

AVIFAUNA OF THE NORTHERN CORDILLERA CENTRAL OF THE ANDES, COLOMBIA

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Resumen. – **Avifauna del norte de la Cordillera Central de los Andes, Colombia.** – Entre 1999 y 2006, realizamos inventarios de aves mediante observaciones de campo, grabaciones sonoras y colecta de especímenes en el extremo norte de la Cordillera Central Andina, departamento de Antioquia, Colombia. Registramos un total de 335 especies en 18 bosques de niebla localizados entre 1300 y 1915 m s.n.m. Entre las diez localidades más visitadas, Bodega Vieja (231 especies), Alto Chaquiral [= Arrierito Antioqueño (202)], La Forzosa (199) y Santa Gertrudis (162) tuvieron la mayor riqueza. Presentamos una evaluación cualitativa de la abundancia relativa y uso de hábitat para cada especie. El ensamble de esta avifauna exhibe una mezcla de afinidades biogeográficas con elementos de los Andes del Norte, las tierras bajas y piedemonte del Chocó, Nechí-Magdalena, y Centro América. Además de esto, la cantidad de registros novedosos que encontramos contradicen la visión de la Cordillera Central como un área bien explorada en Colombia. Dieciséis especies prioritarias para la conservación tienen poblaciones importantes en estos bosques nublados; por ejemplo, acá reportamos las 16 localidades conocidas para el Arriero Antioqueño (*Lipaugus weberi*), cuyo rango de distribución está totalmente confinado a nuestra área de estudio. Las características únicas de esta avifauna resaltan la necesidad de una estrategia de conservación integral desde las comunidades locales para contrarrestar el impacto del cambio del paisaje que resulta de la expansión actual de la ganadería, cafcultura, y cultivos ilícitos en la zona.

Abstract. – From 1999 to 2006, we conducted bird inventories based on observations, tape-recordings, and general specimen collecting in the northern end of the Andean Cordillera Central, Department of Antioquia, Colombia. We recorded 335 species in 18 cloud forests located between 1300 and 1915 m a.s.l. Among the ten localities more frequently visited, Bodega Vieja (231 species), Alto Chaquiral [= Arriero Antioqueño (201)], La Forzosa (199) and Santa Gertrudis (162) had the higher species richness. We present a qualitative assessment of relative abundance and habitat preferences for each species. The avifauna assemblage of this region exhibits mixed biogeographic affinities, with elements from the northern Andes, the lowlands and foothills of Chocó, Nechí-Magdalena, and Central America. Besides this, the outstanding new bird records we found contradict the view of the Cordillera Central as a relatively well explored area in Colombia. Sixteen species of conservation concern have healthy populations in these cloud forests; for instance, we report all the 16 localities known for the Chestnut-capped Piha (*Lipaugus weberi*) whose range is entirely confined to our study region. The unique features of this avifauna highlight the necessity of an integral, community-based conservation strategy to ameliorate the effect of landscape

changes resulting from the ongoing expansion of cattle ranching, coffee plantations, and illicit crops.
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Key words: Antioquia, Chocó, Nechí lowlands, Porce river, northwestern South America, premontane forests.

INTRODUCTION

The cloud forests of the Andes in northwestern South America are recognized for their extremely high levels of avian diversity and endemism (Stotz *et al.* 1996, Rahbek & Graves 2001). The peaks of this pattern lie along the eastern slope of the Andes from southern Peru to southern Colombia (Rahbek & Graves 2001, Hawkins *et al.* 2007). However, many more localities in that stretch of the Andes are better known, particularly in eastern Ecuador and Peru (Terborgh 1975, Stotz *et al.* 1996, Pitman *et al.* 2002), than other portions with continuous cloud forests along altitudinal gradients such as the unexplored areas of the Andes of Colombia (van Velzen 1992).

The northern Andes attain their higher complexity in Colombia where the main range split in three cordilleras: Occidental, Central and Oriental (Fig. 1). Each cordillera has a unique geological history and distinctive topographic, climatic and ecological features (McCourt *et al.* 1984, van Velzen 1992, Gregory-Wodzicki 2000, IGAC 2003); for instance, the Cordillera Central (Fig. 1) is the oldest (c. 65,000,000 years) and the highest on average, of the three (McCourt *et al.* 1984, Gregory-Wodzicki 2000). At its northern end, the Cordillera Central smoothly terminates in the very wet slopes and foothills of the Nechí and Porce valleys, and the Remedios-Segovia low pass to Serranía de San Lucas (Fig. 1). Ornithological studies conducted since 1999 have suggested that the avifauna of the premontane forests of the northern Cordillera Central is one of the most intriguing of northern South America. First, taxa from multiple

biogeographic areas converge to this region (Cuervo *et al.* in press). Second, several new species-level taxa, like the Chestnut-capped Piha (*Lipaugus weberi*), have been found in such a small area (Cuervo *et al.* 2001). Lastly, populations of threatened, poorly known, and rare cloud forest birds have been found to be relatively common and to thrive in its fragmented landscape (Cuervo & Restrepo 2007).

Here we report a comprehensive list of the avifauna of the cloud forests of the northern Cordillera Central as a result of our studies in 18 localities of the region from 1999 to 2006. Our goal is to provide baseline information for ongoing and future biodiversity research and conservation action in the region.

STUDY AREA AND METHODS

Our study area encompasses the northernmost end of the Cordillera Central of the Colombian Andes, consisting of 18 premontane wet forests (Espinal 1992) located between 1300–1915 m in the upper Nechí and lower Porce valley, municipalities of Anorí and Amalfi, Department of Antioquia, Colombia (Fig. 1, Table 1). The landscape consists of a collage of multiple fragments of mature cloud forest, including several large tracts of continuous forest, embedded in a matrix of pastures and, to a lesser extent, coffee plantations (Cuervo & Restrepo 2007).

Since 1999 we have been conducting opportunistic observations, recordings of bird vocalizations, and general specimen collecting that complemented a more comprehensive systematic survey focused on the nine localities reported by Cuervo & Restrepo (2007),

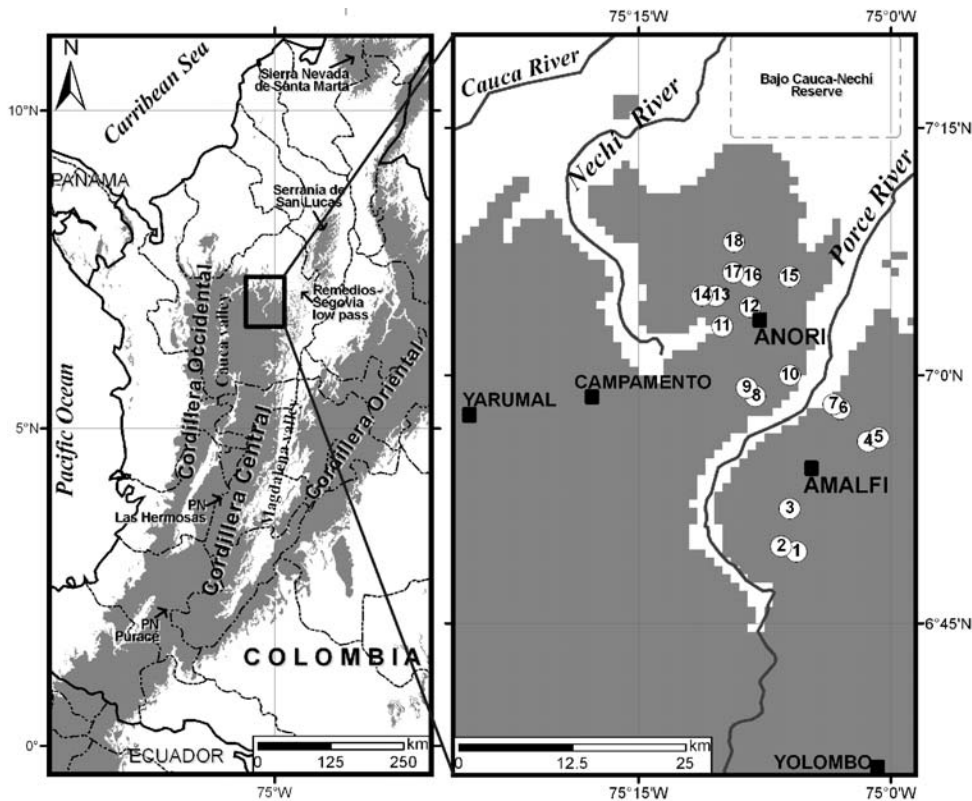


FIG 1. Map of northwestern South America depicting terrain above 1000 m elevation in gray. The location of our study area in the northern Cordillera Central is delimited by a square and shown in detail in the right panel. Open circles represent the location of study sites and numbers within correspond to the locality list in Table 1.

plus La Forzosa (Table 1). The systematic samplings consisted in 17–23 days of mist-netting in the interior and forest edge at each of this subset of nine localities. Copies of all recordings were archived at Banco de Sonidos Animales, Instituto Alexander von Humboldt, and many have been published in a sound guide (Álvarez *et al.* 2007). Voucher specimens were taken whenever possible and deposited in the Instituto de Ciencias Naturales (ICN), Museo Universidad de Antioquia (MUA), and Instituto Alexander von Humboldt (IAvH). Details on habitats, vegetation, sampling strategies, dates, and co-workers have been

reported elsewhere (Cuervo *et al.* 2005, Cuervo & Restrepo 2007).

RESULTS AND DISCUSSION

We recorded a total of 335 species in the cloud forests of the northern tip of the Cordillera Central (Appendix 1), a relatively high number for a local montane avifauna in such narrow elevation range. For example, Renjifo (1999) reported a comprehensive list of 243 species in a fragmented landscape of similar area in the western slope of this same cordillera. The high species richness of the north-

TABLE 1. Geographic coordinates (north latitude, west longitude), elevation range (m a.s.l.), accumulated number of days, and number of species recorded in 18 localities of the northern Cordillera Central. Locality numbers as mapped in Figure 1.

Localities	Coordinates	Elevation (m)	Fieldwork days	Species richness
1. Finca Los Canales*	6°49',75°05'	1810–1880	22	135
2. La Secreta*	6°49',75°06'	1820–1915	20	157
3. Bosque Guayabito*	6°52',75°06'	1700–1815	36	179
4. Bosque Las Ánimas*	6°56',75°01'	1500–1550	19	148
5. Bosque de El Abuelo-Escuela Las Ánimas*	6°56',75°00'	1505–1610	19	164
6. Bosques de Santa Catalina	6°57',75°02'	1500–1540	5	106
7. Bodega Vieja*	6°58',75°03'	1300–1550	34	231
8. Alto El Chaquiral* [=Arrierito Antioqueño]	6°58',75°08'	1650–1735	22	202
9. Reserva La Forzosa	6°59',75°08'	1550–1740	36	198
10. Finca Macondo	7°00',75°05'	1400–1600	5	73
11. Filo Largo	7°03',75°10'	1475–1520	1	47
12. Mangas de Rosita	7°04',75°08'	1520–1550	1	34
13. Mampuestos*	7°04',75°10'	1445–1495	17	136
14. Quebrada La Nutria	7°04',75°11'	1425–1440	1	39
15. La Condena	7°06',75°06'	1600–1750	3	59
16. Alto La Serrana	7°06',75°08'	1630–1700	5	84
17. Camino Anorí-Santa Gertrudis	7°06',75°09'	1600–1700	4	83
18. Santa Gertrudis*	7°08',75°09'	1420–1470	23	162

*One of the nine localities reported in Cuervo & Restrepo (2007), that along with La Forzosa (9) were more thoroughly sampled.

ern slope of the Cordillera Central is consistent with a peak in avian diversity expected at middle elevations in the tropical Andes, due to an area effect and influx of species from the lowlands (Rahbek 1997, Kattan & Franco 2004); this pattern, however, can only be tested when comparable data from the adjacent lowlands and highlands become available. Of the ten localities more thoroughly sampled, species richness was higher in Bodega Vieja, Bosque Guayabito, Alto Chaquiral [=Arrierito Antioqueño], La Forzosa, and Santa Gertrudis (Table 1). These are, overall, medium to large forests (from 110 to more than 1000 ha) with lower disturbance levels than the other sites. In addition to cloud forest birds, we also recorded lowland and open country species in the pastures,

young second growth, edges or gaps surrounding these forests (Appendix 1). We predict that, when properly sampled, La Condena and Macondo, two of the sporadically visited sites, will exhibit similar composition and richness values as the ones mentioned above given the large extension of forest they encompass.

The birds that assemble the avifauna of the northern Cordillera Central of Colombia show diverse biogeographic patterns (Cuervo *et al.* in press). To this region coincide the geographic ranges of taxa, at the species and subspecies level, characteristic of the northern Andes (e.g., *Phaethornis guy emiliae*, *Rhynchocyclus fulvipectus*, *Pyroderus scutatus occidentalis*, *Cyklarbis nigrirostris*), the Nechí-Magdalena lowlands and foothills (e.g., *Capito hypoleucus*, *Hyloctistes*

subulatus cordobae, *Piprites chloris antioquiae*, *Habia gutturalis*), Chocó (e.g., *Androdon aequatorialis*, *Trogon comptus*, *Myiophobus phoenicomitra litae*, *Diglossa indigotica*), or lowlands and foothills of Central America (e.g., *Philydor fuscipenne*, *Automolus rubiginosus saturatus*). Except for the adjacent northern Cordillera Occidental and Serranía de San Lucas (Fig. 1), no other avifauna in the northern Andes is expected to consist of such mixture of montane and trans-Andean lowland rainforest elements.

Overall, the species pool of the Cordillera Central of the Colombian Andes has been previously considered to be relatively well known. However, not only new species have been recently described (Cuervo *et al.* 2001, 2005; Donegan 2007), but also important range extensions have been reported (Beltrán & Kattan 2001). For example, we presented evidence for 36 unexpected species in the region that reinforced the pattern of mixture of biogeographical realms in this corner of South America (Cuervo *et al.* in press). That the avifauna of the Cordillera Central was presumed to be generally well known was based on the assumption that the various expeditions and recent works conducted in the coffee growing region in the departments of Antioquia, Caldas, Quindío, and Risaralda were representative of the whole range. Indeed, there are vast areas where little or no exploration has been conducted yet, such as the páramos and upper montane forests in northern Antioquia, the hill slopes of the dry Cauca canyon, the eastern slope from Antioquia to Tolima, and the southern portion from Parque Nacional Las Hermosas south to Parque Nacional Puracé. The finding of a distinct avifauna in its northern end implies that collecting surveys in the poorly-explored areas of this cordillera should be a priority for field ornithologists in Colombia.

Six IUCN threatened and ten near-threatened species have populations in the northern Cordillera Central (Appendix 1); many of

which were not even known to occur in this area at all such as *Tinamus osgoodi*, *Bangsia melanochlamys*, and *Chloroceryle nitidissima*. Furthermore, *Lipaugus weberi* is exclusively known from the sixteen localities reported in this paper, twelve more since its description in 2001. Although this cotinga may indeed be restricted to the cloud forests of Anorí and Amalfi, ornithological exploration is poor in adjacent areas like Yolombó, Campamento, Yarumal, the northern Cordillera Occidental, and Serranía de San Lucas. Except for *Odontophorus hyperythrus*, *Pyrilia pyrilia*, and *H. gutturalis*, the rest of species of conservation concern mostly range between 1000 and 2000 m, the altitudinal belt at which most forest cover have disappeared in Colombia (Etter & van Wyngaarden 2000). That many premontane birds locally extirpated in other portions of the Colombian Andes (see Renjifo 1999) have relatively large populations in our region is indicative of the mild history of disturbance of the northern end the cordillera. Instead of the extensive deforestation of premontane wet forests due to the expansion of coffee cultivations and cattle ranching that characterized the Colombian Andes in the 20th century, this region remained mostly forested in many parts due to a low local human population density and a gold-mining based economy. However, land use is rapidly changing due to the exhaustion of gold mines, the expansion of illicit crops and cattle ranching all over Colombia, and stable international coffee prices.

Bodega Vieja in Amalfi and Santa Gertrudis in Anorí are two key large forest blocks that still remain unprotected. By being located in the middle of a forest continuum from 1800 m a.s.l. to 150 m, Santa Gertrudis represents a unique opportunity for expanding the Bajo Cauca-Nechí reserve (45,000 ha) which currently protects the lower foothills and lowlands (150–850 m). There are no national parks in the northern Cordillera Central, but

three small reserves were recently established based on our studies: Bosque Guayabito (c. 1000 ha), La Forzosa (c. 350 ha), and Arrierito Antioqueño (i.e., Alto El Chaquiral, c. 110 ha). Although only the Anorí region was identified as an Important Bird Area (Franco & Bravo 2005), realistic conservation impact of the IBA program on the cloud forest habitats of the region is still to be seen. We believe that a network of reserves owned by local farmers would cradle long-term, sustainable conservation of the lower Porce and upper Nechi forests, which are now threatened by ongoing land use changes and increasing human colonization.

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APPENDIX 1. Avifauna of the northern Cordillera Central of the Colombian Andes, indicating relative abundance, major habitats where the species were recorded, and type of evidence gathered per species. See Table 1 for codes and geographic data of the 18 localities studied. Taxonomy follows the A.O.U. South American Checklist Committee recommendations (Remsen *et al.* 2008).

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Tinamidae					
Black Tinamou (VU)	<i>Tinamus osgoodi</i>	9	SC	I	S,H
Little Tinamou	<i>Crypturellus soui</i>	7–10,18	U	III	R,H
Cracidae					
Sickle-winged Guan	<i>Chamaepetes goudotii</i>	1–5,7–9,13	FC	I,II,III	R,S,H
Crested Guan	<i>Penelope purpurascens</i>	7	SC	I	R,S,H
Wattled Guan (NT)	<i>Aburria aburri</i>	3,5,7–9,15–18	U	I	R,H
Speckled Chachalaca	<i>Ortalis guttata columbiana</i>	1–9,11,13,15–17	C	II,III	R,S,H
Odontophoridae					
Rufous-fronted Wood-Quail	<i>Odontophorus erythrops</i>	7,8	U	I	R,S,H
Chestnut Wood-Quail (NT)	<i>Odontophorus hyperythrus</i>	2,3,5,8,9,13,16,18	FC	I	R,S,H
Ardeidae					
Striated Heron	<i>Butorides striata</i>	7	X	IV	S
Cattle Egret	<i>Bubulcus ibis</i>	7–9	U	III	S
Cathartidae					
Turkey Vulture	<i>Cathartes aura</i>	1–9–12,13,18	C	V	S
Black Vulture	<i>Coragyps atratus</i>	1–18	C	V	S
King Vulture	<i>Sarcorambus papa</i>	2,6,7–10,18	U	V	S
Accipitridae					
Gray-headed Kite	<i>Leptodon cayanensis</i>	1	X	II	S
Swallow-tailed Kite	<i>Elanoides forficatus</i>	1–10,13,17,18	U	II,III,V	R,P,S,H
White-tailed Kite	<i>Elanus leucurus</i>	7,9	U	III	S
Semicollared Hawk (NT)	<i>Accipiter collaris</i>	7,8	SC	I,II	M,P,S,H
Sharp-shinned Hawk	<i>Accipiter striatus ventralis</i>	3,8,13	U	I,II	M,P
White Hawk	<i>Leucopternis albicollis</i>	8,9	SC	II	S
Savanna Hawk	<i>Buteogallus meridionalis</i>	3,9	SC	II	S
Harris's Hawk	<i>Parabuteo unicinctus</i>	6,7	SC	III	S
Roadside Hawk	<i>Buteo magnirostris</i>	1–9,12,13,15–18	C	II,III	R,P,S,H

APPENDIX 1. Continued.

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Broad-winged Hawk	<i>Buteo platypterus</i>	1	X	II	S,H
Red-backed Hawk	<i>Buteo polyosoma</i>	1–3,5,8,9	U	II,III,V	R,P,S,H
Short-tailed Hawk	<i>Buteo brachyurus</i>	13	X	II	S
Zone-tailed Hawk	<i>Buteo albonotatus</i>	8	X	II	S
Black Hawk-Eagle	<i>Spizæetus tyrannus</i>	3–9,17,18	FC	II,V	R,P,S,H
Ornate Hawk-Eagle	<i>Spizæetus ornatus</i>	3	X	II	S
Falconidae					
Laughing Falcon	<i>Herpetotheres cachinnans</i>	1,3–10,13,18	FC	II,III	R,S,H
Barred Forest-Falcon	<i>Micrastur ruficollis</i>	1–5,7–9,18	FC	I,II	R,S,H
Crested Caracara	<i>Caracara cheriway</i>	1–4,11,13,17,18	U	III	S
Red-throated Caracara	<i>Ibycter americanus</i>	3,5–9,11,13,15–18	FC	I,II	R,S,H
Yellow-headed Caracara	<i>Milvago chimachima</i>	1,2,8,9,13	U	II,III	S,H
American Kestrel	<i>Falco sparverius</i>	1,3–11,13,14,16–18	C	III	R,S,H
Bat Falcon	<i>Falco rufigularis</i>	18	SC	II	S,H
Aplomado Falcon	<i>Falco femoralis</i>	2	X	III	S
Rallidae					
Russet-crowned Crake	<i>Anurolimnas viridis</i>	1,4,5,7,8,13,14	FC	III	R,S,H
Charadriidae					
Southern Lapwing	<i>Vanellus chilensis</i>	1,3,5,8,9,13,18	U	III	S,H
Columbidae					
Ruddy Ground-Dove	<i>Columbina talpacoti</i>	8,9,18	U	III	S
Scaled Pigeon	<i>Patagioenas speciosa</i>	6,8,16,18	U	II	R,S,H
Band-tailed Pigeon	<i>Patagioenas fasciata</i>	1–9,11,13,16,18	C	I,II,III	R,S,H
Pale-vented Pigeon	<i>Patagioenas cayennensis</i>	4,7–9,18	U	II,III	S,H
Ruddy Pigeon	<i>Patagioenas subvinacea</i>	1–10,13,17,18	C	I,II	R,S,H
Ground-Dove	<i>Geotrygon m. montana</i>	2,6,7,10	SC	I	M,R,H
Eared Dove	<i>Zenaida auriculata</i>	2,8,13	SC	III	S,H
White-tipped Dove	<i>Leptotila verreauxi</i>	8,9	SC	II	S
Psittacidae					
Blue-fronted Parrotlet	<i>Touit dilectissimus</i>	1–9,11–14,16–18	C	I,II	R,S,H

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Saffron-headed Parrot (NT)	<i>Pyrrhula pyrrhula</i>	1–3,5–8,13,17,18	FC	I,II	M,R,P,S,H
Blue-headed Parrot	<i>Pionus menstruus</i>	7,14	SC	I,II	S,H
Bronze-winged Parrot	<i>Pionus c. chalcopterus</i>	4,5,7,8,11,13,14,17,18	FC	I,II	R,P,S,H
Mealy Parrot	<i>Amazona farinosa</i>	17,18	U	I,II	R,P,S,H
Cuculidae					
Squirrel Cuckoo	<i>Piaya cayana</i>	1–9,15,16,18	FC	I,II,III	R,P,S,H
Smooth-billed Ani	<i>Crotophaga ani</i>	1–11,13,14,16–18	C	II,III	R,S,H
Striped Cuckoo	<i>Tapera naevia</i>	1,2,4,5,7–9,12,13,16,17	FC	II,III	R,H
Pavonine Cuckoo	<i>Dromococcyx pavoninus</i>	3,8,9,15,18	U	II,III	R,H
Strigidae					
Tropical Screech-Owl	<i>Megascops choliba</i>	1–5,7–10,13,18	FC	II,III	R,S,H
Cinnamon Screech-Owl	<i>Megascops petersoni</i>	8,9	U	I,II	M,R,P,H
Mottled Owl	<i>Ciccaba virgata</i>	1–4,7–9,13	FC	I,II	R,S,H
Nyctibiidae					
Common Potoo	<i>Nyctibius griseus</i>	3,4,7–9,13	FC	II	R,P,S,H
Caprimulgidae					
Common Nighthawk ⁶	<i>Chordeles minor</i>	7	SC	II	S
Common Pauraque	<i>Nyctidromus albicollis</i>	2–4,6–10,13,14,16	C	III	S,H
Band-winged Nightjar	<i>Caprimulgus longirostris ruficervix</i>	1–3,5–9,16,18	C	II,III	M,R,P,S,H
Apodidae					
Chestnut-collared Swift	<i>Streptoprocne rutila</i>	1–10,13,16–18	C	V	R,P,S,H
White-collared Swift	<i>Streptoprocne zonaris</i>	1–4,7–10,13,15–18	FC	V	P,S,H
Gray-rumped Swift	<i>Chaetura cinereiventris</i>	3,7,8	FC	V	R,S,H
Short-tailed Swift	<i>Chaetura brachyura</i>	13	X	V	S
Lesser Swallow-tailed Swift	<i>Panyptila cayennensis</i>	7	SC	V	S
Trochilidae					
White-necked Jacobin	<i>Florisuga mellivora</i>	3,13	SC	II,III	S
White-tipped Sicklebill	<i>Eutoxeres aquila munda</i>	1–5,7–10,18	C	I,II	M,P,S
Rufous-breasted Hermit	<i>Glaucois hirsutus affinis</i>	13	SC	II	M,P
Band-tailed Barbthroat	<i>Threnetes ruckeri darriensis</i>	10	SC	II	M

APPENDIX 1. Continued.

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Stripe-throated Hermit	<i>Phaethornis s. striigularis</i>	4,7,8	U	I,II	M,PS
Green Hermit	<i>Phaethornis guy emiliae</i>	1–10,13–16,18	C	I,II	M,R,PS,H
Tawny-bellied Hermit	<i>Phaethornis s. syrmatophorus</i>	8	SC	II	M,PS
Green-fronted Lancebill	<i>Doryfera l. ludovicae</i>	1,3–5,7–10,13,16,18	C	I,II	M,PS
Wedge-billed Hummingbird	<i>Scistes geoffroyi albogularis</i>	2,3	U	I,II	M,PS
Brown Violetear	<i>Colibri delphinae</i>	3	X	I	M,P
Green Violetear	<i>Colibri thalassinus</i>	1	X	II	S,H
Sparkling Violetear	<i>Colibri c. coruscans</i>	1	U	II,III	M,PS,H
Tooth-billed Hummingbird	<i>Androdon aequatorialis</i>	7,18	U	I	M,PS,H
Purple-crowned Fairy	<i>Heliothrix barroti</i>	7	X	I	S
Black-throated Mango	<i>Anthracoceros nigricollis</i>	1,4,7	SC	III	S
Greenish Puffleg	<i>Haplophaedia a. aureliae</i>	1–3,7–10,12,15,16,18	C	I,II	M,R,PS,H
Bronzy Inca	<i>Coeligena coeligena ferruginea</i>	1–3,8,9,15,16	FC	I,II	M,R,PS,H
Booted Racket-tail	<i>Ocreatus underwoodii</i>	1–3,5–9,15,16,18	C	I,II	M,R,PS,H
Green-crowned Brilliant	<i>Heliodoxa j. jacula</i>	1–10,13,16,18	C	I,II	M,R,PS,H
Purple-throated Woodstar	<i>Calliphlox mitchelli</i>	5,9	SC	I,II	M,PS
Western Emerald	<i>Chlorostilbon melanorhynchus pumilus</i>	1–5,7,9–11,13–15,17	C	I,II,III	M,PS
Violet-headed Hummingbird	<i>Klais guimeti</i>	7,18	SC	I	M,P
Green-crowned Woodnymph	<i>Thalurania f. fannyi</i>	3–10,12,13,16,18	C	I,II,III	M,PS
Rufous-tailed Hummingbird	<i>Amazilia t. tzacatl</i>	4,6–8,11,13	U	III	R,S,H
Andean Emerald	<i>Amazilia f. franciae</i>	1–9,11,13–18	C	I,II	M,R,PS,H
Steely-vented Hummingbird	<i>Amazilia s. saucerrottei</i>	1–5,7,8,13	FC	II,III	M,PS
Trogonidae					
Golden-headed Quetzal	<i>Pharomacrus auriceps</i>	1–4,7–10,13,15–18	FC	I,II	M,R,PS,H
Collared Trogon	<i>Trogon collaris subtropicalis</i>	1–10,13–18	FC	I,II	M,R,PS,H
Blue-tailed Trogon	<i>Trogon comptus</i>	18	X	I	R,S,H
Alcedinidae					
Green Kingfisher	<i>Chloroceryle a. americana</i>	9,13,17,18	SC	II,IV	M,PS
Momotidae					
Blue-crowned Motmot	<i>Momotus momota aequatorialis</i>	1–4,7–9	U	I,II,III	PS,H

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Bucconidae					
Moustached Puffbird	<i>Malacoptila m. mystacalis</i>	1–10,13,16–18	FC	I,II	M,R,PS,H
Lanceolated Monklet	<i>Micromonacha lanceolata</i>	7,8	SC	I,II	S,H
Capitonidae					
White-mantled Barbet (EN)	<i>Capito b. hypoleucus</i>	2,7,8,10	U	I,II	M,R,PS,H
Red-headed Barbet	<i>Eubucco b. bourcierii</i>	1–10,16,18	FC	I,II	M,R,PS,H
Ramphastidae					
Black-mandibled Toucan	<i>Ramphastos ambiguus swainsonii</i>	7,9,17,18	SC	I,II,III	R,H
Channel-billed Toucan	<i>Ramphastos vitellinus citrolaemus</i>	3	X	II	S
Crimson-rumped Toucanet	<i>Aulacorhynchus b. haematopygus</i>	1–5,7–10	FC	I,II	M,R,PS,H
Picidae					
Olivaceous Piculet	<i>Picumnus olivaceus</i>	1–4,7,9,13,15	U	I,II,III	M,PS
Acorn Woodpecker	<i>Melanerpes formicivorus flavigula</i>	1–3,5,7–9,11,13,14,16,18	U	II,III	M,R,PS,H
Red-crowned Woodpecker	<i>Melanerpes rubricapillus</i>	1,8–10	SC	III	S,H
Smoky-brown Woodpecker	<i>Picooides f. fumigatus</i>	1–10,13,16,18	FC	I,II	M,R,PS,H
Golden-olive Woodpecker	<i>Colaptes rubiginosus gularis</i>	1–5–8,10,18	FC	I,II,III	R,PS,H
Spot-breasted Woodpecker	<i>Colaptes punctigula</i>	1,4–6,8	U	III	S,H
Lineated Woodpecker	<i>Dryocopus lineatus</i>	3–5,7,8,11,13,14,18	FC	II,III	PS,H
Crimson-crested Woodpecker	<i>Campephilus melanoleucus</i>	1–5,7–9,13	FC	I,II,III	R,PS,H
Furnariidae					
Tawny-throated Leaf-tosser	<i>Sclerurus mexicanus andinus</i>	7	SC	I	M,P,H
Azara's Spinetail	<i>Synallaxis azarae media</i>	1–9,11,12,14,16–18	C	I,II,III	M,R,PS,H
Pale-breasted Spinetail	<i>Synallaxis albescens</i>	1–9,11,13,14	FC	II,III	R,PS,H
Slaty Spinetail	<i>Synallaxis brachyura</i>	7	SC	II	S
Red-faced Spinetail	<i>Cranioleuca erythrops griseigularis</i>	1–3,5,7–9,18	FC	I,II	M,R,PS,H
Spotted Barbtail	<i>Premnoplex b. brunnescens</i>	2,3,5,7–9,18	FC	I	M,R,PS,H
Treerunner	<i>Margarornis</i> sp.	7	X	II	S
Montane Foliage-gleaner	<i>Anabacertbia striaticollis</i>	2,3	SC	I	PS
Lineated Foliage-gleaner	<i>Syndactyla subalaris striolata</i>	1–5,7–9,16,18	FC	I,II	M,R,PS,H
Striped Woodhaunter	<i>Hyloctistes subulatus cordobae</i>	5–7,9,17,18	FC	I	M,R,PS,H

APPENDIX 1. Continued.

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Slaty-winged Foliage-gleaner	<i>Philydor fuscipenne erythronotum</i>	7,18	U	I	M,R,PS,H
Buff-fronted Foliage-gleaner	<i>Philydor rufum riveti</i>	1–9,12,13,15–18	C	I,II	M,R,PS,H
Streak-capped Treehunter	<i>Thripadectes virgaticeps magdalenae</i>	1–3,5,7–9,15	U	I	M,PS,H
Ruddy Foliage-gleaner	<i>Automolus rubiginosus saturatus</i>	5,7,18	SC	I	M,R,PS,H
Plain Xenops	<i>Xenops minutus littoralis</i>	4,5,7–9,18	U	I,II	M,R,PS,H
Streaked Xenops	<i>Xenops rutilans heterurus</i>	1–5,7,8,13,15,18	FC	I,II	M,R,PS,H
Plain-brown Woodcreeper	<i>Dendrocincla fuliginosa</i>	7,9,18	SC	I	PS,H
Olivaceous Woodcreeper	<i>Sittasomus griseicapillus levis</i>	2–5,7–10,15,17,18	FC	I,II	M,R,PS,H
Wedge-billed Woodcreeper	<i>Glyphorhynchus spirurus integratus</i>	7	SC	I	M,PS
Strong-billed Woodcreeper	<i>Xiphocolaptes promeropirhynchus</i>	3,5,7,9	U	I	S,H
Black-banded Woodcreeper	<i>Dendrocolaptes picumnus</i>	9	SC	I	R,H
Spotted Woodcreeper	<i>Xiphorhynchus erythropygius insolitus</i>	4–7,10,13,18	FC	I	M,R,PS,H
Olive-backed Woodcreeper	<i>Xiphorhynchus t. triangularis</i>	1–3,8,9,16	U	I	M,PS,H
Montane Woodcreeper	<i>Lepidocolaptes lacrymiger</i>	2,3,5,9	U	I,II	PS,H
Brown-billed Scythebill	<i>Campyloramphus p. pusillus</i>	2,3,5,7–9,16,18	FC	I	M,R,PS,H
Thamnophilidae					
Bar-crested Antshrike	<i>Thamnophilus multistriatus</i>	1,3–5,7–9,12	FC	II,III	R,S,H
Uniform Antshrike	<i>Thamnophilus unicolor grandior</i>	1–4,6–9,15–18	FC	I,II	M,R,PS,H
Plain Antwren	<i>Dysithamnus mentalis semicinerens</i>	2–5,7–10,18	FC	I,II	M,R,PS,H
Checker-throated Antwren	<i>Epinecrophylia fulviventris salmoni</i>	5	X	I	M,P
Slaty Antwren	<i>Myrmotherula s. schisticolor</i>	2–10,18	FC	I	M,R,PS,H
Long-tailed Antbird	<i>Drymophila c. caudata</i>	1,2	U	I,II	M,R,PS,H
Rufous-rumped Antwren	<i>Terenura c. callinota</i>	2,3,7–9,18	U	I,II	M,R,S,H
Parker's Antbird	<i>Cercomacra parkeri</i>	1–10,13,15–18	C	I,II,III	M,R,PS,H
Immaculate Antbird	<i>Myrmeciza i. immaculata</i>	7,15,18	SC	I	R,S,H
Formicariidae					
Rufous-breasted Antthrush	<i>Formicarius rufipectus carrikeri</i>	3,9,10	SC	I	M,R,S,H
Grallaridae					
White-bellied Antpitta	<i>Grallaria b. hypoleuca</i>	2,3,8,9,16	U	I	R,S,H
Ochre-breasted Antpitta	<i>Grallaricula flaviviridis</i>	2,5,8,9,16	U	I	M,R,PS,H

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Conopophagidae					
Chestnut-crowned Gnatcatcher	<i>Conopophaga c. castaneiceps</i>	4–7,9,10,13,18	U	I	M,R,PS,H
Rhinocryptidae					
White-crowned Tapaculo	<i>Scytalopus atratus confusus</i>	3–5,7–9,13,18	FC	II	M,R,PS,H
Stiles's Tapaculo (NT)	<i>Scytalopus stilesi</i>	1–10,13,15–18	C	I	M,R,PS,H
Tyrannidae					
Sooty-headed Tyrannulet	<i>Phyllomyias griseiceps</i>	7,8,17	U	II	R,S,H
Ashy-headed Tyrannulet	<i>Phyllomyias cinereiceps</i>	2	SC	I,II	M,P
Plumbeous-crowned Tyrannulet	<i>Phyllomyias plumbeiceps</i>	2,3,5,7	U	I	M,R,PS,H
Gray Elaenia	<i>Myiobagis caniceps</i>	3,7,9	U	I	M,R,PS,H
Yellow-bellied Elaenia	<i>Elaenia flavogaster</i>	1,2,4,5,7–9,13,15	FC	II,III	R,PS,H
Lesser Elaenia	<i>Elaenia chiriquensis albivertex</i>	13	SC	II	M,P
Mountain Elaenia	<i>Elaenia frantzii</i>	1,2,5,7	U	II	R,PS,H
Torrent Tyrannulet	<i>Serpophaga cinerea</i>	5–7,9	FC	IV	S
Golden-faced Tyrannulet	<i>Zimmerius c. chrysops</i>	1–9,11–18	C	I,II,III	M,R,PS,H
Marble-faced Bristle-Tyrant	<i>Phylloscartes o. ophthalmicus</i>	1–3,5,7–9,13,17,18	FC	I,II	M,R,PS,H
Rufous-browed Tyrannulet	<i>Phylloscartes supercilialis</i>	1–5,7–9,13–15,17,18	FC	I,II	M,R,PS,H
Streak-necked Flycatcher	<i>Mionectes striaticollis columbianus</i>	1–3,8,10,15,16	C	I,II	M,R,PS,H
Olive-striped Flycatcher	<i>Mionectes olivaceus hederaceus</i>	1,4,6–9,13,15,16,18	C	I,II	M,PS
Ochre-bellied Flycatcher	<i>Mionectes oleagineus</i>	4,7,11	SC	I,II	PS,H
Slaty-capped Flycatcher	<i>Leptopogon supercilialis poliocephalus</i>	1,3–5,7,8,13,15,18	FC	I,II,III	M,R,PS,H
Ornate Flycatcher	<i>Myiobicus ornatus stellatus</i>	2–9,12,13,16–18	FC	I,II	M,R,PS,H
Scale-crested Pygmy-Tyrant	<i>Lophotriccus pileatus hesperius</i>	1–11,13–18	C	I,II	M,R,PS,H
Pearly-vented Tody-Tyrant	<i>Hemitriccus margaritaceiventer</i>	3,10	SC	II	R,S,H
Common Tody-Flycatcher	<i>Todirostrum cinereum</i>	4,5,7–9,11,13,14,17	SC	III	S,H
Fulvous-breasted Flatbill	<i>Rhynchocyclus fulvipectus</i>	2,5,7,9	SC	I	M,PS
White-throated Spadebill	<i>Platyrinchus mystaceus neglectus</i>	2–9,18	FC	I	M,R,PS,H
Orange-crested Flycatcher	<i>Myiophobus phoenicomitra litae</i>	7	SC	I	M,PS
Tawny-breasted Flycatcher	<i>Myiobius v. villosus</i>	5,7,18	SC	I	M,PS
Cinnamon Flycatcher	<i>Pyrrhomyias cinnamomeus pyrrhopterus</i>	1–3,8,9,17	U	I,II	M,R,PS,H

APPENDIX 1. Continued.

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Acadian Flycatcher ⁶	<i>Empidonax virens</i>	4,7,8,13,18	FC	I,II,III	M,PS
Willow Flycatcher ⁶	<i>Empidonax trailli</i>	13	SC	I,II,III	M,PS
Alder Flycatcher ⁶	<i>Empidonax alnorum</i>	2–5,7	SC	I,II,III	M,PS
Olive-sided Flycatcher ⁶ (NT)	<i>Contopus cooperi</i>	3,6–9	SC	I,II,III	R,S,H
Smoke-colored Pewee	<i>Contopus fumigatus ardosiacus</i>	2,3,7,9,16	U	I,II	M,R,PS,H
Eastern Wood-Pewee ⁶	<i>Contopus virens</i>	3–8,13,17,18	FC	II,III	R,PS,H
Western Wood-Pewee ⁶	<i>Contopus sordidulus</i>	7	SC	II,III	R,H
Black Phoebe	<i>Sayornis nigricans</i>	1,4,6–9,13,15,17,18	C	3,4	S,H
Vermillion Flycatcher	<i>Pyrocephalus rubinus</i>	4	SC	III	S
Rufous-tailed Tyrant	<i>Knipolegus poecilurus</i>	3	SC	II	R,PS,H
Cattle Tyrant	<i>Machaetornis rixosa</i>	7–9,11	FC	III	S,H
Piratic Flycatcher	<i>Legatus leucophaeus</i>	5,7,8	SC	II	H
Rusty-margined Flycatcher	<i>Myiozetetes cayanensis</i>	3–10,13,14	C	III	R,PS,H
Great Kiskadee	<i>Pitangus sulphuratus</i>	1,4,8,9	U	III	R,S,H
Lemon-browed Flycatcher	<i>Conopias cinchoneti</i>	18	X	II	S
Golden-crowned Flycatcher	<i>Myiodynastes chrysocephalus minor</i>	1–9,13,18	FC	I,II	R,PS,H
Streaked Flycatcher	<i>Myiodynastes maculatus</i>	5,7–9	U	II,III	R,S,H
Fork-tailed Flycatcher	<i>Tyrannus savanna</i>	1–9,11,13	FC	III	S,H
Tropical Kingbird	<i>Tyrannus melancholicus</i>	1–16,18	C	II,III	R,PS,H
Rufous Mourner	<i>Rhytipterna holerythra</i>	7	SC	I	S
Dusky-capped Flycatcher	<i>Myiarchus t. tuberculifer</i>	1–5,7–9,13,18	FC	I,II	M,R,PS,H
Pale-edged Flycatcher	<i>Myiarchus cephalotes cauae</i>	1–3,5–9,13,16–18	FC	I,II	M,R,PS,H
Great Crested Flycatcher ⁵	<i>Myiarchus crinitus</i>	13	X	II	M,PS
Bright-rumped Attila	<i>Attila spadiceus sclateri</i>	2–5,7,8	FC	I,II	M,R,PS,H
Oxyruncidae					
Sharpbill	<i>Oxyruncus cristatus</i>	18	X	I	M,P
Cotingidae					
Golden-breasted Fruiteater	<i>Pipreola a. aureopectus</i>	2,3,8,9	U	I,II	M,R,PS,H
Chestnut-capped Piha (EN)	<i>Lipaugus weberi</i>	2–9,11–18	FC	I,II	M,R,PS,H
Purple-throated Fruitcrow	<i>Querula purpurata</i>	2,3,5,7,18	U	I,II	M,R,PS,H

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Red-ruffed Fruitcrow	<i>Pyroderus scutatus occidentalis</i>	2,3,9	U	I,II	R,P,S,H
Pipridae					
Golden-winged Manakin	<i>Masius chrysopterus bellus</i>	1–3,5,7–9,11,16	FC	I,II	M,R,P,S,H
Striped Manakin	<i>Machaeropterus regulus antioquiiae</i>	4,7,9,10,18	U	I,II	M,R,P,S,H
Blue-crowned Manakin	<i>Lepidothrix coronata</i>	18	X	II	S
White-bearded Manakin	<i>Manacus manacus abditivus</i>	2,9	SC	II	M,P,H
Green Manakin	<i>Xenopipo holochlora litae</i>	18	X	I	M,P
Yellow-headed Manakin (NT)	<i>Xenopipo flavicapilla</i>	2	U	I	M,P
White-crowned Manakin	<i>Pipra pipra bolivari</i>	4–7,9,10,13,18	C	I,II	M,R,P,S,H
Golden-headed Manakin	<i>Pipra erythrocephala</i>	5,18	X	I	P
Tityridae					
Masked Tityra	<i>Tityra semifasciata columbianus</i>	7,9,10	SC	II	P,S,H
Thrush-like Schiffornis	<i>Schiffornis turdina panamensis</i>	18	X	I	M,P,H
Barred Becard	<i>Pachyramphus v. versicolor</i>	2,3,9,10,16–18	U	I,II	R,P,S,H
Cinereous Becard	<i>Pachyramphus r. rufus</i>	7,13	U	II	M,P,S
Cinnamon Becard	<i>Pachyramphus cinnamomeus</i>	3,4,6,7,10,18	FC	II,III	R,S,H
White-winged Becard	<i>Pachyramphus polychopterus cinereiventris</i>	1–8,16,18	FC	I,II	M,R,P,S,H
Incerta Sedis 1					
Wing-barred Piprites	<i>Piprites chloris antioquiiae</i>	2,3,5–8,16–18	FC	I,II	M,R,P,S,H
Vireonidae					
Black-billed Peppershrike	<i>Cycularbis nigrirostris</i>	1–5,7–9	FC	I,II	R,P,S,H
Yellow-browed Shrike-Vireo	<i>Vireolanus eximius</i>	7,10	U	I	R,S,H
Yellow-throated Vireo ⁶	<i>Vireo flavifrons</i>	5	X	II	S
Brown-capped Vireo	<i>Vireo l. leucophrys</i>	1–3,8,18	FC	I,II	M,R,P,S,H
Red-eyed Vireo ⁶	<i>Vireo olivaceus</i>	2,8,13,18	SC	II	R,P,S,H
Rufous-naped Greenlet	<i>Hylophilus semibrunneus</i>	1–9,13,18	C	I,II	M,R,P,S,H
Corvidae					
Black-chested Jay	<i>Cyanocorax affinis</i>	1,2,4,5,8–10,18	U	II,III	R,S,H
Green Jay	<i>Cyanocorax yncas galeatus</i>	1–10,13,16–18	C	I,II	M,R,P,S,H
Hirundinidae					

APPENDIX 1. Continued.

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Blue-and-white Swallow	<i>Pygocbelidon cyanoleuca</i>	1–9,11–13,16–18	FC	III,V	S,H
White-thighed Swallow	<i>Atticora tibialis minima</i>	6–8	U	II,V	M,R,P,S,H
Southern Rough-winged Swallow	<i>Stelgidopteryx ruficollis</i>	1–18	C	III,V	R,P,S,H
Gray-breasted Martin	<i>Progne chalybea</i>	7	U	IS,V	S
Troglodytidae					
Scaly-breasted Wren	<i>Microcerculus marginatus</i>	7,9,10	U	I	R,S,H
House Wren	<i>Troglodytes aedon striatulus</i>	1–9,11–14,17,18	FC	II,III	M,R,P,S,H
Sooty-headed Wren	<i>Thryothorus spadix</i>	1–10,13,15–18	C	I,II	M,R,P,S,H
Whiskered Wren	<i>Thryothorus mystacalis</i>	1	SC	II,III	H
Bay Wren	<i>Thryothorus nigricapillus</i>	5–7,9,15,18	U	II,IV	R,S,H
Gray-breasted Wood-Wren	<i>Henicorbina l. leucophrys</i>	2–18	FC	I,II	M,R,P,S,H
Song Wren	<i>Cypborhinus phaeocephalus</i>	7	X	I	H
Poliopitilidae					
Long-billed Gnatwren	<i>Rampbocaenus melanurus griseodorsalis</i>	1,7,9	U	I,II	M,R,P,S,H
Turdidae					
Andean Solitaire	<i>Myadestes ralloides plumbeiceps</i>	1–3,6–9,16,18	FC	I,II	M,R,P,S,H
Gray-cheeked Thrush ⁶	<i>Catbarus minimus</i>	5,7–9,13,16,18	U	I,II	P,S,H
Swainson's Thrush ⁶	<i>Catbarus ustulatus</i>	1–5,7–10,13,15,18	C	I,II,III	R,P,S,H
Pale-eyed Thrush	<i>Turdus leucops</i>	3,5,7–9,13,15,18	FC	I,II	M,R,P,S,H
Great Thrush	<i>Turdus fuscater quindio</i>	1–3,6,8,9,11,12,14–17	FC	II,III	M,R,P,S,H
Glossy-black Thrush	<i>Turdus serranus</i>	2,3,9,16	SC	I	S
Black-billed Thrush	<i>Turdus i. ignobilis</i>	1–9,13	FC	II,III	R,P,S,H
Pale-vented Thrush	<i>Turdus o. obsoletus</i>	7	SC	I,II	M,P,S
Mimidae					
Tropical Mockingbird	<i>Mimus gilvus tolimensis</i>	1–9,13	FC	III	M,R,P,S,H
Thraupidae					
Black-faced Tanager	<i>Schistochlamys melanopsis</i>	1,3,6–9,12–14,17,18	U	II,III	S
Oleaginous Hemispingus	<i>Hemispingus f. frontalis</i>	2,3,8,9	FC	I,II	M,R,P,S,H
White-lined Tanager	<i>Tachyphonus rufus</i>	1,2,5	U	III	S,H
Crimson-backed Tanager	<i>Rampbocelus dimidiatus</i>	1–10,12,13,15,17	FC	III	S,H

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Flame-rumped Tanager	<i>Ramphocelus flammigerus icteronotus</i>	4,6–14,17,18	FC	III	S,H
Blue-gray Tanager	<i>Thraupis episcopus canus</i>	1–14,17,18	FC	II,III	R,P,S,H
Palm Tanager	<i>Thraupis palmarum atripennis</i>	1,3–5,7–11,13,17,18	FC	II,III	R,P,S,H
Black-and-gold Tanager (VU)	<i>Bangsia melanochlamys</i>	8,9,16–18	U	I,II	M,R,P,S,H
Blue-winged Mountain-Tanager	<i>Anisognathus somptuosus antioquiae</i>	1–4,6,8,9,18	FC	I,II,III	M,R,P,S,H
Purplish-mantled Tanager (NT)	<i>Iridosornis porphyrocephalus</i>	1–3,6–9,15–18	FC	I,II,III	M,R,P,S,H
Multicolored Tanager (VU)	<i>Chloroceryza nitidissima</i>	2,3,5,7–9	U	I,II	M,R,P,S,H
Golden Tanager	<i>Tangara arthus occidentalis</i>	1–5,7–9,11–18	C	I,II	M,R,P,S,H
Silver-throated Tanager	<i>Tangara i. icterocephala</i>	2,3,7,8	FC	I,II	M,R,P,S,H
Saffron-crowned Tanager	<i>Tangara xanthocephala</i>	3	X	II	S
Speckled Tanager	<i>Tangara guttata tolimae</i>	3–10,13,14,18	U	I,II	M,R,P,S,H
Bay-headed Tanager	<i>Tangara gyrola delecticia</i>	1,3–5,7–9,13,14,17,18	FC	I,II,III	M,R,P,S,H
Scrub Tanager	<i>Tangara vitriolina</i>	1–9,11–14,16,17	FC	II,III	R,P,S,H
Blue-necked Tanager	<i>Tangara cyanicollis granadensis</i>	1–5,7–9,11–13,14,17	U	II,III	M,R,P,S,H
Blue-necked Tanager	<i>Tangara nigroviridis consobrina</i>	1–9,11,13–18	FC	I,II	M,R,P,S,H
Black-capped Tanager	<i>Tangara heinei</i>	1–5,7,8,11,13,16–18	FC	II,III	M,R,P,S,H
Purple Honeycreeper	<i>Cyanerpes caeruleus microrhynchus</i>	7,18	SC	I	M,P,S
Green Honeycreeper	<i>Chlorophanes spiza</i>	9	SC	I,II	S
Guira Tanager	<i>Hemithraupis guira guirina</i>	2–5,7–9,13,18	U	I,II	M,P,S
Scarlet-and-white Tanager	<i>Chrysothlypis salmomi</i>	7,15,18	FC	I,II	M,R,P,S,H
Rusty Flowerpiercer	<i>Diglossa sittoides dorbignyi</i>	1–3	U	II,III	M,R,P,S,H
Indigo Flowerpiercer	<i>Diglossa indigotica</i>	8,9,16–18	SC	I,II	M,R,P,S,H
Incerta Sedes 2					
Common Bush-Tanager	<i>Chlorospingus ophthalmicus nigriceps</i>	1,2	U	II	P,S
Yellow-throated Bush-Tanager	<i>Chlorospingus f. flavigularis</i>	2–4,7–10,13,15–18	C	I,II	M,R,P,S,H
Bananaquit	<i>Coereba flaveola columbiana</i>	1–9,11,13,15–18	C	I,II,III	R,P,S,H
Yellow-faced Grassquit	<i>Tiaris olivaceus</i>	1–13,17	C	II,III	R,P,S,H
Dull-colored Grassquit	<i>Tiaris o. obscurus</i>	5	SC	II	M,P,S
Buff-throated Saltator	<i>Saltator maximus</i>	4,5,7–10,13	FC	II,III	R,P,S,H
Black-winged Saltator	<i>Saltator a. atripennis</i>	1–9,12,13,17,18	FC	I,II	M,R,P,S,H

APPENDIX 1. Continued.

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Grayish Saltator	<i>Saltator coerulescens</i>	7–9	U	II,III	S
Streaked Saltator	<i>Saltator striatipectus</i>	1,4,5,9	FC	II,III	R,S,H
Emberizidae					
Rufous-collared Sparrow	<i>Zonotrichia capensis costaricensis</i>	1–9,11–14,16–18	C	II,III	M,R,PS,H
Slaty Finch	<i>Haplospiza r. rustica</i>	15	SC	I	M,R,PS,H
Saffron Finch	<i>Sicalis flaveola</i>	6–8	SC	III	S,H
Blue-black Grassquit	<i>Volatinia jacarina</i>	3–5,7–9,13,14	U	III	S,H
Slate-colored Seedeater	<i>Sporophila scbistacea</i>	9,16	SC	II	S
Variable Seedeater	<i>Sporophila corvina</i>	10	X	III	S
Yellow-bellied Seedeater	<i>Sporophila nigricollis</i>	1,3–9,13	C	II,III	R,PS,H
Ruddy-breasted Seedeater	<i>Sporophila minuta</i>	7–9,11,13,17,18	U	III	S
Thick-billed Seed-Finch	<i>Oryzoborus funereus ochrogyne</i>	5,7,10,13,15	U	I	M,PS
Black-striped Sparrow	<i>Arremonops conirostris</i>	4–9,13,17,18	FC	III	R,S,H
Chestnut-capped Brush-Finch	<i>Arremon brunneinucha frontalis</i>	1–9,11,13,17,18	FC	I,II	M,R,PS,H
Stripe-headed Brush-Finch	<i>Arremon torquatus atricapillus</i>	5,7,9	U	II	M,R,PS,H
White-naped Brush-Finch	<i>Atlapetes albinucha gutturalis</i>	1–9,13,15,16,18	FC	II,III	M,R,PS,H
Cardinalidae					
Summer Tanager ⁶	<i>Piranga rubra</i>	1–5,6,8,9,12,13,17,18	FC	I,II,III	PS,H
Scarlet Tanager ⁶	<i>Piranga olivacea</i>	8,13,18	FC	II	P
White-winged Tanager	<i>Piranga leucoptera venezuelae</i>	2,3,5,7–9,15,18	U	I,II	M,R,PS,H
Sooty Ant-Tanager (NT)	<i>Habia gutturalis</i>	7	X	I	M,R,S,H
Crested Ant-Tanager	<i>Habia cristata</i>	18	SC	I,IV	R,S,H
Lemon-spectacled Tanager	<i>Chlorothraupis olivacea</i>	7	X	I	S
Rose-breasted Grosbeak ⁶	<i>Pheucticus ludovicianus</i>	2–5,13,18	U	II,III	PS
Blue-black Grosbeak	<i>Cyanocompsa c. cyanoides</i>	5,7,10	U	I,II	M,R,PS,H
Parulidae					
Golden-winged Warbler ⁶ (NT)	<i>Vermivora chrysoptera</i>	4,5,8,9,16	U	I	S
Tennessee Warbler ⁶	<i>Vermivora peregrina</i>	3,5,8	U	I,II	PS
Tropical Parula	<i>Parula pitiayumi</i>	7,9	U	II,III	S
Bay-breasted Warbler ⁶	<i>Dendroica castanea</i>	2,4,5,7,13,17	FC	II	PS

English names ¹	Scientific names ²	Localities	Abundance ³	Habitats ⁴	Evidence ⁵
Blackburnian Warbler ⁶	<i>Dendroica fusca</i>	1–9,11–14,16–18	C	I,II,III	PS
Yellow Warbler ⁶	<i>Dendroica petechia</i>	6	U	II	S
American Redstart ⁶	<i>Setophaga ruticilla</i>	4	U	II	PS
Black-and-white Warbler ⁶	<i>Mniotilta varia</i>	1–5,7–9,11,16,18	FC	I,II	S
Northern Waterthrush ⁶	<i>Seiurus noveboracensis</i>	4,13	U	II,IV	PS
Mourning Warbler ⁶	<i>Oporornis philadelphia</i>	4,13,18	U	II	PS
Canada Warbler ⁶	<i>Wilsonia canadensis</i>	1–5,7,8,10,13,18	FC	I,II	PS
Slate-throated Redstart	<i>Myioborus miniatus ballux</i>	1–9,13,15–18	C	I,II,III	M,R,PS,H
Golden-crowned Warbler	<i>Basileuterus calicivorus</i>	7	SC	I,II	PS
Rufous-capped Warbler	<i>Basileuterus rufifrons mesochrysus</i>	3,4	U	II,III	M,PS
Three-striped Warbler	<i>Basileuterus tristriatus</i>	1–5,7–12,15–18	C	I,II	M,R,PS,H
Buff-rumped Warbler	<i>Phaeothlypis fulvicanda</i>	6,7,18	U	II,IV	R,S,H
Icteridae					
Russet-backed Oropendola	<i>Psarocolius angustifrons salmoni</i>	1–10,13,15–18	C	I,II,III	R,PS,H
Scarlet-rumped Cacique	<i>Cacicus uropygialis</i>	7,18	SC	I,II	R,S,H
Red-bellied Grackle (EN)	<i>Hypopyrrhus pyrohypogaster</i>	1–10,12,13,15–18	C	I,II,III	M,R,PS,H
Giant Cowbird	<i>Molothrus oryzivorus</i>	3,4,7,9	SC	III	S
Shiny Cowbird	<i>Molothrus bonariensis</i>	3,4,7,8,12,13	U	III	S,H
Fringillidae					
Andean Siskin	<i>Carduelis spinescens</i>	8	X	II	S
Yellow-bellied Siskin	<i>Carduelis</i> s. <i>xanthogastra</i>	2,3,7–9	U	II	M,R,PS,H
Lesser Goldfinch	<i>Carduelis psaltria</i>	1,4–9,13,16	FC	III	S,H
Thick-billed Euphonia	<i>Euphonia laniirostris</i>	4,8,9	U	III	S,H
Golden-rumped Euphonia	<i>Euphonia cyanocephala pelzelni</i>	5,7,13	SC	II	M,PS
Orange-bellied Euphonia	<i>Euphonia xanthogaster oressinoma</i>	1–10,13,15–18	C	I,II	M,R,PS,H
Blue-naped Chlorophonia	<i>Chlorophonia cyanea longipennis</i>	2,3,6,7,18	U	I	M,R,PS,H
Chestnut-breasted Chlorophonia	<i>Chlorophonia pyrrhophrys</i>	8,9,15	SC	I	S

¹Letters in parenthesis refer to the global IUCN Red List categories: EN = Endangered, VU = Vulnerable, NT = Near threatened.

²Subspecies names are given, when available, from identified specimens in the museum or from unambiguous identifications from other evidence.

³Relative abundance: C= common (more than 10 individuals per day and daily encounters), FC = fairly common (less than 10 individuals per day and daily or almost daily encounters), U = uncommon (found in small numbers and not daily in prime habitat), SC = scarce (only occasionally found in small numbers), X = single record.

⁴Habitat: I = forest interior, II = edges and gaps, III = young second growth, pastures, and cultivated areas, IV = riverine vegetation or water courses, V = aerial or soaring.

⁵Type of evidence: M = museum specimen, R: tape recording, P = photograph, S = sight record, H = vocalization heard and confidently identified.

⁶Nearctic migrant.

