

Avifauna of a relict *Podocarpus* forest in the Cachil Valley, north-west Peru

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Describimos la avifauna del Bosque Cachil, un remanente de bosque de *Podocarpus* en el noroeste del Perú, basados en evaluaciones realizadas entre 1997 y 2012. Este bosque constituye una reserva aislada en una región que ha sido en gran medida deforestada y convertida en tierras agrícolas. Se encuentra muy cerca o en el límite extremo sur de los bosques húmedos de la vertiente occidental de los Andes peruanos y, en consecuencia, define el límite de distribución para muchas especies de aves de bosque húmedo. Reportamos un total de 92 especies, incluyendo 11 extensiones de rango y altitud (*Parabuteo leucorrhous*, *Ciccaba albitarsis*, *Lafresnaya lafresnayi*, *Grallaria guatemalensis*, *G. ruficapilla*, *Scytalopus unicolor*, *Phyllomyias uropygialis*, *Phaeomyias murina*, *Campylorhynchus fasciatus*, *Catharus fuscater* y *Arremon assimilis*).

Montane forests of the western Andes historically constituted a near-continuous strip from Colombia to northern Peru, but they have been reduced to numerous relicts due to human activities. It is estimated that 90% of these forests have been destroyed in north-west Peru, and that their destruction has accelerated rather than declined in recent years²². Specifically, most of Cajamarca, within which the Cachil Valley is located, was continuously forested in the 1940s, but advancement of roads, subsequent human colonisation, agriculture, grazing and demand for quality hardwood *Podocarpus* trees have resulted in rampant and continuing deforestation²⁰. Additionally, deforestation of the west slope of the Andes in southern Peru has brought about severe desertification over the last 1,500 years⁴. Although similar anthropogenic and desertification pressures still exist in north-west Peru, relictual patches of humid and semi-humid forest remain on the west slope south to southern Cajamarca and northern La Libertad^{8,15,22,23}.

The Cachil Valley is at the southern edge of the biodiverse Amotape-Huancabamba zone in north-west Peru^{21,22}. It lies at the southern border of Cajamarca directly adjacent to La Libertad¹⁵ (Fig. 1), at c.2,200–3,200 m on the Pacific slope of the western Andes and drains into the upper río Cascas Valley of the larger río Chicama watershed. The valley is formed by the confluence of Quebrada Cachil to the west and Quebrada Piojo to the east, which join to form the río Cachil. Most of the upper Cachil Valley is privately owned by the Marco Antonio Corcuera family and is maintained as a forest reserve. It is accessed from the road that connects the towns of Cascas, La Libertad, and Contumazá, Cajamarca.

The Corcuera property, which is c.500 ha, comprises elements of humid forests found to the north and east as well as those of semi-humid

habitats on the Pacific slope of northern Peru⁸. Specifically, semi-humid scrub and forest, as well as a well-preserved humid forest relict known as Bosque Cachil, comprise the major habitats. The semi-humid scrub and semi-humid forest habitats are extensive on the steep west side of the Cachil Valley along the entrance road to Bosque Cachil. The semi-humid scrub ranges from 1–2 m tall and is variable in density with scattered *Chusquea scandens* thickets. Semi-humid forest is characterised by columnar cacti and small trees up to 4 m tall, heavily laden with *Tillandsia* spp. bromeliads. Other features of the habitat surrounding Bosque Cachil include rocky slopes with large cliff faces and stands of non-native *Eucalyptus* trees.

Humid forest (Fig. 2C) at Bosque Cachil comprises a narrow, c.100 ha strip of forest between Quebradas Cachil and Piojo, at c.2,350–3,000 m in the uppermost Cachil Valley¹⁸. Bosque Cachil represents one of the southernmost of 23 identified relict forest fragments of the western Andes in north-west Peru and is one of the best known botanically^{8,22,23}. An inventory of flowering plants, gymnosperms and ferns of Bosque Cachil listed 84 families, 171 genera and 228 species, including eight species endemic to Peru¹⁵. Humid forest is dominated by two species of native conifers in the genus *Podocarpus*^{8,20}, and *Podocarpus* trees comprise most of the c.15 m-tall canopy. Moss and epiphytic bromeliads of the genera *Tillandsia* and *Vriesea* are abundant. The midstorey and understorey are open to dense with terrestrial ferns and sapling *Podocarpus* (Fig. 2D). The densest areas of understorey are predominately *Chusquea scandens* thickets. Finally, the lower portions of the forest below the entrance road are mesic with vine tangles and abundant terrestrial ferns.

The avifauna of the Cachil Valley, as a result of its geographic location, is an amalgam of the

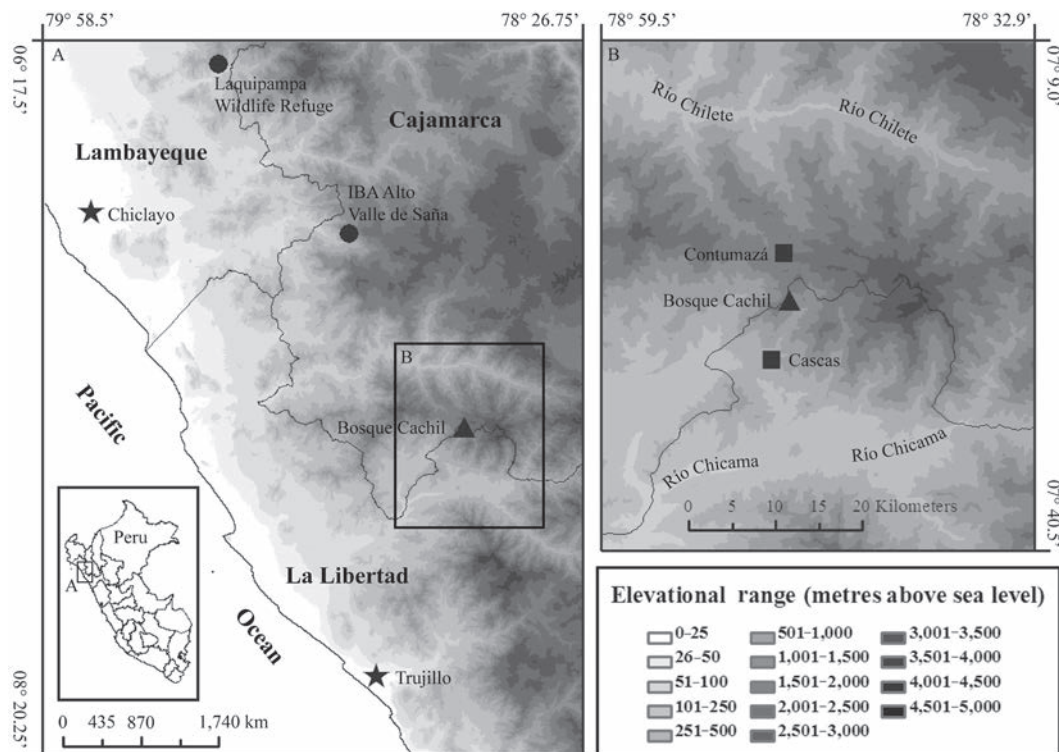


Figure 1. Panel A: Map of the southern Amotape-Huancabamba Zone in north-west Peru showing Bosque Cachil (triangle) relative to Chiclayo and Trujillo (star). Laquipampa Wildlife Refuge (LWR) and the Important Bird Area Alto Valle de Saña (AVS) are indicated by a circle. The box inlayed in panel A is the area enlarged in panel B. Panel B shows Bosque Cachil (triangle) relative to Cascas, La Libertad (square) and Contumazá, Cajamarca (square).

highly threatened Tumbesian, Southern Central Andes, and Peruvian High Andes Endemic Bird Areas (EBAs)¹⁸. Also, many bird species typical of humid forests on the east slope of the Andes occur in localised populations in the Cachil Valley. The uniqueness of the bird communities and the high level of threat from deforestation^{8,9,18,19,22} highlight the urgent need for information on the status and distribution of birds in this poorly studied region. We present an annotated list of the avifauna of the Cachil Valley based on surveys, mist-netting and specimen data compiled over a 16-year span.

Methods

We made ten visits to the Cachil Valley between 1997 and 2010 (4–11 May 1997, 6–8 December 2009, 23–24 January 2010, 6–26 July 2010, 19–21 August 2010, 25 May–27 June 2011, 2–7 July 2011, 11–14 August 2011, 29 October–2 November 2011 and 15–20 January 2012). During July 2010, we used mist-nets and daily surveys of birds to estimate relative species abundance. These methods were used in combination because each is associated with different detection biases¹³.

Up to 13 mist-nets (12 × 2 m; 32–36 mm mesh diameter) were opened before daylight (usually by 05h00) and closed after dusk (usually after 18h00) daily. Occasionally, 1–2 mist-nets were opened for brief periods at night to capture nocturnal birds. While open, mist-nets were checked every 20 minutes. We documented each species caught in mist-nets using digital photographs or a specimen for species known to be present at high density in the Cachil Valley. Specimens were deposited at the Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos (UNMSM), Centro de Ornitología y Biodiversidad (CORBIDI) and Museum of Southwestern Biology, University of New Mexico (MSB).

Daily surveys using the area-search method^{13,12} were conducted individually or by groups of 1–3 experienced observers familiar with the regional avifauna. The majority of surveys were conducted during periods of peak bird activity at c.05h30–08h00 and c.17h00–18h30. Observers counted birds seen and heard along existing trails at 2,400–2,650 m in the interior of humid *Podocarpus* forest, semi-humid scrub and semi-humid forest. Birds



Figure 2. (A) Black-eared Hemispingus *Hemispingus melanotis* ssp. *piurae* or *macrophrys*; note the solid black crown, broad white supercilium and grey nape band typical of both subspecies. (B) Mouse-coloured Tyrannulet *Phaeomyias murina tumbezana*; note the grey upperparts, buffy wingbars and yellow wash to belly which separate *P. m. tumbezana* from *P. m. inflava*. (C) Typical semi-humid forest habitat in the Cachil Valley. (D) Typical humid forest interior of Bosque Cachil. All photos by C Jonathan Schmitt.

were counted by sight and sound using binoculars and a Sony PCM-D50 recorder with Sennheiser ME-66 microphone, an Olympus VN-3100 recorder with internal microphone, and a Sony TCM 5000 recorder with a Sennheiser ME-66 microphone. All efforts were made to avoid double-counting individual birds and observers attempted to survey the area as systematically as possible. The total number of individuals mist-netted and detected on surveys during 6–26 July 2010 are provided as an index of relative abundance (Appendix 1). For poorly known species and species of special interest, we also recorded natural history observations when possible. Taxonomy and nomenclature follow the South American Checklist Committee¹⁴. Finally, copies of all sound-recordings made in the Cachil Valley by CJS are archived on xeno-canto.org.

Results

A total of 92 species of birds was recorded during the ten trips to the Cachil Valley, spanning a 16-year period. Sixty-five of these were documented

with specimens, and an additional 13 with either a photograph or a sound-recording. The remaining 14 species were not documented (Appendix 1). During our netting effort on 8–25 July 2010, we logged 2,544 total mist-net hours. These comprised 720 hours in humid *Podocarpus* forest and 1,824 hours in semi-humid scrub and forest. Twelve species were detected only in humid *Podocarpus* forest. An additional 42 species were found only in semi-humid montane scrub, forest and scrubby field edges on the west slope of the Cachil Valley. The remaining 38 species were detected throughout the Cachil Valley in all habitats (Appendix 1). We documented five species endemic to Peru (Unicoloured Tapaculo *Scytalpus unicolor*, Koepcke's Screech Owl *Megascops koepckeae*, Piura Chat-Tyrant *Ochthoeca piurae*, Rusty-crowned Tit-Spinetail *Leptasthenura pileata* and Black-necked Woodpecker *Colaptes atricollis*) and at least two endemic subspecies (Rusty-crowned Tit-Spinetail *Leptasthenura pileata cajabambae* and Rainbow Starfrontlet *Coeligena iris eva*).

We recorded range extensions for seven humid montane forest species that are typically found further north on the west slope of the Andes. Southward range extensions for three of these species, White-rumped Hawk *Parabuteo leucorrhous*, Rufous-banded Owl *Ciccaba albitarsis* and Scaled Antpitta *Grallaria guatemalensis*, were c.100 km¹⁷, while range extensions for the remaining four species, Mountain Velvetbreast *Lafresnaya lafresnayi*, Chestnut-crowned Antpitta *Grallaria ruficapilla*, Tawny-rumped Tyrannulet *Phyllomyias uropygialis* and Grey-browed Brush Finch *Arremon assimilis*, were c.30 km south of the west Andean portion of their known ranges¹⁷. In addition, the discovery of *Scytalopus unicolor* represents the first well-documented record for the Pacific slope of the west Andes and a c.80–90 km range extension north-west. We found Fasciated Wren *Campylorhynchus fasciatus* and Slaty-backed Nightingale-Thrush *Catharus fuscescens* c.1,000 m higher in elevation than reported previously for the west slope in Peru¹⁷. Similarly, we found Mouse-coloured Tyrannulet *Phaeomyias murina* c.500 m higher than reported previously for the west slope in Peru¹⁷.

Species accounts

Koepcke's Screech Owl *Megascops koepckeae*

We detected this poorly known species in humid *Podocarpus* forest, semi-humid forest, and 1–2 m-tall semi-humid scrub with *Eucalyptus* trees. In response to playback on 25 July 2010, a presumed male gave a 2.5–3.0-second series of c.18 rapid hoots with a mean pace of one series every nine seconds for >6 minutes (XC75957). Only arthropod remains comprising insects (Coleoptera), large spiders and millipedes were identified in stomach contents of four specimens.

Scaled Antpitta *Grallaria guatemalensis*

Our observation of *G. guatemalensis* suggests it is rare or extremely difficult to detect in humid *Podocarpus* forest of the Cachil Valley. On 23 January 2010, song by one individual was recorded by JTC at 2,500 m in the interior of humid *Podocarpus* forest just above the entrance road on a cloudy day with rain. JTC did not detect this species during visits on 6–8 December 2009 and 19–21 August 2010, and it was not detected on 4–11 May 1997 and 6–26 July 2010. Nevertheless, JTC's recording documents a range extension of c.100 km south and an upslope extension of 750 m¹⁷.

Unicoloured Tapaculo *Scytalopus unicolor*

This poorly known, narrowly distributed species¹⁷ was only recently elevated to species status based on vocal evidence⁶. We found it in the Cachil Valley at 2,400–2,950 m. *S. unicolor* is known

from similar elevations in the Marañón drainage of La Libertad^{16,17}, and has been reported from the Pacific slope of the west Andes in southern Cajamarca^{10,24}. However, previous reports from the Pacific slope did not address vocalisations, raising the possibility of confusion with the near-identical Blackish Tapaculo *S. latrans subcinereus* which also occurs in southern Cajamarca at similar elevations^{6,17}. The presence of *S. unicolor* in the Cachil Valley represents a range extension to the north-west of c.80 km and 90 km respectively from the Cajabamba and Huamachuco localities¹⁶.

We detected most individuals in *Chusquea scandens* or dense undergrowth within humid *Podocarpus* forest and semi-humid scrub. Individuals usually foraged in pairs <1 m above ground and behaved like other *Scytalopus*¹⁷. Body mass, an important character for identification of *Scytalopus*¹¹, is unlikely to have been recorded previously for this species (N. K. Krabbe pers. comm.). We found that females averaged 14.88 g (13.90–16.47 g, S.D.= 1.04 g, *N*=5) and males averaged 16.39 g (16.18–16.60 g, S.D.= 0.30, *N*=2).

Vocalisations recorded in the Cachil Valley were similar to descriptions in the literature^{6,17} and were confirmed as *S. unicolor* by N. K. Krabbe, T. S. Schulenberg & D. F. Lane (pers. comm.). Songs consisted of multiple accelerating notes, each descending and becoming shorter during the phrase. The first overtone of each note was clearly louder than the fundamental overtone as described elsewhere⁶ (XC75847). Although we did occasionally hear song (especially in response to playback) that consisted of continually repeated phrases of 3–6 notes as previously described^{6,17}, we noted that most song, and particularly natural song, was given in an accelerating counting rhythm. Counting songs began with c.0.1-second phrases comprising one note and rhythmically accelerated to 5–12 notes per phrase in a 1,2,2,3,3,3,...6,6,6,6,6,6..., or similar pattern (XC75844). As the number of notes per phrase increased, the phrases also grew to 0.4–0.65 seconds. In longer songs, the initial part accelerated rhythmically until reaching a steady pace of continually repeated series' of 3–6 notes.

Mouse-coloured Tyrannulet *Phaeomyias murina tumbezana*

We mist-netted one at 2,550 m in semi-humid scrub on the west slope of the Cachil Valley. The specimen (MSB 35328) was identified as *P. m. tumbezana* based on comparison with four specimens (MSB 34711, 34719, 34751, 34754) of *P. m. inflava* collected near Virú, La Libertad. Compared to the *inflava* specimens, the individual from the Cachil Valley had greyer upperparts, chin, upper breast and head-sides. The wingbars were more buffy and pronounced in the Cachil specimen than the *P. m. inflava*. Additionally, the Cachil

Valley specimen had a yellow wash to the lower belly, which was absent in the *P. m. inflava* (Fig. 2B). These differences are consistent with plates¹⁷, and a detailed description². The presence of this subspecies in the Cachil Valley was unexpected as it is currently known from further north in Tumbes and northern Piura, and it was previously not known above 2,000 m¹⁷. Its presence in the Cachil Valley suggests that *tumbezana* occurs further south than previously known, where it may occupy semi-humid scrub at higher elevations than *inflava*.

Piura Chat-Tyrant *Ochthoeca piurae*

We mist-netted, observed, photographed and sound-recorded endemic *O. piurae* in semi-humid forest on the west slope of the Cachil Valley. The semi-humid forest consisted of tall dense shrubbery, various trees as tall as 4 m, scattered columnar cacti and abundant *Tillandsia* sp. bromeliads. Interestingly, in these areas *O. piurae* and White-browed Chat-Tyrant *O. leucophrys* were syntopic. The presence of *O. piurae* in the Cachil Valley is significant as this species is known from relatively few localities^{7,17} and is perhaps more widespread than previously thought.

Black-eared Hemispingus *Hemispingus melanotis*

We detected this species throughout the Cachil Valley. We were unable to identify individuals to subspecies; they represent either *piurae* or *macrophrys*, each narrowly endemic to the west slope of the Andes in north-west Peru. Specimens from the Cachil Valley had solid black crowns, broad white supercilia and grey nape bands typical of *H. m. piurae* and *H. m. macrophrys* (Fig. 2A). These characters differ from the solid grey crown and slight or absent supercilium of *H. m. melanotis* of the east slope north of the Marañón and *H. m. berlepschi* of the east slope south of the Marañón¹⁷. *H. m. piurae* occurs in north-west Peru as far south as Chugur and Nancho, Cajamarca²⁵ while *H. m. macrophrys* is known from the type locality at Sunchubamba in southernmost Cajamarca¹⁰. The Cachil Valley lies roughly equidistant between these localities, and within the Chicama watershed, where the type locality for *H. m. macrophrys* is located. *H. m. piurae* is described as having a narrow grey nape band between the head and mantle⁵, while *H. m. macrophrys* has a conspicuous nape band formed by a broad grey nape and grey neck-sides¹⁰. Individuals from the Cachil Valley had grey nape bands, but without comparative material of *piurae* and *macrophrys*, we hesitate to identify them to subspecies.

Discussion

As a result of its proximity to the Tumbesian dry forests, humid forests of north-west Peru and the high Peruvian Andes, the Cachil Valley supports

a unique avifauna with overlap between species typical of the Tumbesian, Southern Central Andes, and Peruvian High Andes Endemic Bird Areas (EBAs). For example, *O. piurae*, Bay-crowned Brush Finch *Atlapetes seebohmi* and Three-banded Warbler *Basileuterus trifasciatus* are typical of the Tumbesian EBA, *Coeligena iris* and Purple-throated Sunangel *Heliangelus viola* are typical of the Southern Central Andes EBA⁴, and *Leptasthenura pileata* is typical of the Peruvian High Andes EBA¹⁸. Additionally, the presence of the Peruvian endemics *Megascops koepckeae*, *Scytalopus unicolor* and *Colaptes atricollis* add to the uniqueness of the area's avifauna and emphasise its importance for conservation. The overall diversity of 92 species in the Cachil appears slightly lower than other valleys in the western Andes of north-west Peru^{1,2}. Specifically, 103 species were reported from the Important Bird Area (IBA) Alto Valle del Saña¹, which lies in the upper Saña and Chancay valleys c.70 km north-west of the Cachil Valley. One hundred and eighty-seven species have been reported from Laquipampa Wildlife Refuge (LWR) in the upper La Leche Valley c.140 km north-west of the Cachil Valley². The differences in overall diversity are entirely attributable to the small survey area at Cachil and the correspondingly narrow range of elevations and habitats.

We suggest that more field work be conducted in the Cachil Valley above and below the 2,400–2,700 m core elevational range of the surveys reported here. Additionally, efforts to systematically survey other relict patches of humid or semi-humid forest in south-west Cajamarca and adjacent La Libertad will be essential to elucidate the conservation status of bird populations in the region. Based on the survey presented here, the uniqueness, isolation and apparent vulnerability of the avifauna at Bosque Cachil may warrant its recognition as part of a regional conservation area for birds.

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Appendix I. Ninety-two bird species detected in the Cachil Valley. Relative abundance is presented as two categories: mist-netting and surveys. The former is a measure of the total number of individuals captured on 6–26 July 2010, and the second the number of individuals detected per day during surveys on 6–26 July 2010 (* = the species was only detected on visits other than 6–26 July 2010). Habitat type where the majority of individuals of each species were reported is abbreviated as P: humid *Podocarpus* forest; S: semi-humid scrub and forest; and B: throughout the Cachil Valley in both humid *Podocarpus* forest and semi-humid scrub and forest. Documentation: SP: specimen; P: photograph; R: sound-recording; and V: seen or heard only. Species also reported from the Important Bird Area Alto Valle del Saña (AVS)¹ and Laquipampa Wildlife Refuge (LWR)² are indicated with an X.

		Relative abundance					
		Mist-netting	Surveys	Habitat	Documentation	AVS	LWR
TINAMIDAE							
Andean Tinamou	<i>Nothoprocta pentlandii</i>	3	3	S	SP		X
CATHARTIDAE							
Turkey Vulture	<i>Cathartes aura</i>	0	5	B	V	X	X
ACCIPITRIDAE							
Sharp-shinned Hawk	<i>Accipiter striatus</i>	*	*	B	P,V		X
Roadside Hawk	<i>Rupornis magnirostris</i>	0	1	B	R,V	X	
Harris's Hawk	<i>Parabuteo unicinctus</i>	*	*	B	P,V	X	X
White-rumped Hawk	<i>Parabuteo leucorhous</i>	0	4	P	P,R,V		X
Variable Hawk	<i>Geranoaetus polyosoma</i>	0	10	B	P,V	X	X
Black-chested Buzzard-Eagle	<i>Geranoaetus melanoleucus</i>	0	1	B	V		X
COLUMBIDAE							
Croaking Ground Dove	<i>Columbina cruziana</i>	*	*	S	V		X
Band-tailed Pigeon	<i>Patagioenas fasciata</i>	2	70	B	SP,R,V	X	
Eared Dove	<i>Zenaidura macroura</i>	0	19	S	R,V	X	
White-tipped Dove	<i>Leptotila verreauxi decolor</i>	3	21	S	SP,R,V	X	X
CUCULIDAE							
Groove-billed Ani	<i>Crotaphaga sulcirostris</i>	*	*	S	V	X	X
STRIGIDAE							
Koepcke's Screech Owl	<i>Megascops koepckeae</i>	4	20	B	SP,R,V		X
Rufous-banded Owl	<i>Ciccaba albitarsis</i>	0	3	P	R,V	X	
Peruvian Pygmy Owl	<i>Glauclium peruanum</i>	1	1	B	SP		X
CAPRIMULGIDAE							
Band-winged Nightjar	<i>Caprimulgus longirostris atripunctatus</i>	0	10	S	SP,R,V		
APODIDAE							
Chestnut-collared Swift	<i>Streptoprocne rutila</i>	0	55	B	V		
White-collared Swift	<i>Streptoprocne zonaris</i>	0	450	B	V	X	X
TROCHILIDAE							
Sparkling Violetear	<i>Colibri coruscans</i>	51	108	S	SP,P,R,V	X	X
Purple-throated Sunangel	<i>Helianthus viola</i>	17	28	B	SP,R,V	X	
Speckled Hummingbird	<i>Adelomyia melanogenys maculata</i>	58	75	B	SP,P,R,V	X	X
Green-tailed Trainbearer	<i>Lesbia nuna</i>	14	20	S	SP,V	X	X
Shining Sunbeam	<i>Aglaeactis cupripennis</i>	11	34	S	SP,P,V	X	

		Relative abundance		Habitat	Documentation	AVS	LWR
		Mist-netting	Surveys				
Rainbow Starfrontlet	<i>Coeligena iris eva</i>	43	62	B	SP,P,V	X	X
Mountain Velvetbreast	<i>Lafresnaya lafresnayi</i>	3	14	B	SP,V		
Giant Hummingbird	<i>Patagona gigas</i>	0	1	S	V		
Purple-collared Woodstar	<i>Myrtis fanny</i>	0	2	S	R,V		
White-bellied Woodstar	<i>Chaetocercus mulsant</i>	5	10	S	SP,V	X	
Amazilia Hummingbird	<i>Amazilia amazilia leucophaea</i>	1	2	S	SP,V		X
PICIDAE							
Smoky-brown Woodpecker	<i>Picoides fumigatus</i>	6	13	P	SP,R,V	X	X
Black-necked Woodpecker	<i>Colaptes atricollis</i>	3	5	S	SP,R,V		
FALCONIDAE							
American Kestrel	<i>Falco sparverius</i>	0	2	B	V	X	X
Peregrine Falcon	<i>Falco peregrinus</i>	0	4	B	V		X
PSITTACIDAE							
Scarlet-fronted Parakeet	<i>Aratinga wagleri</i>	0	22	B	V		
Pacific Parrotlet	<i>Forpus coelestis</i>	0	2	S	V		X
Andean Parakeet	<i>Bolborhynchus orbynesius</i>	8	313	S	SP,R,V		
GRALLARIIDAE							
Scaled Antpitta	<i>Grallaria guatemalensis</i>	*	*	P	R		X
Chestnut-crowned Antpitta	<i>Grallaria ruficapilla</i>	5	45	B	SP,R,V	X	X
RHINOCRYPTIDAE							
Unicoloured Tapaculo	<i>Scytalopus unicolor</i>	7	138	B	SP,R,V	X	X
FURNARIIDAE							
Rusty-crowned Tit-Spinetail	<i>Leptasthenura pileata cajabambae</i>	8	8	S	SP		
Line-cheeked Spinetail	<i>Cranioleuca antisiensis</i>	2	135	B	SP,R,V	X	X
Azara's Spinetail	<i>Synallaxis azarae elegantior</i>	5	19	S	SP,R,V	X	X
TYRANNIDAE							
Tawny-rumped Tyrannulet	<i>Phylomyias uropygialis</i>	1	2	B	SP		
White-crested Elaenia	<i>Elaenia albiceps</i>	14	21	B	SP,P,R,V	X	
Southern Beardless Tyrannulet	<i>Camptostoma obsoletum</i>	0	10	S	SP,R,V	X	X
White-banded Tyrannulet	<i>Mecocerculus stictopterus</i>	17	185	P	SP,R,V	X	
White-throated Tyrannulet	<i>Mecocerculus leucophrys brunneomarginatus</i>	4	4	P	SP,V	X	
Black-crested Tit-Tyrant	<i>Anairetes nigrocristatus</i>	1	4	S	SP,R,V		
Yellow-billed Tit-Tyrant	<i>Anairetes flavirostris</i>	5	7	S	SP,V		
Mouse-coloured Tyrannulet	<i>Phaemyias murina tumbezana</i>	1	1	S	SP		X
Tawny-crowned Pygmy Tyrant	<i>Euscarthmus meloryphus fulviceps</i>	0	7	S	R,V		X
Tropical Pewee	<i>Contopus cinereus</i>	3	4	S	SP,R	X	X
Streak-throated Bush Tyrant	<i>Myiotheretes striaticollis</i>	2	7	S	SP,V	X	X
Jelski's Chat-Tyrant	<i>Ochthoeca jelskii</i>	10	23	B	SP,P,V	X	
Piura Chat-Tyrant	<i>Ochthoeca piurae</i>	3	8	S	SP,P,R,V		X
White-browed Chat-Tyrant	<i>Ochthoeca leucophrys</i>	1	1	S	SP		
Dusky-capped Flycatcher	<i>Myiarchus tuberculifer</i>	5	29	B	SP,R,V	X	X
COTINGIDAE							
Red-crested Cotinga	<i>Ampelion rubrocristatus</i>	13	27	B	SP,P,R,V	X	
VIREONIDAE							
Rufous-browed Peppershrike	<i>Cyclarhis gujanensis virenticeps</i>	9	86	B	SP,P,R,V	X	X
HIRUNDINIDAE							
Blue-and-white Swallow	<i>Pygochelidon cyanoleuca cyanoleuca</i>	5	235	B	SP,V	X	X
Brown-bellied Swallow	<i>Orochelidon murina murina</i>	0	75	B	R,V		
TROGLODYTIDAE							
House Wren	<i>Troglodytes aedon</i>	5	12	S	SP,R,V	X	X
Fasciated Wren	<i>Campylorhynchus fasciatus</i>	5	22	S	SP,R,V		X

		Relative abundance		Habitat	Documentation	AVS	LWR
		Mist-netting Surveys					
CINCLIDAE							
White-capped Dipper	<i>Cinclus leucocephalus leucocephalus</i>	1	1	P	SP		
TURDIDAE							
Swainson's Thrush	<i>Catharus ustulatus</i>	*	*	P	P		
Slaty-backed Nightingale-Thrush	<i>Catharus fuscater</i>	6	108	P	SP,P,R,V	X	X
Great Thrush	<i>Turdus fuscater</i>	3	25	B	R,V	X	X
Chiguanco Thrush	<i>Turdus chiguanco</i>	1	54	B	SP,R,V		
THRAUPIDAE							
Black-eared Hemispingus	<i>Hemispingus melanotis</i>	31	199	B	SP,R,V	X	
Rufous-chested Tanager	<i>Thlypopsis ornata</i>	8	18	S	SP,P,V		X
Blue-and-yellow Tanager	<i>Thraupis bonariensis</i>	6	10	B	SP,V		
Fawn-breasted Tanager	<i>Pipraeidea melanonota</i>	0	1	B	V		X
Blue-and-black Tanager	<i>Tangara vassorii vassorii</i>	23	101	B	SP,P,R,V	X	
Cinereous Conebill	<i>Conirostrum cinereum littorale</i>	10	15	S	SP,V	X	
Rusty Flowerpiercer	<i>Diglossa sittoides</i>	3	7	S	SP,V		X
Plushcap	<i>Catamblyrhynchus diadema</i>	2	12	P	SP,P,R,V		
Blue-black Grassquit	<i>Volatina jacarina</i>	0	12	S	V		X
Black-and-white Seedeater	<i>Sporophila luctuosa</i>	0	6	S	V		
Band-tailed Seedeater	<i>Catamenia analis</i>	9	17	S	SP,V		
INCERTAE SEDIS							
Golden-billed Saltator	<i>Saltator aurantirostris</i>	2	8	S	SP,R,V	X	X
EMBERIZIDAE							
Rufous-collared Sparrow	<i>Zonotrichia capensis</i>	32	67	S	SP,P,R,V	X	X
Grey-browed Brush Finch	<i>Arremon assimilis</i>	3	12	P	SP,R,V	X	X
Yellow-breasted Brush Finch	<i>Atlapetes latinuchus baroni</i>	9	26	S	SP,P,R,V	X	
Bay-crowned Brush Finch	<i>Atlapetes seebohmi</i>	14	31	S	SP,R,V		
CARDINALIDAE							
Hepatic Tanager	<i>Piranga flava</i>	3	5	B	SP,R,V	X	X
Golden-bellied Grosbeak	<i>Pheucticus chrysogaster</i>	6	30	S	SP,R,V	X	X
PARULIDAE							
Slate-throated Redstart	<i>Myioborus miniatus</i>	10	0	P	SP,R,V		X
Black-crested Warbler	<i>Basileuterus nigrocristatus</i>	13	92	B	SP,P,R,V		X
Three-banded Warbler	<i>Basileuterus trifasciatus</i>	5	38	B	SP,R,V	X	
ICTERIDAE							
Scrub Blackbird	<i>Dives warszewiczi</i>	2	13	S	SP,R,V		X
FRINGILLIDAE							
Hooded Siskin	<i>Sporagra magellanica</i>	16	40	S	SP,R,V	X	X