Church. Both *P. purpurascens* and *M. ocellata* have apparently been extirpated from the Lamanai area.

Yellow-headed Parrot *Amazona oratrix*
Considered endangered by BirdLife International[2,19]. Crooked Tree Wildlife Sanctuary, c.10 km east of Lamanai, is a key area for this species[19]. Though the form *belizensis* is still locally common, it is heavily exploited for the pet trade (H. L. Jones pers. comm.). Lousada & Howell[11] review the status of *belizensis* and other forms. Typically *belizensis* inhabits pine savanna and adjacent forest patches[11]. In the vicinity of Lamanai, large flocks can still be found in the pine savanna, especially in early morning and late evening. Flocks of up to 30 are occasionally seen along the New River, and small flocks less frequently pass the LFRC.

Chuck-will's-widow *Caprimulgus carolinensis*
Three *C. carolinensis* were perched silently on tree branches along the New River Lagoon's edge on 9 September 1998. On 11 September 1998 an uncertain number of this species was heard calling before sunrise along Irish Creek. This species probably occurs much more frequently in Belize than the few records would indicate (see Jones *et al.*[8]).

Yucatan Nightjar *Caprimulgus badius*
Largely endemic to the Yucatán Peninsula[7], some of this species move south to winter in Belize and northern Honduras. The few published records for Belize are in January–March, although M. Meadows (pers comm.) found the species at Bacalar Chico on 9–20 October 1994. Along the New River, this species appears to be fairly common in late December–late May at least, while a small number of individuals can be found on most nights through the rest of the year (pers. obs.).

Black Catbird *Melanoptila glabrirostris*
Listed as Near-threatened by BirdLife International[2], this species is generally only common in the northern cayes of Belize. According to Howell & Webb[5], it is uncommon to rare inland in northern Belize and Yucatán, although its status is unclear. However, Jones (pers. comm.) reports that on the Belize mainland this species is common at Sarteneja and at scattered other mainland locations south to Belize City. It can readily be found in numbers along many tributaries of the New River. The highest single morning count is of nine along Dawson Creek, between the New River Lagoon and the boat landing, in November 1998 (D. McRae pers. comm.).

Virginia's Warbler *Vermivora virginiae*
A vagrant to Belize, with 2–5 previous records[6–8], this species was observed at close range by MCE in the pine savanna on 15 February 1999 as it foraged near the top of a small (c.5 m) oak tree (*Quercus* spp.). Subsequent visits in following days failed to relocate this bird.

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Table 5.
To facilitate comparison with the nearby (c.20 km from the Lamanai Field Research Center) site of Hill Bank, this checklist has been prepared in an identical manner to that of Vallely & Whitman[18]. Abundance codes are based predominantly upon the author's fieldwork and historical records (such as those from bird tour groups) and discussions with Lamanai's resident naturalist guides (J. Torres, C. Godoy and B. Cruz), and represent a species peak abundance over the course of the year. Precise documentation of temporal variation in abundance awaits further fieldwork. It warrants repeating that these findings are preliminary and based heavily on opportunistic field observation. Birds currently considered uncommon may, in reality, be overlooked, especially in the less well-known northern parts of the reserve and the pine savanna. At the time of writing, the author has had field experience with 335 of the species at Lamanai. The other 33 species in this checklist are based on records from reliable observers.

The habitat designations have been simplified on the checklist. Broadleaf forest is principally found within the Lamanai Archaeological Reserve as well as a few woodlots outside the village of Indian Church. Pine savanna is as described above. Scrub is young, open second-growth habitat that is found in abundance outside Indian Church and at the airstrip. Species recorded in marsh habitat include not only waterbirds, but birds seen in the adjacent vegetation (i.e. marsh grasses, riparian forest etc.) Taxonomy and nomenclature follow that of the AOU[1].

This checklist covers all areas birded on a daily basis by guests of the Lamanai Outpost Lodge and the Lamanai Field Research Center. These areas include:

(1) The lodge grounds.
(2) The Lamanai Archaeological Reserve.
(3) Dirt roads to a point c.3 km west and south of the village of Indian Church.
(4) The Lamanai airstrip.
(5) The pine savanna from the landing at Dawson Creek to a point c.3 km east toward Crooked Tree Wildlife Sanctuary.

(6) The New River and New River Lagoon watersheds from Shipyard in the north to Irish Creek in the south.

Habitats:
BF Broadleaf Forest
SC Scrub
PS Pine Savanna
M Marsh

Abundance codes (assigned by habitat):

		a few individuals encountered on:	many individuals encountered on:
C	Common	>90% of days	>50% of days
F	Fairly common	50–90% of days	10–50% of days
U	Uncommon	10–50% of days	<10% of days
R	Rare	<10% of days	
X	Extremely rare	less than 10 sightings	

Status (s) codes (last column):
sr summer resident (breeding late March–September)
nm non-breeding resident (wintering Neotropical–Nearctic migrant present primarily October–March)
r breeding resident (present year-round)
t Neotropical migrant mainly transient (present during migration)
v visitor with potential to occur in any season

	BF	SC	PS	M	S
TINAMIFORMES					
Great Tinamou *Tinamus major*	F				r
Little Tinamou *Crypturellus soui*	R				r
Thicket Tinamou *C. cinnamomeus*	C		U		r
Slaty-breasted Tinamou *C. boucardi*	R				r
PODICIPEDIFORMES					
Least Grebe *Tachybaptus dominicus*				X	r
Pied-billed Grebe *Podilymbus podiceps*				F	nm
PELECANIFORMES					
American White Pelican *Pelecanus erythrorhynchos*				X	?
Brown Pelican *P. occidentalis*				R	v
Neotropic Cormorant *Phalacrocorax brasilianus*				C	r
Double-crested Cormorant *P. auritus*				X	v
Anhinga *Anhinga anhinga*				F	r
Magnificent Frigatebird *Fregata magnificens*				U	v
CICONIIFORMES					
Pinnated Bittern *Botaurus pinnatus*				R	r
Least Bittern *Ixobrychus exilis*				R	r?
Bare-throated Tiger-heron *Tigrisoma mexicanum*				U	r
Great Blue Heron *Ardea herodias*				C	nm+r?
Great Egret *A. alba*				C	r
Snowy Egret *Egretta thula*				F	r
Little Blue Heron *E. caerulea*				F	nm+t
Tricolored Heron *E. tricolor*				U	?
Cattle Egret *Bubulcus ibis*		C		C	r
Green Heron *Butorides virescens*				C	r
Agami Heron *Agamia agami*				F	r?
Black-crowned Night-heron *Nycticorax nycticorax*				U	r
Yellow-crowned Night-heron *Nyctanassa violacea*				F	r
Boat-billed Heron *Cochlearius cochlearius*				U	r
Threskiornithinae					
White Ibis *Eudocimus albus*				R	v
Glossy Ibis *Plegadis falcinellus*				X	v
Roseate Spoonbill *Ajaia ajaja*				U	nm
Jabiru *Jabiru mycteria*				U	r
Wood Stork *Mycteria americana*				U	r?
Black Vulture *Coragyps atratus*	C	C	C		r
Turkey Vulture *Cathartes aura*	C	C	F		r
Lesser Yellow-headed Vulture *C. burrovianus*		U	F		r
King Vulture *Sarcoramphus papa*	U		U		r
ANSERIFORMES					
Black-bellied Whistling-duck *Dendrocygna autumnalis*				C	r
Muscovy Duck *Cairina moschata*				R	r
American Wigeon *Anas americana*				X	t
Blue-winged Teal *A. discors*				F	nm
Northern Pintail *A. acuta*				X	t
Green-winged Teal *A. crecca*				X	t
FALCONIFORMES					
Osprey *Pandion haliaetus*				U	nm
Grey-headed Kite *Leptodon cayanensis*	R	R			r
Hook-billed Kite *Chondrohierax uncinatus*	R	R			r
Swallow-tailed Kite *Elanoides forficatus*		R			t
White-tailed Kite *Elanus leucurus*		R			r
Snail Kite *Rostrhamus sociabilis*				C	r
Double-toothed Kite *Harpagus bidentatus*	R	R			r
Plumbeous Kite *Ictinia plumbea*		F		C	sr
Black-collared Hawk *Busarellus nigricollis*				U	r
Northern Harrier *Circus cyaneus*				X	t
Cooper's Hawk *Accipiter cooperii*	X				nm
Bicolored Hawk *A. bicolor*	R				r
Crane Hawk *Geranospiza caerulescens*	R	R			r
White Hawk *Leucopternis albicollis*	X				r
Grey Hawk *Asturina nitida*	U	U			r
Common Black-hawk *Buteogallus anthracinus*	R	R		R	r
Great Black-hawk *B. urubitinga*	U	U		U	r
Roadside Hawk *Buteo magnirostris*	C	C	F		r
Broad-winged Hawk *B. platypterus*	X				t
Short-tailed Hawk *B. brachyurus*	F	F	U		r
White-tailed Hawk *B. albicaudatus*		R	R		r
Zone-tailed Hawk *B. albonotatus*	X				?
Black Hawk-eagle *Spizaetus tyrannus*	R				r
Ornate Hawk-eagle *S. ornatus*	R				r
Barred Forest-falcon *Micrastur ruficollis*	R				r
Collared Forest-falcon *M. semitorquatus*	U				r
Laughing Falcon *Herpetotheres cachinnans*	F	F	F		r
American Kestrel *Falco sparverius*		R	R		nm
Merlin *F. columbarius*		R	R		nm
Aplomado Falcon *F. femoralis*		R	F		r
Bat Falcon *F. rufigularis*	C	F	U		r
Orange-breasted Falcon *F. deiroleucus*	R				r
Peregrine Falcon *F. peregrinus*		R		R	nm
GALLIFORMES					
Plain Chachalaca *Ortalis vetula*	C	C	F		r
Great Curassow *Crax rubra*	R				r
Black-throated Bobwhite *Colinus nigrogularis*		U	F		r
Spotted Wood-quail *Odontophorus guttatus*	R				r
GRUIFORMES					
Ruddy Crake *Laterallus ruber*				C	r
Grey-necked Wood-rail *Aramides cajanea*	X	X	X	C	r
Sora *Porzana carolina*				R	nm
Spotted Rail *Pardirallus maculatus*				X	r
Purple Gallinule *Porphyrula martinica*				F	r
Common Moorhen *Gallinula chloropus*				R	nm
American Coot *Fulica americana*				X	nm
Sungrebe *Heliornis fulica*				U	r
Limpkin *Aramus guarauna*				C	r
CHARADRIIFORMES					
Killdeer *Charadrius vociferus*				X	nm+t
Black-necked Stilt *Himantopus mexicanus*				X	t
Northern Jacana *Jacana spinosa*				C	r
Greater Yellowlegs *Tringa melanoleuca*				R	t
Lesser Yellowlegs *T. flavipes*				R	t
Solitary Sandpiper *T. solitaria*				R	nm
Spotted Sandpiper *Actitis macularia*				U	nm
Least Sandpiper *Calidris minutilla*				X	t
Pectoral Sandpiper *C. melanotos*				X	t
Common Snipe *Gallinago gallinago*				X	nm

Laughing Gull *Larus atricilla*				R	nm
Caspian Tern *Sterna caspia*				X	t
Sandwich Tern *S. sandvicensis*				X	t
Black Tern *Chlidonias niger*				R	t
COLUMBIFORMES					
Rock Dove *Columba livia*		X			?
Pale-vented Pigeon *C. cayennensis*	F	C	F		r
Scaled Pigeon *C. speciosa*	F				r
White-crowned Pigeon *C. leucocephala*				X	?
Red-billed Pigeon *C. flavirostris*		C	F		r
Short-billed Pigeon *C. nigrirostris*	U				r
White-winged Dove *Zenaida asiatica*		R			?
Mourning Dove *Z. macroura*		X			nm
Common Ground-dove *Columbina passerina*		R	R		r?
Plain-breasted Ground-dove *Columbina minuta*		U	F		r
Ruddy Ground-dove *C. talpacoti*	R	C	F		r
Blue Ground-dove *Claravis pretiosa*	C				r
White-tipped Dove *Leptotila verreauxi*	C	F	F		r
Grey-fronted Dove *L. rufaxilla*	F				r
Ruddy Quail-dove *Geotrygon montana*	U				r
PSITTACIFORMES					
Olive-throated Parakeet *Aratinga nana*	C	C			r
Brown-hooded Parrot *Pionopsitta haematotis*	F	F			r
White-crowned Parrot *Pionus senilis*	U				r
White-fronted Parrot *Amazona albifrons*	C	C	C		r
Yellow-lored Parrot *A. xantholora*			C		r
Red-lored Parrot *A. autumnalis*	C	C	F		r
Mealy Parrot *A. farinosa*	R				r
Yellow-headed Parrot *A. oratrix*	R	R	F		r
CUCULIFORMES					
Mangrove Cuckoo *Coccyzus minor*		X		X	?
Squirrel Cuckoo *Piaya cayana*	C	C	U		r
Pheasant Cuckoo *Dromococcyx phasianellus*	X				r
Groove-billed Ani *Crotophaga sulcirostris*		C			r
STRIGIFORMES					
Barn Owl *Tyto alba*		R			r
Vermiculated Screech-owl *Otus guatemalae*	F				r
Central American Pygmy-owl *Glaucidium griseiceps*	R				r
Mottled Owl *Ciccaba virgata*	F				r
CAPRIMULGIFORMES					
Lesser Nighthawk *Chordeiles acutipennis*		F		R	nm
Common Nighthawk *Chordeiles minor*		F	F	R	sr?+t
Common Pauraque *Nyctidromus albicollis*	C	C	F	C	r
Yucatan Poorwill *Nyctiphrynus yucatanicus*				R	r
Chuck-will's-widow *Caprimulgus carolinensis*				X	t
Yucatan Nightjar *C. badius*				F	r?
Northern Potoo *Nyctibius jamaicensis*				C	r
APODIFORMES					
White-collared Swift *Streptoprocne zonaris*	U	U			v
Vaux's Swift *Chaetura vauxi*	F	F			r?
Lesser Swallow-tailed Swift *Panyptila cayennensis*	F	F			r
Long-tailed Hermit *Phaethornis superciliosus*	R				r
Little Hermit *P. longuemareus*	F				r
Wedge-tailed Sabrewing *Campylopterus curvipennis*	F				r
White-necked Jacobin *Florisuga mellivora*	R	R			r
Green-breasted Mango *Anthracothorax prevostii*		X			r
Canivet's Emerald *Chlorostilbon canivetii*		R			r
White-bellied Emerald *Amazilia candida*	F	F			r
Rufous-tailed Hummingbird *A. tzacatl*	C	C	C		r
Buff-bellied Hummingbird *A. yucatanensis*			F		r
Purple-crowned Fairy *Heliothryx barroti*	U				r
Ruby-throated Hummingbird *Archilochus colubris*	C				nm
TROGONIFORMES					
Black-headed Trogon *Trogon melanocephalus*	C	C	C		r
Violaceous Trogon *T. violaceus*	C	C			r
Collared Trogon *T. collaris*	U				r
Slaty-tailed Trogon *T. massena*	C				r

CORACIIFORMES							
Tody Motmot *Hylomanes momotula*	X						r
Blue-crowned Motmot *Momotus momota*	F						r
Ringed Kingfisher *Ceryle torquata*	F	F			C		r
Belted Kingfisher *C. alcyon*					F		nm
Amazon Kingfisher *Chloroceryle amazona*					R		r
Green Kingfisher *C. americana*					F		r
American Pygmy Kingfisher *C. aenea*					C		r
PICIFORMES							
White-necked Puffbird *Notharchus macrorhynchos*	R						r
White-whiskered Puffbird *Malacoptila panamensis*	U						r
Rufous-tailed Jacamar *Galbula ruficauda*	F	U					r
Collared Aracari *Pteroglossus torquatus*	C	C					r
Keel-billed Toucan *Ramphastos sulfuratus*	C	C					r
Acorn Woodpecker *Melanerpes formicivorus*				F			r
Black-cheeked Woodpecker *M. pucherani*	R						r
Red-vented Woodpecker *M. pygmaeus*				F			r
Golden-fronted Woodpecker *M. aurifrons*	C	C					r
Yellow-bellied Sapsucker *Sphyrapicus varius*	X						nm
Ladder-backed Woodpecker *Picoides scalaris*		U	U				r
Smoky-brown Woodpecker *Veniliornis fumigatus*	U						r
Golden-olive Woodpecker *Piculus rubiginosus*	U						r
Chestnut-colored Woodpecker *Celeus castaneus*	U						r
Lineated Woodpecker *Dryocopus lineatus*	U	R					r
Pale-billed Woodpecker *Campephilus guatemalensis*	C	C					r
PASSERIFORMES							
Rufous-breasted Spinetail *Synallaxis erythrothorax*		R?					r
Plain Xenops *Xenops minutus*	C						r
Scaly-throated Leaftosser *Sclerurus guatemalensis*	R						r
Tawny-winged Woodcreeper *Dendrocincla anabatina*	F						r
Ruddy Woodcreeper *D. homochroa*	F						r
Olivaceous Woodcreeper *Sittasomus griseicapillus*	F						r
Wedge-billed Woodcreeper *Glyphorynchus spirurus*	R						r
Strong-billed Woodcreeper *Xiphocolaptes promeropirhynchus*	X						r
Northern Barred-woodcreeper *Dendrocolaptes sanctithomae*	U						r
Ivory-billed Woodcreeper *Xiphorhynchus flavigaster*	C						r
Streak-headed Woodcreeper *Lepidocolaptes souleyetii*	X						r
Great Antshrike *Taraba major*		X					r
Barred Antshrike *Thamnophilus doliatus*	C	C					r
Plain Antvireo *Dysithamnus mentalis*	X						r
Dot-winged Antwren *Microrhopias quixensis*	R						r
Dusky Antbird *Cercomacra tyrannina*	U						r
Black-faced Antthrush *Formicarius analis*	C						r
Yellow-bellied Tyrannulet *Ornithion semiflavum*	U						r
Northern Beardless-tyrannulet *Camptostoma imberbe*	C	C	F				r
Greenish Elaenia *Myiopagis viridicata*	C	U	U	X			r
Yellow-bellied Elaenia *Elaenia flavogaster*		C	C				r
Ochre-bellied Flycatcher *Mionectes oleagineus*	F						r
Sepia-capped Flycatcher *Leptopogon amaurocephalus*	U						r
Northern Bentbill *Oncostoma cinereigulare*	C	F	F				r
Slate-headed Tody-flycatcher *Poecilotriccus sylvia*		R					r
Common Tody-flycatcher *Todirostrum cinereum*		U					r
Eye-ringed Flatbill *Rhynchocyclus brevirostris*	U						r
Yellow-olive Flycatcher *Tolmomyias sulphurescens*	C	U					r
Stub-tailed Spadebill *Platyrinchus cancromimus*	C		U				r
Royal Flycatcher *Onychorhynchus coronatus*	F						r
Ruddy-tailed Flycatcher *Terenotriccus erythrurus*	X						r
Sulphur-rumped Flycatcher *Myiobius sulphureipygius*	U						r
Eastern Wood-pewee *Contopus virens*	U	U					t
Tropical Pewee *C. cinereus*		U	U				r
Acadian Flycatcher *Empidonax virescens*	F						t
Yellow-bellied Flycatcher *E. flaviventris*	U						nm
White-throated Flycatcher *E. albigularis*				X?			nm
Least Flycatcher *E. minimus*		C					nm
Black Phoebe *Sayornis nigricans*				X?			r?
Vermilion Flycatcher *Pyrocephalus rubinus*		R	C				r
Bright-rumped Attila *Attila spadiceus*	C	R					r
Rufous Mourner *Rhytipterna holerythra*	X						r
Yucatan Flycatcher *Myiarchus yucatanensis*			U				r
Dusky-capped Flycatcher *M. tuberculifer*	C	C	F				r

Great Crested Flycatcher *M. crinitus*	C	F			nm
Brown-crested Flycatcher *M. tyrannulus*	F	F	F		sr
Great Kiskadee *Pitangus sulphuratus*	R	F	U	F	r
Boat-billed Flycatcher *Megarynchus pitangua*	F	F	F		r
Social Flycatcher *Myiozetetes similis*	F	F	F	F	r
Streaked Flycatcher *Myiodynastes maculatus*	X				sr
Sulphur-bellied Flycatcher *M. luteiventris*		F			sr
Piratic Flycatcher *Legatus leucophaius*		X			sr
Tropical Kingbird *Tyrannus melancholicus*	R	C	C		r
Couch's Kingbird *T. couchii*	U	C	C		r
Eastern Kingbird *T. tyrannus*	F	C	F	F	t
Fork-tailed Flycatcher *T. savana*		R	F	F	r
Thrush-like Schiffornis *Schiffornis turdinus*	C				r
Cinnamon Becard *Pachyramphus cinnamomeus*	X				r
Grey-collared Becard *P. major*	R				r
Rose-throated Becard *P. aglaiae*		R			r
Masked Tityra *Tityra semifasciata*	F	F			r
Black-crowned Tityra *T. inquisitor*		R			r
Lovely Cotinga *Cotinga amabilis*	X				r
White-collared Manakin *Manacus candei*	C				r
Red-capped Manakin *Pipra mentalis*	U				r
White-eyed Vireo *Vireo griseus*	C	C			nm
Mangrove Vireo *V. pallens*	U	C		C	r
Yellow-throated Vireo *V. flavifrons*	U				nm
Philadelphia Vireo *V. philadelphicus*	X				nm
Red-eyed Vireo *V. olivaceus*	C	C			t
Yellow-green Vireo *V. flavoviridis*	F	F			sr
Tawny-crowned Greenlet *Hylophilus ochraceiceps*	C				r
Lesser Greenlet *H. decurtatus*	C	C			r
Green Shrike-vireo *Vireolanius pulchellus*	X				r
Rufous-browed Peppershrike *Cyclarhis gujanensis*			U	C	r
Green Jay *Cyanocorax yncas*	X		F	U	r
Brown Jay *C. morio*	C	C	C		r
Yucatan Jay *C. yucatanicus*			U	U	r
Purple Martin *Progne subis*		C	C	C	t
Grey-breasted Martin *P. chalybea*		C	C	C	sr
Tree Swallow *Tachycineta bicolor*		R?		R?	nm
Mangrove Swallow *Tachycineta albilinea*		U	U	C	r
N. Rough-winged Swallow *Stelgidopteryx serripennis*	U		F	nm	
Barn Swallow *Hirundo rustica*		F	F	F	t
Band-backed Wren *Campylorhynchus zonatus*	X				r?
Spot-breasted Wren *Thryothorus maculipectus*	C	C	F		r
Carolina Wren *T. ludovicianus*	X		U	F	r
House Wren *Troglodytes aedon*		F			r
White-bellied Wren *Uropsila leucogastra*	C	F			r
White-breasted Wood-wren *Henicorhina leucosticta*	C				r
Long-billed Gnatwren *Ramphocaenus melanurus*	C				r
Blue-grey Gnatcatcher *Polioptila caerulea*		U	C	C	r+nm
Swainson's Thrush *Catharus ustulatus*	F				t
Wood Thrush *Hylocichla mustelina*	C				nm
Clay-coloured Robin *Turdus grayi*	F	U			r
White-throated Robin *T. assimilis*	R				r
Grey Catbird *Dumetella carolinensis*	C	C	C		nm
Black Catbird *Melanoptila glabrirostris*			U	F	r
Tropical Mockingbird *Mimus gilvus*		U	F	F	r
Cedar Waxwing *Bombycilla cedrorum*		X			nm
Blue-winged Warbler *Vermivora pinus*	U	U			nm
Golden-winged Warbler *V. chrysoptera*	R				nm
Tennessee Warbler *V. peregrina*	R				nm
Virginia's Warbler *V. virginiae*			X		?
Northern Parula *Parula americana*	R				nm
Yellow Warbler *Dendroica petechia*		F	F		nm
Chestnut-sided Warbler *D. pensylvanica*	C		F		nm
Magnolia Warbler *D. magnolia*	C	C	C		nm
Cape May Warbler *D. tigrina*		X			nm
Black-throated Blue Warbler *D. caerulescens*	X				t?
Yellow-rumped Warbler *Dendroica coronata*			R	X	nm
Black-throated Green Warbler *D. virens*	F	U			nm
Blackburnian Warbler *D. fusca*	C				t
Yellow-throated Warbler *D. dominica*	F	F	F		nm
Grace's Warbler *D. graciae*			U		r
Prairie Warbler *D. discolor*			X		nm
Palm Warbler *D. palmarum*			X		nm
Bay-breasted Warbler *D. castanea*	U				t
Cerulean Warbler *D. cerulea*	X				t
Black-and-white Warbler *Mniotilta varia*	C	U	U		nm
American Redstart *Setophaga ruticilla*	C	C	U		nm
Prothonotary Warbler *Protonotaria citrea*	C				t
Worm-eating warbler *Helmitheros vermivorus*	F				nm
Swainson's Warbler *Limnothlypis swainsonii*	U				nm
Ovenbird *Seiurus aurocapillus*	C				nm
Northern Waterthrush *Seiurus noveboracensis*	C			C	nm
Louisiana Waterthrush *S. motacilla*	F				t
Kentucky Warbler *Oporornis formosus*	C				nm
Mourning Warbler *O. philadelphia*	X				t
Common Yellowthroat *Geothlypis trichas*		C	F	C	nm
Grey-crowned Yellowthroat *G. poliocephala*				U	r
Hooded Warbler *Wilsonia citrina*	C				nm
Wilson's Warbler *W. pusilla*	X				nm
Canada Warbler *W. canadensis*	X				t
Golden-crowned Warbler *Basileuterus culicivorus*	X				r
Yellow-breasted Chat *Icteria virens*	R	U			nm
Grey-throated Chat *Granatellus sallaei*	X			U	r
Grey-headed Tanager *Eucometis penicillata*	F				r
Black-throated Shrike-tanager *Lanio aurantius*	X				r
Red-crowned Ant-tanager *Habia rubica*	U				r
Red-throated Ant-tanager *H. fuscicauda*	C	U	U		r
Hepatic Tanager *Piranga flava*			X		r
Summer Tanager *P. rubra*	C				nm
Scarlet Tanager *P. olivacea*	R				t
Crimson-collared Tanager *Ramphocelus sanguinolentus*		X			r
Blue-grey Tanager *Thraupis episcopus*		R			r
Yellow-winged Tanager *T. abbas*	U	F			r
Scrub Euphonia *Euphonia affinis*			C	C	r
Yellow-throated Euphonia *E. hirundinacea*	C	F	U		r
Olive-backed Euphonia *E. gouldi*	C	R			r
Red-legged Honeycreeper *Cyanerpes cyaneus*	C				r
Blue-black Grassquit *Volatinia jacarina*		C			r
Variable Seedeater *Sporophila americana*		X			r
White-collared Seedeater *S. torqueola*		C	F		r
Thick-billed Seed-finch *Oryzoborus funereus*		X			r
Orange-billed Sparrow *Arremon aurantiirostris*	X				r
Olive Sparrow *Arremonops rufivirgatus*	X	U	F		r
Green-backed Sparrow *A. chloronotus*	C	F			r
Botteri's Sparrow *Aimophila botterii*			C		r
Chipping Sparrow *Spizella passerina*			C		r
Savannah Sparrow *Passerculus sandwichensis*		X			nm
Grasshopper Sparrow *Ammodramus savannarum*			F		r
Greyish Saltator *Saltator coerulescens*		F			r
Buff-throated Saltator *S. maximus*		R			r
Black-headed Saltator *S. atriceps*	C	C	U		r
Black-faced Grosbeak *Caryothraustes poliogaster*	U				r
Northern Cardinal *Cardinalis cardinalis*		U		U	r
Rose-breasted Grosbeak *Pheucticus ludovicianus*	F	F			t
Blue-black Grosbeak *Cyanocompsa cyanoides*	C	U			r
Blue Bunting *C. parellina*	C	F			r
Blue Grosbeak *Guiraca caerulea*	U	C	U		nm
Indigo Bunting *Passerina cyanea*	F	C			nm
Painted Bunting *P. ciris*	X				nm
Dickcissel *Spiza americana*		R			t
Red-winged Blackbird *Agelaius phoeniceus*		C		C	r+nm
Eastern Meadowlark *Sturnella magna*			F		r
Melodious Blackbird *Dives dives*		C			r
Great-tailed Grackle *Quiscalus mexicanus*		C			r
Bronzed Cowbird *Molothrus aeneus*		F			r
Black-cowled Oriole *Icterus dominicensis*	F	F	U		r
Orchard Oriole *I. spurius*		U			nm
Hooded Oriole *I. cucullatus*		U			r
Yellow-backed Oriole *I. chrysater*			R		r
Altamira Oriole *I. gularis*		U			r
Yellow-tailed Oriole *I. mesomelas*		F	U		r
Baltimore Oriole *I. galbula*	U	U			nm
Yellow-billed Cacique *Amblycercus holosericeus*	C	C	U	C	r
Montezuma Oropendola *Psarocolius montezuma*	C	C			r