

Birds, Nangaritza River Valley, Zamora Chinchipe Province, southeast Ecuador: Update and revision

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ABSTRACT: The remote Nangaritza Valley of southeast Ecuador has high bird diversity, combining Amazonian birds with species typical of eastern Andean slopes and foothills, a small number of taxa endemic to the Cordillera del Cóndor region of southern Ecuador and northern Peru, as well as a few forms from the dry Marañón valley region. Here, we update and review avifaunal records from the Nangaritza Valley, comparing them with the bird fauna of the Cordillera del Kutukú and making a brief assessment of bird conservation in the area. To date, 535 species are known to occur in the Nangaritza Valley, including eight species endemic or near endemic to the outer ridges and adjacent Andean slopes in southeast Ecuador and northeast Peru. Conservation perspectives in the area are not favorable owing to increasing deforestation, expansion of the agricultural frontier and mining concessions, which threaten eight regional endemic species.

INTRODUCTION

The Cordillera del Cóndor runs parallel to the Andes in southeast Ecuador and northeast Peru, just north of the Marañón River depression (Schulenberg and Awbrey 1997). The cordillera only holds a few peaks above 2,000 m (max. 3,197 m at 4°46'49" S, 78°54'53" W), and some passes are lower than 1,200 m. Parts of it are characterized by tall sandstone outcrops resembling the higher and wider tabletop tepui mountains of the Guianan plateau (Neill 2007). Main vegetation types include tall premontane forests, which cover lower elevations and a distinctive dense stunted forests and shrubland growing on poor soils on hill tops (Schulenberg and Awbrey 1997; Neill 2007). As a result, the Cordillera del Cóndor region has a very diverse avifauna, combining Amazonian species in low valleys, Andean taxa on higher slopes and hilltops, and some endemic species (Schulenberg and Awbrey 1997). Until recently, very little was documented about the birds of the Ecuadorian side of the Cordillera del Cóndor (Krabbe and Sornoza-Molina 1994; Schulenberg and Awbrey 1997; Balchin and Toyne 1998).

A remote area of the Cordillera del Cóndor, difficult to access until the early 1990s, was the Nangaritza River Valley (Figure 1) (Marín *et al.* 1992; Balchin and Toyne 1998). The first ornithological exploration of this valley was carried out by the Western Foundation of Vertebrate Zoology (WFVZ) in 1987 (Marín *et al.* 1992). Since then, other explorations have increased our knowledge of the avifauna of this region. In 1990, N. Krabbe and F. Sornoza surveyed a campsite at Chinapinza where 114 species were found (Krabbe and Sornoza-Molina 1994). Both studies found taxa formerly known only from Peru, such as Orange-throated Tanager *Wetmorethraupis sterrhopteron*,

Buff-browed Foliage-gleaner *Syndactyla rufosuperciliata cabanisi*, Bar-winged Wood-wren *Henicorhina leucoptera*, and Cinnamon-breasted Tody-Tyrant *Hemitriccus cinnamomeus* (Taczanowski 1875; Lowery and O'Neill 1964; Fitzpatrick and O'Neill 1979; Fitzpatrick *et al.* 1977). Then in 1993–1994, Conservation International's Rapid Assessment Program team explored two sites at the Nangaritza Valley, documenting 210 species (Schulenberg and Awbrey 1997). The Academy of Natural Sciences of Philadelphia (ANSP) collected at Chinapinza in 8–11 June 1993 (Ridgely and Greenfield 2001). In 1997, Balchin and Toyne (1998) surveyed six sites and published a list of 181 species, further increasing the Nangaritza bird list to 290 species. More recently, Aves y Conservación (BirdLife International in Ecuador) held eight expeditions (2000–2004) to the Cordillera del Cóndor, as part of a three-year exploratory effort covering the entire cordillera, including three sites along the Nangaritza Valley. Results have not been fully published yet, but see Navarrete *et al.* (2004), Ágreda *et al.* (2005) and Loaiza *et al.* (2005) for some information on sites along the cordillera. Additional recent explorations include work by Montalvo (2012) at several sites where mining exploration is beginning, and an expedition held in August 2012 to Cerro Plateado Biological Station (Krabbe *et al.* 2012).

Here, we update the bird list for the Nangaritza Valley, adding new records to the results of previous ornithological expeditions (Krabbe and Sornoza-Molina 1994, Schulenberg and Awbrey 1997, Balchin and Toyne 1998), along with more recent explorations carried out by NK (2007, 2008, 2010, unpubl.), FA (2003–2007, unpubl.), DMB (2009–2013, unpubl.), JFF (2007, 2012, unpubl.), a team formed by JFF, PP, GBJ, CR and EB (2009; Freile *et al.*

2011a), and a team led by NK (Krabbe *et al.* 2012). Further, we include unpublished sightings by several ornithologists and bird observers from Yankuam Lodge and surroundings (see Capper and Pereira 2007, and <http://nangaritzabirds.wetpaint.com/>).

MATERIALS AND METHODS

The Nangaritzza River has its source in Cordillera de Sabanillas in the Andes, and flows north along the Cordillera del Cóndor joining the larger Zamora River at Los Encuentros ($3^{\circ}45'43''$ S, $78^{\circ}39'13''$ W). Lower portions of the valley lie at ~ 800 – 900 m, and are ~ 8 – 10 km wide. The Nangaritzza Valley, as some other areas in the Cordillera del Cóndor, is characterized by the presence of tall rocky 'tepui', the tallest to 2,915 m on Cerro Plateado (IGM 1994).

On 1–3 and 7–10 April 2007, 10–12 February 2008, and 7 August 2010, NK (in 2008 with FA, with I. Samuels in 2010) explored at 1550–1750 m on Filo de Chumbiriatza, a tepui-like mountain 4.5 km southwest of Las Orquídeas, at $4^{\circ}15'32''$ S, $78^{\circ}41'05''$ W), making systematic dawn chorus audio-recordings and random observations and audio-recordings, mist-netting, and tissue collecting. In April 2009, JFF and colleagues carried out two expeditions to two 'tepui' protected by the local Asociación San Miguel de Las Orquídeas, one the same visited by NK and FA, but working as high as 1830 m; the other at Miazhi Alto ($4^{\circ}16'59''$ S, $78^{\circ}37'3''$ W, 1256–1300 m elevation (Freile *et al.* 2011a). At each site, 22 and 25 point-counts were established, respectively, and birds seen or heard for 10 consecutive minutes were counted; additionally, eight days of mist-netting and specimen collecting were performed.

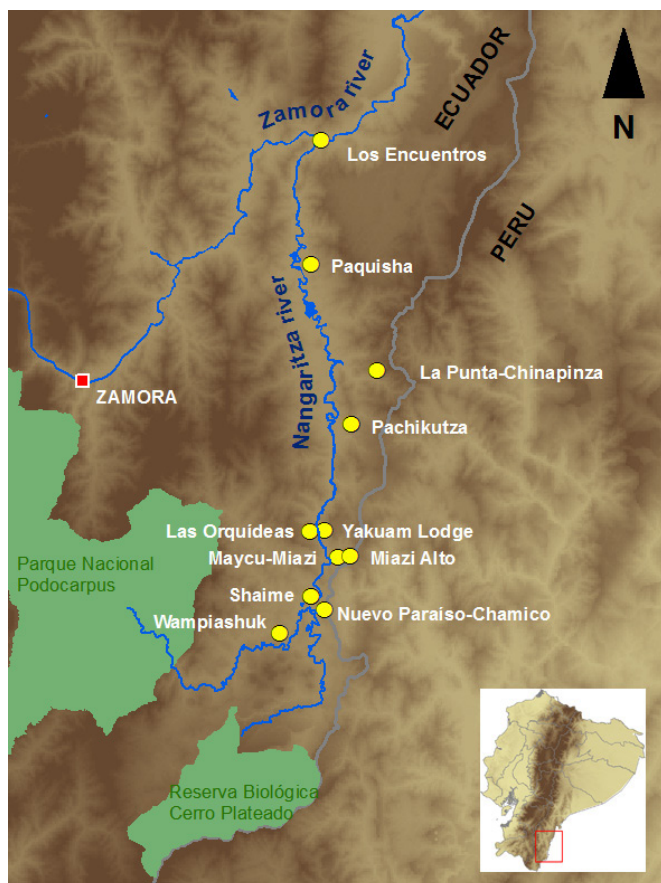


FIGURE 1. Map of surveyed sites in the Nangaritzza Valley, Zamora-Chinchipec, southeast Ecuador.

Tissue collected by NK is deposited in Zoological Museum, University of Copenhagen, and specimens taken by him are deposited in Museo Ecuatoriano de Ciencias Naturales (MECN), Quito. Bird specimens and audio-recordings procured by JFF, EB, CAR, GAB and PP were deposited at the Museo QCAZ de Zoología de Vertebrados, and the most remarkable ones were archived to www.xeno-canto.org (e.g., XC45910-45915). Our observations were combined with previous reports (Krabbe and Sornoza-Molina 1994; Schulenberg and Awbrey 1997; Balchin and Toyne 1998; Krabbe and Ahlman 2009; Solano-Ugalde and Real-Jibaja 2010), and additional unpublished records from seven sites along the valley obtained by experienced ornithologists and birdwatchers (see Acknowledgements).

Taxonomy of this updated checklist follows December 2012 classification by the South American Checklist Committee of the American Ornithologists Union (SACC, Remsen *et al.* 2012) and species authors and publication date are taken from the ITIS web site (<http://www.itis.gov>). Distribution extensions, either altitudinal or latitudinal, within an Ecuadorian context, were compared with those reported by Ridgely and Greenfield (2001, 2006) and updates carried out by Solano-Ugalde and Freile (2012).

RESULTS AND DISCUSSION

A total of 535 species have been recorded to date in the Nangaritzza Valley (Appendix 1), with new species being added to the list up to January 2013. Being a fairly remote area, only recently opened to ornithological exploration and bird tourism, we expect that new records will continue to emerge, including potentially new country records (e.g., Versicolored Barbet *Eubucco versicolor*, Olive Flycatcher *Mitrephanes olivaceus*; see Schulenberg *et al.* 2007). New altitudinal and latitudinal records from the Nangaritzza Valley are presented in Table 1. Noteworthy records are discussed below.

Gray Tinamou *Tinamus tao*. Tape recorded (CAR, PP) inside dense primary foothill forest (1300 m elevation) at Miazhi Alto campsite, and heard along the Maycu-Miazhi trail (FA). Few records exist along the eastern base of the Andes, two of them at the Cordillera del Cóndor region, north of Nangaritzza (Ridgely and Greenfield 2001).

Comb Duck *Sarkidiornis melanotos*. Two females were seen and photographed on 6 December 2011 at the Nangaritzza River near Shaimé (DMB). This is the first record of the species east of the Andes in Amazonian Ecuador (Freile *et al.* 2013).

Hoatzin *Opisthocomus hoazin*. A small flock of 10–12 birds was observed by N. Simpson, R. S. Ridgely, and F. Sornoza 1 km upstream of the Laberinto trail, along the Numpatakaime River. Two additional colonies were observed by JFF, T. Riera and M. Avilés along the same river, up to 1050 m (September 2012). These are the highest records of the Hoatzin in Ecuador, previously found up to 600 m in Ecuador (Ridgely and Greenfield 2001, 2006). The Numpatakaime is a black-water river, providing an igapó-like habitat, similar to that occupied by the species in the lowlands.

Rufescent and Cinnamon Screech-owls *Megascops ingens* and *M. petersoni*. Both collected by NK and ANSP between Chinapinza and La Punta; *M. petersoni* at 1700 m elevation, and *M. ingens* at 1400 and 1900 m. *M. petersoni*

was also recorded by JFF at Las Orquídeas between 1350–1500 m in dense foothill forest characterized by heavy loads of mosses, and J. Nilsson and NK found it at 1600 m on Cerro Plateado (unpubl. data). See Freile and Castro (2013) for a further discussion on syntopy between these species. It has been hypothesized that geographic replacement takes place between *M. petersoni* and *M. marshalli* of the south Peruvian and Bolivian Andes, the latter believed to replace *M. ingens* altitudinally where they co-occur (Fitzpatrick and O'Neill 1986).

Ocellated Poorwill *Nyctiphrynus ocellatus*. One female (ovary 5 × 3 mm) collected inside dense foothill forests above Miazi in April 2009, at 1230 m represents the highest elevational record in Ecuador, where it had previously been found up to 500 m (Ridgely and Greenfield 2001); reported to 1300 m in Peru (Schulenberg *et al.* 2007). Additionally, it represents a range extension in Ecuador to southern Zamora Chinchipe, roughly 200 km south of the range hypothesized by Ridgely and Greenfield (2006).

Ecuadorian Piedtail *Phlogophilus hemileucurus*. Fairly common in April 2009 at Las Orquídeas 'tepui', where observed up to 1830 m elevation feeding at a *Tillandsia* sp. bromeliad, and aggressively chased and displaced by a male Royal Sunangel *Heliangelus regalis* (Freile *et al.* 2011b). There is a single additional record from the Nangaritzza area, of one bird observed at the Shaimi trail (FA).

Orange-breasted Falcon *Falco deiroleucus*. On 14 December 2010 a vocalizing adult was observed flying over the Nangaritzza River near Shaime. On 6 December 2011 an adult was seen perched and also observed hunting at the same location (DMB).

Military Macaw *Ara militaris*. There are only a few records from the Nangaritzza Valley. Observations by FA nearby Yankuam (4–5 birds flocking in Miazi canyon, March 2008), above Labyrinth Trail (along the Numpatakaima River) by R. S. Ridgely, L. Navarrete and FA (April 2008), and by PP above Miazi Alto campsite in April 2009. On 14 December 2010 a flock of 25 individuals was observed and audio-recorded from the road above Miazi and on 5 December 2011 a number of birds were heard near Miazi (DMB). The species occurs along the entire eastern Andes of Ecuador, but is rare and local; these are the first records for the Nangaritzza Valley and the Ecuadorian portion of Cordillera del Cóndor (Ridgely and Greenfield 2001). The species is likely experiencing a sustained population decline (BirdLife International 2012).

White-breasted Parakeet *Pyrrhura albipectus*. First found in the region at Chinapinza (Krabbe and Sornoza-Molina 1994), where fairly common. Balchin and Toyne (1998) found it further south, in forested slopes above Wampiashuk and above Shaimi communities. However, later visits to Shaimi produced no observations of this globally Vulnerable parakeet (BirdLife International 2012). Whether it disappeared from the mid sector of Nangaritzza Valley remains to be determined. In August 2012 NK observed a small flock at 1630 m in the lower parts of Cerro Plateado, recently declared a biological reserve.

Hairy-crested Antbird *Rhegmatorhina melanosticta*. On 13 December 2010 two birds were briefly observed with Bicolored Antbird *Gymnopithys leucaspis* at an

antswarm along the cut-off road to Shaime (DMB). The following morning, its song was audio-recorded in the same general area. On 5 December 2011 an adult male was photographed and audio-recorded by DMB above Miazi. The latter showed a chestnut crown, not creamy white as in the nominate race. An additional photograph taken by J. M. Loaiza (unpubl. report) at Centro Shuar Yawi (2003) confirms that race *brunneiceps* occurs in the area. These are the first records of *brunneiceps* for Ecuador, known from nearby Peru, in Loreto and Amazonas department.

Strong-billed Woodcreeper *Xiphocolaptes promeropirhynchus*. Two forms of this variable species were recorded, *compressirostris* on upper slopes (Chinapinza) and possibly *orenocensis* in the foothills. Further work is needed to solve the intricate taxonomy of the species. These taxa belong to two 'species groups': one from the Andes/northern South America, and one from the Amazon basin. Some authors have treated these groups as separate species (e.g., Hellmayr 1929).

Foothill Elaenia *Myiopagis olallai*. A single bird taped by NK at Shaimi trail represents the southernmost locality in Ecuador. There are only few records of this recently described species (Coopmans and Krabbe 2000).

Highland Elaenia *Elaenia obscura*. A single bird observed at close range by JFF foraging alongside a mixed species flock at 1680 m elevation at Las Orquídeas 'tepui'. Habitat was stunted shrubland, with canopy at 6–8 m height. Identified by general pattern, behavior typical of *Elaenia* but rounded head, no coronal patch, bill short and stubby (Ridgely and Greenfield 2001, Schulenberg *et al.* 2007). Previously recorded between 2150–3000 m in the southern Andes.

Rufous-browed Tyrannulet *Phylloscartes superciliaris*. Singles or pairs observed fairly frequently at Las Orquídeas 'tepui', above 1400 m elevation, foraging at subcanopy (8–12 m height) with mixed species flocks. Also observed at Chinapinza (Krabbe and Sornoza-Molina 1994) and Cerro Plateado (Krabbe *et al.* 2012).

Buff-throated Tody-tyrant *Hemitriccus rufigularis*. Only three records exist from the Nangaritzza area: one collected at Pachicutza (the first Ecuadorian specimen; Ridgely and Greenfield 2001), one reported by Schulenberg and Awbrey (1997) from Miazi, and one observed by JFF at Las Orquídeas 'tepui' (1450 m). The latter bird was silent and quite lethargic. In Ecuador the species has been recorded only from the outlying ridges east of the Andes (Pan de Azúcar, Sumaco, Cordillera de Kutukú, Cordillera del Cóndor) (Ridgely and Greenfield 2001, Krabbe and Nilsson 2003).

Cinnamon-breasted Tody-tyrant *Hemitriccus cinnamomeipectus*. Uncommon at Chinapinza, with additional records from Las Orquídeas 'tepui' above 1600 m elevation, and Cerro Plateado at 1800–2000 m. At Las Orquídeas JFF only observed three birds perching lethargically and silently in dense undergrowth; one apparently loosely and momentarily associated with a large mixed species flock. On 7 August 2010 three single, strongly territorial birds were observed and tape-recorded at 1675, 1700 and 1725 m (NK) at the same 'tepui'. Additionally, the species was found to be fairly common on Cerro Plateado in August 2012, with two birds heard simultaneously at 2000 m and three at 1800 m (NK and J.

Nilsson). Our records are the third and fourth localities in Ecuador, where also known from a recent record at Naytza ridge, north of Cordillera del Cóndor (Ágreda *et al.* 2005).

Roraiman Flycatcher *Myiophobus roraimae*. First observed at Las Orquídeas 'tepui' by FA in 2006. In April 2007 NK observed and audio-recorded at least four individuals here, and in 2009 JFF observed two birds inside dense foothill forest, foraging at 3–6 m height, and once associated with a subcanopy flock. These are the second and third records in Ecuador, where also known from Cordillera de Kutukú (Robbins *et al.* 1987). Ridgely and Greenfield (2001) cited a record from Chinapinza, but a reexamination of the collected specimen reveals it to be a misidentified *M. flavicans* (N. Rice *pers. comm.*). Two unconfirmed records at 1700 and 1750 m on Cerro Plateado (NK).

Sharpbill *Oxyruncus cristatus*. First found at the Nangaritza Valley by T. A. Parker and A. Luna at Miazi (Schulenberg and Awbrey 1997), with recent records at Las Orquídeas 'tepui' and at Miazi Alto (FA, JFF, PP, GAB), and a specimen collected by A. Sornoza in 9 November 2002 (adult male MECN 7909) at Hito 19, near Peruvian border (03°38'2.39" S, 78°25'55.2" W, 1344 m). In April 2009 it was fairly common at Las Orquídeas and Miazi Alto (eight and five records in daily point counts, respectively). These are the third to fifth localities in Ecuador (Ridgely and Greenfield 2006). High vocal activity was noted. Observed in canopy and subcanopy feeding in mixed species flocks, inspecting hanging dead leaves and gleaning the frontal part of large and broad leaves of epiphytes, hanging from the leaf's petiole or briefly hovering in front of them.

White-crowned Manakin *Dixiphia pipra*. Collected at Chinapinza (1425 m) (MECN), Miazi Alto (up to 1250 m) and Las Orquídeas 'tepui' (1230–1700 m). At the latter site it was fairly common and regular with mixed species flocks, and over 30 individuals were netted and four specimens collected: two immature males and one female (QCAZ 3350, 3393, 3402) with entirely grey crown and a suffusion of grey and olive in their underparts, and one young male (QCAZ 3342) yellowish olive below, with little grey (and paler) in crown.

Several subspecies of *D. pipra* are known from western South America, but the geographic distribution, vocalizations and display behavior of some taxa are not well known to date (Kirwan and Green 2011). Ridgely and Greenfield (2001) referred all Ecuadorian specimens to *D. p. coracina*, apparently overlooking that lowland birds resemble vocally (and presumably also in plumage) *D. p. discolor* of immediately adjacent Peru, and that populations in Andean foothills and Amazon lowlands likely differ in voice (and in plumage and display behavior).

NK had recorded calls of females and young at the Nangaritza Valley in 2007, but male song was first audio-recorded in October 2010 by J. Nilsson, who immediately noted that it was different from song of *D. p. coracina*, and again by A. Spencer in August 2011 (XC86207, 86357-8). A comparison of Ecuadorian with Peruvian recordings (MLNS 17454, 17461, 42071, 163854) reveals that Nangaritza birds vocalize like *D. p. occulta*, previously known only from the northern Peruvian Andes (south of the Marañón River; T. S. Schulenberg, *in litt.*). It is presumably replaced geographically by *D. p. coracina* somewhere in the foothills

of southern Ecuador or extreme northern Peru. The southernmost audio recording we can find of *D. p. coracina* is from the Andean slope near Macas in Morona-Santiago (Krabbe and Nilsson 2003), but specimens from the foothills north of Marañón River are referable to *coracina* too (T. S. Schulenberg, *in litt.*). A further discussion of vocal variation in some subspecies was posted at www.xeno-canto.org by A. Spencer.

Lek behavior of most forms of *D. pipra*, including *occulta*, *discolor*, and *coracina* remains undescribed. Only that of isolated *cephaleucos* of coastal Brazil (probably specifically distinct) is described in detail (Castro-Astor *et al.* 2007). A lek of *occulta* at 1650 m on Las Orquídeas 'tepui', briefly studied by JFF, was located at a small forest gap produced by a fallen tree, and had three adult males, as judged by simultaneous vocalizations. The only visible male performed short and direct flights between thin, horizontal, leafless branches, repeatedly using the same eight perches 0.25–4 m apart. Observed behaviors were reminiscent of the turning-around display, to-and-fro flights, and about-face behaviors described for *cephaleucos* by Castro-Astor *et al.* (2007). Five female-plumaged individuals perched nearby performed repetitive and direct movements between the closest 2–3 branches. Distances between these birds were 0.15–1 m. These displays were likely a combination of behaviors described for collective display sites and regular (individual) display sites by Castro-Astor *et al.* (2007). All individuals (adult males and female-plumaged birds) were at seemingly visual-contact distance, and displays included fairly intense vocalization, as described for collective displays (Castro-Astor *et al.* 2007). However, display behaviors observed were simpler than the jumps and flights described by these authors for a collective display. First, several perches were used, not a single central vine. Second, behaviors used in collective displays in eastern Brazil were not observed (even though female-plumaged birds, which were only randomly observed, might have performed some low jumps and turnarounds). Lastly, spatial organization observed does not fit with the dispersed lek described by Castro-Astor *et al.* (2007), as well as previous authors (Snow 1961; Théry 1992).

Bar-winged Wood-wren *Henicorhina leucoptera*. Common at Chinapinza (above 1700 m elevation), Las Orquídeas (above 1500 m), and Cerro Plateado (1600–2600 m). Krabbe and Sornoza-Molina (1994) collected both this species and Grey-breasted Wood-wren *H. leucophrys* in the same nets at 1700 m in Chinapinza. *Henicorhina leucophrys* has not been found elsewhere in the Nangaritza Valley, except at the very head of the valley, near La Canela and on Cerro Plateado, where NK, A. Sornoza and J. Nilsson found it to replace *H. leucoptera* in forest growing on all other substrates than sandstone. White-breasted Wood-wren *H. leucosticta* occurs at lower elevations in the region, mostly up to 1000–1100 m, but as high as 1250 m in Miazi Alto (CAR, PP, EB). At Las Orquídeas 'tepui' *H. leucosticta* ranges up to 1100 m, leaving a 400 m altitudinal belt where apparently no *Henicorhina* species regularly thrives. The ridgetop at Miazi Alto only reaches 1300 m altitude and *H. leucoptera* is absent from this 'tepui', probably allowing *H. leucosticta* to range a little higher by competitive release.

Red-crested Finch *Coryphospingus cucullatus*. A

TABLE 1. Altitudinal and latitudinal range extensions in Ecuador of birds found in the Nangaritza Valley, Zamora-Chinchipec, southeast Ecuador.

SPECIES	RANGE EXTENSION	PREVIOUS RANGE
<i>Tinamus major</i>	southwards	south to S Morona-Santiago
<i>Sarkidiornis melanotos</i>	first Amazonian record in Ecuador	locally in southwest Ecuador; north Amazonia in Peru.
<i>Aramides calopterus</i>	southwards	Scarce records south to Morona-Santiago
<i>Megascops petersoni</i>	1,350 m	up to 1,700 m
<i>Glaucidium brasilianum</i>	southwards	south to S Morona-Santiago
<i>Nyctiphrynus ocellatus</i>	1,230 m and southwards	up to 500 m; south to C Morona-Santiago
<i>Antrostomus rufus</i>	northwards	confined to Rio Mayo Valley, extreme SE Zamora-Chinchipec
<i>Chaetura egregia</i>	1,850 m	up to 1,000 m
<i>Phaethornis malaris</i>	1,240 m	up to 1,000 m
<i>Doryfera johannae</i>	1,830 m	up to 1,400 m
<i>Discosura langsdorffi</i>	southwards	Scattered records south to N Morona-Santiago
<i>Phlogophilus hemileucurus</i>	1,830 m	up to 1,300 m
<i>Urochroa bougueri</i>	southwards	south to N Morona-Santiago
<i>Campylopterus largipennis</i>	1,300 m	up to 1,200 m
<i>Pharomachrus antisianus</i>	1,300 m	down to 1,500 m
<i>Trogon rufus</i>	1,270 m	up to 700 m; south to S Morona-Santiago
<i>Electron platyrhynchum</i>	southwards	south to S Morona-Santiago
<i>Galbula cyanescens</i>	first modern country record	single specimen from Zamora Valley.
<i>Ramphastos tucanus</i>	1,200 m	up to 900 m; south to N Zamora-Chinchipec
<i>Piculus leucolaemus</i>	southwards	south to S Morona-Santiago
<i>Ibycter americanus</i>	1,200 m	up to 800 m; south to N Zamora-Chinchipec
<i>Falco deiroleucus</i>	southwards	c. 400 km south of southernmost confirmed record (W Napo prov.)
<i>Cymbilaimus lineatus</i>	1,250 m	up to 1,000 m
<i>Myrmotherula longicauda</i>	1,200 m	up to 1,000 m
<i>Terenura humeralis</i>	1,250 m	up to 600 m; south to C Morona-Santiago
<i>Schistocichla leucostigma</i>	1,550 m	up to 1,100 m
<i>Hylophylax naevius</i>	1,200 m	up to 1,000 m
<i>Willisornis poecilinotus</i>	1,250 m	up to 1,100 m
<i>Myrmothera campanisona</i>	1,300 m	up to 1,000 m
<i>Formicarius analis</i>	1,250 m	up to 1,000 m
<i>Xiphorhynchus ocellatus</i>	1,250 m	up to 800 m
<i>Xiphorhynchus guttatus</i>	1,300 m	up to 700 m
<i>Xenops minutus</i>	1,320 m	up to 900 m
<i>Automolus ochrolaemus</i>	1,250 m	up to 800 m
<i>Elaenia obscura</i>	1,680 m	down to 2,150 m; mostly Andes
<i>Corythopsis torquatus</i>	1,250 m	up to 1,000 m
<i>Phylloscartes poecilotis</i>	1,250 m	down to 1,500 m
<i>Myiornis albiventris</i>	northwards; first country record	c. 300 km north of northernmost locality in Peru (Brinkhuizen <i>et al.</i> 2013).
<i>Tolmomyias flaviventer</i>	1,300 m	up to 800 m
<i>Lathrotriccus euleri</i>	1,500 m	up to 1,300 m
<i>Colonia colonus</i>	1,250 m	up to 1,100 m
<i>Oxyruncus cristatus</i>	1,350 m	up to 900 m
<i>Snowornis subalaris</i>	1,650 m	up to 1,400 m
<i>Lipagus vociferans</i>	southwards	south to S Morona-Santiago
<i>Dixiphia pipra</i>	1,780 m	up to 1,500 m
<i>Ceratopipra erythrocephala</i>	1,200 m	up to 1,000 m
<i>Piprites chloris</i>	1,300 m	up to 1,100 m
<i>Vireolanius leucotis</i>	1,400 m	up to 1,100 m
<i>Hylophilus hypoxanthus</i>	1,250 m	up to 400 m; south to C Morona-Santiago
<i>Cyanocorax yncas</i>	1,220 m	down to 1,300 m
<i>Troglodytes solstitialis</i>	1,250 m	down to 1,500 m
<i>Henicorhina leucosticta</i>	1,250 m	up to 1,000 m
<i>Henicorhina leucoptera</i>	1,500 m	down to 1,700 m
<i>Turdus albicollis</i>	1,350 m	up to 1,100 m
<i>Hemispingus atropileus</i>	1,500 m	down to 2,250 m
<i>Iridosornis analis</i>	1,220 m	down to 1,400 m
<i>Tangara argyrofenges</i>	northwards	confined to Rio Mayo Valley, extreme SE Zamora-Chinchipec
<i>Tangara cyanotis</i>	1,300 m	down to 1,400 m
<i>Tangara mexicana</i>	1,200 m	up to 1,000 m
<i>Tangara schrankii</i>	1,250 m	up to 1,100 m
<i>Arremon aurantirostris</i>	1,250 m	up to 1,100 m
<i>Cyanocompsa cyanoides</i>	1,230 m	up to 1,000 m
<i>Dendroica castanea</i>	southwards	few records in N Andes
<i>Psarocolius decumanus</i>	1,200 m	up to 1,000 m

seemingly local population at Shaimi (seen and audio-recorded by NK in March 2007) represents the first record outside the Marañón Valley in the southern end of Zamora Chinchipe (Zumba region). Two pairs were observed by JFF at Wampiashuk (4°22'43" S, 78°42'22" W, 940 m) in September 2012. Spreading after deforestation might explain its presence in the Nangaritzza Valley. It has also been recently found at El Padmi, Zamora Chinchipe (3°43'07" S, 78°35'41" W) by M. Sánchez, outside the Zumba region, and observed in the valley of Zamora (a male photographed at Copalinga on 7 December 2010 by DMB).

Biogeographic patterns

Biogeographically, the avifauna of the Nangaritzza Valley combines Amazonian and Andean elements with a small number of endemics to the Cordillera del Cóndor and the Marañón Valley region (Table 2). A total of 245 (46 %) species of Amazonian distribution inhabit the lower portions of this valley, where several species reach higher altitudes than elsewhere in the Ecuadorian Amazon (e.g., *O. hoazin*, *N. ocellatus*). Further, 90 (17 %) species typically occurring in the eastern Andean slopes (above 1200 m) occupy the higher slopes of 'tepui' hills, whereas 148 (28 %) species of the Andean-Amazonian foothills (600–1200 m) range from the lower portion to mid-slopes, co-occurring with both Andean and Amazonian birds. A 6 % of species of Andean highlands are confined to the highest portions of Cerro Plateado region (above 2400–2500 m); eight species (1 %) are endemic or near endemic to outer ridges and adjacent Andean slopes in southeast Ecuador and northeast Peru, in the Andean Ridge-top Forests center of endemism (Stattersfield *et al.* 1998). Most regional endemics occur at high elevations in 'tepui' slopes and ridge tops, with the notable exception of the Orange-throated Tanager *Wetmorethraupis sterrhopteron* (see below). The combination of bird species from different geographic areas affect the low similarity in species composition of nearby localities within the Cordillera del Cóndor (Freile *et al.* 2011a).

Bird diversity and species composition in the Nangaritzza Valley is typical of the transitional zone between the Amazonian lowlands and the Andes (Fjeldså and Krabbe 1999, Pitman *et al.* 2002). Species composition is very similar to that of the larger Cordillera de Kutukú, 120–130 km north of Nangaritzza (Robbins *et al.* 1987; Fjeldså and Krabbe 1999, Krabbe and Sornoza-Molina 1994; Freile *et al.* 2011a).

Even though Kutukú is still insufficiently explored, 478 species have been recorded to date (Robbins *et al.* 1987, Fjeldså and Krabbe 1999, NK, unpubl.). Of these, 391 (63 %) species are shared between Kutukú and Nangaritzza, 90 species exclusive to Kutukú, and 139 species unique to Nangaritzza. Nonetheless, if we exclude species that occupy habitats seemingly absent in each area, species whose altitudinal ranges are absent in each area, and species not yet found in either area but very likely to occur, the number of truly absent species falls to 12 exclusive of the Nangaritzza and 3 to the Kutukú. Exclusive species are not necessarily endemic to either area, but are not expected to occur in both sites.

Of the 12 species absent from Kutukú, Rufous Nightjar

TABLE 2. Number of species occurring in the Nangaritzza Valley, southeast Ecuador, grouped according to their zoogeographic origins. Zoogeographic areas follow Ridgely *et al.* (1998), with every species assigned to a single category.

ZOOGEOGRAPHIC ORIGIN	SPECIES
Amazonian lowlands (<600 m. a.s.l.)	245
Andean-Amazonian foothills (600–1,200 m a.s.l.)	148
East Andean slopes (>1,200 m a.s.l.)	90
Andean highlands (>2,500 m a.s.l.)	35
Cordillera del Cóndor	8
Widespread residents and migrants	9

Antrorstomus rufus, *Elaenia obscura*, Hepatic Tanager *Piranga flava* and *Coryphospingus cucullatus* range in extreme southern Ecuador, in areas regularly drier than the east slope, and might have reached the Nangaritzza Valley after deforestation and due to geographic proximity to the drier Rio Mayo River valley and Andean valleys south of Loja. Buff-browed Foliage-gleaner *Syndactyla rufosuperciliata* and White-bellied Pygmy-Tyrant *Myiornis albiventris* range along the Peruvian Andes south to Bolivia, but in Ecuador only occur in the Cordillera del Cóndor region; the Bluish-fronted Jacamar *Galbula cyanescens* has a widespread distribution in south-west Amazonia but is confined to Zamora Chinchipe province in Ecuador; and Red-ruffed Fruitcrow *Pyroderus scutatus* is spottily distribution along the Andes, with the only population in east Ecuador occurring at Cordillera del Cóndor. *Wetmorethraupis sterrhopteron* is endemic to a small portion of the Cenepa and Nangaritzza river drainages, apparently not occurring north of the Zamora River. *Helianthus regalis*, *Hemitriccus cinnamomeipectus*, and *Henicorhina leucoptera* are endemic to the Cordillera del Cóndor of Ecuador and Peru, and adjacent ridges in northern Peru, but in Ecuador are confined to the Cordillera del Cóndor, south of the Zamora River. However, *H. cinnamomeipectus* was recently discovered north of the Zamora at the small Tayunts ridge, south of Kutukú (Ágreda *et al.* 2005). On the other hand, Maroon-tailed Parakeet *Pyrrhura melanura*, Pale-legged Hornero *Furnarius leucopus* and Wing-banded Wren *Microcerculus bambla* are seemingly truly absent from the Nangaritzza despite a rather wide distribution in the Amazon basin. The parakeet is often numerous and occurs in both mature forest and wooded cropland, and is unlikely to have been overlooked in the Nangaritzza Valley. The hornero is highly vocal and occurs in fairly open habitats, and is also unlikely to have been overlooked (Schulenberg *et al.* 2007).

Conservation

Endemic and nearly endemic species to the Cordillera del Cóndor region are all ranked as globally threatened or near-threatened mostly because of their tiny distribution ranges (BirdLife International 2012). The agricultural frontier is rapidly expanding towards the base of this cordillera, including the Nangaritzza Valley. Land use changes have resulted in the conversion of low-lying forested areas mainly into cattle pastures and *naranjilla* crops (*Solanum quitoense*). Else, timber extraction is in progress with most valued tree species already absent or very rare at the Nangaritzza.

Presently, nearly the entire Cordillera del Cóndor is

under concession to large-scale mining exploration and exploitation. Ongoing road building, including one that traverses the entire Nangaritza Valley and crosses to the Palanda-Zumba region in extreme southeast of Zamora Chinchipe Province, is already opening new colonization fronts. Further, expected mining exploitation (which comprise open pit mining) represents a serious threat to local conservation through water pollution, deforestation, loss of biodiversity, waste production, noise, increased colonization and associated social harms.

Under this scenario, local communities like Las Orquídeas, Shaimi, Miazi, Wampiashuk, Yayu, Yawi and others are motivated to preserve natural areas under their care. These areas include 'tepui' and slopes that embrace most habitats where species like *Heliangelus regalis*, *Hemitriccus cinnamomeipectus*, and *Henicorhina leucoptera* are found. *Wetmorethraupis sterrhopteron* faces a more critical situation in its Ecuadorian range, as it prefers taller forest at low-lying areas nearby the Nangaritza River, where forest loss is more severe. Land protected by the local communities in Nangaritza holds the only extensive continuous forest connecting the Podocarpus National Park, to the west, with the newly created Cerro Plateado Biological Reserve, to the south, and Amazonian forests further east. Mining, in any of its modalities, might have disastrous effects on the habitat quality and, consequently, the avifaunal uniqueness of the Nangaritza River Valley.

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APPENDIX 1. Bird species recorded at the Nangaritza Valley, Zamora-Chinchipec, southeast Ecuador (1987–2012). Localities and data sources: 1) La Punta-Chinapinza, 4°00' S, 78°27' W, 1400–1450 m, 1650–1700 m. a. s. l.; 1900–1950 m (September 1990, June 1993; Krabbe and Sornoza-Molina 1994; specimens in MECN and ANSP). 2) Paquisha, 3°55' S, 78°40' W, 830–1000 m (September 1990; NK and F. Sornoza; additional observations by R. Ahlman, A. Spencer, DB). 3) Cabañas Yankuam and surroundings, 4°15' S, 78°39' W, 890 m (2003–2007, FA; March–April 2007, NK; September 2007, JFF; additional observations by R. Ridgely, F. Sornoza, A. Solano, L. Navarrete, A. Spencer, S. Olmstead, N. Simpson, J. Nilsson, DB). 4) Pachicutza, 4°07' S, 78°37' W, 860–1000 m (July–August 1989; MECN and WFVZ specimens). 5) Shaimi, 4°20' S, 78°40' W, 900–950 m (July–August 1990, MECN and WFVZ specimens, Marín *et al.* 1992; 2003–2007, FA; March 2007, NK; March 2008, S. Olmstead and FA; various observers). 6) Laberinto trail and Numpatakaima River, 4°20' S, 78°40' W, 960 m (2003–2007, FA; April and October 2008, R. Ridgely, L. Navarrete, FA and N. Simpson). 7) Along Nangaritza River 4°14'–4°20' S, 78°40' W, 860–900 m (2003–2007, FA). 8) Nuevo Paraíso and Chamico, 4°21'02" S, 78°39'58" W, 920 m (2003–2007, FA). 9) Miazí and Maycú–Miazí trail, 4°18'56" S, 78°39'03" W, 1000–1130 m (July–August 1993, T. A. Parker, Schulenberg and Awbrey 1997; 2003–2007, FA; April–May 2009, CAR, PP and EB, Freile *et al.* 2011a). 10) Las Orquídeas 'tepui', 4°16'52" S, 78° 40'2" W, 1200–1830 m (JFF, GBJ and PP, Freile *et al.* 2011b); 11) Cerro Plateado: Camp 1, 4°35'41.9" S, 78°51'14.39" W, 1624 m (18–21 Aug 2012); Camp 2, 4°36'14.4" S, 78°49'40.8" W, 2093 m (20–24 and 26 Aug 2012); Camp 3, 4°36'50.39" S, 78°47'42" W, 2600 m (24–26 Aug 2012). Species marked with an asterisk (*) are endemic or nearly endemic to the Cordillera del Cóndor region of southeast Ecuador and northern Peru. Evidence: specimen (S), photograph (P), audio-recording (R), observation (O), heard only (H).

Species/ subspecies	La Punta-Chinapinza ¹	Paquisha ²	Cabañas Yankuam ³	Pachicutza ⁴	Shaimi ⁵	Laberinto-Numpatakaima ⁶	Nangaritza River ⁷	Nuevo Paraíso-Chamico ⁸	Maycú-Miazí ⁹	Las Orquídeas ¹⁰	Cerro Plateado ¹¹	Evidence
<i>Tinamus tao</i> Temminck, 1815									x			R
<i>T. major</i> (Gmelin, 1789)			x				x					O, H
<i>Crypturellus cinereus</i> (Gmelin, 1789)			x									R
<i>C. soui</i> (Hermann, 1783)		x	x		x				x	x		R
<i>C. obsoletus</i> (Temminck, 1815)									x	x		H
<i>Sarkidiornis melanotos</i> (Pennant, 1769)							x					P
<i>Merganetta armata</i> Gould, 1842											x	O
<i>Chamaepetes goudotii</i> (Lesson, 1828)	x						x				x	O, S
<i>Pipile cumanensis</i> (Jacquin, 1784)								x				O
<i>Aburria aburri</i> (Lesson, 1828)									x			O, R
<i>Ortalis guttata</i> (Spix, 1825)		x	x									O, H
<i>Odontophorus speciosus</i> Tschudi, 1843			x						x	x		R, H
<i>Anhinga anhinga</i> (Linnaeus, 1766)							x					O
<i>Tigrisoma fasciatum</i> (Such, 1825)						x	x					O, P
<i>Butorides striata</i> (Linnaeus, 1758)							x					O, P
<i>Ardea cocoi</i> Linnaeus, 1766							x					O
<i>Ardea alba</i> Linnaeus, 1758		x										O
<i>Egretta thula</i> (Molina, 1782)							x					O
<i>Cathartes aura</i> (Linnaeus, 1758)			x						x	x		O
<i>C. melambrotus</i> Wetmore, 1964			x				x		x			O
<i>Coragyps atratus</i> (Bechstein, 1793)			x		x		x		x		x	O
<i>Pandion haliaetus</i> (Linnaeus, 1758)			x				x					O, H
<i>Leptodon cayanensis</i> (Latham, 1790)					x							O
<i>Elanoides forficatus</i> (Linnaeus, 1758)	x				x	x	x		x	x		O, H
<i>Harpagus bidentatus</i> (Latham, 1790)					x							O
<i>Ictinia plumbea</i> (Gmelin, 1788)	x	x	x						x			O
<i>Accipiter superciliosus</i> (Linnaeus, 1766)							x					O
<i>A. bicolor</i> (Vieillot, 1817)			x									O, H
<i>Buteogallus solitarius</i> (Tschudi, 1844)									x		x	O, R
<i>Morphnarchus princeps</i> P. L. Slater, 1865			x								x	O, R

APPENDIX 1. CONTINUED.

Species/ subspecies	La Punta-Chinapinza ¹	Paquisha ²	Cabañas Yankuam ³	Pachikutza ⁴	Shaimi ⁵	Laberinto-Numpatakaima ⁶	Nangaritza River ⁷	Nuevo Paraíso-Chamico ⁸	Maycu-Miazi ⁹	Las Orquídeas ¹⁰	Cerro Plateado ¹¹	Evidence
<i>Rupornis magnirostris</i> (Gmelin, 1788)	x		x		x				x			O, R, S
<i>Geranoaetus polyosoma</i> (Quoy & Gaimard, 1824)											x	O
<i>Pseudastur albicollis</i> (Latham, 1790)			x		x							O, R
<i>Buteo brachyurus</i> Vieillot, 1816			x						x			O
<i>Aramides calopterus</i> P. L. Sclater & Salvin, 1878					x							O
<i>Anurolimnas castaneiceps</i> (P. L. Sclater & Salvin, 1869)			x		x	x			x			R, H
<i>Laterallus melanophaius</i> (Vieillot, 1819)			x		x							O, H
<i>L. exilis</i> (Temminck, 1831)									x			R?
<i>Pardirallus nigricans</i> (Vieillot, 1819)			x						x			O, R
<i>Vanellus cayanus</i> (Latham, 1790)							x					O
<i>Actitis macularius</i> (Linnaeus, 1766)							x					O
<i>Tringa solitaria</i> A. Wilson, 1813							x					O
<i>Chlidonias niger</i> (Linnaeus, 1758)								x				O
<i>Claravis mondeotura</i> (Bonaparte, 1856)		x										O
<i>Patagioenas speciosa</i> (Gmelin, 1789)					x				x	x		O, R
<i>P. fasciata</i> (Say, 1823)					x						x	O, H
<i>P. plumbea</i> (Vieillot, 1818)			x		x					x	x	O, R
<i>P. subvinacea</i> (Lawrence, 1868)	x		x		x		x		x			O, R, S
<i>Leptotila rufaxilla</i> (Richard & Bernard, 1792)			x		x				x			H
<i>Geotrygon saphirina</i> Bonaparte, 1855									x			O?
<i>G. frenata</i> (Tschudi, 1843)	x								x	x	x	O
<i>G. montana</i> (Linnaeus, 1758)										x		R, S
<i>Opisthocomus hoazin</i> (Statius Muller, 1776)						x						O, P
<i>Coccyua minuta</i> (Vieillot, 1817)		x	x		x							O
<i>Piaya cayana</i> (Linnaeus, 1766)	x	x	x		x				x		x	O, R, S
<i>Crotophaga ani</i> Linnaeus, 1758	x		x		x							O
<i>Megascops ingens</i> (Salvin, 1897)	x										x	R
<i>M. petersoni</i> (Fitzpatrick & O'Neill 1986)	x									x		S, R
<i>M. guatemalae</i> (Sharpe, 1875)										x		R
<i>M. albogularis</i> (Cassin, 1849)											x	R
<i>Pulsatrix melanota</i> (Tschudi, 1844)		x	x						x			R
<i>Ciccaba albitarsis</i> (Bonaparte, 1850)											x	R
<i>Glaucidium parkeri</i> Robbins & Howell, 1995										x		R
<i>G. brasilianum</i> (Gmelin, 1788)						x						O
<i>Steatornis caripensis</i> Humboldt, 1817					x						x	O, R
<i>Nyctibius grandis</i> (Gmelin, 1789)			x									H?
<i>N. griseus</i> (Gmelin, 1789)			x									H
<i>Lurocalis rufiventris</i> Taczanowski, 1884											x	R
<i>Nyctidromus albicollis</i> (Gmelin, 1789)			x						x			H
<i>Nyctiphrynus ocellatus</i> (Tschudi, 1844)									x			S
<i>Antrostomus rufus</i> Boddaert, 1783									x			P
<i>Systemellura longirostris</i> (Bonaparte, 1825)											x	R
<i>Nyctipolus nigrescens</i> (Cabanis, 1848)		x	x									O, P
<i>Hydropsalis climacocerca</i> (Tschudi, 1844)							x					O
<i>Uropsalis segmentata</i> (Cassin, 1849)											x	R
<i>U. lyra</i> (Bonaparte, 1850)											x	R
<i>Cypseloides cherriei</i> Ridgway, 1893			x								x	O
<i>C. cryptus</i> Zimmer 1945			x									O
<i>C. lemosi</i> Eisenmann & Lehmann, 1962			x									O
<i>Streptoprocne rutila</i> (Vieillot, 1817)	x	x			x				x		x	O, R, S
<i>S. zonaris</i> (Shaw, 1796)	x	x	x						x		x	O, H
<i>Chaetura cinereiventris</i> P. L. Sclater, 1862	x	x	x		x				x		x	O, S
<i>C. egregia</i> Todd, 1916			x							x		O

APPENDIX 1. CONTINUED.

Species/ subspecies	La Punta-Chinapinza ¹	Paquisha ²	Cabañas Yankuam ³	Pachikutza ⁴	Shaimi ⁵	Laberinto-Numpatakaimo ⁶	Nangaritza River ⁷	Nuevo Paraíso-Chamico ⁸	Maycu-Miazi ⁹	Las Orquídeas ¹⁰	Cerro Plateado ¹¹	Evidence
<i>Aeronautes montivagus</i> (Orbigny & Lafresnaye, 1837)									x			O
<i>Tachornis squamata</i> Cassin, 1853)		x		x			x					O
<i>Florisuga mellivora</i> (Linnaeus, 1758)			x									O
<i>Eutoxeres aquila</i> (Bourcier, 1847)	x			x		x			x	x		P, S
<i>E. condamini</i> (Bourcier, 1851)				x	x							S
<i>Threnetes leucurus</i> (Linnaeus, 1766)			x	x					x			O, S
<i>Phaethornis atrimentalis</i> Lawrence, 1858									x			O
<i>P. griseogularis</i> Gould, 1851			x		x				x	x		O, S
<i>P. guy</i> (Lesson, 1833)	x				x				x	x		R, S
<i>P. syrmatophorus</i> Gould, 1851	x										x	O, S
<i>P. malaris</i> (Nordmann, 1835)			x	x	x				x			O, S
<i>Doryfera ludovicae</i> (Bourcier & Mulsant, 1847)	x									x	x	O, S
<i>D. johannae</i> (Bourcier, 1847)			x						x	x		R, S
<i>Colibri delphinae</i> (Lesson, 1839)										x		O, R
<i>C. thalassinus</i> (Swainson, 1827)	x	x									x	O, S
<i>C. coruscans</i> (Gould, 1846)	x											S
<i>Heliophryx auritus</i> (Gmelin, 1788)			x		x				x			O, R
<i>Heliangelus amethysticollis</i> (Orbigny & Lafresnaye, 1838)	x										x	O, R, S
* <i>H. regalis</i> Fitzpatrick, Willard & Terborgh 1979									x	x	x	R, P, S
<i>Discosura popelairii</i> (Du Bus de Gisignies, 1846)		x										O
<i>D. langsdorffi</i> (Temminck, 1821)			x						x			O, P
<i>Phlogophilus hemileucurus</i> Gould, 1860					x				x	x		O, R, S
<i>Adelomyia melanogenys</i> (Fraser, 1840)	x	x							x	x	x	O, P, R, S
<i>Agelaiocercus kingi</i> (Lesson, 1832)	x									x	x	O, R, S
<i>Haplophaedia aureliae</i> (Bourcier & Mulsant, 1846)	x											S
<i>Eriocnemis vestita</i> (Lesson, 1839)											x	O
<i>Coeligena coeligena</i> (Lesson, 1833)	x										x	O, R, S
<i>C. torquata</i> (Boissonneau, 1840)	x										x	O
<i>Boissonneaua matthewsii</i> (Bourcier, 1847)	x										x	S
<i>Ocreatus underwoodii</i> (Lesson, 1832)	x										x	O, R, S
<i>Urochroa bougueri</i> (Bourcier, 1851)										x		O
<i>Urosticte ruficrissa</i> Lawrence, 1864	x		x							x		O, S
<i>Heliodoxa schreibersii</i> (Bourcier, 1847)			x		x				x			O
<i>H. rubinoides</i> (Bourcier & Mulsant, 1846)	x										x	O, R
<i>H. leadbeateri</i> (Bourcier, 1843)	x									x	x	O, S
<i>Chlorestes notata</i> (G. C. Reich, 1793)			x									O
<i>Klais guimeti</i> (Bourcier, 1843)			x						x	x		O, R, S
<i>Campylopterus largipennis</i> (Boddaert, 1783)			x						x	x		O, P, S
<i>C. villaviscensio</i> (Bourcier, 1851)									x	x		S
<i>Thalurania furcata</i> (Gmelin, 1788)			x	x	x				x	x		O, S
<i>Amazilia fimbriata</i> (Gmelin, 1788)			x	x	x							O, S
<i>Chrysuronia oenone</i> (Lesson, 1832)									x			S
<i>Pharomachrus auriceps</i> (Gould, 1842)							x					O
<i>P. antisanus</i> (Orbigny, 1837)	x								x		x	R, S
<i>Trogon viridis</i> Linnaeus, 1766			x		x				x	x		O, R, S
<i>T. ramonianus</i> (Deville & Des Murs, 1849)					x							O, H
<i>T. curucui</i> Linnaeus, 1766			x						x			O, H
<i>T. rufus</i> Gmelin, 1788									x			O, R
<i>T. collaris</i> Vieillot, 1817			x		x	x			x	x		O, R, S
<i>T. personatus</i> Gould, 1842	x									x	x	R, S
<i>Megaceryle torquata</i> (Linnaeus, 1766)			x				x		x			O
<i>Chloroceryle amazona</i> (Latham, 1790)			x		x		x					O
<i>C. americana</i> (Gmelin, 1788)					x				x			O

APPENDIX 1. CONTINUED.

Species/ subspecies	La Punta-Chinapinza ¹	Paquisha ²	Cabañas Yankuam ³	Pachikutza ⁴	Shaimi ⁵	Laberinto-Numpatakaima ⁶	Nangaritza River ⁷	Nuevo Paraíso-Chamico ⁸	Maycu-Miazi ⁹	Las Orquídeas ¹⁰	Cerro Plateado ¹¹	Evidence
<i>Electron platyrhynchum</i> (Leadbeater, 1829)									x			R
<i>Momotus aequatorialis</i> Gould, 1858									x			O, R
<i>Galbula cyanescens</i> Deville, 1849		x										R, P
<i>G. pastazae</i> Taczanowski & Berlepsch, 1885			x		x			x				R
<i>G. chalconothorax</i> P. L. Sclater, 1855			x		x			x				O, R, P, S
<i>Jacamerops aureus</i> (Statius Muller, 1776)			x					x				O, R
<i>Bucco macrodactylus</i> (Spix, 1824)					x							O
<i>B. capensis</i> Linnaeus, 1766						x						O
<i>Nystalus striolatus</i> (Pelzeln, 1856)		x	x						x			R
<i>Malacoptila fusca</i> (Gmelin, 1788)					x				x			O, S
<i>M. fulvogularis</i> P. L. Sclater, 1854	x											S
<i>Micromonacha lanceolata</i> (Deville, 1849)					x				x			O
<i>Nonnula brunnea</i> P. L. Sclater, 1881						x						O
<i>Monasa morphoeus</i> (Hahn & Kuster, 1823)		x										H
<i>Capito auratus</i> (Dumont, 1816)			x		x							O, H
<i>Eubucco richardsoni</i> (G. R. Gray, 1846)			x		x							O, R, S
<i>E. bourcierii</i> (Lafresnaye, 1845)	x		x		x				x			O, H, S
<i>Ramphastos ambiguus</i> Swainson, 1823									x	x		O, R
<i>R. tucanus</i> Linnaeus, 1758			x						x			O, R
<i>R. vitellinus</i> Lichtenstein, 1823			x	x					x			O, R, S
<i>Aulacorhynchus prasinus</i> (Gould, 1833)	x											R
<i>A. derbianus</i> Gould, 1835								x	x			O
<i>Andigena nigrirostris</i> (Waterhouse, 1839)											x	O
<i>Selenidera reinwardtii</i> (Wagler, 1827)			x		x				x			O, R, S
<i>Pteroglossus castanotis</i> Gould, 1834			x									O
<i>P. azara</i> (Vieillot, 1819)				x					x			O, S
<i>Picumnus lafresnayi</i> Malherbe, 1862			x		x				x			O
<i>Melanerpes cruentatus</i> (Boddaert, 1783)			x	x	x	x			x			O, R, S
<i>Picoides fumigatus</i> (Orbigny, 1840)	x		x						x		x	O, R, S
<i>Veniliornis passerinus</i> (Linnaeus, 1766)					x				x			O
<i>V. dignus</i> (P. L. Sclater & Salvin, 1877)		x	x									O
<i>V. nigriceps</i> (Orbigny, 1840)											x	O, R, S
<i>V. affinis</i> (Swainson, 1821)					x				x			O
<i>Piculus leucolaemus</i> (Natterer & Malherbe, 1845)					x				x	x		O, R
<i>Colaptes rubiginosus</i> (Swainson, 1820)	x		x						x	x	x	O, R, S
<i>C. rivolii</i> (Boissonneau, 1840)											x	R
<i>Celeus elegans</i> (Statius Muller, 1776)			x									O
<i>Dryocopus lineatus</i> (Linnaeus, 1766)			x						x			O, R
<i>Campephilus haematogaster</i> (Tschudi, 1844)									x			O
<i>C. melanoleucos</i> (Gmelin, 1788)			x						x			O
<i>Herpetotheres cachinnans</i> (Linnaeus, 1758)			x						x			O, R
<i>Micrastur ruficollis</i> (Vieillot, 1817)	x								x			O, H
<i>M. buckleyi</i> Swann, 1919			x		x							O, R
<i>Ibycter americanus</i> (Boddaert, 1783)							x					O, H
<i>Daptrius ater</i> Vieillot, 1816			x		x		x		x			O
<i>Falco ruficularis</i> Daudin, 1800			x									O
<i>Falco deiroleucus</i> Temminck, 1825			x									O
<i>Ara militaris</i> (Linnaeus 1766)			x			x			x			O, H
<i>A. severus</i> (Linnaeus, 1758)						x		x				O
<i>Aratinga leucophthalma</i> (Statius Muller, 1776)			x		x		x		x		x	O, R
<i>Pyrrhura albipectus</i> Chapman, 1914	x		x		x						x	O, R, S
<i>Forpus modestus</i> (Cabanis, 1848)		x						x	x			O
<i>Brotogeris cyanopectera</i> (Pelzeln, 1870)			x		x				x			O, R, S

APPENDIX 1. CONTINUED.

Species/ subspecies	La Punta-Chinapinza ¹	Paquisha ²	Cabañas Yankuam ³	Pachikutza ⁴	Shaimi ⁵	Laberinto-Numpatakaima ⁶	Nangaritza River ⁷	Nuevo Paraíso-Chamico ⁸	Maycu-Miazi ⁹	Las Orquídeas ¹⁰	Cerro Plateado ¹¹	Evidence
<i>Bolborhynchus lineola</i> (Cassin, 1853)											x	O, R
<i>Touit stictopterus</i> (P. L. Sclater, 1862)					x				x	x		O
<i>Pionus menstruus</i> (Linnaeus, 1766)			x		x	x	x	x	x	x		O
<i>P. sordidus</i> (Linnaeus, 1758)	x	x						x				O, R
<i>Amazona mercenarius</i> (Tschudi, 1844)	x				x						x	O, R
<i>Cymbilaimus lineatus</i> (Leach, 1814)					x				x			R, S
<i>Taraba major</i> (Vieillot, 1816)			x									O, R
<i>Thamnophilus tenuipunctatus</i> Lafresnaye, 1853		x	x	x	x				x			R, S
<i>T. schistaceus</i> (d'Orbigny, 1835)			x		x				x			R, S
<i>T. unicolor</i> (Sclater, 1859)	x								x	x	x	O, R, S
<i>T. aethiops</i> Sclater, 1858					x	x			x			R
<i>Thamnistes anabatinus</i> Sclater & Salvin, 1860									x			O
<i>Dysithamnus mentalis</i> (Temminck, 1823)	x		x		x				x	x		O, R, S
<i>Thamnomanes ardesiacus</i> (Sclater & Salvin, 1868)									x			R
<i>Epinecrophylla spodionota</i> Sclater & Salvin, 1880					x				x			R
<i>E. ornata</i> (Sclater, 1853)				x		x						O, S
<i>Myrmotherula brachyura</i> (Hermann, 1783)					x				x			O, R
<i>M. longicauda</i> Berlepsch & Stolzmann, 1894			x		x				x	x		O, H
<i>M. axillaris</i> (Vieillot, 1817)			x		x				x			O, R, S
<i>M. schisticolor</i> (Lawrence, 1865)	x											S
<i>M. longipennis</i> Pelzeln, 1868									x			O
<i>Dichrozona cincta</i> (Pelzeln, 1868)									x			O
<i>Herpsilochmus axillaris</i> (Tschudi, 1844)									x			O, R, S
<i>H. rufimarginatus</i> (Temminck, 1822)			x	x	x					x		O, R
<i>Drymophila striaticeps</i> Chapman, 1912	x											O, H, S
<i>Hypocnemis peruviana</i> (Taczanowski, 1884)			x		x				x			R, S
<i>Terenura callinota</i> (Sclater, 1855)										x	x	O
<i>T. humeralis</i> Sclater & Salvin, 1880									x			O
<i>Cercomacra cinerascens</i> (Sclater, 1857)			x		x				x			O, R
<i>C. nigrescens</i> (Cabanis & Heine, 1859)		x							x	x		O, H
<i>C. serva</i> (Sclater, 1858)		x	x		x				x	x		O, R
<i>Pyriglena leuconota</i> (Spix, 1824)					x				x	x	x	O, R, S
<i>Myrmoborus leucophrys</i> (Tschudi, 1844)			x		x				x	x		O, R, P
<i>M. myotherinus</i> (Spix, 1825)			x		x				x			O, R
<i>Schistocichla leucostigma</i> (von Pelzeln 1868)			x							x		O, R, S
<i>Myrmeciza castanea</i> (Zimmer, 1932)			x						x	x		O, R, S
<i>M. fortis</i> (Sclater & Salvin, 1868)									x			O
<i>Pithys albifrons</i> (Linnaeus, 1766)				x	x							S
<i>Rhegmatorhina melanosticta</i> (Sclater & Salvin, 1880)									x			R, P
<i>Hylophylax naevius</i> (Gmelin, 1789)			x		x	x			x			S
<i>Willisornis poecilinotus</i> (Cabanis, 1847)				x	x				x	x		O, R, S
<i>Conopophaga castaneiceps</i> Sclater, 1857										x		R
<i>Grallaria guatemalensis</i> Prevost & Des Murs, 1846		x			x							R
<i>G. haplota</i> Sclater, 1877	x				x							R, S
<i>G. ruficapilla</i> Lafresnaye, 1842											x	R
<i>G. nuchalis</i> Sclater, 1859											x	R
<i>G. hypoleuca</i> Sclater, 1855	x											R
<i>G. rufula</i> Lafresnaye, 1843											x	R
<i>Myrmothera campanisona</i> (Hermann, 1783)		x	x		x				x	x		R
<i>Grallaricula flavirostris</i> (Sclater, 1858)									x			R
<i>G. nana</i> (Lafresnaye, 1842)											x	R
<i>Scytalopus latrans</i> (Salvin, 1895)											x	R, S
<i>S. micropterus</i> (Sclater, 1858)	x											R, S

APPENDIX 1. CONTINUED.

Species/ subspecies	La Punta-Chinapinza ¹	Paquisha ²	Cabañas Yankuam ³	Pachikutza ⁴	Shaimi ⁵	Laberinto-Numpatakaima ⁶	Nangaritza River ⁷	Nuevo Paraíso-Chamico ⁸	Maycu-Miazi ⁹	Las Orquídeas ¹⁰	Cerro Plateado ¹¹	Evidence
<i>S. atratus</i> Hellmayr, 1922		x							x	x		R, S
<i>S. parkeri</i> Krabbe & Schulenberg, 1997											x	R
<i>Formicarius analis</i> (d'Orbigny & Lafresnaye, 1837)					x	x			x			H
<i>F. rufipectus</i> Salvin, 1866	x	x							x	x		R, S
<i>Chamaeza campanisona</i> (Lichtenstein, 1823)					x				x	x		R
<i>Sclerurus mexicanus</i> P. L. Sclater, 1857									x			O, R
<i>Sittasomus griseicapillus</i> (Vieillot, 1818)	x	x	x		x	x			x			O, R
<i>Deconychura longicauda connectens</i> (Zimmer, 1929)									x			O, R
<i>Dendrocincla fuliginosa</i> (Vieillot, 1818)			x		x							O, R
<i>Glyphorhynchus spirurus</i> (Vieillot, 1819)			x	x					x			O, R, S
<i>Dendrocolaptes certhia</i> (Boddaert, 1783)			x						x			O, R
<i>D. picumnus</i> Lichtenstein, 1820					x							O?
<i>Xiphocolaptes promeropirhynchus (macarenae/solivagus)</i> (Lesson, 1840)	x	x	x									O, R, S
<i>Xiphorhynchus ocellatus</i> (Spix, 1824)			x		x				x			S
<i>X. guttatus guttatoides</i> (Lafresnaye, 1850)		x	x						x	x		R, S
<i>X. triangularis</i> (Lafresnaye, 1842)	x	x	x						x	x	x	O, R, S
<i>Campylorhamphus pusillus</i> (P. L. Sclater, 1860)					x				x			O, S
<i>Lepidocolaptes albolineatus</i> (Lafresnaye, 1846)			x		x				x			O
<i>Xenops minutus</i> (Sparrman, 1788)		x	x						x	x		O, R
<i>X. rutilans</i> Temminck, 1821	x		x						x	x	x	O, S
<i>Pseudocolaptes boissonneautii</i> (Lafresnaye, 1840)	x										x	R, S
<i>Lochmias nematura</i> (Lichtenstein, 1823)									x			S
<i>Anabazenops dorsalis</i> (P. L. Sclater & Slavin, 1880)					x				x			O, R
<i>Philydor erythrocerum</i> (Pelzeln, 1859)	x		x		x				x			R, S
<i>P. rufum</i> (Vieillot, 1818)			x		x				x	x	x	O, R
<i>Anabacerthia striaticollis</i> Lafresnaye, 1841	x											S
<i>A. ruficaudata</i> (Orbigny & Lafresnaye, 1838)					x				x			O, R
* <i>Syndactyla rufosuperciliata</i> (Lafresnaye, 1832)	x											S
<i>S. subalaris</i> (P. L. Sclater, 1859)	x								x	x		O, R, S
<i>Hyloctistes subulatus</i> (Spix, 1824)	x				x				x			R, S
<i>Automolus ochroaemus</i> (Tschudi, 1844)			x						x	x		R, S
<i>A. rubiginosus</i> (P. L. Sclater, 1857)		x		x	x				x			S
<i>Thripadectes melanorhynchus</i> (Tschudi, 1844)	x	x								x	x	R
<i>T. flammulatus</i> (Eyton, 1849)											x	R
<i>Premnoplex brunnescens</i> (P. L. Sclater, 1856)	x									x	x	O, R, S
<i>Margarornis squamiger</i> (Orbigny & Lafresnaye, 1838)											x	O
<i>Asthenes griseomurina</i> (P. L. Sclater, 1882)											x	R
<i>Xenerpestes singularis</i> (Taczanowski & Berlepsch, 1885)			x									H
<i>Siptornis striaticollis</i> (Lafresnaye, 1843)		x										O
<i>Cranioleuca curtata</i> (P. L. Sclater, 1870)		x			x						x	O, H
<i>C. gutturata</i> (d'Orbigny & Lafresnaye, 1838)			x						x			O
<i>Synallaxis moesta</i> P. L. Sclater, 1856			x		x							O, R
<i>S. albigularis</i> P. L. Sclater, 1858		x	x		x					x		O, R
<i>S. unirufa</i> Lafresnaye, 1843	x										x	R
<i>Phyllomyias burmeisteri</i> Cabanis & Heine, 1859			x						x			R
<i>P. griseiceps</i> (P. L. Sclater & Salvin, 1871)					x				x			O
<i>P. plumbeiceps</i> (Lawrence, 1869)										x		O, R
<i>Tyrannulus elatus</i> (Latham, 1790)			x		x				x			O, H
<i>Myiopagis gaimardii</i> (Orbigny, 1840)					x							O, H
<i>M. olallai</i> Coopmans & Krabbe, 2000			x		x							R
<i>Elaenia gigas</i> P. L. Sclater, 1871			x		x							O
<i>E. obscura</i> (Orbigny & Lafresnaye, 1837)										x		O

APPENDIX 1. CONTINUED.

Species/ subspecies	La Punta-Chinapinza ¹	Paquisha ²	Cabañas Yankuam ³	Pachikutza ⁴	Shaimi ⁵	Laberinto-Numpatakaima ⁶	Nangaritza River ⁷	Nuevo Paraíso-Chamico ⁸	Maycu-Miazi ⁹	Las Orquídeas ¹⁰	Cerro Plateado ¹¹	Evidence
<i>Ornithion inerme</i> Hartlaub, 1853									x			O
<i>Mecocerculus minor</i> (Taczanowski, 1879)	x										x	R
<i>Serpophaga cinerea</i> (Tschudi, 1844)							x				x	O
<i>Pseudotriccus pelzelni</i> Taczanowski & Berlepsch, 1885	x										x	S
<i>P. ruficeps</i> (Lafresnaye, 1843)											x	O
<i>Corythopsis torquatus</i> Tschudi, 1844									x			S
<i>Zimmerius cinereicapilla</i> (Cabanis, 1873)			x						x			O, R
<i>Z. chrysops</i> (P. L. Sclater, 1859)	x	x	x		x				x	x	x	O, R, S
<i>Phylloscartes ophthalmicus</i> (Taczanowski, 1874)									x		x	O
<i>P. orbitalis</i> (Cabanis, 1873)		x							x			O, R
<i>P. gualaquiza</i> (P. L. Sclater, 1887)		x	x		x				x	x		O, R
* <i>P. superciliaris</i> (P. L. Sclater & Salvin, 1868)	x									x		O, R
<i>Mionectes striaticollis</i> (Orbigny & Lafresnaye, 1837)	x		x							x	x	O, R, S
<i>M. olivaceus</i> Lawrence, 1868	x		x		x				x	x		R, S
<i>M. oleagineus</i> (Lichtenstein, 1823)									x			O, H
<i>Leptopogon superciliaris</i> Tschudi, 1844					x				x	x		S
<i>Sublegatus obscurior</i> Todd, 1920					x				x			O
<i>Myiotriccus ornatus</i> (Lafresnaye, 1853)	x	x	x		x				x	x	x	O, R, S
<i>Myiornis albiventris</i> (Berlepsch & Stolzmann, 1894)					x				x			R, P
<i>Lophotriccus pileatus</i> (Tschudi, 1844)	x								x	x	x	O, R, S
<i>Hemitriccus zosterops</i> (Pelzel, 1868)					x							O
<i>H. granadensis</i> (Hartlaub, 1843)	x											O, H
* <i>H. cinnamomeipectus</i> Fitzpatrick & O'Neill, 1979	x									x	x	O, R, S
<i>H. rufigularis</i> (Cabanis, 1873)									x	x		O
<i>Poecilotriccus capitalis</i> (P. L. Sclater, 1857)			x						x	x		R, P
<i>P. latirostris</i> (Pelzel, 1868)			x						x			O
<i>P. calopterus</i> (P. L. Sclater, 1857)			x		x				x			O, R
<i>Todirostrum cinereum</i> (Linnaeus, 1766)		x	x		x				x			O, H
<i>Tolmomyias assimilis</i> (Pelzel, 1868)									x			R
<i>T. poliocephalus</i> (Taczanowski, 1884)			x									O, R
<i>T. flaviventris</i> (Wied-Neuwied, 1831)			x		x				x			O, R
<i>Platyrinchus mystaceus</i> Vieillot, 1818	x								x	x		S
<i>Myiophobus flavicans</i> (P. L. Sclater, 1861)	x										x	S
* <i>M. roraimae</i> (Salvin & Godman, 1883)										x	x	R
<i>M. cryptoxanthus</i> (P. L. Sclater, 1861)		x	x	x	x				x			R, S
<i>Myiobius villosus</i> P. L. Sclater, 1860									x			O
<i>M. atricaudus</i> Lawrence, 1863					x							S
<i>Terenotriccus erythrurus</i> (Cabanis, 1847)				x	x				x			S
<i>Neopipo cinnamomea</i> (Lawrence, 1869)				x								S
<i>Pyrrhomyias cinnamomeus</i> (Orbigny & Lafresnaye, 1837)	x										x	O, R, S
<i>Hirundinea ferruginea</i> (Gmelin, 1788)							x		x	x		R
<i>Lathrotriccus euleri</i> (Cabanis, 1868)		x	x						x	x		O, R
<i>Contopus cooperi</i> (Nuttall, 1831)	x	x	x		x							O
<i>C. fumigatus</i> (Orbigny & Lafresnaye, 1837)		x	x								x	R
<i>C. sordidulus</i> P. L. Sclater, 1859			x		x				x	x		H
<i>C. nigrescens</i> (P. L. Sclater & Salvin, 1880)					x							O
<i>Sayornis nigricans</i> (Swainson, 1827)					x		x					O
<i>Knipolegus poecilurus</i> (P. L. Sclater, 1862)									x	x		S
<i>Ochthoeca diadema</i> (Hartlaub, 1843)											x	R
<i>O. cinnamomeiventris</i> (Lafresnaye, 1843)											x	O
<i>Colonia colonus</i> (Vieillot, 1818)		x	x						x			O
<i>Legatus leucophaeus</i> (Vieillot, 1818)			x		x		x					O, H
<i>Myiozetetes similis</i> (Spix, 1825)			x		x		x		x			O, R

APPENDIX 1. CONTINUED.

Species/ subspecies	La Punta-Chinapinza ¹	Paquisha ²	Cabañas Yankuam ³	Pachikutza ⁴	Shaimi ⁵	Laberinto-Numpatakaima ⁶	Nangaritza River ⁷	Nuevo Paraíso-Chamico ⁸	Maycu-Miazi ⁹	Las Orquídeas ¹⁰	Cerro Plateado ¹¹	Evidence
<i>M. granadensis</i> Lawrence, 1862			x		x				x			O, R
<i>Pitangus sulphuratus</i> (Linnaeus, 1766)			x									O
<i>Conopias cinchoneti</i> (Tschudi, 1844)			x		x				x	x		O
<i>Myiodynastes chrysocephalus</i> (Tschudi, 1844)	x	x								x	x	O, R
<i>Megarynchus pitangua</i> (Linnaeus, 1766)			x						x			O, H
<i>Empidonomus aurantioatrocristatus</i> (Orbigny & Lafresnaye, 1837)			x									O
<i>Tyrannus melancholicus</i> Vieillot, 1819	x	x	x		x		x		x			O
<i>Rhytipterna simplex</i> (Lichtenstein, 1823)			x						x			O, H
<i>Myiarchus tuberculifer</i> (Orbigny & Lafresnaye, 1837)					x				x			O
<i>M. cephalotes</i> Taczanowski, 1880	x									x	x	O, R, S
<i>Attila spadiceus</i> (Gmelin, 1789)			x						x	x		H
* <i>Oxyruncus cristatus</i> Swainson, 1821									x	x		R
<i>Pipreola riefferii</i> (Boissonneau, 1840)	x										x	R, S
<i>P. lubomirskii</i> Taczanowski, 1879	x	x										S
<i>P. frontalis</i> (P. L. Sclater, 1859)	x	x	x						x			R, S
<i>P. chlorolepidota</i> Swainson, 1838			x	x								R, S
<i>Ampelioides tschudii</i> (G. R. Gray, 1846)									x			O
<i>Rupicola peruvianus</i> (Latham, 1790)			x				x	x	x	x		O
<i>Snowornis subalaris</i> (P. L. Sclater, 1861)			x	x	x				x	x		O, R, S
<i>Cephalopterus ornatus</i> E. Geoffroy Saint-Hilaire, 1809			x		x					x		O
<i>Cotinga cayana</i> (Linnaeus, 1766)												O
<i>Lipaugus vociferans</i> (Wied-Neuwied, 1820)			x									O, H
<i>Tyranneutes stolzmanni</i> (Hellmayr, 1906)			x		x							R
<i>Masius chrysopterus</i> (Lafresnaye, 1843)	x								x			S
<i>Machaeropterus regulus</i> (Hahn, 1819)			x									O
<i>Lepidothrix isidorei</i> (P. L. Sclater, 1852)									x			O
<i>Manacus manacus</i> (Linnaeus, 1766)			x		x							O, H
<i>Xenopipo holochlora</i> (P. L. Sclater, 1888)	x			x	x					x		O, P, S
<i>X. unicolor</i> (Taczanowski, 1844)	x	x										S
<i>Dixiphia pipra</i> (Linnaeus, 1758)	x								x	x		O, R, S
<i>Ceratopipra erythrocephala</i> (Linnaeus, 1758)				x	x					x		R, S
<i>Tityra cayana</i> (Linnaeus, 1766)					x							O
<i>T. semifasciata</i> (Spix, 1825)			x		x				x			O
<i>Schiffornis aenea</i> Zimmer 1936	x								x	x		R, S
<i>Laniocera hypopyrra</i> (Vieillot, 1817)									x			R
<i>Iodopleura isabellae</i> Parzudaki, 1847									x			O
<i>Laniisoma elegans</i> (Thunberg, 1823)									x			R
<i>Pachyramphus viridis</i> (Vieillot, 1816)			x						x			R
<i>P. versicolor</i> (Hartlaub, 1843)											x	O, H
<i>P. castaneus</i> (Jardine & Selby, 1827)			x		x				x			R
<i>P. polychopterus</i> (Vieillot, 1818)			x		x							R
<i>P. albogriseus</i> P. L. Sclater, 1857		x							x			O
<i>Piprites chloris</i> (Temminck, 1822)			x						x	x		R
<i>Cyclarhis gujanensis</i> (Gmelin, 1789)	x								x		x	R, S
<i>Vireolanius leucotis</i> (Swainson, 1838)			x		x				x	x		R
<i>Vireo leucophrys</i> (Lafresnaye, 1844)											x	R
<i>V. olivaceus</i> (Linnaeus, 1766)												O
<i>Hylophilus hypoxanthus</i> Pelzeln, 1868					x				x			O, R
<i>H. olivaceus</i> Tschudi, 1844			x		x				x	x		R
<i>H. ochraceiceps</i> Sclater, 1859			x		x				x			R
<i>Cyanocorax violaceus</i> Du Bus de Gisignies, 1847			x		x				x	x		O, R
<i>C. yncas</i> (Boddaert, 1783)	x	x							x	x	x	O, R, S
<i>Pygochelidon cyanoleuca</i> (Vieillot, 1817)	x		x	x					x		x	O, R

APPENDIX 1. CONTINUED.

Species/ subspecies	La Punta-Chinapinza ¹	Paquisha ²	Cabañas Yankuam ³	Pachikutza ⁴	Shaimi ⁵	Laberinto-Numpatakaima ⁶	Nangaritza River ⁷	Nuevo Paraíso-Chamico ⁸	Maycu-Miazi ⁹	Las Orquídeas ¹⁰	Cerro Plateado ¹¹	Evidence
<i>Orochelidon murina</i> (Cassin, 1853)											x	O
<i>Atticora fasciata</i> (Gmelin, 1789)			x				x		x			O
<i>A. tibialis</i> (Cassin, 1853)				x	x				x			O, S
<i>Stelgidopteryx ruficollis</i> (Vieillot, 1817)		x	x						x	x		O
<i>Progne tapera</i> (Linnaeus, 1766)		x										O
<i>P. chalybea</i> (Gmelin, 1789)			x		x							O
<i>Hirundo rustica</i> Linnaeus, 1758		x										O
<i>Microcerculus marginatus</i> (Sclater, 1855)			x		x				x	x		R
<i>Troglodytes aedon</i> Vieillot, 1809			x		x				x			O
<i>T. solstitialis</i> Sclater, 1859	x								x			O, R
<i>Campylorhynchus turdinus</i> (Wied-Neuwied, 1821)		x	x	x	x				x	x		R, S
<i>Pheugopedius coraya</i> (Gmelin, 1789)			x		x				x			R
<i>Cinnycerthia olivascens</i> Sharpe, 1882	x									x	x	R, S
<i>Henicorhina leucosticta</i> (Cabanis, 1847)		x	x	x	x				x	x		R, P
* <i>H. leucoptera</i> Fitzpatrick, Terborgh & Willard, 1977	x									x	x	O, R, S
<i>H. leucophrys</i> (Tschudi, 1844)	x											S
<i>Cyphorhinus arada</i> Hermann, 1783			x		x				x			R, S
<i>Microbates cinereiventris</i> (Sclater, 1855)									x			O, R
<i>Donacobius atricapilla</i> (Linnaeus, 1766)			x									O
<i>Cinclus leucocephalus</i> Tschudi, 1844											x	O
<i>Myadestes ralloides</i> (d'Orbigny, 1840)	x									x	x	S
<i>Catharus fuscater</i> (Lafresnaye, 1845)									x	x		H
<i>C. ustulatus</i> (Nuttall, 1840)		x			x				x			S
<i>Turdus leucops</i> (Taczanowski, 1877)					x				x	x		S
<i>T. ignobilis</i> Sclater, 1857		x	x		x				x			R, S
<i>T. fulviventris</i> Sclater, 1857	x									x	x	R, S
<i>T. fuscater</i> Lafresnaye 6 d'Orbigny, 1837											x	R
<i>T. serranus</i> Tschudi, 1844											x	R
<i>T. albicollis</i> Vieillot, 1818			x	x					x	x		R, S
<i>Cissopis leverianus</i> (Gmelin, 1788)			x		x				x			O, R, S
<i>Sericoshypha albocristata</i> (Lafresnaye, 1843)											x	R
<i>Creurgops verticalis</i> P. L. Sclater, 1858	x										x	S
<i>Hemispingus atropileus</i> (Lafresnaye, 1842)										x		O
<i>Tachyphonus cristatus</i> (Linnaeus, 1766)			x						x			R
<i>T. rufus</i> (Boddaert, 1783)			x	x	x							O, R, S
<i>Lanio fulvus</i> (Boddaert, 1783)			x	x	x							O, R, S
<i>Ramphocelus carbo</i> (Pallas, 1764)			x	x	x				x			O, R, S
<i>Thraupis episcopus</i> (Linnaeus, 1766)		x	x						x			O
<i>T. palmarum</i> (Wied-Neuwied, 1821)		x	x									O, R
<i>Calochaetes coccineus</i> (P. L. Sclater, 1858)	x								x	x		O, S
* <i>Wetmorethraupis sterrhopteron</i> Lowery & O'Neill 1964					x	x			x			O, R, S, P
<i>Buthraupis montana</i> (Orbigny & Lafresnaye, 1837)											x	O
<i>Anisognathus lacrymosus</i> (Du Bus de Gisignies, 1846)											x	R
<i>A. somptuosus</i> (Lesson, 1831)	x									x		O, R, S
<i>Chlorornis riefferii</i> (Boissonneau, 1840)											x	R, P
<i>Dubusia taeniata</i> (Boissonneau, 1840)											x	R
<i>Iridosornis analis</i> (Tschudi, 1844)	x								x	x	x	R, S
<i>I. rufivertex</i> (Lafresnaye, 1842)											x	O
<i>Pipraeidea melanonota</i> (Vieillot, 1819)									x			O
<i>Chlorochrysa calliparaea</i> (Tschudi, 1844)	x								x			O, S
<i>Tangara argyrofenges</i> (P. L. Sclater & Slavin, 1876)		x										O
<i>T. nigrocincta</i> (Bonaparte, 1838)		x	x						x			O
<i>T. cyanicollis</i> (Orbigny & Lafresnaye, 1837)	x		x	x	x				x			O, R, P

APPENDIX 1. CONTINUED.

Species/ subspecies	La Punta-Chinapinza ¹	Paquisha ²	Cabañas Yankuam ³	Pachikutza ⁴	Shaimi ⁵	Laberinto-Numpatakaima ⁶	Nangaritza River ⁷	Nuevo Paraíso-Chamico ⁸	Maycu-Miazi ⁹	Las Orquídeas ¹⁰	Cerro Plateado ¹¹	Evidence
<i>T. xanthogastra</i> (P. L. Sclater, 1851)			x	x	x			x				O, S
<i>T. nigroviridis</i> (Lafresnaye, 1843)	x										x	O
<i>T. labradorides</i> (Boissonneau, 1840)	x										x	S
<i>T. cyanotis</i> (P. L. Sclater, 1858)								x				O, S
<i>T. mexicana</i> (Linnaeus, 1766)			x		x					x		O
<i>T. chilensis</i> (Vigors, 1832)			x	x	x			x		x		O
<i>T. velia</i> (Linnaeus, 1758)			x									O, P, S
<i>T. callophrys</i> (Cabanis, 1848)			x									O
<i>T. gyrola</i> (Linnaeus, 1758)			x	x	x			x				O
<i>T. xanthocephala</i> Tschudi, 1844	x									x	x	O, S
<i>T. parzudakii</i> (Lafresnaye, 1843)	x									x	x	O, S
<i>T. schrankii</i> (Spix, 1825)			x	x				x		x		O, S
<i>T. arthus</i> Lesson, 1832	x	x			x			x		x	x	O, S
<i>Tersina viridis</i> (Illiger, 1811)			x		x							O, S
<i>Dacnis lineata</i> (Gmelin, 1789)			x		x							O
<i>D. flaviventer</i> Orbigny & Lafresnaye, 1837			x		x			x				O
<i>D. cayana</i> (Linnaeus, 1766)			x					x				O
<i>Cyanerpes caeruleus</i> (Linnaeus, 1758)			x		x			x		x		O
<i>Chlorophanes spiza</i> (Linnaeus, 1758)			x		x			x				O
<i>Iridophanes pulcherrimus</i> (P. L. Sclater, 1853)											x	P
<i>Hemithraupis flavicollis</i> (Vieillot, 1818)					x			x				O
<i>Conirostrum albifrons</i> Lafresnaye, 1842											x	O, R
<i>Diglossa lafresnayii</i> (Boissonneau, 1840)											x	O, R
<i>D. albilatera</i> Lafresnaye, 1843	x										x	O, R
<i>D. glauca</i> (P. L. Sclater & Salvin, 1876)	x	x						x		x		O, R, S
<i>D. caerulescens</i> P. L. Sclater, 1856											x	R
<i>D. cyanea</i> (Lafresnaye, 1840)											x	R, S
<i>Haplospiza rustica</i> (Tschudi, 1844)		x									x	S
<i>Sporophila luctuosa</i> (Lafresnaye, 1843)			x		x							O, R
<i>S. castaneiventris</i> Cabanis, 1848			x	x				x				O, R, S
<i>Oryzoborus angolensis</i> (Linnaeus, 1766)	x		x					x				O, S
<i>O. atrirostris</i> P. L. Sclater & Salvin, 1878		x	x									O, P
<i>Coryphospingus cucullatus</i> (Statius Muller, 1776)					x							R, P
<i>Coereba flaveola</i> (Linnaeus, 1758)	x	x	x		x			x		x		O, R, S
<i>Parkerthraustes humeralis</i> (Lawrence, 1867)					x			x				O, R, S
<i>Saltator grossus</i> (Linnaeus, 1766)	x	x	x		x			x				O, R, S
<i>S. maximus</i> (Statius Muller, 1776)			x	x	x			x				O, R, S
<i>S. caerulescens</i> Vieillot, 1817			x		x			x		x		O, R
<i>Ammodramus aurifrons</i> (Spix, 1825)		x	x	x	x			x				O, R, S
<i>Arremon aurantirostris</i> Lafresnaye, 1847			x	x	x			x				O, R, S
<i>A. brunneinucha</i> (Lafresnaye, 1839)	x							x			x	R, S
<i>Atlapetes latinuchus</i> (Du Bus de Gisignies, 1855)											x	R
<i>Chlorospingus flavopectus</i> (Lafresnaye, 1840)	x	x									x	R
<i>C. flavigularis</i> (P. L. Sclater, 1852)		x	x	x	x			x		x	x	O, R, S
<i>C. canigularis</i> (Lafresnaye, 1848)	x	x						x		x	x	R, S
<i>Piranga flava</i> (Vieillot, 1822)		x								x		R, S
<i>P. rubra</i> (Linnaeus, 1758)		x			x							O
<i>P. olivacea</i> (Gmelin, 1789)					x							O
<i>P. leucoptera</i> Trudeau, 1839	x			x						x	x	O, R, S
<i>Pheucticus chrysogaster</i> (Lesson, 1832)	x											S
<i>Cyanocompsa cyanoides</i> (Lafresnaye, 1847)					x			x		x		O, H
<i>Parula pitiayumi</i> (Vieillot, 1817)			x					x		x		O, R
<i>Dendroica striata</i> (J. R. Forster, 1772)					x							O

APPENDIX 1. CONTINUED.

Species/ subspecies	La Punta-Chinapinza ¹	Paquisha ²	Cabañas Yankuam ³	Pachikutza ⁴	Shaimi ⁵	Laberinto-Numpatakaima ⁶	Nangaritza River ⁷	Nuevo Paraíso-Chamico ⁸	Maycu-Miazi ⁹	Las Orquídeas ¹⁰	Cerro Plateado ¹¹	Evidence
<i>D. castanea</i> (A. Wilson, 1810)		x										O
<i>D. fusca</i> (Statius Muller, 1776)		x										O
<i>D. cerulea</i> (A. Wilson, 1810)		x										O
<i>Setophaga ruticilla</i> (Linnaeus, 1758)					x							O
<i>Wilsonia canadensis</i> (Linnaeus, 1766)		x			x							O
<i>Myioborus miniatus</i> (Swainson, 1827)	x				x			x	x	x	x	O, R, S
<i>M. melanocephalus</i> (Tschudi, 1844)											x	R
<i>Basileuterus luteoviridis</i> (Bonaparte, 1845)											x	R
<i>B. nigrocristatus</i> (Lafresnaye, 1840)											x	O, H
<i>B. coronatus</i> (Tschudi, 1844)	x											O, H
<i>B. tristriatus</i> (Tschudi, 1844)	x							x	x	x	x	O, R, S
<i>Phaeothlypis fulvicauda</i> (Spix, 1825)							x	x				S
<i>Psarocolius angustifrons</i> (Spix, 1824)		x	x					x				O
<i>P. decumanus</i> (Pallas, 1769)					x	x		x				O
<i>Clypicterus oseryi</i> (Deville, 1849)					x							H
<i>Cacicus sclateri</i> (Dubois, 1887)								x				O, H
<i>C. cela</i> (Linnaeus, 1758)			x		x							O, R
<i>C. uropygialis</i> Lafresnaye, 1843		x										O
<i>Icterus croconotus</i> (Wagler, 1829)		x	x									O
<i>Sporagra olivacea</i> (Berlepsch & Stolzmann, 1894)	x		x	x								O, S
<i>Euphonia lanirostris</i> Orbigny & Lafresnaye, 1837			x		x							O
<i>E. cyanocephala</i> (Vieillot, 1819)								x				O
<i>E. chrysopasta</i> P. L. Sclater & Salvin, 1869					x			x				R
<i>E. mesochrysa</i> Salvadori, 1873		x						x	x	x		R
<i>E. xanthogaster</i> (Sundevall, 1834)	x		x	x	x			x	x			O, R, S
<i>E. rufiventris</i> (Vieillot, 1819)					x			x				R
<i>Chlorophonia pyrrhophrys</i> (P. L. Sclater, 1851)											x	O, H
Total	121	79	213	45	192	20	34	9	275	137	133	